UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

FORM 10-K

Annual report pursuant to Section 13 or 15(d) of
the Securities Exchange Act of 1934

For the fiscal year ended December 31, 2020	Commission file number 1-5805

JPMorgan Chase & Co.

(Exact name of registrant as specified in its charter)

Delaware	13-2624428
(State or other jurisdiction of incorporation or organization)	(I.R.S. employer identification no.)
383 Madison Avenue,	
New York, New York	10179
(Address of principal executive offices)	(Zip Code)

Registrant's telephone number, including area code: (212) 270-6000
Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common stock	JPM	The New York Stock Exchange
Depositary Shares, each representing a one-four hundredth interest in a share of 6.10% Non-Cumulative Preferred Stock, Series AA	JPM PR G	The New York Stock Exchange
Depositary Shares, each representing a one-four hundredth interest in a share of 6.15% Non-Cumulative Preferred Stock, Series BB	JPM PR H	The New York Stock Exchange
Depositary Shares, each representing a one-four hundredth interest in a share of 5.75% Non-Cumulative Preferred Stock, Series DD	JPM PR D	The New York Stock Exchange
Depositary Shares, each representing a one-four hundredth interest in a share of 6.00% Non-Cumulative Preferred Stock, Series EE	JPM PR C	The New York Stock Exchange
Depositary Shares, each representing a one-four hundredth interest in a share of 4.75% Non-Cumulative Preferred Stock, Series GG	JPM PR J	The New York Stock Exchange
Alerian MLP Index ETNs due May 24, 2024	AMJ	NYSE Arca, Inc.
Guarantee of Callable Step-Up Fixed Rate Notes due April 26, 2028 of JPMorgan Chase Financial Company LLC	JPM/28	The New York Stock Exchange

Securities registered pursuant to Section 12(g) of the Act: None

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. ☐ Yes ☒ No

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. ☐ Yes ☒ No

Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. ☒ Yes ☐ No

Indicate by check mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). ☒ Yes ☐ No

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer," "smaller reporting company," and "emerging growth company" in Rule 12b-2 of the Exchange Act.

☒ Large accelerated filer ☐ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Indicate by check mark whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report. ☒ Yes ☐ No

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). ☐ Yes ☒ No

The aggregate market value of JPMorgan Chase & Co. common stock held by non-affiliates as of June 30, 2020: $383,953,778,298

Number of shares of common stock outstanding as of January 31, 2021: 3,051,506,436

Documents incorporated by reference: Portions of the registrant's Proxy Statement for the annual meeting of stockholders to be held on May 18, 2021, are incorporated by reference in this Form 10-K in response to Items 10, 11, 12, 13 and 14 of Part III.

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Item 1. Business.

Overview

JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm", NYSE: JPM), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the United States of America ("U.S."), and has operations worldwide; JPMorgan Chase had $3.4 trillion in assets and $279.4 billion in stockholders' equity as of December 31, 2020. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers in the U.S. and many of the world's most prominent corporate, institutional and government clients.

JPMorgan Chase's principal bank subsidiary is JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), a national banking association with U.S. branches in 38 states and Washington, D.C. as of December 31, 2020. JPMorgan Chase's principal non-bank subsidiary is J.P. Morgan Securities LLC ("J.P. Morgan Securities"), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm's principal operating subsidiary outside the U.S. is J.P. Morgan Securities plc, a U.K.-based subsidiary of JPMorgan Chase Bank, N.A.

The Firm's website is www.jpmorganchase.com. JPMorgan Chase makes available on its website, free of charge, annual reports on Form 10-K, quarterly reports on Form 10-Q and current reports on Form 8-K pursuant to Section 13(a) or Section 15(d) of the Securities Exchange Act of 1934, as soon as reasonably practicable after it electronically files or furnishes such material to the U.S. Securities and Exchange Commission (the "SEC") at www.sec.gov. JPMorgan Chase also makes additional information about the Firm available on the Investor Relations section of its website at https://www.jpmorganchase.com/corporate/investor-relations/investor-relations.htm. The Firm has adopted, and posted on its website, a Code of Conduct for all employees of the Firm and a Code of Ethics for its Chairman and Chief Executive Officer, Chief Financial Officer, Principal Accounting Officer and all other professionals of the Firm worldwide serving in a finance, accounting, treasury, tax or investor relations role.

Business segments

For management reporting purposes, JPMorgan Chase's activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm's consumer business is the Consumer & Community Banking ("CCB") segment. The Firm's wholesale business segments are the Corporate & Investment Bank ("CIB"), Commercial Banking ("CB"), and Asset & Wealth Management ("AWM").

A description of the Firm's business segments and the products and services they provide to their respective client bases is provided in the "Business segment results" section of Management's discussion and analysis of financial condition and results of operations ("Management's discussion and analysis" or "MD&A"), beginning on page 46 and in Note 32.

Competition

JPMorgan Chase and its subsidiaries and affiliates operate in highly competitive environments. Competitors include other banks, brokerage firms, investment banking companies, merchant banks, hedge funds, commodity trading companies, private equity firms, insurance companies, mutual fund companies, investment managers, credit card companies, mortgage banking companies, trust companies, securities processing companies, automobile financing companies, leasing companies, e-commerce and other internet-based companies, financial technology companies, and other companies engaged in providing similar products and services. The Firm's businesses generally compete on the basis of the quality and variety of the Firm's products and services, transaction execution, innovation, reputation and price. Competition also varies based on the types of clients, customers, industries and geographies served. With respect to some of its geographies and products, JPMorgan Chase competes globally; with respect to others, the Firm competes on a national or regional basis. New competitors in the financial services industry continue to emerge, including firms that offer products and services solely through the internet and non-financial companies that offer payment or loan products.

Human capital

JPMorgan Chase believes that its long-term growth and success depend on its ability to attract, develop and retain a high-performing and diverse workforce, with inclusion and accessibility as key components of the way the Firm does business. The information provided below relates to JPMorgan Chase's full-time and part-time employees and does not include the Firm's contractors.

Global workforce

JPMorgan Chase had 255,351 employees in 62 countries as of December 31, 2020, with over 60% of those employees located in the U.S. As of December 31, 2020, of the Firm's global employees that self-identified, 49% self-identified as women and of the Firm's U.S.-based employees that self-identified, 52% self-identified as ethnically diverse (defined as all Equal Employment Opportunity Commission classifications other than white). In addition, of the Firm's U.S.-based employees, 3% self-identified as LGBT+, 3% as military veterans and 4% as people with disabilities. The following table presents the distribution of the Firm's global workforce by region and by LOB as of December 31, 2020:

Employee Breakdown by Region	
Region	**Employees**
North America	162,670
Europe/Middle East/Africa	22,346
Latin America/Caribbean	3,691
Asia-Pacific	66,644
Total Firm	**255,351**

Employee Breakdown by LOB	
LOB	**Employees**
CCB	122,894
CIB	61,733
CB	11,675
AWM	20,683
Corporate	38,366
Total Firm	**255,351**

Firm culture

The foundations of JPMorgan Chase's culture are its core values and How We Do Business Principles, which are fundamental to the Firm's success and are represented by four central corporate tenets: exceptional client service; operational excellence; a commitment to integrity, fairness and responsibility; and cultivation of a great team and winning culture. The Firm maintains its focus on its culture of inclusion and respect, which is reinforced by increasing employee awareness and education through engagement, communication and training. An important part of these efforts includes the Firm's Business Resource Groups, which are groups of employees who support JPMorgan Chase's diversity and inclusion strategies by leveraging the unique perspectives of their members.

Attracting and retaining employees

The goal of JPMorgan Chase's recruitment efforts is to attract and hire talented individuals in all roles and at all career levels. The Firm strives to provide both external candidates and internal employees who are seeking a different role with challenging and stimulating career opportunities. These opportunities range from internship training programs for students to entry-level, management and executive careers. During 2020, approximately two thirds of the Firm's employment opportunities were filled by external candidates, with the remainder filled by existing employees.

Diversity is a critical area of focus throughout the Firm's hiring process. JPMorgan Chase engages in efforts aimed at hiring diverse talent, including initiatives focused on gender, underrepresented ethnic groups, LGBT+ individuals, people with disabilities, veterans and others. The Firm's Advancing Black Pathways program, which seeks to leverage JPMorgan Chase's business and philanthropic resources to accelerate economic opportunity for Black Americans by strengthening education and job training, growing careers, investing in entrepreneurship, and building wealth, includes initiatives to increase representation of talented Black individuals across the Firm.

JPMorgan Chase offers a competitive fellowship program that seeks to attract accomplished individuals who have taken a career break and wish to return to the workforce. In addition, where appropriate, the Firm's hiring practices focus on the skills of a job candidate rather than degrees held.

Developing employees

JPMorgan Chase is committed to supporting the professional development and career growth of its employees. The Firm offers comprehensive training programs to employees, with over seven million hours of training delivered globally in 2020. Leadership Edge, the Firm's global leadership development program that is offered to managers, is focused on creating one Firm leadership culture.

Compensation and benefits

The Firm provides comprehensive and market-competitive compensation and benefits programs. JPMorgan Chase's compensation philosophy provides the guiding principles that drive compensation-related decisions across the Firm, including pay-for-performance, responsiveness and alignment with shareholder interests, reinforcement of the Firm's culture and How We Do Business Principles, and integration of risk, controls and conduct considerations. The Firm's commitment to diversity and inclusion for all employees includes compensation review processes that seek to ensure that the Firm's employees are paid equitably for the work they do.

The Firm is also committed to supporting employees' well-being. JPMorgan Chase offers a comprehensive benefits and wellness package to employees and their families, including healthcare coverage, retirement benefits, life and disability insurance, on-site health and wellness centers, employee assistance programs, competitive vacation and leave policies, backup child care arrangements, tuition reimbursement programs, mental health counseling and support, and financial coaching. The Firm has taken action to protect and support its employees during the COVID-19 pandemic, including by implementing health and safety protocols and providing additional benefits.

Supervision and regulation

The Firm is subject to extensive and comprehensive regulation under U.S. federal and state laws, as well as the applicable laws of the jurisdictions outside the U.S. in which the Firm does business.

Financial holding company:

Consolidated supervision. JPMorgan Chase & Co. is a bank holding company ("BHC") and a financial holding company ("FHC") under U.S. federal law, and is subject to comprehensive consolidated supervision, regulation and examination by the Board of Governors of the Federal Reserve System (the "Federal Reserve"). The Federal Reserve acts as the supervisor of the consolidated operations of BHCs, and certain of JPMorgan Chase's subsidiaries are also regulated directly by additional authorities based on the activities or licenses of those subsidiaries.

JPMorgan Chase's national bank subsidiary, JPMorgan Chase Bank, N.A., is supervised and regulated by the Office of the Comptroller of the Currency ("OCC") and, with respect to certain matters, by the Federal Deposit Insurance Corporation (the "FDIC").

JPMorgan Chase's U.S. broker-dealers are supervised and regulated by the Securities and Exchange Commission ("SEC") and the Financial Industry Regulatory Authority ("FINRA"), and subsidiaries of the Firm that engage in certain futures-related and swaps-related activities are supervised and regulated by the Commodity Futures Trading Commission ("CFTC"). J.P. Morgan Securities plc is a U.K.-based bank regulated by the U.K. Prudential Regulation Authority (the "PRA") and the U.K. Financial Conduct Authority ("FCA").

The Firm's other non-U.S. subsidiaries are regulated by the banking, securities, prudential and conduct regulatory authorities in the countries in which they operate.

Permissible business activities. The Bank Holding Company Act restricts BHCs from engaging in business activities other than the business of banking and certain closely-related activities. FHCs can engage in a broader range of financial activities. The Federal Reserve has the authority to limit an FHC's ability to conduct otherwise permissible activities if the FHC or any of its depository institution subsidiaries ceases to meet applicable eligibility requirements. The Federal Reserve may also impose corrective capital and/or managerial requirements on the FHC, and if deficiencies are persistent, may require divestiture of the FHC's depository institutions. If any depository institution controlled by an FHC fails to maintain a satisfactory rating under the Community Reinvestment Act, the Federal Reserve must prohibit the FHC and its subsidiaries from engaging in any activities other than those permissible for BHCs.

Capital and liquidity requirements. The Federal Reserve establishes capital, liquidity and leverage requirements for JPMorgan Chase that are generally consistent with the international Basel III capital and liquidity framework and evaluates the Firm's compliance with those requirements. The OCC establishes similar requirements for JPMorgan Chase Bank, N.A.

Banking supervisors globally continue to refine and enhance the Basel III capital framework for financial institutions. In January 2019, the Basel Committee issued "Minimum capital requirements for market risk." The Basel Committee expects national regulators to implement these revised market risk requirements for banking organizations in their jurisdictions by January 2023, in line with the other elements of the Basel III Reforms. U.S. banking regulators have announced their support for the issuance of the Basel III Reforms and are considering how to appropriately apply such reforms in the U.S. In November 2019, the U.S. banking regulators adopted a rule implementing "Standardized Approach for Counterparty Credit Risk" ("SA-CCR"), which became effective in April 2020 and which has a mandatory compliance date of January 1, 2022.

On October 20, 2020, the federal banking agencies issued a final rule for the net stable funding ratio ("NSFR") under which large banking organizations such as the Firm will be required to maintain an NSFR of at least 100% on an ongoing basis. The final NSFR rule will become effective on July 1, 2021.

Refer to Capital Risk Management on pages 91-101 and Liquidity Risk Management on pages 102–108 .

Stress tests. As a large BHC, JPMorgan Chase is subject to supervisory stress testing administered by the Federal Reserve as part of the Federal Reserve's annual Comprehensive Capital Analysis and Review ("CCAR") framework. The Firm must conduct annual company-run stress tests and must also submit an annual capital plan to the Federal Reserve, taking into account the results of separate stress tests designed by the Firm and the Federal Reserve. The Federal Reserve uses the results under the severely adverse scenario from its supervisory stress test to determine the Firm's "stress capital buffer" ("SCB") requirement for the coming year, which forms part of the Firm's applicable capital buffers. The Firm is required to file its annual CCAR submission on April 5, 2021. The Federal Reserve will notify the Firm of its indicative SCB requirement by June 30, 2021 and final SCB requirement by August 31, 2021. The Firm's final SCB requirement will become effective on October 1, 2021. The OCC requires

JPMorgan Chase Bank, N.A. to perform separate, similar stress tests annually. The Firm publishes each year the results of the annual stress tests for the Firm and JPMorgan Chase Bank, N.A. under the supervisory "severely adverse" scenarios provided by the Federal Reserve and the OCC.

Refer to Capital Risk Management on pages 91-101 for more information concerning the Firm's CCAR.

Enhanced prudential standards. As part of its mandate to identify and monitor risks to the financial stability of the U.S. posed by large banking organizations, the Financial Stability Oversight Council ("FSOC") recommends prudential standards and reporting requirements to the Federal Reserve for systemically important financial institutions ("SIFIs"), such as JPMorgan Chase. The Federal Reserve has adopted several rules to implement those heightened prudential standards, including rules relating to risk management and corporate governance of subject BHCs. JPMorgan Chase is required under these rules to comply with enhanced liquidity and overall risk management standards, including oversight by the board of directors of risk management activities.

Resolution and recovery. The Firm is required to submit periodically to the Federal Reserve and the FDIC a plan for resolution under Title I of the Dodd-Frank Wall Street Reform and Consumer Protection Act ("Dodd-Frank Act") in the event of material distress or failure (a "resolution plan"). In 2019, the FDIC and Federal Reserve revised the regulations governing resolution plan requirements, and on the basis of those revisions, the Firm's resolution plan submissions will alternate between "targeted" and "full" plans. The Firm's next "targeted" resolution plan is due to be filed on or before July 1, 2021. The Firm also has a comprehensive recovery plan, updated annually, summarizing the actions it would take to avoid failure by remaining well-capitalized and well-funded in the case of an adverse event.

JPMorgan Chase Bank, N.A. is also required to provide a resolution plan to the FDIC. The FDIC has proposed changes to its rules relating to the resolution plans of insured depository institutions ("IDIs") in a 2019 advanced notice of proposed rulemaking. In January 2021, the FDIC announced that the moratorium on the preparation of resolution plans for the IDIs has ended. Banks will be given notice of at least 12 months prior to the required submission date for their IDI resolution plans. The OCC has published guidelines establishing standards for recovery planning by insured national banks, and JPMorgan Chase Bank, N.A. has submitted its recovery plan to the OCC. Certain of the Firm's non-U.S. subsidiaries are also subject to local resolution and recovery planning requirements.

Orderly liquidation authority. Certain financial companies, including JPMorgan Chase and certain of its subsidiaries, can also be subjected to resolution under an "orderly liquidation authority." The U.S. Treasury Secretary, in consultation with the President of the United States, must first make certain determinations concerning extraordinary financial distress and systemic risk, and action must be recommended by the FDIC and the Federal Reserve. Absent such actions, the Firm, as a BHC, would remain subject to resolution under the Bankruptcy Code. The FDIC has issued a draft policy statement describing its "single point of entry" strategy for resolution of SIFIs under the orderly liquidation authority, which seeks to keep operating subsidiaries of a BHC open and impose losses on shareholders and creditors of the BHC in receivership according to their statutory order of priority.

Holding company as a source of strength. JPMorgan Chase & Co. is required to serve as a source of financial strength for its depository institution subsidiaries and to commit resources to support those subsidiaries, including when directed to do so by the Federal Reserve.

Regulation of acquisitions. Acquisitions by BHCs and their banks are subject to multiple requirements established by the Federal Reserve and the OCC. For example, FHCs and BHCs are required to obtain the approval of the Federal Reserve before they may acquire more than 5% of the voting shares of an unaffiliated bank. In addition, acquisitions by financial companies are prohibited if, as a result of the acquisition, the total liabilities of the financial company would exceed 10% of the total liabilities of all financial companies. Furthermore, for certain acquisitions, the Firm must provide written notice to the Federal Reserve prior to acquiring direct or indirect ownership or control of any voting shares of any company with over $10 billion in assets that is engaged in activities that are "financial in nature."

Volcker Rule. The Volcker Rule prohibits banking entities, including the Firm, from engaging in certain "proprietary trading" activities, subject to exceptions for underwriting, market-making, risk-mitigating hedging and certain other activities. The Volcker Rule also limits the sponsorship of, and investment in, "covered funds," and imposes limits on certain transactions between the Firm and covered funds for which a JPMorgan Chase entity serves as the investment manager, investment advisor, commodity trading advisor or sponsor, as well as certain covered funds controlled by such funds.

Ongoing obligations. The Firm remains subject to a consent order entered into with the Federal Reserve concerning foreign exchange trading. The Firm is also subject to obligations under the terms of a Deferred Prosecution Agreement entered into with the Department of Justice on September 29, 2020 relating to precious metals and U.S. Treasuries markets investigations as well as under a related order issued by the CFTC.

Subsidiary banks:

The activities of JPMorgan Chase Bank, N.A., the Firm's principal subsidiary bank, are limited to those specifically authorized under the National Bank Act and related interpretations of the OCC. The OCC has authority to bring an enforcement action against JPMorgan Chase Bank, N.A. for unsafe or unsound banking practices, which could include limiting JPMorgan Chase Bank, N.A.'s ability to conduct otherwise permissible activities, or imposing corrective capital or managerial requirements on the bank.

FDIC deposit insurance. The FDIC deposit insurance fund provides insurance coverage for certain deposits and is funded through assessments on banks, such as JPMorgan Chase Bank, N.A.

FDIC powers upon a bank insolvency. Upon the insolvency of JPMorgan Chase Bank, N.A., the FDIC could be appointed as conservator or receiver under the Federal Deposit Insurance Act. The FDIC has broad powers to transfer assets and liabilities without the approval of the institution's creditors.

Prompt corrective action. The Federal Deposit Insurance Corporation Improvement Act of 1991 requires the relevant federal banking regulator to take "prompt corrective action" with respect to a depository institution if that institution does not meet certain capital adequacy standards. The Federal Reserve is also authorized to take appropriate action against the parent BHC, such as JPMorgan Chase & Co., based on the undercapitalized status of any bank subsidiary. In certain instances, the BHC would be required to guarantee the performance of the capital restoration plan for its undercapitalized subsidiary.

OCC Heightened Standards. The OCC has established guidelines setting forth heightened standards for large banks, including minimum standards for the design and implementation of a risk governance framework for banks. Under these standards, a bank's risk governance framework must ensure that the bank's risk profile is easily distinguished and separate from that of its parent BHC for risk management purposes. The bank's board or risk committee is responsible for approving the bank's risk governance framework, providing active oversight of the bank's risk-taking activities, and holding management accountable for adhering to the risk governance framework.

Restrictions on transactions with affiliates. JPMorgan Chase Bank, N.A. and its subsidiaries are subject to restrictions imposed by federal law on extensions of credit to, investments in stock or securities of, and derivatives, securities lending and certain other transactions with, JPMorgan Chase & Co. and certain other affiliates. These restrictions prevent JPMorgan Chase & Co. and other affiliates from borrowing from such subsidiaries unless the loans are secured in specified amounts and comply with certain other requirements.

Dividend restrictions. Federal law imposes limitations on the payment of dividends by national banks, such as JPMorgan Chase Bank, N.A. Refer to Note 26 for the amount of dividends that JPMorgan Chase Bank, N.A. could pay, at January 1, 2021, to JPMorgan Chase without the approval of the banking regulators. The OCC and the Federal Reserve also have authority to prohibit or limit the payment of dividends of a bank subsidiary that they supervise if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the bank.

Depositor preference. Under federal law, the claims of a receiver of an IDI for administrative expense and the claims of holders of U.S. deposit liabilities (including the FDIC and deposits in non-U.S. branches that are dually payable in the U.S. and in a non-U.S. branch) have priority over the claims of other unsecured creditors of the institution, including depositors in non-U.S. branches and public noteholders.

Consumer supervision and regulation. JPMorgan Chase and JPMorgan Chase Bank, N.A. are subject to supervision and regulation by the Consumer Financial Protection Bureau ("CFPB") with respect to federal consumer protection laws, including laws relating to fair lending and the prohibition of unfair, deceptive or abusive acts or practices in connection with the offer, sale or provision of consumer financial products and services. The CFPB also has jurisdiction over small business lending activities with respect to fair lending and the Equal Credit Opportunity Act. As part of its regulatory oversight, the CFPB has authority to take enforcement actions against firms that offer certain products and services to consumers using practices that are deemed to be unfair, deceptive or abusive. The Firm's consumer activities are also subject to regulation under state statutes which are enforced by the Attorney General or empowered agency of each state.

Securities and broker-dealer regulation:
The Firm conducts securities underwriting, dealing and brokerage activities in the U.S. through J.P. Morgan Securities LLC and other non-bank broker-dealer subsidiaries, all of which are subject to regulations of the SEC, FINRA and the New York Stock Exchange, among others. The Firm conducts similar securities activities outside the U.S. subject to local regulatory requirements. In the U.K., those activities are conducted by J.P. Morgan Securities plc. Broker-dealers are subject to laws and regulations covering all aspects of the securities business, including sales and trading practices, securities offerings, publication of research reports, use of customer funds, the financing of client purchases, capital structure, record-keeping and retention, and the conduct of their directors, officers and employees. Refer to Broker-dealer regulatory capital on page 101 for information concerning the capital of J.P. Morgan Securities LLC and J.P. Morgan Securities plc.

Investment management regulation:
The Firm's asset and wealth management businesses are subject to significant regulation in jurisdictions around the world relating to, among other things, the safeguarding and management of client assets, offerings of funds and marketing activities. Certain of the Firm's subsidiaries are registered with, and subject to oversight by, the SEC as investment advisers and broker-dealers. The Firm's registered investment advisers are subject to the fiduciary and other obligations imposed under the Investment Advisers Act of 1940, as well as various state securities laws. The Firm's bank fiduciary activities are subject to supervision by the OCC.

Derivatives regulation:
The Firm is subject to comprehensive regulation of its derivatives businesses, including regulations that impose capital and margin requirements, require central clearing of standardized over-the-counter ("OTC") derivatives, mandate that certain standardized OTC swaps be traded on regulated trading venues, and provide for reporting of certain mandated information. JPMorgan Chase Bank, N.A., J.P. Morgan Securities LLC and J.P. Morgan Securities plc are registered with the CFTC as "swap dealers" and may be required to register with the SEC as "security-based swap dealers." As a result, these entities are or will be subject to a comprehensive regulatory framework applicable to their swap or security-based swap activities, including capital requirements, rules requiring the collateralization of uncleared swaps and security-based swaps, rules regarding segregation of counterparty collateral, business conduct and documentation standards, record-keeping and reporting obligations, and anti-fraud and anti-manipulation requirements. Similar requirements have also been implemented in the EU under the European Market Infrastructure Regulation ("EMIR") and MiFID II.

J.P. Morgan Securities LLC is also registered with the CFTC as a futures commission merchant and is a member of the National Futures Association.

Data, privacy and security regulation:
The Firm and its subsidiaries are subject to numerous U.S. federal, state and local as well as international laws and regulations concerning data that are central to the Firm's businesses, functions and operations. These include laws and regulations relating to data protection, privacy, data use, confidentiality, secrecy, cybersecurity, technology, artificial intelligence, data localization and storage, data retention and destruction, disclosure, transfer, availability, integrity and other similar matters. The application, interpretation and enforcement of these laws and regulations are often uncertain, particularly in light of new and rapidly evolving data-driven technologies and significant increase in computing power. These laws and regulations are evolving at a rapid pace, remain a focus of regulators globally, may be enforced by private parties or government bodies, and will continue to have a significant impact on all of the Firm's businesses and operations. For example, the EU's General Data Protection Regulation ("GDPR") includes a complex range of obligations and operational requirements for companies that receive or process personal data of persons in the EU and provides for significant penalties for non-compliance. In addition, there are a number of legislative proposals in the EU, the U.S. (at both the federal and state level) as well as other jurisdictions that could impose new obligations or limitations in these areas that could affect the Firm's businesses.

The Bank Secrecy Act and Economic Sanctions:
The Bank Secrecy Act ("BSA") requires all financial institutions, including banks and securities broker-dealers, to establish a risk-based system of internal controls reasonably designed to prevent money laundering and the financing of terrorism. The BSA includes a variety of record-keeping and reporting requirements, as well as due diligence/know-your-customer documentation requirements. The Firm is also subject to the regulations and economic sanctions programs administered by the U.S. Treasury's Office of Foreign Assets Control ("OFAC"). In addition, the EU and the U.K. have adopted various economic sanctions programs targeted at entities or individuals that are, or are located in countries that are, involved in terrorism, hostilities, embezzlement or human rights violations.

Anti-Corruption:
The Firm is subject to laws and regulations relating to corrupt and illegal payments to government officials and others in the jurisdictions in which it operates, including the U.S. Foreign Corrupt Practices Act and the U.K. Bribery Act.

Compensation practices:
The Firm's compensation practices are subject to oversight by the Federal Reserve, as well as other agencies. The Federal Reserve has issued guidance jointly with the FDIC and the OCC that is designed to ensure that incentive compensation paid by banking organizations does not encourage imprudent risk-taking that threatens the organizations' safety and soundness. The Financial Stability Board ("FSB") has also established standards covering compensation principles for banks. The Firm's compensation practices are also subject to regulation and oversight by regulators in other jurisdictions, notably the EU Fourth Capital Requirements Directive ("CRD IV"), which includes compensation-related provisions. The European Banking Authority has instituted guidelines on compensation policies which in certain countries, such as the U.K. and Germany, are implemented or supplemented by local regulations or guidelines. The Firm expects that the implementation of regulatory guidelines regarding compensation in the U.S. and other countries will continue to evolve, and may affect the manner in which the Firm structures its compensation programs and practices.

Other significant international regulatory initiatives:
The U.K.'s transition period for its departure from the EU, which is commonly referred to as "Brexit," formally ended on December 31, 2020, and accordingly, from January 1, 2021, the U.K. is no longer obligated to implement EU laws.

In preparation for the completion of Brexit, numerous EU laws and regulations were separately adopted into U.K. domestic legislation in order to ensure continuity. However, the U.K. plans to evaluate the extent to which these EU-legacy laws and regulations should change going forward and has already indicated some areas where it may take a different approach from the EU. For example, the U.K. announced it will develop a U.K. settlement discipline regime rather than adopting the EU's settlement discipline regime which will apply in the EU beginning in February 2022. Additionally, the U.K. will not incorporate into U.K. law the reporting obligation of the EU's Securities Financing Transactions Regulation for non-financial counterparties, which will apply in the EU beginning in January 2021. The full impact of these differences is not yet known as further details have not yet been published.

In the EU, policymakers continue to implement an extensive and complex program of regulatory enhancement relating to financial services, several key elements of which are discussed below.

In response to the COVID-19 pandemic, in July 2020, the European Commission ("EC") published a legislative proposal amending the Markets in Financial Instruments Directive ("MiFID II"). MiFID II requires the trading of shares and certain OTC derivatives to take place on trading venues, and also significantly enhanced requirements for pre- and post-trade transparency, transaction reporting and investor protection, and introduced a position limits and reporting regime for commodities. The EC's proposal included targeted changes to the MiFID II framework intended to reduce the compliance burden on financial services firms as part of the EC's broader initiative to assist in the EU's economic recovery from the COVID-19 pandemic. The proposed changes include amendments to the commodity derivatives regime, investor protection rules and rules relating to research on small and medium-sized Enterprises. The proposal is in the final stages of becoming EU law and is expected to go into effect in 2022.The EC has also begun a review of the broader MiFID II framework and is expected to publish a further legislative proposal for changes to MiFID II in 2021. The U.K. is also re-evaluating the MiFID II framework and how the U.K. version of MiFID II will apply going forward.

The EU capital and liquidity legislation for banks and investment firms implemented many of the finalized Basel III capital and liquidity standards, including in relation to the leverage ratio, market risk capital, and a net stable funding ratio. These requirements will begin to take effect from June 2021. EU legislation also includes a requirement for certain non-EU banks operating in the EU to establish an intermediate parent undertaking ("IPU") located in the EU. The IPU rule will allow a second IPU to be established if a single IPU would conflict with "home country" bank separation rules or impede resolvability. The Firm will be required to establish a legal entity structure that complies with the EU's IPU rule. The U.K. Government has delayed the effective date of the U.K. version of the EU's legislation relating to changes in Basel III requirements until January 1, 2022. The Basel Committee recently finalized certain changes to the Basel III framework, including revisions to the credit risk and operational risk calculation methods. The Firm's banking entities in the U.K. and EU will be required to comply with these changes when they are implemented in those jurisdictions.

The Prudential Regulatory Authority ("PRA") and European Central Bank ("ECB") have published their supervisory expectations applicable to U.K. and EU banks, respectively, for management of financial risks arising from climate change. The supervisory expectations for managing these risks address bank strategy, risk management, scenario analysis and disclosure. U.K. banking entities, including J.P. Morgan Securities plc, will be expected to align their practices with PRA expectations by the end of 2021. J.P. Morgan Securities plc is expanding its risk management framework to comply with PRA expectations by the end of 2021.

Item 1A. Risk Factors.

The following discussion sets forth the material risk factors that could affect JPMorgan Chase's financial condition and operations. Readers should not consider any descriptions of these factors to be a complete set of all potential risks that could affect the Firm. Any of the risk factors discussed below could by itself, or combined with other factors, materially and adversely affect JPMorgan Chase's business, results of operations, financial condition, capital position, liquidity, competitive position or reputation, including by materially increasing expenses or decreasing revenues, which could result in material losses or a decrease in earnings.

Summary

The principal risks that could adversely affect JPMorgan Chase's business, results of operations, financial condition, capital position, liquidity, competitive position or reputation include:

- Risks related to the **COVID-19 pandemic**, including the significant harm that the pandemic has caused and is causing to the global economy and the further negative effects that it could have on certain of JPMorgan Chase's businesses.
- **Regulatory** risks, including the impact that applicable laws, rules and regulations in the highly-regulated financial services industry, as well as changes to or in the interpretation of those laws, rules and regulations, can have on JPMorgan Chase's business and operations; the ways in which differences in financial services regulation in different jurisdictions or with respect to certain competitors can disadvantage JPMorgan Chase's business; the higher compliance costs and potential for operational restrictions due to heightened regulatory scrutiny; risks associated with complying with economic sanctions and anti-corruption and anti-money laundering laws; the ways in which less predictable legal and regulatory frameworks in certain countries can negatively impact JPMorgan Chase's operations and financial results; the losses that security holders will absorb if JPMorgan Chase were to enter into a resolution; and risks related to the regulatory uncertainties associated with the U.K.'s departure from the EU.
- **Political** risks, including the potential negative effects on JPMorgan Chase's businesses due to economic uncertainty or instability caused by political developments.
- **Market** risks, including the effects that economic and market events and conditions, governmental policies concerning taxation, regulation and other matters, changes in interest rates and credit spreads, and market fluctuations can have on JPMorgan Chase's consumer and wholesale businesses and its investment and market-making positions.
- **Credit** risks, including potential negative effects from adverse changes in the financial condition of clients, customers, counterparties, custodians and central counterparties; and the potential for credit losses due to declines in the value of collateral in stressed market conditions or from concentrations of credit and market risk.
- **Liquidity** risks, including the risk that JPMorgan Chase's liquidity could be impaired by market-wide illiquidity or disruption, unforeseen liquidity or capital requirements, the inability to sell assets, default by a significant market participant, unanticipated outflows of cash or collateral, or lack of market or customer confidence in JPMorgan Chase; the dependence of JPMorgan Chase & Co. on the cash flows of its subsidiaries; the adverse effects that any downgrade in any of JPMorgan Chase's credit ratings may have on its liquidity and cost of funding; and potential negative impacts on JPMorgan Chase's funding, investments and financial products, as well as litigation risks, associated with the transition from LIBOR and other benchmark rates.
- **Capital** risks, including the risk that any failure by or inability of JPMorgan Chase to maintain the required level and composition of capital, or unfavorable changes in the capital requirements imposed by banking regulators, could limit JPMorgan Chase's ability to distribute capital to shareholders or to support its business activities.
- **Operational** risks, including risks associated with JPMorgan Chase's dependence on its operational systems and the competence, integrity, health and safety of its employees, as well as the systems and employees of external parties; the potential negative effects of failing to identify and address operational risks related to the introduction of or changes to products, services and delivery platforms; risks from JPMorgan Chase's exposure to external operational systems; legal and operational risks related to safeguarding personal information; the harm that could be caused by a successful cyber attack affecting JPMorgan Chase or by catastrophes or other events; risks associated with JPMorgan Chase's risk management framework, its models and estimations and associated judgments used in its financial statements, and controls over disclosure and financial reporting or from changes in accounting standards or policies; and potential adverse effects of failing to comply with heightened regulatory and other standards for the oversight of vendors and other service providers.
- **Strategic** risks, including the damage to JPMorgan Chase's competitive standing and results that could occur if management fails to develop and execute effective business strategies; risks associated with the significant and increasing competition that JPMorgan Chase faces; and the potential adverse impacts of climate change on JPMorgan Chase's business operations, clients and customers.

- **Conduct** risks, including the negative impact that can result from the failure of employees to conduct themselves in accordance with JPMorgan Chase's expectations, policies and practices.
- **Reputation** risks, including the potential adverse effects on JPMorgan Chase's relationships with its clients, customers, shareholders, regulators and other stakeholders that could arise from employee misconduct, security breaches, inadequate risk management, compliance or operational failures, litigation and regulatory investigations, failure to satisfy expectations concerning social and environmental concerns or other factors that could damage JPMorgan Chase's reputation.
- **Country** risks, including potential impacts on JPMorgan Chase's businesses from an outbreak of hostilities between countries or within a country or region; and the potential adverse effects of local economic, political, regulatory and social factors on JPMorgan Chase's business and revenues in certain countries.
- **People** risks, including the criticality of attracting and retaining qualified and diverse employees; and the potential adverse effects of unfavorable changes in immigration or travel policies on JPMorgan Chase's workforce.
- **Legal** risks relating to litigation and regulatory and government investigations.

The above summary is subject in its entirety to the more complete inventory and discussion of the risks facing JPMorgan Chase set forth below.

COVID-19 Pandemic

The COVID-19 pandemic has caused and is causing significant harm to the global economy and could further negatively affect certain of JPMorgan Chase's businesses.

On March 11, 2020, the World Health Organization declared the outbreak of a strain of novel coronavirus disease, COVID-19, to be a global pandemic. The COVID-19 pandemic and governmental responses to the pandemic led to the institution of social distancing and shelter-in-place requirements in certain areas of the U.S. and other countries resulting in ongoing severe impacts on global economic conditions, including:

- significant disruption and volatility in the financial markets
- significant disruption of global supply chains, and
- closures of many businesses, leading to loss of revenues and increased unemployment.

A prolongation or worsening of the pandemic, or the emergence of other diseases that give rise to similar effects, could deepen the adverse impact on the global economy.

The adverse economic conditions caused by the pandemic have had a negative impact on certain of JPMorgan Chase's businesses and results of operations, including:

- reduction in demand for certain products and services from JPMorgan Chase's clients and customers, resulting in lower revenue, and
- increases in the allowance for credit losses.

Certain models used by JPMorgan Chase in connection with the determination of the allowance for credit losses have heightened performance risk in the economic environment precipitated by the effects of the COVID-19 pandemic and government stimulus. There can be no assurance that, even after adjustments have been made to model outputs, JPMorgan Chase will not recognize unexpected losses arising from the model uncertainty that has resulted from these developments.

A prolongation or worsening of the COVID-19 pandemic and the negative economic impacts of the pandemic could have other significant adverse effects on JPMorgan Chase's businesses, results of operations and financial condition, including:

- recognition of credit losses and further increases in the allowance for credit losses, especially to the extent that businesses remain closed, unemployment continues at elevated levels, clients and customers draw on their lines of credit or significant numbers of people relocate from metropolitan areas
- material impacts on the value of securities, derivatives and other financial instruments which JPMorgan Chase owns or in which it makes markets
- downgrades in JPMorgan Chase's credit ratings
- constraints on liquidity or capital due to elevated levels of deposits, increases in risk-weighted assets ("RWA") related to supporting client activities, downgrades in client credit ratings, regulatory actions or other factors, any or all of which could require JPMorgan Chase to take or refrain from taking actions that it otherwise would under its liquidity and capital management strategies, and
- the possibility that significant portions of JPMorgan Chase's workforce are unable to work effectively, including because of illness, quarantines, shelter-in-place arrangements, government actions or other restrictions in connection with the pandemic.

The extent to which the COVID-19 pandemic negatively affects JPMorgan Chase's businesses, results of operations and financial condition, as well as its regulatory capital and liquidity ratios, will depend on future developments that are highly uncertain and cannot be predicted, including the ultimate scope and duration of the pandemic, the effectiveness of vaccination programs and actions taken by governmental authorities and other third parties in response to the pandemic. Those negative effects, including the possible recognition of charge-offs, may be delayed because of the impact of prior and potential future government stimulus actions or payment assistance provided to clients and customers.

In addition, JPMorgan Chase's participation directly or indirectly, including on behalf of customers and clients or by affiliated entities, in U.S. government programs designed to support individuals, households and businesses impacted by the economic disruptions caused by the COVID-19 pandemic could be criticized and subject JPMorgan Chase to:

- increased governmental and regulatory scrutiny
- negative publicity, and
- increased exposure to litigation,

any or all of which could increase JPMorgan Chase's operational, legal and compliance costs and damage its reputation. To the extent that the COVID-19 pandemic adversely affects JPMorgan Chase's business, results of operations and financial condition, it may also have the effect of heightening many of the other risks described below.

Regulatory

JPMorgan Chase's businesses are highly regulated, and existing, new or changed laws, rules and regulations that apply to JPMorgan Chase have a significant impact on its business and operations.

JPMorgan Chase is a financial services firm with operations worldwide. JPMorgan Chase must comply with the laws, rules and regulations that apply to its operations in all of the jurisdictions around the world in which it does business. Regulation of the financial services industry is extensive.

The regulation and supervision of financial services firms has expanded significantly over an extended period of time. The increased regulation and supervision of JPMorgan Chase has affected the way that it conducts its business and structures its operations. JPMorgan Chase could be required to make further changes to its business and operations in response to expanded supervision, new laws, rules and regulations, and changes to existing laws, rules and regulations. These changes could result in JPMorgan Chase incurring additional costs for complying with laws, rules and regulations and could reduce its profitability. In response to new and existing laws, rules and regulations and expanded supervision, JPMorgan Chase has in the past been and could in the future be, required to:

- limit the products and services that it offers
- reduce the liquidity that it can provide through its market-making activities
- refrain from engaging in business opportunities that it might otherwise pursue
- pay higher taxes, assessments, levies or other governmental charges, including in connection with the resolution of tax examinations
- dispose of certain assets, and do so at times or prices that are disadvantageous
- impose restrictions on certain business activities, or
- increase the prices that it charges for products and services, which could reduce the demand for them.

In particular, JPMorgan Chase's businesses and results of operations could be adversely impacted by changes in laws, rules and regulations, or changes in the application, interpretation or enforcement of laws, rules and regulations, that:

- proscribe or institute more stringent restrictions on certain financial services activities, or
- introduce changes to antitrust or anti-competition laws, rules and regulations that adversely affect the business activities of JPMorgan Chase.

Differences in financial services regulation can be disadvantageous for JPMorgan Chase's business.

The content and application of laws, rules and regulations affecting financial services firms sometimes vary according to factors such as the size of the firm, the jurisdiction in which it is organized or operates, and other criteria. For example:

- larger firms such as JPMorgan Chase are often subject to more stringent supervision and regulation
- financial technology companies and other non-traditional competitors may not be subject to banking regulation, or may be supervised by a national or state regulatory agency that does not have the same resources or regulatory priorities as the regulatory agencies which supervise more diversified financial services firms, or
- the financial services regulatory framework in a particular jurisdiction may favor financial institutions that are based in that jurisdiction.

These differences in the regulatory framework can result in a firm such as JPMorgan Chase losing market share to competitors that are less regulated or not subject to regulation, especially with respect to unregulated financial products.

There can also be significant differences in the ways that similar regulatory initiatives affecting the financial services industry are implemented in the U.S. and in other countries and regions in which JPMorgan Chase does business. For example, when adopting rules that are intended to implement a global regulatory standard, a national regulator may introduce additional or more restrictive requirements, which can create competitive disadvantages for financial services firms, such as JPMorgan Chase, that may be subject to those enhanced regulations.

Legislative and regulatory initiatives outside the U.S. could require JPMorgan Chase to make significant modifications to its operations and legal entity structure in the relevant countries or regions in order to comply with those requirements. These include laws, rules and regulations that have been adopted or proposed relating to:

- the establishment of locally-based intermediate holding companies or operating subsidiaries
- requirements to maintain minimum amounts of capital or liquidity in locally-based subsidiaries
- the separation (or "ring fencing") of core banking products and services from markets activities
- the resolution of financial institutions
- requirements for executing or settling transactions on exchanges or through central counterparties ("CCPs")
- position limits and reporting rules for derivatives
- governance and accountability regimes
- conduct of business and control requirements, and
- restrictions on compensation.

These types of differences in financial services regulation, or inconsistencies or conflicts between laws, rules and regulations between different jurisdictions, have required and could in the future require JPMorgan Chase to:

- divest assets or restructure its operations
- absorb increased operational, capital and liquidity costs
- change the prices that it charges for its products and services
- curtail the products and services that it offers to its customers and clients, or
- incur higher costs for complying with different legal and regulatory frameworks.

Any or all of these factors could harm JPMorgan Chase's ability to compete against other firms that are not subject to the same laws, rules and regulations or supervisory oversight, or harm JPMorgan Chase's businesses, results of operations and profitability.

Heightened regulatory scrutiny of JPMorgan Chase's businesses could result in higher compliance costs and restrictions on its operations.

JPMorgan Chase's operations are subject to heightened oversight and scrutiny from regulatory authorities in many jurisdictions. JPMorgan Chase has paid significant fines, provided other monetary relief, incurred other penalties and experienced other repercussions in connection with resolving investigations and enforcement actions by governmental agencies. JPMorgan Chase could become subject to similar regulatory resolutions or other actions in the future, and addressing the requirements of any such resolutions or actions could result in JPMorgan Chase incurring higher operational and compliance costs or needing to comply with other restrictions.

In connection with resolving specific regulatory investigations or enforcement actions, certain regulators have required JPMorgan Chase and other financial institutions to admit wrongdoing with respect to the activities that gave rise to the resolution. These types of admissions can lead to:

- greater exposure in litigation
- damage to reputation
- disqualification from doing business with certain clients or customers, or in specific jurisdictions, or
- other direct and indirect adverse effects.

Furthermore, U.S. government officials have demonstrated a willingness to bring criminal actions against financial institutions and have required that institutions plead guilty to criminal offenses or admit other wrongdoing in connection with resolving regulatory investigations or enforcement actions. Resolutions of this type can have significant collateral consequences for the subject financial institution, including:

- loss of clients, customers and business
- restrictions on offering certain products or services, and
- losing permission to operate certain businesses, either temporarily or permanently.

JPMorgan Chase expects that:

- it and other financial services firms will continue to be subject to heightened regulatory scrutiny and governmental investigations and enforcement actions
- regulators will continue to require that financial institutions be penalized for actual or deemed violations of law with formal and punitive enforcement actions, including the imposition of significant monetary and other sanctions, rather than resolving these matters through informal supervisory actions; and
- regulators will be more likely to pursue formal enforcement actions and resolutions against JPMorgan Chase to the extent that it has previously been subject to other governmental investigations or enforcement actions.

If JPMorgan Chase fails to meet the requirements of any resolution of a governmental investigation or enforcement action, or to maintain risk and control processes that meet the heightened standards established by its regulators, it could be required to:

- enter into further resolutions of investigations or enforcement actions
- pay additional regulatory fines, penalties or judgments, or
- accept material regulatory restrictions on, or changes in the management of, its businesses.

In these circumstances, JPMorgan Chase could also become subject to other sanctions, or to prosecution or civil litigation with respect to the conduct that gave rise to an investigation or enforcement action.

Complying with economic sanctions and anti-corruption and anti-money laundering laws, rules and regulations can increase JPMorgan Chase's operational and compliance costs and risks.

JPMorgan Chase must comply with economic sanctions and embargo programs administered by the Office of Foreign Assets Control ("OFAC") and similar national and multi-national bodies and governmental agencies outside the U.S., as well as anti-corruption and anti-money laundering laws, rules and regulations throughout the world. JPMorgan Chase can incur higher costs and face greater compliance risks in structuring and operating its businesses to comply with these requirements. Certain governments have enacted laws, which are commonly referred to as "blocking laws," that are designed to prohibit compliance with some U.S. sanctions and may raise significant conflict of laws issues. A violation of a sanction or embargo program or anti-corruption or anti-money laundering laws, rules and regulations, or enforcement of blocking laws, could subject JPMorgan Chase, and individual employees, to regulatory enforcement actions as well as significant civil and criminal penalties.

JPMorgan Chase's operations and financial results can be negatively impacted in countries with less predictable legal and regulatory frameworks.

JPMorgan Chase conducts business in certain countries in which the application of the rule of law is inconsistent or less predictable, including with respect to:

- the absence of a statutory or regulatory basis or guidance for engaging in specific types of business or transactions
- conflicting or ambiguous laws, rules and regulations, or the inconsistent application or interpretation of existing laws, rules and regulations
- uncertainty concerning the enforceability of contractual, intellectual property or other obligations
- difficulty in competing in economies in which the government controls or protects all or a portion of the local economy or specific businesses, or where graft or corruption may be pervasive, and
- the threat of arbitrary regulatory investigations, civil litigations or criminal prosecutions, the termination of licenses required to operate in the local market or the suspension of business relationships with governmental bodies.

If the application of the laws, rules and regulations in a particular country is susceptible to producing inconsistent or unexpected outcomes, this can create a more difficult environment in which JPMorgan Chase conducts its business and could negatively affect JPMorgan Chase's operations and reduce its earnings with respect to that country. For example, conducting business could require JPMorgan Chase to devote significant additional resources to understanding, and monitoring changes in, local laws, rules and regulations, as well as structuring its operations to comply with local laws, rules and regulations and implementing and administering related internal policies and procedures.

There can be no assurance that JPMorgan Chase will always be successful in its efforts to fully understand and to conduct its business in compliance with the laws, rules and regulations of all of the jurisdictions in which it operates, and the risk of non-compliance can be greater in countries that have less predictable legal and regulatory systems.

Requirements for the orderly resolution of JPMorgan Chase could result in JPMorgan Chase having to restructure or reorganize its businesses and could increase its funding or operational costs or curtail its business.

JPMorgan Chase is required under Federal Reserve and FDIC rules to prepare and submit periodically to those agencies a detailed plan for rapid and orderly resolution in bankruptcy, without extraordinary government support, in the event of material financial distress or failure. The agencies' evaluation of JPMorgan Chase's resolution plan may change, and the requirements for resolution plans may be modified from time to time. Any such determinations or modifications could result in JPMorgan Chase needing to make changes to its legal entity structure or to certain internal or external activities, which could increase its funding or operational costs, or hamper its ability to serve clients and customers.

If the Federal Reserve and the FDIC were both to determine that a resolution plan submitted by JPMorgan Chase has deficiencies, they could jointly impose more stringent capital, leverage or liquidity requirements or restrictions on JPMorgan Chase's growth, activities or operations. The agencies could also require that JPMorgan Chase restructure, reorganize or divest assets or businesses in ways that could materially and adversely affect JPMorgan Chase's operations and strategy.

Holders of JPMorgan Chase & Co.'s debt and equity securities will absorb losses if it were to enter into a resolution.

Federal Reserve rules require that JPMorgan Chase & Co. (the "Parent Company") maintain minimum levels of unsecured external long-term debt and other loss-absorbing capacity with specific terms ("eligible LTD") for purposes of recapitalizing JPMorgan Chase's operating subsidiaries if the Parent Company were to enter into a resolution either:

- in a bankruptcy proceeding under Chapter 11 of the U.S. Bankruptcy Code, or
- in a receivership administered by the FDIC under Title II of the Dodd-Frank Act ("Title II").

If the Parent Company were to enter into a resolution, holders of eligible LTD and other debt and equity securities of the Parent Company will absorb the losses of the Parent Company and its subsidiaries.

The preferred "single point of entry" strategy under JPMorgan Chase's resolution plan contemplates that only the Parent Company would enter bankruptcy proceedings. JPMorgan Chase's subsidiaries would be recapitalized, as needed, so that they could continue normal operations or subsequently be divested or wound down in an orderly manner. As a result, the Parent Company's losses and any losses incurred by its subsidiaries would be imposed first on holders of the Parent Company's equity securities and thereafter on its unsecured creditors, including holders of eligible LTD and other debt securities. Claims of holders of those securities would have a junior position to the claims of creditors of JPMorgan Chase's subsidiaries and to the claims of priority (as determined by statute) and secured creditors of the Parent Company.

Accordingly, in a resolution of the Parent Company in bankruptcy, holders of eligible LTD and other debt securities of the Parent Company would realize value only to the extent available to the Parent Company as a shareholder of JPMorgan Chase Bank, N.A. and its other subsidiaries, and only after any claims of priority and secured creditors of the Parent Company have been fully repaid.

The FDIC has similarly indicated that a single point of entry recapitalization model could be a desirable strategy to resolve a systemically important financial institution, such as the Parent Company, under Title II. However, the FDIC has not formally adopted a single point of entry resolution strategy.

If the Parent Company were to approach, or enter into, a resolution, none of the Parent Company, the Federal Reserve or the FDIC is obligated to follow JPMorgan Chase's preferred resolution strategy, and losses to holders of eligible LTD and other debt and equity securities of the Parent Company, under whatever strategy is ultimately followed, could be greater than they might have been under JPMorgan Chase's preferred strategy.

Regulatory uncertainties associated with the U.K.'s departure from the EU could negatively affect JPMorgan Chase's business, results of operations and operating model.

The U.K.'s departure from the EU, which is commonly referred to as "Brexit," was completed on December 31, 2020. The Trade and Cooperation Agreement entered into between the U.K. and the EU in December 2020 included very limited provisions relating to the conduct of financial services activities between the U.K. and the EU. Accordingly, unless or until the U.K. and the EU enter into further agreements relating to financial services, the regulatory environment for financial services in the aftermath of Brexit can be expected to:

- significantly limit the ability of U.K.-based financial services firms to conduct business in the EU, and vice versa
- prolong uncertainty concerning the levels of market access for trading venues, which could result in a reduction or fragmentation of market liquidity, and
- prolong ongoing uncertainties concerning optimal business models for firms providing financial services, especially given that any changes in the regulation of such services by the U.K. may not benefit from equivalence determinations by the EU.

As a result of these limitations and uncertainties, JPMorgan Chase:

- has made and is continuing to make appropriate changes to its legal entity structure and operations in the U.K. and the EU to address the regulatory environment
- is now maintaining, and expects that it will be required to sustain, a more fragmented operating model across its U.K. and EU operating entities, and
- expects that, due to considerations such as operating expenses, liquidity, leverage and capital, this modified European operating framework will be more complex, less efficient and more costly than would otherwise have been the case.

In addition, the COVID-19 pandemic and EU and U.K. government responses to the pandemic, including travel restrictions and lock-downs, have introduced delays and uncertainties into JPMorgan Chase's implementation of its plans for maintaining continuity of service for its clients.

Any or all of the above factors could have an adverse effect on the overall operation of the financial services market across the U.K. and the EU as well as JPMorgan Chase's business, operations and earnings in the U.K., the EU and globally.

Political

Economic uncertainty or instability caused by political developments can hurt JPMorgan Chase's businesses.

The economic environment and market conditions in which JPMorgan Chase operates continue to be uncertain due to political developments in the U.S. and other countries. Certain monetary, fiscal and other policy initiatives and proposals could cause a contraction in U.S. and global economic growth and higher volatility in the financial markets, including:

- monetary policies and actions taken by the Federal Reserve and other central banks or governmental authorities, including any sustained large-scale asset purchases or any suspension or reversal of those actions
- fiscal policies, including with respect to taxation

- actions that governments take or fail to take in response to the effects of the COVID-19 pandemic, as well as the effectiveness of any actions taken
- isolationist foreign policies
- the implementation of tariffs and other protectionist trade policies, or
- political and social pressures with respect to governmental policies and actions.

These types of political developments, and uncertainty about the possible outcomes of these developments, could:

- erode investor confidence in the U.S. economy and financial markets, which could potentially undermine the status of the U.S. dollar as a safe haven currency
- provoke retaliatory countermeasures by other countries and otherwise heighten tensions in diplomatic relations
- lead to the withdrawal of government support for agencies and enterprises such as the U.S. Federal National Mortgage Association and the U.S. Federal Home Loan Mortgage Corporation (together, the "U.S. GSEs")
- increase concerns about whether the U.S. government will be funded, and its outstanding debt serviced, at any particular time
- result in periodic shutdowns of the U.S. government or governments in other countries, and
- increase investor reliance on actions by the Federal Reserve or other central banks, or investor perceptions concerning government support of sectors of the economy or the economy as a whole.

These factors could lead to:

- slower growth rates, rising inflation or recession
- greater market volatility
- a contraction of available credit and the widening of credit spreads
- erosion of adequate risk premium on certain financial assets
- diminished investor and consumer confidence
- lower investment growth
- large-scale sales of government debt and other debt and equity securities in the U.S. and other countries
- reduced commercial activity among trading partners
- the potential for a currency redenomination by a particular country
- the possible departure of a country from, or the dissolution of, a political or economic alliance or treaty
- potential expropriation or nationalization of assets, or
- other market dislocations, including the spread of unfavorable economic conditions from a particular country or region to other countries or regions.

Any of these potential outcomes could cause JPMorgan Chase to suffer losses on its market-making positions or in its investment portfolio, reduce its liquidity and capital levels, hamper its ability to deliver products and services to its clients and customers, and weaken its results of operations and financial condition.

Market

Economic and market events and conditions can materially affect JPMorgan Chase's businesses and investment and market-making positions.

JPMorgan Chase's results of operations can be negatively affected by adverse changes in any of the following:

- investor, consumer and business sentiment
- events that reduce confidence in the financial markets
- inflation or deflation
- high unemployment or, conversely, a tightening labor market
- the availability and cost of capital, liquidity and credit
- levels and volatility of interest rates, credit spreads and market prices for currencies, equities and commodities, and the duration of any changes in levels or volatility
- the economic effects of outbreaks of hostilities, terrorism or other geopolitical instabilities, cyber attacks, climate change, natural disasters, severe weather conditions, health emergencies, the spread of infectious diseases or pandemics, and
- the health of the U.S. and global economies.

All of these are affected by global economic, market and political events and conditions, as well as regulatory restrictions.

In addition, JPMorgan Chase's investment portfolio and market-making businesses can suffer losses due to unanticipated market events, including:

- severe declines in asset values
- unexpected credit events
- unforeseen events or conditions that may cause previously uncorrelated factors to become correlated (and vice versa)
- the inability to effectively hedge market and other risks related to market-making and investment portfolio positions, or
- other market risks that may not have been appropriately taken into account in the development, structuring or pricing of a financial instrument.

If JPMorgan Chase experiences significant losses in its investment portfolio or from market-making activities, this could reduce JPMorgan Chase's profitability and its liquidity and capital levels, and thereby constrain the growth of its businesses.

JPMorgan Chase's consumer businesses can be negatively affected by adverse economic conditions.

JPMorgan Chase's consumer businesses are particularly affected by U.S. and global economic conditions, including:

- personal and household income distribution
- unemployment or underemployment
- prolonged periods of exceptionally low interest rates
- housing prices
- consumer and small business confidence levels
- changes in consumer spending or in the level of consumer debt, and
- the number of personal bankruptcies.

Heightened levels of unemployment or underemployment that result in reduced personal and household income could negatively affect consumer credit performance to the extent that consumers are less able to service their debts. In addition, sustained low growth, low or negative interest rates, inflationary pressures or recessionary conditions could diminish customer demand for the products and services offered by JPMorgan Chase's consumer businesses.

Adverse economic conditions could also lead to an increase in delinquencies, additions to the allowance for credit losses and higher net charge-offs, which can reduce JPMorgan Chase's earnings. These consequences could be significantly worse in certain geographies and industry segments where economic restrictions and shutdowns have occurred related to the COVID-19 pandemic, declining industrial or manufacturing activity that has resulted in or could result in higher levels of unemployment, or where high levels of consumer debt, such as outstanding student loans, could impair the ability of customers to pay their other consumer loan obligations.

JPMorgan Chase's earnings from its consumer businesses could also be adversely affected by governmental policies and actions that affect consumers, including:

- policies and initiatives relating to medical insurance, education, immigration, employment status and housing, and
- policies aimed at the economy more broadly, such as higher taxes and increased regulation which could result in reductions in consumer disposable income.

In addition, governmental proposals to permit student loan obligations to be discharged in bankruptcy proceedings could, if enacted into law, encourage certain of JPMorgan Chase's customers to declare personal bankruptcy and thereby trigger defaults and charge-offs of credit card and other consumer loans extended to those customers.

Unfavorable market and economic conditions can have an adverse effect on JPMorgan Chase's wholesale businesses.

In JPMorgan Chase's wholesale businesses, market and economic factors can affect the volume of transactions that JPMorgan Chase executes for its clients or for which it advises clients, and, therefore, the revenue that JPMorgan Chase receives from those transactions. These factors can also influence the willingness of other financial institutions and investors to participate in capital markets transactions that JPMorgan Chase manages, such as loan syndications or securities underwritings. Furthermore, if a significant and sustained deterioration in market conditions were to occur, the profitability of JPMorgan Chase's capital markets businesses, including its loan syndication, securities underwriting and leveraged lending activities, could be reduced to the extent that those businesses:

- earn less fee revenue due to lower transaction volumes, including when clients are unwilling or unable to refinance their outstanding debt obligations in unfavorable market conditions, or
- dispose of portions of credit commitments at a loss, or hold larger residual positions in credit commitments that cannot be sold at favorable prices.

An adverse change in market conditions in particular segments of the economy, such as a sudden and severe downturn in oil and gas prices or an increase in commodity prices, could have a material adverse effect on clients of JPMorgan Chase whose operations or financial condition are directly or indirectly dependent on the health or stability of those market segments, as well as clients that are engaged in related businesses. JPMorgan Chase could incur losses on its loans and other credit commitments to clients that operate in, or are dependent on, any sector of the economy that is under stress.

The fees that JPMorgan Chase earns from managing client assets or holding assets under custody for clients could be diminished by declining asset values or other adverse macroeconomic conditions. For example, higher interest rates or a downturn in financial markets could affect the valuations of client assets that JPMorgan Chase manages or holds under custody, which, in turn, could affect JPMorgan Chase's revenue from fees that are based on the amount of assets under management or custody. Similarly, adverse macroeconomic or market conditions could prompt outflows from JPMorgan Chase funds or accounts, or cause clients to invest in products that generate lower revenue. Substantial and unexpected withdrawals from a JPMorgan Chase fund can also hamper the investment performance of the fund, particularly if the outflows create the need for the fund to dispose of fund assets at disadvantageous times or prices, and could lead to further withdrawals based on the weaker investment performance.

An economic downturn that results in lower consumer and business spending could also have a negative impact on certain of JPMorgan Chase's wholesale clients, and thereby diminish JPMorgan Chase's earnings from its wholesale operations. For example, the businesses of certain of JPMorgan Chase's wholesale clients are dependent on consistent streams of rental income from commercial real estate properties which are owned or being built by those clients. Severe and sustained adverse economic conditions, including higher unemployment caused by the COVID-19 pandemic and governmental actions taken in response to the pandemic, could result in reductions in the rental cash flows that owners or developers receive from their tenants which, in turn, could depress the values of the properties and impair the ability of borrowers to service or refinance their commercial real estate loans. These consequences could result in JPMorgan Chase experiencing higher delinquencies, defaults and write-offs within its commercial real estate loan portfolio and incurring higher costs for servicing a larger volume of delinquent loans in that portfolio, thereby reducing JPMorgan Chase's earnings from its wholesale businesses.

Changes in interest rates and credit spreads can adversely affect certain of JPMorgan Chase's revenue and income streams related to the Firm's traditional banking and funding activities.

In general, a low or negative interest rate environment may cause:

- net interest margins to be compressed, which could reduce the amounts that JPMorgan Chase earns on its investment securities portfolio to the extent that it is unable to reinvest contemporaneously in higher-yielding instruments
- unanticipated or adverse changes in depositor behavior, which could negatively affect JPMorgan Chase's broader asset and liability management strategy
- JPMorgan Chase to reduce the amount of deposits that it accepts from customers and clients, which could result in lower revenues, and
- a reduction in the value of JPMorgan Chase's mortgage servicing rights ("MSRs") asset, thereby decreasing revenues.

When credit spreads widen, it becomes more expensive for JPMorgan Chase to borrow. JPMorgan Chase's credit spreads may widen or narrow not only in response to events and circumstances that are specific to JPMorgan Chase but also as a result of general economic and geopolitical events and conditions. Changes in JPMorgan Chase's credit spreads will affect, positively or negatively, JPMorgan Chase's earnings on certain liabilities, such as derivatives, that are recorded at fair value.

When interest rates are increasing, JPMorgan Chase can generally be expected to earn higher net interest income. However, higher interest rates can also lead to:

- fewer originations of commercial and residential real estate loans
- losses on underwriting exposures
- the loss of deposits, including in the event that JPMorgan Chase makes incorrect assumptions about depositor behavior
- lower net interest income if central banks introduce interest rate increases more quickly than anticipated and this results in a misalignment in the pricing of short-term and long-term borrowings
- less liquidity in the financial markets, and
- higher funding costs.

All of these outcomes could adversely affect JPMorgan Chase's revenues and its liquidity and capital levels. Higher interest rates can also negatively affect the payment performance on loans within JPMorgan Chase's consumer and wholesale loan portfolios that are linked to variable interest rates. If borrowers of variable rate loans are unable to afford higher interest payments, those borrowers may reduce or stop making payments, thereby causing JPMorgan Chase to incur losses and increased operational costs related to servicing a higher volume of delinquent loans.

JPMorgan Chase's results may be materially affected by market fluctuations and significant changes in the value of financial instruments.

The value of securities, derivatives and other financial instruments which JPMorgan Chase owns or in which it makes markets can be materially affected by market fluctuations. Market volatility, illiquid market conditions and other disruptions in the financial markets may make it extremely difficult to value certain financial instruments. Subsequent valuations of financial instruments in future periods, in light of factors then prevailing, may result in significant changes in the value of these instruments. In addition, at the time of any disposition of these financial instruments, the price that JPMorgan Chase ultimately realizes will depend on the demand and liquidity in the market at that time and may be materially lower than their current fair value. Any of these factors could cause a decline in the value of JPMorgan Chase's financial instruments which may have an adverse effect on JPMorgan Chase's results of operations.

JPMorgan Chase's risk management and monitoring processes, including its stress testing framework, seek to quantify and control JPMorgan Chase's exposure to more extreme market moves. However, JPMorgan Chase's hedging and other risk management strategies may not be effective, and it could incur significant losses, if extreme market events were to occur.

Credit

JPMorgan Chase can be negatively affected by adverse changes in the financial condition of clients, counterparties, custodians and CCPs.

JPMorgan Chase routinely executes transactions with clients and counterparties such as corporations, financial institutions, asset managers, hedge funds, exchanges and government entities within and outside the U.S. Many of these transactions expose JPMorgan Chase to the credit risk of its clients and counterparties, and can involve JPMorgan Chase in disputes and litigation if a client or counterparty defaults. JPMorgan Chase can also be subject to losses or liability where a financial institution that it has appointed to provide custodial services for client assets or funds becomes insolvent as a result of fraud or the failure to abide by existing laws and obligations, including under the EU Alternative Investment Fund Managers Directive.

A default by, or the financial or operational failure of, a CCP through which JPMorgan Chase executes contracts would require JPMorgan Chase to replace those contracts, thereby increasing its operational costs and potentially resulting in losses. JPMorgan Chase can also be exposed to losses if a member of a CCP in which JPMorgan Chase is also a member defaults on its obligations to the CCP because of requirements that each member of the CCP absorb a portion of those losses. As part of its clearing services activities, JPMorgan Chase is also exposed to the risk of nonperformance by its clients, which it seeks to mitigate by requiring clients to provide adequate collateral. JPMorgan Chase is also exposed to intra-day credit risk of its clients in connection with providing cash management, clearing, custodial and other transaction services to those clients. If a client for which JPMorgan Chase provides these services becomes bankrupt or insolvent, JPMorgan Chase may incur losses, become involved in disputes and litigation with one or more CCPs, the client's bankruptcy estate and other creditors, or be subject to regulatory investigations. All of the foregoing events can increase JPMorgan Chase's operational and litigation costs, and JPMorgan Chase may suffer losses to the extent that any collateral that it has received is insufficient to cover those losses. JPMorgan Chase can also be subject to bearing its share of non-default losses incurred by a CCP, including losses from custodial, settlement or investment activities or due to cyber or other security breaches.

Transactions with government entities, including national, state, provincial, municipal and local authorities, can expose JPMorgan Chase to enhanced sovereign, credit, operational and reputation risks. Government entities may, among other things, claim that actions taken by government officials were beyond the legal authority of those officials or repudiate transactions authorized by a previous incumbent government. These types of actions have in the past caused, and could in the future cause, JPMorgan Chase to suffer losses or hamper its ability to conduct business in the relevant jurisdiction.

In addition, local laws, rules and regulations could limit JPMorgan Chase's ability to resolve disputes and litigation in the event of a counterparty default or unwillingness to make previously agreed-upon payments, which could subject JPMorgan Chase to losses.

Disputes may arise with counterparties to derivatives contracts with regard to the terms, the settlement procedures or the value of underlying collateral. The disposition of those disputes could cause JPMorgan Chase to incur unexpected transaction, operational and legal costs, or result in credit losses. These consequences can also impair JPMorgan Chase's ability to effectively manage its credit risk exposure from its market activities, or cause harm to JPMorgan Chase's reputation.

The financial or operational failure of a significant market participant, such as a major financial institution or a CCP, or concerns about the creditworthiness of such a market participant, can have a cascading effect within the financial markets. JPMorgan Chase's businesses could be significantly disrupted by such an event, particularly if it leads to other market participants incurring significant losses, experiencing liquidity issues or defaulting, and JPMorgan Chase is likely to have significant interrelationships with, and credit exposure to, such a significant market participant.

JPMorgan Chase may suffer losses if the value of collateral declines in stressed market conditions.

During periods of market stress or illiquidity, JPMorgan Chase's credit risk may be further increased when:

- JPMorgan Chase cannot realize the fair value of the collateral it holds
- collateral is liquidated at prices that are not sufficient to recover the full amount owed to it, or
- counterparties are unable to post collateral, whether for operational or other reasons.

Furthermore, disputes with counterparties concerning the valuation of collateral may increase in times of significant market stress, volatility or illiquidity, and JPMorgan Chase could suffer losses during these periods if it is unable to realize the fair value of collateral or to manage declines in the value of collateral.

JPMorgan Chase could incur significant losses arising from concentrations of credit and market risk.

JPMorgan Chase is exposed to greater credit and market risk to the extent that groupings of its clients or counterparties:

- engage in similar or related businesses, or in businesses in related industries
- do business in the same geographic region, or
- have business profiles, models or strategies that could cause their ability to meet their obligations to be similarly affected by changes in economic conditions.

For example, a significant deterioration in the credit quality of one of JPMorgan Chase's borrowers or counterparties could lead to concerns about the creditworthiness of other borrowers or counterparties in similar, related or dependent industries. This type of interrelationship could exacerbate JPMorgan Chase's credit, liquidity and market risk exposure and potentially cause it to incur losses, including fair value losses in its market-making businesses and investment portfolios. In addition, JPMorgan Chase may be required to recognize higher allowances for credit losses with respect to certain clients or industries in order to align with directives or expectations of its banking regulators.

Similarly, challenging economic conditions that affect a particular industry or geographic area could lead to concerns about the credit quality of JPMorgan Chase's borrowers or counterparties not only in that particular industry or geography but in related or dependent industries, wherever located. These conditions could also heighten concerns about the ability of customers of JPMorgan Chase's consumer businesses who live in those areas or work in those affected industries or related or dependent industries to meet their obligations to JPMorgan Chase. JPMorgan Chase regularly monitors various segments of its credit and market risk exposures to assess the potential risks of concentration or contagion, but its efforts to diversify or hedge its exposures against those risks may not be successful.

JPMorgan Chase's consumer businesses can also be harmed by an excessive expansion of consumer credit by bank or non-bank competitors. Heightened competition for certain types of consumer loans could prompt industry-wide reactions such as significant reductions in the pricing or margins of those loans or the making of loans to less-creditworthy borrowers. If large numbers of consumers subsequently default on their loans, whether due to weak credit profiles, an economic downturn or other factors, this could impair their ability to repay obligations owed to JPMorgan Chase and result in higher charge-offs and other credit-related losses. More broadly, widespread defaults on consumer debt could lead to recessionary conditions in the U.S. economy, and JPMorgan Chase's consumer businesses may earn lower revenues in such an environment.

If JPMorgan Chase is unable to reduce positions effectively during a market dislocation, this can increase both the market and credit risks associated with those positions and the level of RWA that JPMorgan Chase holds on its balance sheet. These factors could adversely affect JPMorgan Chase's capital position, funding costs and the profitability of its businesses.

Liquidity

JPMorgan Chase's ability to operate its businesses could be impaired if its liquidity is constrained.

JPMorgan Chase's liquidity could be impaired at any given time by factors such as:

- market-wide illiquidity or disruption
- unforeseen liquidity or capital requirements, including as a result of changes in laws, rules and regulations
- inability to sell assets, or to sell assets at favorable times or prices
- default by a CCP or other significant market participant
- unanticipated outflows of cash or collateral
- unexpected loss of consumer deposits, and
- lack of market or customer confidence in JPMorgan Chase or financial institutions in general.

A reduction in JPMorgan Chase's liquidity may be caused by events over which it has little or no control. For example, during periods of market stress, low investor confidence and significant market illiquidity could result in higher funding costs for JPMorgan Chase and could limit its access to some of its traditional sources of liquidity.

JPMorgan Chase may need to raise funding from alternative sources if its access to stable and lower-cost sources of funding, such as deposits and borrowings from Federal Home Loan Banks, is reduced. Alternative sources of funding could be more expensive or limited in availability. JPMorgan Chase's funding costs could also be negatively affected by actions that JPMorgan Chase may take in order to:

- satisfy applicable liquidity coverage ratio and net stable funding ratio requirements
- address obligations under its resolution plan, or
- satisfy regulatory requirements in jurisdictions outside the U.S. relating to the pre-positioning of liquidity in subsidiaries that are material legal entities.

More generally, if JPMorgan Chase fails to effectively manage its liquidity, this could constrain its ability to fund or invest in its businesses and subsidiaries (including, in particular, its broker-dealer subsidiaries), and thereby adversely affect its results of operations.

JPMorgan Chase & Co. is a holding company and depends on the cash flows of its subsidiaries to make payments on its outstanding securities.

JPMorgan Chase & Co. is a holding company that holds the stock of JPMorgan Chase Bank, N.A. and an intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC"). The IHC in turn holds the stock of substantially all of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and owes intercompany indebtedness to the holding company.

The holding company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The ability of JPMorgan Chase Bank, N.A. and the IHC to make payments to the holding company is also limited. JPMorgan Chase Bank, N.A. is subject to restrictions on its dividend distributions, as well as capital adequacy requirements, such as the Supplementary Leverage Ratio ("SLR"), and liquidity requirements and other regulatory restrictions on its ability to make payments to the holding company. The IHC is prohibited from paying dividends or extending credit to the holding company if certain capital or liquidity thresholds are breached or if limits are otherwise imposed by JPMorgan Chase's management or Board of Directors.

As a result of these arrangements, the ability of the holding company to make various payments is dependent on its receiving dividends from JPMorgan Chase Bank, N.A. and dividends and extensions of credit from the IHC. These limitations could affect the holding company's ability to:

- pay interest on its debt securities
- pay dividends on its equity securities
- redeem or repurchase outstanding securities, and
- fulfill its other payment obligations.

These regulatory restrictions and limitations could also result in the holding company seeking protection under bankruptcy laws at a time earlier than would have been the case absent the existence of the capital and liquidity thresholds to which the IHC is subject.

Reductions in JPMorgan Chase's credit ratings may adversely affect its liquidity and cost of funding.

JPMorgan Chase & Co. and certain of its principal subsidiaries are rated by credit rating agencies. Rating agencies evaluate both general and firm-specific and industry-specific factors when determining credit ratings for a particular financial institution, including:

- expected future profitability
- risk management practices
- legal expenses
- ratings differentials between bank holding companies and their bank and non-bank subsidiaries
- regulatory developments
- assumptions about government support, and
- economic and geopolitical trends.

JPMorgan Chase closely monitors and manages, to the extent that it is able, factors that could influence its credit ratings. However, there is no assurance that JPMorgan Chase's credit ratings will not be lowered in the future. Furthermore, any such downgrade could occur at times of broader market instability when JPMorgan Chase's options for responding to events may be more limited and general investor confidence is low.

A reduction in JPMorgan Chase's credit ratings could curtail JPMorgan Chase's business activities and reduce its profitability in a number of ways, including:

- reducing its access to capital markets
- materially increasing its cost of issuing and servicing securities
- triggering additional collateral or funding requirements, and
- decreasing the number of investors and counterparties that are willing or permitted to do business with or lend to JPMorgan Chase.

Any rating reduction could also increase the credit spreads charged by the market for taking credit risk on JPMorgan Chase & Co. and its subsidiaries. This could, in turn, adversely affect the value of debt and other obligations of JPMorgan Chase & Co. and its subsidiaries.

The reform and replacement of benchmark rates could adversely affect JPMorgan Chase's funding, investments and financial products, and expose it to litigation and other disputes.

Interest rate, equity, foreign exchange rate and other types of indices which are deemed to be "benchmarks," including those in widespread and longstanding use, have been the subject of ongoing international, national and other regulatory scrutiny and initiatives and proposals for reform. Some of these reforms are already effective while others are still to be implemented or are under consideration. These reforms may cause certain benchmarks to perform differently than in the past, or to disappear entirely, or have other consequences which cannot be fully anticipated.

Any of the benchmark reforms which have been proposed or implemented, or the general increased regulatory scrutiny of benchmarks, could also increase the costs and risks of administering or otherwise participating in the setting of benchmarks and complying with regulations or requirements relating to benchmarks. Such factors may have the effect of discouraging market participants from continuing to administer or contribute to certain benchmarks, trigger changes in the rules or methodologies used in certain benchmarks or lead to the disappearance of certain benchmarks.

Any of these developments, and any future initiatives to regulate, reform or change the administration of benchmarks, could result in adverse consequences to the return on, value of and market for loans, mortgages, securities, derivatives and other financial instruments whose returns are linked to any such benchmark, including those issued, funded, serviced or held by JPMorgan Chase.

Various regulators, industry bodies and other market participants in the U.S. and other countries are engaged in initiatives to develop, introduce and encourage the use of alternative rates to replace certain benchmarks. There is no assurance that these new rates will be accepted or widely used by market participants, or that the characteristics of any of these new rates will be similar to, or produce the economic equivalent of, the benchmarks that they seek to replace. If a particular benchmark were to be discontinued and an alternative rate has not been successfully introduced to replace that benchmark, this could result in widespread dislocation in the financial markets, engender volatility in the pricing of securities, derivatives and other instruments, and suppress capital markets activities, all of which could have adverse effects on JPMorgan Chase's results of operations.

To the extent that any guidance provided by accounting standard setters concerning the transition from benchmark rates is not comprehensive, fails to provide the expected relief or the ability to elect or implement that guidance is constrained in any significant respect, the transition could:

- affect hedge accounting relationships between financial instruments linked to a particular benchmark and any related derivatives, which could adversely affect JPMorgan Chase's results of operations, or
- increase JPMorgan Chase's operational costs with respect to the determination of whether the transition has resulted in the modification or extinguishment of specific contracts for accounting purposes.

ICE Benchmark Administration, the administrator of LIBOR, has announced that it will consult on its intention to:

- cease publication of (i) all tenors of the euro, sterling, Swiss franc and yen LIBORs and (ii) the one week and two month tenors of U.S. dollar LIBOR, in each case, after December 31, 2021, and
- cease publication of all remaining tenors of U.S. dollar LIBOR after June 30, 2023.

These announcements indicate that it is highly likely that various tenors of the LIBOR benchmark will be discontinued on or about the timeframes mentioned above. Vast amounts of loans, mortgages, securities, derivatives and other financial instruments are linked to the LIBOR benchmark, and any inability of market participants and regulators to successfully introduce benchmark rates to replace LIBOR and implement effective transitional arrangements to address the discontinuation of LIBOR could result in disruption in the financial markets and suppress capital markets activities, all of which could have a negative impact on JPMorgan Chase's results of operations and on LIBOR-linked securities, credit or other instruments which are issued, funded, serviced or held by JPMorgan Chase.

JPMorgan Chase could also become involved in litigation and other types of disputes with clients, customers, counterparties and investors as a consequence of the transition from LIBOR and other benchmark rates to replacement rates, including claims that JPMorgan Chase has:

- treated clients, customers, counterparties or investors unfairly, or caused them to experience losses, higher financing costs or lower returns on investments
- failed to appropriately communicate the effects of the transition from benchmark rates on the products that JPMorgan Chase has sold to its clients and customers, or failed to disclose purported conflicts of interest
- made inappropriate product recommendations to or investments on behalf of its clients, or sold products that did not serve their intended purpose, in connection with the transition from benchmark rates
- engaged in anti-competitive behavior, or in the manipulation of markets or specific benchmarks, in connection with the discontinuation of or transition from benchmark rates, or
- disadvantaged clients, customers, counterparties or investors when interpreting or making determinations under the terms of agreements or financial instruments.

These types of claims could subject JPMorgan Chase to higher legal expenses and operational costs, require it to pay significant amounts in connection with resolving litigation and other disputes, and harm its reputation.

Capital

Maintaining the required level and composition of capital may impact JPMorgan Chase's ability to support business activities, meet evolving regulatory requirements and distribute capital to shareholders.

JPMorgan Chase is subject to various regulatory capital requirements, including leverage- and risk-based capital requirements, that can change due to actions by banking regulators. JPMorgan Chase's adherence to these requirements can also evolve dynamically in response to changes in the composition of its balance sheet or other factors. It is possible that these changing requirements, including meeting or exceeding various capital ratio thresholds, could limit JPMorgan Chase's ability to support its businesses and make capital distributions to its shareholders.

Actions by the Federal Reserve and the U.S. government in response to the economic effects of the COVID-19 pandemic have led to an expansion of the Federal Reserve's balance sheet, growth in deposit balances held by JPMorgan Chase and other U.S. financial institutions and, consequently, an increase in JPMorgan Chase's leverage exposure. If these trends were to continue, JPMorgan Chase may be required to hold more capital or take other actions in order to satisfy the leverage-based capital requirements applicable to it.

JPMorgan Chase is required to submit, at least annually, a capital plan describing proposed dividend payments to shareholders, redemptions and repurchases of its outstanding securities and other capital actions that it intends to take. JPMorgan Chase considers various factors in managing capital, including the impact of stress on its capital levels, as determined by both internal modeling and the Federal Reserve's modeling of JPMorgan Chase's capital position in supervisory stress tests. Because the Federal Reserve and JPMorgan Chase use different forecasting models and methodologies when determining stress test results, there can be significant differences between the estimates of stress loss as determined by the Federal Reserve and JPMorgan Chase, respectively. The Federal

Reserve may require modifications to JPMorgan Chase's capital plan, and may change the Stress Capital Buffer ("SCB") applicable to JPMorgan Chase, from time to time.

Any failure by or inability of JPMorgan Chase to maintain the required level and composition of capital, or unfavorable changes in the capital requirements imposed by banking regulators, could have an adverse impact on JPMorgan Chase's shareholders, such as:

- reducing the amount of common stock that JPMorgan Chase is permitted to repurchase
- requiring the issuance of, or prohibiting the redemption of, capital instruments in a manner inconsistent with JPMorgan Chase's capital management strategy
- constraining the amount of dividends that may be paid on common stock, or
- curtailing JPMorgan Chase's business activities or operations.

Operational

JPMorgan Chase's businesses are dependent on the effectiveness of its operational systems and those of other market participants.

JPMorgan Chase's businesses rely on the ability of JPMorgan Chase's financial, accounting, transaction execution, data processing and other operational systems to process, record, monitor and report a large number of transactions on a continuous basis, and to do so accurately, quickly and securely. In addition to proper design, installation, maintenance and training, the effective functioning of JPMorgan Chase's operational systems depends on:

- the quality of the information contained in those systems, as inaccurate, outdated or corrupted data can significantly compromise the functionality or reliability of a particular system and other systems to which it transmits or from which it receives information, and
- JPMorgan Chase's ability to appropriately maintain and upgrade its systems on a regular basis, and to ensure that any changes introduced to its systems are managed carefully to ensure security and operational continuity and adhere to all applicable legal and regulatory requirements.

JPMorgan Chase also depends on its ability to access and use the operational systems of its vendors, custodians and other market participants, including clearing and payment systems, CCPs, securities exchanges and data processing, security and technology companies.

The ineffectiveness, failure or other disruption of operational systems upon which JPMorgan Chase depends, including due to a systems malfunction, cyberbreach or other systems failure, could result in unfavorable ripple effects in the financial markets and for JPMorgan Chase and its clients and customers, including:

- delays or other disruptions in providing information, services and liquidity to clients and customers
- the inability to settle transactions or obtain access to funds and other assets, including those for which physical settlement and delivery is required
- failure to timely settle or confirm transactions
- the possibility that funds transfers, capital markets trades or other transactions are executed erroneously, as a result of illegal conduct or with unintended consequences
- financial losses, including due to loss-sharing requirements of CCPs, payment systems or other market infrastructures, or as possible restitution to clients and customers
- higher operational costs associated with replacing services provided by a system that is unavailable
- client or customer dissatisfaction with JPMorgan Chase's products and services
- regulatory fines, penalties, or other sanctions against JPMorgan Chase
- loss of confidence in the ability of JPMorgan Chase, or financial institutions generally, to protect against and withstand operational disruptions, or
- harm to JPMorgan Chase's reputation.

As the speed, frequency, volume, interconnectivity and complexity of transactions continue to increase, it can become more challenging to effectively maintain and upgrade JPMorgan Chase's operational systems and infrastructure, especially due to the heightened risks that:

- attempts by third parties to defraud JPMorgan Chase or its clients and customers may increase, evolve or become more complex, particularly during periods of market disruption or economic uncertainty
- errors made by JPMorgan Chase or another market participant, whether inadvertent or malicious, cause widespread system disruption
- isolated or seemingly insignificant errors in operational systems compound, or migrate to other systems over time, to become larger issues
- failures in synchronization or encryption software, or degraded performance of microprocessors due to design flaws, could cause disruptions in operational systems, or the inability of systems to communicate with each other, and
- third parties may attempt to block the use of key technology solutions by claiming that the use infringes on their intellectual property rights.

If JPMorgan Chase's operational systems, or those of external parties on which JPMorgan Chase's businesses depend, are unable to meet the requirements of JPMorgan Chase's businesses and operations or bank regulatory standards, or if they fail or have other significant shortcomings, JPMorgan Chase could be materially and adversely affected.

A successful cyber attack affecting JPMorgan Chase could cause significant harm to JPMorgan Chase and its clients and customers.

JPMorgan Chase experiences numerous attempted cyber attacks on its computer systems, software, networks and other technology assets on a daily basis from various actors, including groups acting on behalf of hostile countries, cyber-criminals, "hacktivists" (i.e., individuals or groups that use technology to promote a political agenda or social change) and others. These cyber attacks can take many forms, including attempts to introduce computer viruses or malicious code, which is commonly referred to as "malware," into JPMorgan Chase's systems. These attacks are typically designed to:

- obtain unauthorized access to confidential information belonging to JPMorgan Chase or its clients, customers, counterparties or employees
- manipulate data
- destroy data or systems with the aim of rendering services unavailable
- disrupt, sabotage or degrade service on JPMorgan Chase's systems
- steal money, or
- extort money through the use of so-called "ransomware."

JPMorgan Chase has also experienced significant distributed denial-of-service attacks which are intended to disrupt online banking services.

JPMorgan Chase has experienced security breaches due to cyber attacks in the past, and it is inevitable that additional breaches will occur in the future. Any such breach could result in serious and harmful consequences for JPMorgan Chase or its clients and customers.

A principal reason that JPMorgan Chase cannot provide absolute security against cyber attacks is that it may not always be possible to anticipate, detect or recognize threats to JPMorgan Chase's systems, or to implement effective preventive measures against all breaches. This is because:

- the techniques used in cyber attacks change frequently and are increasingly sophisticated, and therefore may not be recognized until launched
- cyber attacks can originate from a wide variety of sources, including JPMorgan Chase's own employees, cyber-criminals, hacktivists, groups linked to terrorist organizations or hostile countries, or third parties whose objective is to disrupt the operations of financial institutions more generally
- JPMorgan Chase does not have control over the cybersecurity of the systems of the large number of clients, customers, counterparties and third-party service providers with which it does business, and
- it is possible that a third party, after establishing a foothold on an internal network without being detected, might obtain access to other networks and systems.

The risk of a security breach due to a cyber attack could increase in the future as JPMorgan Chase continues to expand its mobile banking and other internet-based product offerings and its internal use of internet-based products and applications. Furthermore, increased use of remote access and third party video conferencing solutions during the COVID-19 pandemic, to facilitate work-from-home arrangements for employees, could increase JPMorgan Chase's exposure to cyber attacks. In addition, a third party could misappropriate confidential information obtained by intercepting signals or communications from mobile devices used by JPMorgan Chase's employees.

A successful penetration or circumvention of the security of JPMorgan Chase's systems or the systems of a vendor, governmental body or another market participant could cause serious negative consequences, including:

- significant disruption of JPMorgan Chase's operations and those of its clients, customers and counterparties, including losing access to operational systems
- misappropriation of confidential information of JPMorgan Chase or that of its clients, customers, counterparties, employees or regulators
- disruption of or damage to JPMorgan Chase's systems and those of its clients, customers and counterparties
- the inability, or extended delays in the ability, to fully recover and restore data that has been stolen, manipulated or destroyed, or the inability to prevent systems from processing fraudulent transactions
- violations by JPMorgan Chase of applicable privacy and other laws
- financial loss to JPMorgan Chase or to its clients, customers, counterparties or employees
- loss of confidence in JPMorgan Chase's cybersecurity and business resiliency measures
- dissatisfaction among JPMorgan Chase's clients, customers or counterparties
- significant exposure to litigation and regulatory fines, penalties or other sanctions, and
- harm to JPMorgan Chase's reputation.

The extent of a particular cyber attack and the steps that JPMorgan Chase may need to take to investigate the attack may not be immediately clear, and it may take a significant amount of time before such an investigation can be completed. While such an investigation is ongoing, JPMorgan Chase may not necessarily know the full extent of the harm caused by the cyber attack, and that damage may continue to spread. These factors may inhibit JPMorgan Chase's ability to provide rapid, full and reliable information about the cyber attack to its clients, customers, counterparties and regulators, as well as the public. Furthermore, it may not be clear how best to contain and remediate the harm caused by the cyber attack, and certain errors or actions could be repeated or compounded before they are discovered and remediated. Any or all of these factors could further increase the costs and consequences of a cyber attack.

JPMorgan Chase can be negatively affected if it fails to identify and address operational risks associated with the introduction of or changes to products, services and delivery platforms.

When JPMorgan Chase launches a new product or service, introduces a new platform for the delivery or distribution of products or services (including mobile connectivity, electronic trading and cloud computing), or makes changes to an existing product, service or delivery platform, it may not fully appreciate or identify new operational risks that may arise from those changes, or may fail to implement adequate controls to mitigate the risks associated with those changes. Any significant failure in this regard could diminish JPMorgan Chase's ability to operate one or more of its businesses or result in:

- potential liability to clients, counterparties and customers
- increased operating expenses
- higher litigation costs, including regulatory fines, penalties and other sanctions
- damage to JPMorgan Chase's reputation
- impairment of JPMorgan Chase's liquidity
- regulatory intervention, or
- weaker competitive standing.

Any of the foregoing consequences could materially and adversely affect JPMorgan Chase's businesses and results of operations.

JPMorgan Chase's operational costs and customer satisfaction could be adversely affected by the failure of an external operational system.

External operational systems with which JPMorgan is connected, whether directly or indirectly, can be sources of operational risk to JPMorgan Chase. JPMorgan Chase may be exposed not only to a systems failure or cyber attack that may be experienced by a vendor or market infrastructure with which JPMorgan Chase is directly connected, but also to a systems breakdown or cyber attack involving another party to which such a vendor or infrastructure is connected. Similarly, retailers, data aggregators and other external parties with which JPMorgan Chase's customers do business can increase JPMorgan Chase's operational risk. This is particularly the case where activities of customers or those parties are beyond JPMorgan Chase's security and control systems, including through the use of the internet, cloud computing services and personal smart phones and other mobile devices or services.

If an external party obtains access to customer account data on JPMorgan Chase's systems, and that party experiences a cyberbreach of its own systems or misappropriates that data, this could result in a variety of negative outcomes for JPMorgan Chase and its clients and customers, including:

- heightened risk that external parties will be able to execute fraudulent transactions using JPMorgan Chase's systems
- losses from fraudulent transactions, as well as potential liability for losses that exceed thresholds established in consumer protection laws, rules and regulations
- increased operational costs to remediate the consequences of the external party's security breach, and
- harm to reputation arising from the perception that JPMorgan Chase's systems may not be secure.

As JPMorgan Chase's interconnectivity with clients, customers and other external parties continues to expand, JPMorgan Chase increasingly faces the risk of operational failure or cyber attacks with respect to the systems of those parties. Security breaches affecting JPMorgan Chase's clients or customers, or systems breakdowns or failures, security breaches or human error or misconduct affecting other external parties, may require JPMorgan Chase to take steps to protect the integrity of its own operational systems or to safeguard confidential information, including restricting the access of customers to their accounts. These actions can increase JPMorgan Chase's operational costs and potentially diminish customer satisfaction and confidence in JPMorgan Chase.

Furthermore, the widespread and expanding interconnectivity among financial institutions, central agents, CCPs, payment processors, securities exchanges, clearing houses and other financial market infrastructures increases the risk that an operational failure or cyber attack involving one institution or entity may cause industry-wide operational disruptions that could materially affect JPMorgan Chase's ability to conduct business.

JPMorgan Chase's operations could be impaired if its employees, or those of external parties, are not competent and trustworthy, or if measures to protect their health and safety are ineffective.

JPMorgan Chase's ability to operate its businesses efficiently and profitably, to offer products and services that meet the expectations of its clients and customers, and to maintain an effective risk management framework is highly dependent on the competence and integrity of its employees, as well as employees of other parties on which JPMorgan Chase's operations rely, including vendors, custodians and financial markets infrastructures. JPMorgan

Chase's businesses could be materially and adversely affected by:

- the ineffective implementation of business decisions
- any failure to institute controls that appropriately address risks associated with business activities, or to appropriately train employees with respect to those risks and controls
- a significant operational breakdown or failure, theft, fraud or other unlawful conduct, or
- other negative outcomes caused by human error or misconduct by an employee of JPMorgan Chase or of another party on which JPMorgan Chase's operations depend.

JPMorgan Chase's operations could also be impaired if the measures taken by it or by governmental authorities to help ensure the health and safety of its employees are ineffective, or if any external party on which JPMorgan Chase relies fails to take appropriate and effective actions to protect the health and safety of its employees.

JPMorgan Chase faces substantial legal and operational risks in safeguarding personal information.

JPMorgan Chase's businesses are subject to complex and evolving laws, rules and regulations, both within and outside the U.S., governing the privacy and protection of personal information of individuals. The protected parties can include:

- JPMorgan Chase's clients and customers, and prospective clients and customers
- clients and customers of JPMorgan Chase's clients and customers
- employees and prospective employees, and
- employees of JPMorgan Chase's vendors, counterparties and other external parties.

Ensuring that JPMorgan Chase's collection, use, transfer and storage of personal information comply with all applicable laws, rules and regulations in all relevant jurisdictions, including where the laws of different jurisdictions are in conflict, can:

- increase JPMorgan Chase's compliance and operating costs
- hinder the development of new products or services, curtail the offering of existing products or services, or affect how products and services are offered to clients and customers
- demand significant oversight by JPMorgan Chase's management, and
- require JPMorgan Chase to structure its businesses, operations and systems in less efficient ways.

Not all of JPMorgan Chase's clients, customers, vendors, counterparties and other external parties may have appropriate controls in place to protect the confidentiality of the information exchanged between them and JPMorgan Chase, particularly where information is transmitted by electronic means. JPMorgan Chase could be exposed to litigation or regulatory fines, penalties or other sanctions if personal, confidential or proprietary information of clients, customers, employees or others were to be mishandled or misused, such as situations where such information is:

- erroneously provided to parties who are not permitted to have the information, or
- intercepted or otherwise compromised by third parties.

Concerns regarding the effectiveness of JPMorgan Chase's measures to safeguard personal information, or even the perception that those measures are inadequate, could cause JPMorgan Chase to lose existing or potential clients and customers, and thereby reduce JPMorgan Chase's revenues. Furthermore, any failure or perceived failure by JPMorgan Chase to comply with applicable privacy or data protection laws, rules and regulations may subject it to inquiries, examinations and investigations that could result in requirements to modify or cease certain operations or practices, significant liabilities or regulatory fines, penalties or other sanctions. Any of these could damage JPMorgan Chase's reputation and otherwise adversely affect its businesses.

In recent years, well-publicized allegations involving the misuse or inappropriate sharing of personal information have led to expanded governmental scrutiny of practices relating to the safeguarding of personal information and the use or sharing of personal data by companies in the U.S. and other countries. That scrutiny has in some cases resulted in, and could in the future lead to, the adoption of stricter laws, rules and regulations relating to the use and sharing of personal information. These types of laws and regulations could prohibit or significantly restrict financial services firms such as JPMorgan Chase from sharing information among affiliates or with third parties such as vendors, and thereby increase compliance costs, or could restrict JPMorgan Chase's use of personal data when developing or offering products or services to customers. These restrictions could also inhibit JPMorgan Chase's development or marketing of certain products or services, or increase the costs of offering them to customers.

JPMorgan Chase's operations, results and reputation could be harmed by catastrophes or other events.

JPMorgan Chase's business and operational systems could be seriously disrupted, and its reputation could be harmed, by events or contributing factors that are wholly or partially beyond its control, including:

- cyberbreaches or breaches of physical premises, including data centers
- power, telecommunications or internet outages
- failures of, or loss of access to, operational systems, including computer systems, servers, networks and other technology assets

- damage to or loss of property or assets of JPMorgan Chase or third parties, and any consequent injuries, including in connection with any construction projects undertaken by JPMorgan Chase
- effects of climate change
- natural disasters or severe weather conditions
- accidents such as explosions or structural failures
- health emergencies, the spread of infectious diseases or pandemics, or
- events arising from local or larger-scale political events, including outbreaks of hostilities or terrorist acts.

JPMorgan Chase maintains a Firmwide resiliency program that is intended to enable it to recover critical business functions and supporting assets, including staff, technology and facilities, in the event of a business interruption. There can be no assurance that JPMorgan Chase's resiliency plans will fully mitigate all potential business continuity risks to JPMorgan Chase or its clients and customers or that its resiliency plans will be adequate to address the effects of simultaneous occurrences of multiple catastrophes or other business interruption events. In addition, JPMorgan Chase's ability to respond effectively to a business interruption could be hampered to the extent that the members of its workforce, physical assets or systems and other support infrastructure needed to address the event are geographically dispersed, or conversely, if a catastrophic event occurs in an area in which a critical segment of JPMorgan Chase's workforce, physical assets or systems and other support infrastructure is concentrated. Further, should emergency or catastrophic events such as severe or abnormal weather conditions or health emergencies, the spread of infectious diseases or pandemics become more chronic, the disruptive effects of those events on JPMorgan Chase's business and operations, and on its clients, customers, counterparties and employees, could become more significant and long-lasting.

Any significant failure or disruption of JPMorgan Chase's operations or operational systems, or any catastrophic event, could:

- hinder JPMorgan Chase's ability to provide services to its clients and customers or to transact with its counterparties
- require it to expend significant resources to correct the failure or disruption
- cause it to incur losses or liabilities, including from loss of revenue, damage to or loss of property, or injuries
- expose it to litigation or regulatory fines, penalties or other sanctions, and
- harm its reputation.

Furthermore, JPMorgan Chase may incur costs in connection with disposing of certain excess properties, premises and facilities, and those costs may be material to its results of operations in a given period.

Enhanced regulatory and other standards for the oversight of vendors and other service providers can result in higher costs and other potential exposures.

JPMorgan Chase must comply with enhanced regulatory and other standards associated with doing business with vendors and other service providers, including standards relating to the outsourcing of functions as well as the performance of significant banking and other functions by subsidiaries. JPMorgan Chase incurs significant costs and expenses in connection with its initiatives to address the risks associated with oversight of its internal and external service providers. JPMorgan Chase's failure to appropriately assess and manage these relationships, especially those involving significant banking functions, shared services or other critical activities, could materially adversely affect JPMorgan Chase. Specifically, any such failure could result in:

- potential liability to clients and customers
- regulatory fines, penalties or other sanctions
- lower revenues, and the opportunity cost from lost revenues
- increased operational costs, or
- harm to JPMorgan Chase's reputation.

JPMorgan Chase's risk management framework may not be effective in identifying and mitigating every risk to JPMorgan Chase.

Any inadequacy or lapse in JPMorgan Chase's risk management framework, governance structure, practices, models or reporting systems could expose it to unexpected losses, and its financial condition or results of operations could be materially and adversely affected. Any such inadequacy or lapse could:

- hinder the timely escalation of material risk issues to JPMorgan Chase's senior management and the Board of Directors
- lead to business decisions that have negative outcomes for JPMorgan Chase
- require significant resources and time to remediate
- lead to non-compliance with laws, rules and regulations
- attract heightened regulatory scrutiny
- expose JPMorgan Chase to regulatory investigations or legal proceedings
- subject it to litigation or regulatory fines, penalties or other sanctions
- harm its reputation, or
- otherwise diminish confidence in JPMorgan Chase.

JPMorgan Chase relies on data to assess its various risk exposures. Any deficiencies in the quality or effectiveness of

JPMorgan Chase's data gathering, analysis and validation processes could result in ineffective risk management practices. These deficiencies could also result in inaccurate risk reporting.

Many of JPMorgan Chase's risk management strategies and techniques consider historical market behavior. These strategies and techniques are based to some degree on management's subjective judgment. For example, many models used by JPMorgan Chase are based on assumptions regarding historical correlations among prices of various asset classes or other market indicators. In times of market stress, including difficult or less liquid market environments, or in the event of other unforeseen circumstances, previously uncorrelated indicators may become correlated. Conversely, previously-correlated indicators may make unrelated movements at those times. Sudden market movements and unanticipated or unidentified market or economic movements could, in some circumstances, limit the effectiveness of JPMorgan Chase's risk management strategies, causing it to incur losses.

JPMorgan Chase could recognize unexpected losses, its capital levels could be reduced and it could face greater regulatory scrutiny if its models, estimations or judgments, including those used in its financial statements, prove to be inadequate or incorrect.

JPMorgan Chase has developed and uses a variety of models and other analytical and judgment-based estimations to measure, monitor and implement controls over its market, credit, capital, liquidity, operational and other risks. These models and estimations are based on a variety of assumptions and historical trends, and are periodically reviewed and modified as necessary. The models and estimations that JPMorgan Chase uses may not be effective in all cases to identify, observe and mitigate risk due to a variety of factors, such as:

- reliance on historical trends that may not accurately predict future events, including assumptions underlying the models and estimations which predict correlation among certain market indicators or asset prices
- inherent limitations associated with forecasting uncertain economic and financial outcomes
- historical trend information may be incomplete, or may not anticipate severely negative market conditions such as extreme volatility, dislocation or lack of liquidity
- technology that is introduced to run models or estimations may not perform as expected, or may not be well understood by the personnel using the technology
- models and estimations may contain erroneous data, valuations, formulas or algorithms, and
- review processes may fail to detect flaws in models and estimations.

Some of the models and other analytical and judgment-based estimations used by JPMorgan Chase in managing risks are subject to review by, and require the approval of, JPMorgan Chase's regulators. These reviews are required before JPMorgan Chase may use those models and estimations in connection with calculating market risk RWA, credit risk RWA and operational risk RWA under Basel III. If JPMorgan Chase's models or estimations are not approved by its regulators, it may be subject to higher capital charges, which could adversely affect its financial results or limit the ability to expand its businesses. JPMorgan Chase also uses internal models in connection with its stress testing. JPMorgan Chase's capital actions may require regulatory approval and could be constrained if its banking regulators object to a capital plan or require the resubmission of a capital plan due to the perceived inadequacy of JPMorgan Chase's models, estimations or other factors.

Under U.S. generally accepted accounting principles ("U.S. GAAP"), JPMorgan Chase is required to use estimates and apply judgments in preparing its financial statements, including in determining the allowance for credit losses, reserves related to litigation and the credit card rewards liability. Certain financial instruments require a determination of their fair value in order to prepare JPMorgan Chase's financial statements, including:

- trading assets and liabilities
- instruments in the investment portfolio
- certain loans
- MSRs
- structured notes, and
- certain repurchase and resale agreements.

Where quoted market prices are not available for these types of financial instruments, JPMorgan Chase may make fair value determinations based on internally developed models or other means which ultimately rely to some degree on management estimates and judgment, and these types of estimates and judgments may not prove to be accurate due to a variety of factors, as noted above. In addition, sudden illiquidity in markets or declines in prices of certain loans and securities may make it more difficult to value certain financial instruments, which could lead to valuations being subsequently changed or adjusted. If estimates or judgments underlying JPMorgan Chase's financial statements prove to have been incorrect, JPMorgan Chase may experience material losses.

JPMorgan Chase establishes an allowance for expected credit losses that are inherent in its credit exposures. It then employs stress testing and other techniques to determine the amounts of capital and liquidity that would be needed in the event of adverse economic or market events. These processes are critical to JPMorgan Chase's results of operations and financial condition. They require difficult, subjective and complex judgments, including forecasts of how economic conditions might impair the ability of JPMorgan Chase's borrowers and counterparties to repay their loans or other obligations. It is possible that

JPMorgan Chase will fail to identify the proper factors or that it will fail to accurately estimate the impact of factors that it identifies.

Certain models used by JPMorgan Chase in connection with the determination of the allowance for credit losses have heightened performance risk in the economic environment precipitated by the effects of the COVID-19 pandemic and government stimulus. For example, at times certain macroeconomic variables employed in these models remained well outside the range of historical data used to train the models for some stress scenarios. In addition, the historical relationships between these macroeconomic variables and consumer and wholesale credit losses have deteriorated, in part due to the effects of the CARES Act and government stimulus actions. As a result, there continues to be significant uncertainty about the reliability of the projections produced by the models. To compensate for this uncertainty, JPMorgan Chase has made, and may continue to make, significant adjustments to the quantitative results of model calculations to take into consideration model imprecision, emerging risks, trends and other factors that are not yet reflected in those calculations. There can be no assurance that, even after adjustments have been made to model outputs, JPMorgan Chase will not recognize unexpected losses arising from the model uncertainty that has resulted from these developments.

Lapses in controls over disclosure or financial reporting could materially affect JPMorgan Chase's profitability or reputation.

There can be no assurance that JPMorgan Chase's disclosure controls and procedures will be effective in every circumstance, or that a material weakness or significant deficiency in internal control over financial reporting will not occur. Any such lapses or deficiencies could:

- materially and adversely affect JPMorgan Chase's business and results of operations or financial condition
- restrict its ability to access the capital markets
- require it to expend significant resources to correct the lapses or deficiencies
- expose it to litigation or regulatory fines, penalties or other sanctions
- harm its reputation, or
- otherwise diminish investor confidence in JPMorgan Chase.

JPMorgan Chase could be adversely affected by changes in accounting standards or policies.

The preparation of JPMorgan Chase's financial statements is based on accounting standards established by the Financial Accounting Standards Board and the Securities and Exchange Commission, as well as more detailed accounting policies established by JPMorgan Chase's management. From time to time these accounting standards or accounting policies may change, and in some cases these changes could have a significant effect on JPMorgan Chase's financial statements and may adversely affect its financial results or investor perceptions of those results.

As of January 1, 2020, JPMorgan Chase implemented a new accounting standard, commonly referred to as the Current Expected Credit Losses ("CECL") framework, which requires earlier recognition of expected credit losses on loans and certain other instruments. The allowance for credit losses related to certain of JPMorgan Chase's loans and other lending-related commitments portfolios increased upon implementation of CECL, which has had a negative impact on JPMorgan Chase's capital levels.

The ongoing impact of the adoption of CECL could include the following, each of which could result in diminished investor confidence:

- greater volatility in JPMorgan Chase's earnings and capital levels over economic cycles
- potential reductions in its capital distributions, or
- increases in the allowance for credit losses.

In addition, JPMorgan Chase could be adversely impacted by associated changes in the competitive environment in which it operates, including changes in the availability or pricing of loan products, particularly during periods of economic stress, as well as changes related to non-U.S. financial institutions or other competitors that are not subject to this accounting standard.

Strategic

If JPMorgan Chase's management fails to develop and execute effective business strategies, and to anticipate changes affecting those strategies, JPMorgan Chase's competitive standing and results could suffer.

JPMorgan Chase's business strategies significantly affect its competitive standing and operations. These strategies relate to:

- the products and services that JPMorgan Chase offers
- the geographies in which it operates
- the types of clients and customers that it serves
- the counterparties with which it does business, and
- the methods and distribution channels by which it offers products and services.

If management makes choices about these strategies and goals that prove to be incorrect, do not accurately assess the competitive landscape and industry trends, or fail to address changing regulatory and market environments or the expectations of clients, customers, investors, employees and other stakeholders, then the franchise values and growth prospects of JPMorgan Chase's businesses may suffer and its earnings could decline.

JPMorgan Chase's growth prospects also depend on management's ability to develop and execute effective business plans to address these strategic priorities, both in the near term and over longer time horizons. Management's effectiveness in this regard will affect JPMorgan Chase's ability to develop and enhance its resources, control expenses and return capital to shareholders. Each of these objectives could be adversely affected by any failure on the part of management to:

- devise effective business plans and strategies
- offer products and services that meet changing expectations of clients and customers
- allocate capital in a manner that promotes long-term stability to enable JPMorgan Chase to build and invest in market-leading businesses, even in a highly stressed environment
- allocate capital appropriately due to imprecise modeling or subjective judgments made in connection with those allocations
- appropriately address concerns of clients, customers, investors, employees and other stakeholders, including with respect to social and sustainability matters
- react quickly to changes in market conditions or market structures, or
- develop and enhance the operational, technology, risk, financial and managerial resources necessary to grow and manage JPMorgan Chase's businesses.

JPMorgan Chase faces significant and increasing competition in the rapidly evolving financial services industry.

JPMorgan Chase operates in a highly competitive environment in which it must evolve and adapt to the significant changes as a result of changes in financial regulation, technological advances, increased public scrutiny and changes in economic conditions. JPMorgan Chase expects that competition in the U.S. and global financial services industry will continue to be intense. Competitors include:

- other banks and financial institutions
- trading, advisory and investment management firms
- finance companies
- technology companies, and
- other nonbank firms that are engaged in providing similar products and services.

JPMorgan Chase cannot provide assurance that the significant competition in the financial services industry will not materially and adversely affect its future results of operations.

New competitors in the financial services industry continue to emerge. For example, technological advances and the growth of e-commerce have made it possible for non-depository institutions to offer products and services that traditionally were banking products. These advances have also allowed financial institutions and other companies to provide electronic and internet-based financial solutions, including electronic securities trading, payments processing and online automated algorithmic-based investment advice. Furthermore, both financial institutions and their non-banking competitors face the risk that payments processing and other services could be significantly disrupted by technologies, such as cryptocurrencies, that require no intermediation. New technologies have required and could require JPMorgan Chase to spend more to modify or adapt its products to attract and retain clients and customers or to match products and services offered by its competitors, including technology companies. In addition, new technologies may be used by customers, or breached or infiltrated by third parties, in unexpected ways, which can increase JPMorgan Chase's costs for complying with laws, rules and regulations that apply to the offering of products and services through those technologies and reduce the income that JPMorgan Chase earns from providing products and services through those new technologies.

Ongoing or increased competition may put pressure on the pricing for JPMorgan Chase's products and services or may cause JPMorgan Chase to lose market share, particularly with respect to traditional banking products such as deposits and bank accounts. This competition may be on the basis of quality and variety of products and services offered, transaction execution, innovation, reputation and price. The failure of any of JPMorgan Chase's businesses to meet the expectations of clients and customers, whether due to general market conditions, under-performance, a decision not to offer a particular product or service, changes in client and customer expectations or other factors, could affect JPMorgan Chase's ability to attract or retain clients and customers. Any such impact could, in turn, reduce JPMorgan Chase's revenues. Increased competition also may require JPMorgan Chase to make additional capital investments in its businesses, or to extend more of its capital on behalf of its clients in order to remain competitive.

Climate change manifesting as physical or transition risks could have a material adverse impact on JPMorgan Chase's business operations, clients and customers.

JPMorgan Chase operates in many regions, countries and communities around the world where its businesses, and the activities of its clients and customers, could be impacted by climate change. Climate change could manifest as a financial risk to JPMorgan Chase either through changes in the physical climate or from the process of transitioning to a low-carbon economy, including changes in climate policy or in the regulation of financial institutions with respect to risks posed by climate change.

Climate-related physical risks include both acute weather events and chronic shifts in the climate. Potential physical risks from climate change may include altered distribution and intensity of rainfall, prolonged droughts or flooding, increased frequency of wildfires, rising sea levels, or a rising heat index.

Transition risks arise from the process of adjusting to a low-carbon economy. In addition to possible changes in climate policy and financial regulation, potential transition risks may include economic and other changes engendered by the development of low-carbon technological advances (e.g., electric vehicles and renewable energy) and/or changes in consumer preferences towards low-carbon goods and services. Transition risks could be further accelerated by the occurrence of changes in the physical climate.

These climate-related physical risks and transition risks could have a financial impact on JPMorgan Chase both directly on its business and operations and as a result of material adverse impacts to its clients and customers, including:

- declines in asset values
- reduced availability of insurance
- significant interruptions to business operations, and
- negative consequences to business models, and the need to make changes in response to those consequences.

Conduct

Conduct failure by JPMorgan Chase employees can harm clients and customers, impact market integrity, damage JPMorgan Chase's reputation and trigger litigation and regulatory action.

JPMorgan Chase's employees interact with clients, customers and counterparties, and with each other, every day. All employees are expected to demonstrate values and exhibit the behaviors that are an integral part of JPMorgan Chase's How We Do Business Principles, including JPMorgan Chase's commitment to "do first class business in a first class way." JPMorgan Chase endeavors to embed conduct risk management throughout an employee's life cycle, including recruiting, onboarding, training and development, and performance management. Conduct risk management is also an integral component of JPMorgan Chase's promotion and compensation processes.

Notwithstanding these expectations, policies and practices, certain employees have in the past engaged in improper or illegal conduct, and these instances of misconduct have resulted in litigation as well as resolutions of governmental investigations or enforcement actions involving consent orders, deferred prosecution agreements, non-prosecution agreements and other civil or criminal sanctions. There is no assurance that further inappropriate or unlawful actions by employees will not occur, lead to a violation of the terms of these resolutions (and associated consequences), or that any such actions will always be detected, deterred or prevented.

JPMorgan Chase's reputation could be harmed, and collateral consequences could result, from a failure by one or more employees to act consistently with JPMorgan Chase's expectations, policies and practices, including by acting in ways that harm clients, customers, other market participants or other employees. Some examples of this include:

- improperly selling and marketing JPMorgan Chase's products or services
- engaging in insider trading, market manipulation or unauthorized trading
- engaging in improper or fraudulent behavior in connection with government relief programs
- facilitating a transaction where a material objective is to achieve a particular tax, accounting or financial disclosure treatment that may be subject to scrutiny by governmental or regulatory authorities, or where the proposed treatment is unclear or may not reflect the economic substance of the transaction
- failing to fulfill fiduciary obligations or other duties owed to clients or customers
- violating antitrust or anti-competition laws by colluding with other market participants to manipulate markets, prices or indices
- engaging in discriminatory behavior or harassment with respect to clients, customers or employees, or acting contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace
- managing or reporting risks in ways that subordinate JPMorgan Chase's risk appetite to business performance goals or employee compensation objectives, and
- misappropriating property, confidential or proprietary information, or technology assets belonging to JPMorgan Chase, its clients and customers or third parties.

The consequences of any failure by employees to act consistently with JPMorgan Chase's expectations, policies or practices could include litigation, or regulatory or other governmental investigations or enforcement actions. Any of these proceedings or actions could result in judgments, settlements, fines, penalties or other sanctions, or lead to:

- financial losses
- increased operational and compliance costs
- greater scrutiny by regulators and other parties
- regulatory actions that require JPMorgan Chase to restructure, curtail or cease certain of its activities
- the need for significant oversight by JPMorgan Chase's management
- loss of clients or customers, and
- harm to JPMorgan Chase's reputation.

Reputation

Damage to JPMorgan Chase's reputation could harm its businesses.

Maintaining trust in JPMorgan Chase is critical to its ability to attract and retain clients, customers, investors and employees. Damage to JPMorgan Chase's reputation can therefore cause significant harm to JPMorgan Chase's business and prospects, and can arise from numerous sources, including:

- employee misconduct, including discriminatory behavior or harassment with respect to clients, customers or employees, or actions that are contrary to JPMorgan Chase's goal of fostering a diverse and inclusive workplace
- security breaches, including as a result of cyber attacks
- failure to safeguard client, customer or employee information
- failure to manage risk issues associated with its business activities or those of its clients, including failure to fully discharge publicly-announced commitments to support social and sustainability initiatives
- compliance or operational failures
- litigation or regulatory fines, penalties or other sanctions
- regulatory investigations or enforcement actions, or resolutions of these matters, and
- failure or perceived failure of clients, customers, counterparties or other parties to comply with laws, rules or regulations, including companies in which JPMorgan Chase has made principal investments, parties to joint ventures with JPMorgan Chase, and vendors with which JPMorgan Chase does business.

JPMorgan Chase's reputation may be significantly damaged by adverse publicity or negative information regarding JPMorgan Chase, whether or not true, that may be published or broadcast by the media or posted on social media, non-mainstream news services or other parts of the internet. This latter risk can be magnified by the speed and pervasiveness with which information is disseminated through those channels.

Social and environmental activists are increasingly targeting financial services firms such as JPMorgan Chase with public criticism for their relationships with clients that are engaged in certain sensitive industries, including businesses whose products are or are perceived to be harmful to human health, or whose activities negatively affect or are perceived to negatively affect the environment, workers' rights or communities. Activists have also engaged in public protests at JPMorgan Chase's headquarters and other properties. Activist criticism of JPMorgan Chase's relationships with clients in sensitive industries could potentially engender dissatisfaction among clients, customers, investors and employees with how JPMorgan Chase addresses social and sustainability concerns in its business activities. Alternatively, yielding to activism targeted at certain sensitive industries could damage JPMorgan Chase's relationships with clients and customers, and with governmental or regulatory bodies in jurisdictions in which JPMorgan Chase does business, whose views are not aligned with those of social and environmental activists. In either case, the resulting harm to JPMorgan Chase's reputation could:

- cause certain clients and customers to cease doing business with JPMorgan Chase
- impair JPMorgan Chase's ability to attract new clients and customers, or to expand its relationships with existing clients and customers
- diminish JPMorgan Chase's ability to hire or retain employees
- prompt JPMorgan Chase to cease doing business with certain clients or customers.
- cause certain investors to divest from investments in securities of JPMorgan Chase, or
- attract scrutiny from governmental or regulatory bodies.

Actions by the financial services industry generally or individuals in the industry can also affect JPMorgan Chase's reputation. For example, the reputation of the industry as a whole can be damaged by concerns that:

- consumers have been treated unfairly by a financial institution,
- a financial institution has acted inappropriately with respect to the methods used to offer products to customers

If JPMorgan Chase is perceived to have engaged in these types of behaviors, this could weaken its reputation among clients or customers.

Failure to effectively manage potential conflicts of interest can result in litigation and enforcement actions, as well as damage JPMorgan Chase's reputation.

JPMorgan Chase's ability to manage potential conflicts of interest is highly complex due to the broad range of its business activities which encompass a variety of transactions, obligations and interests with and among JPMorgan Chase's clients and customers. JPMorgan Chase can become subject to litigation and enforcement actions, and its reputation can be damaged, by the failure or perceived failure to:

- adequately address or appropriately disclose conflicts of interest, including potential conflicts of interest that may arise in connection with providing multiple products and services in, or having one or more investments related to, the same transaction
- deliver appropriate standards of service and quality

- treat clients and customers with the appropriate standard of care
- use client and customer data responsibly and in a manner that meets legal requirements and regulatory expectations
- provide fiduciary products or services in accordance with the applicable legal and regulatory standards, or
- handle or use confidential information of customers or clients appropriately or in compliance with applicable data protection and privacy laws, rules and regulations.

A failure or perceived failure to appropriately address conflicts of interest or fiduciary obligations could result in customer dissatisfaction, litigation and regulatory fines, penalties or other sanctions, and heightened regulatory scrutiny and enforcement actions, all of which can lead to lost revenue and higher operating costs and cause serious harm to JPMorgan Chase's reputation.

Country

An outbreak of hostilities between countries or within a country or region could have a material adverse effect on the global economy and on JPMorgan Chase's businesses within the affected region or globally.

Aggressive actions by hostile governments or groups, including armed conflict or intensified cyber attacks, could expand in unpredictable ways by drawing in other countries or escalating into full-scale war with potentially catastrophic consequences, particularly if one or more of the combatants possess nuclear weapons. Depending on the scope of the conflict, the hostilities could result in:

- worldwide economic disruption
- heightened volatility in financial markets
- severe declines in asset values, accompanied by widespread sell-offs of investments
- substantial depreciation of local currencies, potentially leading to defaults by borrowers and counterparties in the affected region
- disruption of global trade, and
- diminished consumer, business and investor confidence.

Any of the above consequences could have significant negative effects on JPMorgan Chase's operations and earnings, both in the countries or regions directly affected by the hostilities or globally. Further, if the U.S. were to become directly involved in such a conflict, this could lead to a curtailment of any operations that JPMorgan Chase may have in the affected countries or region, as well as in any nation that is aligned against the U.S. in the hostilities. JPMorgan Chase could also experience more numerous and aggressive cyber attacks launched by or under the sponsorship of one or more of the adversaries in such a conflict.

JPMorgan Chase's business and operations in certain countries can be adversely affected by local economic, political, regulatory and social factors.

Some of the countries in which JPMorgan Chase conducts business have economies or markets that are less developed and more volatile or may have political, legal and regulatory regimes that are less established or predictable than other countries in which JPMorgan Chase operates. In addition, in some jurisdictions in which JPMorgan Chase conducts business, the local economy and business activity are subject to substantial government influence or control. Some of these countries have in the past experienced economic disruptions, including:

- extreme currency fluctuations
- high inflation
- low or negative growth, and
- defaults or reduced ability to service sovereign debt.

The governments in these countries have sometimes reacted to these developments by imposing restrictive policies that adversely affect the local and regional business environment, including:

- price, capital or exchange controls, including imposition of punitive transfer and convertibility restrictions or forced currency exchange
- expropriation or nationalization of assets or confiscation of property, including intellectual property, and
- changes in laws, rules and regulations.

The impact of these actions could be accentuated in trading markets that are smaller, less liquid and more volatile than more-developed markets. These types of government actions can negatively affect JPMorgan Chase's operations in the relevant country, either directly or by suppressing the business activities of local clients or multi-national clients that conduct business in the jurisdiction.

In addition, emerging markets countries, as well as certain more developed countries, have been susceptible to unfavorable social developments arising from poor economic conditions or governmental actions, including:

- widespread demonstrations or civil unrest
- general strikes and demonstrations
- crime and corruption
- security and personal safety issues
- outbreaks of hostilities
- overthrow of incumbent governments
- terrorist attacks, and
- other forms of internal discord.

These economic, political, regulatory and social developments have in the past resulted in, and in the future could lead to, conditions that can adversely affect JPMorgan Chase's operations in those countries and impair the revenues, growth and profitability of those operations. In addition, any of these events or circumstances in one country can affect JPMorgan Chase's operations and investments in another country or countries, including in the U.S.

People

JPMorgan Chase's ability to attract and retain qualified and diverse employees is critical to its success.

JPMorgan Chase's employees are its most important resource, and in many areas of the financial services industry, competition for qualified personnel is intense. JPMorgan Chase endeavors to attract talented and diverse new employees and retain, develop and motivate its existing employees. If JPMorgan Chase were unable to continue to attract or retain qualified and diverse employees, including successors to the Chief Executive Officer or members of the Operating Committee, JPMorgan Chase's performance, including its competitive position, could be materially and adversely affected.

Unfavorable changes in immigration or travel policies could adversely affect JPMorgan Chase's businesses and operations.

JPMorgan Chase relies on the skills, knowledge and expertise of employees located throughout the world. Changes in immigration or travel policies in the U.S. and other countries that unduly restrict or otherwise make it more difficult for employees or their family members to work in, or travel to or transfer between, jurisdictions in which JPMorgan Chase has operations or conducts its business could inhibit JPMorgan Chase's ability to attract and retain qualified employees, and thereby dilute the quality of its workforce, or could prompt JPMorgan Chase to make structural changes to its worldwide or regional operating models that cause its operations to be less efficient or more costly.

Legal

JPMorgan Chase faces significant legal risks from litigation and formal and informal regulatory and government investigations.

JPMorgan Chase is named as a defendant or is otherwise involved in many legal proceedings, including class actions and other litigation or disputes with third parties. Actions currently pending against JPMorgan Chase may result in judgments, settlements, fines, penalties or other sanctions adverse to JPMorgan Chase. Any of these matters could materially and adversely affect JPMorgan Chase's business, financial condition or results of operations, or cause serious reputational harm. As a participant in the financial services industry, it is likely that JPMorgan Chase will continue to experience a high level of litigation and regulatory and government investigations related to its businesses and operations.

Regulators and other government agencies conduct examinations of JPMorgan Chase and its subsidiaries both on a routine basis and in targeted exams, and JPMorgan Chase's businesses and operations are subject to heightened regulatory oversight. This heightened regulatory scrutiny, or the results of such an investigation or examination, may lead to additional regulatory investigations or enforcement actions. There is no assurance that those actions will not result in resolutions or other enforcement actions against JPMorgan Chase. Furthermore, a single event involving a potential violation of law or regulation may give rise to numerous and overlapping investigations and proceedings, either by multiple federal, state or local agencies and officials in the U.S. or, in some instances, regulators and other governmental officials in non-U.S. jurisdictions.

If another financial institution violates a law or regulation relating to a particular business activity or practice, this will often give rise to an investigation by regulators and other governmental agencies of the same or similar activity or practice by JPMorgan Chase.

These and other initiatives by U.S. and non-U.S. governmental authorities may subject JPMorgan Chase to judgments, settlements, fines, penalties or other sanctions, and may require JPMorgan Chase to restructure its operations and activities or to cease offering certain products or services. All of these potential outcomes could harm JPMorgan Chase's reputation or lead to higher operational costs, thereby reducing JPMorgan Chase's profitability, or result in collateral consequences. In addition, the extent of JPMorgan Chase's exposure to legal and regulatory matters can be unpredictable and could, in some cases, exceed the amount of reserves that JPMorgan Chase has established for those matters.

Item 1B. Unresolved Staff Comments.

None.

Item 2. Properties.

JPMorgan Chase's headquarters is located in New York City at 383 Madison Avenue, a 47-story office building that it owns. The Firm is demolishing its former headquarters at 270 Park Avenue in New York City and is building a new headquarters on the same site. Demolition is targeted to be completed in 2021 and construction of the new building has commenced.

The Firm owned or leased facilities in the following locations at December 31, 2020.

December 31, 2020 (in millions)	Approximate square footage
United States[a]	
New York City, New York	
383 Madison Avenue, New York, New York	1.1
All other New York City locations	8.0
Total New York City, New York	**9.1**
Other U.S. locations	
Columbus/Westerville, Ohio	3.8
Chicago, Illinois	2.7
Phoenix/Tempe, Arizona	2.4
Wilmington/Newark, Delaware	2.2
Houston, Texas	1.9
Jersey City, New Jersey	1.7
Dallas/Plano, Texas	1.6
All other U.S. locations	34.8
Total United States	**60.2**
Europe, the Middle East and Africa ("EMEA")	
25 Bank Street, London, U.K.	1.4
All other U.K. locations	2.9
All other EMEA locations	1.4
Total EMEA	**5.7**
Asia-Pacific, Latin America and Canada	
India	4.7
All other locations	3.8
Total Asia-Pacific, Latin America and Canada	**8.5**
Total	**74.4**

(a) At December 31, 2020, the Firm owned or leased 4,908 retail branches in 38 states and Washington D.C.

The premises and facilities occupied by JPMorgan Chase are used across all of the Firm's business segments and for corporate purposes. JPMorgan Chase continues to evaluate its current and projected space requirements and may determine from time to time that certain of its properties (including the premises and facilities noted above) are no longer necessary for its operations. There is no assurance that the Firm will be able to dispose of any such excess properties, premises, or facilities or that it will not incur costs in connection with such dispositions. Such disposition costs may be material to the Firm's results of operations in a given period. Refer to the Consolidated Results of Operations on pages 54-56 for information on occupancy expense.

Item 3. Legal Proceedings.

Refer to Note 30 for a description of the Firm's material legal proceedings.

Item 4. Mine Safety Disclosures.

Not applicable.

Item 5. Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities.

Market for registrant's common equity

JPMorgan Chase's common stock is listed and traded on the New York Stock Exchange. Refer to "Five-year stock performance," on page 45 for a comparison of the cumulative total return for JPMorgan Chase common stock with the comparable total return of the S&P 500 Index, the KBW Bank Index and the S&P Financial Index over the five-year period ended December 31, 2020.

Refer to Capital actions in the Capital Risk Management section of Management's discussion and analysis on page 99 for information on the common dividend payout ratio. Refer to Note 21 for a discussion of restrictions on dividend payments. On January 31, 2021, there were 199,515 holders of record of JPMorgan Chase common stock. Refer to Part III, Item 12 on page 37 for information regarding securities authorized for issuance under the Firm's employee share-based incentive plans.

Repurchases under the common share repurchase program

Refer to Capital actions in the Capital Risk Management section of Management's discussion and analysis on page 99 for information regarding repurchases under the Firm's common share repurchase program.

On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020. On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021, subject to certain restrictions. The Firm's Board of Directors has authorized a new common share repurchase program for up to $30 billion.

Shares repurchased pursuant to the prior common share repurchase program during 2020 were as follows.

Year ended December 31, 2020	Total number of shares of common stock repurchased	Average price paid per share of common stock[(a)]	Aggregate purchase price of common stock repurchases (in millions)[(a)]	Dollar value of remaining authorized repurchase (in millions)[(a)]	
First quarter	50,003,062	$ 127.92	$ 6,397	$ 9,183	(b)
Second quarter	–	–	–	9,183	(b)
Third quarter	–	–	–	–	
October	–	–	–	–	
November	–	–	–	–	
December	–	–	–	–	
Fourth quarter	–	–	–	–	
Year-to-date	50,003,062	$ 127.92	$ 6,397	$ –	

(a) Excludes commissions cost.
(b) The remaining $9.2 billion unused portion under the prior $29.4 billion repurchase program expired on June 30, 2020.

Item 6. Selected Financial Data.

Refer to "Five-year summary of consolidated financial highlights (unaudited)" on page 44 for five-year selected financial data.

Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

Management's discussion and analysis of financial condition and results of operations, entitled "Management's discussion and analysis," appears on pages 46-157. Such information should be read in conjunction with the Consolidated Financial Statements and Notes thereto, which appear on pages 162-298.

Item 7A. Quantitative and Qualitative Disclosures About Market Risk.

Refer to the Market Risk Management section of Management's discussion and analysis on pages 135–142 for a discussion of quantitative and qualitative disclosures about market risk.

Item 8. Financial Statements and Supplementary Data.

The Consolidated Financial Statements, together with the Notes thereto and the report thereon dated February 23, 2021, of PricewaterhouseCoopers LLP, the Firm's independent registered public accounting firm, appear on pages 159-298.

Supplementary financial data for each quarter within the two years ended December 31, 2020, are included on page 299 in the table entitled "Selected quarterly financial data (unaudited).” Also included is a “Glossary of Terms and Acronyms’’ on pages 305-311.

Item 9. Changes in and Disagreements With Accountants on Accounting and Financial Disclosure.

None.

Item 9A. Controls and Procedures.

The internal control framework promulgated by the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”), “Internal Control – Integrated Framework” (“COSO 2013”), provides guidance for designing, implementing and conducting internal control and assessing its effectiveness. The Firm used the COSO 2013 framework to assess the effectiveness of the Firm’s internal control over financial reporting as of December 31, 2020. Refer to “Management’s report on internal control over financial reporting” on page 158.

As of the end of the period covered by this report, an evaluation was carried out under the supervision and with the participation of the Firm’s management, including its Chairman and Chief Executive Officer and its Chief Financial Officer, of the effectiveness of its disclosure controls and procedures (as defined in Rule 13a-15(e) under the Securities Exchange Act of 1934). Based on that evaluation, the Chairman and Chief Executive Officer and the Chief Financial Officer concluded that these disclosure controls and procedures were effective. Refer to Exhibits 31.1 and 31.2 for the Certifications furnished by the Chairman and Chief Executive Officer and Chief Financial Officer, respectively.

The Firm is committed to maintaining high standards of internal control over financial reporting. Nevertheless, because of its inherent limitations, internal control over financial reporting may not prevent or detect all misstatements. Deficiencies or lapses in internal controls may occur from time to time, and there can be no assurance that any such deficiencies will not result in significant deficiencies or material weaknesses in internal control in the future and collateral consequences therefrom. Refer to “Management’s report on internal control over financial reporting” on page 158 for further information. There was no change in the Firm’s internal control over financial reporting (as defined in Rule 13a-15(f) under the Securities Exchange Act of 1934) that occurred during the three months ended December 31, 2020, that has materially affected, or is reasonably likely to materially affect, the Firm’s internal control over financial reporting.

Item 9B. Other Information.

None.

Item 10. Directors, Executive Officers and Corporate Governance.

Executive officers of the registrant

Name	Age (at December 31, 2020)	Positions and offices
James Dimon	64	Chairman of the Board and Chief Executive Officer; he had been President from July 2004 until January 2018.
Ashley Bacon	51	Chief Risk Officer since June 2013.
Lori A. Beer	53	Chief Information Officer since September 2017, prior to which she had been Chief Information Officer of the Corporate & Investment Bank since June 2016. She was Global Head of Banking Technology from January 2014 until May 2016.
Mary Callahan Erdoes	53	Chief Executive Officer of Asset & Wealth Management since September 2009.
Stacey Friedman	52	General Counsel since January 2016, prior to which she was Deputy General Counsel since July 2015 and General Counsel for the Corporate & Investment Bank since August 2012.
Marianne Lake	51	Chief Executive Officer of Consumer Lending and Card Services since May 2019, prior to which she had been Chief Financial Officer since 2013.
Robin Leopold	56	Head of Human Resources since January 2018, prior to which she had been Head of Human Resources for the Corporate & Investment Bank since August 2012.
Douglas B. Petno	55	Chief Executive Officer of Commercial Banking since January 2012.
Jennifer Piepszak	50	Chief Financial Officer since May 2019, prior to which she had been the Chief Executive Officer for Card Services since 2017. She was Chief Executive Officer of Business Banking from 2015 to 2017.
Daniel E. Pinto	58	Co-President and Co-Chief Operating Officer since January 2018, Chief Executive Officer of the Corporate & Investment Bank since March 2014, and Chief Executive Officer of Europe, the Middle East and Africa since June 2011.
Peter Scher	59	Head of Corporate Responsibility since 2011 and Chairman of the Mid-Atlantic Region since 2015.
Gordon A. Smith	62	Co-President and Co-Chief Operating Officer since January 2018, and Chief Executive Officer of Consumer & Community Banking since December 2012.

Unless otherwise noted, during the five fiscal years ended December 31, 2020, all of JPMorgan Chase's above-named executive officers have continuously held senior-level positions with JPMorgan Chase. There are no family relationships among the foregoing executive officers. Information to be provided in Items 10, 11, 12, 13 and 14 of the Form 10-K and not otherwise included herein is incorporated by reference to the Firm's Definitive Proxy Statement for its 2021 Annual Meeting of Stockholders to be held on May 18, 2021, which will be filed with the SEC within 120 days of the end of the Firm's fiscal year ended December 31, 2020.

Item 11. Executive Compensation.

Refer to Item 10.

Item 12. Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters.

Refer to Item 10 for security ownership of certain beneficial owners and management.

The following table sets forth the total number of shares available for issuance under JPMorgan Chase's employee share-based incentive plans (including shares available for issuance to non-employee directors). The Firm is not authorized to grant share-based incentive awards to non-employees, other than to non-employee directors.

December 31, 2020	Number of shares to be issued upon exercise of outstanding options/ stock appreciation rights	Weighted-average exercise price of outstanding options/stock appreciation rights	Number of shares remaining available for future issuance under stock incentive plans
Plan category			
Employee share-based incentive plans approved by shareholders	3,124,739 (a)	$ 41.25	66,621,995 (b)
Total	3,124,739	$ 41.25	66,621,995

(a) Does not include restricted stock units or performance stock units granted under the shareholder-approved Long-Term Incentive Plan ("LTIP"), as amended and restated effective May 15, 2018. Refer to Note 9 for further discussion.
(b) Represents shares available for future issuance under the shareholder-approved LTIP.

All shares available for future issuance will be issued under the shareholder-approved LTIP. Refer to Note 9 for further discussion.

Item 13. Certain Relationships and Related Transactions, and Director Independence.

Refer to Item 10.

Item 14. Principal Accounting Fees and Services.

Refer to Item 10.

Item 15. Exhibits, Financial Statement Schedules.

1 Financial statements

The Consolidated Financial Statements, the Notes thereto and the report of the Independent Registered Public Accounting Firm thereon listed in Item 8 are set forth commencing on page 159.

2 Financial statement schedules

3 Exhibits

3.1 Restated Certificate of Incorporation of JPMorgan Chase & Co., effective April 5, 2006 (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 7, 2006).

3.2 Amendment to the Restated Certificate of Incorporation of JPMorgan Chase & Co., effective June 7, 2013 (incorporated by reference to Appendix F to the Proxy Statement on Schedule 14A of JPMorgan Chase & Co. (File No. 1-5805) filed April 10, 2013).

3.3 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series I (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 24, 2008).

3.4 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series Q (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 23, 2013).

3.5 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series R (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 29, 2013).

3.6 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series S (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 22, 2014).

3.7 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series U (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on March 10, 2014).

3.8 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series V (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on June 9, 2014).

3.9 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series X (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed on September 23, 2014).

3.10 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series Z (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed April 21, 2015).

3.11 Certificate of Designations for 6.10% Non-Cumulative Preferred Stock, Series AA (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed June 4, 2015).

3.12 Certificate of Designations for 6.15% Non-Cumulative Preferred Stock, Series BB (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 29, 2015).

3.13 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series CC (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed October 20, 2017).

3.14 Certificate of Designations for 5.75% Non-Cumulative Preferred Stock, Series DD (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed September 21, 2018).

3.15 Certificate of Designations for 6.00% Non-Cumulative Preferred Stock, Series EE (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 24, 2019).

3.16 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series FF (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed July 31, 2019).

3.17 Certificate of Designations for 4.75% Non-Cumulative Preferred Stock, Series GG (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed November 7, 2019).

3.18 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series HH (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 23, 2020).

3.19 Certificate of Designations for Fixed-to-Floating Rate Non-Cumulative Preferred Stock, Series II (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed February 24, 2020).

3.20 By-laws of JPMorgan Chase & Co., as amended, effective January 30, 2018 (incorporated by reference to Exhibit 3.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 30, 2018).

4.1(a) Indenture, dated as of October 21, 2010, between JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No.1-5805) filed October 21, 2010).

4.1(b) First Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee, to the Indenture, dated as of October 21, 2010 (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 13, 2017).

4.2(a) Subordinated Indenture, dated as of March 14, 2014, between JPMorgan Chase & Co. and U.S. Bank Trust National Association, as Trustee (incorporated by reference to Exhibit 4.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No.1-5805) filed March 14, 2014).

4.2(b) First Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and U.S. Bank Trust National Association, as Trustee, to the Subordinated Indenture, dated as of March 14, 2014 (incorporated by reference to Exhibit 4.2 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 13, 2017).

4.3(a) Indenture, dated as of May 25, 2001, between JPMorgan Chase & Co. and Bankers Trust Company (succeeded by Deutsche Bank Trust Company Americas), as Trustee (incorporated by reference to Exhibit 4(a)(1) to the Registration Statement on Form S-3 of JPMorgan Chase & Co. (File No. 333-52826) filed June 13, 2001).

4.3(b) Sixth Supplemental Indenture, dated as of January 13, 2017, between JPMorgan Chase & Co. and Bankers Trust Company (succeeded by Deutsche Bank Trust Company Americas), as Trustee, to the Indenture, dated as of May 25, 2001 (incorporated by reference to Exhibit 4.3 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed January 13, 2017).

4.4 Indenture, dated as of February 19, 2016, among JPMorgan Chase Financial Company LLC, JPMorgan Chase & Co. and Deutsche Bank Trust Company Americas, as Trustee (incorporated by reference to Exhibit 4(a)(7) to the Registration Statement on Form S-3 of JPMorgan Chase & Co. and JPMorgan Chase Financial Company LLC (File No. 333-209682) filed February 24, 2016).

4.5 Form of Deposit Agreement (incorporated by reference to Exhibit 4.3 to the Registration Statement on Form S-3 of JPMorgan Chase & Co. (File No. 333-191692) filed October 11, 2013).

4.6 Description of Securities of JPMorgan Chase & Co. registered pursuant to Section 12 of the Securities Exchange Act of 1934. [(b)]

Other instruments defining the rights of holders of long-term debt securities of JPMorgan Chase & Co. and its subsidiaries are omitted pursuant to Section (b)(4)(iii)(A) of Item 601 of Regulation S-K. JPMorgan Chase & Co. agrees to furnish copies of these instruments to the SEC upon request.

10.1 Deferred Compensation Plan for Non-Employee Directors of JPMorgan Chase & Co., as amended and restated July 2001 and as of December 31, 2004 (incorporated by reference to Exhibit 10.1 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2007).[(a)]

10.2 2005 Deferred Compensation Plan for Non-Employee Directors of JPMorgan Chase & Co., effective as of January 1, 2005 (incorporated by reference to Exhibit 10.2 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2007).[(a)]

10.3 2005 Deferred Compensation Program of JPMorgan Chase & Co., restated effective as of December 31, 2008 (incorporated by reference to Exhibit 10.4 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2008).[(a)]

10.4 JPMorgan Chase & Co. Amended and Restated Long-Term Incentive Plan, effective May 15, 2018 (incorporated by reference to Appendix B of the Schedule 14A of JPMorgan Chase & Co. (File No. 1-5805) filed April 5, 2018).[(a)]

10.5	Key Executive Performance Plan of JPMorgan Chase & Co., as amended and restated effective January 1, 2014 (incorporated by reference to Appendix G of the Schedule 14A of JPMorgan Chase & Co. (File No. 1-5805) filed April 10, 2013).[(a)]
10.6	Excess Retirement Plan of JPMorgan Chase & Co., restated and amended as of December 31, 2008, as amended (incorporated by reference to Exhibit 10.7 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2009).[(a)]
10.7	Executive Retirement Plan of JPMorgan Chase & Co., as amended and restated December 31, 2008 (incorporated by reference to Exhibit 10.9 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2008).[(a)]
10.8	Bank One Corporation Supplemental Savings and Investment Plan, as amended and restated effective December 31, 2008 (incorporated by reference to Exhibit 10.13 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2008).[(a)]
10.9	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights and restricted stock units, dated as of January 18, 2012 (incorporated by reference to Exhibit 10.25 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2011).[(a)]
10.10	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for stock appreciation rights and restricted stock units for Operating Committee members, dated as of January 17, 2013 (incorporated by reference to Exhibit 10.23 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2012).[(a)]
10.11	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for performance share units and restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 17, 2017 (incorporated by reference to Exhibit 10.23 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2016).[(a)]
10.12	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for performance share units and restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 16, 2018.[(a)]
10.13	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units for Operating Committee members (U.S. and U.K.), dated as of January 15, 2019.[(a)]
10.14	Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions of Performance Share Unit Award Operating Committee (U.S.) (incorporated by reference to Exhibit 10.1 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed March 15, 2019).[(a)]
10.15	Form of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions of Performance Share Unit Award Operating Committee (U.K.) (incorporated by reference to Exhibit 10.2 to the Current Report on Form 8-K of JPMorgan Chase & Co. (File No. 1-5805) filed March 15, 2019).[(a)]
10.16	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units and performance share unit awards for Operating Committee members (U.S. and U.K.), dated as of January 21, 2020.[(a)]
10.17	Forms of JPMorgan Chase & Co. Long-Term Incentive Plan Terms and Conditions for restricted stock units and performance share unit awards for Operating Committee members (U.S. and U.K.), dated as of January 19, 2021.[(a)(b)]
10.18	Form of JPMorgan Chase & Co. Terms and Conditions of Fixed Allowance (UK) (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q of JPMorgan Chase & Co. (File No. 1-5805) for the quarter ended June 30, 2014).[(a)]
10.19	Form of JPMorgan Chase & Co. Performance-Based Incentive Compensation Plan, effective as of January 1, 2006, as amended (incorporated by reference to Exhibit 10.27 to the Annual Report on Form 10-K of JPMorgan Chase & Co. (File No. 1-5805) for the year ended December 31, 2009).[(a)]
10.20	Employee Stock Purchase Plan of JPMorgan Chase & Co., as amended and restated effective as of January 1, 2019 (incorporated by reference to Exhibit 10.1 to the Quarterly Report on Form 10-Q of JPMorgan Chase & Co. (File No. 1-5805) for the quarter ended September 30, 2019).
21	List of subsidiaries of JPMorgan Chase & Co.[(b)]
22.1	Annual Report on Form 11-K of The JPMorgan Chase 401(k) Savings Plan for the year ended December 31, 2019 (to be filed pursuant to Rule 15d-21 under the Securities Exchange Act of 1934).
22.2	Subsidiary Guarantors and Issuers of Guaranteed Securities.[(b)]

23	Consent of independent registered public accounting firm.[(b)]
31.1	Certification.[(b)]
31.2	Certification.[(b)]
32	Certification pursuant to Section 906 of the Sarbanes-Oxley Act of 2002.[(c)]
101.INS	The instance document does not appear in the interactive data file because its XBRL tags are embedded within the Inline XBRL document.[(d)]
101.SCH	XBRL Taxonomy Extension Schema Document.[(b)]
101.CAL	XBRL Taxonomy Extension Calculation Linkbase Document.[(b)]
101.DEF	XBRL Taxonomy Extension Definition Linkbase Document.[(b)]
101.LAB	XBRL Taxonomy Extension Label Linkbase Document.[(b)]
101.PRE	XBRL Taxonomy Extension Presentation Linkbase Document.[(b)]
104	Cover Page Interactive Data File (embedded within the Inline XBRL document and included in Exhibit 101).

(a) This exhibit is a management contract or compensatory plan or arrangement.
(b) Filed herewith.
(c) Furnished herewith. This exhibit shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that Section. Such exhibit shall not be deemed incorporated into any filing under the Securities Act of 1933 or the Securities Exchange Act of 1934.
(d) Pursuant to Rule 405 of Regulation S-T, includes the following financial information included in the Firm's Form 10-K for the year ended December 31, 2020, formatted in XBRL (eXtensible Business Reporting Language) interactive data files: (i) the Consolidated statements of income for the years ended December 31, 2020, 2019 and 2018, (ii) the Consolidated statements of comprehensive income for the years ended December 31, 2020, 2019 and 2018, (iii) the Consolidated balance sheets as of December 31, 2020 and 2019, (iv) the Consolidated statements of changes in stockholders' equity for the years ended December 31, 2020, 2019 and 2018, (v) the Consolidated statements of cash flows for the years ended December 31, 2020, 2019 and 2018, and (vi) the Notes to Consolidated Financial Statements.

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FIVE-YEAR SUMMARY OF CONSOLIDATED FINANCIAL HIGHLIGHTS (unaudited)

As of or for the year ended December 31, (in millions, except per share, ratio, headcount data and where otherwise noted)	2020	2019	2018	2017	2016
Selected income statement data					
Total net revenue[(a)]	**$ 119,543**	$ 115,399	$ 108,783	$ 100,460	$ 96,275
Total noninterest expense[(a)]	**66,656**	65,269	63,148	59,270	56,378
Pre-provision profit[(b)]	**52,887**	50,130	45,635	41,190	39,897
Provision for credit losses	**17,480**	5,585	4,871	5,290	5,361
Income before income tax expense	**35,407**	44,545	40,764	35,900	34,536
Income tax expense	**6,276**	8,114	8,290	11,459	9,803
Net income	**$ 29,131**	$ 36,431	$ 32,474	$ 24,441 [(h)]	$ 24,733
Earnings per share data					
Net income: Basic	**$ 8.89**	$ 10.75	$ 9.04	$ 6.35	$ 6.24
Diluted	**8.88**	10.72	9.00	6.31	6.19
Average shares: Basic	**3,082.4**	3,221.5	3,396.4	3,551.6	3,658.8
Diluted	**3,087.4**	3,230.4	3,414.0	3,576.8	3,690.0
Market and per common share data					
Market capitalization	**$ 387,492**	$ 429,913	$ 319,780	$ 366,301	$ 307,295
Common shares at period-end	**3,049.4**	3,084.0	3,275.8	3,425.3	3,561.2
Book value per share	**81.75**	75.98	70.35	67.04	64.06
Tangible book value per share (“TBVPS”)[(b)]	**66.11**	60.98	56.33	53.56	51.44
Cash dividends declared per share	**3.60**	3.40	2.72	2.12	1.88
Selected ratios and metrics					
Return on common equity (“ROE”)[(c)]	**12 %**	15 %	13 %	10 %	10 %
Return on tangible common equity (“ROTCE”)[(b)(c)]	**14**	19	17	12	13
Return on assets (“ROA”)[(b)]	**0.91**	1.33	1.24	0.96	1.00
Overhead ratio	**56**	57	58	59	59
Loans-to-deposits ratio[(d)]	**47**	64	69	66	67
Firm Liquidity coverage ratio (“LCR”) (average)[(e)]	**110**	116	113	119	NA
JPMorgan Chase Bank, N.A. LCR (average)[(e)]	**160**	116	111	108	NA
Common equity tier 1 (“CET1”) capital ratio[(f)(g)]	**13.1**	12.4	12.0	12.2	12.3
Tier 1 capital ratio[(f)(g)]	**15.0**	14.1	13.7	13.9	14.0
Total capital ratio[(f)(g)]	**17.3**	16.0	15.5	15.9	15.5
Tier 1 leverage ratio[(f)(g)]	**7.0**	7.9	8.1	8.3	8.4
Supplementary leverage ratio (“SLR”)[(f)(g)]	**6.9 %**	6.3 %	6.4 %	6.5 %	6.5 %
Selected balance sheet data (period-end)					
Trading assets[(d)]	**$ 503,126**	$ 369,687	$ 378,551	$ 349,053	$ 342,436
Investment securities, net of allowance for credit losses	**589,999**	398,239	261,828	249,958	289,059
Loans[(d)]	**1,012,853**	997,620	1,015,760	959,429	922,831
Total assets	**3,386,071**	2,687,379	2,622,532	2,533,600	2,490,972
Deposits	**2,144,257**	1,562,431	1,470,666	1,443,982	1,375,179
Long-term debt	**281,685**	291,498	282,031	284,080	295,245
Common stockholders’ equity	**249,291**	234,337	230,447	229,625	228,122
Total stockholders’ equity	**279,354**	261,330	256,515	255,693	254,190
Headcount	**255,351**	256,981	256,105	252,539	243,355
Credit quality metrics					
Allowances for loan losses and lending-related commitments	**$ 30,737**	$ 14,314	$ 14,500	$ 14,672	$ 14,854
Allowance for loan losses to total retained loans	**2.95 %**	1.39 %	1.39 %	1.47 %	1.55 %
Nonperforming assets[(d)]	**$ 10,906**	$ 5,054	$ 5,901	$ 7,119	$ 7,754
Net charge-offs	**5,259**	5,629	4,856	5,387	4,692
Net charge-off rate	**0.55 %**	0.60 %	0.52 %	0.60 % [(i)]	0.54 %

Effective January 1, 2020, the Firm adopted the Financial Instruments – Credit Losses (“CECL”) accounting guidance. Refer to Note 1 for further information.

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

(b) Pre-provision profit, TBVPS and ROTCE are each non-GAAP financial measures. Tangible common equity (“TCE”) is also a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm’s Use of Non-GAAP Financial Measures on pages 62–64 for a further discussion of these measures.

(c) Quarterly ratios are based upon annualized amounts.

(d) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

(e) For the years ended December 31, 2020, 2019, 2018 and 2017, the percentage represents average LCR for the three months ended December 31, 2020, 2019, 2018 and 2017. The U.S. LCR public disclosure requirements for the Firm became effective in 2017. Refer to Liquidity Risk Management on pages 102–108 for additional information on the LCR results.

(f) As of December 31, 2020, the capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the CECL capital transition provisions that became effective in the first quarter of 2020. As of December 31, 2020, the SLR reflects the temporary exclusions of U.S. Treasury securities and deposits at Federal Reserve Banks that became effective in the second quarter of 2020. Refer to Regulatory Developments Relating to the COVID-19 Pandemic on pages 52-53 and Capital Risk Management on pages 91-101 for additional information.

(g) The Basel III capital rules became fully phased-in effective January 1, 2019, and for the SLR became fully phased-in effective January 1, 2018. Prior to these dates, the required capital metrics were subject to the transitional rules. As of December 31, 2018, the risk-based capital metrics were the same on a fully phased-in and transitional basis. Refer to Capital Risk Management on pages 91-101 for additional information on these capital metrics.

(h) In December 2017, the Tax Cuts and Jobs Act (“TCJA”) was signed into law. The Firm’s results for the year ended December 31, 2017 included a $2.4 billion decrease to net income as a result of the enactment of the TCJA.

(i) Excluding net charge-offs of $467 million related to the student loan portfolio sale, the net charge-off rate for the year ended December 31, 2017 would have been 0.55%.

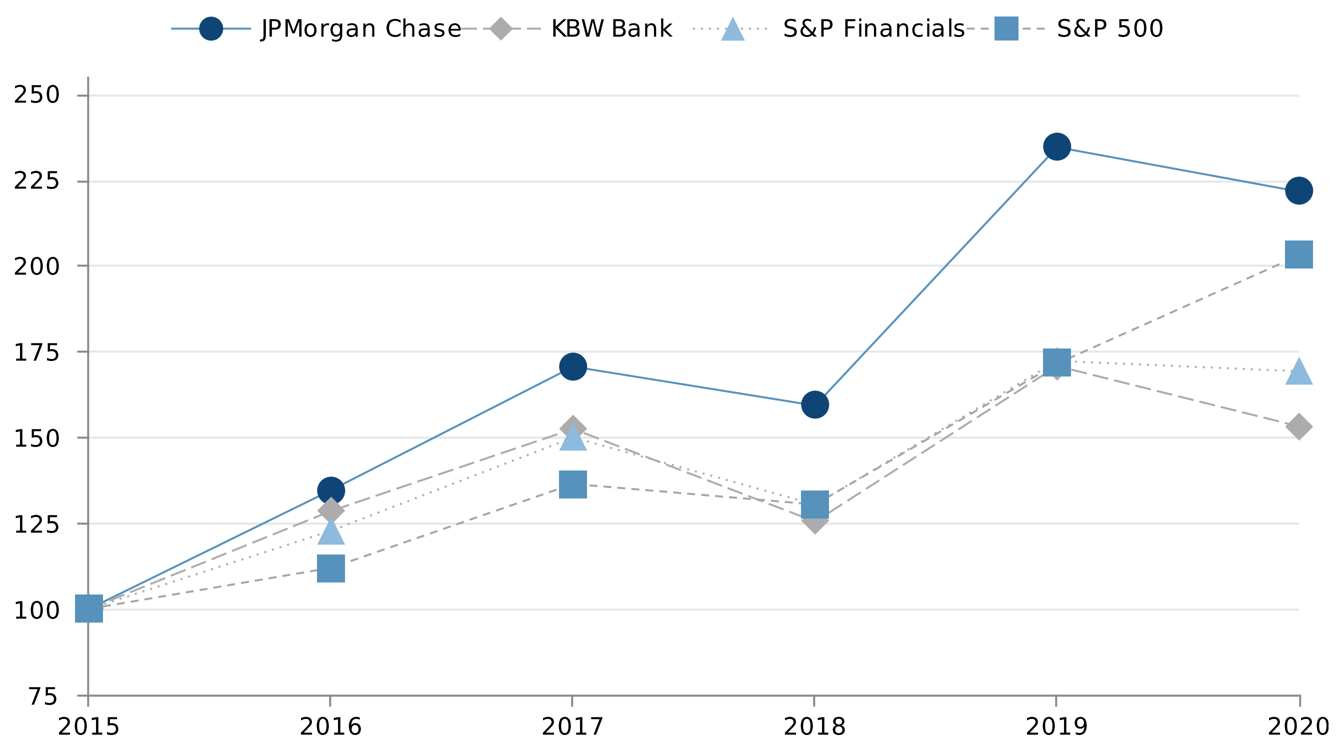
FIVE-YEAR STOCK PERFORMANCE

The following table and graph compare the five-year cumulative total return for JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") common stock with the cumulative return of the S&P 500 Index, the KBW Bank Index and the S&P Financials Index. The S&P 500 Index is a commonly referenced equity benchmark in the United States of America ("U.S."), consisting of leading companies from different economic sectors. The KBW Bank Index seeks to reflect the performance of banks and thrifts that are publicly traded in the U.S. and is composed of leading national money center and regional banks and thrifts. The S&P Financials Index is an index of financial companies, all of which are components of the S&P 500. The Firm is a component of all three industry indices.

The following table and graph assume simultaneous investments of $100 on December 31, 2015, in JPMorgan Chase common stock and in each of the above indices. The comparison assumes that all dividends were reinvested.

December 31, (in dollars)	2015	2016	2017	2018	2019	**2020**
JPMorgan Chase	$ 100.00	$ 134.57	$ 170.54	$ 159.20	$ 234.46	**$ 221.52**
KBW Bank Index	100.00	128.51	152.41	125.42	170.72	**153.12**
S&P Financials Index	100.00	122.75	149.92	130.37	172.21	**169.19**
S&P 500 Index	100.00	111.95	136.38	130.39	171.44	**202.96**

December 31,
(in dollars)



The following is Management's discussion and analysis of the financial condition and results of operations ("MD&A") of JPMorgan Chase for the year ended December 31, 2020. The MD&A is included in both JPMorgan Chase's Annual Report for the year ended December 31, 2020 ("Annual Report") and its Annual Report on Form 10-K for the year ended December 31, 2020 ("2020 Form 10-K") filed with the Securities and Exchange Commission ("SEC"). Refer to the Glossary of terms and acronyms on pages 305-311 for definitions of terms and acronyms used throughout the Annual Report and the 2020 Form 10-K.

The MD&A contains statements that are forward-looking within the meaning of the Private Securities Litigation Reform Act of 1995. These statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. Refer to Forward-looking Statements on page 157) and Part 1, Item 1A: Risk factors in the 2020 Form 10-K on pages 8-32 for a discussion of certain of those risks and uncertainties and the factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties.

INTRODUCTION

JPMorgan Chase & Co. (NYSE: JPM), a financial holding company incorporated under Delaware law in 1968, is a leading financial services firm based in the United States of America ("U.S."), and has operations worldwide; JPMorgan Chase had $3.4 trillion in assets and $279.4 billion in stockholders' equity as of December 31, 2020. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Under the J.P. Morgan and Chase brands, the Firm serves millions of customers in the U.S. and globally many of the world's most prominent corporate, institutional and government clients.

JPMorgan Chase's principal bank subsidiary is JPMorgan Chase Bank, National Association ("JPMorgan Chase Bank, N.A."), a national banking association with U.S. branches in 38 states and Washington, D.C. as of December 31, 2020. JPMorgan Chase's principal nonbank subsidiary is J.P. Morgan Securities LLC ("J.P. Morgan Securities"), a U.S. broker-dealer. The bank and non-bank subsidiaries of JPMorgan Chase operate nationally as well as through overseas branches and subsidiaries, representative offices and subsidiary foreign banks. The Firm's principal operating subsidiary outside the U.S. is J.P. Morgan Securities plc, a U.K.-based subsidiary of JPMorgan Chase Bank, N.A.

For management reporting purposes, the Firm's activities are organized into four major reportable business segments, as well as a Corporate segment. The Firm's consumer business is the Consumer & Community Banking ("CCB") segment. The Firm's wholesale business segments are the Corporate & Investment Bank ("CIB"), Commercial Banking ("CB"), and Asset & Wealth Management ("AWM"). Refer to Business Segment Results on pages 65–84, and Note 32 for a description of the Firm's business segments, and the products and services they provide to their respective client bases.

This executive overview of the MD&A highlights selected information and does not contain all of the information that is important to readers of this 2020 Form 10-K. For a complete description of the trends and uncertainties, as well as the risks and critical accounting estimates, affecting the Firm and its various LOBs, this 2020 Form 10-K should be read in its entirety.

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

Financial performance of JPMorgan Chase

Year ended December 31, (in millions, except per share data and ratios)	2020	2019	Change
Selected income statement data			
Total net revenue[a]	**$119,543**	$115,399	4 %
Total noninterest expense[a]	**66,656**	65,269	2
Pre-provision profit	**52,887**	50,130	5
Provision for credit losses	**17,480**	5,585	213
Net income	**29,131**	36,431	(20)
Diluted earnings per share	**8.88**	10.72	(17)
Selected ratios and metrics			
Return on common equity	**12 %**	15 %	
Return on tangible common equity	**14**	19	
Book value per share	**$ 81.75**	$ 75.98	8
Tangible book value per share	**66.11**	60.98	8
Capital ratios[b]			
CET1	**13.1 %**	**12.4 %**	
Tier 1 capital	**15.0**	**14.1**	
Total capital	**17.3**	**16.0**	

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

(b) As of December 31, 2020, the capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the CECL capital transition provisions that became effective in the first quarter of 2020. Refer to Regulatory Developments relating to the COVID-19 Pandemic on pages 52-53 and Capital Risk Management on pages 91-101 for additional information.

Comparisons noted in the sections below are for the full year of 2020 versus the full year of 2019, unless otherwise specified.

Firmwide overview

JPMorgan Chase reported net income of $29.1 billion for 2020, or $8.88 per share, on net revenue of $119.5 billion. The Firm reported ROE of 12% and ROTCE of 14%. The Firm's results for 2020 included net additions to the allowance for credit losses of $12.2 billion and Firmwide legal expense of $1.1 billion.

- The Firm had net income of $29.1 billion, down 20%.
- Total net revenue was up 4%. Noninterest revenue was $65.0 billion, up 12%, driven by higher CIB Markets revenue, Investment Banking fees and net production revenue in Home Lending. Net interest income was $54.6 billion, down 5%, driven by the impact of lower rates, predominantly offset by higher net interest income in CIB Markets as well as balance sheet growth.
- Noninterest expense was $66.7 billion, up 2%, driven by higher volume- and revenue-related expense, legal expense and continued investments in the businesses, partially offset by lower structural expense.
- The provision for credit losses was $17.5 billion, up $11.9 billion from the prior year, driven by net additions to the allowance for credit losses of $12.2 billion due to the deterioration and increased uncertainty in the macroeconomic environment as a result of the impact of the COVID-19 pandemic.
- The total allowance for credit losses was $30.8 billion at December 31, 2020. The Firm had an allowance for loan losses to retained loans coverage ratio of 2.95%, compared with 1.39% in the prior year; the increase from the prior year was driven by the additions to the allowance for credit losses and the adoption of CECL.
- The Firm's nonperforming assets totaled $10.9 billion at December 31, 2020, an increase of $5.9 billion from the prior year, primarily reflecting client credit deterioration across multiple industries in the wholesale portfolio; and in the consumer portfolio, loans placed on nonaccrual status related to the impact of the COVID-19 pandemic, as well as the adoption of CECL, as the purchased credit deteriorated loans in the mortgage portfolio became subject to nonaccrual loan treatment. In the fourth quarter of 2020, nonperforming assets decreased $556 million from the prior quarter, reflecting some credit improvement in the wholesale portfolio. The consumer portfolio remained relatively flat, as the increase in loans placed on nonaccrual status in Home Lending related to the impact of the COVID-19 pandemic was predominantly offset by lower loans at fair value in CIB, largely due to sales.
- Firmwide average loans of $1.0 trillion were up 1%, driven by higher loan balances in AWM and CIB, as well as loans originated under the Small Business Administration's ("SBA") Paycheck Protection Program ("PPP"), predominantly offset by lower loan balances in Home Lending and Card.
- Firmwide average deposits of $1.9 trillion were up 25%, reflecting significant inflows across the Firm, primarily driven by the impact of the COVID-19 pandemic and the related effect of certain government actions.
- As of December 31, 2020, the Firm had average eligible High Quality Liquid Assets ("HQLA") of approximately $697 billion and unencumbered marketable securities with a fair value of approximately $740 billion, resulting in approximately $1.4 trillion of liquidity sources. Refer to Liquidity Risk Management on pages 102–108 for additional information.

Selected capital-related metrics

- The Firm's CET1 capital was $205 billion, and the Standardized and Advanced CET1 ratios were 13.1% and 13.8%, respectively.
- The Firm's SLR was 6.9%. The SLR reflects the temporary exclusions of U.S. Treasury securities and deposits at Federal Reserve Banks, as required by the Federal Reserve's interim final rule issued on April 1, 2020. The Firm's SLR excluding the temporary relief was 5.8%.
- The Firm grew TBVPS, ending 2020 at $66.11, up 8% versus the prior year.

Pre-provision profit, ROTCE and TBVPS are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 62–64, and Capital Risk Management on pages 91-101 for a further discussion of each of these measures.

Business segment highlights

Selected business metrics for each of the Firm's four LOBs are presented below for the full year of 2020.

CCB ROE 15%	• Average deposits up 22%; client investment assets up 17% • Average loans down 6%; debit and credit card sales volume down 3% • Active mobile customers up 10%
CIB ROE 20%	• $9.5 billion of Global Investment Banking fees, up 25% • #1 ranking for Global Investment Banking fees with 9.2% wallet share for the year • Total Markets revenue of $29.5 billion, up 41%, with Fixed Income Markets up 45% and Equity Markets up 33%
CB ROE 11%	• Gross Investment Banking revenue of $3.3 billion, up 22% • Average deposits up 38%; average loans up 5%
AWM ROE 28%	• Assets under management (AUM) of $2.7 trillion, up 17% • Average deposits up 20%; average loans up 13%

Refer to the Business Segment Results on pages 65-66 for a detailed discussion of results by business segment.

Credit provided and capital raised

JPMorgan Chase continues to support consumers, businesses and communities around the globe. The Firm provided new and renewed credit and raised capital for wholesale and consumer clients during 2020, consisting of:

$2.3 trillion	Total credit provided and capital raised (including loans and commitments)[(a)]
$226 billion	Credit for consumers
$18 billion	Credit for U.S. small businesses
$865 billion	Credit for corporations
$1.1 trillion	Capital raised for corporate clients and non-U.S. government entities
$103 billion	Credit and capital raised for nonprofit and U.S. government entities[(b)]
$28 billion	Loans under the Small Business Administration's Paycheck Protection Program

(a) Excludes loans under the SBA's PPP.
(b) Includes states, municipalities, hospitals and universities.

Recent events

- On January 27, 2021, JPMorgan Chase announced that it will launch a digital retail bank in the U.K. this year, and on February 23, 2021, JPMorgan Chase announced that it will appoint Sanoke Viswanathan, head of International Consumer, to the Operating Committee.
- On December 31, 2020, JPMorgan Chase acquired the Global Loyalty business ("cxLoyalty") of cxLoyalty Group Holdings, Inc. This includes cxLoyalty's technology platforms, full-service travel agency, and gift card and merchandise services.
- On December 31, 2020, JPMorgan Chase acquired 55ip, a financial technology company and leading provider of automated tax-smart investment strategies.
- On December 18, 2020, JPMorgan Chase received the results of the 2020 Comprehensive Capital Analysis and Review ("CCAR") Round 2 stress test from the Federal Reserve. The Firm's Stress Capital Buffer ("SCB") requirement remained at 3.3%. The Federal Reserve also announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021, subject to certain restrictions. The Firm's Board of Directors has authorized a new common share repurchase program for up to $30 billion. The Firm expects to repurchase up to $4.5 billion of common stock in the first quarter of 2021 and, subject to approval by the Board of Directors, maintain the quarterly common stock dividend of $0.90 per share.
- On December 18, 2020, JPMorgan Chase announced the retirement of Lee Raymond, the Firm's Lead Independent Director. Stephen B. Burke has succeeded Mr. Raymond as Lead Independent Director effective January 1, 2021.
- On December 7, 2020, Phebe N. Novakovic became a member of the Firm's Board of Directors. Ms. Novakovic is Chairman and Chief Executive Officer of General Dynamics Corporation.

2021 outlook

These current expectations are forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Such forward-looking statements are based on the current beliefs and expectations of JPMorgan Chase's management and are subject to significant risks and uncertainties. Refer to Forward-Looking Statements on page 157, and the Risk Factors section on pages 8-32 of the Firm's 2020 Form 10-K, for a further discussion of certain of those risks and uncertainties and the other factors that could cause JPMorgan Chase's actual results to differ materially because of those risks and uncertainties. There is no assurance that actual results in 2021 will be in line with the outlook set forth below, and the Firm does not undertake to update any forward-looking statements.

JPMorgan Chase's current outlook for 2021 should be viewed against the backdrop of the global and U.S. economies, the COVID-19 pandemic, financial markets activity, the geopolitical environment, the competitive environment, client and customer activity levels, and regulatory and legislative developments in the U.S. and other countries where the Firm does business. Each of these factors will affect the performance of the Firm and its LOBs. The Firm will continue to make appropriate adjustments to its businesses and operations in response to ongoing developments in the business, economic, regulatory and legal environments in which it operates. The outlook information contained in this Form 10-K supersedes all outlook information included in the Firm's periodic reports furnished or filed with the SEC prior to the date of this Form 10-K.

Full-year 2021

- Management expects net interest income, on a managed basis, to be approximately $55 billion, market dependent.
- Management expects adjusted expense to be approximately $69 billion, which includes accelerated contributions to the Firm's Foundation in the form of equity investments, as well as higher revenue-related expense.

First-quarter 2021

- Management expects net interest income, on a managed basis, to be approximately $13 billion, market dependent.
- Investment banking fees are expected to be flat when compared with the fourth quarter of 2020, depending on market conditions.

Fourth-quarter 2021

- Management expects net interest income, on a managed basis, to be in excess of $14 billion, market dependent.

Net interest income, on a managed basis, and adjusted expense are non-GAAP financial measures. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 62-64.

Business Developments

COVID-19 Pandemic

In response to the COVID-19 pandemic the Firm invoked resiliency plans to allow its businesses to remain operational, utilizing disaster recovery sites and implementing alternative work arrangements globally.

Additionally, the Firm implemented strategies and procedures designed to help it respond to increased market volatility, client demand for credit and liquidity, distress in certain industries and the ongoing impacts to consumers and businesses.

Throughout 2020, the Firm remained focused on serving its clients, customers and communities, as well as the well-being of its employees, during the pandemic. The Firm continues to actively monitor the health and safety situations at local and regional levels, and will continue to adapt as these situations evolve.

Supporting clients and customers

The Firm has supported its clients and customers during the challenging conditions caused by the COVID-19 pandemic by providing assistance, primarily in the form of payment deferrals on loans and extending credit, including through its participation in the Small Business Association's ("SBA") PPP.

Refer to Credit Portfolio on page 112 for information on assistance granted to customers and clients. Refer to Consumer Credit portfolio on page 116 and Wholesale Credit Portfolio on page 122 for information on retained loans under payment deferral.

The Firm has gradually re-opened its branches since April 2020, with nearly 90% of its branches returning to full service as of December 31, 2020. Additionally, the Firm continues to provide a wide range of banking services that are accessible to clients and customers through mobile and other digital channels.

Protecting and supporting employees

In response to the COVID-19 pandemic, the Firm implemented alternative work arrangements, with the vast majority of its global workforce working from home since the onset of the pandemic and continuing into the first quarter of 2021. The Firm also provided additional benefits to employees during the COVID-19 pandemic.

Supporting communities

Since March, the Firm has committed $250 million to help address humanitarian needs and long-term economic challenges posed by the COVID-19 pandemic on the communities in which the Firm operates. As of December 31, 2020, over 75% of this commitment has been funded.

Departure of the U.K. from the EU

The U.K.'s departure from the EU, which is commonly referred to as "Brexit," was completed on December 31, 2020. The U.K. and the EU have entered into a Trade and Cooperation Agreement which delineates many significant aspects of the future relationship between the U.K. and the EU. However, the agreement contained very limited provisions relating to cross-border financial services, and the U.K. and the EU are expected to engage in further negotiations concerning financial services.

The Firm has executed and continues to execute on its Firmwide Brexit Implementation program, which encompasses a strategic implementation plan across all impacted businesses and functions, including an ongoing assessment of political, legal and regulatory and other implementation risks. A key focus of the program has been to ensure continuity of service to the Firm's EU clients in the following areas: regulatory and legal entities; clients; and business and operations.

Regulatory and legal entities

The Firm's legal entities in Germany, Luxembourg and Ireland are now licensed to provide and are providing services to the Firm's EU clients, including through a branch network covering locations such as Paris, Madrid and Milan. Subject to limited exceptions, the Firm's U.K.-based legal entities are no longer permitted to transact business from the U.K. with EU clients.

Clients

Agreements covering substantially all of the Firm's EU client activity have been re-documented to EU legal entities to facilitate continuation of service. The Firm continues to actively engage with those clients that have not completed re-documentation or required operational changes.

Business and operations

The COVID-19 pandemic introduced additional risk to the Firm's Brexit Implementation program, particularly in relation to staff relocations. As a result, the Firm has worked closely with regulators and employees to ensure that critical staff are relocated in a safe and timely manner so that the Firm can meet its regulatory commitments and continue serving its clients. Further relocations are planned for 2021, and the Firm's longer-term EU staffing strategy will be developed over time in cooperation with its regulators and as the post-Brexit market landscape evolves in order to ensure that the Firm maintains operational resilience and effective client coverage.

Interbank Offered Rate ("IBOR") transition

JPMorgan Chase and other market participants continue to make progress in preparing for the discontinuation of the London Interbank Offered Rate ("LIBOR") and other IBORs to comply with the International Organization of Securities Commission's standards for transaction-based benchmark rates.

On November 30, 2020, ICE Benchmark Administration, the administrator of LIBOR, announced a public consultation on its proposal to cease the publication of the principal tenors of U.S. dollar LIBOR (i.e., overnight, one-month, three-month, six-month and 12-month LIBOR) immediately following a final publication on June 30, 2023. The Federal Reserve, the OCC and the FDIC also released guidance encouraging market participants to cease dealing in new U.S. dollar LIBOR contracts from the end of 2021. There has been no change in the scheduled cessation of U.K. sterling, Japanese yen, Swiss franc and Euro LIBOR, or the remaining tenors of U.S. dollar LIBOR, from December 31, 2021.

The Firm continues to work towards reducing its exposure to IBOR-referencing contracts, including derivatives, bilateral and syndicated loans, securities, and debt and preferred stock issuances, to meet the industry milestones and recommendations published by National Working Groups ("NWG"), including the Alternative Reference Rates Committee (the "ARRC") in the U.S.

On October 23, 2020, the International Swaps and Derivatives Association, Inc. ("ISDA") published a new supplement to the ISDA 2006 definitions and the related 2020 IBOR Fallbacks Protocol (the "Protocol"). These publications are intended to facilitate the incorporation of robust rate fallback provisions into both legacy and new derivative contracts with effect from January 25, 2021. The Firm's client-facing legal entities have agreed to adhere to the Protocol, in accordance with recommendations from multiple industry working groups, including the ARRC. ISDA further announced that bilateral templates have been made available for use with counterparties who choose not to adhere to the Protocol.

As a key objective of the ARRC's transition plan to encourage adoption of the Secured Overnight Financing Rate ("SOFR"), counterparty clearing houses, clearing house members and other impacted market participants successfully executed the discounting and price alignment interest ("PAI") switch from federal funds to SOFR on October 16, 2020. The industry completed a similar switch from EONIA to €STR on July 27, 2020.

On March 12, 2020 and January 7, 2021, the Financial Accounting Standards Board ("FASB") issued accounting standards updates providing optional expedients and exceptions for applying generally accepted accounting principles to contracts and hedge accounting relationships affected by reference rate reform. These optional expedients are intended to simplify the operational impact of applying U.S. GAAP to transactions impacted by reference rate reform. The Firm elected to apply certain of these expedients beginning in the third quarter of 2020. On August 27, 2020, the International Accounting Standards Board ("IASB") issued guidance that provides similar relief for entities reporting under International Financial Reporting Standards ("IFRS"). Refer to Accounting and Reporting Developments on page 156 for additional information. The Firm continues to monitor the transition relief being considered by the U.S. Treasury Department regarding the tax implications of reference rate reform.

The Firm's initiatives in connection with LIBOR transition include:

- continuing to reduce its overall exposure to LIBOR
- implementing rate fallback provisions developed by NWGs in new LIBOR contracts, where appropriate
- continuing to educate and inform clients on LIBOR transition and the necessity to prepare for the cessation of LIBOR
- assisting clients with discontinuing their issuance or use of LIBOR-linked products within the timelines specified by NWGs
- supporting clients in their efforts to remediate contracts linked to LIBOR, including contracts to which the Firm is a party, which it manages or for which it acts as agent
- offering products linked to alternative reference rates ("ARRs") across its businesses, and
- planning for the implementation of rate fallback mechanisms across products based on the conventions recommended by NWGs to prepare for transition to ARRs upon the cessation of various IBORs.

The Firm is on schedule to implement necessary changes to operational and risk management systems in order to transition away from IBORs, including by aiming to meet proposed deadlines set by NWGs for the cessation of new contracts referencing these benchmarks. The Firm continues to engage with and remains committed to NWGs in devising solutions to unresolved issues relating to IBOR transition.

The Firm continues to engage with market participants, NWGs and regulators to address market-wide challenges associated with LIBOR transition, including efforts to:

- improve liquidity in ARRs
- develop and introduce forward-looking term rates linked to ARRs, and
- support legislative proposals in the U.S., the U.K. and the EU that aim to resolve concerns involving "tough legacy" contracts (i.e. contracts that do not provide for automatic conversion to another rate or that are difficult to amend in order to add rate fallback provisions).

Resolution of these challenges should provide more certainty and help to provide a framework for market participants in transitioning away from IBORs.

Regulatory Developments Relating to the COVID-19 Pandemic

Since March 2020, the U.S. government as well as central banks and banking authorities around the world have taken and continue to take actions to help individuals, households and businesses that have been adversely affected by the economic disruption caused by the COVID-19 pandemic. The CARES Act and the Consolidated Appropriations Act, which were signed into law on March 27, 2020 and December 27, 2020, respectively, provide, among other things, funding to support loan facilities to assist consumers and businesses. Set forth below is a summary as of the date of this Form 10-K of U.S. government actions currently impacting the Firm and U.S. government programs in which the Firm is participating. The Firm will continue to assess ongoing developments in government actions in response to the COVID-19 pandemic.

U.S. government actions

Eligible retained income definition. On March 17, 2020, the Office of the Comptroller of the Currency ("OCC"), the Board of Governors of the Federal Reserve System ("Federal Reserve"), and the Federal Deposit Insurance Corporation ("FDIC"), collectively the "federal banking agencies," issued an interim final rule (issued as final on August 26, 2020) that revised the definition of "eligible retained income" in the regulatory capital rules that apply to all U.S. banking organizations. On March 23, 2020, the Federal Reserve issued an interim final rule (issued as final on August 26, 2020) that revised the definition of "eligible retained income" for purposes of the total loss-absorbing capacity ("TLAC") buffer requirements that apply to global systemically important banking organizations. The revised definition of eligible retained income makes any automatic limitations on payout distributions that could apply under the agencies' capital rules or TLAC rule take effect on a more graduated basis in the event that a banking organization's capital, leverage and TLAC ratios were to decline below regulatory requirements (including buffers). The March 17, 2020 interim final rule was issued, in conjunction with an interagency statement encouraging banking organizations to use their capital and liquidity buffers, to further support banking organizations' abilities to lend to households and businesses affected by the COVID-19 pandemic.

Reserve requirements. On March 24, 2020, the Federal Reserve issued an interim final rule (issued as final on December 22, 2020) reducing reserve requirement ratios for all depository institutions to zero percent, effective March 26, 2020, an action intended to free up liquidity in the banking system to support lending to households and businesses.

Refer to Note 26 for additional information on the reduction to the reserve requirement.

Regulatory Capital - Current Expected Credit Losses ("CECL") transition delay. On March 31, 2020, the federal banking agencies issued an interim final rule (issued as final on August 26, 2020) that provided banking organizations with the option to delay the effects of CECL on regulatory capital for two years, followed by a three-year transition period ("CECL capital transition provisions"). The Firm elected to apply the CECL capital transition provisions.

Supplementary leverage ratio ("SLR") temporary revision. On April 1, 2020, the Federal Reserve issued an interim final rule that requires, on a temporary basis, the calculation of total leverage exposure for purposes of calculating the SLR for bank holding companies ("BHC"), to exclude the on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks. These exclusions became effective April 1, 2020, and will remain in effect through March 31, 2021.

Refer to Capital Risk Management on pages 91-101 and Note 27 for additional information on the CECL capital transition provisions, the impact to the Firm's capital metrics and the Firm's SLR.

Loan modifications. On April 7, 2020, the federal banking agencies along with the National Credit Union Administration, and the Consumer Financial Protection Bureau, in consultation with the state financial regulators, issued an interagency statement revising a March 22, 2020 interagency statement on loan modifications and the reporting for financial institutions working with customers affected by the COVID-19 pandemic (the "IA Statement"). The IA Statement reconfirmed that efforts to work with borrowers where the loans are prudently underwritten, and not considered past due or carried on nonaccrual status, should not result in the loans automatically being considered modified in a troubled debt restructuring ("TDR") for accounting and financial reporting purposes, or for purposes of their respective risk-based capital rules, which would otherwise require financial institutions subject to the capital rules to hold more capital. The IA Statement also clarified the interaction between its previous guidance and Section 4013 of the CARES Act, as extended by Section 541 of the Consolidated Appropriations Act, which provides certain financial institutions with the option to suspend the application of accounting guidance for TDRs for a limited period of time for loan modifications made to address the effects of the COVID-19 pandemic.

The Firm has granted various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered TDRs because:

- they represent short-term or other insignificant modifications, whether under the Firm's regular loan modification assessments or the IA Statement guidance, or
- the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by

the CARES Act and extended by the Consolidated Appropriations Act.

To the extent that certain modifications do not meet any of the above criteria, the Firm accounts for them as TDRs. Refer to Credit Portfolio on pages 112-113 and Note 12 for additional information on the Firm’s loan modification activities.

PPP. Beginning April 3, 2020, the PPP, established by the CARES Act and administered by the SBA, authorized eligible lenders to provide nonrecourse loans to eligible borrowers until August 8, 2020 to provide an incentive for these businesses to keep their workers on their payroll. As part of the Consolidated Appropriations Act, additional funding was provided for new PPP loans beginning in early January 2021. This program was designed to target smaller businesses as well as to simplify the loan forgiveness process for loans under $150,000. As of February 19, 2021, the Firm has funded approximately $5 billion under this extension of the program.

U.S. government facilities. Beginning in March 2020, the Federal Reserve announced a suite of facilities using its emergency lending powers under section 13(3) of the Federal Reserve Act to support the flow of credit to individuals, households and businesses adversely affected by the COVID-19 pandemic and to support the broader economy.

The Firm has participated and is participating in the PPP and certain of the other government facilities and programs, as needed, to assist its clients and customers or to support the broader economy. Refer to Capital Risk Management on pages 91-101, Liquidity Risk Management on pages 102–108, Credit Portfolio on pages 112-113, Note 12 and Note 27 for additional information on the Firm’s participation in the PPP and other government facilities and programs.

CONSOLIDATED RESULTS OF OPERATIONS

This section provides a comparative discussion of JPMorgan Chase's Consolidated Results of Operations on a reported basis for the two-year period ended December 31, 2020, unless otherwise specified. Refer to Consolidated Results of Operations on pages 48-51 of the Firm's Annual Report on Form 10-K for the year ended December 31, 2019 (the "2019 Form 10-K") for a discussion of the 2019 versus 2018 results. Factors that relate primarily to a single business segment are discussed in more detail within that business segment's results. Refer to pages 152-155 for a discussion of the Critical Accounting Estimates Used by the Firm that affect the Consolidated Results of Operations.

Revenue

Year ended December 31, (in millions)	2020	2019	2018
Investment banking fees	**$ 9,486**	$ 7,501	$ 7,550
Principal transactions	**18,021**	14,018	12,059
Lending- and deposit-related fees[(a)]	**6,511**	6,626	6,377
Asset management, administration and commissions[(a)]	**18,177**	16,908	16,793
Investment securities gains/(losses)	**802**	258	(395)
Mortgage fees and related income	**3,091**	2,036	1,254
Card income[(b)]	**4,435**	5,076	4,743
Other income[(c)]	**4,457**	5,731	5,343
Noninterest revenue	**64,980**	58,154	53,724
Net interest income	**54,563**	57,245	55,059
Total net revenue	**$ 119,543**	$ 115,399	$ 108,783

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.
(b) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.
(c) Included operating lease income of $5.5 billion for each of the years ended December 31, 2020 and 2019, and $4.5 billion for the year ended December 31, 2018.

2020 compared with 2019

Investment banking fees increased, driven by CIB, reflecting:

- higher equity underwriting fees predominantly in follow-on offerings and convertible securities markets due to increased industry-wide fees
- higher debt underwriting fees in investment-grade and high-yield bonds driven by increased industry-wide fees and wallet share gains. The increased activity resulted in part from clients seeking liquidity in the first half of the year as a result of the COVID-19 pandemic.

Refer to CIB segment results on pages 71–76 and Note 6 for additional information.

Principal transactions revenue increased, predominantly in CIB, reflecting higher revenue in Fixed Income Markets, driven by strong performance in Currencies & Emerging Markets, Rates, and Credit.

The increase in principal transactions revenue also reflected higher net valuations on several legacy equity investments in Corporate, compared with net losses in the prior year.

Principal transactions revenue in CIB may in certain cases have offsets across other revenue lines, including net interest income. The Firm assesses the performance of its CIB Markets business on a total revenue basis.

Refer to CIB and Corporate segment results on pages 71–76 and pages 83–84, respectively, and Note 6 for additional information.

Lending- and deposit-related fees decreased as a result of lower deposit-related fees in CCB, reflecting lower transaction activity and the impact of fee refunds related to the COVID-19 pandemic, predominantly offset by higher cash management fees in CIB and CB, as well as higher lending-related fees, particularly loan commitment fees in CIB.

Refer to CCB, CIB and CB segment results on pages 67–70, pages 71–76 and pages 77–79, respectively, and Note 6 for additional information.

Asset management, administration and commissions revenue increased driven by:

- higher asset management fees in AWM as a result of net inflows into liquidity and long term products, and higher performance fees; and in CCB related to a higher level of investment assets
- higher brokerage commissions in CIB and AWM on higher client-driven volume,

partially offset by

- lower volume of annuity sales in CCB.

Refer to CCB, CIB and AWM segment results on pages 67–70, pages 71–76 and pages 80–82, respectively, and Note 6 for additional information.

Investment securities gains/(losses) increased due to the repositioning of the investment securities portfolio, including sales of U.S. GSE and government agency mortgage-backed securities, particularly in the first and third quarters of 2020. Refer to Corporate segment results on pages 83–84 and Note 10 for additional information.

Mortgage fees and related income increased due to higher net mortgage production revenue reflecting higher mortgage production volumes and margins; the prior year included gains on sales of certain loans.

Refer to CCB segment results on pages 67–70, Note 6 and 15 for further information.

Card income decreased due to:

- lower net interchange income reflecting lower credit card sales volumes and debit card transactions as a result of the impact of the COVID-19 pandemic, largely offset by lower acquisition costs and higher annual fees in CCB, and
- lower merchant processing fees in CIB predominantly driven by a reporting reclassification of certain expenses to be a reduction of revenue in Merchant Services. Refer to CCB and CIB segment results on pages 67–70 and pages 71–76, respectively, and Note 6 for further information.

Other income decreased reflecting:

- Increased amortization on higher levels of alternative energy investments in CIB. The increased amortization was more than offset by lower income tax expense from the associated tax credits
- lower net valuation gains on certain investments in AWM
- net losses on certain equity investments in CIB, compared with net gains in the prior year
- higher costs associated with using forward contracts to hedge certain non-U.S. dollar-denominated net investment exposures, and
- higher losses related to the early termination of certain of the Firm's long-term debt in Treasury and CIO,

partially offset by

- a net increase from a gain on an equity investment.

Net interest income decreased due to the impact of lower rates, predominantly offset by higher net interest income in CIB Markets, as well as balance sheet growth.

The Firm's average interest-earning assets were $2.8 trillion, up $434 billion, and the yield was 2.34%, down 127 basis points ("bps"), primarily due to lower rates. The net yield on these assets, on an FTE basis, was 1.98%, a decrease of 48 bps. The net yield excluding CIB Markets was 2.30%, down 97 bps.

Net yield excluding CIB Markets is a non-GAAP financial measure. Refer to the Consolidated average balance sheets, interest and rates schedule on pages 300–304 for further details; and the Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 62–64 for a further discussion of Net interest yield excluding CIB Markets.

Provision for credit losses

Year ended December 31, (in millions)	2020	2019	2018
Consumer, excluding credit card	$ 1,016	$ (378)	$ (119)
Credit card	10,886	5,348	4,818
Total consumer	11,902	4,970	4,699
Wholesale	5,510	615	172
Investment securities	68	NA	NA
Total provision for credit losses	$ 17,480	$ 5,585	$ 4,871

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

2020 compared with 2019

The **provision for credit losses** increased in consumer and wholesale primarily driven by the deterioration and uncertainty in the macroeconomic environment, in particular in the first half of 2020, as a result of the impact of the COVID-19 pandemic.

The increase in **consumer** reflected:

- net additions of $7.4 billion to the allowance for credit losses, consisting of $6.6 billion for Card, $520 million for Auto, $252 million for Business Banking,

partially offset by

- lower net charge-offs largely in Card, reflecting lower charge-offs and higher recoveries, primarily benefiting from payment assistance and government stimulus.

The prior year included a $244 million net reduction in the allowance for credit losses.

The increase in **wholesale** reflected a net addition of $4.7 billion to the allowance for credit losses across the LOBs, impacting multiple industries.

The **investment securities** provision for credit losses relates to the HTM portfolio, which became subject to the CECL accounting guidance beginning on January 1, 2020.

Refer to the segment discussions of CCB on pages 67–70, CIB on pages 71–76, CB on pages 77–79, AWM on pages 80–82, the Allowance for Credit Losses on pages 132-133, and Notes 1, 10 and 13 for further discussion of the credit portfolio and the allowance for credit losses.

Noninterest expense

Year ended December 31, (in millions)	2020	2019	2018
Compensation expense	**$ 34,988**	$ 34,155	$ 33,117
Noncompensation expense:			
Occupancy	**4,449**	4,322	3,952
Technology, communications and equipment	**10,338**	9,821	8,802
Professional and outside services	**8,464**	8,533	8,502
Marketing[a]	**2,476**	3,351	3,044
Other[b][c]	**5,941**	5,087	5,731
Total noncompensation expense	**31,668**	31,114	30,031
Total noninterest expense	**$ 66,656**	$ 65,269	$ 63,148

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.
(b) Included Firmwide legal expense of $1.1 billion, $239 million and $72 million for the years ended December 31, 2020, 2019 and 2018, respectively.
(c) Included FDIC-related expense of $717 million, $457 million and $1.2 billion for the years ended December 31, 2020, 2019 and 2018, respectively.

2020 compared with 2019

Compensation expense increased driven by higher volume- and revenue-related expense, predominantly in CIB and CCB, as well as the impact of investments in the businesses.

Noncompensation expense increased as a result of:

- higher legal expense predominantly in CIB and AWM
- higher volume-related expense, in particular brokerage expense in CIB and depreciation from growth in auto lease assets in CCB
- higher investments in the businesses, including technology and real estate,
- an impairment on a legacy investment in Corporate, and
- higher FDIC-related expense,

partially offset by

- lower marketing expense as a result of lower investments in marketing campaigns and lower travel-related benefits in CCB, and
- lower structural expense, including lower travel and entertainment across the businesses, and payment processing costs, partially offset by higher contributions to the Firm's Foundation.

Income tax expense

Year ended December 31, (in millions, except rate)	2020	2019	2018
Income before income tax expense	**$35,407**	$44,545	$40,764
Income tax expense	**6,276**	8,114	8,290
Effective tax rate	**17.7 %**	18.2 %	20.3 %

2020 compared with 2019

The **effective tax rate** decreased, with the current year rate reflecting the impact of a lower level of pre-tax income and changes in the mix of income and expenses subject to U.S. federal, and state and local taxes, as well as other tax adjustments. The prior year included the effect of $1.1 billion of tax benefits related to the resolution of certain tax audits. Refer to Note 25 for further information.

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

Consolidated balance sheets analysis

The following is a discussion of the significant changes between December 31, 2020 and 2019.

Selected Consolidated balance sheets data

December 31, (in millions)	2020	2019	Change
Assets			
Cash and due from banks	$ 24,874	$ 21,704	15 %
Deposits with banks	502,735	241,927	108
Federal funds sold and securities purchased under resale agreements	296,284	249,157	19
Securities borrowed	160,635	139,758	15
Trading assets[(a)]	503,126	369,687	36
Available-for-sale securities	388,178	350,699	11
Held-to-maturity securities, net of allowance for credit losses	201,821	47,540	325
Investment securities, net of allowance for credit losses	589,999	398,239	48
Loans[(a)]	1,012,853	997,620	2
Allowance for loan losses	(28,328)	(13,123)	116
Loans, net of allowance for loan losses	984,525	984,497	–
Accrued interest and accounts receivable	90,503	72,861	24
Premises and equipment	27,109	25,813	5
Goodwill, MSRs and other intangible assets	53,428	53,341	–
Other assets[(a)]	152,853	130,395	17
Total assets	$ 3,386,071	$ 2,687,379	26 %

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

Cash and due from banks and deposits with banks increased primarily as a result of significant deposit inflows, which also funded asset growth across the Firm, including investment securities and securities purchased under resale agreements. Deposits with banks reflect the Firm's placements of its excess cash with various central banks, including the Federal Reserve Banks.

Federal funds sold and securities purchased under resale agreements increased as a result of higher deployment of cash in Treasury and CIO, as well as the impact of client activity and higher demand for securities to cover short positions in CIB. Refer to Liquidity Risk Management on pages 102–108 and Note 11 for additional information.

Securities borrowed increased driven by client-driven activities in CIB. Refer to Liquidity Risk Management on pages 102–108 and Note 11 for additional information.

Trading assets remained elevated at the end of 2020, due to stronger client-driven market-making activities in debt and equity instruments and higher derivative receivables as a result of market movements in CIB Markets. Refer to Notes 2 and 5 for additional information.

Investment securities increased, reflecting net purchases of U.S. Treasuries and U.S. GSE and government agency MBS in the available-for-sale ("AFS") portfolio, driven by interest rate risk management activities and cash deployment. AFS securities of $164 billion were transferred to the held-to-maturity ("HTM") portfolio, resulting in a decrease in AFS and a comparable increase in HTM securities. The transfers were executed for capital management purposes. Refer to Corporate segment results on pages 83–84, Investment Portfolio Risk Management on page 134 and Notes 2 and 10 for additional information on investment securities.

Loans increased, reflecting:

- growth in wholesale loans and mortgages in AWM and the impact of PPP loans in CBB and CB, as well as higher wholesale loans related to client-driven activities in CIB Markets

largely offset by

- lower loans in Home Lending primarily due to net paydowns; and lower loans in Card due to the decline in sales volumes that began in March as a result of the impact of the COVID-19 pandemic.

The allowance for loan losses increased primarily reflecting the deterioration and uncertainty in the macroeconomic environment, in particular in the first half of 2020, as a result of the impact of the COVID-19 pandemic, consisting of:

- a net $7.4 billion addition in consumer, predominantly in the credit card portfolio, and
- a net $3.6 billion addition in wholesale, across the LOBs, impacting multiple industries.

The adoption of CECL on January 1, 2020, resulted in a $4.2 billion addition to the allowance for loan losses.

There were also additions to the allowance for lending-related commitments, which is included in other liabilities on the consolidated balance sheets, of $1.1 billion related to the impact of the COVID-19 pandemic, and $98 million related to the adoption of CECL. Total additions to the allowance for credit losses were $12.1 billion related to COVID-19, and $4.3 billion related to CECL, as of December 31, 2020.

Refer to Credit and Investment Risk Management on pages 110–134, and Notes 1, 2, 3, 12 and 13 for further discussion of loans and the allowance for loan losses.

Accrued interest and accounts receivable increased driven by higher client receivables related to client-driven activities in CIB prime brokerage.

Refer to Note 16 and 18 for additional information on **Premises and equipment**.

Goodwill, MSRs and other intangibles was flat as the increase in goodwill related to the acquisitions of cxLoyalty and 55ip was offset by lower MSRs as a result of faster prepayment speeds on lower rates, and the realization of expected cash flows, partially offset by net additions to the MSRs. Refer to Note 15 for additional information.

Other assets increased reflecting higher cash collateral placed with central counterparties in CIB.

Selected Consolidated balance sheets data

December 31, (in millions)	2020	2019	Change
Liabilities			
Deposits	**$ 2,144,257**	$ 1,562,431	37
Federal funds purchased and securities loaned or sold under repurchase agreements	**215,209**	183,675	17
Short-term borrowings	**45,208**	40,920	10
Trading liabilities	**170,181**	119,277	43
Accounts payable and other liabilities	**232,599**	210,407	11
Beneficial interests issued by consolidated variable interest entities ("VIEs")	**17,578**	17,841	(1)
Long-term debt	**281,685**	291,498	(3)
Total liabilities	**3,106,717**	2,426,049	28
Stockholders' equity	**279,354**	261,330	7
Total liabilities and stockholders' equity	**$ 3,386,071**	$ 2,687,379	26 %

Deposits increased reflecting significant inflows across the LOBs primarily driven by the impact of the COVID-19 pandemic and the related effect of certain government actions;

- in the wholesale businesses, while the inflows principally occurred in March as clients sought to remain liquid as a result of market conditions, balances continued to increase through the end of 2020, and
- in CCB, the increase was driven by lower spending and higher cash balances across both consumer and small business customers, as well as growth from existing and new accounts.

Refer to the Liquidity Risk Management discussion on pages 102–108; and Notes 2 and 17 for more information.

Federal funds purchased and securities loaned or sold under repurchase agreements increased reflecting:

- higher secured financing of AFS investment securities in Treasury and CIO, as well as trading assets in CIB,

partially offset by

- a decline in client-driven market-making activities in CIB, including the Firm's non-participation in the Federal Reserve's open market operations. Refer to the Liquidity Risk Management discussion on pages 102–108 and Note 11 for additional information.

Short-term borrowings increased reflecting higher financing of CIB prime brokerage activities. Refer to pages 102–108 for information on changes in Liquidity Risk Management.

Trading liabilities increased reflecting client-driven market-making activities, which resulted in higher levels of short positions in debt and equity instruments and higher derivative payables as a result of market movements in CIB Markets. Refer to Notes 2 and 5 for additional information.

Accounts payable and other liabilities increased reflecting higher client payables related to client-driven activities in CIB Markets. Refer to Note 19 for additional information.

Refer to Off-Balance Sheet Arrangements on pages 60-61 and Note 14 and 28 for information on **Beneficial interests issued by consolidated VIEs**.

Long-term debt decreased as a result of maturities of FHLB advances; net maturities of senior debt, which included the early termination of certain of the Firm's debt; partially offset by an issuance of subordinated debt, and higher fair value hedge accounting adjustments related to lower interest rates. Refer to Liquidity Risk Management on pages 102–108 and Note 20 for additional information.

Stockholders' equity increased reflecting the combined impact of net income, capital actions, the adoption of CECL and an increase in accumulated other comprehensive income ("AOCI"). The increase in AOCI was driven by net unrealized gains on AFS securities, and higher valuation of interest rate cash flow hedges. Refer to page 165 for information on changes in stockholders' equity, and Capital actions on page 99, Note 24 for additional information on AOCI.

Consolidated cash flows analysis

The following is a discussion of cash flow activities during the years ended December 31, 2020 and 2019. Refer to Consolidated cash flows analysis on page 54 of the Firm's 2019 Form 10-K for a discussion of the 2018 activities.

	Year ended December 31,		
(in millions)	**2020**	2019	2018
Net cash provided by/(used in)			
Operating activities[a]	**$ (79,910)**	$ 4,092	$ 15,614
Investing activities[a]	**(261,912)**	(52,059)	(199,420)
Financing activities	**596,645**	32,987	34,158
Effect of exchange rate changes on cash	**9,155**	(182)	(2,863)
Net increase/(decrease) in cash and due from banks and deposits with banks	**$ 263,978**	$ (15,162)	$(152,511)

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

Operating activities

JPMorgan Chase's operating assets and liabilities primarily support the Firm's lending and capital markets activities. These assets and liabilities can vary significantly in the normal course of business due to the amount and timing of cash flows, which are affected by client-driven and risk management activities and market conditions. The Firm believes that cash flows from operations, available cash and other liquidity sources, and its capacity to generate cash through secured and unsecured sources, are sufficient to meet its operating liquidity needs.

- In 2020, cash used primarily reflected higher trading assets, other assets, and securities borrowed, partially offset by higher trading liabilities and net income excluding noncash adjustments.
- In 2019, cash provided primarily reflected net income excluding noncash adjustments, lower trading assets, and net proceeds of sales, securitizations, and paydowns of loans held-for-sale, partially offset by higher securities borrowed, an increase in other assets and a decrease in trading liabilities.

Investing activities

The Firm's investing activities predominantly include originating held-for-investment loans and investing in the investment securities portfolio, and other short-term instruments.

- In 2020, cash used primarily reflected net purchases of investment securities, higher net originations of loans, and higher securities purchased under resale agreements.
- In 2019, cash used reflected net purchases of investment securities, partially offset by lower securities purchased under resale agreements, and net proceeds from sales and securitizations of loans held-for-investment.

Financing activities

The Firm's financing activities include acquiring customer deposits and issuing long-term debt, as well as preferred stock.

- In 2020, cash provided reflected higher deposits and an increase in securities loaned or sold under repurchase agreements, partially offset by net payments of long-term borrowings.
- In 2019, cash provided reflected higher deposits, partially offset by a decrease in short-term borrowings and net payments of long-term borrowings.
- For both periods, cash was used for repurchases of common stock and cash dividends on common and preferred stock. On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020.

* * *

Refer to Consolidated Balance Sheets Analysis on pages 57-58, Capital Risk Management on pages 91-101, and Liquidity Risk Management on pages 102–108 for a further discussion of the activities affecting the Firm's cash flows.

OFF-BALANCE SHEET ARRANGEMENTS AND CONTRACTUAL CASH OBLIGATIONS

In the normal course of business, the Firm enters into various off-balance sheet arrangements and contractual obligations that may require future cash payments. Certain obligations are recognized on-balance sheet, while others are disclosed as off-balance sheet under accounting principles generally accepted in the U.S. ("U.S. GAAP").

Special-purpose entities

The Firm has several types of off–balance sheet arrangements, including through nonconsolidated special-purpose entities ("SPEs"), which are a type of VIE, and through lending-related financial instruments (e.g., commitments and guarantees).

The Firm holds capital, as appropriate, against all SPE-related transactions and related exposures, such as derivative contracts and lending-related commitments and guarantees.

The Firm has no commitments to issue its own stock to support any SPE transaction, and its policies require that transactions with SPEs be conducted at arm's length and reflect market pricing. Consistent with this policy, no JPMorgan Chase employee is permitted to invest in SPEs with which the Firm is involved where such investment would violate the Firm's Code of Conduct.

The table below provides an index of where in this 2020 Form 10-K discussions of the Firm's various off-balance sheet arrangements can be found. Refer to Note 1 for additional information about the Firm's consolidation policies.

Type of off-balance sheet arrangement	Location of disclosure	Page references
Special-purpose entities: variable interests and other obligations, including contingent obligations, arising from variable interests in nonconsolidated VIEs	Refer to Note 14	253-260
Off-balance sheet lending-related financial instruments, guarantees, and other commitments	Refer to Note 28	283-288

Contractual cash obligations

The accompanying table summarizes, by remaining maturity, JPMorgan Chase's significant contractual cash obligations at December 31, 2020. The contractual cash obligations included in the table below reflect the minimum contractual obligation under legally enforceable contracts with terms that are both fixed and determinable. Excluded from the table are certain liabilities with variable cash flows and/or no obligation to return a stated amount of principal at maturity.

The carrying amount of on-balance sheet obligations on the Consolidated balance sheets may differ from the minimum contractual amount of the obligations reported below. Refer to Note 28 for a discussion of mortgage repurchase liabilities and other obligations.

Contractual cash obligations

By remaining maturity at December 31, (in millions)	2020					2019
	2021	2022-2023	2024-2025	After 2025	**Total**	Total
On-balance sheet obligations						
Deposits[a]	**$ 2,134,256**	**$ 4,321**	**$ 2,931**	**$ 1,637**	**$ 2,143,145**	$ 1,558,040
Federal funds purchased and securities loaned or sold under repurchase agreements	**214,881**	**118**	**9**	**189**	**215,197**	183,675
Short-term borrowings[a]	**28,514**	**—**	**—**	**—**	**28,514**	35,107
Beneficial interests issued by consolidated VIEs	**14,976**	**2,400**	**—**	**223**	**17,599**	17,874
Long-term debt[a]	**22,461**	**42,084**	**42,180**	**123,477**	**230,202**	250,415
Operating leases[b]	**1,606**	**2,705**	**2,070**	**3,602**	**9,983**	10,090
Other[c]	**8,694**	**2,237**	**2,008**	**2,592**	**15,531**	15,568
Total on-balance sheet obligations	**2,425,388**	**53,865**	**49,198**	**131,720**	**2,660,171**	2,070,769
Off-balance sheet obligations						
Unsettled resale and securities borrowed agreements[d]	**95,084**	**1,764**	**—**	**—**	**96,848**	117,951
Contractual interest payments[e]	**6,071**	**10,450**	**8,128**	**29,719**	**54,368**	54,681
Equity investment commitments	**286**	**—**	**—**	**—**	**286**	539
Contractual purchases and capital expenditures	**1,968**	**942**	**225**	**198**	**3,333**	2,929
Obligations under co-brand programs	**333**	**530**	**240**	**79**	**1,182**	1,548
Total off-balance sheet obligations	**103,742**	**13,686**	**8,593**	**29,996**	**156,017**	177,648
Total contractual cash obligations	**$ 2,529,130**	**$ 67,551**	**$ 57,791**	**$ 161,716**	**$ 2,816,188**	$ 2,248,417

(a) Excludes structured notes on which the Firm is not obligated to return a stated amount of principal at the maturity of the notes, but is obligated to return an amount based on the performance of the structured notes.
(b) Includes noncancelable operating leases for premises and equipment used primarily for business purposes. Excludes the benefit of noncancelable sublease rentals of $593 million and $846 million at December 31, 2020 and 2019, respectively. Refer to Note 18 for further information on operating leases.
(c) Primarily includes dividends declared on preferred and common stock, deferred annuity contracts, pension and other postretirement employee benefit obligations, insurance liabilities and income taxes payable associated with the deemed repatriation under the TCJA.
(d) Refer to unsettled resale and securities borrowed agreements in Note 28 for further information.
(e) Includes accrued interest and future contractual interest obligations. Excludes interest related to structured notes for which the Firm's payment obligation is based on the performance of certain benchmarks.

EXPLANATION AND RECONCILIATION OF THE FIRM'S USE OF NON-GAAP FINANCIAL MEASURES

Non-GAAP financial measures

The Firm prepares its Consolidated Financial Statements in accordance with U.S. GAAP; these financial statements appear on pages 162-166. That presentation, which is referred to as "reported" basis, provides the reader with an understanding of the Firm's results that can be tracked consistently from year-to-year and enables a comparison of the Firm's performance with the U.S. GAAP financial statements of other companies.

In addition to analyzing the Firm's results on a reported basis, management reviews Firmwide results, including the overhead ratio, on a "managed" basis; these Firmwide managed basis results are non-GAAP financial measures. The Firm also reviews the results of the LOBs on a managed basis. The Firm's definition of managed basis starts, in each case, with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. These financial measures allow management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense. These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Management also uses certain non-GAAP financial measures at the Firm and business-segment level, because these other non-GAAP financial measures provide information to investors about the underlying operational performance and trends of the Firm or of the particular business segment, as the case may be, and, therefore, facilitate a comparison of the Firm or the business segment with the performance of its relevant competitors. Refer to Business Segment Results on pages 65–84 for additional information on these non-GAAP measures. Non-GAAP financial measures used by the Firm may not be comparable to similarly named non-GAAP financial measures used by other companies.

The following summary table provides a reconciliation from the Firm's reported U.S. GAAP results to managed basis.

	2020			2019			2018		
Year ended December 31, (in millions, except ratios)	Reported	Fully taxable-equivalent adjustments[b]	Managed basis	Reported	Fully taxable-equivalent adjustments[b]	Managed basis	Reported	Fully taxable-equivalent adjustments[b]	Managed basis
Other income	**$ 4,457**	**$ 2,968**	**$ 7,425**	$ 5,731	$ 2,534	$ 8,265	$ 5,343	$ 1,877	$ 7,220
Total noninterest revenue[a]	**64,980**	**2,968**	**67,948**	58,154	2,534	60,688	53,724	1,877	55,601
Net interest income	**54,563**	**418**	**54,981**	57,245	531	57,776	55,059	628	55,687
Total net revenue	**119,543**	**3,386**	**122,929**	115,399	3,065	118,464	108,783	2,505	111,288
Total noninterest expense[a]	**66,656**	**NA**	**66,656**	65,269	NA	65,269	63,148	NA	63,148
Pre-provision profit	**52,887**	**3,386**	**56,273**	50,130	3,065	53,195	45,635	2,505	48,140
Provision for credit losses	**17,480**	**NA**	**17,480**	5,585	NA	5,585	4,871	NA	4,871
Income before income tax expense	**35,407**	**3,386**	**38,793**	44,545	3,065	47,610	40,764	2,505	43,269
Income tax expense	**6,276**	**3,386**	**9,662**	8,114	3,065	11,179	8,290	2,505	10,795
Net income	**$ 29,131**	**NA**	**$ 29,131**	$ 36,431	NA	$ 36,431	$ 32,474	NA	$ 32,474
Overhead ratio	**56 %**	**NM**	**54 %**	57 %	NM	55 %	58 %	NM	57 %

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

(b) Predominantly recognized in CIB, CB and Corporate.

Net interest income and net yield excluding CIB Markets

In addition to reviewing net interest income and the net yield on a managed basis, management also reviews these metrics excluding CIB Markets, as shown below; these metrics, which exclude CIB Markets, are non-GAAP financial measures. Management reviews these metrics to assess the performance of the Firm's lending, investing (including asset-liability management) and deposit-raising activities. The resulting metrics that exclude CIB Markets are referred to as non-markets-related net interest income and net yield. CIB Markets consists of Fixed Income Markets and Equity Markets. Management believes that disclosure of non-markets-related net interest income and net yield provides investors and analysts with other measures by which to analyze the non-markets-related business trends of the Firm and provides a comparable measure to other financial institutions that are primarily focused on lending, investing and deposit-raising activities.

Year ended December 31, (in millions, except rates)	**2020**	2019	2018
Net interest income – reported	**$ 54,563**	$ 57,245	$ 55,059
Fully taxable-equivalent adjustments	**418**	531	628
Net interest income – managed basis(a)	**$ 54,981**	$ 57,776	$ 55,687
Less: CIB Markets net interest income(b)	**8,374**	3,120	3,087
Net interest income excluding CIB Markets(a)	**$ 46,607**	$ 54,656	$ 52,600
Average interest-earning assets(c)	**$2,779,710**	$2,345,279	$2,212,657
Less: Average CIB Markets interest-earning assets(b)(c)	**751,131**	672,417	593,104
Average interest-earning assets excluding CIB Markets	**$2,028,579**	$1,672,862	$1,619,553
Net yield on average interest-earning assets – managed basis	**1.98 %**	2.46 %	2.52 %
Net yield on average CIB Markets interest-earning assets(b)	**1.11**	0.46	0.52
Net yield on average interest-earning assets excluding CIB Markets	**2.30 %**	3.27 %	3.25 %

(a) Interest includes the effect of related hedges. Taxable-equivalent amounts are used where applicable.
(b) Refer to pages 74-75 for further information on CIB Markets.
(c) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

Calculation of certain U.S. GAAP and non-GAAP financial measures

Certain U.S. GAAP and non-GAAP financial measures are calculated as follows:

Book value per share ("BVPS")
Common stockholders' equity at period-end / Common shares at period-end

Overhead ratio
Total noninterest expense / Total net revenue

Pre-provision profit
Total net revenue – Total noninterest expense

Return on assets ("ROA")
Reported net income / Total average assets

Return on common equity ("ROE")
Net income* / Average common stockholders' equity

Return on tangible common equity ("ROTCE")
Net income* / Average tangible common equity

Tangible book value per share ("TBVPS")
Tangible common equity at period-end / Common shares at period-end

* Represents net income applicable to common equity

In addition, the Firm reviews other non-GAAP financial measures which include:

- Adjusted expense, which is noninterest expense excluding Firmwide legal expense
- Allowance for loan losses to period-end loans retained excluding trade finance and conduits
- Pre-provision profit, which represents total net revenue less total noninterest expense.

Management believes that these measures help investors understand the effect of these items on reported results and provide an alternate presentation of the Firm's performance.

Tangible common equity, ROTCE and TBVPS

Tangible common equity ("TCE"), ROTCE and TBVPS are each non-GAAP financial measures. TCE represents the Firm's common stockholders' equity (i.e., total stockholders' equity less preferred stock) less goodwill and identifiable intangible assets (other than MSRs), net of related deferred tax liabilities. ROTCE measures the Firm's net income applicable to common equity as a percentage of average TCE. TBVPS represents the Firm's TCE at period-end divided by common shares at period-end. TCE, ROTCE and TBVPS are utilized by the Firm, as well as investors and analysts, in assessing the Firm's use of equity.

The following summary table provides a reconciliation from the Firm's common stockholders' equity to TCE.

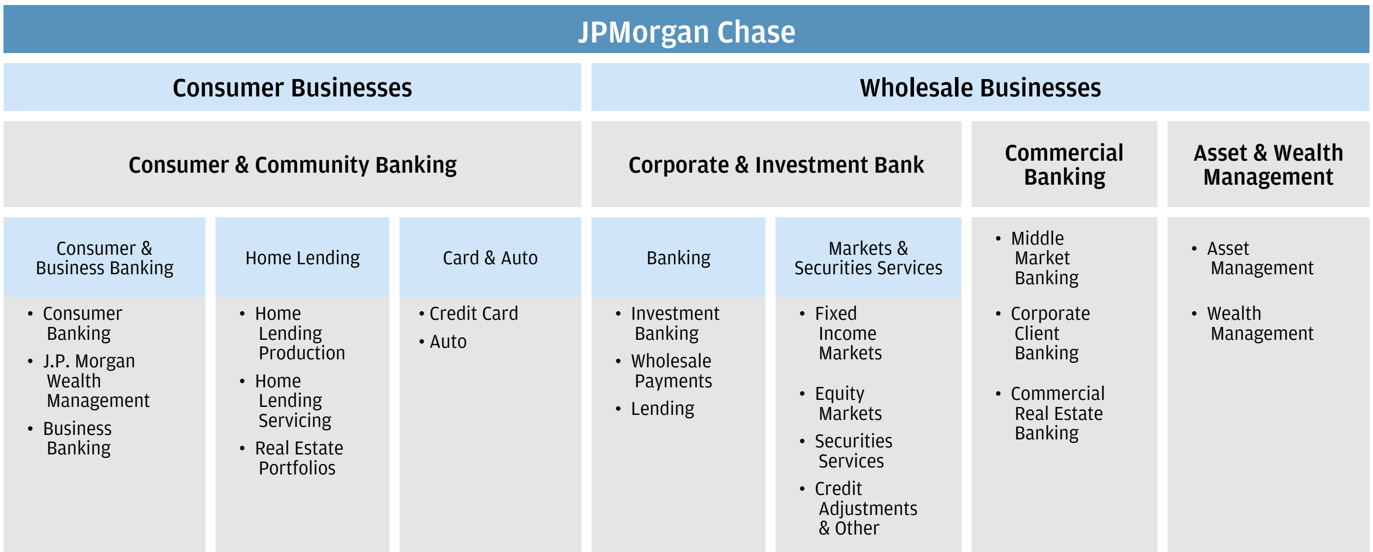
	Period-end		Average		
			Year ended December 31,		
(in millions, except per share and ratio data)	**Dec 31, 2020**	Dec 31, 2019	**2020**	2019	2018
Common stockholders' equity	**$ 249,291**	$ 234,337	**$ 236,865**	$ 232,907	$ 229,222
Less: Goodwill	**49,248**	47,823	**47,820**	47,620	47,491
Less: Other intangible assets	**904**	819	**781**	789	807
Add: Certain deferred tax liabilities[(a)]	**2,453**	2,381	**2,399**	2,328	2,231
Tangible common equity	**$ 201,592**	$ 188,076	**$ 190,663**	$ 186,826	$ 183,155
Return on tangible common equity	**NA**	NA	**14 %**	19 %	17 %
Tangible book value per share	**$ 66.11**	$ 60.98	**NA**	NA	NA

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating TCE.

BUSINESS SEGMENT RESULTS

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.

The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is currently evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Explanation and Reconciliation of the Firm's use of Non-GAAP Financial Measures, on pages 62–64 for a definition of managed basis.



Business segment changes
In the fourth quarter of 2020, the Firm transferred certain assets, liabilities, revenue, expense and headcount associated with certain wealth management clients from AWM to the J.P. Morgan Wealth Management business unit within CCB. Prior-period amounts have been revised to conform with the current presentation, including the transfer of approximately 1,650 technology and support staff during the second and third quarters of 2020. Ultra-high-net-worth and certain high-net-worth client relationships remained in AWM.

In the first quarter of 2020, the Firm began reporting a Wholesale Payments business unit within CIB following a realignment of the Firm's wholesale payments businesses. The Wholesale Payments business comprises:

- Merchant Services, which was realigned from CCB to CIB
- Treasury Services and Trade Finance in CIB. Trade Finance was previously reported in Lending in CIB.

In connection with the alignment of Wholesale Payments, the assets, liabilities and headcount associated with the Merchant Services business were realigned to CIB from CCB, and the revenue and expenses of the Merchant Services business are reported across CCB, CIB and CB based primarily on client relationships. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Payment processing-only clients are those that only use payment services offered by Merchant Services, and in general do not currently utilize other services offered by the Firm. Prior-period amounts have been revised to reflect this realignment and revised allocation methodology.

Description of business segment reporting methodology

Results of the business segments are intended to present each segment as if it were a stand-alone business. The management reporting process that derives business segment results includes the allocation of certain income and expense items. The Firm also assesses the level of capital required for each LOB on at least an annual basis. The Firm periodically assesses the assumptions, methodologies and reporting classifications used for segment reporting, and further refinements may be implemented in future periods.

Revenue sharing
When business segments join efforts to sell products and services to the Firm's clients, the participating business segments may agree to share revenue from those transactions. Revenue is generally recognized in the segment responsible for the related product or service, with allocations to the other segment(s) involved in the transaction. The segment results reflect these revenue-sharing agreements.

Expense Allocation
Where business segments use services provided by corporate support units, or another business segment, the costs of those services are allocated to the respective business segments. The expense is generally allocated based on the actual cost and use of services provided. In contrast, certain costs and investments related to corporate support units, technology and operations not currently utilized by any LOB, are not

allocated to the business segments and are retained in Corporate. Expense retained in Corporate generally includes parent company costs that would not be incurred if the segments were stand-alone businesses; and other items not aligned with a particular business segment.

Funds transfer pricing

Funds transfer pricing is the process by which the Firm allocates interest income and expense to each business segment and transfers the primary interest rate risk and liquidity risk exposures to Treasury and CIO within Corporate. The funds transfer pricing process considers the interest rate risk, liquidity risk and regulatory requirements on a product-by-product basis within each business segment.

Debt expense and preferred stock dividend allocation

As part of the funds transfer pricing process, almost all of the cost of the credit spread component of outstanding unsecured long-term debt and preferred stock dividends is allocated to the reportable business segments, while the balance of the cost is retained in Corporate. The methodology to allocate the cost of unsecured long-term debt and preferred stock dividends to the business segments is aligned with the Firm's process to allocate capital. The allocated cost of unsecured long-term debt is included in a business segment's net interest income, and net income is reduced by preferred stock dividends to arrive at a business segment's net income applicable to common equity.

Business segment capital allocation

The amount of capital assigned to each business is referred to as equity. As of January 1, 2021, the Firm has changed its line of business capital allocations primarily as a result of changes in exposures for each LOB and an increase in the relative risk weighting toward Standardized RWA. The assumptions and methodologies used to allocate capital are periodically assessed and as a result, the capital allocated to the LOBs may change from time to time.

Refer to Line of business equity on page 98 for additional information on business segment capital allocation.

Segment Results – Managed Basis

The following tables summarize the Firm's results by segment for the periods indicated.

Year ended December 31,	Consumer & Community Banking[(a)]			Corporate & Investment Bank			Commercial Banking		
(in millions, except ratios)	**2020**	2019	2018	**2020**	2019	2018	**2020**	2019	2018
Total net revenue	**$ 51,268**	$ 55,133	$ 51,271	**$49,284**	$ 39,265	$ 37,382	**$ 9,313**	$ 9,264	$ 9,336
Total noninterest expense	**27,990**	28,276	27,168	**23,538**	22,444	21,876	**3,798**	3,735	3,627
Pre-provision profit/(loss)	**23,278**	26,857	24,103	**25,746**	16,821	15,506	**5,515**	5,529	5,709
Provision for credit losses	**12,312**	4,954	4,754	**2,726**	277	(60)	**2,113**	296	129
Net income/(loss)	**8,217**	16,541	14,707	**17,094**	11,954	11,799	**2,578**	3,958	4,264
Return on equity ("ROE")	**15%**	31%	28%	**20 %**	14%	16%	**11 %**	17%	20%

Year ended December 31,	Asset & Wealth Management			Corporate			Total[(a)]		
(in millions, except ratios)	**2020**	2019	2018	**2020**	2019	2018	**2020**	2019	2018
Total net revenue	**$14,240**	$ 13,591	$ 13,427	**$ (1,176)**	$ 1,211	$ (128)	**$ 122,929**	$ 118,464	$ 111,288
Total noninterest expense	**9,957**	9,747	9,575	**1,373**	1,067	902	**66,656**	65,269	63,148
Pre-provision profit/(loss)	**4,283**	3,844	3,852	**(2,549)**	144	(1,030)	**56,273**	53,195	48,140
Provision for credit losses	**263**	59	52	**66**	(1)	(4)	**17,480**	5,585	4,871
Net income/(loss)	**2,992**	2,867	2,945	**(1,750)**	1,111	(1,241)	**29,131**	36,431	32,474
Return on equity ("ROE")	**28 %**	26%	32%	**NM**	NM	NM	**12%**	15%	13%

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

The following sections provide a comparative discussion of the Firm's results by segment as of or for the years ended December 31, 2020 and 2019.

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit and investment products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2020	2019	2018
Revenue			
Lending- and deposit-related fees[a]	**$ 3,166**	$ 3,938	$ 3,787
Asset management, administration and commissions[a]	**2,780**	2,808	2,592
Mortgage fees and related income	**3,079**	2,035	1,252
Card income[b]	**3,068**	3,412	3,108
All other income	**5,647**	5,603	4,599
Noninterest revenue	**17,740**	17,796	15,338
Net interest income	**33,528**	37,337	35,933
Total net revenue	**51,268**	55,133	51,271
Provision for credit losses	**12,312**	4,954	4,754
Noninterest expense			
Compensation expense	**11,014**	10,815	10,580
Noncompensation expense[b][c]	**16,976**	17,461	16,588
Total noninterest expense	**27,990**	28,276	27,168
Income before income tax expense	**10,966**	21,903	19,349
Income tax expense	**2,749**	5,362	4,642
Net income	**$ 8,217**	$16,541	$14,707
Revenue by line of business			
Consumer & Business Banking	**$22,955**	$27,376	$25,607
Home Lending	**6,018**	5,179	5,484
Card & Auto[b]	**22,295**	22,578	20,180
Mortgage fees and related income details:			
Net production revenue	**2,629**	1,618	268
Net mortgage servicing revenue[d]	**450**	417	984
Mortgage fees and related income	**$ 3,079**	$ 2,035	$ 1,252
Financial ratios			
Return on equity	**15 %**	31 %	28 %
Overhead ratio	**55**	51	53

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation.

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including an increase to net revenue of $725 million and $649 million for the years ended December 31, 2019 and 2018, respectively. Ultra-high-net-worth and certain high-net-worth client relationships remained in AWM.

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.
(b) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.
(c) Included depreciation expense on leased assets of $4.2 billion, $4.0 billion and $3.4 billion for the years ended December 31, 2020, 2019 and 2018, respectively.
(d) Included MSR risk management results of $(18) million, $(165) million and $(111) million for the years ended December 31, 2020, 2019 and 2018, respectively.

2020 compared with 2019

Net income was $8.2 billion, a decrease of 50%, largely driven by an increase in the provision for credit losses.

Net revenue was $51.3 billion, a decrease of 7%.

Net interest income was $33.5 billion, down 10%, driven by:

- the impact of deposit margin compression in CBB, spread compression and lower loans in Home Lending, predominantly due to paydowns and prior year loan sales, and lower loans in Card due to the decline in sales volume as a result of the COVID-19 pandemic,

partially offset by

- growth in deposits in CBB, and loan margin expansion in Card, the prior year included charges for the unwind of the internal funding from Treasury and CIO associated with the sales of certain mortgage loans.

Noninterest revenue was $17.7 billion, flat, reflecting:

- lower deposit-related fees due to lower transaction activity and the impact of fee refunds related to the COVID-19 pandemic,
- lower card income due to lower net interchange income reflecting lower credit card sales volumes and debit card transactions as a result of the impact of the COVID-19 pandemic, largely offset by lower acquisition costs and higher annual fees, and
- lower asset management, administration and commissions due to a lower volume of annuity sales offset by a higher level of investment assets,

offset by

- higher net mortgage production revenue reflecting higher mortgage production volumes and margins; the prior year included gains on the sales of certain mortgage loans.

Refer to Note 15 for further information regarding changes in the value of the MSR asset and related hedges, and mortgage fees and related income.

Noninterest expense was $28.0 billion, relatively flat, reflecting:

- lower marketing expense as a result of lower investments in marketing campaigns and lower travel-related benefits, and
- lower structural expenses,

offset by

- investments in the business, higher volume-related compensation, and higher depreciation on auto lease assets.

The provision for credit losses was $12.3 billion, an increase of $7.4 billion from the prior year, driven by:

- additions to the allowance for credit losses as a result of the impact of the COVID-19 pandemic, consisting of: $6.6 billion for Card, $649 million for CBB, and $560 million for Auto,

partially offset by

- lower net charge-offs largely in Card, reflecting lower charge-offs and higher recoveries primarily benefiting from payment assistance and government stimulus.

The prior year included a $300 million net reduction in the allowance for credit losses.

Refer to Credit and Investment Risk Management on pages 110–134 and Allowance for Credit Losses on pages 132-133 for further discussions of the credit portfolios and the allowance for credit losses.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2020		2019	2018
Selected balance sheet data (period-end)				
Total assets	**$ 496,705**		$ 541,367	$ 560,177
Loans:				
Consumer & Business Banking	**48,810**	(d)	29,585	28,450
Home Lending[(a)(b)]	**182,121**		213,445	247,721
Card	**144,216**		168,924	156,632
Auto	**66,432**		61,522	63,573
Total loans	**441,579**		473,476	496,376
Deposits	**958,706**		723,418	684,124
Equity	**52,000**		52,000	51,000
Selected balance sheet data (average)				
Total assets	**$ 501,584**		$ 543,127	$ 548,637
Loans:				
Consumer & Business Banking	**43,064**		28,859	27,890
Home Lending[(a)(c)]	**197,148**		230,662	250,373
Card	**146,633**		156,325	145,652
Auto	**61,476**		61,862	64,675
Total loans	**448,321**		477,708	488,590
Deposits	**851,390**		698,378	675,537
Equity	**52,000**		52,000	51,000
Headcount	**122,894**		125,756	127,826

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation, including a decrease to period-end assets of $6.6 billion and $6.2 billion and headcount of 4,022 and 4,092, as of December 31, 2019 and 2018, respectively.

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including an increase to headcount of 2,641 and 2,400 as of December 31, 2019 and 2018, respectively.

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(b) At December 31, 2020, 2019 and 2018, Home Lending loans held-for-sale and loans at fair value were $9.7 billion, $16.6 billion and $7.9 billion, respectively.
(c) Average Home Lending loans held-for sale and loans at fair value were $11.1 billion, $14.1 billion and $9.0 billion, respectively, for the years ended December 31, 2020, 2019 and 2018.
(d) At December 31, 2020 included $19.2 billion of loans in Business Banking under the PPP. Refer to Credit Portfolio on pages 112-113 for a further discussion of the PPP.

Selected metrics

As of or for the year ended December 31, (in millions, except ratio data)	2020		2019	2018
Credit data and quality statistics				
Nonaccrual loans[(a)(b)(c)]	**$5,675**	(f)	$3,027	$3,349
Net charge-offs/(recoveries)				
Consumer & Business Banking	**263**		298	246
Home Lending	**(169)**		(98)	(294)
Card	**4,286**		4,848	4,518
Auto	**123**		206	243
Total net charge-offs/(recoveries)	**$4,503**		$5,254	$4,713
Net charge-off/(recovery) rate				
Consumer & Business Banking	**0.61 %**	(g)	1.03 %	0.88 %
Home Lending	**(0.09)**		(0.05)	(0.12)
Card	**2.93**		3.10	3.10
Auto	**0.20**		0.33	0.38
Total net charge-off/(recovery) rate	**1.03 %**		1.13 %	0.98 %
30+ day delinquency rate				
Home Lending[(d)(e)]	**1.15 %**	(h)	1.58 %	1.63 %
Card	**1.68**	(h)	1.87	1.83
Auto	**0.69**	(h)	0.94	0.93
90+ day delinquency rate - Card	**0.92 %**	(h)	0.95 %	0.92 %
Allowance for loan losses				
Consumer & Business Banking	**$1,372**		$ 750	$ 796
Home Lending	**1,813**		1,890	2,791
Card	**17,800**		5,683	5,184
Auto	**1,042**		465	464
Total allowance for loan losses	**$22,027**		$8,788	$9,235

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption resulted in a change in the accounting for PCI loans, which are considered purchased credit deteriorated ("PCD") loans under CECL. Refer to Note 1 for further information.

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation.

(a) At December 31, 2020, nonaccrual loans included $1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.
(b) At December 31, 2020, 2019 and 2018, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $558 million, $963 million and $2.6 billion, respectively. These amounts have been excluded based upon the government guarantee. Prior-period amounts of mortgage loans 90 or more days past due and insured by U.S. government agencies excluded from nonaccrual loans have been revised to conform with the current presentation; refer to footnote (c) for additional information.
(c) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(d) At December 31, 2020, the 30+ day delinquency rates included PCD loans. The rates prior to January 1, 2020 were revised to include the impact of PCI loans.
(e) At December 31, 2020, 2019 and 2018, excluded mortgage loans insured by U.S. government agencies of $744 million, $1.7 billion and $4.1 billion, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee. Prior-period amounts of mortgage loans 30 or more days past due and insured by U.S. government agencies excluded from 30+ day delinquency rate have been revised to conform with the current presentation; refer to footnote (c) for additional information.

(f) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Refer to Consumer Credit Portfolio on pages 114-116 for further information on consumer payment assistance activity. Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent. Collateral-dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.

(g) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP. Given that PPP loans are guaranteed by the SBA, the Firm does not expect to realize material credit losses on these loans. Refer to Credit Portfolio on pages 112-113 for a further discussion of the PPP.

(h) At December 31, 2020, the principal balance of loans in Home Lending, Card and Auto under payment deferral programs offered in response to the COVID-19 pandemic were $9.1 billion, $264 million and $376 million, respectively. Loans that are performing according to their modified terms are generally not considered delinquent. Refer to Consumer Credit Portfolio on pages 114-116 for further information on consumer payment assistance activity.

Selected metrics

As of or for the year ended December 31, (in billions, except ratios and where otherwise noted)	2020	2019	2018
Business Metrics			
CCB households (in millions)	**63.4**	62.6	61.7
Number of branches	**4,908**	4,976	5,036
Active digital customers (in thousands)[(a)]	**55,274**	52,453	49,254
Active mobile customers (in thousands)[(b)]	**40,899**	37,315	33,260
Debit and credit card sales volume	**$1,081.2**	$1,114.4	$1,016.9
Consumer & Business Banking			
Average deposits	**$ 832.5**	$ 683.7	$ 661.7
Deposit margin	**1.58 %**	2.48 %	2.38 %
Business banking origination volume	**$ 26.6** [(f)]	$ 6.6	$ 6.7
Client investment assets	**590.2**	501.4	399.7
Number of client advisors	**4,417**	4,196	3,929
Home Lending			
Mortgage origination volume by channel			
Retail	**$ 72.9**	$ 51.0	$ 38.3
Correspondent	**40.9**	54.2	41.1
Total mortgage origination volume[(c)]	**$ 113.8**	$ 105.2	$ 79.4
Total loans serviced (period-end)	**$ 626.3**	$ 761.4	$ 789.8
Third-party mortgage loans serviced (period-end)	**447.3**	520.8	519.6
MSR carrying value (period-end)	**3.3**	4.7	6.1
Ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end)	**0.74 %**	0.90 %	1.17 %
MSR revenue multiple[(d)]	**2.55x**	2.65x	3.34x
Credit Card			
Credit card sales volume, excluding commercial card	**$ 702.7**	$ 762.8	$ 692.4
New accounts opened (in millions)	**5.4**	$ 7.8	7.8
Net revenue rate[(e)]	**10.92 %**	10.48 %	10.17 %
Auto			
Loan and lease origination volume	**$ 38.4**	$ 34.0	$ 31.8
Average auto operating lease assets	**22.0**	21.6	18.8

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including an increase to client investment assets of $143.3 billion and $117.3 billion as of December 31, 2019 and 2018, respectively.

(a) Users of all web and/or mobile platforms who have logged in within the past 90 days.
(b) Users of all mobile platforms who have logged in within the past 90 days.
(c) Firmwide mortgage origination volume was $133.4 billion, $115.9 billion and $86.9 billion for the years ended December 31, 2020, 2019 and 2018, respectively.
(d) Represents the ratio of MSR carrying value (period-end) to third-party mortgage loans serviced (period-end) divided by the ratio of loan servicing-related revenue to third-party mortgage loans serviced (average).
(e) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.
(f) Included $21.9 billion of origination volume under the PPP for the year ended December 31, 2020. Refer to Credit Portfolio on pages 112-113 for a further discussion of the PPP.

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Wholesale Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Selected income statement data

Year ended December 31, (in millions)	2020	2019	2018
Revenue			
Investment banking fees	$ 9,477	$ 7,575	$ 7,473
Principal transactions	17,560	14,399	12,262
Lending- and deposit-related fees[(a)]	2,070	1,668	1,633
Asset management, administration and commissions[(a)]	4,721	4,400	4,361
All other income	1,292	2,018	2,125
Noninterest revenue	35,120	30,060	27,854
Net interest income	14,164	9,205	9,528
Total net revenue[(b)]	49,284	39,265	37,382
Provision for credit losses	2,726	277	(60)
Noninterest expense			
Compensation expense	11,612	11,180	10,776
Noncompensation expense	11,926	11,264	11,100
Total noninterest expense	23,538	22,444	21,876
Income before income tax expense	23,020	16,544	15,566
Income tax expense	5,926	4,590	3,767
Net income	$ 17,094	$ 11,954	$ 11,799

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation.

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.

(b) Includes tax-equivalent adjustments, predominantly due to income tax credits related to alternative energy investments; income tax credits and amortization of the cost of investments in affordable housing projects; and tax-exempt income from municipal bonds of $2.8 billion, $2.3 billion and $1.7 billion for the years ended December 31, 2020, 2019 and 2018, respectively.

Selected income statement data

Year ended December 31, (in millions, except ratios)	2020	2019	2018
Financial ratios			
Return on equity	20 %	14 %	16 %
Overhead ratio	48	57	59
Compensation expense as percentage of total net revenue	24	28	29
Revenue by business			
Investment Banking	$ 8,871	$ 7,215	$ 6,987
Wholesale Payments	5,560	5,842	5,930
Lending	1,146	1,021	999
Total Banking	15,577	14,078	13,916
Fixed Income Markets	20,878	14,418	12,706
Equity Markets	8,605	6,494	6,888
Securities Services	4,253	4,154	4,245
Credit Adjustments & Other[(a)]	(29)	121	(373)
Total Markets & Securities Services	33,707	25,187	23,466
Total net revenue	$49,284	$39,265	$37,382

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation.

(a) Includes credit valuation adjustments ("CVA") managed centrally within CIB and funding valuation adjustments ("FVA") on derivatives and certain components of fair value option elected liabilities, which are primarily reported in principal transactions revenue. Results are presented net of associated hedging activities and net of CVA and FVA amounts allocated to Fixed Income Markets and Equity Markets. Refer to Notes 2, 3 and 24 for additional information.

2020 compared with 2019

Net income was $17.1 billion, up 43%.

Net revenue was $49.3 billion, up 26%.

Banking revenue was $15.6 billion, up 11%.

- Investment Banking revenue was $8.9 billion, up 23%, driven by higher Investment Banking fees, up 25%, reflecting higher equity and debt underwriting fees. The Firm maintained its #1 ranking for Global Investment Banking fees with overall share gains, according to Dealogic.
  - Equity underwriting fees were $2.8 billion, up 66%, predominantly in follow-on offerings and convertible securities markets due to increased industry-wide fees.
  - Debt underwriting fees were $4.4 billion, up 23%, driven by increased industry-wide fees and wallet share gains in investment grade and high yield bonds. The increased activity resulted in part from clients seeking liquidity in the first half of the year as a result of the COVID-19 pandemic.
  - Advisory fees of $2.4 billion were flat, reflecting an increase in wallet share, despite a decrease in industry-wide fees.
- Wholesale Payments revenue was $5.6 billion, down 5%, driven by deposit margin compression and a reporting reclassification for certain expenses which are now reported as a reduction of revenue in Merchant Services, largely offset by higher deposit balances.
- Lending revenue was $1.1 billion, up 12%, predominantly driven by higher net interest income reflecting higher yields on new loans and higher loan balances, as well as higher loan commitment fees, largely offset by fair value losses on hedges of accrual loans.

Markets & Securities Services revenue was $33.7 billion, up 34%. Markets revenue was $29.5 billion, up 41%.

- Fixed Income Markets revenue was $20.9 billion, up 45%, driven by strong client activity across products primarily in Rates, Credit, Currencies & Emerging Markets, and Securitized Products.
- Equity Markets revenue was $8.6 billion, up 33%, driven by strong client activity across products.
- Securities Services revenue was $4.3 billion, up 2%, driven by deposit balance and fee growth largely offset by deposit margin compression.

The provision for credit losses was $2.7 billion, compared with $277 million in the prior year. The increase was driven by net additions to the allowance for credit losses as a result of the impact of the COVID-19 pandemic across multiple industries.

Noninterest expense was $23.5 billion, up 5%, driven by higher volume- and revenue-related expense and legal expense.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	**2020**	2019	2018
Selected balance sheet data (period-end)			
Assets	**$ 1,097,219**	$ 914,705	$ 909,292
Loans:			
Loans retained[(a)]	**133,296**	121,733	129,389
Loans held-for-sale and loans at fair value[(b)(c)]	**39,588**	34,317	36,407
Total loans	**172,884**	156,050	165,796
Equity	**80,000**	80,000	70,000
Selected balance sheet data (average)			
Assets	**$ 1,122,939**	$ 993,508	$ 930,126
Trading assets-debt and equity instruments[(c)]	**422,237**	376,182	321,280
Trading assets-derivative receivables	**72,065**	48,196	60,552
Loans:			
Loans retained[(a)]	**135,676**	122,371	114,417
Loans held-for-sale and loans at fair value[(b)(c)]	**33,792**	32,884	30,317
Total loans	**169,468**	155,255	144,734
Equity	**80,000**	80,000	70,000
Headcount	**61,733**	60,013	58,572

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm’s Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB’s Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation, including an increase to period-end assets of $6.6 billion and $6.2 billion and headcount of 4,022 and 4,092, as of December 31, 2019 and 2018, respectively.

(a) Loans retained includes credit portfolio loans, loans held by consolidated Firm-administered multi-seller conduits, trade finance loans, mortgage-related secured lending, other held-for-investment loans and overdrafts

(b) Loans held-for-sale and loans at fair value primarily reflect lending-related positions originated and purchased in CIB Markets, including loans held for securitization.

(c) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	**2020**	2019	2018
Credit data and quality statistics			
Net charge-offs/ (recoveries)	**$ 370**	$ 183	$ 93
Nonperforming assets:			
Nonaccrual loans:			
Nonaccrual loans retained[(a)]	**1,008**	308	443
Nonaccrual loans held-for-sale and loans at fair value[(b)(c)]	**1,662**	644	921
Total nonaccrual loans	**2,670**	952	1,364
Derivative receivables	**56**	30	60
Assets acquired in loan satisfactions	**85**	70	57
Total nonperforming assets	**2,811**	1,052	1,481
Allowance for credit losses:			
Allowance for loan losses	**2,366**	1,202	1,199
Allowance for lending-related commitments	**1,534**	848	754
Total allowance for credit losses	**3,900**	2,050	1,953
Net charge-off/(recovery) rate[(d)]	**0.27 %**	0.15 %	0.08 %
Allowance for loan losses to period-end loans retained	**1.77**	0.99	0.93
Allowance for loan losses to period-end loans retained, excluding trade finance and conduits[(e)]	**2.54**	1.31	1.24
Allowance for loan losses to nonaccrual loans retained[(a)]	**235**	390	271
Nonaccrual loans to total period-end loans[(b)]	**1.54**	0.61	0.82

(a) Allowance for loan losses of $278 million, $110 million and $174 million were held against these nonaccrual loans at December 31, 2020, 2019 and 2018, respectively.

(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

(c) At December 31, 2020, 2019 and 2018, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $316 million, $127 million and $155 million, respectively. These amounts have been excluded based upon the government guarantee.

(d) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.

(e) Management uses allowance for loan losses to period-end loans retained, excluding trade finance and conduits, a non-GAAP financial measure, to provide a more meaningful assessment of CIB’s allowance coverage ratio.

Investment banking fees

(in millions)	Year ended December 31, 2020	2019	2018
Advisory	$ 2,368	$ 2,377	$ 2,509
Equity underwriting	2,758	1,666	1,684
Debt underwriting[(a)]	4,351	3,532	3,280
Total investment banking fees	$ 9,477	$ 7,575	$ 7,473

(a) Represents long-term debt and loan syndications.

League table results – wallet share

Year ended December 31,	2020 Rank	2020 Share	2019 Rank	2019 Share	2018 Rank	2018 Share
Based on fees[(a)]						
M&A[(b)]						
Global	# 2	9.3 %	# 2	8.9 %	# 2	8.6 %
U.S.	2	9.7	2	9.2	2	8.8
Equity and equity-related[(c)]						
Global	2	8.6	1	9.3	1	9.0
U.S.	2	11.1	2	13.2	1	12.3
Long-term debt[(d)]						
Global	1	8.9	1	7.8	1	7.2
U.S.	1	12.8	1	12.0	1	11.4
Loan syndications						
Global	1	11.1	1	10.1	1	10.1
U.S.	1	11.5	1	12.5	1	12.3
Global investment banking fees[(e)]	# 1	9.2 %	# 1	8.9 %	# 1	8.6 %

(a) Source: Dealogic as of January 4, 2021. Reflects the ranking of revenue wallet and market share.
(b) Global M&A excludes any withdrawn transactions. U.S. M&A revenue wallet represents wallet from client parents based in the U.S.
(c) Global equity and equity-related ranking includes rights offerings and Chinese A-Shares.
(d) Long-term debt rankings include investment-grade, high-yield, supranationals, sovereigns, agencies, covered bonds, asset-backed securities ("ABS") and mortgage-backed securities ("MBS"); and exclude money market, short-term debt, and U.S. municipal securities.
(e) Global investment banking fees exclude money market, short-term debt and shelf securities.

Markets revenue

The following table summarizes select income statement data for the Markets businesses. Markets consists of Fixed Income Markets and Equity Markets. Markets revenue comprises principal transactions, fees, commissions and other income, as well as net interest income. The Firm assesses its Markets business performance on a total revenue basis, as offsets may occur across revenue line items. For example, securities that generate net interest income may be risk-managed by derivatives that are recorded in principal transactions revenue. Refer to Notes 6 and 7 for a description of the composition of these income statement line items.

Principal transactions reflects revenue on financial instruments and commodities transactions that arise from client-driven market-making activity. Principal transactions revenue includes amounts recognized upon executing new transactions with market participants, as well as "inventory-related revenue", which is revenue recognized from gains and losses on derivatives and other instruments that the Firm has been holding in anticipation of, or in response to, client demand, and changes in the fair value of instruments used by the Firm to actively manage the risk exposure arising from such inventory. Principal transactions revenue recognized upon executing new transactions with market participants is driven by many factors including the level of client activity, the bid-offer spread (which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa), market liquidity and volatility. These factors are interrelated and sensitive to the same factors that drive inventory-related revenue, which include general market conditions, such as interest rates, foreign exchange rates, credit spreads, and equity and commodity prices, as well as other macroeconomic conditions.

For the periods presented below, the predominant source of principal transactions revenue was the amount recognized upon executing new transactions.

Year ended December 31, (in millions, except where otherwise noted)	**2020**			2019			2018		
	Fixed Income Markets	Equity Markets	Total Markets	Fixed Income Markets	Equity Markets	Total Markets	Fixed Income Markets	Equity Markets	Total Markets
Principal transactions	**$ 11,857**	**$ 6,087**	**$ 17,944**	$ 8,786	$ 5,739	$ 14,525	$ 7,560	$ 5,566	$ 13,126
Lending- and deposit-related fees	**226**	**10**	**236**	198	7	205	197	6	203
Asset management, administration and commissions	**411**	**2,087**	**2,498**	407	1,775	2,182	410	1,794	2,204
All other income	**493**	**(62)**	**431**	872	8	880	952	22	974
Noninterest revenue	**12,987**	**8,122**	**21,109**	10,263	7,529	17,792	9,119	7,388	16,507
Net interest income	**7,891**	**483**	**8,374**	4,155	(1,035)	3,120	3,587	(500)	3,087
Total net revenue	**$ 20,878**	**$ 8,605**	**$ 29,483**	$ 14,418	$ 6,494	$ 20,912	$ 12,706	$ 6,888	$ 19,594
Loss days[(a)]			4			1			5

(a) Loss days represent the number of days for which CIB Markets, which consists of Fixed Income Markets and Equity Markets, posted losses to total net revenue. The loss days determined under this measure differ from the measure used to determine backtesting gains and losses. Daily backtesting gains and losses include positions in the Firm's Risk Management value-at-risk ("VaR") measure and exclude select components of total net revenue, which may more than offset backtesting gains or losses on a particular day. For more information on daily backtesting gains and losses, refer to the VaR discussion on pages 137–139.

Selected metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)	**2020**	2019	2018
Assets under custody ("AUC") by asset class (period-end) (in billions):			
Fixed Income	**$ 15,840**	$ 13,498	$ 12,440
Equity	**11,489**	10,100	8,078
Other[(a)]	**3,651**	3,233	2,699
Total AUC	**$ 30,980**	$ 26,831	$ 23,217
Merchant processing volume (in billions)[(b)]	**$ 1,597.3**	$ 1,511.5	$ 1,366.1
Client deposits and other third party liabilities (average)[(c)]	**$ 610,555**	$ 464,795	$ 434,422

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. Prior-period amounts have been revised to conform with the current presentation.

(a) Consists of mutual funds, unit investment trusts, currencies, annuities, insurance contracts, options and other contracts.
(b) Represents total merchant processing volume across CIB, CCB and CB.
(c) Client deposits and other third-party liabilities pertain to the Wholesale Payments and Securities Services businesses.

International metrics

As of or for the year ended December 31, (in millions, except where otherwise noted)		2020		2019[c]		2018[c]
Total net revenue[a]						
Europe/Middle East/Africa	**$**	**13,872**	$	11,905	$	12,422
Asia-Pacific		**7,524**		5,319		5,077
Latin America/Caribbean		**1,931**		1,543		1,473
Total international net revenue		**23,327**		18,767		18,972
North America		**25,957**		20,498		18,410
Total net revenue	**$**	**49,284**	$	39,265	$	37,382
Loans retained (period-end)[a]						
Europe/Middle East/Africa	**$**	**27,659**	$	26,067	$	23,648
Asia-Pacific		**12,802**		14,759		17,101
Latin America/Caribbean		**5,425**		6,173		6,515
Total international loans		**45,886**		46,999		47,264
North America		**87,410**		74,734		82,125
Total loans retained	**$**	**133,296**	$	121,733	$	129,389
Client deposits and other third-party liabilities (average)[b]						
Europe/Middle East/Africa	**$**	**211,592**	$	174,477	$	162,846
Asia-Pacific		**124,145**		90,364		82,867
Latin America/Caribbean		**37,664**		29,024		26,668
Total international	**$**	**373,401**	$	293,865	$	272,381
North America		**237,154**		170,930		162,041
Total client deposits and other third-party liabilities	**$**	**610,555**	$	464,795	$	434,422
AUC (period-end)[b] **(in billions)**						
North America	**$**	**20,028**	$	16,855	$	14,359
All other regions		**10,952**		9,976		8,858
Total AUC	**$**	**30,980**	$	26,831	$	23,217

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period amounts have been revised to conform with the current presentation.

(a) Total net revenue and loans retained (excluding loans held-for-sale and loans at fair value) are based on the location of the trading desk, booking location, or domicile of the client, as applicable.

(b) Client deposits and other third-party liabilities pertaining to the Wholesale Payments and Securities Services businesses, and AUC, are based on the domicile of the client.

(c) Prior-period amounts have been revised to conform with the current presentation.

Commercial Banking provides comprehensive financial solutions, including lending, wholesale payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and midsized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Selected income statement data

Year ended December 31, (in millions)	2020	2019	2018
Revenue			
Lending- and deposit-related fees[(a)]	**$ 1,187**	$ 941	$ 896
All other income[(a)]	**1,880**	1,769	1,724
Noninterest revenue	**3,067**	2,710	2,620
Net interest income	**6,246**	6,554	6,716
Total net revenue[(b)]	**9,313**	9,264	9,336
Provision for credit losses	**2,113**	296	129
Noninterest expense			
Compensation expense	**1,854**	1,785	1,694
Noncompensation expense	**1,944**	1,950	1,933
Total noninterest expense	**3,798**	3,735	3,627
Income before income tax expense	**3,402**	5,233	5,580
Income tax expense	**824**	1,275	1,316
Net income	**$ 2,578**	$ 3,958	$ 4,264

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In conjunction with this realignment, treasury services product revenue has been renamed wholesale payments. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period revenue and expense amounts have been revised to conform with the current presentation.

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions (which are included in all other income) to lending and deposit-related fees. Prior period amounts have been revised to conform with the current period presentation.

(b) Total net revenue included tax-equivalent adjustments from income tax credits related to equity investments in designated community development entities and in entities established for rehabilitation of historic properties, as well as tax-exempt income related to municipal financing activities of $351 million, $460 million and $444 million for the years ended December 31, 2020, 2019 and 2018, respectively.

2020 compared with 2019

Net income was $2.6 billion, a decrease of 35%, driven by an increase in the provision for credit losses.

Net revenue was $9.3 billion, flat compared to the prior year. Net interest income was $6.2 billion, a decrease of 5%, driven by deposit margin compression, predominantly offset by higher deposit balances and lending revenue. Noninterest revenue was $3.1 billion, an increase of 13%, driven by higher deposit-related fees, particularly cash management fees, higher investment banking revenue, and a gain on a strategic investment. The increase was partially offset by a $56 million markdown of a held-for-sale position and lower card income, primarily due to lower volumes as a result of the COVID-19 pandemic.

Noninterest expense was $3.8 billion, an increase of 2%, driven by higher compensation expense.

The provision for credit losses was $2.1 billion, compared to $296 million in the prior year. The increase was driven by net additions to the allowance for credit losses as a result of the impact of the COVID-19 pandemic across multiple industries.

CB product revenue consists of the following:

Lending includes a variety of financing alternatives, which are primarily provided on a secured basis; collateral includes receivables, inventory, equipment, real estate or other assets. Products include term loans, revolving lines of credit, bridge financing, asset-based structures, leases, and standby letters of credit.

Wholesale payments includes revenue from a broad range of products and services that enable CB clients to manage payments and receipts, as well as invest and manage funds.

Investment banking includes revenue from a range of products providing CB clients with sophisticated capital-raising alternatives, as well as balance sheet and risk management tools through advisory, equity underwriting, and loan syndications. Revenue from Fixed Income and Equity Markets products used by CB clients is also included.

Other product revenue primarily includes tax-equivalent adjustments generated from Community Development Banking activities and certain income derived from principal transactions.

Selected income statement data (continued)

Year ended December 31, (in millions, except ratios)	2020	2019	2018
Revenue by product			
Lending	**$4,396**	$4,057	$4,049
Wholesale payments	**3,715**	4,200	4,351
Investment banking[(a)]	**1,069**	919	852
Other	**133**	88	84
Total Commercial Banking net revenue	**$9,313**	$9,264	$9,336
Investment banking revenue, gross[(b)]	**$3,348**	$2,744	$2,491
Revenue by client segment			
Middle Market Banking	**$3,640**	$3,805	$3,797
Corporate Client Banking	**3,203**	3,119	3,119
Commercial Real Estate Banking	**2,313**	2,169	2,251
Other	**157**	171	169
Total Commercial Banking net revenue	**$9,313**	$9,264	$9,336
Financial ratios			
Return on equity	**11 %**	17 %	20 %
Overhead ratio	**41**	40	39

In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. In conjunction with this realignment, treasury services product revenue has been renamed wholesale payments. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Prior-period revenue and expense amounts have been revised to conform with the current presentation.

(a) Includes CB's share of revenue from investment banking products sold to CB clients through the CIB.

(b) Refer to Business Segment Results page 65 for a discussion of revenue sharing.

Selected metrics

As of or for the year ended December 31, (in millions, except headcount)	2020		2019	2018
Selected balance sheet data (period-end)				
Total assets	**$ 228,932**		$ 220,514	$ 220,229
Loans:				
Loans retained	**207,880**		207,287	204,219
Loans held-for-sale and loans at fair value	**2,245**		1,009	1,978
Total loans	**$ 210,125**		$ 208,296	$ 206,197
Equity	**22,000**		22,000	20,000
Period-end loans by client segment				
Middle Market Banking	**$ 61,115**	(a)	$ 54,188	$ 56,656
Corporate Client Banking	**47,420**		51,165	48,343
Commercial Real Estate Banking	**101,146**		101,951	100,088
Other	**444**		992	1,110
Total Commercial Banking loans	**$ 210,125**	(a)	$ 208,296	$ 206,197
Selected balance sheet data (average)				
Total assets	**$ 233,158**		$ 218,896	$ 218,259
Loans:				
Loans retained	**217,767**		206,837	204,243
Loans held-for-sale and loans at fair value	**1,129**		1,082	1,258
Total loans	**$ 218,896**		$ 207,919	$ 205,501
Client deposits and other third-party liabilities	**237,825**		172,734	170,901
Equity	**22,000**		22,000	20,000
Average loans by client segment				
Middle Market Banking	**$ 61,558**		$ 55,690	$ 57,092
Corporate Client Banking	**54,172**		50,360	47,780
Commercial Real Estate Banking	**102,479**		100,884	99,243
Other	**687**		985	1,386
Total Commercial Banking loans	**$ 218,896**		$ 207,919	$ 205,501
Headcount	**11,675**		11,629	11,042

(a) At December 31, 2020, total loans included $6.6 billion of loans under the PPP, of which $6.4 billion were in Middle Market Banking. Refer to Credit Portfolio on pages 112-113 for a further discussion of the PPP.

Selected metrics

As of or for the year ended December 31, (in millions, except ratios)	**2020**	2019	2018
Credit data and quality statistics			
Net charge-offs/(recoveries)	**$ 401**	$ 160	$ 53
Nonperforming assets			
Nonaccrual loans:			
Nonaccrual loans retained[(a)]	**1,286**	498	511
Nonaccrual loans held-for-sale and loans at fair value	**120**	—	—
Total nonaccrual loans	**1,406**	498	511
Assets acquired in loan satisfactions	**24**	25	2
Total nonperforming assets	**1,430**	523	513
Allowance for credit losses:			
Allowance for loan losses	**3,335**	2,780	2,682
Allowance for lending-related commitments	**651**	293	254
Total allowance for credit losses	**3,986**	3,073	2,936
Net charge-off/(recovery) rate[(b)]	**0.18 %**	0.08 %	0.03 %
Allowance for loan losses to period-end loans retained	**1.60**	1.34	1.31
Allowance for loan losses to nonaccrual loans retained[(a)]	**259**	558	525
Nonaccrual loans to period-end total loans	**0.67**	0.24	0.25

(a) Allowance for loan losses of $273 million, $114 million and $92 million was held against nonaccrual loans retained at December 31, 2020, 2019 and 2018, respectively.
(b) Loans held-for-sale and loans at fair value were excluded when calculating the net charge-off/(recovery) rate.

ASSET & WEALTH MANAGEMENT

Asset & Wealth Management, with client assets of $3.7 trillion, is a global leader in investment and wealth management.

Asset Management
Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Wealth Management
Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Selected income statement data

Year ended December 31, (in millions, except ratios and headcount)	2020	2019	2018
Revenue			
Asset management, administration and commissions	**$10,610**	$ 9,818	$ 9,808
All other income	**212**	418	244
Noninterest revenue	**10,822**	10,236	10,052
Net interest income	**3,418**	3,355	3,375
Total net revenue	**14,240**	13,591	13,427
Provision for credit losses	**263**	59	52
Noninterest expense			
Compensation expense	**4,959**	5,028	4,888
Noncompensation expense	**4,998**	4,719	4,687
Total noninterest expense	**9,957**	9,747	9,575
Income before income tax expense	**4,020**	3,785	3,800
Income tax expense	**1,028**	918	855
Net income	**$ 2,992**	$ 2,867	$ 2,945
Revenue by line of business			
Asset Management	**$ 7,654**	$ 7,254	$ 7,163
Wealth Management	**6,586**	6,337	6,264
Total net revenue	**$14,240**	$13,591	$13,427
Financial ratios			
Return on common equity	**28 %**	26 %	32 %
Overhead ratio	**70**	72	71
Pre-tax margin ratio:			
Asset Management	**29**	26	26
Wealth Management	**27**	30	30
Asset & Wealth Management	**28**	28	28

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including a decrease to net revenue of $725 million and $649 million for the years ended December 31, 2019 and 2018, respectively. Effective in the first quarter of 2021, the Wealth Management business was renamed Global Private Bank.

2020 compared with 2019

Net income was $3.0 billion, an increase of 4%.

Net revenue was $14.2 billion, an increase of 5%. Net interest income was $3.4 billion, up 2%, driven by higher deposit and loan balances as well as loan margin expansion, offset by deposit margin compression. Noninterest revenue was $10.8 billion, up 6%, predominantly driven by higher asset management fees as a result of net inflows into liquidity and long term products, higher performance fees and increased brokerage commissions on higher client-driven volume, partially offset by lower net investment valuation gains.

Revenue from Asset Management was $7.7 billion, up 6%, predominantly driven by higher asset management fees as a result of net inflows into liquidity products as well as higher performance fees, partially offset by lower net investment valuation gains.

Revenue from Wealth Management was $6.6 billion, up 4%, predominantly driven by higher deposit and loan balances, increased brokerage commissions and asset management fees, largely offset by deposit margin compression.

The provision for credit losses was $263 million, driven by additions to the allowance for credit losses, predominantly as a result of the impact of the COVID-19 pandemic.

Noninterest expense was $10.0 billion, an increase of 2%, driven by legal expense, volume- and revenue-related expense as well as investments in the business, partially offset by lower structural expense.

AWM's client segments consist of the following:

Private Banking clients include high- and ultra-high-net-worth individuals, families, money managers and business owners.

Institutional clients include both corporate and public institutions, endowments, foundations, nonprofit organizations and governments worldwide.

Retail clients include financial intermediaries and individual investors.

Asset Management has two high-level measures of its overall fund performance.

- **Percentage of mutual fund assets under management in funds rated 4- or 5-star:** Mutual fund rating services rank funds based on their risk-adjusted performance over various periods. A 5-star rating is the best rating and represents the top 10% of industry-wide ranked funds. A 4-star rating represents the next 22.5% of industry-wide ranked funds. A 3-star rating represents the next 35% of industry-wide ranked funds. A 2-star rating represents the next 22.5% of industry-wide ranked funds. A 1-star rating is the worst rating and represents the bottom 10% of industry-wide ranked funds. The "overall Morningstar rating" is derived from a weighted average of the performance associated with a fund's three-, five- and ten-year (if applicable) Morningstar Rating metrics. For U.S. domiciled funds, separate star ratings are given at the individual share class level. The Nomura "star rating" is based on three-year risk-adjusted performance only. Funds with fewer than three years of history are not rated and hence excluded from this analysis. All ratings, the assigned peer categories and the asset values used to derive this analysis are sourced from these fund rating providers mentioned in footnote (a). The data providers re-denominate the asset values into U.S. dollars. This % of AUM is based on star ratings at the share class level for U.S. domiciled funds, and at a "primary share class" level to represent the star rating of all other funds except for Japan where Nomura provides ratings at the fund level. The "primary share class", as defined by Morningstar, denotes the share class recommended as being the best proxy for the portfolio and in most cases will be the most retail version (based upon annual management charge, minimum investment, currency and other factors). The performance data could have been different if all funds/accounts would have been included. Past performance is not indicative of future results.
- **Percentage of mutual fund assets under management in funds ranked in the 1st or 2nd quartile (one, three and five years):** All quartile rankings, the assigned peer categories and the asset values used to derive this analysis are sourced from the fund ranking providers mentioned in footnote (b). Quartile rankings are done on the net-of-fee absolute return of each fund. The data providers re-denominate the asset values into U.S. dollars. This % of AUM is based on fund performance and associated peer rankings at the share class level for U.S. domiciled funds and at the "primary share class" level or fund level for all other funds. The "primary share class", as defined by Morningstar, denotes the share class recommended as being the best proxy for the portfolio and in most cases will be the most retail version (based upon annual management charge, minimum investment, currency and other factors). Where peer group rankings given for a fund are in more than one "primary share class" territory both rankings are included to reflect local market competitiveness. The performance data could have been different if all funds/accounts would have been included. Past performance is not indicative of future results.

Selected metrics

As of or for the year ended December 31, (in millions, except ranking data and ratios)	2020	2019	2018
% of JPM mutual fund assets rated as 4- or 5-star[a]	**55 %**	61 %	58 %
% of JPM mutual fund assets ranked in 1st or 2nd quartile:[b]			
1 year	**55**	59	68
3 years	**69**	77	73
5 years	**68**	75	85
Selected balance sheet data (period-end)[c]			
Total assets	**$203,384**	$173,175	$ 161,047
Loans	**186,608**	158,149	145,794
Deposits	**198,755**	142,740	133,276
Equity	**10,500**	10,500	9,000
Selected balance sheet data (average)[c]			
Total assets	**$181,432**	$161,863	$ 151,632
Loans	**166,311**	147,404	136,929
Deposits	**161,955**	135,265	132,123
Equity	**10,500**	10,500	9,000
Headcount	**20,683**	21,550	21,520
Number of Wealth Management client advisors	**2,462**	2,419	2,385
Credit data and quality statistics[c]			
Net charge-offs/(recoveries)	**$ (14)**	$ 29	$ –
Nonaccrual loans	**785**	115	263
Allowance for credit losses:			
Allowance for loan losses	**598**	350	326
Allowance for lending-related commitments	**38**	19	16
Total allowance for credit losses	**636**	369	342
Net charge-off/(recovery) rate	**(0.01)%**	0.02 %	– %
Allowance for loan losses to period-end loans	**0.32**	0.22	0.22
Allowance for loan losses to nonaccrual loans	**76**	304	124
Nonaccrual loans to period-end loans	**0.42**	0.07	0.18

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including a decrease to headcount of 2,641 and 2,400 as of December 31, 2019 and 2018, respectively.

(a) Represents the Nomura "star rating" for Japan domiciled funds and Morningstar for all other domiciled funds. Includes only Asset Management retail open-ended mutual funds that have a rating. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds.

(b) Quartile ranking sourced from Lipper, Morningstar and Nomura based on country of domicile. Includes only Asset Management retail open-ended mutual funds that are ranked by the aforementioned sources. Excludes money market funds, Undiscovered Managers Fund, and Brazil domiciled funds.

(c) Loans, deposits and related credit data and quality statistics relate to the Wealth Management business.

Client assets

2020 compared with 2019

Client assets were $3.7 trillion, an increase of 18%. Assets under management were $2.7 trillion, an increase of 17% driven by the impact of higher market levels and net inflows into both long-term and liquidity products.

Client assets

December 31, (in billions)	2020	2019	2018
Assets by asset class			
Liquidity	**$ 641**	$ 539	$ 477
Fixed income	**671**	591	455
Equity	**595**	463	376
Multi-asset	**656**	596	515
Alternatives	**153**	139	135
Total assets under management	**2,716**	2,328	1,958
Custody/brokerage/ administration/deposits	**936**	761	661
Total client assets	**$ 3,652**	$ 3,089	$ 2,619
Assets by client segment			
Private Banking	**$ 689**	$ 628	$ 518
Institutional	**1,273**	1,081	930
Retail	**754**	619	510
Total assets under management	**$ 2,716**	$ 2,328	$ 1,958
Private Banking	**$ 1,581**	$ 1,359	$ 1,155
Institutional	**1,311**	1,106	950
Retail	**760**	624	514
Total client assets	**$ 3,652**	$ 3,089	$ 2,619

Client assets (continued)

Year ended December 31, (in billions)	2020	2019	2018
Assets under management rollforward			
Beginning balance	**$ 2,328**	$ 1,958	$ 2,010
Net asset flows:			
Liquidity	**104**	61	30
Fixed income	**48**	104	(4)
Equity	**33**	(11)	–
Multi-asset	**5**	2	17
Alternatives	**6**	2	5
Market/performance/other impacts	**192**	212	(100)
Ending balance, December 31	**$ 2,716**	$ 2,328	$ 1,958
Client assets rollforward			
Beginning balance	**$ 3,089**	$ 2,619	$ 2,685
Net asset flows	**276**	176	74
Market/performance/other impacts	**287**	294	(140)
Ending balance, December 31	**$ 3,652**	$ 3,089	$ 2,619

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including a decrease to client assets of $137 billion and $114 billion as of December 31, 2019 and 2018, respectively.

International metrics

Year ended December 31, (in billions, except where otherwise noted)	2020	2019	2018
Total net revenue (in millions)[a]			
Europe/Middle East/Africa[b]	**$ 2,956**	$ 2,869	$ 2,850
Asia-Pacific[b]	**1,665**	1,509	1,538
Latin America/Caribbean[b]	**782**	724	755
Total international net revenue	**5,403**	5,102	5,143
North America	**8,837**	8,489	8,284
Total net revenue	**$ 14,240**	$ 13,591	$ 13,427
Assets under management			
Europe/Middle East/Africa[b]	**$ 517**	$ 428	$ 366
Asia-Pacific[b]	**224**	192	163
Latin America/Caribbean[b]	**70**	62	51
Total international assets under management	**811**	682	580
North America	**1,905**	1,646	1,378
Total assets under management	**$ 2,716**	$ 2,328	$ 1,958
Client assets			
Europe/Middle East/Africa[b]	**$ 622**	$ 520	$ 440
Asia-Pacific[b]	**330**	272	226
Latin America/Caribbean[b]	**166**	147	125
Total international client assets	**1,118**	939	791
North America	**2,534**	2,150	1,828
Total client assets	**$ 3,652**	$ 3,089	$ 2,619

In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to CCB. Prior-period amounts have been revised to conform with the current presentation, including a decrease to net revenue of $725 million and $649 million for the years ended December 31, 2019 and 2018, respectively, and client assets of $137 billion and $114 billion as of December 31, 2019 and 2018, respectively.

(a) Regional revenue is based on the domicile of the client.
(b) The prior period amounts have been revised to conform with the current period presentation.

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

Selected income statement and balance sheet data

Year ended December 31, (in millions, except headcount)	2020	2019	2018
Revenue			
Principal transactions	**$ 245**	$ (461)	$ (426)
Investment securities gains/(losses)	**795**	258	(395)
All other income	**159**	89	558
Noninterest revenue	**1,199**	(114)	(263)
Net interest income	**(2,375)**	1,325	135
Total net revenue[(a)]	**(1,176)**	1,211	(128)
Provision for credit losses	**66**	(1)	(4)
Noninterest expense	**1,373**	1,067	902
Income/(loss) before income tax expense/(benefit)	**(2,615)**	145	(1,026)
Income tax expense/(benefit)	**(865)**	(966)	215
Net income/(loss)	**$ (1,750)**	$ 1,111	$ (1,241)
Total net revenue			
Treasury and CIO	**(1,368)**	2,032	510
Other Corporate	**192**	(821)	(638)
Total net revenue	**$ (1,176)**	$ 1,211	$ (128)
Net income/(loss)			
Treasury and CIO	**(1,403)**	1,394	(69)
Other Corporate	**(347)**	(283)	(1,172)
Total net income/(loss)	**$ (1,750)**	$ 1,111	$ (1,241)
Total assets (period-end)	**$1,359,831**	$ 837,618	$ 771,787
Loans (period-end)	**1,657**	1,649	1,597
Headcount	**38,366**	38,033	37,145

(a) Included tax-equivalent adjustments, driven by tax-exempt income from municipal bonds, of $241 million, $314 million and $382 million for the years ended December 31, 2020, 2019 and 2018, respectively.

2020 compared with 2019

Net income was a loss of $1.8 billion compared with income of $1.1 billion in the prior year.

Net revenue was a loss of $1.2 billion, compared with revenue of $1.2 billion in the prior year, driven by lower net interest income partially offset by higher noninterest revenue. The decrease in net interest income was predominantly driven by lower rates, including the impact of faster prepayments on mortgage-backed securities, as well as limited opportunities to deploy funds in response to significant deposit growth across the LOBs.

Noninterest revenue increased reflecting higher net valuations on certain legacy equity investments and higher net investment securities gains due to the repositioning of the investment securities portfolio.

Noninterest expense of $1.4 billion was up $305 million driven by an impairment on a legacy investment.

The provision for credit losses relates to the HTM portfolio, which became subject to the CECL accounting guidance beginning on January 1, 2020.

Refer to Note 10 and Note 13 for additional information on the investment securities portfolio and the allowance for credit losses.

The current period income tax benefit was predominantly driven by a lower level of pre-tax income and changes in the level and mix of income and expenses subject to U.S. federal, and state and local taxes. The prior period included $1.1 billion of tax benefits related to the resolution of certain tax audits.

Treasury and CIO overview

Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The risks managed by Treasury and CIO arise from the activities undertaken by the Firm's four major reportable business segments to serve their respective client bases, which generate both on- and off-balance sheet assets and liabilities.

Treasury and CIO seek to achieve the Firm's asset-liability management objectives generally by investing in high-quality securities that are managed for the longer-term as part of the Firm's investment securities portfolio. Treasury and CIO also use derivatives to meet the Firm's asset-liability management objectives. Refer to Note 5 for further information on derivatives. In addition, Treasury and CIO manage the Firm's cash position primarily through deposits at central banks and investments in short-term instruments. Refer to Liquidity Risk Management on pages 102–108 for further information on liquidity and funding risk. Refer to Market Risk Management on pages 135–142 for information on interest rate, foreign exchange and other risks.

The investment securities portfolio primarily consists of U.S. GSE and government agency and nonagency mortgage-backed securities, U.S. and non-U.S. government securities, obligations of U.S. states and municipalities, other ABS and corporate debt securities. At December 31, 2020, the investment securities portfolio was $587.9 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and, where not available, based primarily upon internal risk ratings). Refer to Note 10 for further information on the Firm's investment securities portfolio and internal risk ratings.

Selected income statement and balance sheet data

As of or for the year ended December 31, (in millions)	**2020**	2019	2018
Investment securities gains/ (losses)	**$ 795**	$ 258	$ (395)
Available-for-sale securities (average)	**$ 413,367**	$ 283,205	$ 203,449
Held-to-maturity securities (average)	**94,569**	34,939	31,747
Investment securities portfolio (average)	**$ 507,936**	$ 318,144	$ 235,196
Available-for-sale securities (period-end)	**$ 386,065**	$ 348,876	$ 228,681
Held-to-maturity securities, net of allowance for credit losses (period-end)[a][b]	**201,821**	47,540	31,434
Investment securities portfolio, net of allowance for credit losses (period-end)[a]	**$ 587,886**	$ 396,416	$ 260,115

(a) At December 31, 2020, the allowance for credit losses on HTM securities was $78 million.

(b) During 2020, the Firm transferred $164.2 billion of investment securities from AFS to HTM for capital management purposes.

Refer to Note 10 for further information.

Risk is an inherent part of JPMorgan Chase's business activities. When the Firm extends a consumer or wholesale-loan, advises customers and clients on their investment decisions, makes markets in securities, or offers other products or services, the Firm takes on some degree of risk. The Firm's overall objective is to manage its businesses, and the associated risks, in a manner that balances serving the interests of its clients, customers and investors and protects the safety and soundness of the Firm.

The Firm believes that effective risk management requires, among other things:

- Acceptance of responsibility, including identification and escalation of risks by all individuals within the Firm;
- Ownership of risk identification, assessment, data and management within each of the LOBs and Corporate; and
- Firmwide structures for risk governance.

The Firm follows a disciplined and balanced compensation framework with strong internal governance and independent oversight by the Board of Directors (the "Board"). The impact of risk and control issues is carefully considered in the Firm's performance evaluation and incentive compensation processes.

Risk governance and oversight framework

The Firm's risk management governance and oversight framework involves understanding drivers of risks, types of risks, and impacts of risks.

The Firm's risk governance and oversight functions align to:

Drivers of Risks
Factors that cause a risk to exist

Types of Risks
Categories by which risks manifest themselves

Impacts of Risks
Consequences of risks, both quantitative and qualitative

Drivers of Risks are factors that cause a risk to exist. Drivers of risks include the economic environment, regulatory and government policy, competitor and market evolution, business decisions, process and judgment error, deliberate wrongdoing, dysfunctional markets, and natural disasters.

Types of Risks are categories by which risks manifest themselves. Risks are generally categorized in the following four risk types:

- Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.
- Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.
- Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.
- Operational risk is the risk associated with an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems. It includes compliance, conduct, legal, and estimations and model risk.

Impacts of Risks are consequences of risks, both quantitative and qualitative. There may be many consequences of risks manifesting, including quantitative impacts such as a reduction in earnings and capital, liquidity outflows, and fines or penalties, or qualitative impacts such as reputation damage, loss of clients and customers, and regulatory and enforcement actions.

The Firm's risk governance and oversight framework is managed on a Firmwide basis. The Firm has an Independent Risk Management ("IRM") function, which consists of the Risk Management and Compliance organizations. The Chief Executive Officer ("CEO") appoints, subject to approval by the Risk Committee of the Board ("Board Risk Committee"), the Firm's Chief Risk Officer ("CRO") to lead the IRM organization and manage the risk governance structure of the Firm. The framework is subject to approval by the Board Risk Committee in the form of the Risk Governance and Oversight Policy. The Firm's CRO oversees and delegates authorities to LOB CROs, Firmwide Risk Executives ("FREs"), and the Firm's Chief Compliance Officer ("CCO"), who each establish Risk Management and Compliance organizations, set the Firm's risk governance policies and standards, and define and oversee the implementation of the Firm's risk governance. The LOB CROs are responsible for risks that arise in their LOBs, while FREs oversee risk areas that span across the individual LOBs, functions and regions.

Three lines of defense

The Firm relies upon each of its LOBs and Corporate areas giving rise to risk to operate within the parameters identified by the IRM function, and within its own management-identified risk and control standards. Each LOB and Treasury & CIO, including their aligned Operations, Technology and Control Management, are the Firm's "first line of defense" and own the identification of risks, as well as the design and execution of controls to manage those risks. The first line of defense is responsible for adherence to applicable laws, rules and regulations and for the implementation of the risk management structure (which may include policy, standards, limits, thresholds and controls) established by IRM.

The IRM function is independent of the businesses and is the Firm's "second line of defense." The IRM function independently assesses and challenges the first line of defense risk management practices. IRM is also responsible for its own adherence to applicable laws, rules and regulations and for the implementation of policies and standards established by IRM with respect to its own processes.

Internal Audit is an independent function that provides objective assessment on the adequacy and effectiveness of Firmwide processes, controls, governance and risk management as the "third line of defense." The Internal Audit Function is headed by the General Auditor, who reports to the Audit Committee and administratively to the CEO.

In addition, there are other functions that contribute to the Firmwide control environment but are not considered part of a particular line of defense, including Finance, Human Resources and Legal.

Risk identification and ownership

Each LOB and Corporate area owns the ongoing identification of risks, as well as the design and execution of controls, inclusive of IRM-specified controls, to manage those risks. To support this activity, the Firm has a formal Risk Identification framework designed to facilitate their responsibility to identify material risks inherent to the Firm, catalog them in a central repository and review the most material risks on a regular basis. The IRM function reviews and challenges the LOB and Corporate's identified risks, maintains the central repository and provides the consolidated Firmwide results to the Firmwide Risk Committee ("FRC") and Board Risk Committee.

Risk appetite

The Firm's overall appetite for risk is governed by a "Risk Appetite" framework. The framework and the Firm's risk appetite are set and approved by the Firm's CEO, Chief Financial Officer ("CFO") and CRO. Quantitative parameters and qualitative factors are used to monitor and measure the Firm's capacity to take risk consistent with its stated risk appetite. Qualitative factors have been established to assess select operational risks, and impact to the Firm's reputation. Risk Appetite results are reported to the Board Risk Committee.

Risk governance and oversight structure

The independent status of the IRM function is supported by a governance structure that provides for escalation of risk issues to senior management, the FRC, and the Board of Directors, as appropriate.

The chart below illustrates the committees of the Board of Directors and key senior management-level committees in the Firm's risk governance structure. In addition, there are other committees, forums and paths of escalation that support the oversight of risk which are not shown in the chart below or described in this Form 10-K.

(a) Includes the CEO for Consumer Lending, the CEO for Consumer Banking, and select Business Heads; the CEOs for Corporate & Investment Bank and Consumer & Community Banking are also the Firm's Co-Presidents and Co-Chief Operating Officers.

(b) The General Auditor reports to the Audit Committee and administratively to the CEO.

(c) The Firmwide Risk Committee escalates significant issues directly to the Board Risk Committee as appropriate. The CRO may also escalate directly to the Board Risk Committee.

The Firm's Operating Committee, which consists of the Firm's CEO, CRO, CFO, General Counsel, CEOs of the LOBs and other senior executives, is accountable to and may refer matters to the Firm's Board of Directors. The Operating Committee is responsible for escalating to the Board the information necessary to facilitate the Board's exercise of its duties.

Board oversight

The Firm's Board of Directors provides oversight of risk. The Board Risk Committee is the principal committee that oversees risk matters. The Audit Committee oversees the control environment, and the Compensation & Management Development Committee oversees compensation and other management-related matters. Each committee of the Board oversees reputational risks and conduct risks within its scope of responsibility.

The JPMorgan Chase Bank, N.A. Board of Directors is responsible for the oversight of management of the bank. The JPMorgan Chase Bank, N.A. Board accomplishes this function acting directly and through the principal standing committees of the Firm's Board of Directors. Risk and control oversight on behalf of JPMorgan Chase Bank N.A. is primarily the responsibility of the Risk Committee and the Audit Committee, respectively, and, with respect to compensation and other management-related matters, the Compensation & Management Development Committee.

The Board Risk Committee assists the Board in its oversight of management's responsibility to implement a global risk management framework reasonably designed to identify, assess and manage the Firm's risks. The Board Risk Committee's responsibilities include approval of applicable primary risk policies and review of certain associated frameworks, analysis and reporting established by management. Breaches in risk appetite and parameters, issues that may have a material adverse impact on the Firm, including capital and liquidity issues, and other significant risk-related matters are escalated to the Board Risk Committee, as appropriate.

The Audit Committee assists the Board in its oversight of management's responsibility to ensure that there is an effective system of controls reasonably designed to safeguard the Firm's assets and income, ensure the integrity of the Firm's financial statements, and maintain compliance with the Firm's ethical standards, policies, plans and procedures, and with laws and regulations. It also assists the Board in its oversight of the Firm's independent registered public accounting firm's qualifications, independence and performance, and of the performance of the Firm's Internal Audit function.

The Compensation & Management Development Committee ("CMDC") assists the Board in its oversight of the Firm's compensation principles and practices. The CMDC reviews and approves the Firm's compensation and qualified benefits programs. The Committee reviews the performance of Operating Committee members against their goals, and approves their compensation awards. In addition, the CEO's award is subject to ratification by the independent directors of the Board. The CMDC also reviews the development of and succession for key executives, and provides oversight of the Firm's culture, including reviewing updates from management regarding significant conduct issues and any related employee actions, including compensation actions.

The Public Responsibility Committee assists the Board in its oversight of the Firm's positions and practices on public responsibility matters such as community investment, fair lending, sustainability, consumer practices and other public policy issues that reflect the Firm's values and character and could impact the Firm's reputation among its stakeholders. The Committee also provides guidance on these matters to management and the Board, as appropriate.

The Corporate Governance & Nominating Committee exercises general oversight with respect to the governance of the Board of Directors. It reviews the qualifications of and recommends to the Board of Directors proposed nominees for election to the Board. The Committee evaluates and recommends to the Board corporate governance practices applicable to the Firm. It also appraises the framework for assessing the Board's performance and self-evaluation.

Management oversight

The Firm's senior management-level committees that are primarily responsible for key risk-related functions include:

The Firmwide Risk Committee ("FRC") is the Firm's highest management-level risk committee. It provides oversight of the risks inherent in the Firm's businesses and serves as an escalation point for risk topics and issues raised by underlying committees and/or FRC members.

The Firmwide Control Committee ("FCC") is an escalation committee for senior management to review and discuss the Firmwide operational risk environment including identified issues, operational risk metrics and significant events that have been escalated.

Line of Business and Regional Risk Committees are responsible for providing oversight of the governance, limits, and controls that are in place through the scope of their activities. These committees review the ways in which the particular LOB or the business operating in a particular region could be exposed to adverse outcomes with a focus on identifying, accepting, escalating and/or requiring remediation of matters brought to these committees.

Line of Business and Corporate Function Control Committees oversee the operational risk and control environment of their respective business or function, inclusive of Operational Risk, Compliance and Conduct Risks. As part of that mandate, they are responsible for reviewing indicators of elevated or emerging risks and other data that may impact the level of operating risk in a business or function, addressing key operational risk issues, focusing on processes with control concerns and overseeing control remediation.

The Asset and Liability Committee ("ALCO") is responsible for overseeing the Firm's asset and liability management ("ALM") activities and the management of liquidity risk, balance sheet, interest rate risk, and capital risk.

The Firmwide Valuation Governance Forum ("VGF") is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm.

Risk governance and oversight functions

The Firm manages its risk through risk governance and oversight functions. The scope of a particular function may include one or more drivers, types and/or impacts of risk. For example, Country Risk Management oversees country risk which may be a driver of risk or an aggregation of exposures that could give rise to multiple risk types such as credit or market risk.

The following sections discuss the risk governance and oversight functions in place to manage the risks inherent in the Firms business activities.

Risk governance and oversight functions	Page
Strategic Risk	90
Capital risk	91-101
Liquidity risk	102-108
Reputation risk	109
Consumer Credit Risk	114-120
Wholesale credit risk	121-131
Investment portfolio risk	134
Market risk	135-142
Country risk	143-144
Operational risk	145-151
Compliance Risk	148
Conduct risk	149
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Estimations and Model risk	151

STRATEGIC RISK MANAGEMENT

Strategic risk is the risk to earnings, capital, liquidity or reputation associated with poorly designed or failed business plans or inadequate response to changes in the operating environment.

Management and oversight

The Operating Committee and the senior leadership of each LOB and Corporate are responsible for managing the Firm's most significant strategic risks. Strategic risks are overseen by IRM through participation in relevant business reviews, LOB and Corporate senior management meetings, risk and control committees and other relevant governance forums and ongoing discussions. The Board of Directors oversees management's strategic decisions, and the Board Risk Committee oversees IRM and the Firm's risk management framework.

In the process of developing business plans and strategic initiatives, LOB and Corporate senior management identify the associated risks that are incorporated into the Firmwide Risk Identification process and monitored and assessed as part of the Firmwide Risk Appetite framework.

In addition, IRM conducts a qualitative assessment of the LOB and Corporate strategic initiatives to assess their impact on the risk profile of the Firm.

The Firm's strategic planning process, which includes the development and execution of strategic initiatives, is one component of managing the Firm's strategic risk. Guided by the Firm's How We Do Business Principles (the "Principles"), the Operating Committee and senior management teams in each LOB and Corporate review and update the strategic plan periodically. The process includes evaluating the high-level strategic framework and performance against prior-year initiatives, assessing the operating environment, refining existing strategies and developing new strategies.

These strategic initiatives, along with IRM's assessment, are incorporated in the Firm's budget and provided to the Board for review.

The Firm's balance sheet strategy, which focuses on risk-adjusted returns, strong capital and robust liquidity, is also a component in the management of strategic risk. Refer to Capital Risk Management on pages 91-101 for further information on capital risk. Refer to Liquidity Risk Management on pages 102–108 for further information on liquidity risk. Refer to Reputation Risk Management on page 109 for further information on reputation risk.

Capital risk is the risk the Firm has an insufficient level or composition of capital to support the Firm's business activities and associated risks during normal economic environments and under stressed conditions.

A strong capital position is essential to the Firm's business strategy and competitive position. Maintaining a strong balance sheet to manage through economic volatility is considered a strategic imperative of the Firm's Board of Directors, CEO and Operating Committee. The Firm's fortress balance sheet philosophy focuses on risk-adjusted returns, strong capital and robust liquidity. The Firm's capital risk management strategy focuses on maintaining long-term stability to enable the Firm to build and invest in market-leading businesses, including in highly stressed environments. Senior management considers the implications on the Firm's capital prior to making any significant decisions that could impact future business activities. In addition to considering the Firm's earnings outlook, senior management evaluates all sources and uses of capital with a view to ensuring the Firm's capital strength.

Capital management oversight

The Firm has a Capital Management Oversight function whose primary objective is to provide independent oversight of capital risk across the Firm.

Capital Management Oversight's responsibilities include:

- Defining, monitoring and reporting capital risk metrics;
- Establishing, calibrating and monitoring capital risk limits and indicators, including capital risk appetite;
- Developing a process to classify, monitor and report capital limit breaches; and
- Performing an independent assessment of the Firm's capital management activities, including changes made to the Contingency Capital Plan described below.

In addition, the Basel Independent Review function ("BIR"), which is a part of the IRM function, conducts independent assessments of the Firm's regulatory capital framework. These assessments are intended to ensure compliance with the applicable regulatory capital rules in support of senior management's responsibility for managing capital and for the Board Risk Committee's oversight of management in executing that responsibility.

Capital management

Treasury & CIO is responsible for capital management.

The primary objectives of the Firm's capital management are to:

- Maintain sufficient capital in order to continue to build and invest in the Firm's businesses through the cycle and in stressed environments;
- Retain flexibility to take advantage of future investment opportunities;
- Promote the Firm's ability to serve as a source of strength to its subsidiaries;
- Ensure the Firm operates above the minimum regulatory capital ratios as well as maintain "well-capitalized" status for the Firm and its insured depository institution ("IDI") subsidiaries at all times under applicable regulatory capital requirements;
- Meet capital distribution objectives; and
- Maintain sufficient capital resources to operate throughout a resolution period in accordance with the Firm's preferred resolution strategy.

The Firm addresses these objectives through establishing internal minimum capital requirements and a strong capital governance framework. The internal minimum capital levels consider the Firm's regulatory capital requirements as well as an internal assessment of capital adequacy, in normal economic cycles and in stress events, when setting its minimum capital levels.

Capital management is intended to be flexible in order to react to a range of potential events.

The current capital governance framework requires regular monitoring of the Firm's capital position and follows prescribed escalation protocols, both at the Firm and material legal entity levels.

Governance

Committees responsible for overseeing the Firm's capital management include the Capital Governance Committee, the Treasurer Committee and the Firmwide ALCO. Oversight of capital management is governed through the CIO, Treasury and Corporate ("CTC") Risk Committee. In addition, the Board Risk Committee periodically reviews the Firm's capital risk tolerance. Refer to Firmwide Risk Management on pages 85-89 for additional discussion on the Board Risk Committee and the ALCO.

Capital planning and stress testing

Comprehensive Capital Analysis and Review

The Federal Reserve requires large BHCs, including the Firm, to submit at least annually a capital plan that has been reviewed and approved by the Board of Directors. The Federal Reserve uses CCAR and other stress testing processes to ensure that large BHCs have sufficient capital during periods of economic and financial stress, and have robust, forward-looking capital assessment and planning processes in place that address each BHC's unique risks to enable it to absorb losses under certain stress scenarios. Through CCAR, the Federal Reserve evaluates each BHC's capital adequacy and internal capital adequacy assessment processes ("ICAAP"), as well as its plans to make capital distributions, such as dividend payments or stock repurchases. The Federal Reserve uses results under the severely adverse scenario from its supervisory stress test to determine each firm's SCB requirement for the coming year. Refer to Key Regulatory Developments on pages 93–94 for additional information.

On June 29, 2020, the Firm announced that it had completed the 2020 CCAR stress test process. On August 10, 2020, the Federal Reserve affirmed the Firm's SCB requirement of 3.3% and the Firm's minimum Standardized CET1 capital ratio of 11.3% (up from 10.5%). The SCB requirement became effective on October 1, 2020.

In June 2020, the Federal Reserve determined that changes in financial markets or the macroeconomic outlook due to the COVID-19 pandemic could have a material effect on a firm's risk profile and financial condition and therefore required all large bank holding companies, including the Firm, to update and resubmit their capital plans by November 2, 2020. On December 18, 2020, the Federal Reserve released its results from the 2020 CCAR Round 2 stress test, which showed that large banks had strong levels of capital and announced that it would allow all large banks, including the Firm, to resume share repurchases commencing in the first quarter of 2021, subject to certain restrictions for at least the first quarter of 2021 given considerable economic uncertainty remained. The Federal Reserve has stated that due to uncertainty about future economic conditions and the ultimate path of the current recovery, the SCB will not be reset at this time. The Federal Reserve will notify firms by March 31, 2021 whether a revised SCB requirement based on the 2020 CCAR Round 2 stress test will be recalculated ahead of the 2021 annual CCAR assessment.

Refer to Capital actions on page 99 for information on actions taken by the Firm's Board of Directors following the 2020 CCAR results.

Internal Capital Adequacy Assessment Process

Annually, the Firm prepares the ICAAP, which informs the Board of Directors of the ongoing assessment of the Firm's processes for managing the sources and uses of capital as well as compliance with supervisory expectations for capital planning and capital adequacy. The Firm's ICAAP integrates stress testing protocols with capital planning.

The CCAR and other stress testing processes assess the potential impact of alternative economic and business scenarios on the Firm's earnings and capital. Economic scenarios, and the parameters underlying those scenarios, are defined centrally and applied uniformly across the businesses. These scenarios are articulated in terms of macroeconomic factors, which are key drivers of business results; global market shocks, which generate short-term but severe trading losses; and idiosyncratic operational risk events. The scenarios are intended to capture and stress key vulnerabilities and idiosyncratic risks facing the Firm. However, when defining a broad range of scenarios, actual events can be worse. Accordingly, management considers additional stresses outside these scenarios, as necessary. These results are reviewed by management and the Board of Directors.

Contingency capital plan

The Firm's contingency capital plan establishes the capital management framework for the Firm and specifies the principles underlying the Firm's approach towards capital management in normal economic conditions and during stress. The contingency capital plan defines how the Firm calibrates its targeted capital levels and meets minimum capital requirements, monitors the ongoing appropriateness of planned capital distributions, and sets out the capital contingency actions that are expected to be taken or considered at various levels of capital depletion during a period of stress.

Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's IDI subsidiaries, including JPMorgan Chase Bank, N.A. The U.S. capital requirements generally follow the Capital Accord of the Basel Committee, as amended from time to time.

Basel III Overview

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. BHCs and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. The minimum amount of regulatory capital that must be held by BHCs and banks is determined by calculating risk-weighted assets ("RWA"), which are on-balance sheet assets and off-balance sheet exposures, weighted according to risk. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Firm is evaluated against the lower of the Standardized or Advanced approaches compared to their respective minimum capital ratios.

Basel III establishes capital requirements for calculating credit risk RWA and market risk RWA, and in the case of Basel III Advanced, operational risk RWA. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced. In addition to the RWA calculated under these approaches, the Firm may supplement such amounts to incorporate management judgment and feedback from its regulators.

Basel III also includes a requirement for Advanced Approach banking organizations, including the Firm, to calculate the SLR. Refer to SLR on page 98 for additional information.

COVID-19 Pandemic

The Firm has been impacted by market events as a result of the COVID-19 pandemic, but remains well-capitalized. However, the continuation or further deterioration of the current macroeconomic environment could result in impacts to the Firm's capital and leverage.

Key Regulatory Developments

Current Expected Credit Losses. Effective January 1, 2020, the Firm adopted the Financial Instruments – Credit Losses guidance under U.S. GAAP. As permitted under the U.S. capital rules issued by the federal banking agencies in 2019, the Firm initially elected to phase-in the January 1, 2020 ("day 1") CECL adoption impact to retained earnings of $2.7 billion to CET1 capital, at 25% per year in each of 2020 to 2023. As part of their response to the impact of the COVID-19 pandemic, on March 31, 2020, the federal banking agencies issued an interim final rule (issued as final on August 26, 2020) that provided the option to delay the effects of CECL on regulatory capital for two years, followed by a three-year transition period ("CECL capital transition provisions").

The final rule provides a uniform approach for estimating the effects of CECL compared to the legacy incurred loss model during the first two years of the transition period (the "day 2" transition amount), whereby the Firm may exclude from CET1 capital 25% of the change in the allowance for credit losses (excluding allowances on PCD loans). The cumulative day 2 transition amount as at December 31, 2021 that is not recognized in CET1 capital, as well as the $2.7 billion day 1 impact, will be phased into CET1 capital at 25% per year beginning January 1, 2022. The Firm has elected to apply the CECL capital transition provisions, and accordingly, for the year ended December 31, 2020, the capital metrics of the Firm exclude $5.7 billion, which is the $2.7 billion day 1 impact to retained earnings and 25% of the $12.2 billion increase in the allowance for credit losses (excluding allowances on PCD loans).

The impacts of the CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure. Refer to Note 1 for further information on the CECL accounting guidance.

Money Market Mutual Fund Liquidity Facility ("MMLF"). The Federal Reserve established the MMLF facility on March 18, 2020, authorized through at least March 31, 2021, to enhance the liquidity and functioning of money markets. Under the MMLF, the Federal Reserve Bank of Boston ("FRBB") makes nonrecourse advances to participating financial institutions to purchase certain types of assets from eligible money market mutual fund clients. These assets, which are reflected in other assets on the Firm's Consolidated balance sheets, are pledged to the FRBB as collateral. On March 23, 2020, the federal banking agencies issued an interim final rule (issued as final on September 29, 2020) to neutralize the effects of purchasing assets through the program on risk-based and leverage-based capital ratios. As of December 31, 2020, the Firm excluded assets purchased from money market mutual fund clients pursuant to nonrecourse advances provided under the MMLF in the amount of $187 million from its RWA and $358 million from adjusted three month average assets and total leverage exposure.

Supplementary leverage ratio temporary revision. On April 1, 2020, the Federal Reserve issued an interim final rule that requires, on a temporary basis, the calculation of total leverage exposure for purposes of calculating the SLR for bank holding companies, to exclude the on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks. These exclusions became effective April 1, 2020, and will remain in effect through March 31, 2021.

On June 1, 2020, the Federal Reserve, OCC and FDIC issued an interim final rule that provides IDI subsidiaries with an option to apply this temporary exclusion subject to certain restrictions. As of December 31, 2020, JPMorgan Chase Bank, N.A. has not elected to apply this exclusion.

Paycheck Protection Program. On April 13, 2020, the federal banking agencies issued an interim final rule (issued as final on September 29, 2020) to neutralize the regulatory capital effects of participating in the PPP on risk-based capital ratios by applying a zero percent risk weight to loans originated under the program. Given that PPP loans are guaranteed by the SBA, the Firm does not expect to realize material credit losses on these loans. As of December 31, 2020, the Firm had approximately $27 billion of loans under the program.

The rule also provides that if a PPP loan is pledged as collateral for a non-recourse loan under the Federal Reserve's Paycheck Protection Program Lending ("PPPL") Facility, the PPP loan can be excluded from leverage-based capital ratios. As of December 31, 2020, the Firm had not participated in the PPPL Facility.

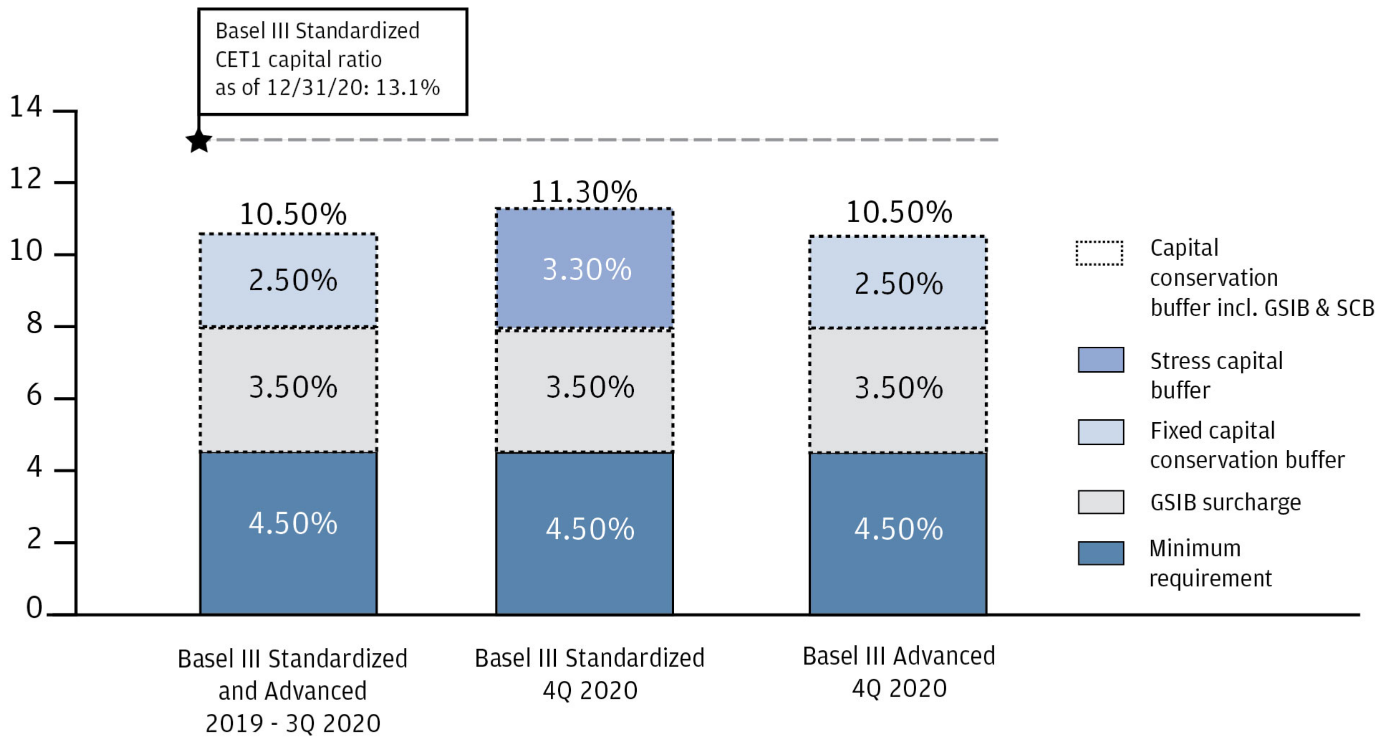
Refer to Regulatory Developments Relating to the COVID-19 Pandemic on pages 52-53 for additional information on regulatory actions and significant financing programs that the U.S. government and regulators have introduced to address the effects of the COVID-19 pandemic.

Stress Capital Buffer. On March 4, 2020, the Federal Reserve issued the final rule introducing the SCB framework for the Basel III Standardized approach that is designed to more closely integrate the results of the quantitative assessment in the annual CCAR with the ongoing minimum capital requirements for BHCs under the U.S. Basel III rules. The final rule replaces the fixed 2.5% CET1 capital conservation buffer in the Standardized approach with a dynamic institution-specific SCB. The final rule does not apply to the U.S. Basel III Advanced approach capital requirements. The SCB requirement for BHCs will be effective on October 1 of each year and is expected to remain in effect until September 30 of the following year.

TLAC Holdings rule. On October 20, 2020, the federal banking agencies issued a final rule prescribing the regulatory capital treatment for holdings of TLAC debt instruments by certain large banking organizations, such as the Firm and JPMorgan Chase Bank, N.A. This rule expands the scope of the existing capital deductions rule around the holdings of capital instruments of financial institutions to also include TLAC debt instruments issued by systemically important banking organizations. The final rule will become effective on April 1, 2021 and is not expected to have a material impact on the Firm's risk-based capital metrics.

Risk-based Capital Regulatory Minimums

The following chart presents the Firm's Basel III minimum CET1 capital ratio under the Basel III rules currently in effect.



The Firm's Basel III Standardized-risk-based ratios are currently more binding than the Basel III Advanced-risk-based ratios.

All banking institutions are currently required to have a minimum CET1 capital ratio of 4.5% of risk-weighted assets.

Certain banking organizations, including the Firm, are required to hold additional levels of capital to serve as a "capital conservation buffer". The capital conservation buffer incorporates a global systemically important bank ("GSIB") surcharge, a discretionary countercyclical capital buffer and a fixed capital conservation buffer of 2.5% for Advanced regulatory capital requirements and a variable SCB requirement, floored at 2.5%, for Standardized regulatory capital requirements.

Under the Federal Reserve's GSIB rule, the Firm is required to assess its GSIB surcharge on an annual basis under two separately prescribed methods based on data for the previous fiscal year-end, and is subject to the higher of the two. The first ("Method 1"), reflects the GSIB surcharge as prescribed by the Basel Committee's assessment methodology, and is calculated across five criteria: size, cross-jurisdictional activity, interconnectedness, complexity and substitutability. The second ("Method 2"), modifies the Method 1 requirements to include a measure of short-term wholesale funding in place of substitutability, and introduces a GSIB score "multiplication factor".

The following table presents the Firm's effective GSIB surcharge for the years ended December 31, 2020 and 2019.

	2020	2019
Fully Phased-In:		
Method 1	2.50 %	2.50 %
Method 2	3.50 %	3.50 %

The Firm's effective regulatory minimum GSIB surcharge calculated under Method 2 remains unchanged at 3.5% for 2021. On November 11, 2020, the Financial Stability Board ("FSB") released its annual GSIB list, which published the Firm's Method 1 GSIB surcharge of 2.0% (down from 2.5%) effective January 1, 2021, based upon data as of December 31, 2019.

The Firm's estimated Method 2 surcharge calculated using data as of December 31, 2020 is 4.0%. Accordingly, based on the GSIB rule currently in effect, the Firm's effective regulatory minimum GSIB surcharge is expected to increase to 4.0% on January 1, 2023 unless the Firm's Method 2 GSIB surcharge calculation based upon data as of December 31, 2021 is lower.

The U.S. federal regulatory capital standards include a framework for setting a discretionary countercyclical capital buffer taking into account the macro financial environment in which large, internationally active banks function. As of December 31, 2020, the U.S. countercyclical capital buffer remained at 0%. The Federal Reserve will continue to review the buffer at least annually. The buffer can be increased if the Federal Reserve, FDIC and OCC determine that systemic risks are meaningfully above normal and can be calibrated up to an additional 2.5% of RWA subject to a 12-month implementation period.

Failure to maintain regulatory capital equal to or in excess of the risk-based regulatory capital minimum plus the capital conservation buffer (inclusive of the GSIB surcharge) and any countercyclical buffer will result in limitations to the amount of capital that the Firm may distribute, such as through dividends and common share repurchases, as well as certain executive discretionary bonus payments.

The Firm has a target Basel III CET1 capital ratio of 12%. However, the Firm may remain above that level in order to satisfy leverage-based capital requirements if deposits continue to grow due to actions taken by the Federal Reserve and the U.S. government in response to the COVID-19 pandemic.

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt ("eligible LTD"). Refer to TLAC on page 100 for additional information.

Leverage-based Capital Regulatory Minimums

Supplementary leverage ratio

Banking organizations subject to the Basel III Advanced approach are currently required to have a minimum SLR of 3.0%. Certain banking organizations, including the Firm, are also required to hold an additional 2.0% leverage buffer.

The SLR is defined as Tier 1 capital under Basel III divided by the Firm's total leverage exposure. Total leverage exposure is calculated by taking the Firm's total average on-balance sheet assets, less amounts permitted to be deducted for Tier 1 capital, and adding certain off-balance sheet exposures, such as undrawn commitments and derivatives potential future exposure.

Failure to maintain an SLR equal to or greater than the regulatory minimum will result in limitations on the amount of capital that the Firm may distribute such as through dividends and common share repurchases.

Other regulatory capital

In addition to meeting the capital ratio requirements of Basel III, the Firm and its IDI subsidiaries also must maintain minimum capital and leverage ratios in order to be "well-capitalized" under the regulations issued by the Federal Reserve and the Prompt Corrective Action ("PCA") requirements of the FDIC Improvement Act ("FDICIA"), respectively. Refer to Note 27 for additional information.

Additional information regarding the Firm's capital ratios, as well as the U.S. federal regulatory capital standards to which the Firm is subject, is presented in Note 27. Refer to the Firm's Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for further information on the Firm's Basel III measures.

The following table presents the Firm's risk-based and leverage-based capital metrics under both the Basel III Standardized and Advanced approaches.

	Standardized			Advanced		
(in millions, except ratios)	December 31, 2020[c][d]	December 31, 2019	Minimum capital ratios[e]	December 31, 2020[c][d]	December 31, 2019	Minimum capital ratios[e]
Risk-based capital metrics:						
CET1 capital	**$ 205,078**	$ 187,753		**$ 205,078**	$ 187,753	
Tier 1 capital	**234,844**	214,432		**234,844**	214,432	
Total capital	**269,923**	242,589		**257,228**	232,112	
Risk-weighted assets	**1,560,609**	1,515,869		**1,484,431**	1,397,878	
CET1 capital ratio	**13.1 %**	12.4 %	**11.3 %**	**13.8 %**	13.4 %	10.5 %
Tier 1 capital ratio	**15.0**	14.1	**12.8**	**15.8**	15.3	12.0
Total capital ratio	**17.3**	16.0	**14.8**	**17.3**	16.6	14.0
Leverage-based capital metrics:						
Adjusted average assets[a]	**$ 3,353,319**	$ 2,730,239		**$ 3,353,319**	$ 2,730,239	
Tier 1 leverage ratio	**7.0 %**	7.9 %	**4.0 %**	**7.0 %**	7.9 %	4.0 %
Total leverage exposure[b]	**NA**	NA		**$ 3,401,542**	$ 3,423,431	
SLR[b]	**NA**	NA	**NA**	**6.9 %**	6.3 %	5.0 %

(a) Adjusted average assets, for purposes of calculating the leverage ratios, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.
(b) As of December 31, 2020, total leverage exposure for purposes of calculating the SLR excludes U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the interim final rule issued by the Federal Reserve on April 1, 2020.
(c) As of December 31, 2020, the capital metrics reflect the CECL capital transition provisions.
(d) As of December 31, 2020, the capital metrics reflect the exclusion of assets purchased from money market mutual fund clients pursuant to nonrecourse advances provided under the MMLF. Additionally, loans originated under the PPP receive a zero percent risk weight.
(e) Represents minimum requirements and regulatory buffers applicable to the Firm. For the period ended December 31, 2019, the CET1, Tier 1, Total, Tier 1 leverage and SLR minimum capital ratios applicable to the Firm were 10.5%, 12.0%, 14.0%, 4.0% and 5.0%, respectively. Refer to Note 27 for additional information.

Capital components

The following table presents reconciliations of total stockholders' equity to Basel III CET1 capital, Tier 1 capital and Total capital as of December 31, 2020 and 2019.

(in millions)		December 31, 2020		December 31, 2019
Total stockholders' equity	**$**	**279,354**	$	261,330
Less: Preferred stock		30,063		26,993
Common stockholders' equity		**249,291**		234,337
Add:				
Certain deferred tax liabilities[a]		2,453		2,381
Less:				
Goodwill		49,248		47,823
Other intangible assets		904		819
Other CET1 capital adjustments[b]		(3,486)		323
Standardized/Advanced CET1 capital		**205,078**		187,753
Preferred stock		30,063		26,993
Less: Other Tier 1 adjustments		297		314
Standardized/Advanced Tier 1 capital	**$**	**234,844**	$	214,432
Long-term debt and other instruments qualifying as Tier 2 capital	$	16,645	$	13,733
Qualifying allowance for credit losses[c]		18,372		14,314
Other		62		110
Standardized Tier 2 capital	**$**	**35,079**	$	28,157
Standardized Total capital	**$**	**269,923**	$	242,589
Adjustment in qualifying allowance for credit losses for Advanced Tier 2 capital[d]		(12,695)		(10,477)
Advanced Tier 2 capital	**$**	**22,384**	$	17,680
Advanced Total capital	**$**	**257,228**	$	232,112

(a) Represents deferred tax liabilities related to tax-deductible goodwill and to identifiable intangibles created in nontaxable transactions, which are netted against goodwill and other intangibles when calculating CET1 capital.

(b) As of December 31, 2020, the impact of the CECL capital transition provision was an increase in CET1 capital of $5.7 billion.

(c) Represents the allowance for credit losses eligible for inclusion in Tier 2 capital up to 1.25% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.

(d) Represents an adjustment to qualifying allowance for credit losses for the excess of eligible credit reserves over expected credit losses up to 0.6% of credit risk RWA, including the impact of the CECL capital transition provision with any excess deducted from RWA.

Capital rollforward

The following table presents the changes in Basel III CET1 capital, Tier 1 capital and Tier 2 capital for the year ended December 31, 2020.

Year Ended December 31, (in millions)	2020
Standardized/Advanced CET1 capital at December 31, 2019	$ 187,753
Net income applicable to common equity	27,548
Dividends declared on common stock	(11,119)
Net purchase of treasury stock	(5,135)
Changes in additional paid-in capital	(128)
Changes related to AOCI	6,417
Adjustment related to AOCI[a]	(1,829)
Changes related to other CET1 capital adjustments[b]	1,571
Change in Standardized/Advanced CET1 capital	17,325
Standardized/Advanced CET1 capital at December 31, 2020	**$ 205,078**
Standardized/Advanced Tier 1 capital at December 31, 2019	$ 214,432
Change in CET1 capital[b]	17,325
Net issuance of noncumulative perpetual preferred stock	3,070
Other	17
Change in Standardized/Advanced Tier 1 capital	20,412
Standardized/Advanced Tier 1 capital at December 31, 2020	**$ 234,844**
Standardized Tier 2 capital at December 31, 2019	$ 28,157
Change in long-term debt and other instruments qualifying as Tier 2	2,912
Change in qualifying allowance for credit losses[b]	4,058
Other	(48)
Change in Standardized Tier 2 capital	6,922
Standardized Tier 2 capital at December 31, 2020	**$ 35,079**
Standardized Total capital at December 31, 2020	**$ 269,923**
Advanced Tier 2 capital at December 31, 2019	$ 17,680
Change in long-term debt and other instruments qualifying as Tier 2	2,912
Change in qualifying allowance for credit losses[b]	1,840
Other	(48)
Change in Advanced Tier 2 capital	4,704
Advanced Tier 2 capital at December 31, 2020	**$ 22,384**
Advanced Total capital at December 31, 2020	**$ 257,228**

(a) Includes cash flow hedges and DVA related to structured notes recorded in AOCI.

(b) Includes the impact of the CECL capital transition provisions.

RWA rollforward

The following table presents changes in the components of RWA under Basel III Standardized and Advanced approaches for the year ended December 31, 2020. The amounts in the rollforward categories are estimates, based on the predominant driver of the change.

	Standardized			Advanced			
Year ended December 31, 2020 (in millions)	Credit risk RWA	Market risk RWA	**Total RWA**	Credit risk RWA	Market risk RWA	Operational risk RWA	**Total RWA**
December 31, 2019	$ 1,440,220	$ 75,649	**$ 1,515,869**	$ 932,948	$ 75,652	$ 389,278	**$ 1,397,878**
Model & data changes[(a)]	(800)	(16,320)	**(17,120)**	(6,100)	(16,320)	–	**(22,420)**
Portfolio runoff[(b)]	(4,450)	–	**(4,450)**	(4,000)	–	–	**(4,000)**
Movement in portfolio levels[(c)]	29,249	37,061	**66,310**	79,482	37,578	(4,087)	**112,973**
Changes in RWA	23,999	20,741	**44,740**	69,382	21,258	(4,087)	**86,553**
December 31, 2020	**$ 1,464,219**	**$ 96,390**	**$ 1,560,609**	**$ 1,002,330**	**$ 96,910**	**$ 385,191**	**$ 1,484,431**

(a) Model & data changes refer to material movements in levels of RWA as a result of revised methodologies and/or treatment per regulatory guidance (exclusive of rule changes).
(b) Portfolio runoff for credit risk RWA primarily reflects reduced risk from position rolloffs in legacy portfolios in Home Lending.
(c) Movement in portfolio levels (inclusive of rule changes) refers to: changes in book size, composition, credit quality, and market movements for credit risk RWA; changes in position and market movements for market risk RWA; updates to cumulative losses for operational risk RWA; and deductions to credit risk RWA for excess eligible credit reserves not eligible for inclusion in Tier 2 capital.

Supplementary leverage ratio

The following table presents the components of the Firm's SLR.

Three months ended (in millions, except ratio)	**December 31, 2020**	December 31, 2019
Tier 1 capital	**$ 234,844**	214,432
Total average assets	3,399,818	2,777,270
Less: Regulatory capital adjustments[(a)]	46,499	47,031
Total adjusted average assets[(b)]	3,353,319	2,730,239
Add: Off-balance sheet exposures[(c)]	729,978	693,192
Less: Exclusion for U.S. Treasuries and Federal Reserve Bank deposits	681,755	–
Total leverage exposure	**$ 3,401,542**	$ 3,423,431
SLR	**6.9 %**	6.3 %

(a) For purposes of calculating the SLR, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets. As of December 31, 2020, includes adjustments for the CECL capital transition provisions and the exclusion of average assets purchased from money market mutual fund clients pursuant to nonrecourse advances provided under the MMLF.
(b) Adjusted average assets used for the calculation of Tier 1 leverage ratio.
(c) Off-balance sheet exposures are calculated as the average of the three month-end spot balances during the reporting quarter.

Refer to Note 27 for JPMorgan Chase Bank, N.A.'s SLR.

Line of business equity

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. As of January 1, 2021, the Firm has changed its line of business capital allocations primarily as a result of changes in exposures for each LOB and an increase in the relative risk weighting toward Standardized RWA. The assumptions and methodologies used to allocate capital are periodically assessed and as a result, the capital allocated to the LOBs may change from time to time.

The following table presents the capital allocated to each business segment.

Line of business equity (Allocated capital)

		December 31,	
(in billions)	**January 1, 2021**	2020	2019
Consumer & Community Banking	**$ 50.0**	$ 52.0	$ 52.0
Corporate & Investment Bank	**83.0**	80.0	80.0
Commercial Banking	**24.0**	22.0	22.0
Asset & Wealth Management	**14.0**	10.5	10.5
Corporate	**78.3**	84.8	69.8
Total common stockholders' equity	**$ 249.3**	$ 249.3	$ 234.3

Capital actions

Common stock dividends

The Firm's common stock dividends are planned as part of the Capital Management governance framework in line with the Firm's capital management objectives.

The Firm's quarterly common stock dividend is currently $0.90 per share. The Firm's dividends are subject to the Board of Directors' approval on a quarterly basis.

Refer to Note 21 and Note 26 for information regarding dividend restrictions.

The following table shows the common dividend payout ratio based on net income applicable to common equity.

Year ended December 31,	**2020**	2019	2018
Common dividend payout ratio	**40 %**	31 %	30 %

Common stock

On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020. On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021. As directed by the Federal Reserve, total net repurchases and common stock dividends in the first quarter of 2021 are restricted and cannot exceed the average of the Firm's net income for the four preceding calendar quarters. The Firm's Board of Directors has authorized a new common share repurchase program for up to $30 billion.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2020, 2019 and 2018.

Year ended December 31, (in millions)	**2020**	2019	2018
Total number of shares of common stock repurchased	**50.0**	213.0	181.5
Aggregate purchase price of common stock repurchases	**$ 6,397**	$ 24,121	$ 19,983

The authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares – for example, during internal trading blackout periods.

Refer to Part II, Item 5: Market for Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities on page 34 of the 2020 Form 10-K for additional information regarding repurchases of the Firm's equity securities.

Preferred stock

Preferred stock dividends declared were $1.6 billion for the year ended December 31, 2020.

The Firm has not issued or redeemed any preferred stock since the first quarter of 2020. Refer to Note 21 for additional information on the Firm's preferred stock, including the issuance and redemption of preferred stock.

Subordinated Debt

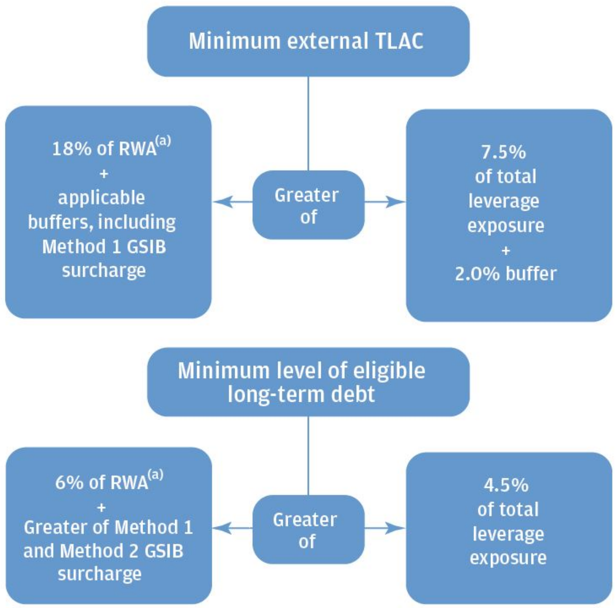
On May 13, 2020, the Firm issued $3.0 billion of fixed-to-floating rate subordinated notes due 2031. Refer to Long-term funding and issuance on page 107 and Note 20 for additional information.

Other capital requirements

Total Loss-Absorbing Capacity

The Federal Reserve's TLAC rule requires the U.S. GSIB top-tier holding companies, including the Firm, to maintain minimum levels of external TLAC and eligible long-term debt.

The minimum external TLAC and the minimum level of eligible long-term debt requirements are shown below:



(a) RWA is the greater of Standardized and Advanced compared to their respective minimum capital ratios.

Failure to maintain TLAC equal to or in excess of the regulatory minimum plus applicable buffers will result in limitations to the amount of capital that the Firm may distribute, such as through dividends and common share repurchases.

The following table presents the TLAC and external long-term debt minimum requirements including applicable regulatory buffers, as of December 31, 2020 and 2019.

	Minimum Requirements
TLAC to RWA	23.0 %
TLAC to leverage exposure	9.5
External long-term debt to RWA	9.5
External long-term debt to leverage	4.5

Effective January 1, 2021, Method 1 GSIB surcharge is 2.0% (down from 2.5%). As a result, the Firm's TLAC to RWA requirement will become 22.5%. Refer to Risk-based Capital Regulatory Minimums on pages 94-95 for further information on the GSIB surcharge.

The following table presents the eligible external TLAC and eligible LTD amounts, as well as a representation of the amounts as a percentage of the Firm's total RWA and total leverage exposure applying the impact of the CECL capital transition provisions as of December 31, 2020 and 2019.

	December 31, 2020		December 31, 2019	
(in billions, except ratio)	External TLAC	LTD	External TLAC	LTD
Total eligible amount	$ 421.0	$ 181.4	$ 386.4	$ 161.8
% of RWA	27.0 %	11.6 %	25.5 %	10.7 %
Surplus/(shortfall)	$ 62.1	$ 33.1	$ 37.7	$ 17.8
% of total leverage exposure	12.4 %	5.3 %	11.3 %	4.7 %
Surplus/(shortfall)	$ 97.9	$ 28.3	$ 61.2	$ 7.8

Refer to Part I, Item 1A: Risk Factors on pages 8-32 of the 2020 Form 10-K for information on the financial consequences to holders of the Firm's debt and equity securities in a resolution scenario.

Broker-dealer regulatory capital

J.P. Morgan Securities

JPMorgan Chase's principal U.S. broker-dealer subsidiary is J.P. Morgan Securities. J.P. Morgan Securities is subject to Rule 15c3-1 under the Securities Exchange Act of 1934 (the "Net Capital Rule"). J.P. Morgan Securities is also registered as a futures commission merchant and is subject to regulatory capital requirements, including those imposed by the SEC, Commodity Futures Trading Commission ("CFTC"), Financial Industry Regulatory Authority ("FINRA") and the National Futures Association ("NFA").

J.P. Morgan Securities has elected to compute its minimum net capital requirements in accordance with the "Alternative Net Capital Requirements" of the Net Capital Rule.

The following table presents J.P. Morgan Securities' net capital:

December 31, 2020 (in millions)	Actual[(a)]	Minimum
Net Capital	$ 27,651	$ 5,024

(a) Net capital reflects the exclusion of assets purchased from money market mutual fund clients pursuant to nonrecourse advances provided under the MMLF.

In addition to its alternative minimum net capital requirements, J.P. Morgan Securities is required to hold "tentative net capital" in excess of $1.0 billion and is also required to notify the SEC in the event that its tentative net capital is less than $5.0 billion. Tentative net capital is net capital before deducting market and credit risk charges as defined by the Net Capital Rule. As of December 31, 2020, J.P. Morgan Securities maintained tentative net capital in excess of the minimum and notification requirements.

J.P. Morgan Securities plc

J.P. Morgan Securities plc is a wholly-owned subsidiary of JPMorgan Chase Bank, N.A. and has authority to engage in banking, investment banking and broker-dealer activities. J.P. Morgan Securities plc is jointly regulated by the U.K. Prudential Regulation Authority ("PRA") and the Financial Conduct Authority ("FCA"). J.P. Morgan Securities plc is subject to the European Union Capital Requirements Regulation and the PRA capital rules, each of which implement Basel III and thereby subject J.P. Morgan Securities plc to its requirements. Effective January 1, 2021, J.P. Morgan Securities plc is subject to the amended EU Capital Requirement Regulation, as adopted in the U.K.

The Bank of England requires, on a transitional basis, that U.K. banks, including U.K. regulated subsidiaries of overseas groups, maintain a minimum requirement for own funds and eligible liabilities ("MREL"). As of December 31, 2020, J.P. Morgan Securities plc was compliant with the requirements of the MREL rule.

The following table presents J.P. Morgan Securities plc's capital metrics:

December 31, 2020 (in millions, except ratios)	Estimated	Minimum ratios
Total capital	$ 55,156	
CET1 ratio	17.9 %	4.5 %
Total capital ratio	22.8 %	8.0 %

LIQUIDITY RISK MANAGEMENT

Liquidity risk is the risk that the Firm will be unable to meet its contractual and contingent financial obligations as they arise or that it does not have the appropriate amount, composition and tenor of funding and liquidity to support its assets and liabilities.

Liquidity risk oversight

The Firm has a Liquidity Risk Oversight function whose primary objective is to provide oversight of liquidity risk across the Firm. Liquidity Risk Oversight's responsibilities include:

- Defining, monitoring and reporting liquidity risk metrics;
- Establishing and monitoring limits and indicators, including liquidity risk appetite;
- Developing a process to classify, monitor and report limit breaches;
- Performing an independent review of liquidity risk management processes;
- Monitoring and reporting internal Firmwide and legal entity liquidity stress tests as well as regulatory defined liquidity stress tests;
- Approving or escalating for review new or updated liquidity stress assumptions; and
- Monitoring liquidity positions, balance sheet variances and funding activities;

Liquidity management

The primary objectives of the Firm's liquidity management are to:

- Ensure that the Firm's core businesses and material legal entities are able to operate in support of client needs and meet contractual and contingent financial obligations through normal economic cycles as well as during stress events, and
- Manage an optimal funding mix and availability of liquidity sources.

As part of the Firm's overall liquidity management strategy, the Firm manages liquidity and funding using a centralized, global approach in order to:

- Optimize liquidity sources and uses;
- Monitor exposures;
- Identify constraints on the transfer of liquidity between the Firm's legal entities; and
- Maintain the appropriate amount of surplus liquidity at a Firmwide and legal entity level, where relevant.

In the context of the Firm's liquidity management, Treasury and CIO is responsible for:

- Analyzing and understanding the liquidity characteristics of the assets and liabilities of the Firm, LOBs and legal entities, taking into account legal, regulatory, and operational restrictions;
- Developing internal liquidity stress testing assumptions;
- Defining and monitoring Firmwide and legal entity-specific liquidity strategies, policies, reporting and contingency funding plans;
- Managing liquidity within the Firm's approved liquidity risk appetite tolerances and limits;
- Managing compliance with regulatory requirements related to funding and liquidity risk; and
- Setting transfer pricing in accordance with underlying liquidity characteristics of balance sheet assets and liabilities as well as certain off-balance sheet items.

Governance

Committees responsible for liquidity governance include the Firmwide ALCO as well as LOB and regional ALCOs, the Treasurer Committee, and the CTC Risk Committee. In addition, the Board Risk Committee reviews and recommends to the Board of Directors, for formal approval, the Firm's liquidity risk tolerances, liquidity strategy, and liquidity policy. Refer to Firmwide Risk Management on pages 85-89 for further discussion of ALCO and other risk-related committees.

Internal stress testing

Liquidity stress tests are intended to ensure that the Firm has sufficient liquidity under a variety of adverse scenarios, including scenarios analyzed as part of the Firm's resolution and recovery planning. Stress scenarios are produced for JPMorgan Chase & Co. ("Parent Company") and the Firm's material legal entities on a regular basis, and other stress tests are performed in response to specific market events or concerns. Liquidity stress tests assume all of the Firm's contractual financial obligations are met and take into consideration:

- Varying levels of access to unsecured and secured funding markets,
- Estimated non-contractual and contingent cash outflows, and
- Potential impediments to the availability and transferability of liquidity between jurisdictions and material legal entities such as regulatory, legal or other restrictions.

Liquidity outflow assumptions are modeled across a range of time horizons and currency dimensions and contemplate both market and idiosyncratic stresses.

Results of stress tests are considered in the formulation of the Firm's funding plan and assessment of its liquidity position. The Parent Company acts as a source of funding for the Firm through equity and long-term debt issuances, and its intermediate holding company, JPMorgan Chase Holdings LLC (the "IHC") provides funding support to the ongoing operations of the Parent Company and its subsidiaries. The Firm maintains liquidity at the Parent Company, IHC, and operating subsidiaries at levels sufficient to comply with liquidity risk tolerances and minimum liquidity requirements, and to manage through periods of stress when access to normal funding sources may be disrupted.

Contingency funding plan

The Firm's Contingency Funding Plan ("CFP") sets out the strategies for addressing and managing liquidity resource needs during a liquidity stress event and incorporates liquidity risk limits, indicators and risk appetite tolerances that make up Liquidity Escalation Points. The CFP also identifies the alternative contingent funding and liquidity resources available to the Firm and its legal entities in a period of stress.

Liquidity Coverage Ratio

The LCR rule requires that the Firm and JPMorgan Chase Bank, N.A. maintain an amount of eligible HQLA that is sufficient to meet its estimated total net cash outflows over a prospective 30 calendar-day period of significant stress. Eligible HQLA, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule. HQLA primarily consist of cash and certain high-quality liquid securities as defined in the LCR rule.

Under the LCR rule, the amount of eligible HQLA held by JPMorgan Chase Bank, N.A. that is in excess of its stand-alone 100% minimum LCR requirement, and that is not transferable to non-bank affiliates, must be excluded from the Firm's reported eligible HQLA.

Estimated net cash outflows are based on standardized stress outflow and inflow rates prescribed in the LCR rule, which are applied to the balances of the Firm's assets, sources of funds, and obligations. The LCR for both the Firm and JPMorgan Chase Bank, N.A. is required to be a minimum of 100%.

The following table summarizes the Firm and JPMorgan Chase Bank, N.A.'s average LCR for the three months ended December 31, 2020, September 30, 2020 and December 31, 2019 based on the Firm's interpretation of the LCR framework.

	Three months ended		
Average amount (in millions)	**December 31, 2020**	September 30, 2020	December 31, 2019
JPMorgan Chase & Co.:			
Eligible HQLA			
Eligible cash[(a)]	**$ 455,612**	$ 458,336	$ 203,296
Eligible securities[(b)(c)]	**241,447**	211,841	341,990
Total eligible HQLA[(d)]	**$ 697,059**	$ 670,177	$ 545,286
Net cash outflows	**$ 634,037**	$ 587,811	$ 469,402
LCR	**110 %**	114 %	116 %
Net excess eligible HQLA[(d)]	**$ 63,022**	$ 82,366	$ 75,884
JPMorgan Chase Bank, N.A.:			
LCR	**160 %**	157 %	116 %
Net excess eligible HQLA	**$ 401,903**	$ 366,096	$ 79,483

(a) Represents cash on deposit at central banks, primarily the Federal Reserve Banks.
(b) Predominantly U.S. Treasuries, U.S. GSE and government agency MBS, and sovereign bonds net of applicable haircuts under the LCR rule.
(c) Eligible HQLA securities may be reported in securities borrowed or purchased under resale agreements, trading assets, or investment securities on the Firm's Consolidated balance sheets.
(d) Excludes average excess eligible HQLA at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates.

The Firm's average LCR decreased during the three months ended December 31, 2020, compared with the three-month period ended September 30, 2020, predominantly driven by a decrease in cash from long-term debt maturities, including the early termination of certain of the Firm's debt at the end of the third quarter 2020.

The Firm's average LCR decreased during the three months ended December 31, 2020, compared with the prior year period primarily due to the relative impact on net cash outflows from the significant increase in deposits as well as elevated market activities in the CIB.

JPMorgan Chase Bank, N.A.'s average LCR increased during the three months ended December 31, 2020, compared with both the three month periods ended September 30, 2020 and December 31, 2019 primarily due to growth in deposits. Deposits continued to increase in the fourth quarter primarily driven by the COVID-19 pandemic and the related effect of certain government actions. The increase in excess liquidity in JPMorgan Chase Bank, N.A. is excluded from the Firm's reported LCR under the LCR rule.

The Firm's average LCR fluctuates from period to period, due to changes in its eligible HQLA and estimated net cash outflows as a result of ongoing business activity. Refer to the Firm's U.S. LCR Disclosure reports, which are available on the Firm's website for a further discussion of the Firm's LCR.

Other liquidity sources

In addition to the assets reported in the Firm's eligible HQLA above, the Firm had unencumbered marketable securities, such as equity and debt securities, that the Firm believes would be available to raise liquidity. This includes securities included as part of the excess eligible HQLA at JPMorgan Chase Bank, N.A. that are not transferable to non-bank affiliates. The fair value of these securities was approximately $740 billion and $315 billion as of December 31, 2020 and 2019, respectively, although the amount of liquidity that could be raised would be dependent on prevailing market conditions. The fair value increased compared to December 31, 2019, due to an increase in excess eligible HQLA at JPMorgan Chase Bank, N.A. which was primarily a result of increased deposits.

The Firm also had available borrowing capacity at FHLBs and the discount window at the Federal Reserve Bank as a result of collateral pledged by the Firm to such banks of approximately $307 billion and $322 billion as of December 31, 2020 and 2019, respectively. This borrowing capacity excludes the benefit of cash and securities reported in the Firm's eligible HQLA or other unencumbered securities that are currently pledged at the Federal Reserve Bank discount window and other central banks. Available borrowing capacity decreased from December 31, 2019 primarily due to lower pledged credit card receivable balances driven by the COVID-19 pandemic and a decrease in pledged mortgage collateral as a result of paydown and maturity activity. Although available, the Firm does not view this borrowing capacity at the Federal Reserve Bank discount window and the other central banks as a primary source of liquidity.

NSFR

The net stable funding ratio ("NSFR") is a liquidity requirement for large banking organizations that is intended to measure the adequacy of "available" and "required" amounts of stable funding over a one-year horizon. On October 20, 2020, the federal banking agencies issued a final NSFR rule under which large banking organizations such as the Firm will be required to maintain an NSFR of at least 100% on an ongoing basis. The final NSFR rule will become effective on July 1, 2021, and the Firm will be required to publicly disclose its quarterly average NSFR semi-annually beginning in 2023.

As of December 31, 2020 the Firm estimates that it was compliant with the 100% minimum NSFR based on its current understanding of the final rule.

Funding

Sources of funds

Management believes that the Firm's unsecured and secured funding capacity is sufficient to meet its on- and off-balance sheet obligations.

The Firm funds its global balance sheet through diverse sources of funding including stable deposits, secured and unsecured funding in the capital markets and stockholders' equity. Deposits are the primary funding source for JPMorgan Chase Bank, N.A. Additionally, JPMorgan Chase Bank, N.A. may also access funding through short- or long-term secured borrowings, through the issuance of unsecured long-term debt, or from borrowings from the Parent Company or the IHC. The Firm's non-bank subsidiaries are primarily funded from long-term unsecured borrowings and short-term secured borrowings, primarily securities loaned or sold under repurchase agreements. Excess funding is invested by Treasury and CIO in the Firm's investment securities portfolio or deployed in cash or other short-term liquid investments based on their interest rate and liquidity risk characteristics.

Deposits

The table below summarizes, by LOB and Corporate, the period-end and average deposit balances as of and for the years ended December 31, 2020 and 2019.

As of or for the year ended December 31, (in millions)	2020	2019	Average 2020	Average 2019
Consumer & Community Banking	$ 958,706	$ 723,418 [a]	$ 851,390	$ 698,378 [a]
Corporate & Investment Bank	702,215	511,905 [a]	655,095	515,938 [a]
Commercial Banking	284,263	184,115	237,645	172,666
Asset & Wealth Management	198,755	142,740 [a]	161,955	135,265 [a]
Corporate	318	253	666	820
Total Firm	$ 2,144,257	$ 1,562,431	$ 1,906,751	$ 1,523,067

(a) In the fourth quarter of 2020, the Firm realigned certain wealth management clients from AWM to the J.P. Morgan Wealth Management business unit within CCB. In the first quarter of 2020, the Merchant Services business was realigned from CCB to CIB as part of the Firm's Wholesale Payments business. Prior-period amounts have been revised to conform with the current presentation.

Deposits provide a stable source of funding and reduce the Firm's reliance on the wholesale funding markets. A significant portion of the Firm's deposits are consumer deposits and wholesale operating deposits, which are both considered to be stable sources of liquidity. Wholesale operating deposits are considered to be stable sources of liquidity because they are generated from customers that maintain operating service relationships with the Firm.

The table below shows the loan and deposit balances, the loans-to-deposits ratios, and deposits as a percentage of total liabilities, as of December 31, 2020 and 2019.

As of December 31, (in billions except ratios)	2020	2019
Deposits	$ 2,144.3	$ 1,562.4
Deposits as a % of total liabilities	69 %	64 %
Loans	1,012.9	997.6
Loans-to-deposits ratio	47 %	64 %

The Firm believes that average deposit balances are generally more representative of deposit trends than period-end deposit balances, over time. However, during periods of market disruption those trends could be affected.

Average deposits increased for the year ended December 31, 2020, reflecting significant inflows across the LOBs primarily driven by the impact of the COVID-19 pandemic and the related effect of certain government actions. In the wholesale businesses, while the inflows principally occurred in March as clients sought to remain liquid as a result of market conditions, balances continued to increase through the end of 2020. In CCB, the increase was driven by lower spending and higher cash balances across both consumer and small business customers, as well as growth from existing and new accounts.

Refer to the discussion of the Firm's Business Segment Results and the Consolidated Balance Sheets Analysis on pages 65–84 and pages 57-58, respectively, for further information on deposit and liability balance trends.

The following table summarizes short-term and long-term funding, excluding deposits, as of December 31, 2020 and 2019, and average balances for the years ended December 31, 2020 and 2019. Refer to the Consolidated Balance Sheets Analysis on pages 57-58 and Note 20 for additional information.

Sources of funds (excluding deposits)

As of or for the year ended December 31, (in millions)	2020	2019	Average 2020	Average 2019
Commercial paper	**$ 12,031**	$ 14,754	**$ 12,129**	$ 22,977
Other borrowed funds	**8,510**	7,544	**9,198**	10,369
Total short-term unsecured funding	**$ 20,541**	$ 22,298	**$ 21,327**	$ 33,346
Securities sold under agreements to repurchase[(a)]	**$ 207,877**	$ 175,709	**$ 246,354**	$ 217,807
Securities loaned[(a)]	**4,886**	5,983	**6,536**	8,816
Other borrowed funds[(b)]	**24,667**	18,622	**23,812**	26,050
Obligations of Firm-administered multi-seller conduits[(c)]	**10,523**	9,223	**11,430**	10,929
Total short-term secured funding	**$ 247,953**	$ 209,537	**$ 288,132**	$ 263,602
Senior notes	**$ 166,089**	$ 166,185	**$ 171,509**	$ 168,546
Subordinated debt	**21,608**	17,591	**20,789**	17,387
Structured notes[(d)]	**75,325**	74,724	**73,056**	65,487
Total long-term unsecured funding	**$ 263,022**	$ 258,500	**$ 265,354**	$ 251,420
Credit card securitization[(c)]	**$ 4,943**	$ 6,461	**$ 5,520**	$ 9,707
FHLB advances	**14,123**	28,635	**27,076**	34,143
Other long-term secured funding[(e)]	**4,540**	4,363	**4,460**	4,643
Total long-term secured funding	**$ 23,606**	$ 39,459	**$ 37,056**	$ 48,493
Preferred stock[(f)]	**$ 30,063**	$ 26,993	**$ 29,899**	$ 27,511
Common stockholders' equity[(f)]	**$ 249,291**	$ 234,337	**$ 236,865**	$ 232,907

(a) Primarily consists of short-term securities loaned or sold under agreements to repurchase.
(b) Effective March 2020, includes nonrecourse advances provided under the MMLF.
(c) Included in beneficial interests issued by consolidated variable interest entities on the Firm's Consolidated balance sheets.
(d) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.
(e) Includes long-term structured notes which are secured.
(f) Refer to Capital Risk Management on pages 91-101, Consolidated statements of changes in stockholders' equity on page 165, Note 21 and Note 22 for additional information on preferred stock and common stockholders' equity.

Short-term funding

The Firm's sources of short-term secured funding primarily consist of securities loaned or sold under agreements to repurchase. These instruments are secured predominantly by high-quality securities collateral, including government-issued debt and U.S. GSE and government agency MBS. Securities sold under agreements to repurchase increased at December 31, 2020, compared with December 31, 2019, reflecting higher secured financing of AFS investment securities in Treasury and CIO, as well as trading assets in CIB, partially offset by a decline in client-driven market-making activities in CIB, including the Firm's non-participation in the Federal Reserve's open market operations.

The balances associated with securities loaned or sold under agreements to repurchase fluctuate over time due to investment and financing activities of clients, the Firm's demand for financing, the ongoing management of the mix of the Firm's liabilities, including its secured and unsecured financing (for both the investment securities and market-making portfolios), and other market and portfolio factors.

As of December 31, 2020, the Firm participated in the MMLF government facility. The secured nonrecourse advances under the MMLF are included in other borrowed funds. Refer to Capital Risk Management on pages 91-101 for additional information on the MMLF.

The Primary Dealer Credit Facility ("PDCF") was established by the Federal Reserve on March 20, 2020. Under the PDCF, the Federal Reserve Bank of New York ("FRBNY") provides collateralized financing on a term basis to primary dealers. These financing transactions were reported as securities sold under agreements to repurchase. The Firm participated in the PDCF in the first quarter of 2020, and ceased its participation in May 2020 as the secured financing market normalized.

The Firm's sources of short-term unsecured funding consist of other borrowed funds and issuance of wholesale commercial paper. The decrease in short-term unsecured funding at December 31, 2020, from December 31, 2019 and for the average year ended December 31, 2020 compared to the prior year period, was due to lower net commercial paper issuance primarily for short-term liquidity management.

Long-term funding and issuance

Long-term funding provides an additional source of stable funding and liquidity for the Firm. The Firm's long-term funding plan is driven primarily by expected client activity, liquidity considerations, and regulatory requirements, including TLAC. Long-term funding objectives include maintaining diversification, maximizing market access and optimizing funding costs. The Firm evaluates various funding markets, tenors and currencies in creating its optimal long-term funding plan.

The significant majority of the Firm's long-term unsecured funding is issued by the Parent Company to provide flexibility in support of both bank and non-bank subsidiary funding needs. The Parent Company advances substantially all net funding proceeds to its subsidiary, the IHC. The IHC does not issue debt to external counterparties. The following table summarizes long-term unsecured issuance and maturities or redemptions for the years ended December 31, 2020 and 2019. Refer to Note 20 for additional information on long-term debt.

Long-term unsecured funding

Year ended December 31,	2020	2019	2020	2019
(Notional in millions)	Parent Company		Subsidiaries	
Issuance				
Senior notes issued in the U.S. market	$ **25,500**	$ 14,000	$ **60**	$ 1,750
Senior notes issued in non-U.S. markets	**1,355**	5,867	**–**	–
Total senior notes	**26,855**	19,867	**60**	1,750
Subordinated debt	**3,000**	–	**–**	–
Structured notes[(a)]	**7,596**	5,844	**24,185**	33,563
Total long-term unsecured funding – issuance	$ **37,451**	$ 25,711	$ **24,245**	$ 35,313
Maturities/redemptions				
Senior notes	$ **28,719**	$ 18,098	$ **7,701**	$ 5,367
Subordinated debt	**135**	183	**–**	–
Structured notes	**5,340**	2,944	**30,002**	19,271
Total long-term unsecured funding – maturities/redemptions	$ **34,194**	$ 21,225	$ **37,703**	$ 24,638

(a) Includes certain TLAC-eligible long-term unsecured debt issued by the Parent Company.

The Firm can also raise secured long-term funding through securitization of consumer credit card loans and through FHLB advances. The following table summarizes the securitization issuance and FHLB advances and their respective maturities or redemptions for the years ended December 31, 2020 and 2019.

Long-term secured funding

Year ended December 31,	Issuance		Maturities/Redemptions	
(in millions)	2020	2019	2020	2019
Credit card securitization	$ **1,000**	$ –	$ **2,525**	$ 6,975
FHLB advances	**15,000**	–	**29,509**	15,817
Other long-term secured funding[(a)]	**1,130**	204	**1,048**	927
Total long-term secured funding	$ **17,130**	$ 204	$ **33,082**	$ 23,719

(a) Includes long-term structured notes which are secured.

The Firm's wholesale businesses also securitize loans for client-driven transactions; those client-driven loan securitizations are not considered to be a source of funding for the Firm and are not included in the table above. Refer to Note 14 for a further description of client-driven loan securitizations.

Credit ratings

The cost and availability of financing are influenced by credit ratings. Reductions in these ratings could have an adverse effect on the Firm's access to liquidity sources, increase the cost of funds, trigger additional collateral or funding requirements and decrease the number of investors and counterparties willing to lend to the Firm. The nature and magnitude of the impact of ratings downgrades depends on numerous contractual and behavioral factors, which the Firm believes are incorporated in its liquidity risk and stress testing metrics. The Firm believes that it maintains sufficient liquidity to withstand a potential decrease in funding capacity due to ratings downgrades.

Additionally, the Firm's funding requirements for VIEs and other third-party commitments may be adversely affected by a decline in credit ratings.

The credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries as of December 31, 2020 were as follows:

	JPMorgan Chase & Co.			JPMorgan Chase Bank, N.A.			J.P. Morgan Securities LLC J.P. Morgan Securities plc		
December 31, 2020	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook	Long-term issuer	Short-term issuer	Outlook
Moody's Investors Service	A2	P-1	Stable	Aa2	P-1	Stable	Aa3	P-1	Stable
Standard & Poor's	A-	A-2	Stable	A+	A-1	Stable	A+	A-1	Stable
Fitch Ratings[(a)]	AA-	F1+	Negative	AA	F1+	Negative	AA	F1+	Negative

(a) On April 18, 2020, Fitch affirmed the credit ratings of the Parent Company and the Firm's principal bank and non-bank subsidiaries but revised the outlook on the credit ratings from stable to negative given expectations that credit fundamentals will deteriorate as a result of the COVID-19 pandemic.

JPMorgan Chase's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings, or stock price.

Critical factors in maintaining high credit ratings include a stable and diverse earnings stream, strong capital and liquidity ratios, strong credit quality and risk management controls, and diverse funding sources. Rating agencies continue to evaluate economic and geopolitical trends, regulatory developments, future profitability, risk management practices, and litigation matters, as well as their broader ratings methodologies. Changes in any of these factors could lead to changes in the Firm's credit ratings.

Reputation risk is the risk that an action or inaction may negatively impact perception of the Firm's integrity and reduce confidence in the Firm's competence by various constituents, including clients, counterparties, customers, investors, regulators, employees, communities or the broader public.

Organization and management

Reputation Risk Management establishes the governance framework for managing reputation risk across the Firm. As reputation risk is inherently challenging to identify, manage, and quantify, a reputation risk management function is critical.

The Firm's reputation risk management function includes the following activities:

- Maintaining a Firmwide Reputation Risk Governance policy and standards consistent with the reputation risk framework
- Managing the governance infrastructure and processes that support consistent identification, escalation, management and monitoring of reputation risk issues Firmwide
- Providing guidance to LOB Reputation Risk Offices ("RRO"), as appropriate

The types of events that give rise to reputation risk are wide-ranging and could be introduced in various ways, including by the Firm's employees and the clients, customers and counterparties the Firm does business with. These events could result in financial losses, litigation and regulatory fines, as well as other damages to the Firm.

Governance and oversight

The Reputation Risk Governance policy establishes the principles for managing reputation risk for the Firm. It is the responsibility of employees in each LOB and Corporate to consider the reputation of the Firm when deciding whether to offer a new product, engage in a transaction or client relationship, enter a new jurisdiction, initiate a business process or other matters. Sustainability, social responsibility and environmental impacts are important considerations in assessing the Firm's reputation risk, and are a component of the Firm's reputation risk governance.

Reputation risk issues deemed material are escalated as appropriate.

CREDIT AND INVESTMENT RISK MANAGEMENT

Credit and investment risk is the risk associated with the default or change in credit profile of a client, counterparty or customer; or loss of principal or a reduction in expected returns on investments, including consumer credit risk, wholesale credit risk, and investment portfolio risk.

Credit risk management

Credit risk is the risk associated with the default or change in credit profile of a client, counterparty or customer. The Firm provides credit to a variety of customers, ranging from large corporate and institutional clients to individual consumers and small businesses. In its consumer businesses, the Firm is exposed to credit risk primarily through its home lending, credit card, auto, and business banking businesses. In its wholesale businesses, the Firm is exposed to credit risk through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through its operating services activities (such as cash management and clearing activities), and securities financing activities. The Firm is also exposed to credit risk through its investment securities portfolio and cash placed with banks.

Credit Risk Management monitors, measures and manages credit risk throughout the Firm and defines credit risk policies and procedures. The Firm's credit risk management governance includes the following activities:

- Maintaining a credit risk policy framework
- Monitoring, measuring and managing credit risk across all portfolio segments, including transaction and exposure approval
- Setting industry and geographic concentration limits, as appropriate, and establishing underwriting guidelines
- Assigning and managing credit authorities in connection with the approval of credit exposure
- Managing criticized exposures and delinquent loans and
- Estimating credit losses and ensuring appropriate credit risk-based capital management

Risk identification and measurement

The Credit Risk Management function monitors, measures, manages and limits credit risk across the Firm's businesses. To measure credit risk, the Firm employs several methodologies for estimating the likelihood of obligor or counterparty default. Methodologies for measuring credit risk vary depending on several factors, including type of asset (e.g., consumer versus wholesale), risk measurement parameters (e.g., delinquency status and borrower's credit score versus wholesale risk-rating) and risk management and collection processes (e.g., retail collection center versus centrally managed workout groups). Credit risk measurement is based on the probability of default of an obligor or counterparty, the loss severity given a default event and the exposure at default.

Based on these factors and the methodology and estimates described in Note 13 and Note 10, the Firm estimates credit losses for its exposures. The allowance for loan losses reflects credit losses related to the consumer and wholesale held-for-investment loan portfolios, the allowance for lending-related commitments reflects credit losses related to the Firm's lending-related commitments and the allowance for investment securities reflects the credit losses related to the Firm's HTM and AFS securities. Refer to Note 13, Note 10 and Critical Accounting Estimates used by the Firm on pages 152-155 for further information.

In addition, potential and unexpected credit losses are reflected in the allocation of credit risk capital and represent the potential volatility of actual losses relative to the established allowances for loan losses and lending-related commitments. The analyses for these losses include stress testing that considers alternative economic scenarios as described in the Stress testing section below.

Stress testing

Stress testing is important in measuring and managing credit risk in the Firm's credit portfolio. The stress testing process assesses the potential impact of alternative economic and business scenarios on estimated credit losses for the Firm. Economic scenarios and the underlying parameters are defined centrally, articulated in terms of macroeconomic factors and applied across the businesses. The stress test results may indicate credit migration, changes in delinquency trends and potential losses in the credit portfolio. In addition to the periodic stress testing processes, management also considers additional stresses outside these scenarios, including industry and country-specific stress scenarios, as necessary. The Firm uses stress testing to inform decisions on setting risk appetite both at a Firm and LOB level, as well as to assess the impact of stress on individual counterparties.

Risk monitoring and management

The Firm has developed policies and practices that are designed to preserve the independence and integrity of the approval and decision-making process of extending credit to ensure credit risks are assessed accurately, approved properly, monitored regularly and managed actively at both the transaction and portfolio levels. The policy framework establishes credit approval authorities, concentration limits, risk-rating methodologies, portfolio review parameters and guidelines for management of distressed exposures. In addition, certain models, assumptions and inputs used in evaluating and monitoring credit risk are independently validated by groups that are separate from the LOBs.

Consumer credit risk is monitored for delinquency and other trends, including any concentrations at the portfolio level, as certain of these trends can be modified through changes in underwriting policies and portfolio guidelines. Consumer Risk Management evaluates delinquency and other trends against business expectations, current and forecasted economic conditions, and industry benchmarks. Historical and forecasted economic performance and trends are incorporated into the modeling of estimated consumer credit losses and are part of the monitoring of the credit risk profile of the portfolio.

Wholesale credit risk is monitored regularly at an aggregate portfolio, industry, and individual client and counterparty level with established concentration limits that are reviewed and revised periodically as deemed appropriate by management. Industry and counterparty limits, as measured in terms of exposure and economic risk appetite, are subject to stress-based loss constraints. Wrong-way risk is the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing.

Management of the Firm's wholesale credit risk exposure is accomplished through a number of means, including:

- Loan underwriting and credit approval process
- Loan syndications and participations
- Loan sales and securitizations
- Credit derivatives
- Master netting agreements, and
- Collateral and other risk-reduction techniques

In addition to Credit Risk Management, an independent Credit Review function is responsible for:

- Independently validating or changing the risk grades assigned to exposures in the Firm's wholesale credit portfolio, and assessing the timeliness of risk grade changes initiated by responsible business units; and
- Evaluating the effectiveness of business units' credit management processes, including the adequacy of credit analyses and risk grading/LGD rationales, proper monitoring and management of credit exposures, and compliance with applicable grading policies and underwriting guidelines.

Refer to Note 12 for further discussion of consumer and wholesale loans.

Risk reporting

To enable monitoring of credit risk and effective decision-making, aggregate credit exposure, credit quality forecasts, concentration levels and risk profile changes are reported regularly to senior members of Credit Risk Management. Detailed portfolio reporting of industry, clients, counterparties and customers, product and geography are prepared, and the appropriateness of the allowance for credit losses is reviewed by senior management at least on a quarterly basis. Through the risk reporting and governance structure, credit risk trends and limit exceptions are provided regularly to, and discussed with, risk committees, senior management and the Board of Directors.

CREDIT PORTFOLIO

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption resulted in a change in the accounting for PCI loans, which are considered PCD loans under CECL. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

The Firm has provided various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered troubled debt restructurings ("TDRs") because:

- they represent short-term or other insignificant modifications, whether under the Firm's regular loan modification assessments or the IA Statement guidance, or
- the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs provided by the CARES Act and extended by the Consolidated Appropriations Act.

To the extent that certain modifications do not meet any of the above criteria, the Firm accounts for them as TDRs. The Firm considers expected losses of principal and accrued interest associated with all COVID-19 related loan modifications in its allowance for credit losses. Refer to Business Developments on pages 50-51 for more information on customer and client assistance granted. Refer to Notes 12 and 13 for further information on the Firm's accounting policies on loan modifications and the allowance for credit losses.

The effectiveness of the Firm's actions in helping borrowers recover and in mitigating the Firm's credit losses remains uncertain in light of the unpredictable nature and duration of the COVID-19 pandemic. Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers and clients who would have otherwise moved into past due or nonaccrual status. Refer to Consumer Credit Portfolio on pages 114-120 and Wholesale Credit Portfolio on pages 121-131 for information on loan modifications as of December 31, 2020.

In the following tables, reported loans include loans retained (i.e., held-for-investment); loans held-for-sale; and certain loans accounted for at fair value. The following tables do not include loans which the Firm accounts for at fair value and classifies as trading assets; refer to Notes 2 and 3 for further information regarding these loans. Refer to Notes 12, 28, and 5 for additional information on the Firm's loans, lending-related commitments and derivative receivables, including the Firm's accounting policies.

Refer to Note 10 for information regarding the credit risk inherent in the Firm's investment securities portfolio; and refer to Note 11 for information regarding credit risk inherent in the securities financing portfolio. Refer to Consumer Credit Portfolio on pages 114-120 and Note 12 for further discussions of the consumer credit environment and consumer loans. Refer to Wholesale Credit Portfolio on pages 121-131 and Note 12 for further discussions of the wholesale credit environment and wholesale loans.

Total credit portfolio

December 31, (in millions)	Credit exposure 2020	Credit exposure 2019	Nonperforming[f][g] 2020	Nonperforming[f][g] 2019
Loans retained	**$ 960,506**	$ 945,601	**$ 8,782**	$ 3,983
Loans held-for-sale	**7,873**	7,064	**284**	7
Loans at fair value [a]	**44,474**	44,955	**1,507**	647
Total loans – reported	**1,012,853**	997,620	**10,573**	4,637
Derivative receivables	**79,630**	49,766	**56**	30
Receivables from customers[b]	**47,710**	33,706	**–**	–
Total credit-related assets	**1,140,193**	1,081,092	**10,629**	4,667
Assets acquired in loan satisfactions				
Real estate owned	**NA**	NA	**256**	344
Other	**NA**	NA	**21**	43
Total assets acquired in loan satisfactions	**NA**	NA	**277**	387
Lending-related commitments[a]	**1,165,688**	1,108,399	**577**	474
Total credit portfolio	**$ 2,305,881**	$ 2,189,491	**$ 11,483**	$ 5,528
Credit derivatives used in credit portfolio management activities[c][d]	**$ (22,239)**	$ (18,530)	**$ –**	$ –
Liquid securities and other cash collateral held against derivatives[e]	**(14,806)**	(13,052)	**NA**	NA

Year ended December 31, (in millions, except ratios)	2020	2019
Net charge-offs	**$ 5,259**	$ 5,629
Average retained loans	**958,303**	941,919
Net charge-off rates	**0.55 %**	0.60 %

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.

(b) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.

(c) Represents the net notional amount of protection purchased and sold through credit derivatives used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. Refer to Credit derivatives on page 131 and Note 5 for additional information.

(d) Prior-period amount has been revised to conform with the current presentation.

(e) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.

(f) At December 31, 2020 and 2019, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $874 million and $1.1 billion, respectively, and real estate owned ("REO") insured by U.S. government agencies of $9 million and $41 million, respectively. Prior-period amount of mortgage loans 90 or more days past due and insured by U.S. government agencies excluded from nonperforming assets has been revised to conform with the current presentation; refer to footnote (a) for additional information. These amounts have been excluded based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.

(g) At December 31, 2020, nonperforming loans included $1.6 billion of PCD loans on nonaccrual status. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.

Paycheck Protection Program

The PPP, established by the CARES Act and implemented by the SBA, provided the Firm with delegated authority to process and originate PPP loans. When certain criteria are met, PPP loans are subject to forgiveness and the Firm will receive payment of the forgiveness amount from the SBA. PPP loans have a contractual term of two or five years and provide borrowers with an automatic payment deferral of principal and interest. Given that PPP loans are guaranteed by the SBA, the Firm does not expect to realize material credit losses on these loans. PPP processing fees are deferred and accreted into interest income over the contractual life of the loans, but may be accelerated upon forgiveness or prepayment. The impact on interest income related to PPP loans was not material for the year ended December 31, 2020.

The Firm was in the early stages of the PPP loan forgiveness process at December 31, 2020.

At December 31, 2020, the Firm had approximately $27 billion of loans under the PPP, of which $19 billion are in the consumer portfolio and $8 billion are in the wholesale portfolio.

CONSUMER CREDIT PORTFOLIO

The Firm's retained consumer portfolio consists primarily of residential real estate loans, credit card loans, scored auto and business banking loans, as well as associated lending-related commitments. The Firm's focus is on serving primarily the prime segment of the consumer credit market. Originated mortgage loans are retained in the residential real estate portfolio, securitized or sold to U.S. government agencies and U.S. government-sponsored enterprises; other types of consumer loans are typically retained on the balance sheet. Refer to Note 12 for further information on the consumer loan portfolio. Refer to Note 28 for further information on lending-related commitments.

In 2020, the allowance for credit losses increased, reflecting the deterioration in and uncertainty around the future macroeconomic environment as a result of the impact of the COVID-19 pandemic. Net charge-offs for the year ended December 31, 2020 decreased when compared to December 31, 2019, benefiting from payment assistance and government stimulus. The potential for increased infection rates and related lock downs, as well as the duration and effectiveness of government and other consumer relief measures remains uncertain which could have a longer term impact on delinquency rates and net charge-offs.

The following table presents consumer credit-related information with respect to the scored credit portfolio held in CCB, AWM, CIB and Corporate.

Consumer credit portfolio

As of or for the year ended December 31, (in millions, except ratios)	Credit exposure		Nonaccrual loans[j][k][l]		Net charge-offs/ (recoveries)		Net charge-off/ (recovery) rate[m]	
	2020	2019	**2020**	2019	**2020**	2019	**2020**	2019
Consumer, excluding credit card								
Residential real estate[a]	**$ 225,302**	$ 243,317	**$ 5,313**	$ 2,780	**$ (164)**	$ (92)	**(0.07)%**	(0.04)%
Auto and other[b][c][d]	**76,825**	51,682	**151**	$ 146	**338**	$ 456	**0.51** [d]	0.88
Total loans - retained	**302,127**	294,999	**5,464**	2,926	**174**	364	**0.06**	0.12
Loans held-for-sale	**1,305**	3,002	**—**	2	**NA**	NA	**NA**	NA
Loans at fair value[e][f]	**15,147**	19,816	**1,003**	438	**NA**	NA	**NA**	NA
Total consumer, excluding credit card loans	**318,579**	317,817	**6,467**	3,366	**174**	364	**0.06**	0.12
Lending-related commitments[g]	**57,319**	40,169						
Total consumer exposure, excluding credit card	**375,898**	357,986						
Credit Card								
Loans retained[h]	**143,432**	168,924	**NA**	NA	**4,286**	4,848	**2.93**	3.10
Loans held-for-sale	**784**	—	**NA**	NA	**NA**	NA	**NA**	NA
Total credit card loans	**144,216**	168,924	**NA**	NA	**4,286**	4,848	**2.93**	3.10
Lending-related commitments[g][i]	**658,506**	650,720						
Total credit card exposure[i]	**802,722**	819,644						
Total consumer credit portfolio[i]	**$ 1,178,620**	$ 1,177,630	**$ 6,467**	$ 3,366	**$ 4,460**	$ 5,212	**0.99 %**	1.11 %

(a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in Corporate.
(b) At December 31, 2020 and 2019, excluded operating lease assets of $20.6 billion and $22.8 billion, respectively. These operating lease assets are included in other assets on the Firm's Consolidated balance sheets. Refer to Note 18 for further information.
(c) Includes scored auto and business banking loans and overdrafts.
(d) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP. Given that PPP loans are guaranteed by the SBA, the Firm does not expect to realize material credit losses on these loans. Refer to Credit Portfolio on pages 112-113 for a further discussion of the PPP.
(e) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(f) Includes scored mortgage loans held in CCB and CIB.
(g) Credit card, home equity and certain business banking lending-related commitments represent the total available lines of credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit would be used at the same time. For credit card commitments, and if certain conditions are met, home equity commitments and certain business banking commitments, the Firm can reduce or cancel these lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to Note 28 for further information.
(h) Includes billed interest and fees.
(i) Also includes commercial card lending-related commitments primarily in CB and CIB.
(j) At December 31, 2020 and 2019, nonaccrual loans excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $874 million and $1.1 billion, respectively. Prior-period amount of mortgage loans 90 or more days past due and insured by U.S. government agencies excluded from nonaccrual loans has been revised to conform with the current presentation; refer to footnote (e) for additional information. These amounts have been excluded from nonaccrual loans based upon the government guarantee. In addition, the Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status, as permitted by regulatory guidance.
(k) At December 31, 2020, nonaccrual loans included $1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.
(l) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent. Collateral-dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.
(m) Average consumer loans held-for-sale and loans at fair value were $18.3 billion and $20.4 billion for the years ended December 31, 2020 and 2019, respectively. Prior-period amounts have been revised to conform with the current presentation; refer to footnote (e) for additional information. These amounts were excluded when calculating net charge-off/(recovery) rates.

Consumer assistance

In March 2020, the Firm began providing assistance to customers in response to the COVID-19 pandemic, predominantly in the form of payment deferrals.

As of December 31, 2020, the Firm had $10.7 billion of retained loans under payment deferral programs, which represented a decrease of approximately $1.5 billion from September 30, 2020 and $17.5 billion from June 30, 2020. During the fourth quarter of 2020, there were approximately $1.4 billion of new enrollments in payment deferral programs predominantly in residential real estate and credit card. Predominantly all borrowers that exited payment deferral programs are current. The Firm continues to monitor the credit risk associated with loans subject to payment deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments and considers expected losses of principal and accrued interest on these loans in its allowance for credit losses.

	December 31, 2020			September 30, 2020	June 30, 2020	
(in millions, except ratios)	Loan balance	Percent of loan class balance[e]	Percent of accounts who exited payment deferral and are current	Loan balance	Loan balance	Type of assistance
Residential real estate[a][b]	**$ 10,106**	**4.5 %**	**95 %**	$ 11,458	$ 20,548	Rolling three month payment deferral up to one year; in most cases, deferred payments will be due at the end of the loan term
Auto and other[c]	**377**	**0.5**	**94**	457	3,357	• Auto: Currently offering one month payment deferral (initially offered three month payment deferral). Maturity date is extended by number of months deferred • Business Banking: Three month deferral with automatic deferment to either maturity (loan) or one year forward (line)
Credit card	**264**	**0.2**	**90** [f]	368	4,384	Currently offering deferral of one month minimum payment (initially offered three month minimum payment deferral). Interest continues to accrue during the deferral period and is added to the principal balance
Total consumer[d]	**$ 10,747**	**2.4 %**	**91 %**	$ 12,283	$ 28,289	

(a) Excludes $13.4 billion, $17.1 billion and $34.0 billion of third-party mortgage loans serviced at December 31, 2020, September 30, 2020 and June 30, 2020, respectively.
(b) The weighted average LTV ratio of residential real estate loans under payment deferral at December 31, 2020 was 57%.
(c) Excludes risk-rated business banking and auto dealer loans held in CCB and auto operating lease assets that were still under payment deferral programs as of December 31, 2020, September 30, 2020 and June 30, 2020. Auto operating lease asset payment assistance is currently offering one month payment deferral (initially offered three month payment deferral). Deferrals do not extend the term of the lease and all deferred payments are due at the end of the lease term.
(d) Includes $3.8 billion, $3.8 billion and $5.7 billion of loans that were accounted for as TDRs prior to payment deferral as of December 31, 2020, September 30, 2020 and June 30, 2020, respectively.
(e) Represents the unpaid principal balance of retained loans which were still under payment deferral programs, divided by the total unpaid principal balance of the respective loan classes retained loans.
(f) 85% of the balance that exited deferral were current at December 31, 2020.

Of the $10.7 billion of loans still under payment deferral programs as of December 31, 2020, approximately $4.0 billion were accounted for as TDRs, either because they were accounted for as TDRs prior to payment deferral, or because they did not qualify for or the Firm did not elect the option to suspend TDR accounting guidance provided by the CARES Act and extended by the Consolidated Appropriations Act. A portion of the remaining $6.7 billion of loans could become TDRs in future periods, depending on the nature and timing of further modifications or payment arrangements offered to these borrowers. If the remaining $6.7 billion of loans were considered TDRs, the Firm estimates that it would result in an increase in standardized RWA of as much as $2.5 billion.

Predominantly all borrowers, including those accounted for as TDRs, were current upon enrollment in payment deferral programs and are expected to exit payment deferral programs in a current status, either because no payments are contractually due during the deferral period or because payments originally contractually due during the deferral period will be due at maturity upon exit. For those borrowers that are unable to resume making payments in accordance with the original or modified contractual terms of their agreements upon exit from deferral programs, they will be placed on nonaccrual status in line with the Firm's nonaccrual policy, except for credit cards as permitted by regulatory guidance, and charged off or down in accordance with the Firm's charge-off policies. Refer to Note 12 for additional information on the Firm's nonaccrual and charge-off policies.

Consumer, excluding credit card

Portfolio analysis

Loan balances were flat from December 31, 2019 as PPP loan originations in Business Banking were offset by lower residential real estate loans, reflecting paydowns.

The following discussions provide information concerning individual loan products. Refer to Note 12 for further information about this portfolio, including information about delinquencies, loan modifications and other credit quality indicators.

Residential real estate: The residential real estate portfolio, including loans held-for-sale and loans at fair value, predominantly consists of prime mortgage loans and home equity lines of credit. The portfolio decreased from December 31, 2019 driven by paydowns largely offset by originations of prime mortgage loans that have been retained on the balance sheet. The 30+ delinquency rate decreased to 0.98% at December 31, 2020, from 1.35% at December 31, 2019, primarily due to payment assistance and government stimulus. Nonaccrual loans increased from December 31, 2019 due primarily to loans placed on nonaccrual status related to the impact of the COVID-19 pandemic as well as the adoption of CECL, as PCD loans became subject to nonaccrual treatment. Net recoveries for the year ended December 31, 2020 were higher when compared with the prior year as the current year benefited from a recovery on a loan sale.

The carrying value of home equity lines of credit outstanding was $23.7 billion at December 31, 2020. This amount included $8.6 billion of HELOCs that have recast from interest-only to fully amortizing payments or have been modified and $7.7 billion of interest-only balloon HELOCs, which primarily mature after 2030. The Firm manages the risk of HELOCs during their revolving period by closing or reducing the undrawn line to the extent permitted by law when borrowers are exhibiting a material deterioration in their credit risk profile.

At December 31, 2020 and 2019, the carrying value of interest-only residential mortgage loans were $25.6 billion and $22.5 billion, respectively. These loans have an interest-only payment period generally followed by an adjustable-rate or fixed-rate fully amortizing payment period to maturity and are typically originated as higher-balance loans to higher-income borrowers, predominantly in AWM. The net charge-off rate for the year ended December 31, 2020 was consistent with the rate of the broader residential mortgage portfolio as the performance of this portfolio is generally in line with the performance of the broader residential mortgage portfolio.

The following table provides a summary of the Firm's residential mortgage portfolio insured and/or guaranteed by U.S. government agencies, predominantly loans held-for-sale and loans at fair value. The Firm monitors its exposure to certain potential unrecoverable claim payments related to government-insured loans and considers this exposure in estimating the allowance for loan losses.

(in millions)	December 31, 2020	December 31, 2019
Current	$ 669	$ 1,432
30-89 days past due	235	704
90 or more days past due	874	1,090
Total government guaranteed loans[a]	$ 1,778	$ 3,226

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

Geographic composition and current estimated loan-to-value ratio of residential real estate loans

At December 31, 2020, $146.6 billion, or 65% of the total retained residential real estate loan portfolio, excluding mortgage loans insured by U.S. government agencies, were concentrated in California, New York, Florida, Texas and Illinois, compared with $157.9 billion, or 65%, at December 31, 2019.

Average current estimated loan-to-value ("LTV") ratios have declined consistent with recent improvements in home prices, customer pay-downs, and charge-offs or liquidations of higher LTV loans.

Refer to Note 12 for information on the geographic composition and current estimated LTVs of the Firm's residential real estate loans.

Modified residential real estate loans

The following table presents information relating to modified retained residential real estate loans for which concessions have been granted to borrowers experiencing financial difficulty, which include both TDRs and modified loans accounted for as PCI loans prior to the adoption of CECL. The following table does not include loans with short-term or other insignificant modifications that are not considered concessions and, therefore, are not TDRs, or loans for which the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act. Refer to Note 12 for further information on modifications for the years ended December 31, 2020 and 2019.

(in millions)		December 31, 2020	December 31, 2019	
Retained loans[a]	$	15,406	5,926	
PCI loans		NA	12,372	[d]
Nonaccrual retained loans[b][c]	$	3,899	2,332	

(a) At December 31, 2020 and 2019, $7 million and $14 million, respectively, of loans modified subsequent to repurchase from Ginnie Mae in accordance with the standards of the appropriate government agency (i.e., Federal Housing Administration ("FHA"), U.S. Department of Veterans Affairs ("VA"), Rural Housing Service of the U.S. Department of Agriculture ("RHS")) are not included in the table above. When such loans perform subsequent to modification in accordance with Ginnie Mae guidelines, they are generally sold back into Ginnie Mae loan pools. Modified loans that do not re-perform become subject to foreclosure. Refer to Note 14 for additional information about sales of loans in securitization transactions with Ginnie Mae.

(b) At December 31, 2020 and 2019, nonaccrual loans included $3.0 billion and $1.9 billion, respectively, of TDRs for which the borrowers were less than 90 days past due. Refer to Note 12 for additional information about loans modified in a TDR that are on nonaccrual status.

(c) At December 31, 2020, nonaccrual loans included $1.3 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.

(d) Amount represents the unpaid principal balance of modified PCI loans at December 31, 2019, which were moved to retained loans upon the adoption of CECL.

Auto and other: The auto and other loan portfolio predominantly consists of prime-quality scored auto and business banking loans, as well as overdrafts. The portfolio increased when compared with December 31, 2019, predominantly due to PPP loan originations of $21.9 billion in Business Banking of which $19.2 billion remained outstanding at December 31, 2020 as well as from growth in the auto portfolio from loan originations, partially offset by paydowns and charge-offs or liquidation of delinquent loans. The 30+ delinquency rate decreased to 0.60% at December 31, 2020, from 1.31% at December 31, 2019, primarily due to payment assistance and government stimulus, as well as PPP loan originations as these loans are all considered current. The scored auto portfolio net charge-off rates were 0.25% and 0.44% for the years ended December 31, 2020 and 2019, respectively. Auto charge-offs for the year ended December 31, 2020 benefited from payment assistance programs and high vehicle collateral values.

Nonperforming assets

The following table presents information as of December 31, 2020 and 2019, about consumer, excluding credit card, nonperforming assets.

Nonperforming assets[a]

December 31, (in millions)		2020		2019
Nonaccrual loans				
Residential real estate[b][c][d]	**$**	**6,316**	$	3,220
Auto and other		**151**		146
Total nonaccrual loans		**6,467**		3,366
Assets acquired in loan satisfactions				
Real estate owned[e]		**131**		229
Other		**21**		24
Total assets acquired in loan satisfactions		**152**		253
Total nonperforming assets	**$**	**6,619**	$	3,619

(a) At December 31, 2020 and 2019, nonperforming assets excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $874 million and $1.1 billion, respectively, and REO insured by U.S. government agencies of $9 million and $41 million, respectively. Prior-period amount of mortgage loans 90 or more days past due and insured by U.S. government agencies excluded from nonperforming assets has been revised to conform with the current presentation; refer to footnote (b) for additional information. These amounts have been excluded based upon the government guarantee.

(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

(c) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent. Collateral-dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.

(d) At December 31, 2020, nonaccrual loans included $1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.

(e) Prior-period amount has been revised to conform with the current presentation.

Nonaccrual loans

The following table presents changes in consumer, excluding credit card, nonaccrual loans for the years ended December 31, 2020 and 2019.

Nonaccrual loan activity[(a)]

Year ended December 31, (in millions)	2020		2019
Beginning balance	$ 3,366		$ 3,853
Additions:			
PCD loans, upon adoption of CECL	708		NA
Other additions	5,184	(c)	2,174
Total additions	**5,892**		**2,174**
Reductions:			
Principal payments and other[(b)]	983		1,167
Charge-offs	390		371
Returned to performing status	1,024		751
Foreclosures and other liquidations	394		372
Total reductions	**2,791**		2,661
Net changes	**3,101**		(487)
Ending balance	**$ 6,467**		$ 3,366

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(b) Other reductions includes loan sales.
(c) Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent. Collateral-dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.

Active and suspended foreclosure: Refer to Note 12 for information on loans that were in the process of active or suspended foreclosure.

Refer to Note 12 for further information about the consumer credit portfolio, including information about delinquencies, loan modifications and other credit quality indicators.

Purchased credit deteriorated ("PCD") loans

The following tables provide credit-related information for PCD loans, which were accounted for as PCI loans prior to the adoption of CECL. PCI loans are considered PCD loans under CECL and are subject to the Firm's nonaccrual and charge-off policies. PCD loans are now reported in the consumer, excluding credit card portfolio's residential real estate class. Refer to Note 1 for further information.

(in millions, except ratios)	December 31, 2020	December 31, 2019
Loan delinquency[(a)]		
Current	$ 16,036	$ 18,571
30-149 days past due	432	970
150 or more days past due[(b)]	573	822
Total PCD loans	**$ 17,041**	$ 20,363
% of 30+ days past due to total retained PCD loans	5.90 %	8.80 %
Nonaccrual loans[(c)]	$ 1,609	NA

(in millions, except ratios)	Twelve months ended December 31, 2020
Net charge-offs	$ 74
Net charge-off rate	0.39 %

(a) At December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(b) Includes loans to customers that have exited COVID-19 payment deferral programs and are 150 or more days past due and therefore considered collateral-dependent. Collateral dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.
(c) Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent.

Credit card

Total credit card loans decreased from December 31, 2019 reflecting a decline in sales volume that began in March as a result of the impact of the COVID-19 pandemic. The December 31, 2020 30+ and 90+ day delinquency rates of 1.68% and 0.92%, respectively, decreased compared to the December 31, 2019 30+ and 90+ day delinquency rates of 1.87% and 0.95%, respectively. The delinquency rates were positively impacted by borrowers who received payment assistance and government stimulus. Net charge-offs decreased for the year ended December 31, 2020 compared with the prior year reflecting lower charge-offs and higher recoveries primarily benefiting from payment assistance and government stimulus.

Consistent with the Firm's policy, all credit card loans typically remain on accrual status until charged off. However, the Firm's allowance for loan losses includes the estimated uncollectible portion of accrued and billed interest and fee income. Refer to Note 12 for further information about this portfolio, including information about delinquencies.

Geographic and FICO composition of credit card loans

At December 31, 2020, $65.0 billion, or 45% of the total retained credit card loan portfolio, was concentrated in California, Texas, New York, Florida and Illinois, compared with $77.5 billion, or 46%, at December 31, 2019. Refer to Note 12 for additional information on the geographic and FICO composition of the Firm's credit card loans.

Modifications of credit card loans

At December 31, 2020, the Firm had $1.4 billion of credit card loans outstanding that have been modified in TDRs, which does not include loans with short-term or other insignificant modifications that are not considered TDRs, compared to $1.5 billion at December 31, 2019. Refer to Note 12 for additional information about loan modification programs for borrowers.

In its wholesale businesses, the Firm is exposed to credit risk primarily through its underwriting, lending, market-making, and hedging activities with and for clients and counterparties, as well as through various operating services (such as cash management and clearing activities), securities financing activities and cash placed with banks. A portion of the loans originated or acquired by the Firm's wholesale businesses is generally retained on the balance sheet. The Firm distributes a significant percentage of the loans that it originates into the market as part of its syndicated loan business and to manage portfolio concentrations and credit risk. The wholesale portfolio is actively managed, in part by conducting ongoing, in-depth reviews of client credit quality and transaction structure inclusive of collateral where applicable, and of industry, product and client concentrations. Refer to the industry discussion on pages 123-127 for further information.

The Firm's wholesale credit portfolio includes exposure held in CIB, CB, AWM and Corporate, as well as risk-rated business banking and auto dealer exposures held in CCB for which the wholesale methodology is applied when determining the allowance for credit losses.

In 2020, the impacts of the COVID-19 pandemic resulted in broad-based credit deterioration and an increase in the allowance for credit losses. As of December 31, 2020, the investment-grade percentage of the portfolio decreased from 74% to 71%, and criticized exposure increased $26.5 billion from $15.1 billion to $41.6 billion. The increase in criticized exposure was largely driven by downgrades in Consumer & Retail, Oil & Gas and Real Estate, and to a lesser extent, net portfolio activity in Technology, Media & Telecommunications. The continuation or worsening of the effects of the COVID-19 pandemic on the macroeconomic environment could result in further impacts to credit quality metrics, including investment-grade percentages, as well as to criticized and nonperforming exposures and charge-offs.

As of December 31, 2020 retained loans were up $33.3 billion predominantly driven by AWM and CIB, and lending-related commitments were up $32.4 billion, predominantly driven by CIB and CB.

Wholesale credit portfolio

December 31, (in millions)	Credit exposure		Nonperforming[f]	
	2020	2019	**2020**	2019
Loans retained	**$ 514,947**	$ 481,678	**$ 3,318**	$ 1,057
Loans held-for-sale	**5,784**	4,062	**284**	5
Loans at fair value [a]	**29,327**	25,139	**504**	209
Loans – reported	**550,058**	510,879	**4,106**	1,271
Derivative receivables	**79,630**	49,766	**56**	30
Receivables from customers[b]	**47,710**	33,706	**—**	—
Total wholesale credit-related assets	**677,398**	594,351	**4,162**	1,301
Assets acquired in loan satisfactions				
Real estate owned [c]	**NA**	NA	**125**	115
Other	**NA**	NA	**—**	19
Total assets acquired in loan satisfactions	**NA**	NA	**125**	134
Lending-related commitments [a]	**449,863**	417,510	**577**	474
Total wholesale credit portfolio	**$1,127,261**	$1,011,861	**$ 4,864**	$ 1,909
Credit derivatives used in credit portfolio management activities[c][d]	**$ (22,239)**	$ (18,530)	**$ —**	$ —
Liquid securities and other cash collateral held against derivatives[e]	**(14,806)**	(13,052)	**NA**	NA

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.
(b) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM; these are reported within accrued interest and accounts receivable on the Consolidated balance sheets.
(c) Prior-period amounts have been revised to conform with the current presentation.
(d) Represents the net notional amount of protection purchased and sold through credit derivatives used to manage both performing and nonperforming wholesale credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. Refer to Credit derivatives on page 131 and Note 5 for additional information.
(e) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.
(f) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2020, predominantly all of these loans were considered performing.

Wholesale assistance

In March 2020, the Firm began providing assistance to clients in response to the COVID-19 pandemic, predominantly in the form of payment deferrals and covenant modifications.

As of December 31, 2020, the Firm had approximately $1.6 billion of retained loans still under payment deferral, which has decreased approximately $4.6 billion from the third quarter, and $15.1 billion from the second quarter. Predominantly all clients that exited deferral are current or have paid down their loans, and the Firm has not experienced significant new payment deferral requests. The Firm continues to monitor the credit risk associated with loans subject to deferrals throughout the deferral period and on an ongoing basis after the borrowers are required to resume making regularly scheduled payments and considers expected losses of principal and accrued interest on these loans in its allowance for credit losses.

(in millions, except ratios)	December 31, 2020			September 30, 2020	June 30, 2020
Industry	Loan balance	Percent of total industry loan balance[(a)]	IG percentage of loan balance in payment deferral	Loan balance	Loan balance
Real Estate	$ 550	0.46 %	36 %	$ 4,385	$ 5,211
Individuals and Individual Entities	402	0.37	4	691	809
Transportation	394	5.99	92	346	294
Consumer & Retail	82	0.21	2	413	690
Automotive	22	0.13	–	15	8,827
Industrials	19	0.09	–	91	335
Healthcare	7	0.04	–	100	300
All Other industries	147	0.08	99	233	309
Total wholesale	$ 1,623	0.32 %	45 %	$ 6,274	$ 16,775

(a) Represents the balance of the retained loans which were still under payment deferral, divided by the respective industry total retained loans balance.

In addition, the Firm granted assistance in the form of covenant modifications. These types of assistance, both payment deferrals and covenant modifications, are generally not reported as TDRs, either because the modifications were insignificant or they qualified for the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act. A portion of the $1.6 billion of loans under payment deferral as December 31, 2020 could become TDRs in future periods, depending on the nature and timing of further modifications or payment arrangements offered to these borrowers. If the $1.6 billion of loans under payment deferral were considered TDRs, the Firm estimates that it would result in an increase in standardized RWA of as much as $500 million. Loans under assistance continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2020, predominantly all of these loans were considered performing.

Wholesale credit exposure – maturity and ratings profile

The following tables present the maturity and internal risk ratings profiles of the wholesale credit portfolio as of December 31, 2020 and 2019. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and takes into consideration collateral and structural support when determining the internal risk rating for each credit facility. Refer to Note 12 for further information on internal risk ratings.

	Maturity profile[(g)]				Ratings profile			
December 31, 2020 (in millions, except ratios)	1 year or less	1 year through 5 years	After 5 years	**Total**	Investment-grade	Noninvestment-grade	**Total**	Total % of IG
Loans retained	$ 183,969	$ 197,905	$ 133,073	$ 514,947	$ 379,273	$ 135,674	$ 514,947	74 %
Derivative receivables				79,630			79,630	
Less: Liquid securities and other cash collateral held against derivatives[(b)]				(14,806)			(14,806)	
Total derivative receivables, net of collateral	18,456	17,599	28,769	64,824	38,941	25,883	64,824	60
Lending-related commitments[(c)]	116,950	315,179	17,734	449,863	312,694	137,169	449,863	70
Subtotal	319,375	530,683	179,576	1,029,634	730,908	298,726	1,029,634	71
Loans held-for-sale and loans at fair value[(c)(d)]				35,111			35,111	
Receivables from customers				47,710			47,710	
Total exposure – net of liquid securities and other cash collateral held against derivatives				$ 1,112,455			$ 1,112,455	
Credit derivatives used in credit portfolio management activities[(e)(f)]	$ (6,190)	$ (13,223)	$ (2,826)	$ (22,239)	$ (17,860)	$ (4,379)	$ (22,239)	80 %

December 31, 2019 (in millions, except ratios)	Maturity profile[g] 1 year or less	 1 year through 5 years	 After 5 years	 Total	Ratings profile Investment-grade	 Noninvestment-grade	 Total	 Total % of IG
Loans retained[a]	$ 159,006	$ 186,256	$ 136,416	$ 481,678	$ 363,444	$ 118,234	$ 481,678	75 %
Derivative receivables				49,766			49,766	
Less: Liquid securities and other cash collateral held against derivatives[b]				(13,052)			(13,052)	
Total derivative receivables, net of collateral	7,136	7,569	22,009	36,714	29,416	7,298	36,714	80
Lending-related commitments[a][c]	87,577	312,939	16,994	417,510	296,702	120,808	417,510	71
Subtotal	253,719	506,764	175,419	935,902	689,562	246,340	935,902	74
Loans held-for-sale and loans at fair value[c][d]				29,201			29,201	
Receivables from customers				33,706			33,706	
Total exposure – net of liquid securities and other cash collateral held against derivatives				$ 998,809			$ 998,809	
Credit derivatives used in credit portfolio management activities[a][e][f]	$ (5,412)	$ (10,031)	$ (3,087)	$ (18,530)	$ (16,724)	$ (1,806)	$ (18,530)	90 %

(a) Prior-period amounts have been revised to conform with the current presentation.
(b) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.
(c) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.
(d) Represents loans held-for-sale, primarily related to syndicated loans and loans transferred from the retained portfolio, and loans at fair value.
(e) These derivatives do not qualify for hedge accounting under U.S. GAAP.
(f) The notional amounts are presented on a net basis by underlying reference entity and the ratings profile shown is based on the ratings of the reference entity on which protection has been purchased. Predominantly all of the credit derivatives entered into by the Firm where it has purchased protection used in credit portfolio management activities are executed with investment-grade counterparties.
(g) The maturity profile of retained loans, lending-related commitments and derivative receivables is generally based on remaining contractual maturity. Derivative contracts that are in a receivable position at December 31, 2020, may become payable prior to maturity based on their cash flow profile or changes in market conditions.

Wholesale credit exposure – industry exposures

The Firm focuses on the management and diversification of its industry exposures, and pays particular attention to industries with actual or potential credit concerns.

Exposures deemed criticized align with the U.S. banking regulators' definition of criticized exposures, which consist of the special mention, substandard and doubtful categories. Total criticized exposure excluding loans held-for-sale and loans at fair value, was $41.6 billion at December 31, 2020, compared with $15.1 billion at December 31, 2019, representing approximately 4.0% and 1.5% of total wholesale credit exposure, respectively. The increase in total criticized exposure was largely driven by downgrades in Consumer & Retail, Oil & Gas and Real Estate due to impacts from the COVID-19 pandemic, and to a lesser extent, net portfolio activity in Technology, Media & Telecommunications. Predominantly all of the $41.6 billion was performing and largely undrawn.

The table below summarizes by industry the Firm's exposures as of December 31, 2020 and 2019. The industry of risk category is generally based on the client or counterparty's primary business activity. Refer to Note 4 for additional information on industry concentrations.

Wholesale credit exposure – industries[(a)]

			Noninvestment-grade			Selected metrics			
As of or for the year ended December 31, 2020 (in millions)	Credit exposure[(f)(g)]	Investment-grade[(g)]	Noncriticized[(g)]	Criticized performing	Criticized nonperforming	30 days or more past due and accruing loans[(h)]	Net charge-offs/ (recoveries)	Credit derivative hedges[(i)]	Liquid securities and other cash collateral held against derivative receivables[(k)]
Real Estate	$ 148,498	$ 116,124	$ 27,576	$ 4,294	$ 504	$ 374	$ 94	$ (110)	$ –
Individuals and Individual Entities[(b)]	122,870	107,266	14,688	227	689	1,570	(17)	–	–
Consumer & Retail	108,437	57,580	41,624	8,852	381	203	55	(381)	(5)
Technology, Media & Telecommunications	72,150	36,435	27,770	7,738	207	10	73	(934)	(56)
Asset Managers	66,573	57,582	8,885	85	21	19	1	–	(4,685)
Industrials	66,470	37,512	26,881	1,852	225	278	70	(658)	(61)
Healthcare	60,118	44,901	13,356	1,684	177	96	104	(378)	(191)
Banks & Finance Cos	54,032	35,115	17,820	1,045	52	20	13	(555)	(1,648)
Automotive	43,331	25,548	15,575	2,149	59	152	22	(434)	–
Oil & Gas	39,159	18,456	14,969	4,952	782	11	249	(238)	(4)
State & Municipal Govt[(c)]	38,286	37,705	574	2	5	41	–	–	(41)
Utilities	30,124	22,451	7,048	571	54	14	(7)	(402)	(1)
Chemicals & Plastics	17,176	10,622	5,703	822	29	6	–	(83)	–
Central Govt	17,025	16,652	373	–	–	–	–	(8,364)	(982)
Transportation	16,232	7,549	6,340	2,137	206	30	117	(83)	(26)
Metals & Mining	15,542	5,958	8,699	704	181	8	16	(141)	(13)
Insurance	13,141	10,177	2,960	3	1	7	–	–	(1,771)
Securities Firms	8,048	6,116	1,927	1	4	–	18	(49)	(3,423)
Financial Markets Infrastructure	6,515	6,449	66	–	–	–	–	–	(10)
All other[(d)]	100,713	84,650	15,185	504	374	83	(9)	(9,429)	(1,889)
Subtotal	**$ 1,044,440**	**$ 744,848**	**$ 258,019**	**$ 37,622**	**$ 3,951**	**$ 2,922**	**$ 799**	**$ (22,239)**	**$ (14,806)**
Loans held-for-sale and loans at fair value	35,111								
Receivables from customers	47,710								
Total[(e)]	**$ 1,127,261**								

			Noninvestment-grade			Selected metrics			
As of or for the year ended December 31, 2019 (in millions)	Credit exposure[(f)(g)]	Investment-grade[(g)]	Noncriticized[(g)]	Criticized performing	Criticized nonperforming	30 days or more past due and accruing loans	Net charge-offs/ (recoveries)	Credit derivative hedges[(i)]	Liquid securities and other cash collateral held against derivative receivables[(k)]
Real Estate	$ 150,919	$ 121,625	$ 27,779	$ 1,457	$ 58	$ 104	$ 13	$ (100)	$ –
Individuals and Individual Entities[(b)]	105,027	93,181	11,617	192	37	388	33	–	(287)
Consumer & Retail	106,986	58,704	45,806	2,261	215	118	124	(235)	(5)
Technology, Media & Telecommunications	60,033	35,878	21,066	2,953	136	27	27	(658)	(13)
Asset Managers	54,304	47,569	6,716	6	13	18	–	–	(4,410)
Industrials	62,483	39,434	21,673	1,157	219	172	48	(746)	(1)
Healthcare	50,824	36,988	12,544	1,141	151	108	14	(405)	(144)
Banks & Finance Cos	50,786	34,941	15,031	808	6	–	–	(834)	(1,419)
Automotive	35,118	24,255	10,246	615	2	8	1	(194)	–
Oil & Gas	41,641	22,244	17,823	995	579	–	98	(429)	(6)
State & Municipal Govt[(c)]	30,095	29,586	509	–	–	33	7	–	(16)
Utilities	34,843	22,213	12,316	301	13	2	39	(414)	(34)
Chemicals & Plastics	17,499	12,033	5,243	221	2	5	–	(10)	(13)
Central Govt	14,865	14,524	341	–	–	–	–	(9,018)	(850)
Transportation	14,497	8,734	5,336	353	74	30	8	(37)	(37)
Metals & Mining	15,586	7,095	7,789	661	41	2	(1)	(33)	(2)
Insurance	12,348	9,458	2,867	19	4	3	–	(36)	(1,790)
Securities Firms	7,381	6,010	1,344	27	–	–	–	(48)	(3,088)
Financial Markets Infrastructure	4,121	3,969	152	–	–	–	–	–	(4)
All other[(d)]	79,598	73,453	5,722	412	11	4	4	(5,333) [(j)]	(933)
Subtotal	$ 948,954	$ 701,894	$ 231,920	$ 13,579	$ 1,561	$ 1,022	$ 415	$ (18,530)	$ (13,052)
Loans held-for-sale and loans at fair value	29,201								
Receivables from customers	33,706								
Total[(e)]	$ 1,011,861								

(a) The industry rankings presented in the table as of December 31, 2019, are based on the industry rankings of the corresponding exposures at December 31, 2020, not actual rankings of such exposures at December 31, 2019.

(b) Individuals and Individual Entities predominantly consists of Wealth Management clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.

(c) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2020 and 2019, noted above, the Firm held: $7.2 billion and $6.5 billion, respectively, of trading assets; $20.4 billion and $29.8 billion, respectively, of AFS securities; and $12.8 billion and $4.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.

(d) All other includes: SPEs and Private education and civic organizations, representing approximately 92% and 8%, respectively, at December 31, 2020 and 90% and 10%, respectively, at December 31, 2019 .

(e) Excludes cash placed with banks of $516.9 billion and $254.0 billion, at December 31, 2020 and 2019, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(f) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(g) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.

(h) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.

(i) Represents the net notional amounts of protection purchased and sold through credit derivatives used to manage the credit exposures; these derivatives do not qualify for hedge accounting under U.S. GAAP. The All other category includes purchased credit protection on certain credit indices.

(j) Prior-period amount has been revised to conform with the current presentation.

(k) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.

Presented below is additional detail on certain of the Firm's largest industry exposures and/or certain industries which present potential heightened credit concerns.

Real Estate

Real Estate exposure was $148.5 billion as of December 31, 2020, of which $85.6 billion was multifamily lending as shown in the table below. During the year ended December 31, 2020, the following changes were primarily driven by impacts from the COVID-19 pandemic:

- the investment-grade portion of the Real Estate portfolio decreased from 81% to 78%.
- the drawn percentage of this portfolio increased from 78% to 80%
- criticized exposure increased by $3.3 billion from $1.5 billion to $4.8 billion

	December 31, 2020				
(in millions, except ratios)	**Loans and Lending-related Commitments[d]**	**Derivative Receivables**	**Credit exposure**	**% Investment-grade**	**% Drawn[e]**
Multifamily[a]	**$ 85,368**	**$ 183**	**$ 85,551**	**85 %**	**92 %**
Office	**16,372**	**475**	**16,847**	**76**	**70**
Other Income Producing Properties[b]	**13,435**	**421**	**13,856**	**76**	**55**
Retail	**10,573**	**199**	**10,772**	**60**	**69**
Services and Non Income Producing	**9,242**	**22**	**9,264**	**62**	**47**
Industrial	**9,039**	**69**	**9,108**	**76**	**73**
Lodging	**3,084**	**16**	**3,100**	**24**	**57**
Total Real Estate Exposure[c]	**147,113**	**1,385**	**148,498**	**78**	**80**

	December 31, 2019				
(in millions, except ratios)	Loans and Lending-related Commitments[d]	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[e]
Multifamily[a]	$ 86,381	$ 58	$ 86,439	91 %	92 %
Office	15,734	231	15,965	80	70
Other Income Producing Properties[b]	14,372	181	14,553	48	45
Retail	11,347	87	11,434	83	68
Services and Non Income Producing	9,922	19	9,941	57	47
Industrial	8,842	24	8,866	74	75
Lodging	3,702	19	3,721	51	38
Total Real Estate Exposure	150,300	619	150,919	81	78

(a) Multifamily exposure is largely in California.
(b) Other Income Producing Properties consists of clients with diversified property types or other property types outside of multifamily, office, retail, industrial and lodging with less material exposures.
(c) Real Estate exposure is approximately 80% secured; unsecured exposure is approximately 78% investment-grade.
(d) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.
(e) Represents drawn exposure as a percentage of credit exposure.

Consumer & Retail

Consumer & Retail exposure was $108.4 billion as of December 31, 2020, and predominantly included Retail, Food and Beverage, and Business and Consumer Services as shown in the table below. During the year ended December 31, 2020, the following changes were primarily driven by impacts from the COVID-19 pandemic:

- the investment-grade portion of the Consumer & Retail portfolio decreased from 55% to 53%
- the drawn percentage of this portfolio increased from 35% to 36%
- criticized exposure increased by $6.7 billion from $2.5 billion to $9.2 billion

(in millions, except ratios)	December 31, 2020 Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
Retail[(a)]	$ 32,486	$ 887	$ 33,373	52 %	33 %
Food and Beverage	28,012	897	28,909	62	33
Business and Consumer Services	24,760	599	25,359	52	41
Consumer Hard Goods	12,937	178	13,115	59	36
Leisure[(b)]	7,440	241	7,681	18	43
Total Consumer & Retail[(c)]	**105,635**	**2,802**	**108,437**	**53**	**36**

(in millions, except ratios)	December 31, 2019 Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(d)]
Retail[(a)]	$ 29,290	$ 294	$ 29,584	54 %	37 %
Food and Beverage	27,956	625	28,581	67	36
Business and Consumer Services	24,242	249	24,491	51	37
Consumer Hard Goods	13,144	109	13,253	65	35
Leisure[(b)]	10,930	147	11,077	21	19
Total Consumer & Retail	105,562	1,424	106,986	55	35

(a) Retail consists of Home Improvement & Specialty Retailers, Restaurants, Supermarkets, Discount & Drug Stores, Specialty Apparel and Department Stores.
(b) Leisure consists of Gaming, Arts & Culture, Travel Services and Sports & Recreation. As of December 31, 2020 approximately 75% of the noninvestment-grade Leisure portfolio is secured.
(c) Approximately 80% of the noninvestment-grade portfolio is secured.
(d) Represents drawn exposure as a percent of credit exposure.

Oil & Gas

Oil & Gas exposure was $39.2 billion as of December 31, 2020, including $19.3 billion of Exploration & Production and Oil field Services as shown in the table below. During the year ended December 31, 2020, the following changes were driven by lower oil prices and impacts from the COVID-19 pandemic:

- the investment-grade portion of the Oil & Gas portfolio decreased from 53% to 47%
- criticized exposure increased by $4.1 billion from $1.6 billion to $5.7 billion

(in millions, except ratios)	December 31, 2020 Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Exploration & Production ("E&P") and Oil field Services	$ 18,228	$ 1,048	$ 19,276	32 %	37 %
Other Oil & Gas[(a)]	19,288	595	19,883	62	21
Total Oil & Gas[(b)]	**37,516**	**1,643**	**39,159**	**47**	**29**

(in millions, except ratios)	December 31, 2019 Loans and Lending-related Commitments	Derivative Receivables	Credit exposure	% Investment-grade	% Drawn[(c)]
Exploration & Production ("E&P") and Oil field Services	$ 22,543	$ 646	$ 23,189	38 %	38 %
Other Oil & Gas[(a)]	18,246	206	18,452	73	23
Total Oil & Gas[(b)]	40,789	852	41,641	53	31

(a) Other Oil & Gas includes Integrated Oil & Gas companies, Midstream/Oil Pipeline companies and refineries.
(b) Secured lending was $13.2 billion and $15.7 billion at December 31, 2020 and 2019, respectively, approximately half of which is reserve-based lending to the Exploration & Production sub-sector; unsecured exposure is largely investment-grade.
(c) Represents drawn exposure as a percent of credit exposure.

Loans

In its wholesale businesses, the Firm provides loans to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals. Refer to Note 12 for a further discussion on loans, including information about delinquencies, loan modifications and other credit quality indicators.

The following table presents the change in the nonaccrual loan portfolio for the years ended December 31, 2020 and 2019. The increase was driven by downgrades across multiple industries on client credit deterioration, with the largest concentration in Real Estate, predominantly within retail and lodging.

Wholesale nonaccrual loan activity

Year ended December 31, (in millions)	2020	2019
Beginning balance	$ 1,271	$ 1,587
Additions[(a)]	6,753	2,552
Reductions:		
Paydowns and other	2,290	1,585
Gross charge-offs	922	425
Returned to performing status	569	652
Sales	137	206
Total reductions	3,918	2,868
Net changes	2,835	(316)
Ending balance	$ 4,106	$ 1,271

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

The following table presents net charge-offs/recoveries, which are defined as gross charge-offs less recoveries, for the years ended December 31, 2020 and 2019. The amounts in the table below do not include gains or losses from sales of nonaccrual loans.

Wholesale net charge-offs/(recoveries)

Year ended December 31, (in millions, except ratios)	2020	2019
Loans – reported		
Average loans retained	$ 509,907	$ 472,628
Gross charge-offs	954	472
Gross recoveries collected	(155)	(57)
Net charge-offs/(recoveries)	799	415
Net charge-off/(recovery) rate	0.16 %	0.09 %

Lending-related commitments

The Firm uses lending-related financial instruments, such as commitments (including revolving credit facilities) and guarantees, to address the financing needs of its clients. The contractual amounts of these financial instruments represent the maximum possible credit risk should the clients draw down on these commitments or when the Firm fulfills its obligations under these guarantees, and the clients subsequently fail to perform according to the terms of these contracts. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn upon or a default occurring. As a result, the Firm does not believe that the total contractual amount of these wholesale lending-related commitments is representative of the Firm's expected future credit exposure or funding requirements. Refer to Note 28 for further information on wholesale lending-related commitments.

Receivables from Customers

Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

Clearing services

The Firm provides clearing services for clients entering into certain securities and derivative contracts. Through the provision of these services the Firm is exposed to the risk of non-performance by its clients and may be required to share in losses incurred by CCPs. Where possible, the Firm seeks to mitigate its credit risk to its clients through the collection of adequate margin at inception and throughout the life of the transactions and can also cease the provision of clearing services if clients do not adhere to their obligations under the clearing agreement. Refer to Note 28 for a further discussion of clearing services.

Derivative contracts

Derivatives enable clients and counterparties to manage risks including credit risk and risks arising from fluctuations in interest rates, foreign exchange, equities, and commodities. The Firm makes markets in derivatives in order to meet these needs and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. The Firm also uses derivative instruments to manage its own credit risk and other market risk exposure. The nature of the counterparty and the settlement mechanism of the derivative affect the credit risk to which the Firm is exposed. For OTC derivatives the Firm is exposed to the credit risk of the derivative counterparty. For exchange-traded derivatives ("ETD"), such as futures and options, and cleared over-the-counter ("OTC-cleared") derivatives, the Firm can also be exposed to the credit risk of the relevant CCP. Where possible, the Firm seeks to mitigate its credit risk exposures arising from derivative contracts through the use of legally enforceable master netting arrangements and collateral agreements. The percentage of the Firm's over-the-counter derivative transactions subject to collateral agreements – excluding foreign exchange spot trades, which are not typically covered by collateral agreements due to their short maturity and centrally cleared trades that are settled daily – was approximately 88% and 90% at December 31, 2020 and 2019, respectively. Refer to Note 5 for additional information on the Firm's use of collateral agreements. Refer to Note 5 for a further discussion of derivative contracts, counterparties and settlement types.

The fair value of derivative receivables reported on the Consolidated balance sheets were $79.6 billion and $49.8 billion at December 31, 2020 and 2019, respectively, with increases in CIB resulting from market movements. Derivative receivables represent the fair value of the derivative contracts after giving effect to legally enforceable master netting agreements and the related cash collateral held by the Firm. In addition, the Firm held liquid securities and other cash collateral that the Firm believes is legally enforceable and may be used as security when the fair value of the client's exposure is in the Firm's favor. Liquid securities represents high quality liquid assets as defined in the LCR rule. In management's view, the appropriate measure of current credit risk should also take into consideration other collateral, which generally represents securities that do not qualify as high quality liquid assets under the LCR rule, but that the Firm believes is legally enforceable. The collateral amounts for each counterparty are limited to the net derivative receivables for the counterparty. The following tables summarize the net derivative receivables and the internal ratings profile for the periods presented.

Derivative receivables

December 31, (in millions)	2020	2019
Total, net of cash collateral	**$ 79,630**	$ 49,766
Liquid securities and other cash collateral held against derivative receivables[a]	**(14,806)**	(13,052)
Total, net of liquid securities and other cash collateral	**$ 64,824**	$ 36,714
Other collateral held against derivative receivables[a]	**(6,022)**	(1,837)
Total, net of collateral	**$ 58,802**	$ 34,877

(a) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.

Ratings profile of derivative receivables

December 31, (in millions, except ratios)	2020[a] Exposure net of collateral	2020[a] % of exposure net of collateral	2019[a] Exposure net of collateral	2019[a] % of exposure net of collateral
Investment-grade	**$ 37,013**	**63 %**	$ 27,851	80 %
Noninvestment-grade	**21,789**	**37**	7,026	20
Total	**$ 58,802**	**100 %**	$ 34,877	100 %

(a) In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.

The Firm also holds additional collateral (primarily cash, G7 government securities, other liquid government agency and guaranteed securities, and corporate debt and equity securities) delivered by clients at the initiation of transactions, as well as collateral related to contracts that have a non-daily call frequency and collateral that the Firm has agreed to return but has not yet settled as of the reporting date. Although this collateral does not reduce the balances and is not included in the table above, it is available as security against potential exposure that could arise should the fair value of the client's derivative contracts move in the Firm's favor. Refer to Note 5 for additional information on the Firm's use of collateral agreements.

While useful as a current view of credit exposure, the net fair value of the derivative receivables does not capture the potential future variability of that credit exposure. To capture the potential future variability of credit exposure, the Firm calculates, on a client-by-client basis, three measures of potential derivatives-related credit loss: Peak, Derivative Risk Equivalent ("DRE"), and Average exposure ("AVG"). These measures all incorporate netting and collateral benefits, where applicable.

Peak represents a conservative measure of potential derivative exposure, including the benefit of collateral, to a counterparty calculated in a manner that is broadly equivalent to a 97.5% confidence level over the life of the transaction. Peak is the primary measure used by the Firm for setting credit limits for derivative contracts, senior management reporting and derivatives exposure management.

DRE exposure is a measure that expresses the risk of derivative exposure, including the benefit of collateral, on a basis intended to be equivalent to the risk of loan exposures. DRE is a less extreme measure of potential credit loss than Peak and is used as an input for aggregating derivative credit risk exposures with loans and other credit risk.

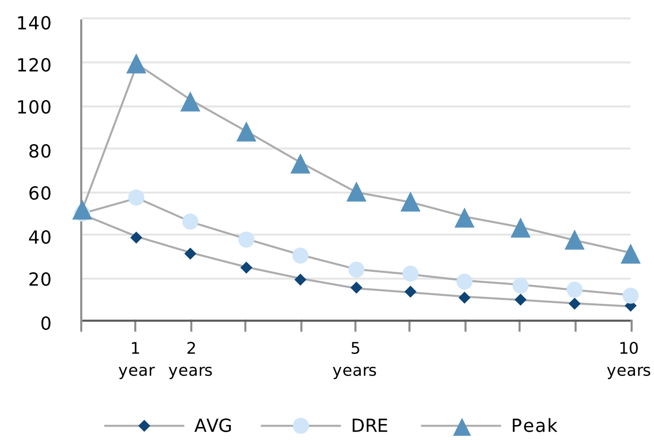
Finally, AVG is a measure of the expected fair value of the Firm's derivative exposure, including the benefit of collateral, at future time periods. AVG over the total life of the derivative contract is used as the primary metric for pricing purposes and is used to calculate credit risk capital and CVA, as further described below.

The fair value of the Firm's derivative receivables incorporates CVA to reflect the credit quality of counterparties. CVA is based on the Firm's AVG to a counterparty and the counterparty's credit spread in the credit derivatives market. The Firm believes that active risk management is essential to controlling the dynamic credit risk in the derivatives portfolio. In addition, the Firm's risk management process takes into consideration the potential impact of wrong-way risk, which is broadly defined as the risk that exposure to a counterparty is positively correlated with the impact of a default by the same counterparty, which could cause exposure to increase at the same time as the counterparty's capacity to meet its obligations is decreasing. Many factors may influence the nature and magnitude of these correlations over time. To the extent that these correlations are identified, the Firm may adjust the CVA associated with a particular counterparty's AVG. The Firm risk manages exposure to changes in CVA by entering into credit derivative contracts, as well as interest rate, foreign exchange, equity and commodity derivative contracts.

The below graph shows exposure profiles to the Firm's current derivatives portfolio over the next 10 years as calculated by the Peak, DRE and AVG metrics. The three measures generally show that exposure will decline after the first year, if no new trades are added to the portfolio.

Exposure profile of derivatives measures

December 31, 2020
(in billions)



Credit derivatives

The Firm uses credit derivatives for two primary purposes: first, in its capacity as a market-maker, and second, as an end-user, to manage the Firm's own credit risk associated with various exposures.

Credit portfolio management activities

Included in the Firm's end-user activities are credit derivatives used to mitigate the credit risk associated with traditional lending activities (loans and lending-related commitments) and derivatives counterparty exposure in the Firm's wholesale businesses (collectively, "credit portfolio management activities"). Information on credit portfolio management activities is provided in the table below.

The Firm also uses credit derivatives as an end-user to manage other exposures, including credit risk arising from certain securities held in the Firm's market-making businesses. These credit derivatives are not included in credit portfolio management activities.

Credit derivatives used in credit portfolio management activities

	Notional amount of protection purchased and sold[(b)]	
December 31, (in millions)	**2020**	2019
Credit derivatives used to manage:		
Loans and lending-related commitments	**$ 3,877**	$ 2,047
Derivative receivables [(a)]	**18,362**	16,483
Credit derivatives used in credit portfolio management activities	**$ 22,239**	$ 18,530

(a) Prior-period amount has been revised to conform with the current presentation.

(b) Amounts are presented net, considering the Firm's net protection purchased or sold with respect to each underlying reference entity or index.

The credit derivatives used in credit portfolio management activities do not qualify for hedge accounting under U.S. GAAP; these derivatives are reported at fair value, with gains and losses recognized in principal transactions revenue. In contrast, the loans and lending-related commitments being risk-managed are accounted for on an accrual basis. This asymmetry in accounting treatment, between loans and lending-related commitments and the credit derivatives used in credit portfolio management activities, causes earnings volatility that is not representative, in the Firm's view, of the true changes in value of the Firm's overall credit exposure.

The effectiveness of credit default swaps ("CDS") as a hedge against the Firm's exposures may vary depending on a number of factors, including the named reference entity (i.e., the Firm may experience losses on specific exposures that are different than the named reference entities in the purchased CDS); the contractual terms of the CDS (which may have a defined credit event that does not align with an actual loss realized by the Firm); and the maturity of the Firm's CDS protection (which in some cases may be shorter than the Firm's exposures). However, the Firm generally seeks to purchase credit protection with a maturity date that is the same or similar to the maturity date of the exposure for which the protection was purchased, and remaining differences in maturity are actively monitored and managed by the Firm. Refer to Credit derivatives in Note 5 for a detailed description of credit derivatives.

ALLOWANCE FOR CREDIT LOSSES

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. Refer to Note 1 for further information.

The Firm's allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which covers the Firm's HTM and AFS securities and is recognized within Investment Securities on the Consolidated balance sheets.

The allowance for credit losses increased compared with December 31, 2019, primarily reflecting the deterioration and uncertainty in the macroeconomic environment, in particular in the first half of 2020, as a result of the impact of the COVID-19 pandemic, consisting of:

- a net $7.4 billion addition in consumer, predominantly in the credit card portfolio, and
- a net $4.7 billion addition in wholesale, across the LOBs, impacting multiple industries.

The adoption of CECL on January 1, 2020, resulted in a $4.3 billion addition to the allowance for credit losses.

Discussion of changes in the allowance during 2020

The increase in the allowance for loan losses and lending-related commitments was primarily driven by an increase in the provision for credit losses, reflecting the deterioration in and uncertainty around the future macroeconomic environment as a result of the impact of the COVID-19 pandemic.

As of December 31, 2020, the Firm's central case reflected U.S. unemployment rates of approximately 7% through the second quarter of 2021 and remaining above 5% until the second half of 2022. This compared with relatively low levels of unemployment of approximately 4% throughout 2020 and 2021 in the Firm's January 1, 2020 central case.

Further, while the Firm's January 1, 2020 central case U.S. GDP forecast reflected a 1.7% expansion in 2020, actual U.S. GDP contracted approximately 2.5% in 2020. As of December 31, 2020, the Firm's central case assumptions reflect a return to pre-pandemic GDP levels in the fourth quarter of 2021.

Due to elevated uncertainty in the near term outlook, driven by the potential for increased infection rates and related lock downs resulting from the pandemic, as well as the prospect that government and other consumer relief measures set to expire may not be extended, the Firm has placed significant weighting on its adverse scenarios. These scenarios incorporate more punitive macroeconomic factors than the central case assumptions, resulting in weighted average U.S. unemployment rates remaining elevated throughout 2021 and 2022, ending the fourth quarter of 2022 at approximately 6%, and in U.S. GDP ending 2022 approximately 0.9% higher than fourth quarter 2019 actual pre-pandemic levels.

The Firm's central case assumptions reflected U.S. unemployment rates and U.S. real GDP as follows:

	Assumptions at January 1, 2020		
	2Q20	4Q20[b]	2Q21
U.S. unemployment rate[a]	3.7 %	3.8 %	4.0 %
Cumulative change in U.S. real GDP from 12/31/2019	0.9 %	1.7 %	2.4 %
	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate[a]	6.8 %	5.7 %	5.1 %
Cumulative change in U.S. real GDP from 12/31/2019	(1.9)%	0.6 %	2.0 %

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) 4Q20 actual U.S. unemployment rate (quarterly average) was 6.8%. 4Q20 actual cumulative change in U.S. real GDP from 4Q19 was (2.5%).

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods. Refer to Note 13 and Note 10 for a description of the policies, methodologies and judgments used to determine the Firm's allowances for credit losses on loans, lending-related commitments, and investment securities.

Refer to Critical Accounting Estimates Used by the Firm on pages 152-155 for further information on the allowance for credit losses and related management judgments.

Refer to Consumer Credit Portfolio on pages 114-120, Wholesale Credit Portfolio on pages 121-131 and Note 12 for additional information on the consumer and wholesale credit portfolios.

The adoption of the CECL accounting guidance resulted in a change in the accounting for PCI loans, which are considered PCD loans under CECL. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

Allowance for credit losses and related information

Year ended December 31, (in millions, except ratios)	2020[(d)] Consumer, excluding credit card	2020[(d)] Credit card	2020[(d)] Wholesale	2020[(d)] Total	2019 Consumer, excluding credit card	2019 Credit card	2019 Wholesale	2019 Total
Allowance for loan losses								
Beginning balance at January 1,	**$ 2,538**	**$ 5,683**	**$ 4,902**	**$ 13,123**	$ 3,434	$ 5,184	$ 4,827	$ 13,445
Cumulative effect of a change in accounting principle	**297**	**5,517**	**(1,642)**	**4,172**	NA	NA	NA	NA
Gross charge-offs	**805**	**5,077**	**954**	**6,836**	902	5,436	472	6,810
Gross recoveries collected	**(631)**	**(791)**	**(155)**	**(1,577)**	(536)	(588)	(57)	(1,181)
Net charge-offs	**174**	**4,286**	**799**	**5,259**	366	4,848	415	5,629
Write-offs of PCI loans[(a)]	**NA**	**NA**	**NA**	**NA**	151	–	–	151
Provision for loan losses	**974**	**10,886**	**4,431**	**16,291**	(378)	5,348	479	5,449
Other	**1**	**–**	**–**	**1**	(1)	(1)	11	9
Ending balance at December 31,	**$ 3,636**	**$ 17,800**	**$ 6,892**	**$ 28,328**	$ 2,538	$ 5,683	$ 4,902	$ 13,123
Allowance for lending-related commitments								
Beginning balance at January 1,	**$ 12**	**$ –**	**$ 1,179**	**$ 1,191**	$ 12	$ –	$ 1,043	$ 1,055
Cumulative effect of a change in accounting principle	**133**	**–**	**(35)**	**98**	NA	NA	NA	NA
Provision for lending-related commitments	**42**	**–**	**1,079**	**1,121**	–	–	136	136
Other	**–**	**–**	**(1)**	**(1)**	–	–	–	–
Ending balance at December 31,	**$ 187**	**$ –**	**$ 2,222**	**$ 2,409**	$ 12	$ –	$ 1,179	$ 1,191
Impairment methodology								
Asset-specific[(b)]	**$ (7)**	**$ 633**	**$ 682**	**$ 1,308**	$ 75	$ 477	$ 295	$ 847
Portfolio-based	**3,643**	**17,167**	**6,210**	**27,020**	1,476	5,206	4,607	11,289
PCI	**NA**	**NA**	**NA**	**NA**	987	–	–	987
Total allowance for loan losses	**$ 3,636**	**$ 17,800**	**$ 6,892**	**$ 28,328**	$ 2,538	$ 5,683	$ 4,902	$ 13,123
Impairment methodology								
Asset-specific	**$ –**	**$ –**	**$ 114**	**$ 114**	$ –	$ –	$ 102	$ 102
Portfolio-based	**187**	**–**	**2,108**	**2,295**	12	–	1,077	1,089
Total allowance for lending-related commitments	**$ 187**	**$ –**	**$ 2,222**	**$ 2,409**	$ 12	$ –	$ 1,179	$ 1,191
Total allowance for credit losses	**$ 3,823**	**$ 17,800**	**$ 9,114**	**$ 30,737**	$ 2,550	$ 5,683	$ 6,081	$ 14,314
Memo:								
Retained loans, end of period	**$ 302,127**	**$ 143,432**	**$ 514,947**	**$ 960,506**	$ 294,999	$ 168,924	$ 481,678	$ 945,601
Retained loans, average	**302,005**	**146,391**	**509,907**	**958,303**	312,972	156,319	472,628	941,919
Credit ratios								
Allowance for loan losses to retained loans	**1.20 %**	**12.41 %**	**1.34 %**	**2.95 %**	0.86 %	3.36 %	1.02 %	1.39 %
Allowance for loan losses to retained nonaccrual loans[(c)]	**67**	**NM**	**208**	**323**	87	NM	464	329
Allowance for loan losses to retained nonaccrual loans excluding credit card	**67**	**NM**	**208**	**120**	87	NM	464	187
Net charge-off rates	**0.06**	**2.93**	**0.16**	**0.55**	0.12	3.10	0.09	0.60

(a) Prior to the adoption of CECL, write-offs of PCI loans were recorded against the allowance for loan losses when actual losses for a pool exceeded estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan was recognized when the underlying loan was removed from a pool.

(b) Includes modified PCD loans and loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loan losses modified or reasonably expected to be modified in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.

(c) The Firm's policy is generally to exempt credit card loans from being placed on nonaccrual status as permitted by regulatory guidance.

(d) Excludes HTM securities, which had an allowance for credit losses of $78 million and a provision for credit losses of $68 million as of and for the year ended December 31, 2020.

INVESTMENT PORTFOLIO RISK MANAGEMENT

Investment portfolio risk is the risk associated with the loss of principal or a reduction in expected returns on investments arising from the investment securities portfolio or from principal investments. The investment securities portfolio is predominantly held by Treasury and CIO in connection with the Firm's balance sheet or asset-liability management objectives. Principal investments are predominantly privately-held non-traded financial instruments and are managed in the LOBs and Corporate. Investments are typically intended to be held over extended periods and, accordingly, the Firm has no expectation for short-term realized gains with respect to these investments.

Investment securities risk

Investment securities risk includes the exposure associated with a default in the payment of principal and interest. This risk is mitigated given that the investment securities portfolio held by Treasury and CIO is predominantly invested in high-quality securities. At December 31, 2020, the Treasury and CIO investment securities portfolio, net of allowance for credit losses, was $587.9 billion, and the average credit rating of the securities comprising the portfolio was AA+ (based upon external ratings where available and where not available, based primarily upon internal risk ratings). Refer to Corporate segment results on pages 83–84 and Note 10 for further information on the investment securities portfolio and internal risk ratings. Refer to Market Risk Management on pages 135–142 for further information on the market risk inherent in the portfolio. Refer to Liquidity Risk Management on pages 102–108 for further information on related liquidity risk.

Governance and oversight

Investment securities risks are governed by the Firm's Risk Appetite framework, and reviewed at the CTC Risk Committee with regular updates to the Board Risk Committee.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investment securities in accordance with relevant policies. Approved levels for investment securities are established for each risk category, including capital and credit risks.

Principal investment risk

Principal investments are typically privately held non-traded financial instruments representing ownership or other forms of junior capital and span multiple asset classes. These investments are made by dedicated investing businesses or as part of a broader business strategy. In general, principal investments include tax-oriented investments and investments made to enhance or accelerate the Firm's business strategies. The Firm's investments will continue to evolve in line with its strategies, including the Firm's commitment to support underserved communities and minority-owned businesses. The Firm's principal investments are managed by the LOBs and Corporate and are reflected within their respective financial results. The aggregate carrying values of the principal investment portfolios have not been significantly affected by recent market events as a result of the COVID-19 pandemic. However, the duration and severity of adverse macroeconomic conditions could subject certain principal investments to impairments, write-downs, or other negative impacts.

As of December 31, 2020 and 2019, the aggregate carrying values of the principal investment portfolios were $27.5 billion and $24.2 billion, respectively, which included tax-oriented investments (e.g., alternative energy and affordable housing investments) of $21.3 billion and $18.2 billion, respectively, and private equity, various debt and equity instruments, and real assets of $6.2 billion and $6.0 billion, respectively.

Governance and oversight

The Firm's approach to managing principal risk is consistent with the Firm's risk governance structure. A Firmwide risk policy framework exists for all principal investing activities and includes approval by executives who are independent from the investing businesses, as appropriate.

The Firm's independent control functions are responsible for reviewing the appropriateness of the carrying value of investments in accordance with relevant policies. As part of the risk governance structure, approved levels for investments are established and monitored for each relevant business or segment in order to manage the overall size of the portfolios. The Firm also conducts stress testing on these portfolios using specific scenarios that estimate losses based on significant market moves and/or other risk events.

Market risk is the risk associated with the effect of changes in market factors, such as interest and foreign exchange rates, equity and commodity prices, credit spreads or implied volatilities, on the value of assets and liabilities held for both the short and long term.

Market Risk Management

Market Risk Management monitors market risks throughout the Firm and defines market risk policies and procedures.

Market Risk Management seeks to manage risk, facilitate efficient risk/return decisions, reduce volatility in operating performance and provide transparency into the Firm's market risk profile for senior management, the Board of Directors and regulators. Market Risk Management is responsible for the following functions:

- Maintaining a market risk policy framework
- Independently measuring, monitoring and controlling LOB, Corporate, and Firmwide market risk
- Defining, approving and monitoring of limits
- Performing stress testing and qualitative risk assessments

Risk measurement

Measures used to capture market risk

There is no single measure to capture market risk and therefore Market Risk Management uses various metrics, both statistical and nonstatistical, to assess risk including:

- Value-at-risk (VaR)
- Stress testing
- Profit and loss drawdowns
- Earnings-at-risk
- Other sensitivity-based measures

Risk monitoring and control

Market risk exposure is managed primarily through a series of limits set in the context of the market environment and business strategy. In setting limits, Market Risk Management takes into consideration factors such as market volatility, product liquidity, accommodation of client business, and management experience. Market Risk Management maintains different levels of limits. Firm level limits include VaR and stress limits. Similarly, LOB and Corporate limits include VaR and stress limits and may be supplemented by certain nonstatistical risk measures such as profit and loss drawdowns. Limits may also be set within the LOBs and Corporate, as well as at the legal entity level.

Market Risk Management sets limits and regularly reviews and updates them as appropriate. Senior management is responsible for reviewing and approving certain of these risk limits on an ongoing basis. Limits that have not been reviewed within specified time periods by Market Risk Management are reported to senior management. The LOBs and Corporate are responsible for adhering to established limits against which exposures are monitored and reported.

Limit breaches are required to be reported in a timely manner to limit approvers, which include Market Risk Management and senior management. In the event of a breach, Market Risk Management consults with appropriate members of the Firm to determine the suitable course of action required to return the applicable positions to compliance, which may include a reduction in risk in order to remedy the breach or granting a temporary increase in limits to accommodate an expected increase in client activity and/or market volatility. Certain Firm, Corporate or LOB-level limit breaches are escalated as appropriate.

COVID-19 Pandemic

Market Risk Management continues to actively monitor the impact of the COVID-19 pandemic on market risk exposures by leveraging existing risk measures and controls.

Models used to measure market risk are inherently imprecise and are limited in their ability to measure certain risks or to predict losses. This imprecision may be heightened when sudden or severe shifts in market conditions occur, such as those observed at the onset of the COVID-19 pandemic. For additional discussion on model uncertainty refer to Estimations and Model Risk Management on page 151.

Market Risk Management periodically reviews the Firm's existing market risk measures to identify opportunities for enhancement, and to the extent appropriate, will calibrate those measures accordingly over time. This is increasingly important in periods of sustained, heightened market volatility.

The following table summarizes the predominant business activities and related market risks, as well as positions which give rise to market risk and certain measures used to capture those risks, for each LOB and Corporate.

In addition to the predominant business activities, each LOB and Corporate may engage in principal investing activities. To the extent principal investments are deemed market risk sensitive, they are reflected in relevant risk measures and captured in the table below. Refer to Investment Portfolio Risk Management on page 134 for additional discussion on principal investments.

LOBs and Corporate	Predominant business activities	Related market risks	Positions included in Risk Management VaR	Positions included in earnings-at-risk	Positions included in other sensitivity-based measures
CCB	• Services mortgage loans • Originates loans and takes deposits	• Risk from changes in the probability of newly originated mortgage commitments closing • Interest rate risk and prepayment risk	• Mortgage commitments, classified as derivatives • Warehouse loans that are fair value option elected, classified as loans – debt instruments • MSRs • Hedges of mortgage commitments, warehouse loans and MSRs, classified as derivatives • Interest-only and mortgage-backed securities, classified as trading assets debt instruments, and related hedges, classified as derivatives • Fair value option elected liabilities[(a)]	• Retained loan portfolio • Deposits	• Fair value option elected liabilities DVA[(a)]
CIB	• Makes markets and services clients across fixed income, foreign exchange, equities and commodities • Originates loans and takes deposits	• Risk of loss from adverse movements in market prices and implied volatilities across interest rate, foreign exchange, credit, commodity and equity instruments • Basis and correlation risk from changes in the way asset values move relative to one another • Interest rate risk and prepayment risk	• Trading assets/liabilities – debt and marketable equity instruments, and derivatives, including hedges of the retained loan portfolio • Certain securities purchased, loaned or sold under resale agreements and securities borrowed • Fair value option elected liabilities[(a)] • Derivative CVA and associated hedges • Marketable equity investments	• Retained loan portfolio • Deposits	• Privately held equity and other investments measured at fair value; and certain asset-backed fair value option elected loans • Derivatives FVA and fair value option elected liabilities DVA[(a)]
CB	• Originates loans and takes deposits	• Interest rate risk and prepayment risk	• Marketable equity investments[(b)]	• Retained loan portfolio • Deposits	
AWM	• Provides initial capital investments in products such as mutual funds and capital invested alongside third-party investors • Originates loans and takes deposits	• Risk from adverse movements in market factors (e.g., market prices, rates and credit spreads) • Interest rate risk and prepayment risk	• Debt securities held in advance of distribution to clients, classified as trading assets - debt instruments[(b)]	• Retained loan portfolio • Deposits	• Initial seed capital investments and related hedges, classified as derivatives • Certain deferred compensation and related hedges, classified as derivatives • Capital invested alongside third-party investors, typically in privately distributed collective vehicles managed by AWM (i.e., co-investments)
Corporate	• Manages the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks	• Structural interest rate risk from the Firm's traditional banking activities • Structural non-USD foreign exchange risks	• Derivative positions measured at fair value through noninterest revenue in earnings • Marketable equity investments	• Deposits with banks • Investment securities portfolio and related interest rate hedges • Long-term debt and related interest rate hedges	• Privately held equity and other investments measured at fair value • Foreign exchange exposure related to Firm-issued non-USD long-term debt ("LTD") and related hedges

(a) Reflects structured notes in Risk Management VaR and the DVA on structured notes in other sensitivity-based measures.
(b) The AWM and CB contributions to Firmwide average VaR were not material for the year ended December 31, 2020 and 2019.

Value-at-risk

JPMorgan Chase utilizes VaR, a statistical risk measure, to estimate the potential loss from adverse market moves in the current market environment. The Firm has a single VaR framework used as a basis for calculating Risk Management VaR and Regulatory VaR.

The framework is employed across the Firm using historical simulation based on data for the previous 12 months. The framework's approach assumes that historical changes in market values are representative of the distribution of potential outcomes in the immediate future. The Firm believes the use of Risk Management VaR provides a daily measure of risk that is closely aligned to risk management decisions made by the LOBs and Corporate and, along with other market risk measures, provides the appropriate information needed to respond to risk events.

The Firm's Risk Management VaR is calculated assuming a one-day holding period and an expected tail-loss methodology which approximates a 95% confidence level. Risk Management VaR provides a consistent framework to measure risk profiles and levels of diversification across product types and is used for aggregating risks and monitoring limits across businesses. VaR results are reported to senior management, the Board of Directors and regulators.

Under the Firm's Risk Management VaR methodology, assuming current changes in market values are consistent with the historical changes used in the simulation, the Firm would expect to incur VaR "backtesting exceptions," defined as losses greater than that predicted by VaR estimates, an average of five times every 100 trading days. The number of VaR backtesting exceptions observed can differ from the statistically expected number of backtesting exceptions if the current level of market volatility is materially different from the level of market volatility during the 12 months of historical data used in the VaR calculation.

Underlying the overall VaR model framework are individual VaR models that simulate historical market returns for individual risk factors and/or product types. To capture material market risks as part of the Firm's risk management framework, comprehensive VaR model calculations are performed daily for businesses whose activities give rise to market risk. These VaR models are granular and incorporate numerous risk factors and inputs to simulate daily changes in market values over the historical period; inputs are selected based on the risk profile of each portfolio, as sensitivities and historical time series used to generate daily market values may be different across product types or risk management systems. The VaR model results across all portfolios are aggregated at the Firm level.

As VaR is based on historical data, it is an imperfect measure of market risk exposure and potential future losses. In addition, based on their reliance on available historical data, limited time horizons, and other factors, VaR measures are inherently limited in their ability to measure certain risks and to predict losses, particularly those associated with market illiquidity and sudden or severe shifts in market conditions.

For certain products, specific risk parameters are not captured in VaR due to the lack of liquidity and availability of appropriate historical data. The Firm uses proxies to estimate the VaR for these and other products when daily time series are not available. It is likely that using an actual price-based time series for these products, if available, would affect the VaR results presented. The Firm therefore considers other nonstatistical measures such as stress testing, in addition to VaR, to capture and manage its market risk positions.

The daily market data used in VaR models may be different than the independent third-party data collected for VCG price testing in its monthly valuation process. For example, in cases where market prices are not observable, or where proxies are used in VaR historical time series, the data sources may differ. Refer to Valuation process in Note 2 for further information on the Firm's valuation process. As VaR model calculations require daily data and a consistent source for valuation, it may not be practical to use the data collected in the VCG monthly valuation process for VaR model calculations.

The Firm's VaR model calculations are periodically evaluated and enhanced in response to changes in the composition of the Firm's portfolios, changes in market conditions, improvements in the Firm's modeling techniques and measurements, and other factors. Such changes may affect historical comparisons of VaR results. Refer to Estimations and Model Risk Management on page 151 for information regarding model reviews and approvals.

The Firm calculates separately a daily aggregated VaR in accordance with regulatory rules ("Regulatory VaR"), which is used to derive the Firm's regulatory VaR-based capital requirements under Basel III. This Regulatory VaR model framework currently assumes a ten business-day holding period and an expected tail loss methodology which approximates a 99% confidence level. Regulatory VaR is applied to "covered" positions as defined by Basel III, which may be different than the positions included in the Firm's Risk Management VaR. For example, credit derivative hedges of accrual loans are included in the Firm's Risk Management VaR, while Regulatory VaR excludes these credit derivative hedges. In addition, in contrast to the Firm's Risk Management VaR, Regulatory VaR currently excludes the diversification benefit for certain VaR models.

Refer to JPMorgan Chase's Basel III Pillar 3 Regulatory Capital Disclosures reports, which are available on the Firm's website, for additional information on Regulatory VaR and the other components of market risk regulatory capital for the Firm (e.g., VaR-based measure, stressed VaR-based measure and the respective backtesting).

The table below shows the results of the Firm's Risk Management VaR measure using a 95% confidence level. VaR can vary significantly as positions change, market volatility fluctuates, and diversification benefits change.

Total VaR

As of or for the year ended December 31,	2020			2019		
(in millions)	Avg.	Min	Max	Avg.	Min	Max
CIB trading VaR by risk type						
Fixed income	**$ 98**	**$ 35**	**$ 156**	$ 40	$ 31	$ 50
Foreign exchange	**10**	**4**	**18**	7	4	15
Equities	**24**	**13**	**41**	20	13	31
Commodities and other	**28**	**7**	**47**	8	6	12
Diversification benefit to CIB trading VaR	**(67)** (a)	**NM** (b)	**NM** (b)	(33) (a)	NM (b)	NM (b)
CIB trading VaR	**93**	**32** (b)	**160** (b)	42	29 (b)	61 (b)
Credit portfolio VaR	**16**	**3**	**28**	5	3	7
Diversification benefit to CIB VaR	**(17)** (a)	**NM** (b)	**NM** (b)	(5) (a)	NM (b)	NM (b)
CIB VaR	**92**	**31** (b)	**162** (b)	42	29 (b)	63 (b)
CCB VaR	**5**	**1**	**12**	5	1	11
Corporate and other LOB VaR	**19**	**9**	**82** (c)	10	9	13
Diversification benefit to other VaR	**(4)** (a)	**NM** (b)	**NM** (b)	(4) (a)	NM (b)	NM (b)
Other VaR	**20**	**10** (b)	**82** (b)	11	8 (b)	17 (b)
Diversification benefit to CIB and other VaR	**(17)** (a)	**NM** (b)	**NM** (b)	(10) (a)	NM (b)	NM (b)
Total VaR	**$ 95**	**$ 32** (b)	**$ 164** (b)	$ 43	$ 30 (b)	$ 65 (b)

(a) Diversification benefit represents the difference between the portfolio VaR and the sum of its individual components. This reflects the non-additive nature of VaR due to imperfect correlation across LOBs, Corporate, and risk types.
(b) The maximum and minimum VaR for each portfolio may have occurred on different trading days than the components and consequently diversification benefit is not meaningful.
(c) Maximum Corporate and other LOB VaR was higher than the prior year, due to increases in the fourth quarter of 2020 driven by a private equity position that became publicly traded at the end of the third quarter of 2020.

Generally, average VaR and maximum VaR across risk types and LOBs were higher due to increased volatility that occurred at the onset of the COVID-19 pandemic, which remains in the one-year historical look-back period. As a result average total VaR increased by $52 million for the year-ended December 31, 2020 when compared with the prior year driven by the fixed income and commodities risk types.

Effective January 1, 2020, the Firm refined the scope of VaR to exclude positions related to the risk management of interest rate exposure from changes in the Firm's own credit spread on fair value option elected liabilities, and included these positions in other sensitivity-based measures. Additionally, effective July 1, 2020, the Firm refined the scope of VaR to exclude certain asset-backed fair value option elected loans, and included them in other sensitivity-based measures to more effectively measure the risk from these loans. In the absence of these refinements, the average Total VaR and each of the components would have been higher by the amounts reported in the following table:

(in millions)	Amount by which reported average VaR would have been higher for the year ended December 31, 2020
CIB fixed income VaR	$ 9
CIB trading VaR	7
CIB VaR	9
Total VaR	8

VaR backtesting

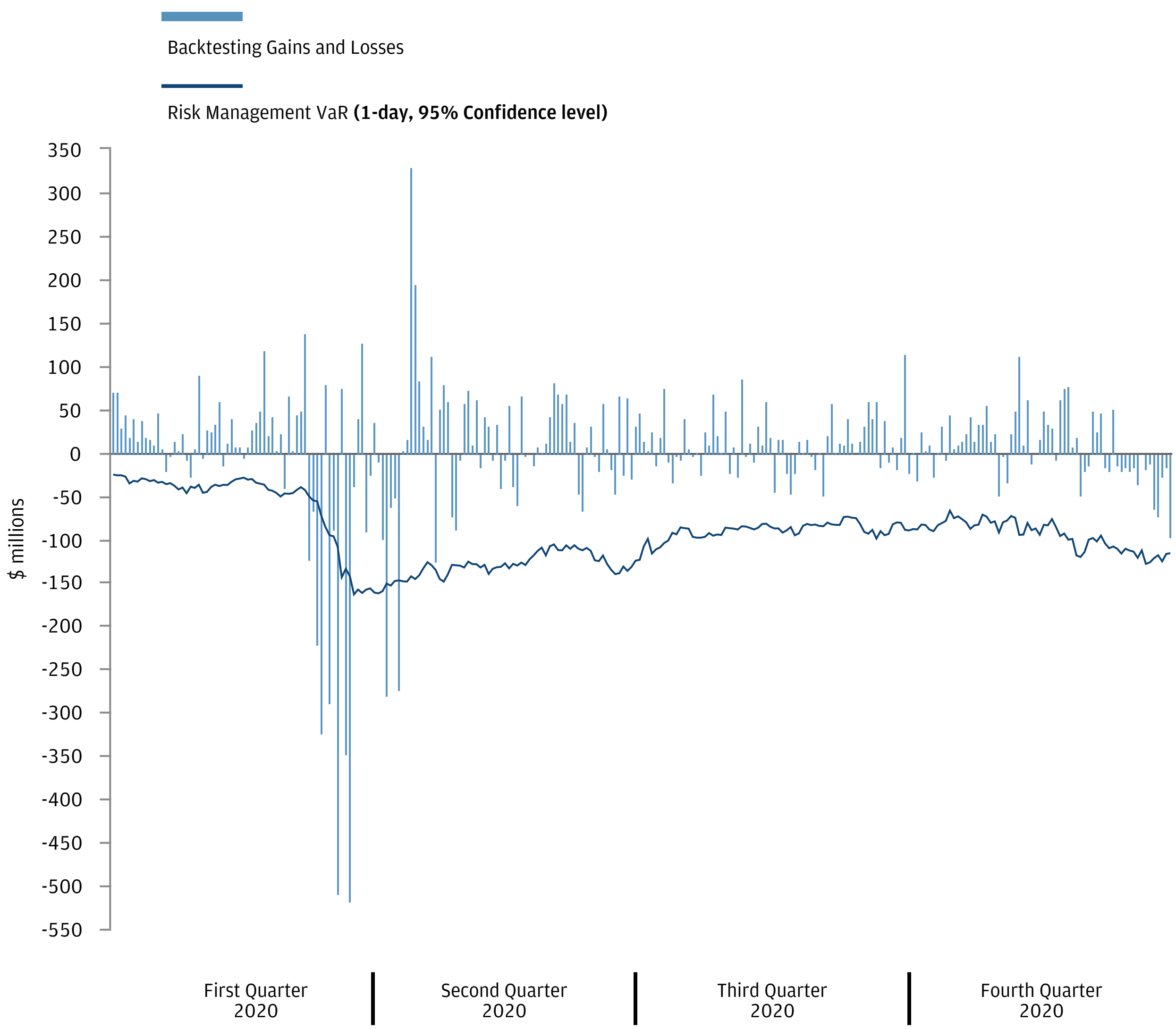
The Firm performs daily VaR model backtesting, which compares the daily Risk Management VaR results with the daily gains and losses that are utilized for VaR backtesting purposes. The gains and losses in the chart below do not reflect the Firm's revenue results as they exclude select components of total net revenue, such as those associated with the execution of new transactions (i.e., intraday client-driven trading and intraday risk management activities), fees, commissions, certain valuation adjustments and net interest income. These excluded components of total net revenue may more than offset backtesting gains and losses on a particular day. The definition of backtesting gains and losses above is consistent with the requirements for backtesting under Basel III capital rules.

The following chart compares Firmwide daily backtesting gains and losses with the Firm's Risk Management VaR for the year ended December 31, 2020. The results in the chart below differ from the results of backtesting disclosed in the Market Risk section of the Firm's Basel III Pillar 3 Regulatory Capital Disclosures reports, which are based on Regulatory VaR applied to the Firm's covered positions.

For the year ended December 31, 2020, the Firm posted backtesting gains on 162 of the 260 days, and observed 10 VaR backtesting exceptions, which were predominantly driven by volatility at the onset of the COVID-19 pandemic that was materially higher than the levels realized in the historical data used for the VaR calculation. Firmwide backtesting loss days can differ from the loss days for which Fixed Income Markets and Equity Markets posted losses, as disclosed in CIB Markets revenue, as the population of positions which compose each metric are different and due to the exclusion of select components of total net revenue in backtesting gains and losses as described above. For more information on CIB Markets revenue, refer to pages 74-75.

Daily Risk Management VaR Backtesting Results

Year ended December 31, 2020



Other risk measures

Stress testing

Along with VaR, stress testing is an important tool used to assess risk. While VaR reflects the risk of loss due to adverse changes in markets using recent historical market behavior, stress testing reflects the risk of loss from hypothetical changes in the value of market risk sensitive positions applied simultaneously. Stress testing measures the Firm's vulnerability to losses under a range of stressed but possible economic and market scenarios. The results are used to understand the exposures responsible for those potential losses and are measured against limits.

The Firm's stress framework covers market risk sensitive positions in the LOBs and Corporate. The framework is used to calculate multiple magnitudes of potential stress for both market rallies and market sell-offs, assuming significant changes in market factors such as credit spreads, equity prices, interest rates, currency rates and commodity prices, and combines them in multiple ways to capture an array of hypothetical economic and market scenarios.

The Firm generates a number of scenarios that focus on tail events in specific asset classes and geographies, including how the event may impact multiple market factors simultaneously. Scenarios also incorporate specific idiosyncratic risks and stress basis risk between different products. The flexibility in the stress framework allows the Firm to construct new scenarios that can test the outcomes against possible future stress events. Stress testing results are reported on a regular basis to senior management of the Firm, as appropriate.

Stress scenarios are governed by an overall stress framework and are subject to the standards outlined in the Firm's policies related to model risk management. Significant changes to the framework are reviewed as appropriate.

The Firm's stress testing framework is utilized in calculating the Firm's CCAR and other stress test results, which are reported to the Board of Directors. In addition, stress testing results are incorporated into the Firm's Risk Appetite framework, and are reported periodically to the Board Risk Committee.

Profit and loss drawdowns

Profit and loss drawdowns are used to highlight trading losses above certain levels of risk tolerance. A profit and loss drawdown is a decline in revenue from its year-to-date peak level.

Earnings-at-risk

The effect of interest rate exposure on the Firm's reported net income is important as interest rate risk represents one of the Firm's significant market risks. Interest rate risk arises not only from trading activities but also from the Firm's traditional banking activities, which include extension of loans and credit facilities, taking deposits and issuing debt as well as from the investment securities portfolio. Refer to the table on page 136 for a summary by LOB and Corporate, identifying positions included in earnings-at-risk.

The CTC Risk Committee establishes the Firm's structural interest rate risk policy and related limits, which are subject to approval by the Board Risk Committee. Treasury and CIO, working in partnership with the LOBs, calculates the Firm's structural interest rate risk profile and reviews it with senior management, including the CTC Risk Committee. In addition, oversight of structural interest rate risk is managed through a dedicated risk function reporting to the CTC CRO. This risk function is responsible for providing independent oversight and governance around assumptions and establishing and monitoring limits for structural interest rate risk. The Firm manages structural interest rate risk generally through its investment securities portfolio and interest rate derivatives.

Structural interest rate risk can occur due to a variety of factors, including:

- Differences in timing among the maturity or repricing of assets, liabilities and off-balance sheet instruments
- Differences in the amounts of assets, liabilities and off-balance sheet instruments that are maturing or repricing at the same time
- Differences in the amounts by which short-term and long-term market interest rates change (for example, changes in the slope of the yield curve)
- The impact of changes in the maturity of various assets, liabilities or off-balance sheet instruments as interest rates change

The Firm manages interest rate exposure related to its assets and liabilities on a consolidated, Firmwide basis. Business units transfer their interest rate risk to Treasury and CIO through funds transfer pricing, which takes into account the elements of interest rate exposure that can be risk-managed in financial markets. These elements include asset and liability balances and contractual rates of interest, contractual principal payment schedules, expected prepayment experience, interest rate reset dates and maturities, rate indices used for repricing, and any interest rate ceilings or floors for adjustable rate products.

One way the Firm evaluates its structural interest rate risk is through earnings-at-risk. Earnings-at-risk estimates the Firm's interest rate exposure for a given interest rate scenario. It is presented as a sensitivity to a baseline, which includes net interest income and certain interest rate sensitive fees. The baseline uses market interest rates and in the case of deposits, pricing assumptions. The Firm conducts simulations of changes to this baseline for interest rate-sensitive assets and liabilities denominated in U.S. dollars and other currencies ("non-U.S. dollar" currencies). These simulations primarily include retained loans, deposits, deposits with banks, investment securities, long-term debt and any related interest rate hedges, and funds transfer pricing of positions in risk management VaR and other sensitivity-based measures as described on page 136.

Earnings-at-risk scenarios estimate the potential change to a net interest income baseline, over the following 12 months utilizing multiple assumptions. These scenarios include a parallel shift involving changes to both short-term and long-term rates by an equal amount; a steeper yield curve involving holding short-term rates constant and increasing long-term rates; and a flatter yield curve involving increasing short-term rates and holding long-term rates constant. These scenarios consider many different factors, including:

- The impact on exposures as a result of instantaneous changes in interest rates from baseline rates.
- Forecasted balance sheet, as well as modeled prepayment and reinvestment behavior, but do not include assumptions about actions that could be taken by the Firm or its clients and customers in response to any such instantaneous rate changes. Mortgage prepayment assumptions are based on the interest rates used in the scenarios compared with underlying contractual rates, the time since origination, and other factors which are updated periodically based on historical experience.
- The pricing sensitivity of deposits, known as deposit betas, represent the amount by which deposit rates paid could change upon a given change in market interest rates over the cycle. The deposit rates paid in these scenarios may differ from actual deposit rates paid, due to repricing lags and other factors.

The Firm's earnings-at-risk scenarios are periodically evaluated and enhanced in response to changes in the composition of the Firm's balance sheet, changes in market conditions, improvements in the Firm's simulation and other factors. While a relevant measure of the Firm's interest rate exposure, the earnings at risk analysis does not represent a forecast of the Firm's net interest income (Refer to Outlook on page 49 for additional information).

The Firm's U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	**2020**	2019
Parallel shift:		
+100 bps shift in rates	**$ 6.9**	$ 0.3
Steeper yield curve:		
+100 bps shift in long-term rates	**2.4**	1.2
Flatter yield curve:		
+100 bps shift in short-term rates	**4.5**	(0.9)

The change in the Firm's U.S. dollar sensitivities as of December 31, 2020 compared to December 31, 2019 reflected updates to the Firm's baseline for lower short-term and long-term rates as well as the impact of changes in the Firm's balance sheet. In addition, during the fourth quarter of 2020 as part of the Firm's continuous evaluation and periodic enhancement to its earnings-at-risk calculations, the Firm updated the deposit rates paid betas for consumer deposit products based upon observed pricing during the most recent economic cycle. In the absence of this update, the Firm's U.S. dollar sensitivities as of December 31, 2020 would have been lower by $2.0 billion to the +100bps shift in short-term and parallel rate scenarios.

The Firm's sensitivity to rates is primarily a result of assets repricing at a faster pace than deposits.

Based upon current and implied market rates as of December 31, 2020, scenarios reflecting lower rates could result in negative interest rates. The U.S. has never experienced an interest rate environment where the Federal Reserve has a negative interest rate policy. While the impact of negative interest rates on the Firm's earnings-at-risk would vary by scenario, a parallel shift downward of up to 100bps would negatively impact net interest income. In a negative interest rate environment, the modeling assumptions used for certain assets and liabilities require additional management judgment and therefore, the actual outcomes may differ from these assumptions.

The Firm's non-U.S. dollar sensitivities are presented in the table below.

December 31, (in billions)	**2020**	2019
Parallel shift:		
+100 bps shift in rates	**$ 0.9**	$ 0.5
Flatter yield curve:		
+100 bps shift in short-term rates	**0.8**	0.5

The results of the non-U.S. dollar interest rate scenario involving a steeper yield curve with long-term rates rising by 100 basis points and short-term rates staying at current levels were not material to the Firm's earnings-at-risk at December 31, 2020 and 2019.

Non-U.S. dollar foreign exchange risk

Non-U.S. dollar FX risk is the risk that changes in foreign exchange rates affect the value of the Firm's assets or liabilities or future results. The Firm has structural non-U.S. dollar FX exposures arising from capital investments, forecasted expense and revenue, the investment securities portfolio and non-U.S. dollar-denominated debt issuance. Treasury and CIO, working in partnership with the LOBs, primarily manage these risks on behalf of the Firm. Treasury and CIO may hedge certain of these risks using derivatives.

Other sensitivity-based measures

The Firm quantifies the market risk of certain debt and equity and funding activities by assessing the potential impact on net revenue, other comprehensive income ("OCI") and noninterest expense due to changes in relevant market variables. Refer to the table Predominant business activities that give rise to market risk on page 136 for additional information on the positions captured in other sensitivity-based measures.

The table below represents the potential impact to net revenue, OCI or noninterest expense for market risk sensitive instruments that are not included in VaR or earnings-at-risk. Where appropriate, instruments used for hedging purposes are reported net of the positions being hedged. The sensitivities disclosed in the table below may not be representative of the actual gain or loss that would have been realized at December 31, 2020 and 2019, as the movement in market parameters across maturities may vary and are not intended to imply management's expectation of future changes in these sensitivities.

Year ended December 31, **Gain/(loss)** (in millions) **Activity**	**Description**	**Sensitivity measure**	**2020**	**2019**
Debt and equity[(a)]				
Asset Management activities	Consists of seed capital and related hedges; fund co-investments[(b)]; and certain deferred compensation and related hedges[(c)]	10% decline in market value	$ (48)	$ (68)
Other debt and equity	Consists of certain asset-backed fair value option elected loans, privately held equity and other investments held at fair value[(b)]	10% decline in market value	(919)	(867) [(e)]
Funding activities				
Non-USD LTD cross-currency basis	Represents the basis risk on derivatives used to hedge the foreign exchange risk on the non-USD LTD[(d)]	1 basis point parallel tightening of cross currency basis	(16)	(17)
Non-USD LTD hedges foreign currency ("FX") exposure	Primarily represents the foreign exchange revaluation on the fair value of the derivative hedges[(d)]	10% depreciation of currency	13	15
Derivatives – funding spread risk	Impact of changes in the spread related to derivatives FVA[(b)]	1 basis point parallel increase in spread	(4)	(5)
Fair value option elected liabilities – funding spread risk	Impact of changes in the spread related to fair value option elected liabilities DVA[(d)]	1 basis point parallel increase in spread	33	29
Fair value option elected liabilities – interest rate sensitivity	Interest rate sensitivity on fair value option liabilities resulting from a change in the Firm's own credit spread[(d)]	1 basis point parallel increase in spread	(3)	(2)
	Interest rate sensitivity related to risk management of changes in the Firm's own credit spread on fair value option liabilities[(b)]	1 basis point parallel increase in spread	3	2

(a) Excludes equity securities without readily determinable fair values that are measured under the measurement alternative. Refer to Note 2 for additional information.
(b) Impact recognized through net revenue.
(c) In the second quarter of 2020, the Firm refined the approach for risk management of certain deferred compensation, which is recognized through noninterest expense. As a result, certain deferred compensation and related hedges are now included in other sensitivity-based measures.
(d) Impact recognized through OCI.
(e) Prior-period amount has been revised to conform with the current presentation. In the absence of the scope refinement, Other debt and equity would have been $(203) million and $(192) million for the periods ending December 31, 2020 and 2019, respectively. Refer to Total VaR on page 138 for additional information.

The Firm, through its LOBs and Corporate, may be exposed to country risk resulting from financial, economic, political or other significant developments which adversely affect the value of the Firm's exposures related to a particular country or set of countries. The Country Risk Management group actively monitors the various portfolios which may be impacted by these developments and measures the extent to which the Firm's exposures are diversified given the Firm's strategy and risk tolerance relative to a country.

Organization and management

Country Risk Management is an independent risk management function that assesses, manages and monitors country risk originated across the Firm.

The Firm's country risk management function includes the following activities:

- Maintaining policies, procedures and standards consistent with a comprehensive country risk framework
- Assigning sovereign ratings, assessing country risks and establishing risk tolerance relative to a country
- Measuring and monitoring country risk exposure and stress across the Firm
- Managing and approving country limits and reporting trends and limit breaches to senior management
- Developing surveillance tools, such as signaling models and ratings indicators, for early identification of potential country risk concerns
- Providing country risk scenario analysis

Sources and measurement

The Firm is exposed to country risk through its lending and deposits, investing, and market-making activities, whether cross-border or locally funded. Country exposure includes activity with both government and private-sector entities in a country.

Under the Firm's internal country risk management approach, attribution of exposure to an individual country is based on the country where the largest proportion of the assets of the counterparty, issuer, obligor or guarantor are located or where the largest proportion of its revenue is derived, which may be different than the domicile (i.e. legal residence) or country of incorporation.

Individual country exposures reflect an aggregation of the Firm's risk to an immediate default, with zero recovery, of the counterparties, issuers, obligors or guarantors attributed to that country. Activities which result in contingent or indirect exposure to a country are not included in the country exposure measure (for example, providing clearing services or secondary exposure to collateral on securities financing receivables).

Assumptions are sometimes required in determining the measurement and allocation of country exposure, particularly in the case of certain non-linear or index products, or where the nature of the counterparty, issuer, obligor or guarantor is not suitable for attribution to an individual country. The use of different measurement approaches or assumptions could affect the amount of reported country exposure.

Under the Firm's internal country risk measurement framework:

- Lending exposures are measured at the total committed amount (funded and unfunded), net of the allowance for credit losses and eligible cash and marketable securities collateral received
- Deposits are measured as the cash balances placed with central and commercial banks
- Securities financing exposures are measured at their receivable balance, net of eligible collateral received
- Debt and equity securities are measured at the fair value of all positions, including both long and short positions
- Counterparty exposure on derivative receivables is measured at the derivative's fair value, net of the fair value of the eligible collateral received
- Credit derivatives protection purchased and sold is reported based on the underlying reference entity and is measured at the notional amount of protection purchased or sold, net of the fair value of the recognized derivative receivable or payable. Credit derivatives protection purchased and sold in the Firm's market-making activities is measured on a net basis, as such activities often result in selling and purchasing protection related to the same underlying reference entity; this reflects the manner in which the Firm manages these exposures

The Firm's internal country risk reporting differs from the reporting provided under the FFIEC bank regulatory requirements. Refer to Cross-border outstandings on page 318 of the 2020 Form 10-K for further information on the FFIEC's reporting methodology.

Stress testing

Stress testing is an important component of the Firm's country risk management framework, which aims to estimate and limit losses arising from a country crisis by measuring the impact of adverse asset price movements to a country based on market shocks combined with counterparty specific assumptions. Country Risk Management periodically designs and runs tailored stress scenarios to test vulnerabilities to individual countries or sets of countries in response to specific or potential market events, sector performance concerns, sovereign actions and geopolitical risks. These tailored stress results are used to inform potential risk reduction across the Firm, as necessary.

COVID-19 Pandemic

Country Risk Management continues to monitor the impact of the COVID-19 pandemic, leveraging existing stress testing, exposure reporting and controls, as well as tailored analysis, to assess the extent to which individual countries may be adversely impacted.

Risk reporting

Country exposure and stress are measured and reported regularly, and used by Country Risk Management to identify trends, and monitor high usages and breaches against limits.

For country risk management purposes, the Firm may report exposure to jurisdictions that are not fully autonomous, including Special Administrative Regions ("SAR") and dependent territories, separately from the independent sovereign states with which they are associated.

The following table presents the Firm's top 20 exposures by country (excluding the U.S.) as of December 31, 2020, and their comparative exposures as of December 31, 2019. The selection of countries represents the Firm's largest total exposures by individual country, based on the Firm's internal country risk management approach, and does not represent the Firm's view of any actual or potentially adverse credit conditions. Country exposures may fluctuate from period to period due to client activity and market flows.

The overall increase in top 20 exposures was largely driven by client activity and growth in client deposits, relative to the period ending December 31, 2019. This resulted in an increase in cash placements with the central banks of Germany and the United Kingdom.

Top 20 country exposures (excluding the U.S.)[a]

December 31, (in billions)	2020				2019[f]
	Lending and deposits[c]	Trading and investing[d]	Other[e]	Total exposure	Total exposure
Germany	$ 120.8	$ 5.8	$ 0.6	$ 127.2	$ 51.6
United Kingdom	57.2	9.4	1.8	68.4	42.4
Japan	36.7	8.6	0.3	45.6	43.8
China	9.7	9.9	1.6	21.2	19.2
France	13.4	4.6	0.8	18.8	18.1
Switzerland	14.7	0.5	3.5	18.7	18.3
Australia	9.9	5.7	0.3	15.9	11.7
Canada	13.4	0.9	0.2	14.5	13.2
Luxembourg	11.1	1.3	–	12.4	12.9
Brazil	4.2	6.6	–	10.8	7.2
India	3.9	5.1	1.5	10.5	11.3
South Korea	5.4	4.3	0.4	10.1	6.4
Italy	4.7	4.7	0.3	9.7	6.8
Singapore	4.0	2.7	2.0	8.7	6.8
Netherlands[b]	5.4	0.1	2.2	7.7	5.8
Hong Kong SAR	3.7	1.9	0.6	6.2	5.1
Spain	4.1	1.6	0.1	5.8	5.8
Saudi Arabia	4.9	0.9	–	5.8	5.2
Mexico	3.9	1.0	–	4.9	4.7
Sweden	5.4	(1.1)	–	4.3	1.1

(a) Country exposures presented in the table reflect 90% and 87% of total Firmwide non-U.S. exposure, where exposure is attributed to an individual country, at December 31, 2020 and 2019, respectively.
(b) In the fourth quarter of 2020, Country Risk Management determined that the exposure for certain commodities contracts corresponds to an EU-wide risk and should not be attributed to the individual country of registration, previously the Netherlands. As such, the exposure is no longer included and the prior-period amount has been revised to conform with the current presentation.
(c) Lending and deposits includes loans and accrued interest receivable, lending-related commitments (net of eligible collateral and the allowance for credit losses), deposits with banks (including central banks), acceptances, other monetary assets, and issued letters of credit net of participations. Excludes intra-day and operating exposures, such as those from settlement and clearing activities.
(d) Includes market-making inventory, Investment securities, and counterparty exposure on derivative and securities financings net of eligible collateral and hedging. Includes exposure from single reference entity ("single-name"), index and other multiple reference entity transactions for which one or more of the underlying reference entities is in a country listed in the above table.
(e) Predominantly includes physical commodity inventory.
(f) The country rankings presented in the table as of December 31, 2019, are based on the country rankings of the corresponding exposures at December 31, 2020, not actual rankings of such exposures at December 31, 2019.

Operational risk is the risk of an adverse outcome resulting from inadequate or failed internal processes or systems; human factors; or external events impacting the Firm's processes or systems; Operational Risk includes compliance, conduct, legal, and estimations and model risk. Operational risk is inherent in the Firm's activities and can manifest itself in various ways, including fraudulent acts, business interruptions, cyber attacks, inappropriate employee behavior, failure to comply with applicable laws and regulations or failure of vendors to perform in accordance with their agreements. Operational Risk Management attempts to manage operational risk at appropriate levels in light of the Firm's financial position, the characteristics of its businesses, and the markets and regulatory environments in which it operates.

Operational Risk Management Framework

The Firm's Compliance, Conduct, and Operational Risk ("CCOR") Management Framework is designed to enable the Firm to govern, identify, measure, monitor and test, manage and report on the Firm's operational risk.

Operational Risk Governance

The LOBs and Corporate are responsible for the management of operational risk. The Control Management Organization, which consists of control managers within each LOB and Corporate, is responsible for the day-to-day execution of the CCOR Framework and the evaluation of the effectiveness of their control environments to determine where targeted remediation efforts may be required.

The Firm's Global Chief Compliance Officer ("CCO") and FRE for Operational Risk is responsible for defining the CCOR Management Framework and establishing minimum standards for its execution. Operational Risk Officers ("OROs") report to both the LOB CROs and to the FRE for Operational Risk, and are independent of the respective businesses or functions they oversee.

The Firm's CCOR Management policy establishes the CCOR Management Framework for the Firm. The CCOR Management Framework is articulated in the Risk Governance and Oversight Policy which is reviewed and approved by the Board Risk Committee periodically.

Operational Risk identification

The Firm utilizes a structured risk and control self-assessment process that is executed by the LOBs and Corporate. As part of this process, the LOBs and Corporate evaluate the effectiveness of their control environment to assess where controls have failed, and to determine where remediation efforts may be required. The Firm's Operational Risk and Compliance organization ("Operational Risk and Compliance") provides oversight of these activities and may also perform independent assessments of significant operational risk events and areas of concentrated or emerging risk.

Operational Risk Measurement

Operational Risk and Compliance performs independent risk assessments of the Firm's operational risks, which includes assessing the effectiveness of the control environment and reporting the results to senior management.

In addition, operational risk measurement includes operational risk-based capital and operational risk loss projections under both baseline and stressed conditions.

The primary component of the operational risk capital estimate is the Loss Distribution Approach ("LDA") statistical model, which simulates the frequency and severity of future operational risk loss projections based on historical data. The LDA model is used to estimate an aggregate operational risk loss over a one-year time horizon, at a 99.9% confidence level. The LDA model incorporates actual internal operational risk losses in the quarter following the period in which those losses were realized, and the calculation generally continues to reflect such losses even after the issues or business activities giving rise to the losses have been remediated or reduced.

As required under the Basel III capital framework, the Firm's operational risk-based capital methodology, which uses the Advanced Measurement Approach ("AMA"), incorporates internal and external losses as well as management's view of tail risk captured through operational risk scenario analysis, and evaluation of key business environment and internal control metrics. The Firm does not reflect the impact of insurance in its AMA estimate of operational risk capital.

The Firm considers the impact of stressed economic conditions on operational risk losses and develops a forward looking view of material operational risk events that may occur in a stressed environment. The Firm's operational risk stress testing framework is utilized in calculating results for the Firm's CCAR and other stress testing processes.

Refer to Capital Risk Management section, on pages 91-101 for information related to operational risk RWA, and CCAR.

Operational Risk Monitoring and testing

The results of risk assessments performed by Operational Risk and Compliance are leveraged as one of the key criteria in the independent monitoring and testing of the LOBs and Corporate's compliance with laws and regulation. Through monitoring and testing, Operational Risk and Compliance independently identify areas of operational risk and tests the effectiveness of controls within the LOBs and Corporate.

Management of Operational Risk

The operational risk areas or issues identified through monitoring and testing are escalated to the LOBs and Corporate to be remediated through action plans, as needed, to mitigate operational risk. Operational Risk and

Compliance may advise the LOBs and Corporate in the development and implementation of action plans.

Operational Risk Reporting
Escalation of risks is a fundamental expectation for employees at the Firm. Risks identified by Operational Risk and Compliance are escalated to the appropriate LOB and Corporate Control Committees, as needed. Operational Risk and Compliance has established standards to ensure that consistent operational risk reporting and operational risk reports are produced on a Firmwide basis as well as by the LOBs and Corporate. Reporting includes the evaluation of key risk indicators and key performance indicators against established thresholds as well as the assessment of different types of operational risk against stated risk appetite. The standards reinforce escalation protocols to senior management and to the Board of Directors.

COVID-19 Pandemic
Under the CCOR Management Framework, Operational Risk and Compliance monitors and assesses COVID-19 related legal and regulatory developments associated with the Firm's financial products and services offered to clients and customers as part of the existing change management process. The Firm will continue to review and assess the impact of the pandemic on operational risk and implement adequate measures as needed.

Subcategories and examples of operational risks

Operational risk can manifest itself in various ways. Operational risk subcategories such as Compliance risk, Conduct risk, Legal risk, and Estimations and Model risk as well as other operational risks, can lead to losses which are captured through the Firm's operational risk measurement processes. Refer to pages 148, 149, 150 and 151, respectively for more information on Compliance, Conduct, Legal, and Estimations and Model risk. Details on other select examples of operational risks are provided below.

Cybersecurity risk
Cybersecurity risk is the risk of the Firm's exposure to harm or loss resulting from misuse or abuse of technology by malicious actors. Cybersecurity risk is an important and continuously evolving focus for the Firm. Significant resources are devoted to protecting and enhancing the security of computer systems, software, networks and other technology assets. The Firm's security efforts are designed to protect against, among other things, cybersecurity attacks by unauthorized parties attempting to obtain access to confidential information, destroy data, disrupt or degrade service, sabotage systems or cause other damage.

Ongoing business expansions may expose the Firm to potential new threats as well as expanded regulatory scrutiny including the introduction of new cybersecurity requirements. The Firm continues to make significant investments in enhancing its cyber defense capabilities and to strengthen its partnerships with the appropriate government and law enforcement agencies and other businesses in order to understand the full spectrum of cybersecurity risks in the operating environment, enhance defenses and improve resiliency against cybersecurity threats. The Firm actively participates in discussions of cybersecurity risks with law enforcement, government officials, peer and industry groups, and has significantly increased efforts to educate employees and certain clients on the topic of cybersecurity risks.

Third parties with which the Firm does business or that facilitate the Firm's business activities (e.g., vendors, supply chain, exchanges, clearing houses, central depositories, and financial intermediaries) are also sources of cybersecurity risk to the Firm. Third party cybersecurity incidents such as system breakdowns or failures, misconduct by the employees of such parties, or cyberattacks could affect their ability to deliver a product or service to the Firm or result in lost or compromised information of the Firm or its clients. Clients are also sources of cybersecurity risk to the Firm, particularly when their activities and systems are beyond the Firm's own security and control systems. As a result, the Firm engages in regular and ongoing discussions with certain vendors and clients regarding cybersecurity risks and opportunities to improve security. However, where cybersecurity incidents occur as a result of client failures to maintain the security of their own systems and processes, clients are responsible for losses incurred.

To protect the confidentiality, integrity and availability of the Firm's infrastructure, resources and information, the Firm maintains a cybersecurity program designed to prevent, detect, and respond to cyberattacks. The Audit Committee is updated periodically on the Firm's Information Security Program, recommended changes, cybersecurity policies and practices, ongoing efforts to improve security, as well as its efforts regarding significant cybersecurity events. In addition, the Firm has a cybersecurity incident response plan ("IRP") designed to enable the Firm to respond to attempted cybersecurity incidents, coordinate such responses with law enforcement and other government agencies, and notify clients and customers, as applicable. Among other key focus areas, the IRP is designed to mitigate the risk of insider trading connected to a cybersecurity incident, and includes various escalation points. Due to the impact of COVID-19, the Firm increased the use of remote access and also video conferencing solutions provided by third parties to facilitate remote work. As a result the Firm took additional precautionary measures to mitigate cybersecurity risks.

The Cybersecurity and Technology Control functions are responsible for governance and oversight of the Firm's Information Security Program. In partnership with the Firm's LOBs and Corporate, the Cybersecurity and Technology Control organization identifies information security risk issues and oversees programs for the technological protection of the Firm's information resources including applications, infrastructure as well as confidential and personal information related to the Firm's customers. The Cybersecurity and Technology organization consists of business aligned information security managers that are supported within the organization by the following products that execute the Information Security Program for the Firm:

- Cyber Defense & Fraud

- Data Management, Protection & Privacy
- Identity & Access Management
- Governance & Controls
- Production Management & Resiliency
- Software & Platform Enablement

The Global Cybersecurity and Technology Control governance structure is designed to identify, escalate, and mitigate information security risks. This structure uses key governance forums to disseminate information and monitor technology efforts. These forums are established at multiple levels throughout the Firm and include representatives from each LOB and Corporate. Reports containing overviews of key technology risks and efforts to enhance related controls are produced for these forums, and are reviewed by management at multiple levels. The forums are used to escalate information security risks or other matters as appropriate.

The IRM function provides oversight of the activities designed to identify, assess, measure, and mitigate cybersecurity risk.

The Firm’s Security Awareness Program includes training that reinforces the Firm's Information Technology Risk and Security Management policies, standards and practices, as well as the expectation that employees comply with these policies. The Security Awareness Program engages personnel through training on how to identify potential cybersecurity risks and protect the Firm’s resources and information. This training is mandatory for all employees globally on a periodic basis, and it is supplemented by Firmwide testing initiatives, including periodic phishing tests. Finally, the Firm’s Global Privacy Program requires all employees to take periodic awareness training on data privacy. This privacy-focused training includes information about confidentiality and security, as well as responding to unauthorized access to or use of information.

Business and technology resiliency risk

Business disruptions can occur due to forces beyond the Firm’s control such as the spread of infectious diseases or pandemics, severe weather, power or telecommunications loss, accidents, failure of a third party to provide expected services, cyberattack, flooding, transit strikes, terrorism, health emergencies. The safety of the Firm’s employees and customers is of the highest priority. The Firmwide resiliency program is intended to enable the Firm to recover its critical business functions and supporting assets (i.e., staff, technology and facilities) in the event of a business interruption. The program includes governance, awareness training, and testing of recovery strategies, as well as strategic and tactical initiatives to identify, assess, and manage business interruption and public safety risks. The strength and proficiency of the Firmwide resiliency program has played an integral role in maintaining the Firm’s business operations during and after various events.

Payment fraud risk

Payment fraud risk is the risk of external and internal parties unlawfully obtaining personal monetary benefit through misdirected or otherwise improper payment. The risk of payment fraud remains at a heightened level across the industry, particularly during the current COVID-19 pandemic due to the use of contingent forms of payment authentication methods, scams involving the pandemic being perpetrated including an increase in the level of fraud attempts against consumers. The complexities of these incidents and the strategies used by perpetrators continue to evolve. The Firm employs various controls for managing payment fraud risk as well as providing employee and client education and awareness trainings. The Firm’s monitoring of customer behavior to detect new fraud strategies is periodically evaluated and enhanced in an effort to mitigate these fraud risks.

Third-party outsourcing risk

The Firm‘s Third-Party Oversight (“TPO”) and Inter-affiliates Oversight (“IAO”) framework assist the LOBs and Corporate in selecting, documenting, onboarding, monitoring and managing their supplier relationships including services provided by affiliates. The objectives of the TPO framework are to hold suppliers to a high level of operational performance and to mitigate key risks including data loss and business disruption. The Corporate Third-Party Oversight group is responsible for Firmwide training, monitoring, reporting and standards.

Insurance

One of the ways in which operational risk may be mitigated is through insurance maintained by the Firm. The Firm purchases insurance from commercial insurers and maintains a wholly-owned captive insurer, Park Assurance Company. Insurance may also be required by third parties with whom the Firm does business.

COMPLIANCE RISK MANAGEMENT

Compliance risk, a subcategory of operational risk, is the risk of failing to comply with laws, rules, regulations or codes of conduct and standards of self-regulatory organizations.

Overview

Each LOB and Corporate hold primary ownership of and accountability for managing compliance risk. The Firm's Operational Risk and Compliance Organization ("Operational Risk and Compliance"), which is independent of the LOBs and Corporate, provides independent review, monitoring and oversight of business operations with a focus on compliance with the laws, rules, and regulations applicable to the delivery of the Firm's products and services to clients and customers.

These compliance risks relate to a wide variety of laws, rules and regulations depending on the LOB and the jurisdiction, and include risks related to financial products and services, relationships and interactions with clients and customers, and employee activities. For example, compliance risks include those associated with anti-money laundering compliance, trading activities, market conduct, and complying with the laws, rules, and regulations related to the offering of products and services across jurisdictional borders. Compliance risk is also inherent in the Firm's fiduciary activities, including the failure to exercise the applicable standard of care (such as the duties of loyalty or care), to act in the best interest of clients and customers or to treat clients and customers fairly.

Other functions provide oversight of significant regulatory obligations that are specific to their respective areas of responsibility.

Operational Risk and Compliance implements policies and standards designed to govern, identify, measure, monitor and test, manage, and report on compliance risk.

Governance and oversight

Operational Risk and Compliance is led by the Firm's Global CCO and FRE for Operational Risk.

The Firm maintains oversight and coordination of its compliance risk through the implementation of the CCOR Risk Management Framework. The Firm's CCO also provides regular updates to the Audit Committee and the Board Risk Committee. In certain Special Purpose Committees of the Board have previously been established to oversee the Firm's compliance with regulatory Consent Orders.

Code of Conduct

The Firm has a Code of Conduct (the "Code") that sets forth the Firm's expectation that employees will conduct themselves with integrity at all times and provides the principles that govern employee conduct with clients, customers, shareholders and one another, as well as with the markets and communities in which the Firm does business. The Code requires employees to promptly report any potential or actual violation of the Code, any internal Firm policy, or any law or regulation applicable to the Firm's business. It also requires employees to report any illegal conduct, or conduct that violates the underlying principles of the Code, by any of the Firm's employees, clients, customers, suppliers, contract workers, business partners, or agents. All newly hired employees are assigned Code training and current employees are periodically assigned Code training on an ongoing basis. Employees are required to affirm their compliance with the Code periodically.

Employees can report any potential or actual violations of the Code through the JPMC Conduct Hotline by phone or the internet. The Hotline is anonymous, except in certain non-U.S. jurisdictions where laws prohibit anonymous reporting, and is available at all times globally, with translation services. It is administered by an outside service provider. The Code prohibits retaliation against anyone who raises an issue or concern in good faith. Periodically, the Audit Committee receives reports on the Code of Conduct program.

Conduct risk, a subcategory of operational risk, is the risk that any action or inaction by an employee or employees could lead to unfair client or customer outcomes, impact the integrity of the markets in which the Firm operates, or compromise the Firm's reputation.

Overview

Each LOB and Corporate is accountable for identifying and managing its conduct risk to provide appropriate engagement, ownership and sustainability of a culture consistent with the Firm's How We Do Business Principles (the "Principles"). The Principles serve as a guide for how employees are expected to conduct themselves. With the Principles serving as a guide, the Firm's Code sets out the Firm's expectations for each employee and provides information and resources to help employees conduct business ethically and in compliance with the laws everywhere the Firm operates. Refer to Compliance Risk Management on page 148 for further discussion of the Code.

Governance and oversight

The Conduct Risk Program is governed by the CCOR Management policy, which establishes the framework for governance, identification, measurement, monitoring and testing, management and reporting conduct risk in the Firm.

The Firm has a senior committee that provides oversight of the Firm's conduct initiatives to develop a more holistic view of conduct risks and to connect key programs across the Firm in order to identify opportunities and emerging areas of focus. This committee is responsible for setting overall program direction for strategic enhancements to the Firm's employee conduct framework and review the consolidated Firmwide Conduct Risk Appetite Assessment.

Conduct risk management encompasses various aspects of people management practices throughout the employee life cycle, including recruiting, onboarding, training and development, performance management, promotion and compensation processes. Each LOB, Treasury and CIO, and designated corporate functions completes an assessment of conduct risk periodically, reviews metrics and issues which may involve conduct risk, and provides business conduct training as appropriate.

LEGAL RISK MANAGEMENT

Legal risk, a subcategory of operational risk, is the risk of loss primarily caused by the actual or alleged failure to meet legal obligations that arise from the rule of law in jurisdictions in which the Firm operates, agreements with clients and customers, and products and services offered by the Firm.

Overview

The global Legal function ("Legal") provides legal services and advice to the Firm. Legal is responsible for managing the Firm's exposure to legal risk by:

- managing actual and potential litigation and enforcement matters, including internal reviews and investigations related to such matters
- advising on products and services, including contract negotiation and documentation
- advising on offering and marketing documents and new business initiatives
- managing dispute resolution
- interpreting existing laws, rules and regulations, and advising on changes to them
- advising on advocacy in connection with contemplated and proposed laws, rules and regulations, and
- providing legal advice to the LOBs, Corporate, functions and the Board.

Legal selects, engages and manages outside counsel for the Firm on all matters in which outside counsel is engaged. In addition, Legal advises the Firm's Conflicts Office which reviews the Firm's wholesale transactions that may have the potential to create conflicts of interest for the Firm.

Governance and oversight

The Firm's General Counsel reports to the CEO and is a member of the Operating Committee, the Firmwide Risk Committee and the Firmwide Control Committee. The Firm's General Counsel and other members of Legal report on significant legal matters to the Firm's Board of Directors and to the Audit Committee.

Legal serves on and advises various committees and advises the Firm's LOBs and Corporate on potential reputation risk issues.

Estimations and Model risk, a subcategory of operational risk, is the potential for adverse consequences from decisions based on incorrect or misused estimation outputs.

The Firm uses models and other analytical and judgment-based estimations across various businesses and functions. The estimation methods are of varying levels of sophistication and are used for many purposes, such as the valuation of positions and measurement of risk, assessing regulatory capital requirements, conducting stress testing, and making business decisions. A dedicated independent function, Model Risk Governance and Review ("MRGR"), defines and governs the Firm's policies relating to the management of model risk and risks associated with certain analytical and judgment-based estimations, such as those used in risk management, budget forecasting and capital planning and analysis.

The governance of analytical and judgment-based estimations within MRGR's scope follows a consistent approach to the approach used for models, which is described in detail below.

Model risks are owned by the users of the models within the Firm based on the specific purposes of such models. Users and developers of models are responsible for developing, implementing and testing their models, as well as referring models to the MRGR for review and approval. Once models have been approved, model users and developers are responsible for maintaining a robust operating environment, and must monitor and evaluate the performance of the models on an ongoing basis. Model users and developers may seek to enhance models in response to changes in the portfolios and in product and market developments, as well as to capture improvements in available modeling techniques and systems capabilities.

Models are tiered based on an internal standard according to their complexity, the exposure associated with the model and the Firm's reliance on the model. This tiering is subject to the approval of the MRGR. In its review of a model, the MRGR considers whether the model is suitable for the specific purposes for which it will be used. When reviewing a model, the MRGR analyzes and challenges the model methodology and the reasonableness of model assumptions, and may perform or require additional testing, including back-testing of model outcomes. Model reviews are approved by the appropriate level of management within the MRGR based on the relevant model tier.

Under the Firm's Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Firm's policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

While models are inherently imprecise, the degree of imprecision or uncertainty can be heightened by the market or economic environment. This is particularly true when the current and forecasted environment is significantly different from the historical macroeconomic environments upon which the models were trained, as the Firm has experienced during the COVID-19 pandemic. This uncertainty may necessitate a greater degree of judgment and analytics to inform adjustments to model outputs than in typical periods.

Refer to Critical Accounting Estimates Used by the Firm on pages 152-155 and Note 2 for a summary of model-based valuations and other valuation techniques.

CRITICAL ACCOUNTING ESTIMATES USED BY THE FIRM

JPMorgan Chase's accounting policies and use of estimates are integral to understanding its reported results. The Firm's most complex accounting estimates require management's judgment to ascertain the appropriate carrying value of assets and liabilities. The Firm has established policies and control procedures intended to ensure that estimation methods, including any judgments made as part of such methods, are well-controlled, independently reviewed and applied consistently from period to period. The methods used and judgments made reflect, among other factors, the nature of the assets or liabilities and the related business and risk management strategies, which may vary across the Firm's businesses and portfolios. In addition, the policies and procedures are intended to ensure that the process for changing methodologies occurs in an appropriate manner. The Firm believes its estimates for determining the carrying value of its assets and liabilities are appropriate. The following is a brief description of the Firm's critical accounting estimates involving significant judgments.

Allowance for credit losses

The Firm's allowance for credit losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's financial assets measured at amortized cost and certain off-balance sheet lending-related commitments. The allowance for credit losses comprises:

- The allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated),
- The allowance for lending-related commitments, and
- The allowance for credit losses on investment securities, which covers the Firm's HTM and AFS securities.

The allowance for credit losses involves significant judgment on a number of matters including development and weighting of macroeconomic forecasts, incorporation of historical loss experience, assessment of risk characteristics, assignment of risk ratings, valuation of collateral, and the determination of remaining expected life. Refer to Note 10 and Note 13 for further information on these judgments as well as the Firm's policies and methodologies used to determine the Firm's allowance for credit losses.

One of the most significant judgments involved in estimating the Firm's allowance for credit losses relates to the macroeconomic forecasts used to estimate credit losses over the eight-quarter forecast period within the Firm's methodology. The eight-quarter forecast incorporates hundreds of macroeconomic variables ("MEVs") that are relevant for exposures across the Firm, with modeled credit losses being driven primarily by a subset of less than twenty variables. The specific variables that have the greatest effect on the modeled losses of each portfolio vary by portfolio and geography.

- Key MEVs for the consumer portfolio include U.S. unemployment, house price index ("HPI") and U.S. real gross domestic product ("GDP").
- Key MEVs for the wholesale portfolio include U.S. real GDP, U.S. unemployment, U.S. equity prices, corporate credit spreads, oil prices, commercial real estate prices and HPI.

Changes in the Firm's assumptions and forecasts of economic conditions could significantly affect its estimate of expected credit losses in the portfolio at the balance sheet date or lead to significant changes in the estimate from one reporting period to the next.

The COVID-19 pandemic has resulted in a weak labor market and weak overall economic conditions that will continue to affect borrowers across the Firm's consumer and wholesale lending portfolios. Significant judgment is required to estimate the severity and duration of the current economic downturn, as well as its potential impact on borrower defaults and loss severities. In particular, macroeconomic conditions and forecasts regarding the duration and severity of the economic downturn caused by the COVID-19 pandemic have been rapidly changing and remain highly uncertain. It is difficult to predict exactly how borrower behavior will be impacted by these changes in economic conditions. The effectiveness of government support, customer assistance and enhanced unemployment benefits should act as mitigants to credit losses, but the extent of the mitigation impact remains uncertain.

It is difficult to estimate how potential changes in any one factor or input might affect the overall allowance for credit losses because management considers a wide variety of factors and inputs in estimating the allowance for credit losses. Changes in the factors and inputs considered may not occur at the same rate and may not be consistent across all geographies or product types, and changes in factors and inputs may be directionally inconsistent, such that improvement in one factor or input may offset deterioration in others.

To consider the impact of a hypothetical alternate macroeconomic forecast, the Firm compared the modeled credit losses determined using its central and relative adverse macroeconomic scenarios, which are two of the five scenarios considered in estimating the allowances for loan losses and lending-related commitments. The central and relative adverse scenarios each included a full suite of MEVs, but differed in the levels, paths and peaks/troughs of those variables over the eight-quarter forecast period.

For example, compared to the Firm's central scenario described on page 132 and in Note 13, the Firm's relative adverse scenario assumes a significantly elevated U.S. unemployment rate throughout 2021, averaging 3.0% higher over the eight-quarter forecast, with a peak difference of approximately 4.0% in the second quarter of 2021; lower U.S. real GDP with a slower recovery, remaining nearly 2.6% lower at the end of the eight-quarter forecast, with a peak difference of nearly 4.1% in the third quarter of 2021; and a 10.1% further deterioration in the national HPI with a trough in the first quarter of 2022.

This analysis is not intended to estimate expected future changes in the allowance for credit losses, for a number of reasons, including:

- the Firm has placed significant weight on its adverse scenarios in estimating its allowance for credit losses as of December 31, 2020, and accordingly, the existing allowance already reflects credit losses beyond those estimated under the central scenario
- the impacts of changes in many MEVs are both interrelated and nonlinear, so the results of this analysis cannot be simply extrapolated for more severe changes in macroeconomic variables
- the COVID-19 pandemic has stressed many MEVs at a speed and to degrees not seen in recent history, adding significantly higher degrees of uncertainty around modeled credit loss estimations
- significant changes in the expected severity and duration of the economic downturn caused by the COVID-19 pandemic, the effects of government support and customer assistance, and the speed of the subsequent recovery could significantly affect the Firm's estimate of expected credit losses irrespective of the estimated sensitivities described below.

Without considering the additional weight the Firm has placed on its adverse scenarios or any other offsetting or correlated effects in other qualitative components of the Firm's allowance for credit losses for the lending exposures noted below, the difference between the modeled estimates under the Firm's relative adverse and central scenarios at December 31, 2020 would result in the following:

- An increase of approximately $700 million for residential real estate loans and lending-related commitments
- An increase of approximately $5.1 billion for credit card loans
- An increase of approximately $2.8 billion for wholesale loans and lending-related commitments

This analysis relates only to the modeled credit loss estimates and is not intended to estimate changes in the overall allowance for credit losses as it does not reflect any potential changes in other adjustments to the quantitative calculation, which would also be influenced by the judgment management applies to the modeled lifetime loss estimates to reflect the uncertainty and imprecision of these modeled lifetime loss estimates based on then-current circumstances and conditions.

Recognizing that forecasts of macroeconomic conditions are inherently uncertain, particularly in light of the recent economic conditions, the Firm believes that its process to consider the available information and associated risks and uncertainties is appropriately governed and that its estimates of expected credit losses were reasonable and appropriate for the period ended December 31, 2020.

Fair value

JPMorgan Chase carries a portion of its assets and liabilities at fair value. The majority of such assets and liabilities are measured at fair value on a recurring basis, including, derivatives and structured note products. Certain assets and liabilities are measured at fair value on a nonrecurring basis, including certain mortgage, home equity and other loans, where the carrying value is based on the fair value of the underlying collateral.

Assets measured at fair value

The following table includes the Firm's assets measured at fair value and the portion of such assets that are classified within level 3 of the valuation hierarchy. Refer to Note 2 for further information.

December 31, 2020 (in billions, except ratios)	Total assets at fair value	Total level 3 assets
Federal Funds sold and securities purchased under resale agreements	$ 238.0	$ –
Securities borrowed	53.0	–
Trading assets:		
Trading debt and equity instruments	$ 423.5	$ 2.6
Derivative receivables[(a)]	79.6	7.7
Total trading assets	503.1	10.3
AFS securities	388.2	–
Loans	44.5	2.3
MSRs	3.3	3.3
Other	304.1	0.5
Total assets measured at fair value on a recurring basis	1,243.2	16.4
Total assets measured at fair value on a nonrecurring basis	3.6	2.0
Total assets measured at fair value	$ 1,246.8	$ 18.4
Total Firm assets	$ 3,386.1	
Level 3 assets at fair value as a percentage of total Firm assets[(a)]		0.5%
Level 3 assets at fair value as a percentage of total Firm assets at fair value[(a)]		1.5%

(a) For purposes of the table above, the derivative receivables total reflects the impact of netting adjustments; however, the $7.7 billion of derivative receivables classified as level 3 does not reflect the netting adjustment as such netting is not relevant to a presentation based on the transparency of inputs to the valuation of an asset. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

Valuation

Details of the Firm's processes for determining fair value are set out in Note 2. Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the valuation hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, the lack of observability of certain significant inputs requires management to assess all relevant empirical data in deriving valuation inputs including, for example, transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves. Refer to Note 2 for a further discussion of the valuation of level 3 instruments, including unobservable inputs used.

For instruments classified in levels 2 and 3, management judgment must be applied to assess the appropriate level of valuation adjustments to reflect counterparty credit quality, the Firm's creditworthiness, market funding rates, liquidity considerations, unobservable parameters, and for portfolios that meet specified criteria, the size of the net open risk position. The judgments made are typically affected by the type of product and its specific contractual terms, and the level of liquidity for the product or within the market as a whole. In periods of heightened market volatility and uncertainty judgments are further affected by the wider variation of reasonable valuation estimates, particularly for positions that are less liquid. Refer to Note 2 for a further discussion of valuation adjustments applied by the Firm.

Imprecision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of methodologies or assumptions different than those used by the Firm could result in a different estimate of fair value at the reporting date. Refer to Note 2 for a detailed discussion of the Firm's valuation process and hierarchy, and its determination of fair value for individual financial instruments.

Goodwill impairment

Under U.S. GAAP, goodwill must be allocated to reporting units and tested for impairment at least annually. The Firm's process and methodology used to conduct goodwill impairment testing is described in Note 15.

Management applies significant judgment when testing goodwill for impairment. The goodwill associated with each business combination is allocated to the related reporting units for goodwill impairment testing.

For the year ended December 31, 2020, the Firm reviewed current economic conditions, including the potential impacts of the COVID-19 pandemic on business performance, estimated market cost of equity, as well as actual business results and projections of business performance for all its reporting units. The Firm has concluded that the goodwill allocated to its reporting units was not impaired as of December 31, 2020. The fair values of these reporting units exceeded their carrying values by at least 15% and did not indicate a significant risk of goodwill impairment based on current projections and valuations.

The projections for all of the Firm's reporting units are consistent with management's current business outlook assumptions in the short term, and the Firm's best estimates of long-term growth and return on equity in the longer term. Where possible, the Firm uses third-party and peer data to benchmark its assumptions and estimates.

Refer to Note 15 for additional information on goodwill, including the goodwill impairment assessment as of December 31, 2020.

Credit card rewards liability

JPMorgan Chase offers credit cards with various rewards programs which allow cardholders to earn rewards points based on their account activity and the terms and conditions of the rewards program. Generally, there are no limits on the points that an eligible cardholder can earn, nor do the points expire, and the points can be redeemed for a variety of rewards, including cash (predominantly in the form of account credits), gift cards and travel. The Firm maintains a rewards liability which represents the estimated cost of rewards points earned and expected to be redeemed by cardholders. The liability is accrued as the cardholder earns the benefit and is reduced when the cardholder redeems points. This liability was $7.7 billion and $6.4 billion at December 31, 2020 and 2019, respectively, and is recorded in accounts payable and other liabilities on the Consolidated balance sheets.

The rewards liability is sensitive to redemption rate ("RR") and cost per point ("CPP") assumptions. The RR assumption is used to estimate the number of points earned by customers that will be redeemed over the life of the account. The CPP assumption is used to estimate the cost of future point redemptions. These assumptions are evaluated periodically considering historical actuals and cardholder redemption behavior and updates to them will impact the rewards liability. As of December 31, 2020, a combined increase of 25 basis points in RR and 1 basis point in CPP would increase the rewards liability by approximately $215 million.

Income taxes

JPMorgan Chase is subject to the income tax laws of the various jurisdictions in which it operates, including U.S. federal, state and local, and non-U.S. jurisdictions. These laws are often complex and may be subject to different interpretations. To determine the financial statement impact of accounting for income taxes, including the provision for income tax expense and unrecognized tax benefits, JPMorgan Chase must make assumptions and judgments about how to interpret and apply these complex tax laws to numerous transactions and business events, as well as make judgments regarding the timing of when certain items may affect taxable income in the U.S. and non-U.S. tax jurisdictions.

JPMorgan Chase's interpretations of tax laws around the world are subject to review and examination by the various taxing authorities in the jurisdictions where the Firm operates, and disputes may occur regarding its view on a tax position. These disputes over interpretations with the various taxing authorities may be settled by audit, administrative appeals or adjudication in the court systems of the tax jurisdictions in which the Firm operates. JPMorgan Chase regularly reviews whether it may be assessed additional income taxes as a result of the resolution of these matters, and the Firm records additional reserves as appropriate. In addition, the Firm may revise its estimate of income taxes due to changes in income tax laws, legal interpretations, and business strategies. It is possible that revisions in the Firm's estimate of income taxes may materially affect the Firm's results of operations in any reporting period.

The Firm's provision for income taxes is composed of current and deferred taxes. Deferred taxes arise from differences between assets and liabilities measured for financial reporting versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. The Firm has also recognized deferred tax assets in connection with certain tax attributes, including net operating loss ("NOL") carryforwards and foreign tax credit ("FTC") carryforwards. The Firm performs regular reviews to ascertain whether its deferred tax assets are realizable. These reviews include management's estimates and assumptions regarding future taxable income, which also incorporates various tax planning strategies, including strategies that may be available to utilize NOLs before they expire. In connection with these reviews, if it is determined that a deferred tax asset is not realizable, a valuation allowance is established. The valuation allowance may be reversed in a subsequent reporting period if the Firm determines that, based on revised estimates of future taxable income or changes in tax planning strategies, it is more likely than not that all or part of the deferred tax asset will become realizable. As of December 31, 2020, management has determined it is more likely than not that the Firm will realize its deferred tax assets, net of the existing valuation allowance.

The Firm adjusts its unrecognized tax benefits as necessary when additional information becomes available. Uncertain tax positions that meet the more-likely-than-not recognition threshold are measured to determine the amount of benefit to recognize. An uncertain tax position is measured at the largest amount of benefit that management believes is more likely than not to be realized upon settlement. It is possible that the reassessment of JPMorgan Chase's unrecognized tax benefits may have a material impact on its effective income tax rate in the period in which the reassessment occurs.

Refer to Note 25 for additional information on income taxes.

Litigation reserves

Refer to Note 30 for a description of the significant estimates and judgments associated with establishing litigation reserves.

ACCOUNTING AND REPORTING DEVELOPMENTS

Financial Accounting Standards Board ("FASB") Standards Adopted since January 1, 2020

Standard	Summary of guidance	Effects on financial statements
Financial Instruments - Credit Losses ("CECL") *Issued June 2016*	• Establishes a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. • Eliminates existing guidance for PCI loans, and requires recognition of the nonaccretable difference as an increase to the allowance for expected credit losses on financial assets purchased with more than insignificant credit deterioration since origination, with a corresponding increase in the amortized cost of the related loans. • Requires inclusion of expected recoveries, limited to the cumulative amount of prior writeoffs, when estimating the allowance for credit losses for in scope financial assets (including collateral-dependent assets). • Amends existing impairment guidance for AFS securities to incorporate an allowance, which will allow for reversals of credit impairments in the event that the credit of an issuer improves. • Requires a cumulative-effect adjustment to retained earnings as of the beginning of the reporting period of adoption.	• Adopted January 1, 2020. • Refer to Note 1 for further information.
Goodwill *Issued January 2017*	• Requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value. • Eliminates the requirement that an impairment loss be recognized only if the estimated implied fair value of the goodwill is below its carrying value.	• Adopted January 1, 2020. • No impact upon adoption as the guidance was applied prospectively. • Refer to Note 15 for further information.
Reference Rate Reform *Issued March 2020 and updated January 2021*	• Provides optional expedients and exceptions to current accounting guidance when financial instruments, hedge accounting relationships, and other transactions are amended due to reference rate reform. • Provides an election to account for certain contract amendments related to reference rate reform as modifications rather than extinguishments without the requirement to assess the significance of the amendments. • Allows for changes in critical terms of a hedge accounting relationship without automatic termination of that relationship. Provides various practical expedients and elections designed to allow hedge accounting to continue uninterrupted during the transition period. • Provides a one-time election to transfer securities out of the held-to-maturity classification if certain criteria are met. • The January 2021 update provides an election to account for derivatives modified to change the rate used for discounting, margining, or contract price alignment (collectively "discounting transition") as modifications.	• Issued and effective March 12, 2020. The January 7, 2021 update was effective when issued. • The Firm elected to apply certain of the practical expedients related to contract modifications and hedge accounting relationships, and discounting transition beginning in the third quarter of 2020. The discounting transition election was applied retrospectively. The main purpose of the practical expedients is to ease the administrative burden of accounting for contracts impacted by reference rate reform, and these elections did not have a material impact on the Consolidated Financial Statements.

FORWARD-LOOKING STATEMENTS

From time to time, the Firm has made and will make forward-looking statements. These statements can be identified by the fact that they do not relate strictly to historical or current facts. Forward-looking statements often use words such as “anticipate,” “target,” “expect,” “estimate,” “intend,” “plan,” “goal,” “believe,” or other words of similar meaning. Forward-looking statements provide JPMorgan Chase’s current expectations or forecasts of future events, circumstances, results or aspirations. JPMorgan Chase’s disclosures in this 2020 Form 10-K contain forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. The Firm also may make forward-looking statements in its other documents filed or furnished with the SEC. In addition, the Firm’s senior management may make forward-looking statements orally to investors, analysts, representatives of the media and others.

All forward-looking statements are, by their nature, subject to risks and uncertainties, many of which are beyond the Firm’s control. JPMorgan Chase’s actual future results may differ materially from those set forth in its forward-looking statements. While there is no assurance that any list of risks and uncertainties or risk factors is complete, below are certain factors which could cause actual results to differ from those in the forward-looking statements:

- Economic, financial, reputational and other impacts of the COVID-19 pandemic;
- Local, regional and global business, economic and political conditions and geopolitical events;
- Changes in laws and regulatory requirements, including capital and liquidity requirements affecting the Firm’s businesses, and the ability of the Firm to address those requirements;
- Heightened regulatory and governmental oversight and scrutiny of JPMorgan Chase’s business practices, including dealings with retail customers;
- Changes in trade, monetary and fiscal policies and laws;
- Changes in income tax laws and regulations;
- Securities and capital markets behavior, including changes in market liquidity and volatility;
- Changes in investor sentiment or consumer spending or savings behavior;
- Ability of the Firm to manage effectively its capital and liquidity;
- Changes in credit ratings assigned to the Firm or its subsidiaries;
- Damage to the Firm’s reputation;
- Ability of the Firm to appropriately address social, environmental and sustainability concerns that may arise, including from its business activities;
- Ability of the Firm to deal effectively with an economic slowdown or other economic or market disruption, including, but not limited to, in the interest rate environment;
- Technology changes instituted by the Firm, its counterparties or competitors;
- The effectiveness of the Firm’s control agenda;
- Ability of the Firm to develop or discontinue products and services, and the extent to which products or services previously sold by the Firm require the Firm to incur liabilities or absorb losses not contemplated at their initiation or origination;
- Acceptance of the Firm’s new and existing products and services by the marketplace and the ability of the Firm to innovate and to increase market share;
- Ability of the Firm to attract and retain qualified and diverse employees;
- Ability of the Firm to control expenses;
- Competitive pressures;
- Changes in the credit quality of the Firm’s clients, customers and counterparties;
- Adequacy of the Firm’s risk management framework, disclosure controls and procedures and internal control over financial reporting;
- Adverse judicial or regulatory proceedings;
- Changes in applicable accounting policies, including the introduction of new accounting standards;
- Ability of the Firm to determine accurate values of certain assets and liabilities;
- Occurrence of natural or man-made disasters or calamities, including health emergencies, the spread of infectious diseases, pandemics or outbreaks of hostilities, or the effects of climate change, and the Firm’s ability to deal effectively with disruptions caused by the foregoing;
- Ability of the Firm to maintain the security of its financial, accounting, technology, data processing and other operational systems and facilities;
- Ability of the Firm to withstand disruptions that may be caused by any failure of its operational systems or those of third parties;
- Ability of the Firm to effectively defend itself against cyber attacks and other attempts by unauthorized parties to access information of the Firm or its customers or to disrupt the Firm’s systems; and
- The other risks and uncertainties detailed in Part I, Item 1A: Risk Factors in JPMorgan Chase’s 2020 Form 10-K.

Any forward-looking statements made by or on behalf of the Firm speak only as of the date they are made, and JPMorgan Chase does not undertake to update any forward-looking statements. The reader should, however, consult any further disclosures of a forward-looking nature the Firm may make in any subsequent Form 10-Ks, Quarterly Reports on Form 10-Qs, or Current Reports on Form 8-K.

Management's report on internal control over financial reporting

Management of JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm") is responsible for establishing and maintaining adequate internal control over financial reporting. Internal control over financial reporting is a process designed by, or under the supervision of, the Firm's principal executive and principal financial officers, or persons performing similar functions, and effected by JPMorgan Chase's Board of Directors, management and other personnel, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with accounting principles generally accepted in the United States of America ("U.S. GAAP").

JPMorgan Chase's internal control over financial reporting includes those policies and procedures that (1) pertain to the maintenance of records, that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the Firm's assets; (2) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with U.S. GAAP, and that receipts and expenditures of the Firm are being made only in accordance with authorizations of JPMorgan Chase's management and directors; and (3) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use or disposition of the Firm's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate. Management has completed an assessment of the effectiveness of the Firm's internal control over financial reporting as of December 31, 2020. In making the assessment, management used the "Internal Control — Integrated Framework" ("COSO 2013") promulgated by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO").

Based upon the assessment performed, management concluded that as of December 31, 2020, JPMorgan Chase's internal control over financial reporting was effective based upon the COSO 2013 framework. Additionally, based upon management's assessment, the Firm determined that there were no material weaknesses in its internal control over financial reporting as of December 31, 2020.

The effectiveness of the Firm's internal control over financial reporting as of December 31, 2020, has been audited by PricewaterhouseCoopers LLP, an independent registered public accounting firm, as stated in their report which appears herein.

James Dimon
Chairman and Chief Executive Officer

Jennifer Piepszak
Executive Vice President and Chief Financial Officer

February 23, 2021

To the Board of Directors and Shareholders of JPMorgan Chase & Co.:

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of JPMorgan Chase & Co. and its subsidiaries (the “Firm”) as of December 31, 2020 and 2019, and the related consolidated statements of income, comprehensive income, changes in stockholders’ equity and cash flows for each of the three years in the period ended December 31, 2020, including the related notes (collectively referred to as the “consolidated financial statements”). We also have audited the Firm’s internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control - Integrated Framework* (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Firm as of December 31, 2020 and 2019, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2020 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Firm maintained, in all material respects, effective internal control over financial reporting as of December 31, 2020, based on criteria established in *Internal Control – Integrated Framework* (2013) issued by the COSO.

Change in Accounting Principle

As discussed in Note 1 and Note 13 to the consolidated financial statements, the Firm changed the manner in which it accounts for credit losses on certain financial instruments in 2020.

Basis for Opinions

The Firm’s management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in the accompanying Management’s report on internal control over financial reporting. Our responsibility is to express opinions on the Firm’s consolidated financial statements and on the Firm’s internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Firm in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

Definition and Limitations of Internal Control over Financial Reporting

A company’s internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company’s internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company’s assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

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Critical Audit Matters

The critical audit matters communicated below are matters arising from the current period audit of the consolidated financial statements that were communicated or required to be communicated to the audit committee and that: (i) relate to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matters below, providing separate opinions on the critical audit matters or on the accounts or disclosures to which they relate.

Allowance for Loan Losses - Portfolio-based component of Wholesale Loan and Credit Card Loan Portfolios

As described in Note 13 to the consolidated financial statements, the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios was $23.4 billion on total portfolio-based retained loans of $653.4 billion at December 31, 2020. The Firm's allowance for loan losses represents management's estimate of expected credit losses over the remaining expected life of the Firm's loan portfolios and considers expected future changes in macroeconomic conditions. The portfolio-based component of the Firm's allowance for loan losses for the wholesale and credit card retained loan portfolios begins with a quantitative calculation of expected credit losses over the expected life of the loan by applying credit loss factors to the estimated exposure at default. The credit loss factors applied are determined based on the weighted average of five internally developed macroeconomic scenarios that take into consideration the Firm's economic outlook as derived through forecast macroeconomic variables, the most significant of which are U.S. unemployment and U.S. real gross domestic product. This quantitative calculation is further adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate.

The principal considerations for our determination that performing procedures relating to the allowance for loan losses for the portfolio-based component of the wholesale and credit card loan portfolios is a critical audit matter are (i) the significant judgment and estimation by management in the forecast of macroeconomic variables, specifically U.S. unemployment and U.S. real gross domestic product, as the Firm's forecasts of economic conditions significantly affect its estimate of expected credit losses at the balance sheet date, (ii) the significant judgment and estimation by management in determining the quantitative calculation utilized in their credit loss estimates and the adjustments to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate, which both in turn led to a high degree of auditor judgment, subjectivity and effort in performing procedures and in evaluating audit evidence obtained relating to the credit loss estimates and the appropriateness of the adjustments to the credit loss estimates, and (iii) the audit effort involved professionals with specialized skill and knowledge to assist in evaluating the audit evidence.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the Firm's allowance for loan losses, including controls over model validation and generation of macroeconomic scenarios. These procedures also included, among others, testing management's process for estimating the allowance for loan losses, which involved (i) evaluating the appropriateness of the models and methodologies used in quantitative calculations; (ii) evaluating the reasonableness of forecasts of U.S. unemployment and U.S. real gross domestic product; (iii) testing the completeness and accuracy of data used in the estimate; and (iv) evaluating the reasonableness of management's adjustments to the quantitative output for the impacts of model imprecision, emerging risk assessments, trends and other subjective factors that are not yet otherwise reflected in the credit loss estimate. These procedures also included the use of professionals with specialized skill and knowledge to assist in evaluating the appropriateness of certain models, methodologies and macroeconomic variables.

Fair Value of Certain Level 3 Financial Instruments

As described in Notes 2 and 3 to the consolidated financial statements, the Firm carries $1.2 trillion of its assets and $437.6 billion of its liabilities at fair value on a recurring basis. Included in these balances are $10.3 billion of trading assets and $41.5 billion of liabilities measured at fair value on a recurring basis, collectively financial instruments, which are classified as level 3 as they contain one or more inputs to valuation which are unobservable and significant to their fair value measurement. The Firm utilized internally developed valuation models and unobservable inputs to estimate fair value of the level 3 financial instruments. The unobservable inputs used by management to estimate the fair value of certain of these financial instruments include forward equity prices, volatility relating to interest rates and equity prices and correlation relating to interest rates, equity prices, credit and foreign exchange rates.

The principal considerations for our determination that performing procedures relating to the fair value of certain level 3 financial instruments is a critical audit matter are (i) the significant judgment and estimation by management in determining the inputs to estimate fair value, which in turn led to a high degree of auditor judgment, subjectivity, and effort in performing procedures related to the fair value of these financial instruments, and (ii) the audit effort involved professionals with specialized skill and knowledge to assist in evaluating the audit evidence obtained from these procedures.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to the Firm's processes for determining fair value which include controls over models, inputs, and data. These procedures also included, among others, the involvement of professionals with specialized skill and knowledge to assist in developing an independent estimate of fair value for a sample of these financial instruments. Developing the independent estimate involved testing the completeness and accuracy of data provided by management, developing independent inputs and, as appropriate, evaluating and utilizing management's aforementioned unobservable inputs; and comparing management's estimate to the independently developed estimate of fair value.

PricewaterhouseCoopers LLP

February 23, 2021

We have served as the Firm's auditor since 1965.

Consolidated statements of income

Year ended December 31, (in millions, except per share data)	2020	2019	2018
Revenue			
Investment banking fees	$ 9,486	$ 7,501	$ 7,550
Principal transactions	18,021	14,018	12,059
Lending- and deposit-related fees[(a)]	6,511	6,626	6,377
Asset management, administration and commissions[(a)]	18,177	16,908	16,793
Investment securities gains/(losses)	802	258	(395)
Mortgage fees and related income	3,091	2,036	1,254
Card income[(b)]	4,435	5,076	4,743
Other income	4,457	5,731	5,343
Noninterest revenue	64,980	58,154	53,724
Interest income	64,523	84,040	76,100
Interest expense	9,960	26,795	21,041
Net interest income	54,563	57,245	55,059
Total net revenue	119,543	115,399	108,783
Provision for credit losses	17,480	5,585	4,871
Noninterest expense			
Compensation expense	34,988	34,155	33,117
Occupancy expense	4,449	4,322	3,952
Technology, communications and equipment expense	10,338	9,821	8,802
Professional and outside services	8,464	8,533	8,502
Marketing[(b)]	2,476	3,351	3,044
Other expense	5,941	5,087	5,731
Total noninterest expense	66,656	65,269	63,148
Income before income tax expense	35,407	44,545	40,764
Income tax expense	6,276	8,114	8,290
Net income	$ 29,131	$ 36,431	$ 32,474
Net income applicable to common stockholders	$ 27,410	$ 34,642	$ 30,709
Net income per common share data			
Basic earnings per share	$ 8.89	$ 10.75	$ 9.04
Diluted earnings per share	8.88	10.72	9.00
Weighted-average basic shares	3,082.4	3,221.5	3,396.4
Weighted-average diluted shares	3,087.4	3,230.4	3,414.0

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.
(b) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of comprehensive income

Year ended December 31, (in millions)	2020	2019	2018
Net income	**$ 29,131**	$ 36,431	$ 32,474
Other comprehensive income/(loss), after–tax			
Unrealized gains/(losses) on investment securities	**4,123**	2,855	(1,858)
Translation adjustments, net of hedges	**234**	20	20
Fair value hedges	**19**	30	(107)
Cash flow hedges	**2,320**	172	(201)
Defined benefit pension and OPEB plans	**212**	964	(373)
DVA on fair value option elected liabilities	**(491)**	(965)	1,043
Total other comprehensive income/(loss), after–tax	**6,417**	3,076	(1,476)
Comprehensive income	**$ 35,548**	$ 39,507	$ 30,998

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated balance sheets

December 31, (in millions, except share data)	2020	2019
Assets		
Cash and due from banks	**$ 24,874**	$ 21,704
Deposits with banks	**502,735**	241,927
Federal funds sold and securities purchased under resale agreements (included **$238,015** and $14,561 at fair value)	**296,284**	249,157
Securities borrowed (included **$52,983** and $6,237 at fair value)	**160,635**	139,758
Trading assets (included assets pledged of **$130,645** and $111,522)[(a)]	**503,126**	369,687
Available-for-sale securities (amortized cost of **$381,729** and $345,306; included assets pledged of $32,227 and $10,325)	**388,178**	350,699
Held-to-maturity securities (net of allowance for credit losses of $78)	**201,821**	47,540
Investment securities, net of allowance for credit losses	**589,999**	398,239
Loans (included **$44,474** and $44,955 at fair value)[(a)]	**1,012,853**	997,620
Allowance for loan losses	**(28,328)**	(13,123)
Loans, net of allowance for loan losses	**984,525**	984,497
Accrued interest and accounts receivable	**90,503**	72,861
Premises and equipment	**27,109**	25,813
Goodwill, MSRs and other intangible assets	**53,428**	53,341
Other assets (included **$13,827** and $12,676 at fair value and assets pledged of **$3,739** and $3,349)[(a)]	**152,853**	130,395
Total assets[(b)]	**$ 3,386,071**	$ 2,687,379
Liabilities		
Deposits (included **$14,484** and $28,589 at fair value)	**$ 2,144,257**	$ 1,562,431
Federal funds purchased and securities loaned or sold under repurchase agreements (included **$155,735** and $549 at fair value)	**215,209**	183,675
Short-term borrowings (included **$16,893** and $5,920 at fair value)	**45,208**	40,920
Trading liabilities	**170,181**	119,277
Accounts payable and other liabilities (included **$3,476** and $3,728 at fair value)	**232,599**	210,407
Beneficial interests issued by consolidated VIEs (included **$41** and $36 at fair value)	**17,578**	17,841
Long-term debt (included **$76,817** and $75,745 at fair value)	**281,685**	291,498
Total liabilities[(b)]	**3,106,717**	2,426,049
Commitments and contingencies (refer to Notes 28, 29 and 30)		
Stockholders' equity		
Preferred stock ($1 par value; authorized 200,000,000 shares: issued **3,006,250** and 2,699,250 shares)	**30,063**	26,993
Common stock ($1 par value; authorized 9,000,000,000 shares; issued **4,104,933,895** shares)	**4,105**	4,105
Additional paid-in capital	**88,394**	88,522
Retained earnings	**236,990**	223,211
Accumulated other comprehensive income	**7,986**	1,569
Shares held in restricted stock units ("RSU") trust, at cost (**zero** and 472,953 shares)	**–**	(21)
Treasury stock, at cost (**1,055,499,435** and 1,020,912,567 shares)	**(88,184)**	(83,049)
Total stockholders' equity	**279,354**	261,330
Total liabilities and stockholders' equity	**$ 3,386,071**	$ 2,687,379

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

(b) The following table presents information on assets and liabilities related to VIEs that are consolidated by the Firm at December 31, 2020 and 2019. The assets of the consolidated VIEs are used to settle the liabilities of those entities. The holders of the beneficial interests do not have recourse to the general credit of JPMorgan Chase. The assets and liabilities in the table below include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation. Refer to Note 14 for a further discussion.

December 31, (in millions)	2020	2019
Assets		
Trading assets	**$ 1,934**	$ 2,633
Loans	**37,619**	42,931
All other assets	**681**	881
Total assets	**$ 40,234**	$ 46,445
Liabilities		
Beneficial interests issued by consolidated VIEs	**$ 17,578**	$ 17,841
All other liabilities	**233**	447
Total liabilities	**$ 17,811**	$ 18,288

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of changes in stockholders' equity

Year ended December 31, (in millions, except per share data)	2020	2019	2018
Preferred stock			
Balance at January 1	**$ 26,993**	$ 26,068	$ 26,068
Issuance	**4,500**	5,000	1,696
Redemption	**(1,430)**	(4,075)	(1,696)
Balance at December 31	**30,063**	26,993	26,068
Common stock			
Balance at January 1 and December 31	**4,105**	4,105	4,105
Additional paid-in capital			
Balance at January 1	**88,522**	89,162	90,579
Shares issued and commitments to issue common stock for employee share-based compensation awards, and related tax effects	**(72)**	(591)	(738)
Other	**(56)**	(49)	(679)
Balance at December 31	**88,394**	88,522	89,162
Retained earnings			
Balance at January 1	**223,211**	199,202	177,676
Cumulative effect of change in accounting principles	**(2,650)**	62	(183)
Net income	**29,131**	36,431	32,474
Dividends declared:			
Preferred stock	**(1,583)**	(1,587)	(1,551)
Common stock (**$3.60**, $3.40 and $2.72 per share for 2020, 2019 and 2018, respectively)	**(11,119)**	(10,897)	(9,214)
Balance at December 31	**236,990**	223,211	199,202
Accumulated other comprehensive income			
Balance at January 1	**1,569**	(1,507)	(119)
Cumulative effect of change in accounting principles	**—**	—	88
Other comprehensive income/(loss), after-tax	**6,417**	3,076	(1,476)
Balance at December 31	**7,986**	1,569	(1,507)
Shares held in RSU Trust, at cost			
Balance at the beginning of the period	**(21)**	(21)	(21)
Liquidation of RSU Trust	**21**	—	—
Balance at December 31	**—**	(21)	(21)
Treasury stock, at cost			
Balance at January 1	**(83,049)**	(60,494)	(42,595)
Repurchase	**(6,397)**	(24,121)	(19,983)
Reissuance	**1,262**	1,566	2,084
Balance at December 31	**(88,184)**	(83,049)	(60,494)
Total stockholders' equity	**$ 279,354**	$ 261,330	$ 256,515

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Consolidated statements of cash flows

Year ended December 31, (in millions)	2020	2019	2018
Operating activities			
Net income	**$ 29,131**	$ 36,431	$ 32,474
Adjustments to reconcile net income to net cash provided by/(used in) operating activities:			
Provision for credit losses	**17,480**	5,585	4,871
Depreciation and amortization	**8,614**	8,368	7,791
Deferred tax expense	**(3,981)**	949	1,721
Other	**1,649**	1,996	2,717
Originations and purchases of loans held-for-sale[a]	**(166,504)**	(169,289)	(172,728)
Proceeds from sales, securitizations and paydowns of loans held-for-sale[a]	**175,490**	171,415	163,747
Net change in:			
Trading assets[a]	**(148,749)**	6,551	(35,067)
Securities borrowed	**(20,734)**	(27,631)	(6,861)
Accrued interest and accounts receivable	**(18,012)**	(78)	(5,849)
Other assets[a]	**(42,434)**	(17,570)	(8,779)
Trading liabilities	**77,198**	(14,516)	18,290
Accounts payable and other liabilities	**7,827**	(352)	14,630
Other operating adjustments[a]	**3,115**	2,233	(1,343)
Net cash provided by/(used in) operating activities	**(79,910)**	4,092	15,614
Investing activities			
Net change in:			
Federal funds sold and securities purchased under resale agreements	**(47,115)**	72,396	(123,201)
Held-to-maturity securities:			
Proceeds from paydowns and maturities	**21,360**	3,423	2,945
Purchases	**(12,400)**	(13,427)	(9,368)
Available-for-sale securities:			
Proceeds from paydowns and maturities	**57,675**	52,200	37,401
Proceeds from sales	**149,758**	70,181	46,067
Purchases	**(397,145)**	(242,149)	(95,091)
Proceeds from sales and securitizations of loans held-for-investment	**23,559**	62,095	29,826
Other changes in loans, net[a]	**(50,263)**	(51,743)	(83,013)
All other investing activities, net	**(7,341)**	(5,035)	(4,986)
Net cash (used in) investing activities	**(261,912)**	(52,059)	(199,420)
Financing activities			
Net change in:			
Deposits	**602,765**	101,002	26,728
Federal funds purchased and securities loaned or sold under repurchase agreements	**31,528**	1,347	23,415
Short-term borrowings	**4,438**	(28,561)	18,476
Beneficial interests issued by consolidated VIEs	**1,347**	4,289	1,712
Proceeds from long-term borrowings	**78,686**	61,085	71,662
Payments of long-term borrowings	**(105,055)**	(69,610)	(76,313)
Proceeds from issuance of preferred stock	**4,500**	5,000	1,696
Redemption of preferred stock	**(1,430)**	(4,075)	(1,696)
Treasury stock repurchased	**(6,517)**	(24,001)	(19,983)
Dividends paid	**(12,690)**	(12,343)	(10,109)
All other financing activities, net	**(927)**	(1,146)	(1,430)
Net cash provided by financing activities	**596,645**	32,987	34,158
Effect of exchange rate changes on cash and due from banks and deposits with banks	**9,155**	(182)	(2,863)
Net increase/(decrease) in cash and due from banks and deposits with banks	**263,978**	(15,162)	(152,511)
Cash and due from banks and deposits with banks at the beginning of the period	**263,631**	278,793	431,304
Cash and due from banks and deposits with banks at the end of the period	**$ 527,609**	$ 263,631	$ 278,793
Cash interest paid	**$ 13,077**	$ 29,918	$ 21,152
Cash income taxes paid, net	**7,661**	5,624	3,542

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

The Notes to Consolidated Financial Statements are an integral part of these statements.

Note 1 – Basis of presentation

JPMorgan Chase & Co. ("JPMorgan Chase" or the "Firm"), a financial holding company incorporated under Delaware law in 1968, is a leading global financial services firm in the U.S., with operations worldwide. The Firm is a leader in investment banking, financial services for consumers and small businesses, commercial banking, financial transaction processing and asset management. Refer to Note 32 for a further discussion of the Firm's business segments.

The accounting and financial reporting policies of JPMorgan Chase and its subsidiaries conform to U.S. GAAP. Additionally, where applicable, the policies conform to the accounting and reporting guidelines prescribed by regulatory authorities.

Certain amounts reported in prior periods have been reclassified to conform with the current presentation.

Consolidation

The Consolidated Financial Statements include the accounts of JPMorgan Chase and other entities in which the Firm has a controlling financial interest. All material intercompany balances and transactions have been eliminated.

Assets held for clients in an agency or fiduciary capacity by the Firm are not assets of JPMorgan Chase and are not included on the Consolidated balance sheets.

The Firm determines whether it has a controlling financial interest in an entity by first evaluating whether the entity is a voting interest entity or a variable interest entity.

Voting interest entities

Voting interest entities are entities that have sufficient equity and provide the equity investors voting rights that enable them to make significant decisions relating to the entity's operations. For these types of entities, the Firm's determination of whether it has a controlling interest is primarily based on the amount of voting equity interests held. Entities in which the Firm has a controlling financial interest, through ownership of the majority of the entities' voting equity interests, or through other contractual rights that give the Firm control, are consolidated by the Firm.

Investments in companies in which the Firm has significant influence over operating and financing decisions (but does not own a majority of the voting equity interests) are accounted for (i) in accordance with the equity method of accounting (which requires the Firm to recognize its proportionate share of the entity's net earnings), or (ii) at fair value if the fair value option was elected. These investments are generally included in other assets, with income or loss included in noninterest revenue.

Certain Firm-sponsored asset management funds are structured as limited partnerships or limited liability companies. For many of these entities, the Firm is the general partner or managing member, but the non-affiliated partners or members have the ability to remove the Firm as the general partner or managing member without cause (i.e., kick-out rights), based on a simple majority vote, or the non-affiliated partners or members have rights to participate in important decisions. Accordingly, the Firm does not consolidate these voting interest entities. However, in the limited cases where the non-managing partners or members do not have substantive kick-out or participating rights, the Firm evaluates the funds as VIEs and consolidates the funds if the Firm is the general partner or managing member and has a potentially significant interest.

The Firm's investment companies and asset management funds have investments in both publicly-held and privately-held entities, including investments in buyouts, growth equity and venture opportunities. These investments are accounted for under investment company guidelines and, accordingly, irrespective of the percentage of equity ownership interests held, are carried on the Consolidated balance sheets at fair value, and are recorded in other assets, with income or loss included in noninterest revenue. If consolidated, the Firm retains the accounting under such specialized investment company guidelines.

Variable interest entities

VIEs are entities that, by design, either (1) lack sufficient equity to permit the entity to finance its activities without additional subordinated financial support from other parties, or (2) have equity investors that do not have the ability to make significant decisions relating to the entity's operations through voting rights, or do not have the obligation to absorb the expected losses, or do not have the right to receive the residual returns of the entity.

The most common type of VIE is an SPE. SPEs are commonly used in securitization transactions in order to isolate certain assets and distribute the cash flows from those assets to investors. The basic SPE structure involves a company selling assets to the SPE; the SPE funds the purchase of those assets by issuing securities to investors. The legal documents that govern the transaction specify how the cash earned on the assets must be allocated to the SPE's investors and other parties that have rights to those cash flows. SPEs are generally structured to insulate investors from claims on the SPE's assets by creditors of other entities, including the creditors of the seller of the assets.

The primary beneficiary of a VIE (i.e., the party that has a controlling financial interest) is required to consolidate the assets and liabilities of the VIE. The primary beneficiary is the party that has both (1) the power to direct the activities of the VIE that most significantly impact the VIE's economic performance; and (2) through its interests in the VIE, the obligation to absorb losses or the right to receive benefits from the VIE that could potentially be significant to the VIE.

To assess whether the Firm has the power to direct the activities of a VIE that most significantly impact the VIE's economic performance, the Firm considers all the facts and circumstances, including its role in establishing the VIE and its ongoing rights and responsibilities. This assessment includes, first, identifying the activities that most significantly impact the VIE's economic performance; and second, identifying which party, if any, has power over those activities. In general, the parties that make the most significant decisions affecting the VIE (such as asset managers, collateral managers, servicers, or owners of call options or liquidation rights over the VIE's assets) or have the right to unilaterally remove those decision-makers are deemed to have the power to direct the activities of a VIE.

To assess whether the Firm has the obligation to absorb losses of the VIE or the right to receive benefits from the VIE that could potentially be significant to the VIE, the Firm considers all of its economic interests, including debt and equity investments, servicing fees, and derivatives or other arrangements deemed to be variable interests in the VIE. This assessment requires that the Firm apply judgment in determining whether these interests, in the aggregate, are considered potentially significant to the VIE. Factors considered in assessing significance include: the design of the VIE, including its capitalization structure; subordination of interests; payment priority; relative share of interests held across various classes within the VIE's capital structure; and the reasons why the interests are held by the Firm.

The Firm performs on-going reassessments of: (1) whether entities previously evaluated under the majority voting-interest framework have become VIEs, based on certain events, and are therefore subject to the VIE consolidation framework; and (2) whether changes in the facts and circumstances regarding the Firm's involvement with a VIE cause the Firm's consolidation conclusion to change.

Refer to Note 14 for further discussion of the Firm's VIEs.

Revenue recognition

Interest income

The Firm recognizes interest income on loans, debt securities, and other debt instruments, generally on a level-yield basis, based on the underlying contractual rate. Refer to Note 7 for further discussion of interest income.

Revenue from contracts with customers

JPMorgan Chase recognizes noninterest revenue from certain contracts with customers, in investment banking fees, deposit-related fees, asset management administration and commissions, and components of card income, when the Firm's related performance obligations are satisfied. Refer to Note 6 for further discussion of the Firm's revenue from contracts with customers.

Principal transactions revenue

JPMorgan Chase carries a portion of its assets and liabilities at fair value. Changes in fair value are reported primarily in principal transactions revenue. Refer to Notes 2 and 3 for further discussion of fair value measurement. Refer to Note 6 for further discussion of principal transactions revenue.

Use of estimates in the preparation of consolidated financial statements

The preparation of the Consolidated Financial Statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities, revenue and expense, and disclosures of contingent assets and liabilities. Actual results could be different from these estimates.

Foreign currency translation

JPMorgan Chase revalues assets, liabilities, revenue and expense denominated in non-U.S. currencies into U.S. dollars using applicable exchange rates.

Gains and losses relating to translating functional currency financial statements for U.S. reporting are included in the Consolidated statements of comprehensive income. Gains and losses relating to nonfunctional currency transactions, including non-U.S. operations where the functional currency is the U.S. dollar, are reported in the Consolidated statements of income.

Offsetting assets and liabilities

U.S. GAAP permits entities to present derivative receivables and derivative payables with the same counterparty and the related cash collateral receivables and payables on a net basis on the Consolidated balance sheets when a legally enforceable master netting agreement exists. U.S. GAAP also permits securities sold and purchased under repurchase agreements and securities borrowed or loaned under securities loan agreements to be presented net when specified conditions are met, including the existence of a legally enforceable master netting agreement. The Firm has elected to net such balances when the specified conditions are met.

The Firm uses master netting agreements to mitigate counterparty credit risk in certain transactions, including derivative contracts, resale, repurchase, securities borrowed and securities loaned agreements. A master netting agreement is a single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due). Upon the exercise of derivatives termination rights by the non-defaulting party (i) all transactions are terminated, (ii) all transactions are valued and the positive values of "in the money" transactions are netted against the negative values of "out of the money" transactions and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount. Upon exercise of default rights under repurchase agreements and securities loan agreements in general (i) all transactions are terminated and accelerated, (ii) all values of securities or cash held or to be delivered are calculated, and all such sums are netted against each other and (iii) the only remaining payment obligation is of one of the parties to pay the netted termination amount.

Typical master netting agreements for these types of transactions also often contain a collateral/margin agreement that provides for a security interest in, or title transfer of, securities or cash collateral/margin to the party that has the right to demand margin (the "demanding party"). The collateral/margin agreement typically requires a party to transfer collateral/margin to the demanding party with a value equal to the amount of the margin deficit on a net basis across all transactions governed by the master netting agreement, less any threshold. The collateral/margin agreement grants to the demanding party, upon default by the counterparty, the right to set-off any amounts payable by the counterparty against any posted collateral or the cash equivalent of any posted collateral/margin. It also grants to the demanding party the right to liquidate collateral/margin and to apply the proceeds to an amount payable by the counterparty.

Refer to Note 5 for further discussion of the Firm's derivative instruments. Refer to Note 11 for further discussion of the Firm's securities financing agreements.

Statements of cash flows

For JPMorgan Chase's Consolidated statements of cash flows, cash is defined as those amounts included in cash and due from banks and deposits with banks.

Accounting standard adopted January 1, 2020

Financial Instruments – Credit Losses ("CECL")

The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. Refer to Note 13 for further information. Prior to the adoption of the CECL accounting guidance, the Firm's allowance for credit losses represented management's estimate of probable credit losses inherent in the Firm's retained loan portfolios and certain lending-related commitments.

The following table presents the impacts to the allowance for credit losses and retained earnings upon adoption of this guidance on January 1, 2020:

(in billions)	December 31, 2019	CECL adoption impact	January 1, 2020
Allowance for credit losses			
Consumer, excluding credit card[(a)]	$ 2.6	$ 0.4	$ 3.0
Credit card	5.7	5.5	11.2
Wholesale[(a)]	6.0	(1.6)	4.4
Firmwide	$ 14.3	$ 4.3	$ 18.6
Retained earnings			
Firmwide allowance increase		$ 4.3	
Balance sheet reclassification[(b)]		(0.8)	
Total pre-tax impact		3.5	
Tax effect		(0.8)	
Decrease to retained earnings		$ 2.7	

(a) In conjunction with the adoption of CECL, the Firm reclassified risk-rated business banking and auto dealer loans and lending-related commitments held in CCB from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Accordingly, $0.6 billion of the allowance for credit losses at December 31, 2019 and $(0.2) billion of the CECL adoption impact were reclassified.

(b) Represents the recognition of the nonaccretable difference on purchased credit deteriorated loans and the Firm's election to recognize the reserve for uncollectible accrued interest on credit card loans in the allowance, both of which resulted in a corresponding increase to loans.

Securities Financing Agreements

As permitted by the guidance, the Firm elected the fair value option for certain securities financing agreements. The difference between their carrying amount and fair value was immaterial and was recorded as part of the Firm's cumulative-effect adjustment. Refer to Note 11 for further information.

Investment securities

Upon adoption, HTM securities are presented net of an allowance for credit losses. The guidance also amended the previous other-than-temporary impairment ("OTTI") model for AFS securities to incorporate an allowance. Refer to Note 10 for further information.

Credit quality disclosures

As a result of the adoption of this guidance, the Firm expanded credit quality disclosures for financial assets measured at amortized cost particularly within the retained loan portfolios. Refer to Note 12 for further information.

PCD loans

The adoption resulted in a change in the accounting for PCI loans, which are considered purchased credit deteriorated ("PCD") loans under CECL. Upon adoption, the Firm recognized the nonaccretable difference on PCD loans in the allowance, which resulted in a corresponding increase to loans. PCD loans are subject to the Firm's nonaccrual and charge-off policies and are now reported in the consumer, excluding credit card portfolio's residential real estate loan class. Refer to Note 12 for further information.

Changes in credit portfolio segments and classes
In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. The Firm also revised its loan classes. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 12 for further information.

Accrued interest receivables
As permitted by the guidance, the Firm elected to continue classifying accrued interest on loans, including accrued but unbilled interest on credit card loans, and investment securities in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. For other loans and securities, the Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Capital transition provisions
As permitted under the U.S. capital rules issued by the federal banking agencies in 2019, the Firm initially elected to phase-in the January 1, 2020 (“day 1”) CECL adoption impact to retained earnings of $2.7 billion to CET1 capital, at 25% per year in each of 2020 to 2023. As part of their response to the impact of the COVID-19 pandemic, on March 31, 2020, the federal banking agencies issued an interim final rule (issued as final on August 26, 2020) that provided the option to delay the effects of CECL on regulatory capital for two years, followed by a three-year transition period (“CECL capital transition provisions”). Refer to Note 27 for further information.

Accounting standards adopted January 1, 2018
Effective January 1, 2018, the Firm adopted several accounting standards resulting in a net decrease of $183 million to retained earnings and a net increase of $88 million to AOCI. The adoption of the recognition and measurement guidance resulted in $505 million of fair value gains in the first quarter of 2018, recorded in total net revenue, on certain equity investments that were previously held at cost.

Significant accounting policies
The following table identifies JPMorgan Chase’s other significant accounting policies and the Note and page where a detailed description of each policy can be found.

Fair value measurement	Note 2	page 171
Fair value option	Note 3	page 192
Derivative instruments	Note 5	page 198
Noninterest revenue and noninterest expense	Note 6	page 212
Interest income and Interest expense	Note 7	page 215
Pension and other postretirement employee benefit plans	Note 8	page 216
Employee share-based incentives	Note 9	page 221
Investment securities	Note 10	page 223
Securities financing activities	Note 11	page 229
Loans	Note 12	page 232
Allowance for credit losses	Note 13	page 248
Variable interest entities	Note 14	page 253
Goodwill and Mortgage servicing rights	Note 15	page 261
Premises and equipment	Note 16	page 265
Leases	Note 18	page 266
Long-term debt	Note 20	page 269
Earnings per share	Note 23	page 274
Income taxes	Note 25	page 277
Off–balance sheet lending-related financial instruments, guarantees and other commitments	Note 28	page 283
Litigation	Note 30	page 290

Note 2 – Fair value measurement

JPMorgan Chase carries a portion of its assets and liabilities at fair value. These assets and liabilities are predominantly carried at fair value on a recurring basis (i.e., assets and liabilities that are measured and reported at fair value on the Firm's Consolidated balance sheets). Certain assets, liabilities and unfunded lending-related commitments are measured at fair value on a nonrecurring basis; that is, they are not measured at fair value on an ongoing basis but are subject to fair value adjustments only in certain circumstances (for example, when there is evidence of impairment).

Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is based on quoted market prices or inputs, where available. If prices or quotes are not available, fair value is based on valuation models and other valuation techniques that consider relevant transaction characteristics (such as maturity) and use, as inputs, observable or unobservable market parameters, including yield curves, interest rates, volatilities, prices (such as commodity, equity or debt prices), correlations, foreign exchange rates and credit curves. Valuation adjustments may be made to ensure that financial instruments are recorded at fair value, as described below.

The level of precision in estimating unobservable market inputs or other factors can affect the amount of gain or loss recorded for a particular position. Furthermore, while the Firm believes its valuation methods are appropriate and consistent with those of other market participants, the methods and assumptions used reflect management judgment and may vary across the Firm's businesses and portfolios.

The Firm uses various methodologies and assumptions in the determination of fair value. The use of different methodologies or assumptions by other market participants compared with those used by the Firm could result in the Firm deriving a different estimate of fair value at the reporting date.

Valuation process

Risk-taking functions are responsible for providing fair value estimates for assets and liabilities carried on the Consolidated balance sheets at fair value. The Firm's VCG, which is part of the Firm's Finance function and independent of the risk-taking functions, is responsible for verifying these estimates and determining any fair value adjustments that may be required to ensure that the Firm's positions are recorded at fair value. The VGF is composed of senior finance and risk executives and is responsible for overseeing the management of risks arising from valuation activities conducted across the Firm. The Firmwide VGF is chaired by the Firmwide head of the VCG (under the direction of the Firm's Controller), and includes sub-forums covering the CIB, CCB, CB, AWM and certain corporate functions including Treasury and CIO.

Price verification process

The VCG verifies fair value estimates provided by the risk-taking functions by leveraging independently derived prices, valuation inputs and other market data, where available. Where independent prices or inputs are not available, the VCG performs additional review to ensure the reasonableness of the estimates. The additional review may include evaluating the limited market activity including client unwinds, benchmarking valuation inputs to those used for similar instruments, decomposing the valuation of structured instruments into individual components, comparing expected to actual cash flows, reviewing profit and loss trends, and reviewing trends in collateral valuation. There are also additional levels of management review for more significant or complex positions.

The VCG determines any valuation adjustments that may be required to the estimates provided by the risk-taking functions. No adjustments to quoted prices are applied for instruments classified within level 1 of the fair value hierarchy (refer to the discussion below for further information on the fair value hierarchy). For other positions, judgment is required to assess the need for valuation adjustments to appropriately reflect liquidity considerations, unobservable parameters, and, for certain portfolios that meet specified criteria, the size of the net open risk position. The determination of such adjustments follows a consistent framework across the Firm:

- Liquidity valuation adjustments are considered where an observable external price or valuation parameter exists but is of lower reliability, potentially due to lower market activity. Liquidity valuation adjustments are made based on current market conditions. Factors that may be considered in determining the liquidity adjustment include analysis of: (1) the estimated bid-offer spread for the instrument being traded; (2) alternative pricing points for similar instruments in active markets; and (3) the range of reasonable values that the price or parameter could take.
- The Firm manages certain portfolios of financial instruments on the basis of net open risk exposure and, as permitted by U.S. GAAP, has elected to estimate the fair value of such portfolios on the basis of a transfer of the entire net open risk position in an orderly transaction. Where this is the case, valuation adjustments may be necessary to reflect the cost of exiting a larger-than-normal market-size net open risk position. Where applied, such adjustments are based on factors that a relevant market participant would consider in the transfer of the net open risk position, including the size of the adverse market move that is likely to occur during the period required to reduce the net open risk position to a normal market-size.
- Uncertainty adjustments related to unobservable parameters may be made when positions are valued using prices or input parameters to valuation models

that are unobservable due to a lack of market activity or because they cannot be implied from observable market data. Such prices or parameters must be estimated and are, therefore, subject to management judgment. Adjustments are made to reflect the uncertainty inherent in the resulting valuation estimate.

- Where appropriate, the Firm also applies adjustments to its estimates of fair value in order to appropriately reflect counterparty credit quality (CVA), the Firm's own creditworthiness (DVA) and the impact of funding (FVA), using a consistent framework across the Firm. Refer to Credit and funding adjustments on page 188 of this Note for more information on such adjustments.

Valuation model review and approval

If prices or quotes are not available for an instrument or a similar instrument, fair value is generally determined using valuation models that consider relevant transaction terms such as maturity and use as inputs market-based or independently sourced parameters. Where this is the case the price verification process described above is applied to the inputs in those models.

Under the Firm's Estimations and Model Risk Management Policy, the MRGR reviews and approves new models, as well as material changes to existing models, prior to implementation in the operating environment. In certain circumstances exceptions may be granted to the Firm's policy to allow a model to be used prior to review or approval. The MRGR may also require the user to take appropriate actions to mitigate the model risk if it is to be used in the interim. These actions will depend on the model and may include, for example, limitation of trading activity.

Valuation hierarchy

A three-level valuation hierarchy has been established under U.S. GAAP for disclosure of fair value measurements. The valuation hierarchy is based on the observability of inputs to the valuation of an asset or liability as of the measurement date. The three levels are defined as follows.

- Level 1 – inputs to the valuation methodology are quoted prices (unadjusted) for identical assets or liabilities in active markets.

- Level 2 – inputs to the valuation methodology include quoted prices for similar assets and liabilities in active markets, and inputs that are observable for the asset or liability, either directly or indirectly, for substantially the full term of the financial instrument.

- Level 3 – one or more inputs to the valuation methodology are unobservable and significant to the fair value measurement.

A financial instrument's categorization within the valuation hierarchy is based on the lowest level of input that is significant to the fair value measurement.

The following table describes the valuation methodologies generally used by the Firm to measure its significant products/instruments at fair value, including the general classification of such instruments pursuant to the valuation hierarchy.

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Securities financing agreements	Valuations are based on discounted cash flows, which consider: • Derivative features: refer to the discussion of derivatives below for further information. • Market rates for the respective maturity • Collateral characteristics	Predominantly level 2
Loans and lending-related commitments – wholesale		
Loans carried at fair value (trading loans and non-trading loans) and associated lending-related commitments	Where observable market data is available, valuations are based on: • Observed market prices (circumstances are infrequent) • Relevant broker quotes • Observed market prices for similar instruments Where observable market data is unavailable or limited, valuations are based on discounted cash flows, which consider the following: • Credit spreads derived from the cost of CDS; or benchmark credit curves developed by the Firm, by industry and credit rating • Prepayment speed • Collateral characteristics	Level 2 or 3
Loans – consumer		
Loans carried at fair value – conforming residential mortgage loans expected to be sold	Fair value is based on observable prices for mortgage-backed securities with similar collateral and incorporates adjustments to these prices to account for differences between the securities and the value of the underlying loans, which include credit characteristics, portfolio composition, and liquidity.	Predominantly level 2
Investment and trading securities	Quoted market prices	Level 1
	In the absence of quoted market prices, securities are valued based on: • Observable market prices for similar securities • Relevant broker quotes • Discounted cash flows In addition, the following inputs to discounted cash flows are used for the following products: Mortgage- and asset-backed securities specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Current market assumptions related to yield, prepayment speed, conditional default rates and loss severity Collateralized loan obligations ("CLOs") specific inputs: • Collateral characteristics • Deal-specific payment and loss allocations • Expected prepayment speed, conditional default rates, loss severity • Credit spreads • Credit rating data	Level 2 or 3
Physical commodities	Valued using observable market prices or data.	Level 1 or 2

Product/instrument	Valuation methodology	Classifications in the valuation hierarchy
Derivatives	Exchange-traded derivatives that are actively traded and valued using the exchange price.	Level 1
	Derivatives that are valued using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs as well as considering the contractual terms. The key valuation inputs used will depend on the type of derivative and the nature of the underlying instruments and may include equity prices, commodity prices, interest rate yield curves, foreign exchange rates, volatilities, correlations, CDS spreads and recovery rates. Additionally, the credit quality of the counterparty and of the Firm as well as market funding levels may also be considered. In addition, specific inputs used for derivatives that are valued based on models with significant unobservable inputs are as follows: Structured credit derivatives specific inputs include: • CDS spreads and recovery rates • Credit correlation between the underlying debt instruments Equity option specific inputs include: • Forward equity price • Equity volatility • Equity correlation • Equity-FX correlation • Equity-IR correlation Interest rate and FX exotic options specific inputs include: • Interest rate volatility • Interest rate spread volatility • Interest rate correlation • Foreign exchange correlation • Interest rate-FX correlation Commodity derivatives specific inputs include: • Commodity volatility • Forward commodity price • Commodity correlation Additionally, adjustments are made to reflect counterparty credit quality (CVA) and the impact of funding (FVA). Refer to page 188 of this Note.	Level 2 or 3
Mortgage servicing rights	Refer to Mortgage servicing rights in Note 15.	Level 3
Private equity direct investments	Fair value is estimated using all available information; the range of potential inputs include: • Transaction prices • Trading multiples of comparable public companies • Operating performance of the underlying portfolio company • Adjustments as required, since comparable public companies are not identical to the company being valued, and for company-specific issues and lack of liquidity. • Additional available inputs relevant to the investment.	Level 2 or 3
Fund investments (e.g., mutual/collective investment funds, private equity funds, hedge funds, and real estate funds)	Net asset value • NAV is supported by the ability to redeem and purchase at the NAV level.	Level 1
	• Adjustments to the NAV as required, for restrictions on redemption (e.g., lock-up periods or withdrawal limitations) or where observable activity is limited.	Level 2 or 3[(a)]
Beneficial interests issued by consolidated VIEs	Valued using observable market information, where available. In the absence of observable market information, valuations are based on the fair value of the underlying assets held by the VIE.	Level 2 or 3

(a) Excludes certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient.

Product/instrument	Valuation methodology	Classification in the valuation hierarchy
Structured notes (included in deposits, short-term borrowings and long-term debt)	• Valuations are based on discounted cash flow analyses that consider the embedded derivative and the terms and payment structure of the note. • The embedded derivative features are considered using models such as the Black-Scholes option pricing model, simulation models, or a combination of models that may use observable or unobservable valuation inputs, depending on the embedded derivative. The specific inputs used vary according to the nature of the embedded derivative features, as described in the discussion above regarding derivatives valuation. Adjustments are then made to this base valuation to reflect the Firm’s own credit risk (DVA). Refer to page 188 of this Note.	Level 2 or 3

The following table presents the assets and liabilities reported at fair value as of December 31, 2020 and 2019, by major product category and fair value hierarchy.

Assets and liabilities measured at fair value on a recurring basis

	Fair value hierarchy				
December 31, 2020 (in millions)	Level 1	Level 2	Level 3	Derivative netting adjustments[g]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 238,015	$ –	$ –	$ 238,015
Securities borrowed	–	52,983	–	–	52,983
Trading assets:					
Debt instruments:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	68,395	449	–	68,844
Residential – nonagency	–	2,138	28	–	2,166
Commercial – nonagency	–	1,327	3	–	1,330
Total mortgage-backed securities	–	71,860	480	–	72,340
U.S. Treasury, GSEs and government agencies[a]	104,263	10,996	–	–	115,259
Obligations of U.S. states and municipalities	–	7,184	8	–	7,192
Certificates of deposit, bankers' acceptances and commercial paper	–	1,230	–	–	1,230
Non-U.S. government debt securities	26,772	40,671	182	–	67,625
Corporate debt securities	–	21,017	507	–	21,524
Loans[b]	–	6,101	893	–	6,994
Asset-backed securities	–	2,304	28	–	2,332
Total debt instruments	131,035	161,363	2,098	–	294,496
Equity securities	97,035	2,652	179	–	99,866
Physical commodities[c]	6,382	5,189	–	–	11,571
Other	–	17,165	346	–	17,511
Total debt and equity instruments[d]	234,452	186,369	2,623	–	423,444
Derivative receivables:					
Interest rate	2,318	386,865	2,307	(355,765)	35,725
Credit	–	12,879	624	(12,823)	680
Foreign exchange	146	205,127	987	(190,479)	15,781
Equity	–	71,279	3,519	(54,125)	20,673
Commodity	–	21,272	231	(14,732)	6,771
Total derivative receivables	2,464	697,422	7,668	(627,924)	79,630
Total trading assets[e]	236,916	883,791	10,291	(627,924)	503,074
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	21,018	92,283	–	–	113,301
Residential – nonagency	–	10,233	–	–	10,233
Commercial – nonagency	–	2,856	–	–	2,856
Total mortgage-backed securities	21,018	105,372	–	–	126,390
U.S. Treasury and government agencies	201,951	–	–	–	201,951
Obligations of U.S. states and municipalities	–	20,396	–	–	20,396
Certificates of deposit	–	–	–	–	–
Non-U.S. government debt securities	13,135	9,793	–	–	22,928
Corporate debt securities	–	216	–	–	216
Asset-backed securities:					
Collateralized loan obligations	–	10,048	–	–	10,048
Other	–	6,249	–	–	6,249
Total available-for-sale securities	236,104	152,074	–	–	388,178
Loans[b][f]	–	42,169	2,305	–	44,474
Mortgage servicing rights	–	–	3,276	–	3,276
Other assets[b][e]	8,110	4,561	538	–	13,209
Total assets measured at fair value on a recurring basis	$ 481,130	$ 1,373,593	$ 16,410	$ (627,924)	$ 1,243,209
Deposits	$ –	$ 11,571	$ 2,913	$ –	$ 14,484
Federal funds purchased and securities loaned or sold under repurchase agreements	–	155,735	–	–	155,735
Short-term borrowings	–	14,473	2,420	–	16,893
Trading liabilities:					
Debt and equity instruments[d]	82,669	16,838	51	–	99,558
Derivative payables:					
Interest rate	2,496	349,082	2,049	(340,615)	13,012
Credit	–	14,344	848	(13,197)	1,995
Foreign exchange	132	214,373	1,421	(194,493)	21,433
Equity	–	74,032	7,381	(55,515)	25,898
Commodity	–	21,767	962	(14,444)	8,285
Total derivative payables	2,628	673,598	12,661	(618,264)	70,623
Total trading liabilities	85,297	690,436	12,712	(618,264)	170,181
Accounts payable and other liabilities	2,895	513	68	–	3,476
Beneficial interests issued by consolidated VIEs	–	41	–	–	41
Long-term debt	–	53,420	23,397	–	76,817
Total liabilities measured at fair value on a recurring basis	$ 88,192	$ 926,189	$ 41,510	$ (618,264)	$ 437,627

December 31, 2019 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Derivative netting adjustments[g]	Total fair value
Federal funds sold and securities purchased under resale agreements	$ –	$ 14,561	$ –	$ –	$ 14,561
Securities borrowed	–	6,237	–	–	6,237
Trading assets:			–		
Debt instruments:			–		
Mortgage-backed securities:			–		
U.S. GSEs and government agencies[a]	–	44,510	797	–	45,307
Residential – nonagency	–	1,977	23	–	2,000
Commercial – nonagency	–	1,486	4	–	1,490
Total mortgage-backed securities	–	47,973	824	–	48,797
U.S. Treasury, GSEs and government agencies[a]	78,289	10,295	–	–	88,584
Obligations of U.S. states and municipalities	–	6,468	10	–	6,478
Certificates of deposit, bankers' acceptances and commercial paper	–	252	–	–	252
Non-U.S. government debt securities	26,600	27,169	155	–	53,924
Corporate debt securities	–	17,956	558	–	18,514
Loans[b]	–	6,340	673	–	7,013
Asset-backed securities	–	2,593	37	–	2,630
Total debt instruments	104,889	119,046	2,257	–	226,192
Equity securities	71,890	244	196	–	72,330
Physical commodities[c]	3,638	3,579	–	–	7,217
Other	–	13,896	232	–	14,128
Total debt and equity instruments[d]	180,417	136,765	2,685	–	319,867
Derivative receivables:					
Interest rate	721	311,173	1,400	(285,873)	27,421
Credit	–	14,252	624	(14,175)	701
Foreign exchange	117	137,938	432	(129,482)	9,005
Equity	–	43,642	2,085	(39,250)	6,477
Commodity	–	17,058	184	(11,080)	6,162
Total derivative receivables	838	524,063	4,725	(479,860)	49,766
Total trading assets[e]	181,255	660,828	7,410	(479,860)	369,633
Available-for-sale securities:					
Mortgage-backed securities:					
U.S. GSEs and government agencies[a]	–	110,117	–	–	110,117
Residential – nonagency	–	12,989	1	–	12,990
Commercial – nonagency	–	5,188	–	–	5,188
Total mortgage-backed securities	–	128,294	1	–	128,295
U.S. Treasury and government agencies	139,436	–	–	–	139,436
Obligations of U.S. states and municipalities	–	29,810	–	–	29,810
Certificates of deposit	–	77	–	–	77
Non-U.S. government debt securities	12,966	8,821	–	–	21,787
Corporate debt securities	–	845	–	–	845
Asset-backed securities:			–	–	–
Collateralized loan obligations	–	24,991	–	–	24,991
Other	–	5,458	–	–	5,458
Total available-for-sale securities	152,402	198,296	1	–	350,699
Loans[b][f]	–	44,439	516	–	44,955
Mortgage servicing rights	–	–	4,699	–	4,699
Other assets[b][e]	7,305	3,824	917	–	12,046
Total assets measured at fair value on a recurring basis	$ 340,962	$ 928,185	$ 13,543	$ (479,860)	$ 802,830
Deposits	$ –	$ 25,229	$ 3,360	$ –	$ 28,589
Federal funds purchased and securities loaned or sold under repurchase agreements	–	549	–	–	549
Short-term borrowings	–	4,246	1,674	–	5,920
Trading liabilities:					
Debt and equity instruments[d]	59,047	16,481	41	–	75,569
Derivative payables:					
Interest rate	795	276,746	1,732	(270,670)	8,603
Credit	–	14,358	763	(13,469)	1,652
Foreign exchange	109	143,960	1,039	(131,950)	13,158
Equity	–	47,261	5,480	(40,204)	12,537
Commodity	–	19,685	200	(12,127)	7,758
Total derivative payables	904	502,010	9,214	(468,420)	43,708
Total trading liabilities	59,951	518,491	9,255	(468,420)	119,277
Accounts payable and other liabilities	3,231	452	45	–	3,728
Beneficial interests issued by consolidated VIEs	–	36	–	–	36
Long-term debt	–	52,406	23,339	–	75,745
Total liabilities measured at fair value on a recurring basis	$ 63,182	$ 601,409	$ 37,673	$ (468,420)	$ 233,844

(a) At December 31, 2020 and 2019, included total U.S. GSE obligations of $117.6 billion and $104.5 billion, respectively, which were mortgage-related.

(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

(c) Physical commodities inventories are generally accounted for at the lower of cost or net realizable value. "Net realizable value" is a term defined in U.S. GAAP as not exceeding fair value less costs to sell ("transaction costs"). Transaction costs for the Firm's physical commodities inventories are either not applicable or immaterial to the value of the inventory. Therefore, net realizable value approximates fair value for the Firm's physical commodities inventories. When fair value hedging has been applied (or when net realizable value is below cost), the carrying value of physical commodities approximates fair value, because under fair value hedge accounting, the cost basis is adjusted for changes in fair value. Refer to Note 5 for a further discussion of the Firm’s hedge accounting relationships. To provide consistent fair value disclosure information, all physical commodities inventories have been included in each period presented.

(d) Balances reflect the reduction of securities owned (long positions) by the amount of identical securities sold but not yet purchased (short positions).

(e) Certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient are not required to be classified in the fair value hierarchy. At December 31, 2020 and 2019, the fair values of these investments, which include certain hedge funds, private equity funds, real estate and other funds, were $670 million and $684 million, respectively. Included in these balances at December 31, 2020 and 2019, were trading assets of $52 million and $54 million, respectively, and other assets of $618 million and $630 million, respectively.

(f) At December 31, 2020 and 2019, included within loans were $15.1 billion and $19.8 billion, respectively, of residential first-lien mortgages, and $6.3 billion and $8.2 billion, respectively, of commercial first-lien mortgages. Residential mortgage loans include conforming mortgage loans originated with the intent to sell to U.S. GSEs and government agencies of $8.4 billion and $13.6 billion, respectively.

(g) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral received and paid when a legally enforceable master netting agreement exists. The level 3 balances would be reduced if netting were applied, including the netting benefit associated with cash collateral.

Level 3 valuations

The Firm has established well-structured processes for determining fair value, including for instruments where fair value is estimated using significant unobservable inputs (level 3). Refer to pages 171-175 of this Note for further information on the Firm's valuation process and a detailed discussion of the determination of fair value for individual financial instruments.

Estimating fair value requires the application of judgment. The type and level of judgment required is largely dependent on the amount of observable market information available to the Firm. For instruments valued using internally developed valuation models and other valuation techniques that use significant unobservable inputs and are therefore classified within level 3 of the fair value hierarchy, judgments used to estimate fair value are more significant than those required when estimating the fair value of instruments classified within levels 1 and 2.

In arriving at an estimate of fair value for an instrument within level 3, management must first determine the appropriate valuation model or other valuation technique to use. Second, due to the lack of observability of significant inputs, management must assess relevant empirical data in deriving valuation inputs including transaction details, yield curves, interest rates, prepayment speed, default rates, volatilities, correlations, prices (such as commodity, equity or debt prices), valuations of comparable instruments, foreign exchange rates and credit curves.

The following table presents the Firm's primary level 3 financial instruments, the valuation techniques used to measure the fair value of those financial instruments, the significant unobservable inputs, the range of values for those inputs and the weighted or arithmetic averages of such inputs. While the determination to classify an instrument within level 3 is based on the significance of the unobservable inputs to the overall fair value measurement, level 3 financial instruments typically include observable components (that is, components that are actively quoted and can be validated to external sources) in addition to the unobservable components. The level 1 and/or level 2 inputs are not included in the table. In addition, the Firm manages the risk of the observable components of level 3 financial instruments using securities and derivative positions that are classified within levels 1 or 2 of the fair value hierarchy.

The range of values presented in the table is representative of the highest and lowest level input used to value the significant groups of instruments within a product/instrument classification. Where provided, the weighted averages of the input values presented in the table are calculated based on the fair value of the instruments that the input is being used to value.

In the Firm's view, the input range, weighted and arithmetic average values do not reflect the degree of input uncertainty or an assessment of the reasonableness of the Firm's estimates and assumptions. Rather, they reflect the characteristics of the various instruments held by the Firm and the relative distribution of instruments within the range of characteristics. For example, two option contracts may have similar levels of market risk exposure and valuation uncertainty, but may have significantly different implied volatility levels because the option contracts have different underlyings, tenors, or strike prices. The input range and weighted average values will therefore vary from period-to-period and parameter-to-parameter based on the characteristics of the instruments held by the Firm at each balance sheet date.

Level 3 inputs[a]

December 31, 2020							
Product/Instrument	**Fair value (in millions)**	**Principal valuation technique**	**Unobservable inputs[g]**	**Range of input values**			**Average[i]**
Residential mortgage-backed securities and loans[b]	$ 1,282	Discounted cash flows	Yield	0%	-	18%	6%
			Prepayment speed	0%	-	46%	10%
			Conditional default rate	0%	-	30%	14%
			Loss severity	0%	-	107%	7%
Commercial mortgage-backed securities and loans[c]	466	Market comparables	Price	$0	-	$101	$84
Corporate debt securities	507	Market comparables	Price	$2	-	$116	$85
Loans[d]	1,930	Market comparables	Price	$10	-	$104	$72
Asset-backed securities	28	Market comparables	Price	$1	-	$97	$57
Net interest rate derivatives	238	Option pricing	Interest rate volatility	7bps	-	513bps	101bps
			Interest rate spread volatility	11bps	-	23bps	15bps
			Interest rate correlation	(65)%	-	99%	35%
			IR-FX correlation	(35)%	-	50%	0%
	20	Discounted cash flows	Prepayment speed	0%	-	30%	8%
Net credit derivatives	(260)	Discounted cash flows	Credit correlation	34%	-	65%	48%
			Credit spread	3bps	-	1,302bps	441bps
			Recovery rate	0%	-	67%	46%
			Conditional default rate	2%	-	100%	58%
			Loss severity		100%		100%
	36	Market comparables	Price	$1	-	$115	$71
Net foreign exchange derivatives	(298)	Option pricing	IR-FX correlation	(40)%	-	65%	18%
	(136)	Discounted cash flows	Prepayment speed		9%		9%
Net equity derivatives	(3,862)	Option pricing	Forward equity price[h]	61%	-	106%	99%
			Equity volatility	5%	-	138%	35%
			Equity correlation	18%	-	99%	60%
			Equity-FX correlation	(79)%	-	55%	(27)%
			Equity-IR correlation	20%	-	50%	28%
Net commodity derivatives	(731)	Option pricing	Oil Commodity Forward	$600 / MT	-	$609 / MT	$605 / MT
			Forward power price	$12 / MWH	-	$55 / MWH	$34 / MWH
			Commodity volatility	1%	-	58%	29%
			Commodity correlation	(49)%	-	95%	23%
MSRs	3,276	Discounted cash flows	Refer to Note 15				
Other assets	299	Discounted cash flows	Credit spread		45bps		45bps
			Yield	4%		30%	7%
	585	Market comparables	Price	$29	-	$29	$29
Long-term debt, short-term borrowings, and deposits[e]	27,912	Option pricing	Interest rate volatility	7bps	-	513bps	101bps
			Interest rate correlation	(65)%	-	99%	35%
			IR-FX correlation	(35)%	-	50%	0%
			Equity correlation	18%	-	99%	60%
			Equity-FX correlation	(79)%	-	55%	(27)%
			Equity-IR correlation	20%	-	50%	28%
	818	Discounted cash flows	Credit correlation	34%	-	65%	48%
Other level 3 assets and liabilities, net[f]	250						

(a) The categories presented in the table have been aggregated based upon the product type, which may differ from their classification on the Consolidated balance sheets. Furthermore, the inputs presented for each valuation technique in the table are, in some cases, not applicable to every instrument valued using the technique as the characteristics of the instruments can differ.
(b) Comprises U.S. GSE and government agency securities of $449 million, nonagency securities of $28 million and non-trading loans of $805 million.
(c) Comprises nonagency securities of $3 million, trading loans of $43 million and non-trading loans of $420 million.
(d) Comprises trading loans of $850 million and non-trading loans of $1.1 billion.
(e) Long-term debt, short-term borrowings and deposits include structured notes issued by the Firm that are financial instruments that typically contain embedded derivatives. The estimation of the fair value of structured notes includes the derivative features embedded within the instrument. The significant unobservable inputs are broadly consistent with those presented for derivative receivables.
(f) Includes level 3 assets and liabilities that are insignificant both individually and in aggregate.
(g) Price is a significant unobservable input for certain instruments. When quoted market prices are not readily available, reliance is generally placed on price-based internal valuation techniques. The price input is expressed assuming a par value of $100.
(h) Forward equity price is expressed as a percentage of the current equity price.
(i) Amounts represent weighted averages except for derivative related inputs where arithmetic averages are used.

Changes in and ranges of unobservable inputs

The following discussion provides a description of the impact on a fair value measurement of a change in each unobservable input in isolation, and the interrelationship between unobservable inputs, where relevant and significant. The impact of changes in inputs may not be independent, as a change in one unobservable input may give rise to a change in another unobservable input. Where relationships do exist between two unobservable inputs, those relationships are discussed below. Relationships may also exist between observable and unobservable inputs (for example, as observable interest rates rise, unobservable prepayment rates decline); such relationships have not been included in the discussion below. In addition, for each of the individual relationships described below, the inverse relationship would also generally apply.

The following discussion also provides a description of attributes of the underlying instruments and external market factors that affect the range of inputs used in the valuation of the Firm's positions.

Yield – The yield of an asset is the interest rate used to discount future cash flows in a discounted cash flow calculation. An increase in the yield, in isolation, would result in a decrease in a fair value measurement.

Credit spread – The credit spread is the amount of additional annualized return over the market interest rate that a market participant would demand for taking exposure to the credit risk of an instrument. The credit spread for an instrument forms part of the discount rate used in a discounted cash flow calculation. Generally, an increase in the credit spread would result in a decrease in a fair value measurement.

The yield and the credit spread of a particular mortgage-backed security primarily reflect the risk inherent in the instrument. The yield is also impacted by the absolute level of the coupon paid by the instrument (which may not correspond directly to the level of inherent risk). Therefore, the range of yield and credit spreads reflects the range of risk inherent in various instruments owned by the Firm. The risk inherent in mortgage-backed securities is driven by the subordination of the security being valued and the characteristics of the underlying mortgages within the collateralized pool, including borrower FICO scores, LTV ratios for residential mortgages and the nature of the property and/or any tenants for commercial mortgages. For corporate debt securities, obligations of U.S. states and municipalities and other similar instruments, credit spreads reflect the credit quality of the obligor and the tenor of the obligation.

Prepayment speed – The prepayment speed is a measure of the voluntary unscheduled principal repayments of a prepayable obligation in a collateralized pool. Prepayment speeds generally decline as borrower delinquencies rise. An increase in prepayment speeds, in isolation, would result in a decrease in a fair value measurement of assets valued at a premium to par and an increase in a fair value measurement of assets valued at a discount to par.

Prepayment speeds may vary from collateral pool to collateral pool, and are driven by the type and location of the underlying borrower, and the remaining tenor of the obligation as well as the level and type (e.g., fixed or floating) of interest rate being paid by the borrower. Typically collateral pools with higher borrower credit quality have a higher prepayment rate than those with lower borrower credit quality, all other factors being equal.

Conditional default rate – The conditional default rate is a measure of the reduction in the outstanding collateral balance underlying a collateralized obligation as a result of defaults. While there is typically no direct relationship between conditional default rates and prepayment speeds, collateralized obligations for which the underlying collateral has high prepayment speeds will tend to have lower conditional default rates. An increase in conditional default rates would generally be accompanied by an increase in loss severity and an increase in credit spreads. An increase in the conditional default rate, in isolation, would result in a decrease in a fair value measurement. Conditional default rates reflect the quality of the collateral underlying a securitization and the structure of the securitization itself. Based on the types of securities owned in the Firm's market-making portfolios, conditional default rates are most typically at the lower end of the range presented.

Loss severity – The loss severity (the inverse concept is the recovery rate) is the expected amount of future realized losses resulting from the ultimate liquidation of a particular loan, expressed as the net amount of loss relative to the outstanding loan balance. An increase in loss severity is generally accompanied by an increase in conditional default rates. An increase in the loss severity, in isolation, would result in a decrease in a fair value measurement.

The loss severity applied in valuing a mortgage-backed security investment depends on factors relating to the underlying mortgages, including the LTV ratio, the nature of the lender's lien on the property and other instrument-specific factors.

Correlation – Correlation is a measure of the relationship between the movements of two variables. Correlation is a pricing input for a derivative product where the payoff is driven by one or more underlying risks. Correlation inputs are related to the type of derivative (e.g., interest rate, credit, equity, foreign exchange and commodity) due to the nature of the underlying risks. When parameters are positively correlated, an increase in one parameter will result in an increase in the other parameter. When parameters are negatively correlated, an increase in one parameter will result in a decrease in the other parameter. An increase in correlation can result in an increase or a decrease in a fair value measurement. Given a short correlation position, an increase in correlation, in isolation, would generally result in a decrease in a fair value measurement.

The level of correlation used in the valuation of derivatives with multiple underlying risks depends on a number of factors including the nature of those risks. For example, the correlation between two credit risk exposures would be different than that between two interest rate risk exposures. Similarly, the tenor of the transaction may also impact the correlation input, as the relationship between the underlying risks may be different over different time periods. Furthermore, correlation levels are very much dependent on market conditions and could have a relatively wide range of levels within or across asset classes over time, particularly in volatile market conditions.

Volatility – Volatility is a measure of the variability in possible returns for an instrument, parameter or market index given how much the particular instrument, parameter or index changes in value over time. Volatility is a pricing input for options, including equity options, commodity options, and interest rate options. Generally, the higher the volatility of the underlying, the riskier the instrument. Given a long position in an option, an increase in volatility, in isolation, would generally result in an increase in a fair value measurement.

The level of volatility used in the valuation of a particular option-based derivative depends on a number of factors, including the nature of the risk underlying the option (e.g., the volatility of a particular equity security may be significantly different from that of a particular commodity index), the tenor of the derivative as well as the strike price of the option.

Forward price - Forward price is the price at which the buyer agrees to purchase the asset underlying a forward contract on the predetermined future delivery date, and is such that the value of the contract is zero at inception.

The forward price is used as an input in the valuation of certain derivatives and depends on a number of factors including interest rates, the current price of the underlying asset, and the expected income to be received and costs to be incurred by the seller as a result of holding that asset until the delivery date. An increase in the forward can result in an increase or a decrease in a fair value measurement.

Changes in level 3 recurring fair value measurements

The following tables include a rollforward of the Consolidated balance sheets amounts (including changes in fair value) for financial instruments classified by the Firm within level 3 of the fair value hierarchy for the years ended December 31, 2020, 2019 and 2018. When a determination is made to classify a financial instrument within level 3, the determination is based on the significance of the unobservable inputs to the overall fair value measurement. However, level 3 financial instruments typically include, in addition to the unobservable or level 3 components, observable components (that is, components that are actively quoted and can be validated to external sources); accordingly, the gains and losses in the table below include changes in fair value due in part to observable factors that are part of the valuation methodology. Also, the Firm risk-manages the observable components of level 3 financial instruments using securities and derivative positions that are classified within level 1 or 2 of the fair value hierarchy; as these level 1 and level 2 risk management instruments are not included below, the gains or losses in the following tables do not reflect the effect of the Firm's risk management activities related to such level 3 instruments.

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs								Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2020
	Fair value at January 1, 2020	Total realized/ unrealized gains/(losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2020	
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 797	$ (172)	$ 134	$ (149)	$ (161)	$ –	$ –	$ 449	$ (150)
Residential – nonagency	23	2	15	(5)	(4)	–	(3)	28	(1)
Commercial – nonagency	4	–	1	–	(1)	2	(3)	3	–
Total mortgage-backed securities	824	(170)	150	(154)	(166)	2	(6)	480	(151)
U.S. Treasury, GSEs and government agencies	–	–	–	–	–	–	–	–	–
Obligations of U.S. states and municipalities	10	–	–	(1)	(1)	–	–	8	–
Non-U.S. government debt securities	155	21	281	(245)	(7)	–	(23)	182	11
Corporate debt securities	558	(23)	582	(205)	(236)	411	(580)	507	(25)
Loans[b]	673	(73)	1,112	(484)	(182)	791	(944)	893	(40)
Asset-backed securities	37	(3)	44	(40)	(9)	9	(10)	28	(4)
Total debt instruments	2,257	(248)	2,169	(1,129)	(601)	1,213	(1,563)	2,098	(209)
Equity securities	196	(75)	53	(376)	(1)	535	(153)	179	(20)
Other	232	271	245	(9)	(154)	6	(245)	346	206
Total trading assets – debt and equity instruments	2,685	(52) [d]	2,467	(1,514)	(756)	1,754	(1,961)	2,623	(23) [d]
Net derivative receivables:[c]									
Interest rate	(332)	2,682	308	(148)	(2,228)	(332)	308	258	325
Credit	(139)	(212)	73	(154)	181	59	(32)	(224)	(110)
Foreign exchange	(607)	49	49	(24)	83	13	3	(434)	116
Equity	(3,395)	(65)	1,664	(2,317)	1,162	(935)	24	(3,862)	(556)
Commodity	(16)	(546)	27	(241)	356	(310)	(1)	(731)	267
Total net derivative receivables	(4,489)	1,908 [d]	2,121	(2,884)	(446)	(1,505)	302	(4,993)	42 [d]
Available-for-sale securities:									
Mortgage-backed securities	1	–	–	–	(1)	–	–	–	–
Asset-backed securities	–	–	–	–	–	–	–	–	–
Total available-for-sale securities	1	–	–	–	(1)	–	–	–	–
Loans[b]	516	(243) [d]	962	(84)	(733)	2,571	(684)	2,305	(18) [d]
Mortgage servicing rights	4,699	(1,540) [e]	1,192	(176)	(899)	–	–	3,276	(1,540) [e]
Other assets[b]	917	(63) [d]	75	(104)	(320)	40	(7)	538	(3) [d]

Year ended December 31, 2020 (in millions)	Fair value measurements using significant unobservable inputs									Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2020
	Fair value at January 1, 2020	Total realized/ unrealized (gains)/losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2020	
Liabilities:[a]										
Deposits	$ 3,360	$ 165 [d][f]	$ –	$ –	$ 671	$ (605)	$ 265	$ (943)	$ 2,913	$ 455 [d][f]
Short-term borrowings	1,674	(338) [d][f]	–	–	5,140	(4,115)	105	(46)	2,420	143 [d][f]
Trading liabilities – debt and equity instruments	41	(2) [d]	(126)	14	–	(4)	136	(8)	51	(1) [d]
Accounts payable and other liabilities	45	33 [d]	(87)	37	–	–	47	(7)	68	28 [d]
Beneficial interests issued by consolidated VIEs	–	–	–	–	–	–	–	–	–	–
Long-term debt	23,339	40 [d][f]	–	–	9,883	(9,833)	1,250	(1,282)	23,397	1,920 [d][f]

Year ended December 31, 2019 (in millions)	Fair value at January 1, 2019	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2019	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2019
	Fair value measurements using significant unobservable inputs								
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 549	$ (62)	$ 773	$ (310)	$ (134)	$ 1	$ (20)	$ 797	$ (58)
Residential – nonagency	64	25	83	(86)	(20)	15	(58)	23	2
Commercial – nonagency	11	2	20	(26)	(14)	15	(4)	4	1
Total mortgage-backed securities	624	(35)	876	(422)	(168)	31	(82)	824	(55)
U.S. Treasury, GSEs and government agencies	–	–	–	–	–	–	–	–	–
Obligations of U.S. states and municipalities	689	13	85	(159)	(8)	–	(610)	10	13
Non-U.S. government debt securities	155	1	290	(287)	–	14	(18)	155	4
Corporate debt securities	334	47	437	(247)	(52)	112	(73)	558	40
Loans[b]	738	29	456	(519)	(82)	437	(386)	673	13
Asset-backed securities	127	–	37	(93)	(40)	28	(22)	37	(3)
Total debt instruments	2,667	55	2,181	(1,727)	(350)	622	(1,191)	2,257	12
Equity securities	232	(41)	58	(103)	(22)	181	(109)	196	(18)
Other	301	(36)	50	(26)	(54)	2	(5)	232	91
Total trading assets – debt and equity instruments	3,200	(22) [d]	2,289	(1,856)	(426)	805	(1,305)	2,685	85 [d]
Net derivative receivables:[c]									
Interest rate	(38)	(394)	109	(125)	5	(7)	118	(332)	(599)
Credit	(107)	(36)	20	(9)	8	29	(44)	(139)	(127)
Foreign exchange	(297)	(551)	17	(67)	312	(22)	1	(607)	(380)
Equity	(2,225)	(310)	397	(573)	(503)	(405)	224	(3,395)	(1,608)
Commodity	(1,129)	497	36	(348)	89	(6)	845	(16)	130
Total net derivative receivables	(3,796)	(794) [d]	579	(1,122)	(89)	(411)	1,144	(4,489)	(2,584) [d]
Available-for-sale securities:									
Mortgage-backed securities	1	–	–	–	–	–	–	1	–
Asset-backed securities	–	–	–	–	–	–	–	–	–
Total available-for-sale securities	1	–	–	–	–	–	–	1	–
Loans[b]	856	59 [d]	236	(188)	(482)	188	(153)	516	38 [d]
Mortgage servicing rights	6,130	(1,180) [e]	1,489	(789)	(951)	–	–	4,699	(1,180) [e]
Other assets[b]	1,161	(150) [d]	229	(166)	(156)	6	(7)	917	(180) [d]

Year ended December 31, 2019 (in millions)	Fair value at January 1, 2019	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2019	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2019
	Fair value measurements using significant unobservable inputs									
Liabilities:[a]										
Deposits	$ 4,169	$ 278 [d][f]	$ –	$ –	$ 916	$ (806)	$ 12	$ (1,209)	$ 3,360	$ 307 [d][f]
Short-term borrowings	1,523	229 [d][f]	–	–	3,441	(3,356)	85	(248)	1,674	155 [d][f]
Trading liabilities – debt and equity instruments	50	2 [d]	(22)	41	–	1	16	(47)	41	3 [d]
Accounts payable and other liabilities	10	(2) [d]	(84)	115	–	–	6	–	45	29 [d]
Beneficial interests issued by consolidated VIEs	1	(1) [d]	–	–	–	–	–	–	–	–
Long-term debt	19,418	2,815 [d][f]	–	–	10,441	(8,538)	651	(1,448)	23,339	2,822 [d][f]

Year ended December 31, 2018 (in millions)	Fair value at January 1, 2018	Total realized/ unrealized gains/ (losses)	Purchases[g]	Sales	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2018	Change in unrealized gains/(losses) related to financial instruments held at Dec. 31, 2018
	Fair value measurements using significant unobservable inputs								
Assets:[a]									
Trading assets:									
Debt instruments:									
Mortgage-backed securities:									
U.S. GSEs and government agencies	$ 307	$ (23)	$ 478	$ (164)	$ (73)	$ 94	$ (70)	$ 549	$ (21)
Residential – nonagency	60	(2)	78	(50)	(7)	59	(74)	64	1
Commercial – nonagency	11	2	18	(18)	(17)	36	(21)	11	(2)
Total mortgage-backed securities	378	(23)	574	(232)	(97)	189	(165)	624	(22)
U.S. Treasury, GSEs and government agencies	1	–	–	–	–	–	(1)	–	–
Obligations of U.S. states and municipalities	744	(17)	112	(70)	(80)	–	–	689	(17)
Non-U.S. government debt securities	78	(22)	459	(277)	(12)	23	(94)	155	(9)
Corporate debt securities	312	(18)	364	(309)	(48)	262	(229)	334	(1)
Loans[b]	612	1	941	(536)	(219)	619	(680)	738	(13)
Asset-backed securities	153	28	98	(41)	(55)	45	(101)	127	22
Total debt instruments	2,278	(51)	2,548	(1,465)	(511)	1,138	(1,270)	2,667	(40)
Equity securities	295	(40)	118	(120)	(1)	107	(127)	232	9
Other	690	(285)	55	(40)	(118)	3	(4)	301	(301)
Total trading assets – debt and equity instruments	3,263	(376) [d]	2,721	(1,625)	(630)	1,248	(1,401)	3,200	(332) [d]
Net derivative receivables:[c]									
Interest rate	264	150	107	(133)	(430)	(15)	19	(38)	187
Credit	(35)	(40)	5	(7)	(57)	4	23	(107)	(28)
Foreign exchange	(396)	103	52	(20)	30	(108)	42	(297)	(63)
Equity	(3,409)	198	1,676	(2,208)	1,805	(617)	330	(2,225)	561
Commodity	(674)	(73)	1	(72)	(301)	7	(17)	(1,129)	146
Total net derivative receivables	(4,250)	338 [d]	1,841	(2,440)	1,047	(729)	397	(3,796)	803 [d]
Available-for-sale securities:								–	
Mortgage-backed securities	1	–	–	–	–	–	–	1	–
Asset-backed securities	276	1	–	–	(277)	–	–	–	–
Total available-for-sale securities	277	1 [j]	–	–	(277)	–	–	1	–
Loans[b]	2,152	9 [d]	412	(1,256)	(496)	194	(159)	856	(4) [d]
Mortgage servicing rights	6,030	230 [e]	1,246	(636)	(740)	–	–	6,130	230 [e]
Other assets[b]	1,496	(319) [d]	195	(38)	(176)	4	(1)	1,161	(331) [d]

Year ended December 31, 2018 (in millions)	Fair value at January 1, 2018	Total realized/ unrealized (gains)/ losses	Purchases	Sales	Issuances	Settlements[h]	Transfers into level 3[i]	Transfers (out of) level 3[i]	Fair value at Dec. 31, 2018	Change in unrealized (gains)/losses related to financial instruments held at Dec. 31, 2018
	Fair value measurements using significant unobservable inputs									
Liabilities:[a]										
Deposits	$ 4,142	$(136) [d][f]	$ –	$ –	$ 1,437	$ (736)	$ 2	$ (540)	$ 4,169	$ (204) [d][f]
Short-term borrowings	1,665	(329) [d][f]	–	–	3,455	(3,388)	272	(152)	1,523	(131) [d][f]
Trading liabilities – debt and equity instruments	39	19 [d]	(99)	114	–	(1)	14	(36)	50	16 [d]
Accounts payable and other liabilities	13	–	(12)	5	–	–	4	–	10	–
Beneficial interests issued by consolidated VIEs	39	–	–	1	–	(39)	–	–	1	–
Long-term debt	16,125	(1,169) [d][f]	–	–	11,919	(7,769)	1,143	(831)	19,418	(1,385) [d][f]

(a) Level 3 assets at fair value as a percentage of total Firm assets accounted for at fair value (including assets measured at fair value on a nonrecurring basis) were 1%, 2% and 3% at December 31, 2020, 2019 and 2018, respectively. Level 3 liabilities at fair value as a percentage of total Firm liabilities at fair value (including liabilities measured at fair value on a nonrecurring basis) were 9%, 16% and 15% at December 31, 2020, 2019 and 2018, respectively.
(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(c) All level 3 derivatives are presented on a net basis, irrespective of underlying counterparty.
(d) Predominantly reported in principal transactions revenue, except for changes in fair value for CCB mortgage loans, and lending-related commitments originated with the intent to sell, and mortgage loan purchase commitments, which are reported in mortgage fees and related income.
(e) Changes in fair value for MSRs are reported in mortgage fees and related income.
(f) Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue, and they were not material for the years ended December 31, 2020, 2019 and 2018, respectively. Unrealized (gains)/losses are reported in OCI, and they were $221 million, $319 million and $(277) million for the years ended December 31, 2020, 2019 and 2018, respectively.
(g) Loan originations are included in purchases.
(h) Includes financial assets and liabilities that have matured, been partially or fully repaid, impacts of modifications, deconsolidation associated with beneficial interests in VIEs and other items.
(i) All transfers into and/or out of level 3 are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.
(j) Realized gains/(losses) on AFS securities, as well as other-than-temporary impairment ("OTTI") losses that are recorded in earnings, are reported in investment securities gains/(losses). Unrealized gains/(losses) are reported in OCI. There were no realized gains/(losses) and foreign exchange hedge accounting adjustments recorded in income on AFS securities for the years ended December 31, 2020 and 2019, respectively and $1 million recorded for the year ended December 31, 2018. There were no material unrealized gains/(losses) recorded on AFS securities in OCI for the years ended December 31, 2020, 2019 and 2018 respectively.

Level 3 analysis

Consolidated balance sheets changes

Level 3 assets at fair value including assets measured at fair value on a nonrecurring basis were 0.5% of total Firm assets at December 31, 2020. The following describes significant changes to level 3 assets since December 31, 2019, for those items measured at fair value on a recurring basis. Refer to Assets and liabilities measured at fair value on a nonrecurring basis on page 189 for further information on changes impacting items measured at fair value on a nonrecurring basis.

For the year ended December 31, 2020

Level 3 assets were $16.4 billion at December 31, 2020, reflecting an increase of $2.9 billion from December 31, 2019.

The increase for the year ended December 31, 2020 was driven by:

- $907 million increase in gross interest rate derivative receivables and $1.4 billion increase in gross equity derivative receivables largely due to gains net of settlements.
- $1.8 billion increase in non-trading loans due to net transfers.

partially offset by

- $1.4 billion decrease in MSRs due to losses and settlements partially offset by purchases.

Refer to the sections below for additional information.

Transfers between levels for instruments carried at fair value on a recurring basis

During the year ended December 31, 2020, significant transfers from level 2 into level 3 included the following:

- $1.8 billion of total debt and equity instruments, predominantly equity securities and trading loans, driven by a decrease in observability.
- $2.6 billion of gross equity derivative receivables and $3.5 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $880 million of gross interest rate derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $2.6 billion of non-trading loans driven by a decrease in observability.
- $1.2 billion of long-term debt driven by a decrease in observability and an increase in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2020, significant transfers from level 3 into level 2 included the following:

- $2.0 billion of total debt and equity instruments, predominantly due to corporate debt and trading loans, driven by an increase in observability.
- $2.4 billion of gross equity derivative receivables and $2.4 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $943 million of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.3 billion of long-term debt driven by an increase in observability and a decrease in the significance of unobservable inputs for structured notes.

During the year ended December 31, 2019, significant transfers from level 2 into level 3 included the following:

- $993 million of total debt and equity instruments, the majority of which were trading loans, driven by a decrease in observability.
- $904 million of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.

During the year ended December 31, 2019, significant transfers from level 3 into level 2 included the following:

- $1.5 billion of total debt and equity instruments, the majority of which were obligations of U.S. states and municipalities and trading loans, driven by an increase in observability.
- $1.1 billion of gross equity derivative receivables and $1.3 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $962 million of gross commodities derivative payables as a result of an increase in observability.
- $1.2 billion of deposits as a result of an increase in observability and a decrease in the significance of unobservable inputs.
- $1.4 billion of long-term debt as a result of an increase in observability and a decrease in the significance of unobservable inputs.

During the year ended December 31, 2018, significant transfers from level 2 into level 3 included the following:

- $1.4 billion of total debt and equity instruments, the majority of which were trading loans, driven by a decrease in observability.
- $1.0 billion of gross equity derivative receivables and $1.6 billion of gross equity derivative payables as a result of a decrease in observability and an increase in the significance of unobservable inputs.
- $1.1 billion of long-term debt driven by a decrease in observability and an increase in the significance of unobservable inputs for certain structured notes.

During the year ended December 31, 2018, significant transfers from level 3 into level 2 included the following:

- $1.5 billion of total debt and equity instruments, the majority of which were trading loans, driven by an increase in observability.
- $1.2 billion of gross equity derivative receivables and $1.5 billion of gross equity derivative payables as a result of an increase in observability and a decrease in the significance of unobservable inputs.

All transfers are based on changes in the observability and/or significance of the valuation inputs and are assumed to occur at the beginning of the quarterly reporting period in which they occur.

Gains and losses

The following describes significant components of total realized/unrealized gains/(losses) for instruments measured at fair value on a recurring basis for the years ended December 31, 2020, 2019 and 2018. These amounts exclude any effects of the Firm's risk management activities where the financial instruments are classified as level 1 and 2 of the fair value hierarchy. Refer to Changes in level 3 recurring fair value measurements rollforward tables on pages 182-186 for further information on these instruments.

2020

- $10 million of net gains on assets driven by gains in net interest rate derivative receivables due to market movements largely offset by losses in MSRs reflecting faster prepayment speeds on lower rates. Refer to Note 15 for additional information on MSRs.
- $102 million of net gains on liabilities driven by market movements in short-term borrowings.

2019

- $2.1 billion of net losses on assets largely due to MSRs reflecting faster prepayment speeds on lower rates. Refer to Note 15 for additional information on MSRs.
- $3.3 billion of net losses on liabilities predominantly driven by market movements in long-term debt.

2018

- $1.6 billion of net gains on liabilities largely driven by market movements in long-term debt.

Credit and funding adjustments – derivatives

Derivatives are generally valued using models that use as their basis observable market parameters. These market parameters generally do not consider factors such as counterparty nonperformance risk, the Firm's own credit quality, and funding costs. Therefore, it is generally necessary to make adjustments to the base estimate of fair value to reflect these factors.

CVA represents the adjustment, relative to the relevant benchmark interest rate, necessary to reflect counterparty nonperformance risk. The Firm estimates CVA using a scenario analysis to estimate the expected positive credit exposure across all of the Firm's existing positions with each counterparty, and then estimates losses based on the probability of default and estimated recovery rate as a result of a counterparty credit event considering contractual factors designed to mitigate the Firm's credit exposure, such as collateral and legal rights of offset. The key inputs to this methodology are (i) the probability of a default event occurring for each counterparty, as derived from observed or estimated CDS spreads; and (ii) estimated recovery rates implied by CDS spreads, adjusted to consider the differences in recovery rates as a derivative creditor relative to those reflected in CDS spreads, which generally reflect senior unsecured creditor risk.

FVA represents the adjustment to reflect the impact of funding and is recognized where there is evidence that a market participant in the principal market would incorporate it in a transfer of the instrument. The Firm's FVA framework, applied to uncollateralized (including partially collateralized) over-the-counter ("OTC") derivatives incorporates key inputs such as: (i) the expected funding requirements arising from the Firm's positions with each counterparty and collateral arrangements; and (ii) the estimated market funding cost in the principal market which, for derivative liabilities, considers the Firm's credit risk (DVA). For collateralized derivatives, the fair value is estimated by discounting expected future cash flows at the relevant overnight indexed swap rate given the underlying collateral agreement with the counterparty, and therefore a separate FVA is not necessary.

The following table provides the impact of credit and funding adjustments on principal transactions revenue in the respective periods, excluding the effect of any associated hedging activities. The FVA presented below includes the impact of the Firm's own credit quality on the inception value of liabilities as well as the impact of changes in the Firm's own credit quality over time.

Year ended December 31, (in millions)	**2020**	2019	2018
Credit and funding adjustments:			
Derivatives CVA	**$ (337)**	$ 241	$ 193
Derivatives FVA	**(64)**	199	(74)

Valuation adjustments on fair value option elected liabilities

The valuation of the Firm's liabilities for which the fair value option has been elected requires consideration of the Firm's own credit risk. DVA on fair value option elected liabilities reflects changes (subsequent to the issuance of the liability) in the Firm's probability of default and LGD, which are estimated based on changes in the Firm's credit spread observed in the bond market. Realized (gains)/losses due to DVA for fair value option elected liabilities are reported in principal transactions revenue. Unrealized (gains)/losses are reported in OCI. Refer to page 186 in this Note and Note 24 for further information.

Assets and liabilities measured at fair value on a nonrecurring basis

The following tables present the assets and liabilities held as of December 31, 2020 and 2019, respectively, for which nonrecurring fair value adjustments were recorded during the years ended December 31, 2020 and 2019, respectively, by major product category and fair value hierarchy.

December 31, 2020 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	**$ –**	**$ 1,611** (c)	**$ 972** (d)	**$ 2,583**
Other assets(a)	**–**	**5**	**979**	**984**
Total assets measured at fair value on a nonrecurring basis	**$ –**	**$ 1,616**	**$ 1,951**	**$ 3,567**
Accounts payable and other liabilities(b)	**–**	**–**	**12**	**12**
Total liabilities measured at fair value on a nonrecurring basis	**$ –**	**$ –**	**$ 12**	**$ 12**

December 31, 2019 (in millions)	Fair value hierarchy Level 1	Level 2	Level 3	Total fair value
Loans	$ –	$ 3,462 (c)	$ 269	$ 3,731
Other assets	–	14	1,043 (e)	1,057
Total assets measured at fair value on a nonrecurring basis	$ –	$ 3,476	$ 1,312	$ 4,788

(a) Primarily includes equity securities without readily determinable fair values that were adjusted based on observable price changes in orderly transactions from an identical or similar investment of the same issuer (measurement alternative). Of the $979 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2020, $535 million related to equity securities adjusted based on the measurement alternative. These equity securities are classified as level 3 due to the infrequency of the observable prices and/or the restrictions on the shares.
(b) There were no liabilities measured at fair value on a nonrecurring basis at December 31, 2019.
(c) Primarily includes certain mortgage loans that were reclassified to held-for-sale.
(d) Of the $972 million in level 3 assets measured at fair value on a nonrecurring basis as of December 31, 2020, $602 million related to residential real estate loans carried at the net realizable value of the underlying collateral (e.g., collateral-dependent loans). These amounts are classified as level 3 as they are valued using information from broker's price opinions, appraisals and automated valuation models and discounted based upon the Firm's experience with actual liquidation values. These discounts ranged from 13% to 46% with a weighted average of 27%.
(e) Prior-period amounts have been revised to conform with the current presentation.

Nonrecurring fair value changes

The following table presents the total change in value of assets and liabilities for which fair value adjustments have been recognized for the years ended December 31, 2020, 2019 and 2018, related to assets and liabilities held at those dates.

December 31, (in millions)	2020	2019	2018
Loans(a)	**$ (393)**	$ (274)	$ (68)
Other assets(b)	**(529)**	182 (c)	132
Accounts payable and other liabilities	**(11)**	–	–
Total nonrecurring fair value gains/(losses)	**$ (933)**	$ (92)	$ 64

(a) Includes the impact of certain mortgage loans that were reclassified to held-for-sale.
(b) Included $(134) million, $201 million and $149 million for the years ended December 31, 2020, 2019 and 2018, respectively,of net (losses)/gains as a result of the measurement alternative.
(c) Prior-period amounts have been revised to conform with the current presentation.

Refer to Note 12 for further information about the measurement of collateral-dependent loans.

Equity securities without readily determinable fair values

The Firm measures certain equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer, with such changes recognized in other income.

In its determination of the new carrying values upon observable price changes, the Firm may adjust the prices if deemed necessary to arrive at the Firm's estimated fair values. Such adjustments may include adjustments to reflect the different rights and obligations of similar securities, and other adjustments that are consistent with the Firm's valuation techniques for private equity direct investments.

The following table presents the carrying value of equity securities without readily determinable fair values held as of December 31, 2020 and 2019, that are measured under the measurement alternative and the related adjustments recorded during the periods presented for those securities with observable price changes. These securities are included in the nonrecurring fair value tables when applicable price changes are observable.

As of or for the year ended December 31, (in millions)	**2020**	2019
Other assets		
Carrying value[(a)]	**$ 2,368**	$ 2,441
Upward carrying value changes[(b)]	**167**	243 [(d)]
Downward carrying value changes/impairment[(c)]	**(301)**	(42)

(a) The period-end carrying values reflect cumulative purchases and sales in addition to upward and downward carrying value changes.
(b) The cumulative upward carrying value changes between January 1, 2018 and December 31, 2020 were $708 million.
(c) The cumulative downward carrying value changes/impairment between January 1, 2018 and December 31, 2020 were $(430) million.
(d) Prior-period amounts have been revised to conform with the current presentation.

Included in other assets above is the Firm's interest in approximately 40 million Visa Class B common shares, recorded at a nominal carrying value. These shares are subject to certain transfer restrictions currently and will be convertible into Visa Class A common shares upon final resolution of certain litigation matters involving Visa. The conversion rate of Visa Class B common shares into Visa Class A common shares is 1.6228 at December 31, 2020, and may be adjusted by Visa depending on developments related to the litigation matters.

Additional disclosures about the fair value of financial instruments that are not carried on the Consolidated balance sheets at fair value

U.S. GAAP requires disclosure of the estimated fair value of certain financial instruments, which are included in the following table. However, this table does not include other items, such as nonfinancial assets, intangible assets, certain financial instruments, and customer relationships. In the opinion of management, these items, in the aggregate, add significant value to JPMorgan Chase, but their fair value is not disclosed in this table.

Financial instruments for which carrying value approximates fair value

Certain financial instruments that are not carried at fair value on the Consolidated balance sheets are carried at amounts that approximate fair value, due to their short-term nature and generally negligible credit risk. These instruments include cash and due from banks, deposits with banks, federal funds sold, securities purchased under resale agreements and securities borrowed, short-term receivables and accrued interest receivable, short-term borrowings, federal funds purchased, securities loaned and sold under repurchase agreements, accounts payable, and accrued liabilities. In addition, U.S. GAAP requires that the fair value of deposit liabilities with no stated maturity (i.e., demand, savings and certain money market deposits) be equal to their carrying value; recognition of the inherent funding value of these instruments is not permitted.

The following table presents by fair value hierarchy classification the carrying values and estimated fair values at December 31, 2020 and 2019, of financial assets and liabilities, excluding financial instruments that are carried at fair value on a recurring basis, and their classification within the fair value hierarchy.

	December 31, 2020					December 31, 2019				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value	Level 1	Level 2	Level 3	Total estimated fair value
Financial assets										
Cash and due from banks	**$ 24.9**	**$ 24.9**	**$ –**	**$ –**	**$ 24.9**	$ 21.7	$ 21.7	$ –	$ –	$ 21.7
Deposits with banks	**502.7**	**502.7**	**–**	**–**	**502.7**	241.9	241.9	–	–	241.9
Accrued interest and accounts receivable	**89.4**	**–**	**89.3**	**0.1**	**89.4**	71.3	–	71.2	0.1	71.3
Federal funds sold and securities purchased under resale agreements	**58.3**	**–**	**58.3**	**–**	**58.3**	234.6	–	234.6	–	234.6
Securities borrowed	**107.7**	**–**	**107.7**	**–**	**107.7**	133.5	–	133.5	–	133.5
Investment securities, held-to-maturity	**201.8**	**53.2**	**152.3**	**–**	**205.5**	47.5	0.1	48.8	–	48.9
Loans, net of allowance for loan losses[(a)]	**940.1**	**–**	**210.9**	**755.6**	**966.5**	939.5	–	214.1	734.9	949.0
Other	**81.8**	**–**	**80.0**	**1.9**	**81.9**	61.3	–	60.6	0.8	61.4
Financial liabilities										
Deposits	**$ 2,129.8**	**$ –**	**$ 2,128.9**	**$ –**	**$ 2,128.9**	$ 1,533.8	$ –	$ 1,534.1	$ –	$ 1,534.1
Federal funds purchased and securities loaned or sold under repurchase agreements	**59.5**	**–**	**59.5**	**–**	**59.5**	183.1	–	183.1	–	183.1
Short-term borrowings	**28.3**	**–**	**28.3**	**–**	**28.3**	35.0	–	35.0	–	35.0
Accounts payable and other liabilities	**186.6**	**–**	**181.9**	**4.3**	**186.2**	164.0	0.1	160.0	3.5	163.6
Beneficial interests issued by consolidated VIEs	**17.5**	**–**	**17.6**	**–**	**17.6**	17.8	–	17.9	–	17.9
Long-term debt	**204.8**	**–**	**209.2**	**3.2**	**212.4**	215.5	–	218.3	3.5	221.8

(a) Fair value is typically estimated using a discounted cash flow model that incorporates the characteristics of the underlying loans (including principal, contractual interest rate and contractual fees) and other key inputs, including expected lifetime credit losses, interest rates, prepayment rates, and primary origination or secondary market spreads. For certain loans, the fair value is measured based on the value of the underlying collateral. Carrying value of the loan takes into account the loan's allowance for loan losses, which represents the loan's expected credit losses over its remaining expected life. The difference between the estimated fair value and carrying value of a loan is generally attributable to changes in market interest rates, including credit spreads, market liquidity premiums and other factors that affect the fair value of a loan but do not affect its carrying value.

The majority of the Firm's lending-related commitments are not carried at fair value on a recurring basis on the Consolidated balance sheets. The carrying value and the estimated fair value of these wholesale lending-related commitments were as follows for the periods indicated.

	December 31, 2020					December 31, 2019				
		Estimated fair value hierarchy					Estimated fair value hierarchy			
(in billions)	Carrying value[(a)(b)]	Level 1	Level 2	Level 3	Total estimated fair value	Carrying value[(a)(b)]	Level 1	Level 2	Level 3	Total estimated fair value
Wholesale lending-related commitments	**$ 2.2**	**$ –**	**$ –**	**$ 2.1**	**$ 2.1**	$ 1.2	$ –	$ –	$ 1.9	$ 1.9

(a) Excludes the current carrying values of the guarantee liability and the offsetting asset, each of which is recognized at fair value at the inception of the guarantees.
(b) Includes the wholesale allowance for lending-related commitments.

The Firm does not estimate the fair value of consumer off-balance sheet lending-related commitments. In many cases, the Firm can reduce or cancel these commitments by providing the borrower notice or, in some cases as permitted by law, without notice. Refer to page 173 of this Note for a further discussion of the valuation of lending-related commitments.

Note 3 – Fair value option

The fair value option provides an option to elect fair value as an alternative measurement for selected financial assets, financial liabilities, unrecognized firm commitments, and written loan commitments.

The Firm has elected to measure certain instruments at fair value for several reasons including to mitigate income statement volatility caused by the differences between the measurement basis of elected instruments (e.g., certain instruments that otherwise would be accounted for on an accrual basis) and the associated risk management arrangements that are accounted for on a fair value basis, as well as to better reflect those instruments that are managed on a fair value basis.

The Firm's election of fair value includes the following instruments:

- Loans purchased or originated as part of securitization warehousing activity, subject to bifurcation accounting, or managed on a fair value basis, including lending-related commitments
- Certain securities financing agreements
- Owned beneficial interests in securitized financial assets that contain embedded credit derivatives, which would otherwise be required to be separately accounted for as a derivative instrument
- Structured notes, which are predominantly financial instruments that contain embedded derivatives, that are issued as part of client-driven activities
- Certain long-term beneficial interests issued by CIB's consolidated securitization trusts where the underlying assets are carried at fair value

Changes in fair value under the fair value option election

The following table presents the changes in fair value included in the Consolidated statements of income for the years ended December 31, 2020, 2019 and 2018, for items for which the fair value option was elected. The profit and loss information presented below only includes the financial instruments that were elected to be measured at fair value; related risk management instruments, which are required to be measured at fair value, are not included in the table.

	2020			2019			2018		
December 31, (in millions)	Principal transactions	All other income	Total changes in fair value recorded[f]	Principal transactions	All other income	Total changes in fair value recorded[f]	Principal transactions	All other income	Total changes in fair value recorded[f]
Federal funds sold and securities purchased under resale agreements	**$ 12**	**$ –**	**$ 12**	$ (36)	$ –	$ (36)	$ (35)	$ –	$ (35)
Securities borrowed	**143**	**–**	**143**	133	–	133	22	–	22
Trading assets:									
Debt and equity instruments, excluding loans	**1,546**	**(1)** [d]	**1,545**	2,482	(1) [d]	2,481	(1,680)	1 [d]	(1,679)
Loans reported as trading assets:									
Changes in instrument-specific credit risk[a]	**135**	**–**	**135**	248	–	248	15	–	15
Other changes in fair value[a]	**(19)**	**–**	**(19)**	(1)	–	(1)	28	–	28
Loans:									
Changes in instrument-specific credit risk[a]	**190**	**7** [d]	**197**	475	2 [d]	477	385	1 [d]	386
Other changes in fair value[a]	**470**	**3,239** [d]	**3,709**	267	1,224 [d]	1,491	138	185 [d]	323
Other assets[a]	**103**	**(65)** [e]	**38**	8	6 [e]	14	11	(45) [e]	(34)
Deposits[b]	**(726)**	**–**	**(726)**	(1,730)	–	(1,730)	181	–	181
Federal funds purchased and securities loaned or sold under repurchase agreements	**(6)**	**–**	**(6)**	(8)	–	(8)	11	–	11
Short-term borrowings[b]	**294**	**–**	**294**	(693)	–	(693)	862	–	862
Trading liabilities	**2**	**–**	**2**	6	–	6	1	–	1
Other liabilities	**(94)**	**–**	**(94)**	(16)	–	(16)	–	–	–
Long-term debt[b][c]	**(2,120)**	**(1)** [d]	**(2,121)**	(6,173)	1 [d]	(6,172)	2,695	–	2,695

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(b) Unrealized gains/(losses) due to instrument-specific credit risk (DVA) for liabilities for which the fair value option has been elected are recorded in OCI and subsequently recorded in principal transactions revenue when realized. Realized gains/(losses) due to instrument-specific credit risk recorded in principal transactions revenue were $20 million for the year ended December 31,2020 and were not material for the years ended December 31, 2019 and 2018.
(c) Long-term debt measured at fair value predominantly relates to structured notes. Although the risk associated with the structured notes is actively managed, the gains/(losses) reported in this table do not include the income statement impact of the risk management instruments used to manage such risk.
(d) Reported in mortgage fees and related income.
(e) Reported in other income.
(f) Changes in fair value exclude contractual interest, which is included in interest income and interest expense for all instruments other than hybrid financial instruments. Refer to Note 7 for further information regarding interest income and interest expense.

Determination of instrument-specific credit risk for items for which the fair value option was elected

The following describes how the gains and losses that are attributable to changes in instrument-specific credit risk, were determined.

- Loans and lending-related commitments: For floating-rate instruments, all changes in value are attributed to instrument-specific credit risk. For fixed-rate instruments, an allocation of the changes in value for the period is made between those changes in value that are interest rate-related and changes in value that are credit-related. Allocations are generally based on an analysis of borrower-specific credit spread and recovery information, where available, or benchmarking to similar entities or industries.
- Long-term debt: Changes in value attributable to instrument-specific credit risk were derived principally from observable changes in the Firm's credit spread as observed in the bond market.
- Securities financing agreements: Generally, for these types of agreements, there is a requirement that collateral be maintained with a market value equal to or in excess of the principal amount loaned; as a result, there would be no adjustment or an immaterial adjustment for instrument-specific credit risk related to these agreements.

Difference between aggregate fair value and aggregate remaining contractual principal balance outstanding

The following table reflects the difference between the aggregate fair value and the aggregate remaining contractual principal balance outstanding as of December 31, 2020 and 2019, for loans, long-term debt and long-term beneficial interests for which the fair value option has been elected.

	2020			2019		
December 31, (in millions)	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding	Contractual principal outstanding	Fair value	Fair value over/(under) contractual principal outstanding
Loans						
Nonaccrual loans						
Loans reported as trading assets[(a)]	**$ 3,386**	**$ 555**	**$ (2,831)**	$ 2,563	$ 234	$ (2,329)
Loans[(a)]	**1,867**	**1,507**	**(360)**	964	696	(268)
Subtotal	**5,253**	**2,062**	**(3,191)**	3,527	930	(2,597)
90 or more days past due and government guaranteed[(b)]						
Loans reported as trading assets	**—**	**—**	**—**	—	—	—
Loans	**328**	**317**	**(11)**	138	129	(9)
Subtotal	**328**	**317**	**(11)**	138	129	(9)
All other performing loans[(c)]						
Loans reported as trading assets[(a)]	**7,917**	**6,439**	**(1,478)**	8,288	6,779	(1,509)
Loans[(a)]	**42,022**	**42,650**	**628**	43,955	44,130	175
Subtotal	**49,939**	**49,089**	**(850)**	52,243	50,909	(1,334)
Total loans	**$ 55,520**	**$ 51,468**	**$ (4,052)**	$ 55,908	$ 51,968	$ (3,940)
Long-term debt						
Principal-protected debt	**$ 40,560** (e)	**$ 40,526**	**$ (34)**	$ 40,124 (e)	$ 39,246	$ (878)
Nonprincipal-protected debt[(d)]	**NA**	**36,291**	**NA**	NA	36,499	NA
Total long-term debt	**NA**	**$ 76,817**	**NA**	NA	$ 75,745	NA
Long-term beneficial interests						
Nonprincipal-protected debt[(d)]	**NA**	**$ 41**	**NA**	NA	$ 36	NA
Total long-term beneficial interests	**NA**	**$ 41**	**NA**	NA	$ 36	NA

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(b) These balances are excluded from nonaccrual loans as the loans are insured and/or guaranteed by U.S. government agencies.
(c) There were no performing loans that were ninety days or more past due as of December 31, 2020 and 2019.
(d) Remaining contractual principal is not applicable to nonprincipal-protected structured notes and long-term beneficial interests. Unlike principal-protected structured notes and long-term beneficial interests, for which the Firm is obligated to return a stated amount of principal at maturity, nonprincipal-protected structured notes and long-term beneficial interests do not obligate the Firm to return a stated amount of principal at maturity, but for structured notes to return an amount based on the performance of an underlying variable or derivative feature embedded in the note. However, investors are exposed to the credit risk of the Firm as issuer for both nonprincipal-protected and principal-protected notes.
(e) Where the Firm issues principal-protected zero-coupon or discount notes, the balance reflects the contractual principal payment at maturity or, if applicable, the contractual principal payment at the Firm's next call date.

At December 31, 2020 and 2019, the contractual amount of lending-related commitments for which the fair value option was elected was $18.1 billion and $8.6 billion, respectively, with a corresponding fair value of $(39) million and $(120) million, respectively. Refer to Note 28 for further information regarding off-balance sheet lending-related financial instruments. Prior-period amounts have been revised to conform with the current presentation.

Structured note products by balance sheet classification and risk component

The following table presents the fair value of structured notes, by balance sheet classification and the primary risk type.

	December 31, 2020				December 31, 2019			
(in millions)	Long-term debt	Short-term borrowings	Deposits	Total	Long-term debt	Short-term borrowings	Deposits	Total
Risk exposure								
Interest rate	**$ 38,129**	**$ 65**	**$ 5,057**	**$ 43,251**	$ 35,470	$ 34	$ 16,692	$ 52,196
Credit	**6,409**	**1,022**	**–**	**7,431**	5,715	875	–	6,590
Foreign exchange	**3,613**	**92**	**–**	**3,705**	3,862	48	5	3,915
Equity	**26,943**	**5,021**	**6,893**	**38,857**	29,294	4,852	8,177	42,323
Commodity	**250**	**13**	**232**	**495**	472	32	1,454	1,958
Total structured notes	**$ 75,344**	**$ 6,213**	**$ 12,182**	**$ 93,739**	$ 74,813	$ 5,841	$ 26,328	$106,982

Note 4 – Credit risk concentrations

Concentrations of credit risk arise when a number of clients, counterparties or customers are engaged in similar business activities or activities in the same geographic region, or when they have similar economic features that would cause their ability to meet contractual obligations to be similarly affected by changes in economic conditions.

JPMorgan Chase regularly monitors various segments of its credit portfolios to assess potential credit risk concentrations and to obtain additional collateral when deemed necessary and permitted under the Firm's agreements. Senior management is significantly involved in the credit approval and review process, and risk levels are adjusted as needed to reflect the Firm's risk appetite.

In the Firm's consumer portfolio, concentrations are managed primarily by product and by U.S. geographic region, with a key focus on trends and concentrations at the portfolio level, where potential credit risk concentrations can be remedied through changes in underwriting policies and portfolio guidelines. Refer to Note 12 for additional information on the geographic composition of the Firm's consumer loan portfolios. In the wholesale portfolio, credit risk concentrations are evaluated primarily by industry and monitored regularly on both an aggregate portfolio level and on an individual client or counterparty basis.

The Firm's wholesale exposure is managed through loan syndications and participations, loan sales, securitizations, credit derivatives, master netting agreements, collateral and other risk-reduction techniques. Refer to Note 12 for additional information on loans.

The Firm does not believe that its exposure to any particular loan product or industry segment (e.g., real estate), or its exposure to residential real estate loans with high LTV ratios, results in a significant concentration of credit risk.

Terms of loan products and collateral coverage are included in the Firm's assessment when extending credit and establishing its allowance for loan losses.

The table below presents both on–balance sheet and off–balance sheet consumer and wholesale credit exposure by the Firm's three credit portfolio segments as of December 31, 2020 and 2019. The wholesale industry of risk category is generally based on the client or counterparty's primary business activity.

In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

	2020				2019			
		On-balance sheet				On-balance sheet		
December 31, (in millions)	Credit exposure[h][i]	Loans[i]	Derivatives	Off-balance sheet[i][k]	Credit exposure[h][i]	Loans[i]	Derivatives	Off-balance sheet[i][k]
Consumer, excluding credit card	**$ 375,898**	**$ 318,579**[j]	**$ –**	**$ 57,319**	$ 357,986	$ 317,817	$ –	$ 40,169
Credit card[a]	**802,722**	**144,216**	**–**	**658,506**	819,644	168,924	–	650,720
Total consumer-related[a]	**1,178,620**	**462,795**	**–**	**715,825**	1,177,630	486,741	–	690,889
Wholesale-related[b]								
Real Estate	**148,498**	**118,299**	**1,385**	**28,814**	150,919	117,709	619	32,591
Individuals and Individual Entities[c]	**122,870**	**109,746**	**1,750**	**11,374**	105,027	94,616	694	9,717
Consumer & Retail	**108,437**	**39,013**	**2,802**	**66,622**	106,986	36,985	1,424	68,577
Technology, Media & Telecommunications	**72,150**	**14,687**	**4,252**	**53,211**	60,033	15,322	2,766	41,945
Asset Managers	**66,573**	**31,059**	**9,277**	**26,237**	54,304	24,008	7,160	23,136
Industrials	**66,470**	**21,143**	**1,851**	**43,476**	62,483	22,063	878	39,542
Healthcare	**60,118**	**19,405**	**3,252**	**37,461**	50,824	17,607	2,078	31,139
Banks & Finance Cos	**54,032**	**31,004**	**8,044**	**14,984**	50,786	31,191	5,165	14,430
Automotive	**43,331**	**17,128**	**5,995**	**20,208**	35,118	18,844	368	15,906
Oil & Gas	**39,159**	**11,267**	**1,643**	**26,249**	41,641	13,101	852	27,688
State & Municipal Govt[d]	**38,286**	**18,054**	**2,347**	**17,885**	30,095	13,271	2,000	14,824
Utilities	**30,124**	**4,874**	**3,340**	**21,910**	34,843	5,157	2,573	27,113
Chemicals & Plastics	**17,176**	**4,884**	**856**	**11,436**	17,499	4,864	459	12,176
Central Govt	**17,025**	**3,396**	**12,313**	**1,316**	14,865	2,840	10,477	1,548
Transportation	**16,232**	**6,566**	**1,495**	**8,171**	14,497	5,253	715	8,529
Metals & Mining	**15,542**	**4,854**	**882**	**9,806**	15,586	5,364	402	9,820
Insurance	**13,141**	**1,042**	**2,527**	**9,572**	12,348	1,356	2,282	8,710
Securities Firms	**8,048**	**469**	**4,838**	**2,741**	7,381	757	4,507	2,117
Financial Markets Infrastructure	**6,515**	**19**	**3,757**	**2,739**	4,121	13	2,482	1,626
All other[e]	**100,713**	**58,038**	**7,024**	**35,651**	79,598	51,357	1,865	26,376
Subtotal	**1,044,440**	**514,947**	**79,630**	**449,863**	948,954	481,678	49,766	417,510
Loans held-for-sale and loans at fair value	**35,111**	**35,111**	**–**	**–**	29,201	29,201	–	–
Receivables from customers[f]	**47,710**	**–**	**–**	**–**	33,706	–	–	–
Total wholesale-related	**1,127,261**	**550,058**	**79,630**	**449,863**	1,011,861	510,879	49,766	417,510
Total exposure[g][h]	**$ 2,305,881**	**$1,012,853**	**$ 79,630**	**$1,165,688**	$2,189,491	$ 997,620	$ 49,766	$1,108,399

(a) Also includes commercial card lending-related commitments primarily in CB and CIB.

(b) The industry rankings presented in the table as of December 31, 2019, are based on the industry rankings of the corresponding exposures at December 31, 2020, not actual rankings of such exposures at December 31, 2019.

(c) Individuals and Individual Entities predominantly consists of Wealth Management clients within AWM and includes exposure to personal investment companies and personal and testamentary trusts.

(d) In addition to the credit risk exposure to states and municipal governments (both U.S. and non-U.S.) at December 31, 2020 and 2019, noted above, the Firm held: $7.2 billion and $6.5 billion, respectively, of trading assets; $20.4 billion and $29.8 billion, respectively, of AFS securities; and $12.8 billion and $4.8 billion, respectively, of HTM securities, issued by U.S. state and municipal governments. Refer to Note 2 and Note 10 for further information.

(e) All other includes: SPEs and Private education and civic organizations, representing approximately 92% and 8%, respectively, at December 31, 2020 and 90% and 10%, respectively, at December 31, 2019 . Refer to Note 14 for more information on exposures to SPEs.

(f) Receivables from customers reflect held-for-investment margin loans to brokerage clients in CIB, CCB and AWM that are collateralized by assets maintained in the clients' brokerage accounts (e.g., cash on deposit, liquid and readily marketable debt or equity securities). Because of this collateralization, no allowance for credit losses is generally held against these receivables. To manage its credit risk the Firm establishes margin requirements and monitors the required margin levels on an ongoing basis, and requires clients to deposit additional cash or other collateral, or to reduce positions, when appropriate. These receivables are reported within accrued interest and accounts receivable on the Firm's Consolidated balance sheets.

(g) Excludes cash placed with banks of $516.9 billion and $254.0 billion, at December 31, 2020 and 2019, respectively, which is predominantly placed with various central banks, primarily Federal Reserve Banks.

(h) Credit exposure is net of risk participations and excludes the benefit of credit derivatives used in credit portfolio management activities held against derivative receivables or loans and liquid securities and other cash collateral held against derivative receivables.

(i) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of certain off-balance sheet commitments. Prior-period amounts have been revised to conform with the current presentation.

(j) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(k) Represents lending-related financial instruments.

Note 5 – Derivative instruments

Derivative contracts derive their value from underlying asset prices, indices, reference rates, other inputs or a combination of these factors and may expose counterparties to risks and rewards of an underlying asset or liability without having to initially invest in, own or exchange the asset or liability. JPMorgan Chase makes markets in derivatives for clients and also uses derivatives to hedge or manage its own risk exposures. Predominantly all of the Firm's derivatives are entered into for market-making or risk management purposes.

Market-making derivatives
The majority of the Firm's derivatives are entered into for market-making purposes. Clients use derivatives to mitigate or modify interest rate, credit, foreign exchange, equity and commodity risks. The Firm actively manages the risks from its exposure to these derivatives by entering into other derivative contracts or by purchasing or selling other financial instruments that partially or fully offset the exposure from client derivatives.

Risk management derivatives
The Firm manages certain market and credit risk exposures using derivative instruments, including derivatives in hedge accounting relationships and other derivatives that are used to manage risks associated with specified assets and liabilities.

The Firm generally uses interest rate derivatives to manage the risk associated with changes in interest rates. Fixed-rate assets and liabilities appreciate or depreciate in market value as interest rates change. Similarly, interest income and expense increase or decrease as a result of variable-rate assets and liabilities resetting to current market rates, and as a result of the repayment and subsequent origination or issuance of fixed-rate assets and liabilities at current market rates. Gains and losses on the derivative instruments related to these assets and liabilities are expected to substantially offset this variability.

Foreign currency derivatives are used to manage the foreign exchange risk associated with certain foreign currency–denominated (i.e., non-U.S. dollar) assets and liabilities and forecasted transactions, as well as the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. As a result of fluctuations in foreign currencies, the U.S. dollar–equivalent values of the foreign currency–denominated assets and liabilities or the forecasted revenues or expenses increase or decrease. Gains or losses on the derivative instruments related to these foreign currency–denominated assets or liabilities, or forecasted transactions, are expected to substantially offset this variability.

Commodities derivatives are used to manage the price risk of certain commodities inventories. Gains or losses on these derivative instruments are expected to substantially offset the depreciation or appreciation of the related inventory.

Credit derivatives are used to manage the counterparty credit risk associated with loans and lending-related commitments. Credit derivatives compensate the purchaser when the entity referenced in the contract experiences a credit event, such as bankruptcy or a failure to pay an obligation when due. Credit derivatives primarily consist of CDS. Refer to the Credit derivatives section on pages 209-211 of this Note for a further discussion of credit derivatives.

Refer to the risk management derivatives gains and losses table on page 209 of this Note, and the hedge accounting gains and losses tables on pages 206-208 of this Note for more information about risk management derivatives.

Derivative counterparties and settlement types
The Firm enters into OTC derivatives, which are negotiated and settled bilaterally with the derivative counterparty. The Firm also enters into, as principal, certain ETD such as futures and options, and OTC-cleared derivative contracts with CCPs. ETD contracts are generally standardized contracts traded on an exchange and cleared by the CCP, which is the Firm's counterparty from the inception of the transactions. OTC-cleared derivatives are traded on a bilateral basis and then novated to the CCP for clearing.

Derivative clearing services
The Firm provides clearing services for clients in which the Firm acts as a clearing member at certain exchanges and clearing houses. The Firm does not reflect the clients' derivative contracts in its Consolidated Financial Statements. Refer to Note 28 for further information on the Firm's clearing services.

Accounting for derivatives

All free-standing derivatives that the Firm executes for its own account are required to be recorded on the Consolidated balance sheets at fair value.

As permitted under U.S. GAAP, the Firm nets derivative assets and liabilities, and the related cash collateral receivables and payables, when a legally enforceable master netting agreement exists between the Firm and the derivative counterparty. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. The accounting for changes in value of a derivative depends on whether or not the transaction has been designated and qualifies for hedge accounting. Derivatives that are not designated as hedges are reported and measured at fair value through earnings. The tabular disclosures on pages 202-209 of this Note provide additional information on the amount of, and reporting for, derivative assets, liabilities, gains and losses. Refer to Notes 2 and 3 for a further discussion of derivatives embedded in structured notes.

Derivatives designated as hedges

The Firm applies hedge accounting to certain derivatives executed for risk management purposes – generally interest rate, foreign exchange and commodity derivatives. However, JPMorgan Chase does not seek to apply hedge accounting to all of the derivatives involved in the Firm's risk management activities. For example, the Firm does not apply hedge accounting to purchased CDS used to manage the credit risk of loans and lending-related commitments, because of the difficulties in qualifying such contracts as hedges. For the same reason, the Firm does not apply hedge accounting to certain interest rate, foreign exchange, and commodity derivatives used for risk management purposes.

To qualify for hedge accounting, a derivative must be highly effective at reducing the risk associated with the exposure being hedged. In addition, for a derivative to be designated as a hedge, the risk management objective and strategy must be documented. Hedge documentation must identify the derivative hedging instrument, the asset or liability or forecasted transaction and type of risk to be hedged, and how the effectiveness of the derivative is assessed prospectively and retrospectively. To assess effectiveness, the Firm uses statistical methods such as regression analysis, nonstatistical methods such as dollar-value comparisons of the change in the fair value of the derivative to the change in the fair value or cash flows of the hedged item, and qualitative comparisons of critical terms and the evaluation of any changes in those terms. The extent to which a derivative has been, and is expected to continue to be, highly effective at offsetting changes in the fair value or cash flows of the hedged item must be assessed and documented at least quarterly. If it is determined that a derivative is not highly effective at hedging the designated exposure, hedge accounting is discontinued.

There are three types of hedge accounting designations: fair value hedges, cash flow hedges and net investment hedges. JPMorgan Chase uses fair value hedges primarily to hedge fixed-rate long-term debt, AFS securities and certain commodities inventories. For qualifying fair value hedges, the changes in the fair value of the derivative, and in the value of the hedged item for the risk being hedged, are recognized in earnings. Certain amounts excluded from the assessment of effectiveness are recorded in OCI and recognized in earnings over the life of the derivative. If the hedge relationship is terminated, then the adjustment to the hedged item continues to be reported as part of the basis of the hedged item, and for benchmark interest rate hedges, is amortized to earnings as a yield adjustment. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily net interest income and principal transactions revenue.

JPMorgan Chase uses cash flow hedges primarily to hedge the exposure to variability in forecasted cash flows from floating-rate assets and liabilities and foreign currency–denominated revenue and expense. For qualifying cash flow hedges, changes in the fair value of the derivative are recorded in OCI and recognized in earnings as the hedged item affects earnings. Derivative amounts affecting earnings are recognized consistent with the classification of the hedged item – primarily noninterest revenue, net interest income and compensation expense. If the hedge relationship is terminated, then the change in value of the derivative recorded in AOCI is recognized in earnings when the cash flows that were hedged affect earnings. For hedge relationships that are discontinued because a forecasted transaction is expected to not occur according to the original hedge forecast, any related derivative values recorded in AOCI are immediately recognized in earnings.

JPMorgan Chase uses net investment hedges to protect the value of the Firm's net investments in certain non-U.S. subsidiaries or branches whose functional currencies are not the U.S. dollar. For qualifying net investment hedges, changes in the fair value of the derivatives due to changes in spot foreign exchange rates are recorded in OCI as translation adjustments. Amounts excluded from the assessment of effectiveness are recorded directly in earnings.

The following table outlines the Firm's primary uses of derivatives and the related hedge accounting designation or disclosure category.

Type of Derivative	Use of Derivative	Designation and disclosure	Affected segment or unit	Page reference
Manage specifically identified risk exposures in qualifying hedge accounting relationships:				
• Interest rate	Hedge fixed rate assets and liabilities	Fair value hedge	Corporate	206-207
• Interest rate	Hedge floating-rate assets and liabilities	Cash flow hedge	Corporate	208
• Foreign exchange	Hedge foreign currency-denominated assets and liabilities	Fair value hedge	Corporate	206-207
• Foreign exchange	Hedge foreign currency-denominated forecasted revenue and expense	Cash flow hedge	Corporate	208
• Foreign exchange	Hedge the value of the Firm's investments in non-U.S. dollar functional currency entities	Net investment hedge	Corporate	208
• Commodity	Hedge commodity inventory	Fair value hedge	CIB	206-207
Manage specifically identified risk exposures not designated in qualifying hedge accounting relationships:				
• Interest rate	Manage the risk associated with mortgage commitments, warehouse loans and MSRs	Specified risk management	CCB	209
• Credit	Manage the credit risk associated with wholesale lending exposures	Specified risk management	CIB	209
• Interest rate and foreign exchange	Manage the risk associated with certain other specified assets and liabilities	Specified risk management	Corporate	209
Market-making derivatives and other activities:				
• Various	Market-making and related risk management	Market-making and other	CIB	209
• Various	Other derivatives	Market-making and other	CIB, AWM, Corporate	209

Notional amount of derivative contracts

The following table summarizes the notional amount of derivative contracts outstanding as of December 31, 2020 and 2019.

	Notional amounts[b]	
December 31, (in billions)	**2020**	2019
Interest rate contracts		
Swaps	**$ 20,986**	$ 21,228
Futures and forwards	**3,057**	3,152
Written options	**3,375**	3,938
Purchased options	**3,675**	4,361
Total interest rate contracts	**31,093**	32,679
Credit derivatives[a]	**1,201**	1,242
Foreign exchange contracts		
Cross-currency swaps	**3,924**	3,604
Spot, futures and forwards	**6,871**	5,577
Written options	**830**	700
Purchased options	**825**	718
Total foreign exchange contracts	**12,450**	10,599
Equity contracts		
Swaps	**448**	406
Futures and forwards	**140**	142
Written options	**676**	646
Purchased options	**621**	611
Total equity contracts	**1,885**	1,805
Commodity contracts		
Swaps	**138**	147
Spot, futures and forwards	**198**	211
Written options	**124**	135
Purchased options	**105**	124
Total commodity contracts	**565**	617
Total derivative notional amounts	**$ 47,194**	$ 46,942

(a) Refer to the Credit derivatives discussion on pages 209-211 for more information on volumes and types of credit derivative contracts.
(b) Represents the sum of gross long and gross short third-party notional derivative contracts.

While the notional amounts disclosed above give an indication of the volume of the Firm's derivatives activity, the notional amounts significantly exceed, in the Firm's view, the possible losses that could arise from such transactions. For most derivative contracts, the notional amount is not exchanged; it is simply a reference amount used to calculate payments.

Impact of derivatives on the Consolidated balance sheets

The following table summarizes information on derivative receivables and payables (before and after netting adjustments) that are reflected on the Firm's Consolidated balance sheets as of December 31, 2020 and 2019, by accounting designation (e.g., whether the derivatives were designated in qualifying hedge accounting relationships or not) and contract type.

Free-standing derivative receivables and payables[(a)]

	Gross derivative receivables				Gross derivative payables			
December 31, 2020 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	**$ 390,659**	**$ 831**	**$ 391,490**	**$ 35,725**	**$ 353,627**	**$ –**	**$ 353,627**	**$ 13,012**
Credit	**13,503**	**–**	**13,503**	**680**	**15,192**	**–**	**15,192**	**1,995**
Foreign exchange	**205,359**	**901**	**206,260**	**15,781**	**214,229**	**1,697**	**215,926**	**21,433**
Equity	**74,798**	**–**	**74,798**	**20,673**	**81,413**	**–**	**81,413**	**25,898**
Commodity	**20,579**	**924**	**21,503**	**6,771**	**20,834**	**1,895**	**22,729**	**8,285**
Total fair value of trading assets and liabilities	**$ 704,898**	**$ 2,656**	**$ 707,554**	**$ 79,630**	**$ 685,295**	**$ 3,592**	**$ 688,887**	**$ 70,623**

	Gross derivative receivables				Gross derivative payables			
December 31, 2019 (in millions)	Not designated as hedges	Designated as hedges	Total derivative receivables	Net derivative receivables[(b)]	Not designated as hedges	Designated as hedges	Total derivative payables	Net derivative payables[(b)]
Trading assets and liabilities								
Interest rate	$ 312,451	$ 843	$ 313,294	$ 27,421	$ 279,272	$ 1	$ 279,273	$ 8,603
Credit	14,876	–	14,876	701	15,121	–	15,121	1,652
Foreign exchange	138,179	308	138,487	9,005	144,125	983	145,108	13,158
Equity	45,727	–	45,727	6,477	52,741	–	52,741	12,537
Commodity	16,914	328	17,242	6,162	19,736	149	19,885	7,758
Total fair value of trading assets and liabilities	$ 528,147	$ 1,479	$ 529,626	$ 49,766	$ 510,995	$ 1,133	$ 512,128	$ 43,708

(a) Balances exclude structured notes for which the fair value option has been elected. Refer to Note 3 for further information.
(b) As permitted under U.S. GAAP, the Firm has elected to net derivative receivables and derivative payables and the related cash collateral receivables and payables when a legally enforceable master netting agreement exists.

Derivatives netting

The following tables present, as of December 31, 2020 and 2019, gross and net derivative receivables and payables by contract and settlement type. Derivative receivables and payables, as well as the related cash collateral from the same counterparty, have been netted on the Consolidated balance sheets where the Firm has obtained an appropriate legal opinion with respect to the master netting agreement. Where such a legal opinion has not been either sought or obtained, amounts are not eligible for netting on the Consolidated balance sheets, and those derivative receivables and payables are shown separately in the tables below.

In addition to the cash collateral received and transferred that is presented on a net basis with derivative receivables and payables, the Firm receives and transfers additional collateral (financial instruments and cash). These amounts mitigate counterparty credit risk associated with the Firm's derivative instruments, but are not eligible for net presentation:

- collateral that consists of liquid securities and other cash collateral held at third-party custodians, which are shown separately as "Collateral not nettable on the Consolidated balance sheets" in the tables below, up to the fair value exposure amount. Liquid securities represent high quality liquid assets as defined in the LCR rule;
- the amount of collateral held or transferred that exceeds the fair value exposure at the individual counterparty level, as of the date presented, which is excluded from the tables below; and
- collateral held or transferred that relates to derivative receivables or payables where an appropriate legal opinion has not been either sought or obtained with respect to the master netting agreement, which is excluded from the tables below.

	2020			2019		
December 31, (in millions)	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables	Gross derivative receivables	Amounts netted on the Consolidated balance sheets	Net derivative receivables
U.S. GAAP nettable derivative receivables						
Interest rate contracts:						
OTC	$ 367,056	$ (337,451)	$ 29,605	$ 299,205	$ (276,255)	$ 22,950
OTC–cleared	18,340	(17,919)	421	9,442	(9,360)	82
Exchange-traded[a]	554	(395)	159	347	(258)	89
Total interest rate contracts	385,950	(355,765)	30,185	308,994	(285,873)	23,121
Credit contracts:						
OTC	9,052	(8,514)	538	10,743	(10,317)	426
OTC–cleared	4,326	(4,309)	17	3,864	(3,858)	6
Total credit contracts	13,378	(12,823)	555	14,607	(14,175)	432
Foreign exchange contracts:						
OTC	201,349	(189,655)	11,694	136,252	(129,324)	6,928
OTC–cleared	834	(819)	15	185	(152)	33
Exchange-traded[a]	35	(5)	30	10	(6)	4
Total foreign exchange contracts	202,218	(190,479)	11,739	136,447	(129,482)	6,965
Equity contracts:						
OTC	34,030	(27,374)	6,656	23,106	(20,820)	2,286
Exchange-traded[a]	28,294	(26,751)	1,543	19,654	(18,430)	1,224
Total equity contracts	62,324	(54,125)	8,199	42,760	(39,250)	3,510
Commodity contracts:						
OTC	10,924	(7,901)	3,023	7,093	(5,149)	1,944
OTC–cleared	20	(20)	–	28	(28)	–
Exchange-traded[a]	6,833	(6,811)	22	6,154	(5,903)	251
Total commodity contracts	17,777	(14,732)	3,045	13,275	(11,080)	2,195
Derivative receivables with appropriate legal opinion	681,647	(627,924)	53,723 [d]	516,083	(479,860)	36,223 [d]
Derivative receivables where an appropriate legal opinion has not been either sought or obtained	25,907		25,907	13,543		13,543
Total derivative receivables recognized on the Consolidated balance sheets	$ 707,554		$ 79,630	$ 529,626		$ 49,766
Collateral not nettable on the Consolidated balance sheets[b][c]			(14,806)			(13,052)
Net amounts			$ 64,824			$ 36,714

December 31, (in millions)	2020 Gross derivative payables	2020 Amounts netted on the Consolidated balance sheets	2020 Net derivative payables	2019 Gross derivative payables	2019 Amounts netted on the Consolidated balance sheets	2019 Net derivative payables
U.S. GAAP nettable derivative payables						
Interest rate contracts:						
OTC	**$ 331,854**	**$ (320,780)**	**$ 11,074**	$ 267,311	$ (260,229)	$ 7,082
OTC-cleared	**19,710**	**(19,494)**	**216**	10,217	(10,138)	79
Exchange-traded[(a)]	**358**	**(341)**	**17**	365	(303)	62
Total interest rate contracts	**351,922**	**(340,615)**	**11,307**	277,893	(270,670)	7,223
Credit contracts:						
OTC	**10,671**	**(9,141)**	**1,530**	11,570	(10,080)	1,490
OTC-cleared	**4,075**	**(4,056)**	**19**	3,390	(3,389)	1
Total credit contracts	**14,746**	**(13,197)**	**1,549**	14,960	(13,469)	1,491
Foreign exchange contracts:						
OTC	**210,803**	**(193,672)**	**17,131**	142,360	(131,792)	10,568
OTC-cleared	**836**	**(819)**	**17**	186	(152)	34
Exchange-traded[(a)]	**34**	**(2)**	**32**	12	(6)	6
Total foreign exchange contracts	**211,673**	**(194,493)**	**17,180**	142,558	(131,950)	10,608
Equity contracts:						
OTC	**35,330**	**(28,763)**	**6,567**	27,594	(21,778)	5,816
Exchange-traded[(a)]	**34,491**	**(26,752)**	**7,739**	20,216	(18,426)	1,790
Total equity contracts	**69,821**	**(55,515)**	**14,306**	47,810	(40,204)	7,606
Commodity contracts:						
OTC	**10,365**	**(7,544)**	**2,821**	8,714	(6,235)	2,479
OTC-cleared	**32**	**(32)**	**—**	30	(30)	—
Exchange-traded[(a)]	**7,391**	**(6,868)**	**523**	6,012	(5,862)	150
Total commodity contracts	**17,788**	**(14,444)**	**3,344**	14,756	(12,127)	2,629
Derivative payables with appropriate legal opinion	**665,950**	**(618,264)**	**47,686** [(d)]	497,977	(468,420)	29,557 [(d)]
Derivative payables where an appropriate legal opinion has not been either sought or obtained	**22,937**		**22,937**	14,151		14,151
Total derivative payables recognized on the Consolidated balance sheets	**$ 688,887**		**$ 70,623**	$ 512,128		$ 43,708
Collateral not nettable on the Consolidated balance sheets[(b)(c)]			**(11,964)**			(6,960)
Net amounts			**$ 58,659**			$ 36,748

(a) Exchange-traded derivative balances that relate to futures contracts are settled daily.

(b) Includes liquid securities and other cash collateral held at third-party custodians related to derivative instruments where an appropriate legal opinion has been obtained. For some counterparties, the collateral amounts of financial instruments may exceed the derivative receivables and derivative payables balances. Where this is the case, the total amount reported is limited to the net derivative receivables and net derivative payables balances with that counterparty. In the fourth quarter of 2020, the Firm refined its approach for disclosing additional collateral held by the Firm that may be used as security when the fair value of the client's exposure is in the Firm's favor. Prior-period amounts have been revised to conform with the current presentation.

(c) Derivative collateral relates only to OTC and OTC-cleared derivative instruments.

(d) Net derivatives receivable included cash collateral netted of $88.0 billion and $65.9 billion at December 31, 2020 and 2019, respectively. Net derivatives payable included cash collateral netted of $78.4 billion and $54.4 billion at December 31, 2020 and 2019, respectively. Derivative cash collateral relates to OTC and OTC-cleared derivative instruments.

Liquidity risk and credit-related contingent features

In addition to the specific market risks introduced by each derivative contract type, derivatives expose JPMorgan Chase to credit risk — the risk that derivative counterparties may fail to meet their payment obligations under the derivative contracts and the collateral, if any, held by the Firm proves to be of insufficient value to cover the payment obligation. It is the policy of JPMorgan Chase to actively pursue, where possible, the use of legally enforceable master netting arrangements and collateral agreements to mitigate derivative counterparty credit risk inherent in derivative receivables.

While derivative receivables expose the Firm to credit risk, derivative payables expose the Firm to liquidity risk, as the derivative contracts typically require the Firm to post cash or securities collateral with counterparties as the fair value of the contracts moves in the counterparties' favor or upon specified downgrades in the Firm's and its subsidiaries' respective credit ratings. Certain derivative contracts also provide for termination of the contract, generally upon a downgrade of either the Firm or the counterparty, at the fair value of the derivative contracts. The following table shows the aggregate fair value of net derivative payables related to OTC and OTC-cleared derivatives that contain contingent collateral or termination features that may be triggered upon a ratings downgrade, and the associated collateral the Firm has posted in the normal course of business, at December 31, 2020 and 2019.

OTC and OTC-cleared derivative payables containing downgrade triggers

December 31, (in millions)	**2020**	2019
Aggregate fair value of net derivative payables	**$ 27,712**	$ 14,819
Collateral posted	**26,289**	13,329

The following table shows the impact of a single-notch and two-notch downgrade of the long-term issuer ratings of JPMorgan Chase & Co. and its subsidiaries, predominantly JPMorgan Chase Bank, N.A., at December 31, 2020 and 2019, related to OTC and OTC-cleared derivative contracts with contingent collateral or termination features that may be triggered upon a ratings downgrade. Derivatives contracts generally require additional collateral to be posted or terminations to be triggered when the predefined threshold rating is breached. A downgrade by a single rating agency that does not result in a rating lower than a preexisting corresponding rating provided by another major rating agency will generally not result in additional collateral (except in certain instances in which additional initial margin may be required upon a ratings downgrade), nor in termination payments requirements. The liquidity impact in the table is calculated based upon a downgrade below the lowest current rating of the rating agencies referred to in the derivative contract.

Liquidity impact of downgrade triggers on OTC and OTC-cleared derivatives

	2020		2019	
December 31, (in millions)	Single-notch downgrade	Two-notch downgrade	Single-notch downgrade	Two-notch downgrade
Amount of additional collateral to be posted upon downgrade[(a)]	**$ 119**	**$ 1,243**	$ 189	$ 1,467
Amount required to settle contracts with termination triggers upon downgrade[(b)]	**153**	**2,449**	104	1,398

(a) Includes the additional collateral to be posted for initial margin.
(b) Amounts represent fair values of derivative payables, and do not reflect collateral posted.

Derivatives executed in contemplation of a sale of the underlying financial asset

In certain instances the Firm enters into transactions in which it transfers financial assets but maintains the economic exposure to the transferred assets by entering into a derivative with the same counterparty in contemplation of the initial transfer. The Firm generally accounts for such transfers as collateralized financing transactions as described in Note 11, but in limited circumstances they may qualify to be accounted for as a sale and a derivative under U.S. GAAP. The amount of such transfers accounted for as a sale where the associated derivative was outstanding was not material at both December 31, 2020 and 2019.

Impact of derivatives on the Consolidated statements of income

The following tables provide information related to gains and losses recorded on derivatives based on their hedge accounting designation or purpose.

Fair value hedge gains and losses

The following tables present derivative instruments, by contract type, used in fair value hedge accounting relationships, as well as pre-tax gains/(losses) recorded on such derivatives and the related hedged items for the years ended December 31, 2020, 2019 and 2018, respectively. The Firm includes gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the related hedged item.

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2020 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	**$ 2,962**	**$ (1,889)**	**$ 1,073**	**$ –**	**$ 1,093**	**$ –**
Foreign exchange[c]	**793**	**(619)**	**174**	**(457)**	**174**	**25**
Commodity[d]	**(2,507)**	**2,650**	**143**	**–**	**137**	**–**
Total	**$ 1,248**	**$ 142**	**$ 1,390**	**$ (457)**	**$ 1,404**	**$ 25**

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2019 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ 3,204	$ (2,373)	$ 831	$ –	$ 828	$ –
Foreign exchange[c]	154	328	482	(866)	482	39
Commodity[d]	(77)	148	71	–	63	–
Total	$ 3,281	$ (1,897)	$ 1,384	$ (866)	$ 1,373	$ 39

	Gains/(losses) recorded in income			Income statement impact of excluded components[e]		OCI impact
Year ended December 31, 2018 (in millions)	Derivatives	Hedged items	Income statement impact	Amortization approach	Changes in fair value	Derivatives - Gains/(losses) recorded in OCI[f]
Contract type						
Interest rate[a][b]	$ (1,145)	$ 1,782	$ 637	$ –	$ 623	$ –
Foreign exchange[c]	1,092	(616)	476	(566)	476	(140)
Commodity[d]	789	(754)	35	–	26	–
Total	$ 736	$ 412	$ 1,148	$ (566)	$ 1,125	$ (140)

(a) Primarily consists of hedges of the benchmark (e.g., London Interbank Offered Rate ("LIBOR")) interest rate risk of fixed-rate long-term debt and AFS securities. Gains and losses were recorded in net interest income.
(b) Excludes the amortization expense associated with the inception hedge accounting adjustment applied to the hedged item. This expense is recorded in net interest income and substantially offsets the income statement impact of the excluded components. Also excludes the accrual of interest on interest rate swaps and the related hedged items.
(c) Primarily consists of hedges of the foreign currency risk of long-term debt and AFS securities for changes in spot foreign currency rates. Gains and losses related to the derivatives and the hedged items due to changes in foreign currency rates and the income statement impact of excluded components were recorded primarily in principal transactions revenue and net interest income.
(d) Consists of overall fair value hedges of physical commodities inventories that are generally carried at the lower of cost or net realizable value (net realizable value approximates fair value). Gains and losses were recorded in principal transactions revenue.
(e) The assessment of hedge effectiveness excludes certain components of the changes in fair values of the derivatives and hedged items such as forward points on foreign exchange forward contracts, time values and cross-currency basis spreads. Excluded components may impact earnings either through amortization of the initial amount over the life of the derivative or through fair value changes recognized in the current period.
(f) Represents the change in value of amounts excluded from the assessment of effectiveness under the amortization approach, predominantly cross-currency basis spreads. The amount excluded at inception of the hedge is recognized in earnings over the life of the derivative.

As of December 31, 2020 and 2019, the following amounts were recorded on the Consolidated balance sheets related to certain cumulative fair value hedge basis adjustments that are expected to reverse through the income statement in future periods as an adjustment to yield.

December 31, 2020 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	$ 139,684 [(c)]	$ 3,572	$ 847	$ 4,419
Liabilities				
Long-term debt	$ 177,611	$ 3,194	$ 11,473	$ 14,667
Beneficial interests issued by consolidated VIEs	746	–	(3)	(3)

December 31, 2019 (in millions)	Carrying amount of the hedged items[(a)(b)]	Cumulative amount of fair value hedging adjustments included in the carrying amount of hedged items: Active hedging relationships	Discontinued hedging relationships[(d)(e)]	Total
Assets				
Investment securities - AFS	$ 125,860 [(c)]	$ 2,110	$ 278	$ 2,388
Liabilities				
Long-term debt	$ 157,545	$ 6,719	$ 161	$ 6,880
Beneficial interests issued by consolidated VIEs	2,365	–	(8)	(8)

(a) Excludes physical commodities with a carrying value of $11.5 billion and $6.5 billion at December 31, 2020 and 2019, respectively, to which the Firm applies fair value hedge accounting. As a result of the application of hedge accounting, these inventories are carried at fair value, thus recognizing unrealized gains and losses in current periods. Since the Firm exits these positions at fair value, there is no incremental impact to net income in future periods.
(b) Excludes hedged items where only foreign currency risk is the designated hedged risk, as basis adjustments related to foreign currency hedges will not reverse through the income statement in future periods. At December 31, 2020 and 2019, the carrying amount excluded for AFS securities is $14.5 billion and $14.9 billion, respectively, and for long-term debt is $6.6 billion and $2.8 billion, respectively.
(c) Carrying amount represents the amortized cost, net of allowance if applicable. Refer to Note 10 for additional information.
(d) Represents basis adjustments existing on the balance sheet date associated with hedged items that have been de-designated from qualifying fair value hedging relationships.
(e) Positive amounts related to assets represent cumulative fair value hedge basis adjustments that will reduce net interest income in future periods. Positive (negative) amounts related to liabilities represent cumulative fair value hedge basis adjustments that will increase (reduce) net interest income in future periods.

Cash flow hedge gains and losses

The following tables present derivative instruments, by contract type, used in cash flow hedge accounting relationships, and the pre-tax gains/(losses) recorded on such derivatives, for the years ended December 31, 2020, 2019 and 2018, respectively. The Firm includes the gains/(losses) on the hedging derivative in the same line item in the Consolidated statements of income as the change in cash flows on the related hedged item.

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2020 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	**$ 570**	**$ 3,582**	**$ 3,012**
Foreign exchange[(b)]	**–**	**41**	**41**
Total	**$ 570**	**$ 3,623**	**$ 3,053**

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2019 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ (28)	$ (3)	$ 25
Foreign exchange[(b)]	(75)	125	200
Total	$ (103)	$ 122	$ 225

	Derivatives gains/(losses) recorded in income and other comprehensive income/(loss)		
Year ended December 31, 2018 (in millions)	Amounts reclassified from AOCI to income	Amounts recorded in OCI	Total change in OCI for period
Contract type			
Interest rate[(a)]	$ 44	$ (44)	$ (88)
Foreign exchange[(b)]	(26)	(201)	(175)
Total	$ 18	$ (245)	$ (263)

(a) Primarily consists of hedges of LIBOR-indexed floating-rate assets and floating-rate liabilities. Gains and losses were recorded in net interest income.

(b) Primarily consists of hedges of the foreign currency risk of non-U.S. dollar-denominated revenue and expense. The income statement classification of gains and losses follows the hedged item – primarily noninterest revenue and compensation expense.

The Firm did not experience any forecasted transactions that failed to occur for the years ended 2020, 2019 and 2018.

Over the next 12 months, the Firm expects that approximately $818 million (after-tax) of net gains recorded in AOCI at December 31, 2020, related to cash flow hedges will be recognized in income. For cash flow hedges that have been terminated, the maximum length of time over which the derivative results recorded in AOCI will be recognized in earnings is approximately nine years, corresponding to the timing of the originally hedged forecasted cash flows. For open cash flow hedges, the maximum length of time over which forecasted transactions are hedged is approximately seven years. The Firm's longer-dated forecasted transactions relate to core lending and borrowing activities.

Net investment hedge gains and losses

The following table presents hedging instruments, by contract type, that were used in net investment hedge accounting relationships, and the pre-tax gains/(losses) recorded on such instruments for the years ended December 31, 2020, 2019 and 2018.

	2020		2019		2018	
Year ended December 31, (in millions)	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI	Amounts recorded in income[(a)(b)]	Amounts recorded in OCI
Foreign exchange derivatives	**$(122)**	**$(1,408)**	$72	$64	$11	$1,219

(a) Certain components of hedging derivatives are permitted to be excluded from the assessment of hedge effectiveness, such as forward points on foreign exchange forward contracts. The Firm elects to record changes in fair value of these amounts directly in other income.

(b) Excludes amounts reclassified from AOCI to income on the sale or liquidation of hedged entities. The Firm reclassified net pre-tax gains/(losses) of $3 million and $18 million to other income, and $(17) million to other expense related to the liquidation of certain legal entities during the years ended December 31, 2020, 2019 and 2018, respectively. Refer to Note 24 for further information.

Gains and losses on derivatives used for specified risk management purposes

The following table presents pre-tax gains/(losses) recorded on a limited number of derivatives, not designated in hedge accounting relationships, that are used to manage risks associated with certain specified assets and liabilities, including certain risks arising from mortgage commitments, warehouse loans, MSRs, wholesale lending exposures, and foreign currency denominated assets and liabilities.

Year ended December 31, (in millions)	Derivatives gains/(losses) recorded in income		
	2020	2019	2018
Contract type			
Interest rate[(a)]	**$ 2,994**	$ 1,491	$ 79
Credit[(b)]	**(176)**	(30)	(21)
Foreign exchange[(c)]	**43**	(5)	117
Total	**$ 2,861**	$ 1,456	$ 175

(a) Primarily represents interest rate derivatives used to hedge the interest rate risk inherent in mortgage commitments, warehouse loans and MSRs, as well as written commitments to originate warehouse loans. Gains and losses were recorded predominantly in mortgage fees and related income.

(b) Relates to credit derivatives used to mitigate credit risk associated with lending exposures in the Firm's wholesale businesses. These derivatives do not include credit derivatives used to mitigate counterparty credit risk arising from derivative receivables, which is included in gains and losses on derivatives related to market-making activities and other derivatives. Gains and losses were recorded in principal transactions revenue.

(c) Primarily relates to derivatives used to mitigate foreign exchange risk of specified foreign currency-denominated assets and liabilities. Gains and losses were recorded in principal transactions revenue.

Gains and losses on derivatives related to market-making activities and other derivatives

The Firm makes markets in derivatives in order to meet the needs of customers and uses derivatives to manage certain risks associated with net open risk positions from its market-making activities, including the counterparty credit risk arising from derivative receivables. All derivatives not included in the hedge accounting or specified risk management categories above are included in this category. Gains and losses on these derivatives are primarily recorded in principal transactions revenue. Refer to Note 6 for information on principal transactions revenue.

Credit derivatives

Credit derivatives are financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) and which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Credit derivatives expose the protection purchaser to the creditworthiness of the protection seller, as the protection seller is required to make payments under the contract when the reference entity experiences a credit event, such as a bankruptcy, a failure to pay its obligation or a restructuring. The seller of credit protection receives a premium for providing protection but has the risk that the underlying instrument referenced in the contract will be subject to a credit event.

The Firm is both a purchaser and seller of protection in the credit derivatives market and uses these derivatives for two primary purposes. First, in its capacity as a market-maker, the Firm actively manages a portfolio of credit derivatives by purchasing and selling credit protection, predominantly on corporate debt obligations, to meet the needs of customers. Second, as an end-user, the Firm uses credit derivatives to manage credit risk associated with lending exposures (loans and unfunded commitments) and derivatives counterparty exposures in the Firm's wholesale businesses, and to manage the credit risk arising from certain financial instruments in the Firm's market-making businesses. Following is a summary of various types of credit derivatives.

Credit default swaps

Credit derivatives may reference the credit of either a single reference entity ("single-name") or a broad-based index. The Firm purchases and sells protection on both single-name and index-reference obligations. Single-name CDS and index CDS contracts are either OTC or OTC-cleared derivative contracts. Single-name CDS are used to manage the default risk of a single reference entity, while index CDS contracts are used to manage the credit risk associated with the broader credit markets or credit market segments. Like the S&P 500 and other market indices, a CDS index consists of a portfolio of CDS across many reference entities. New series of CDS indices are periodically established with a new underlying portfolio of reference entities to reflect changes in the credit markets. If one of the reference entities in the index experiences a credit event, then the reference entity that defaulted is removed from the index. CDS can also be referenced against specific portfolios of reference names or against customized exposure levels based on specific client demands: for example, to provide protection against the first $1 million of realized credit losses in a $10 million portfolio of exposure. Such structures are commonly known as tranche CDS.

For both single-name CDS contracts and index CDS contracts, upon the occurrence of a credit event, under the terms of a CDS contract neither party to the CDS contract has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value of the reference obligation at settlement of the credit derivative contract, also known as the recovery value. The protection purchaser does not need to hold the debt instrument of the underlying reference entity in order to receive amounts due under the CDS contract when a credit event occurs.

Credit-related notes

A credit-related note is a funded credit derivative where the issuer of the credit-related note purchases from the note investor credit protection on a reference entity or an index. Under the contract, the investor pays the issuer the par value of the note at the inception of the transaction, and in return, the issuer pays periodic payments to the investor, based on the credit risk of the referenced entity. The issuer also repays the investor the par value of the note at maturity unless the reference entity (or one of the entities that makes up a reference index) experiences a specified credit event. If a credit event occurs, the issuer is not obligated to repay the par value of the note, but rather, the issuer pays the investor the difference between the par value of the note and the fair value of the defaulted reference obligation at the time of settlement. Neither party to the credit-related note has recourse to the defaulting reference entity.

The following tables present a summary of the notional amounts of credit derivatives and credit-related notes the Firm sold and purchased as of December 31, 2020 and 2019. Upon a credit event, the Firm as a seller of protection would typically pay out only a percentage of the full notional amount of net protection sold, as the amount actually required to be paid on the contracts takes into account the recovery value of the reference obligation at the time of settlement. The Firm manages the credit risk on contracts to sell protection by purchasing protection with identical or similar underlying reference entities. Other purchased protection referenced in the following tables includes credit derivatives bought on related, but not identical, reference positions (including indices, portfolio coverage and other reference points) as well as protection purchased through credit-related notes.

The Firm does not use notional amounts of credit derivatives as the primary measure of risk management for such derivatives, because the notional amount does not take into account the probability of the occurrence of a credit event, the recovery value of the reference obligation, or related cash instruments and economic hedges, each of which reduces, in the Firm's view, the risks associated with such derivatives.

Total credit derivatives and credit-related notes

	Maximum payout/Notional amount			
December 31, 2020 (in millions)	Protection sold	Protection purchased with identical underlyings[b]	Net protection (sold)/ purchased[c]	Other protection purchased[d]
Credit derivatives				
Credit default swaps	**$ (535,094)**	**$ 554,565**	**$ 19,471**	**$ 4,001**
Other credit derivatives[a]	**(40,084)**	**57,344**	**17,260**	**9,415**
Total credit derivatives	**(575,178)**	**611,909**	**36,731**	**13,416**
Credit-related notes	**–**	**–**	**–**	**10,248**
Total	**$ (575,178)**	**$ 611,909**	**$ 36,731**	**$ 23,664**

	Maximum payout/Notional amount			
December 31, 2019 (in millions)	Protection sold	Protection purchased with identical underlyings[b]	Net protection (sold)/ purchased[c]	Other protection purchased[d]
Credit derivatives				
Credit default swaps	$ (562,338)	$ 571,892	$ 9,554	$ 3,936
Other credit derivatives[a]	(50,395) [e]	46,541 [e]	(3,854)	7,364
Total credit derivatives	(612,733)	618,433	5,700	11,300
Credit-related notes	–	–	–	9,606
Total	$ (612,733)	$ 618,433	$ 5,700	$ 20,906

(a) Other credit derivatives predominantly consist of credit swap options and total return swaps.
(b) Represents the total notional amount of protection purchased where the underlying reference instrument is identical to the reference instrument on protection sold; the notional amount of protection purchased for each individual identical underlying reference instrument may be greater or lower than the notional amount of protection sold.
(c) Does not take into account the fair value of the reference obligation at the time of settlement, which would generally reduce the amount the seller of protection pays to the buyer of protection in determining settlement value.
(d) Represents protection purchased by the Firm on referenced instruments (single-name, portfolio or index) where the Firm has not sold any protection on the identical reference instrument.
(e) Prior-period amounts have been revised to conform with the current presentation.

The following tables summarize the notional amounts by the ratings, maturity profile, and total fair value, of credit derivatives and credit-related notes as of December 31, 2020 and 2019, where JPMorgan Chase is the seller of protection. The maturity profile is based on the remaining contractual maturity of the credit derivative contracts. The ratings profile is based on the rating of the reference entity on which the credit derivative contract is based. The ratings and maturity profile of credit derivatives and credit-related notes where JPMorgan Chase is the purchaser of protection are comparable to the profile reflected below.

Protection sold – credit derivatives and credit-related notes ratings[a]/maturity profile

December 31, 2020 (in millions)	<1 year	1–5 years	>5 years	Total notional amount	Fair value of receivables[b]	Fair value of payables[b]	Net fair value
Risk rating of reference entity							
Investment-grade	**$ (93,905)**	**$ (307,648)**	**$ (35,326)**	**$ (436,879)**	**$ 5,521**	**$ (835)**	**$ 4,686**
Noninvestment-grade	**(31,809)**	**(97,337)**	**(9,153)**	**(138,299)**	**3,953**	**(2,542)**	**1,411**
Total	**$ (125,714)**	**$ (404,985)**	**$ (44,479)**	**$ (575,178)**	**$ 9,474**	**$ (3,377)**	**$ 6,097**

December 31, 2019 (in millions)	<1 year[c]	1–5 years	>5 years	Total notional amount	Fair value of receivables[b][c]	Fair value of payables[b][c]	Net fair value
Risk rating of reference entity							
Investment-grade	$ (119,788)	$ (311,407)	$ (42,129)	$ (473,324)	$ 6,168	$ (901)	$ 5,267
Noninvestment-grade	(41,799)	(87,769)	(9,841)	(139,409)	4,287	(2,817)	1,470
Total	$ (161,587)	$ (399,176)	$ (51,970)	$ (612,733)	$ 10,455	$ (3,718)	$ 6,737

(a) The ratings scale is primarily based on external credit ratings defined by S&P and Moody's.
(b) Amounts are shown on a gross basis, before the benefit of legally enforceable master netting agreements including cash collateral netting.
(c) Prior-period amounts have been revised to conform with the current presentation.

Note 6 – Noninterest revenue and noninterest expense

Noninterest revenue

The Firm records noninterest revenue from certain contracts with customers in investment banking fees, deposit-related fees, asset management, administration, and commissions, and components of card income. The related contracts are often terminable on demand and the Firm has no remaining obligation to deliver future services. For arrangements with a fixed term, the Firm may commit to deliver services in the future. Revenue associated with these remaining performance obligations typically depends on the occurrence of future events or underlying asset values, and is not recognized until the outcome of those events or values are known.

Investment banking fees

This revenue category includes debt and equity underwriting and advisory fees. As an underwriter, the Firm helps clients raise capital via public offering and private placement of various types of debt and equity instruments. Underwriting fees are primarily based on the issuance price and quantity of the underlying instruments, and are recognized as revenue typically upon execution of the client's transaction. The Firm also manages and syndicates loan arrangements. Credit arrangement and syndication fees, included within debt underwriting fees, are recorded as revenue after satisfying certain retention, timing and yield criteria.

The Firm also provides advisory services, by assisting its clients with mergers and acquisitions, divestitures, restructuring and other complex transactions. Advisory fees are recognized as revenue typically upon execution of the client's transaction.

The following table presents the components of investment banking fees.

Year ended December 31, (in millions)	**2020**	2019	2018
Underwriting			
Equity	**$ 2,759**	$ 1,648	$ 1,684
Debt	**4,362**	3,513	3,347
Total underwriting	**7,121**	5,161	5,031
Advisory	**2,365**	2,340	2,519
Total investment banking fees	**$ 9,486**	$ 7,501	$ 7,550

Investment banking fees are earned primarily by CIB. Refer to Note 32 for segment results.

Principal transactions

Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and
- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

Refer to Note 5 for further information on the income statement classification of gains and losses from derivatives activities.

In the financial commodity markets, the Firm transacts in OTC derivatives (e.g., swaps, forwards, options) and ETD that reference a wide range of underlying commodities. In the physical commodity markets, the Firm primarily purchases and sells precious and base metals and may hold other commodities inventories under financing and other arrangements with clients.

The following table presents all realized and unrealized gains and losses recorded in principal transactions revenue. This table excludes interest income and interest expense on trading assets and liabilities, which are an integral part of the overall performance of the Firm's client-driven market-making activities in CIB and cash deployment activities in Treasury and CIO. Refer to Note 7 for further information on interest income and interest expense.

Trading revenue is presented primarily by instrument type. The Firm's client-driven market-making businesses generally utilize a variety of instrument types in connection with their market-making and related risk-management activities; accordingly, the trading revenue presented in the table below is not representative of the total revenue of any individual LOB.

Year ended December 31, (in millions)	2020	2019	2018
Trading revenue by instrument type			
Interest rate[a]	$ 2,575	$ 2,739 [c]	$ 1,844 [c]
Credit[b]	2,753	1,628 [c]	1,625 [c]
Foreign exchange	4,253	3,179 [c]	3,222 [c]
Equity	6,171	5,589 [c]	4,822 [c]
Commodity	2,088	1,133 [c]	895 [c]
Total trading revenue	17,840	14,268	12,408
Private equity gains/ (losses)	181	(250)	(349)
Principal transactions	$ 18,021	$ 14,018	$ 12,059

(a) Includes the impact of changes in funding valuation adjustments on derivatives.
(b) Includes the impact of changes in credit valuation adjustments on derivatives, net of the associated hedging activities.
(c) The prior-period amounts have been revised to conform with the current presentation.

Principal transactions revenue is earned primarily by CIB. Refer to Note 32 for segment results.

Lending- and deposit-related fees

Lending-related fees include fees earned from loan commitments, standby letters of credit, financial guarantees, and other loan-servicing activities. Deposit-related fees include fees earned from providing overdraft and other deposit account services, and from performing cash management activities. Lending- and deposit-related fees in this revenue category are recognized over the period in which the related service is provided.

The following table presents the components of lending- and deposit-related fees.

Year ended December 31, (in millions)	2020	2019	2018
Lending-related fees	$ 1,271	$ 1,184	$ 1,117
Deposit-related fees[a]	5,240	5,442	5,260
Total lending- and deposit-related fees	$ 6,511	$ 6,626	$ 6,377

(a) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.

Lending- and deposit-related fees are earned by CCB, CIB, CB, and AWM. Refer to Note 32 for segment results.

Asset management, administration and commissions

This revenue category includes fees from investment management and related services, custody, brokerage services and other products. The Firm manages assets on behalf of its clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts. Management fees are typically based on the value of assets under management and are collected and recognized at the end of each period over which the management services are provided and the value of the managed assets is known. The Firm also receives performance-based management fees, which are earned based on exceeding certain benchmarks or other performance targets and are accrued and recognized when the probability of reversal is remote, typically at the end of the related billing period. The Firm has contractual arrangements with third parties to provide distribution and other services in connection with its asset management activities. Amounts paid to these third-party service providers are generally recorded in professional and outside services expense.

The following table presents the components of Firmwide asset management, administration and commissions.

Year ended December 31, (in millions)	2020	2019	2018
Asset management fees			
Investment management fees[a]	$ 11,694	$ 10,865	$ 10,768
All other asset management fees[b]	338	315	270
Total asset management fees	12,032	11,180	11,038
Total administration fees[c]	2,249	2,197	2,179
Commissions and other fees			
Brokerage commissions[d]	2,959	2,439	2,505
All other commissions and fees[e]	937	1,092	1,071
Total commissions and fees	3,896	3,531	3,576
Total asset management, administration and commissions	$ 18,177	$ 16,908	$ 16,793

(a) Represents fees earned from managing assets on behalf of the Firm's clients, including investors in Firm-sponsored funds and owners of separately managed investment accounts.
(b) Represents fees for services that are ancillary to investment management services, such as commissions earned on the sales or distribution of mutual funds to clients. These fees are recorded as revenue at the time the service is rendered or, in the case of certain distribution fees based on the underlying fund's asset value and/or investor redemption, recorded over time as the investor remains in the fund or upon investor redemption.
(c) Predominantly includes fees for custody, securities lending, funds services and securities clearance. These fees are recorded as revenue over the period in which the related service is provided.
(d) Represents commissions earned when the Firm acts as a broker, by facilitating its clients' purchases and sales of securities and other financial instruments. Brokerage commissions are collected and recognized as revenue upon occurrence of the client transaction. The Firm reports certain costs paid to third-party clearing houses and exchanges net against commission revenue.
(e) In the first quarter of 2020, the Firm reclassified certain fees from asset management, administration and commissions to lending- and deposit-related fees. Prior-period amounts have been revised to conform with the current presentation.

Asset management, administration and commissions are earned primarily by AWM, CIB and CCB. Refer to Note 32 for segment results.

Mortgage fees and related income

This revenue category reflects CCB's Home Lending net production and net mortgage servicing revenue.

Net production revenue includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Net production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option. Net mortgage servicing revenue includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Refer to Note 15 for further information on risk management activities and MSRs.

Net interest income from mortgage loans is recorded in interest income.

Card income

This revenue category includes interchange and other income from credit and debit card transactions; and fees earned from processing card transactions for merchants, both of which are recognized when purchases are made by a cardholder and presented net of certain transaction-related costs. Card income also includes account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

Certain credit card products offer the cardholder the ability to earn points based on account activity, which the cardholder can choose to redeem for cash and non-cash rewards. The cost to the Firm related to these proprietary rewards programs varies based on multiple factors including the terms and conditions of the rewards programs, cardholder activity, cardholder reward redemption rates and cardholder reward selections. The Firm maintains a liability for its obligations under its rewards programs and reports the current-period cost as a reduction of card income.

Credit card revenue sharing agreements

The Firm has contractual agreements with numerous co-brand partners that grant the Firm exclusive rights to issue co-branded credit card products and market them to the customers of such partners. These partners endorse the co-brand credit card programs and provide their customer or member lists to the Firm. The partners may also conduct marketing activities and provide rewards redeemable under their own loyalty programs that the Firm will grant to co-brand credit cardholders based on account activity. The terms of these agreements generally range from five to ten years.

The Firm typically makes payments to the co-brand credit card partners based on the cost of partners' marketing activities and loyalty program rewards provided to credit cardholders, new account originations and sales volumes. Payments to partners based on marketing efforts undertaken by the partners are expensed by the Firm as incurred and reported as marketing expense. Payments for partner loyalty program rewards are reported as a reduction of card income when incurred. Payments to partners based on new credit card account originations are accounted for as direct loan origination costs and are deferred and recognized as a reduction of card income on a straight-line basis over a 12-month period. Payments to partners based on sales volumes are reported as a reduction of card income when the related interchange income is earned.

The following table presents the components of card income:

Year ended December 31, (in millions)	**2020**	2019	2018
Interchange and merchant processing income	**$ 18,563**	$ 20,370	$ 18,808
Reward costs and partner payments[a]	**(13,637)**	(14,540)	(13,320) [c]
Other card income[b]	**(491)**	(754)	(745)
Total card income	**$ 4,435**	$ 5,076	$ 4,743

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

(b) Predominantly represents the amortization of account origination costs and annual fees, which are deferred and recognized on a straight-line basis over a 12-month period.

(c) Includes an adjustment to the credit card rewards liability of approximately $330 million, recorded in the second quarter of 2018.

Card income is earned primarily by CCB, CIB and CB. Refer to Note 32 for segment results.

Refer to Note 18 for information on operating lease income included within other income.

Noninterest expense

Other expense

Other expense on the Firm's Consolidated statements of income included the following:

Year ended December 31, (in millions)	**2020**	2019	2018
Legal expense/(benefit)	**$ 1,115**	$ 239	$ 72
FDIC-related expense	**717**	457	1,239

Note 7 – Interest income and Interest expense

Interest income and interest expense are recorded in the Consolidated statements of income and classified based on the nature of the underlying asset or liability.

The following table presents the components of interest income and interest expense:

Year ended December 31, (in millions)	2020	2019	2018
Interest income			
Loans[(a)(b)]	**$ 43,758**	$ 51,855	$ 49,032
Taxable securities	**7,843**	7,962	5,653
Non-taxable securities[(c)]	**1,184**	1,329	1,595
Total investment securities[(a)]	**9,027**	9,291	7,248
Trading assets - debt instruments[(b)]	**7,832**	9,141	7,146
Federal funds sold and securities purchased under resale agreements	**2,436**	6,146	3,819
Securities borrowed[(d)]	**(302)**	1,574	913
Deposits with banks	**749**	3,887	5,907
All other interest-earning assets[(b)(e)]	**1,023**	2,146	2,035
Total interest income	**$ 64,523**	$ 84,040	$ 76,100
Interest expense			
Interest bearing deposits	**$ 2,357**	$ 8,957	$ 5,973
Federal funds purchased and securities loaned or sold under repurchase agreements	**1,058**	4,630	3,066
Short-term borrowings[(f)]	**372**	1,248	1,144
Trading liabilities - debt and all other interest-bearing liabilities[(d)(g)]	**195**	2,585	2,387
Long-term debt	**5,764**	8,807	7,978
Beneficial interest issued by consolidated VIEs	**214**	568	493
Total interest expense	**$ 9,960**	$ 26,795	$ 21,041
Net interest income	**$ 54,563**	$ 57,245	$ 55,059
Provision for credit losses	**17,480**	5,585	4,871
Net interest income after provision for credit losses	**$ 37,083**	$ 51,660	$ 50,188

(a) Includes the amortization/accretion of unearned income (e.g., purchase premiums/discounts, net deferred fees/costs, and others).
(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(c) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(d) Negative interest income is related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
(e) Includes interest earned on brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated balance sheets.
(f) Includes commercial paper.
(g) All other interest-bearing liabilities includes interest expense on brokerage-related customer payables.

Interest income and interest expense includes the current-period interest accruals for financial instruments measured at fair value, except for derivatives and financial instruments containing embedded derivatives that would be separately accounted for in accordance with U.S. GAAP, absent the fair value option election; for those instruments, all changes in fair value including any interest elements, are reported in principal transactions revenue. For financial instruments that are not measured at fair value, the related interest is included within interest income or interest expense, as applicable. Refer to Notes 12, 10, 11 and 20, for further information on accounting for interest income and interest expense related to loans, investment securities, securities financing activities (i.e., securities purchased or sold under resale or repurchase agreements; securities borrowed; and securities loaned) and long-term debt, respectively.

Note 8 – Pension and other postretirement employee benefit plans

The Firm has various defined benefit pension plans and OPEB plans that provide benefits to its employees in the U.S. and certain non-U.S. locations. The Firm also provides a qualified defined contribution plan in the U.S. and maintains other similar arrangements in certain non-U.S. locations.

The principal defined benefit pension plan in the U.S. is a qualified noncontributory plan that provides benefits to substantially all U.S. employees who were hired prior to December 2, 2017. The Firm has frozen the U.S. defined benefit pension plan (the “Plan Freeze”). Effective as of January 1, 2020 (and January 1, 2019 for new hires), new pay credits have been directed to the U.S. defined contribution plan. Interest credits will continue to accrue on the U.S. defined benefit pension plan. As a result of the Plan Freeze, a curtailment was triggered and a remeasurement of the U.S. defined benefit pension obligation and plan assets occurred as of November 30, 2018. The plan design change did not have a material impact on the U.S. defined benefit pension plan or the Firm’s Consolidated Financial Statements.

The Firm also has defined benefit pension plans that are offered in certain non-U.S. locations based on factors such as eligible compensation, age and/or years of service. It is the Firm’s policy to fund the pension plans in amounts sufficient to meet the requirements under applicable laws. The Firm does not anticipate at this time making any contribution to the U.S. defined benefit pension plan in 2021. The 2021 contributions to the non-U.S. defined benefit pension plans are expected to be $50 million, of which $35 million are contractually required.

The Firm also has a number of nonqualified noncontributory defined benefit pension plans that are unfunded. These plans provide supplemental defined pension benefits to certain employees.

The Firm offers postretirement medical and life insurance benefits to certain U.S. retirees and postretirement medical benefits to certain qualifying U.S. and U.K. employees.

The Firm partially defrays the cost of its U.S. OPEB obligation through corporate-owned life insurance (“COLI”) purchased on the lives of eligible employees and retirees. While the Firm owns the COLI policies, certain COLI proceeds (death benefits, withdrawals and other distributions) may be used only to reimburse the Firm for its net postretirement benefit claim payments and related administrative expense. The Firm has prefunded its U.S. postretirement benefit obligations. The U.K. OPEB plan is unfunded.

Pension and OPEB accounting guidance generally requires that the difference between plan assets at fair value and the benefit obligation be measured and recorded on the balance sheet. Plans that are overfunded (excess of plan assets over benefit obligation) are recorded in other assets and plans that are underfunded (excess benefit obligation over plan assets) are recorded in other liabilities. Gains or losses resulting from changes in the benefit obligation and the fair value of plan assets are recorded in OCI and recognized as part of the net periodic benefit cost over subsequent periods as discussed in the Gains and losses section of this Note. Additionally, benefits earned during the year are reported in compensation expense; all other components of net periodic defined benefit costs are reported in other expense in the Consolidated statements of income.

The following table presents the pretax changes in benefit obligations, plan assets, the net funded status, and the amounts recorded in AOCI on the Consolidated balance sheets for the Firm's defined benefit pension and OPEB plans.

As of or for the year ended December 31, (in millions)	Defined benefit pension and OPEB plans 2020	2019
Change in projected and accumulated benefit obligations, U.S. defined benefit pension plans		
Benefit obligation, beginning of year	**$ (13,277)**	$ (12,173)
Benefits earned during the year	**(2)**	(327)
Interest cost on benefit obligations	**(422)**	(518)
Plan amendments	**—**	(5)
Net gain/(loss)	**(1,086)**	(944)
Benefits paid	**640**	690
Benefit obligations, end of year, U.S. defined benefit pension plans	**$ (14,147)**	$ (13,277)
Benefit obligations, other defined benefit pension and OPEB plans	**(4,990)**	(4,428)
Benefit obligations, end of year	**$ (19,137)**	$ (17,705)
Change in plan assets, U.S. defined benefit pension plans		
Fair value of plan assets, beginning of year	**$ 16,329**	$ 14,521
Actual return on plan assets	**1,901**	2,465
Firm contributions	**29**	33
Benefits paid	**(640)**	(690)
Fair value of plan assets, end of year, U.S. defined benefit pension plans	**$ 17,619**	$ 16,329
Fair value of plan assets, other defined benefit pension and OPEB plans	**7,798**	7,037
Fair value of plan assets, end of year	**$ 25,417**	$ 23,366
Net funded status, U.S. defined benefit pension plans	**$ 3,472**	$ 3,052
Net funded status, other defined benefit pension and OPEB plans	**2,808**	2,609
Net funded status	**$ 6,280**	$ 5,661
Amounts recorded in accumulated other comprehensive income/(loss), U.S. defined benefit pension plans		
Net gain/(loss), U.S. defined benefit pension plans	**$ (1,558)**	$ (1,745)
Prior service credit/(cost), U.S. defined benefit pension plans	**(4)**	(5)
Accumulated other comprehensive income/(loss), end of year, U.S. defined benefit pension plans	**$ (1,562)**	$ (1,750)
Accumulated other comprehensive income/(loss), other defined benefit pension and OPEB plans	**(24)**	(66)
Accumulated other comprehensive income/(loss)	**$ (1,586)**	$ (1,816)

The following table presents the weighted-average actuarial assumptions used to value the benefit obligations for the U.S. defined benefit pension plans.

As of December 31,	U.S. defined benefit pension plans 2020	2019
Discount rate	**2.50%**	3.30%
Rate of compensation increase	**NA**	NA
Interest crediting rate	**4.65**	4.65

Gains and losses

For the Firm's defined benefit pension plans, fair value is used to determine the expected return on plan assets. Amortization of net gains and losses is included in annual net periodic benefit cost if, as of the beginning of the year, the net gain or loss exceeds 10% of the greater of the projected benefit obligation or the fair value of the plan assets. Any excess is amortized over the average expected remaining lifetime of plan participants, which for the U.S. defined benefit pension plans is currently 37 years and for the non-U.S. defined benefit pension plans is the period appropriate for the affected plan. For the years ended December 31, 2020 and 2019, the net gain was primarily attributable to a market-driven increase in the fair value of plan assets, predominantly offset by a decrease in the discount rate.

The following table presents the components of net periodic benefit costs reported in the Consolidated statements of income for the Firm's defined benefit pension, defined contribution and OPEB plans, and in other comprehensive income for the defined benefit pension and OPEB plans.

	Pension and OPEB plans		
Year ended December 31, (in millions)	**2020**	2019	2018
Components of net periodic benefit cost, U.S. defined benefit pension plans			
Benefits earned during the year	**$ 2**	$ 327	$ 323
Interest cost on benefit obligations	**422**	518	478
Expected return on plan assets	**(634)**	(776)	(836)
Amortization:			
Net (gain)/loss	**6**	147	80
Prior service (credit)/cost	**—**	—	(21)
Curtailment (gain)/loss	**—**	—	21
Net periodic defined benefit plan cost/(credit), U.S. defined benefit pension plans	**$ (204)**	$ 216	$ 45
Other defined benefit pension and OPEB plans	**(81)**	(72)	(72)
Total net periodic defined benefit plan cost/(credit)	**$ (285)**	$ 144	$ (27)
Total defined contribution plans	**1,332**	952	872
Total pension and OPEB cost included in noninterest expense	**$ 1,047**	$ 1,096	$ 845
Changes recognized in other comprehensive income, U.S. defined benefit pension plans			
Prior service (credit)/cost arising during the year	**—**	5	—
Net (gain)/loss arising during the year	**(181)**	(745)	453
Amortization of net (loss)/gain	**(6)**	(147)	(80)
Amortization of prior service (cost)/credit	**—**	—	21
Curtailment (loss)/gain	**—**	—	(21)
Total recognized in other comprehensive income, U.S. defined benefit pension plans	**$ (187)**	$ (887)	$ 373
Other defined benefit pension and OPEB plans	**(27)**	(270)	77
Total recognized in other comprehensive income	**$ (214)**	$ (1,157)	$ 450
Total recognized in net periodic defined benefit plan cost/(credit) and other comprehensive income	**$ (499)**	$ (1,013)	$ 423

The following table presents the weighted-average actuarial assumptions used to determine the net periodic benefit costs for the U.S. defined benefit pension plans.

	U.S. defined benefit pension plans		
Year ended December 31, (in millions)	**2020**	2019	2018
Discount rate	**3.30%**	4.30%	3.70 / 4.50%
Expected long-term rate of return on plan assets	**4.00**	5.50	5.50
Rate of compensation increase	**NA**	2.30	2.30
Interest crediting rate	**4.65**	4.90	4.90

Plan assumptions

The Firm's expected long-term rate of return for defined benefit pension plan assets is a blended weighted average, by asset allocation of the projected long-term returns for the various asset classes, taking into consideration local market conditions and the specific allocation of plan assets. Returns on asset classes are developed using a forward-looking approach and are not strictly based on historical returns. Consideration is also given to current market conditions and the portfolio mix of each plan.

The discount rate used in determining the benefit obligation under the U.S. defined benefit pension plan was provided by the Firm's actuaries. This rate was selected by reference to the yields on portfolios of bonds with maturity dates and coupons that closely match each of the plan's projected cash flows.

At December 31, 2020, the Firm decreased the discount rates used to determine its benefit obligations for the U.S. defined benefit pension plans in light of current market interest rates, which is expected to decrease expense by approximately $64 million in 2021. The 2021 expected long-term rate of return on U.S. defined benefit pension plan assets is 3.00%.

The following table represents the effect of a 25-basis point decline in the expected long-term rate of return of 3.00% and discount rate of 2.50%.

Effect on U.S. defined benefit pension plans		
(in millions)	Pension expense	Benefit obligation
Expected long-term rate of return	$ 43	NA
Discount rate	(20)	404

Investment strategy and asset allocation

The assets of the Firm's defined benefit pension plans are held in various trusts and are invested in well-diversified portfolios of equity and fixed income securities, cash and cash equivalents, and alternative investments. The trust-owned assets of the Firm's U.S. OPEB plan are invested primarily in fixed income securities. COLI policies used to partially defray the cost of the Firm's U.S. OPEB plan are invested in separate accounts of an insurance company and are allocated to investments intended to replicate equity and fixed income indices.

The investment policies for the assets of the Firm's defined benefit pension plans are to optimize the risk-return relationship as appropriate to the needs and goals of each plan. Assets are managed by a combination of internal and external investment managers. The Firm regularly reviews the asset allocations and asset managers, as well as other factors that could impact the portfolios, which are rebalanced when deemed necessary.

Investments held by the Firm's defined benefit pension and OPEB plans include financial instruments which are exposed to various risks such as interest rate, market and credit risks. Exposure to a concentration of credit risk is mitigated by the broad diversification of both U.S. and non-U.S. investments. Additionally, the investments in each of the collective investment funds and/or registered investment companies are further diversified into various financial instruments. As of December 31, 2020, assets held by the Firm's defined benefit pension and OPEB plans do not include securities issued by JPMorgan Chase or its affiliates, except through indirect exposures through investments in ETFs, mutual funds and collective investment funds managed by third-parties. The defined benefit pension and OPEB plans hold investments that are sponsored or managed by affiliates of JPMorgan Chase in the amount of $2.7 billion and $3.1 billion, as of December 31, 2020 and 2019, respectively.

The following table presents the weighted-average asset allocation of the fair values of total plan assets at December 31 for the years indicated, as well as the respective approved asset allocation ranges by asset class.

	U.S. defined benefit pension plan[c]		
	Asset	% of plan assets	
December 31,	Allocation	**2020**	2019
Asset class			
Debt securities[a]	42-100%	**77 %**	74 %
Equity securities	0-40	**15**	16
Real estate	0-4	**1**	1
Alternatives[b]	0-15	**7**	9
Total	100 %	**100 %**	100 %

(a) Debt securities primarily includes cash and cash equivalents, corporate debt, U.S. federal, state, local and non-U.S. government, asset-backed and mortgage-backed securities.
(b) Alternatives primarily include limited partnerships.
(c) Represents the U.S. defined benefit pension plan only as it is the most significant plan. The other U.S. defined benefit pension plans are unfunded. The weighted-average asset allocation for the U.S. OPEB plan was 59% debt securities and 41% equity securities and 60% debt securities and 40% equity securities at December 31, 2020 and 2019, respectively.

Fair value measurement of the plans' assets and liabilities

Refer to Note 2 for information on fair value measurements, including descriptions of level 1, 2, and 3 of the fair value hierarchy and the valuation methods employed by the Firm.

Pension plan assets and liabilities measured at fair value

	Defined benefit pension and OPEB plans							
	2020				2019			
December 31, (in millions)	Level 1	Level 2	Level 3	Total fair value	Level 1	Level 2	Level 3	Total fair value
Equity securities	**$ 2,353**	**$ –**	**$ 2**	**$ 2,355**	$ 2,259	$ 3	$ 2	$ 2,264
Corporate debt securities	**–**	**7,414**	**11**	**7,425**	–	6,474	2	6,476
U.S. federal, state, local and non-U.S. government debt securities	**1,395**	**360**	**–**	**1,755**	1,616	401	–	2,017
Mortgage-backed securities	**461**	**1,184**	**31**	**1,676**	312	681	4	997
Other[(a)]	**788**	**861**	**201**	**1,850**	718	49	250	1,017
U.S. defined benefit pension plans[(b)]	**$ 4,997**	**$ 9,819**	**$ 245**	**$ 15,061**	$ 4,905	$ 7,608	$ 258	$ 12,771
Other defined benefit pension and OPEB plans[(c)]	**2,034**	**2,565**	**2,707**	**7,306**	1,834	2,307	2,431	6,572
Total assets measured at fair value	**$ 7,031**	**$ 12,384**	**$ 2,952**	**$ 22,367**	$ 6,739	$ 9,915	$ 2,689	$ 19,343

(a) Other consists primarily of mutual funds, money market funds and participating annuity contracts.
(b) At December 31, 2020 and 2019, excludes $3.2 billion and $3.9 billion, respectively, of certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient, and $606 million and $343 million, respectively, of net defined benefit pension plan payables, primarily for investments sold and purchased, which are not required to be classified in the fair value hierarchy. Investments in level 3 of the valuation hierarchy include $199 million and $250 million of participating annuity contracts at December 31, 2020 and 2019, respectively.
(c) At December 31, 2020 and 2019, excludes $487 million and $465 million, respectively, of certain investments that are measured at fair value using the net asset value per share (or its equivalent) as a practical expedient. Investments in level 3 of the valuation hierarchy include $2.7 billion and $2.4 billion of COLI policies at December 31, 2020 and 2019, respectively.

Changes in level 3 fair value measurements using significant unobservable inputs

Investments classified in level 3 of the valuation hierarchy increased $263 million in 2020 from $2.7 billion to $3.0 billion, consisting of $343 million in unrealized gains, partially offset by $113 million in settlements. In addition, there were transfers into level 3 of $33 million. In 2019, there was an increase of $307 million from $2.4 billion to $2.7 billion, consisting of $401 million in unrealized gains, partially offset by $85 million in settlements.

Estimated future benefit payments

The following table presents benefit payments expected to be paid for the U.S. defined benefit pension plans for the years indicated.

Year ended December 31, (in millions)	U.S. defined benefit pension plans
2021	$ 912
2022	918
2023	897
2024	847
2025	829
Years 2026–2030	3,843

Note 9 – Employee share-based incentives

Employee share-based awards

In 2020, 2019 and 2018, JPMorgan Chase granted long-term share-based awards to certain employees under its LTIP, as amended and restated effective May 15, 2018. Under the terms of the LTIP, as of December 31, 2020, 67 million shares of common stock were available for issuance through May 2022. The LTIP is the only active plan under which the Firm is currently granting share-based incentive awards. In the following discussion, the LTIP, plus prior Firm plans and plans assumed as the result of acquisitions, are referred to collectively as the "LTI Plans," and such plans constitute the Firm's share-based incentive plans.

RSUs are awarded at no cost to the recipient upon their grant. Generally, RSUs are granted annually and vest at a rate of 50% after two years and 50% after three years and are converted into shares of common stock as of the vesting date. In addition, RSUs typically include full-career eligibility provisions, which allow employees to continue to vest upon voluntary termination based on age or service-related requirements, subject to post-employment and other restrictions. All RSU awards are subject to forfeiture until vested and contain clawback provisions that may result in cancellation under certain specified circumstances. Predominantly all RSUs entitle the recipient to receive cash payments equivalent to any dividends paid on the underlying common stock during the period the RSUs are outstanding.

Performance share units ("PSUs") are granted annually, and approved by the Firm's Board of Directors, to members of the Firm's Operating Committee under the variable compensation program. PSUs are subject to the Firm's achievement of specified performance criteria over a three-year period. The number of awards that vest can range from zero to 150% of the grant amount. In addition, dividends that accrue during the vesting period are reinvested in dividend equivalent share units. PSUs and the related dividend equivalent share units are converted into shares of common stock after vesting.

Once the PSUs and dividend equivalent share units have vested, the shares of common stock that are delivered, after applicable tax withholding, must be held for an additional two-year period, for a total combined vesting and holding period of approximately five to eight years from the grant date depending on regulations in certain countries.

Under the LTI Plans, stock appreciation rights ("SARs") and stock options have generally been granted with an exercise price equal to the fair value of JPMorgan Chase's common stock on the grant date. SARs and stock options generally expire ten years after the grant date. There were no material grants of SARs or stock options in 2020, 2019 and 2018.

The Firm separately recognizes compensation expense for each tranche of each award, net of estimated forfeitures, as if it were a separate award with its own vesting date. Generally, for each tranche granted, compensation expense is recognized on a straight-line basis from the grant date until the vesting date of the respective tranche, provided that the employees will not become full-career eligible during the vesting period. For awards with full-career eligibility provisions and awards granted with no future substantive service requirement, the Firm accrues the estimated value of awards expected to be awarded to employees as of the grant date without giving consideration to the impact of post-employment restrictions. For each tranche granted to employees who will become full-career eligible during the vesting period, compensation expense is recognized on a straight-line basis from the grant date until the earlier of the employee's full-career eligibility date or the vesting date of the respective tranche.

The Firm's policy for issuing shares upon settlement of employee share-based incentive awards is to issue either new shares of common stock or treasury shares. During 2020, 2019 and 2018, the Firm settled all of its employee share-based awards by issuing treasury shares.

Refer to Note 23 for further information on the classification of share-based awards for purposes of calculating earnings per share.

RSUs, PSUs, SARs and stock options activity

Generally, compensation expense for RSUs and PSUs is measured based on the number of units granted multiplied by the stock price at the grant date, and for SARs and stock options, is measured at the grant date using the Black-Scholes valuation model. Compensation expense for these awards is recognized in net income as described previously. The following table summarizes JPMorgan Chase's RSUs, PSUs, SARs and stock options activity for 2020.

Year ended December 31, 2020 (in thousands, except weighted-average data, and where otherwise stated)	RSUs/PSUs Number of units	RSUs/PSUs Weighted-average grant date fair value	SARs/Options Number of awards	SARs/Options Weighted-average exercise price	SARs/Options Weighted-average remaining contractual life (in years)	SARs/Options Aggregate intrinsic value
Outstanding, January 1	**52,239**	**$ 99.62**	**5,527**	**$ 41.36**		
Granted	**17,891**	**132.17**	**1**	**137.80**		
Exercised or vested	**(21,502)**	**96.64**	**(2,389)**	**41.40**		
Forfeited	**(1,118)**	**111.59**	**(4)**	**122.59**		
Canceled	**NA**	**NA**	**(11)**	**39.33**		
Outstanding, December 31	**47,510**	**$ 112.85**	**3,124**	**$ 41.25**	**1.4**	**$ 265,059**
Exercisable, December 31	**NA**	**NA**	**3,124**	**41.25**	**1.4**	**265,059**

The total fair value of RSUs that vested during the years ended December 31, 2020, 2019 and 2018, was $2.8 billion, $2.9 billion and $3.6 billion, respectively. The total intrinsic value of options exercised during the years ended December 31, 2020, 2019 and 2018, was $182 million, $503 million and $370 million, respectively.

Compensation expense

The Firm recognized the following noncash compensation expense related to its various employee share-based incentive plans in its Consolidated statements of income.

Year ended December 31, (in millions)	**2020**	2019	2018
Cost of prior grants of RSUs, PSUs, SARs and stock options that are amortized over their applicable vesting periods	**$ 1,101**	$ 1,141	$ 1,241
Accrual of estimated costs of share-based awards to be granted in future periods including those to full-career eligible employees	**1,350**	1,115	1,081
Total noncash compensation expense related to employee share-based incentive plans	**$ 2,451**	$ 2,256	$ 2,322

At December 31, 2020, approximately $664 million (pretax) of compensation expense related to unvested awards had not yet been charged to net income. That cost is expected to be amortized into compensation expense over a weighted-average period of 1.6 years. The Firm does not capitalize any compensation expense related to share-based compensation awards to employees.

Tax benefits

Income tax benefits (including tax benefits from dividends or dividend equivalents) related to share-based incentive arrangements recognized in the Firm's Consolidated statements of income for the years ended December 31, 2020, 2019 and 2018, were $837 million, $895 million and $1.1 billion, respectively.

Note 10 – Investment securities

Investment securities consist of debt securities that are classified as AFS or HTM. Debt securities classified as trading assets are discussed in Note 2. Predominantly all of the Firm's AFS and HTM securities are held by Treasury and CIO in connection with its asset-liability management activities.

AFS securities are carried at fair value on the Consolidated balance sheets. Unrealized gains and losses, after any applicable hedge accounting adjustments or allowance for credit losses, are reported in AOCI. The specific identification method is used to determine realized gains and losses on AFS securities, which are included in investment securities gains/(losses) on the Consolidated statements of income. HTM securities, which the Firm has the intent and ability to hold until maturity, are carried at amortized cost, net of allowance for credit losses, on the Consolidated balance sheets.

For both AFS and HTM securities, purchase discounts or premiums are generally amortized into interest income on a level-yield basis over the contractual life of the security. However, premiums on certain callable debt securities are amortized to the earliest call date.

Effective January 1, 2020, the Firm adopted the CECL accounting guidance, which also amended the AFS securities impairment guidance. Refer to Note 1 for further information.

During 2020, the Firm transferred $164.2 billion of investment securities from AFS to HTM for capital management purposes. AOCI included pretax unrealized gains of $5.0 billion on the securities at the dates of transfer.

Unrealized gains or losses at the date of transfer of these securities continue to be reported in AOCI and are amortized into interest income on a level-yield basis over the remaining life of the securities. This amortization will offset the effect on interest income of the amortization of the premium or discount resulting from the transfer recorded at fair value.

Transfers of securities from AFS to HTM are non-cash transactions and are recorded at fair value.

The amortized costs and estimated fair values of the investment securities portfolio were as follows for the dates indicated.

December 31, (in millions)	2020 Amortized cost[(e)]	2020 Gross unrealized gains	2020 Gross unrealized losses	2020 Fair value	2019 Amortized cost[(e)]	2019 Gross unrealized gains	2019 Gross unrealized losses	2019 Fair value
Available-for-sale securities								
Mortgage-backed securities:								
U.S. GSEs and government agencies[(a)]	**$ 110,979**	**$ 2,372**	**$ 50**	**$ 113,301**	$ 107,811	$ 2,395	$ 89	$ 110,117
Residential:								
U.S.	**6,246**	**224**	**3**	**6,467**	10,223	233	6	10,450
Non-U.S.	**3,751**	**20**	**5**	**3,766**	2,477	64	1	2,540
Commercial	**2,819**	**71**	**34**	**2,856**	5,137	64	13	5,188
Total mortgage-backed securities	**123,795**	**2,687**	**92**	**126,390**	125,648	2,756	109	128,295
U.S. Treasury and government agencies	**199,910**	**2,141**	**100**	**201,951**	139,162	449	175	139,436
Obligations of U.S. states and municipalities	**18,993**	**1,404**	**1**	**20,396**	27,693	2,118	1	29,810
Certificates of deposit	**—**	**—**	**—**	**—**	77	—	—	77
Non-U.S. government debt securities	**22,587**	**354**	**13**	**22,928**	21,427	377	17	21,787
Corporate debt securities	**215**	**4**	**3**	**216**	823	22	—	845
Asset-backed securities:								
Collateralized loan obligations	**10,055**	**24**	**31**	**10,048**	25,038	9	56	24,991
Other	**6,174**	**91**	**16**	**6,249**	5,438	40	20	5,458
Total available-for-sale securities[(b)]	**381,729**	**6,705**	**256**	**388,178**	345,306	5,771	378	350,699
Held-to-maturity securities[(c)]								
Mortgage-backed securities:								
U.S. GSEs and government agencies[(a)]	**107,889**	**2,968**	**29**	**110,828**	36,523	1,165	62	37,626
U.S. Residential	**4,345**	**8**	**30**	**4,323**	—	—	—	—
Commercial	**2,602**	**77**	**—**	**2,679**	—	—	—	—
Total mortgage-backed securities	**114,836**	**3,053**	**59**	**117,830**	36,523	1,165	62	37,626
U.S. Treasury and government agencies	**53,184**	**50**	**—**	**53,234**	51	—	1	50
Obligations of U.S. states and municipalities	**12,751**	**519**	**—**	**13,270**	4,797	299	—	5,096
Asset-backed securities:								
Collateralized loan obligations	**21,050**	**90**	**2**	**21,138**	6,169	—	—	6,169
Total held-to-maturity securities, net of allowance for credit losses[(d)]	**201,821**	**3,712**	**61**	**205,472**	47,540	1,464	63	48,941
Total investment securities, net of allowance for credit losses[(d)]	**$ 583,550**	**$ 10,417**	**$ 317**	**$ 593,650**	$ 392,846	$ 7,235	$ 441	$ 399,640

(a) Includes AFS U.S. GSE obligations with fair values of $65.8 billion and $78.5 billion, and HTM U.S. GSE obligations with amortized cost of $86.3 billion and $31.6 billion, at December 31, 2020 and 2019, respectively. As of December 31, 2020, mortgage-backed securities issued by Fannie Mae and Freddie Mac each exceeded 10% of JPMorgan Chase's total stockholders' equity; the amortized cost and fair value of such securities were $95.7 billion and $98.8 billion, and $54.7 billion and $55.8 billion, respectively.

(b) There was no allowance for credit losses on AFS securities at December 31, 2020.

(c) The Firm purchased $12.4 billion, $13.4 billion and $9.4 billion of HTM securities for the years ended December 31, 2020, 2019 and 2018, respectively.

(d) HTM securities measured at amortized cost are reported net of allowance for credit losses of $78 million at December 31, 2020.

(e) Excludes $2.1 billion and $1.9 billion of accrued interest receivables at December 31, 2020 and 2019, respectively. The Firm did not reverse through interest income any accrued interest receivables for the years ended December 31, 2020 and 2019.

At December 31, 2020, the investment securities portfolio consisted of debt securities with an average credit rating of AA+ (based upon external ratings where available, and where not available, based primarily upon internal risk ratings). Risk ratings are used to identify the credit quality of securities and differentiate risk within the portfolio. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., probability of default ("PD") and loss given default ("LGD")) may differ as they reflect internal historical experiences and assumptions. Risk ratings are assigned at acquisition, are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary over the life of the investment for updated information affecting the issuer's ability to fulfill its obligations.

AFS securities impairment

The following tables present the fair value and gross unrealized losses by aging category for AFS securities at December 31, 2020 and 2019. The tables exclude U.S. Treasury and government agency securities and U.S. GSE and government agency MBS with unrealized losses of $150 million and $264 million, at December 31, 2020 and 2019, respectively; changes in the value of these securities are generally driven by changes in interest rates rather than changes in their credit profile given the explicit or implicit guarantees provided by the U.S. government.

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2020 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	**$ 562**	**$ 3**	**$ 32**	**$ –**	**$ 594**	**$ 3**
Non-U.S.	**2,507**	**4**	**235**	**1**	**2,742**	**5**
Commercial	**699**	**18**	**124**	**16**	**823**	**34**
Total mortgage-backed securities	**3,768**	**25**	**391**	**17**	**4,159**	**42**
Obligations of U.S. states and municipalities	**49**	**1**	**–**	**–**	**49**	**1**
Certificates of deposit	**–**	**–**	**–**	**–**	**–**	**–**
Non-U.S. government debt securities	**2,709**	**9**	**968**	**4**	**3,677**	**13**
Corporate debt securities	**91**	**3**	**5**	**–**	**96**	**3**
Asset-backed securities:						
Collateralized loan obligations	**5,248**	**18**	**2,645**	**13**	**7,893**	**31**
Other	**268**	**1**	**685**	**15**	**953**	**16**
Total available-for-sale securities with gross unrealized losses	**$ 12,133**	**$ 57**	**$ 4,694**	**$ 49**	**$ 16,827**	**$ 106**

	Available-for-sale securities with gross unrealized losses					
	Less than 12 months		12 months or more			
December 31, 2019 (in millions)	Fair value	Gross unrealized losses	Fair value	Gross unrealized losses	Total fair value	Total gross unrealized losses
Available-for-sale securities						
Mortgage-backed securities:						
Residential:						
U.S.	$ 1,072	$ 3	$ 423	$ 3	$ 1,495	$ 6
Non-U.S.	13	–	420	1	433	1
Commercial	1,287	12	199	1	1,486	13
Total mortgage-backed securities	2,372	15	1,042	5	3,414	20
Obligations of U.S. states and municipalities	186	1	–	–	186	1
Certificates of deposit	77	–	–	–	77	–
Non-U.S. government debt securities	3,970	13	1,406	4	5,376	17
Corporate debt securities	–	–	–	–	–	–
Asset-backed securities:						
Collateralized loan obligations	10,364	11	7,756	45	18,120	56
Other	1,639	9	753	11	2,392	20
Total available-for-sale securities with gross unrealized losses	$ 18,608	$ 49	$ 10,957	$ 65	$ 29,565	$ 114

As a result of the adoption of the amended AFS securities impairment guidance, an allowance for credit losses on AFS securities is required for impaired securities if a credit loss exists.

AFS securities are considered impaired if the fair value is less than the amortized cost.

The Firm recognizes impairment losses in earnings if the Firm has the intent to sell the debt security, or if it is more likely than not that the Firm will be required to sell the debt security before recovery of its amortized cost. In these circumstances the impairment loss recognized in investment securities gains/(losses) is equal to the full difference between the amortized cost (net of allowance if applicable) and the fair value of the securities.

For impaired debt securities that the Firm has the intent and ability to hold, the securities are evaluated to determine if a credit loss exists. If it is determined that a credit loss exists, that loss is recognized as an allowance for credit losses through the provision for credit losses in the Consolidated Statements of Income, limited by the amount of impairment. Any impairment not due to credit losses is recorded in OCI.

Factors considered in evaluating credit losses include adverse conditions specifically related to the industry, geographic area or financial condition of the issuer or underlying collateral of a security; and payment structure of the security.

When assessing securities issued in a securitization for credit losses, the Firm estimates cash flows considering relevant market and economic data, underlying loan-level data, and structural features of the securitization, such as subordination, excess spread, overcollateralization or other forms of credit enhancement, and compares the losses projected for the underlying collateral ("pool losses") against the level of credit enhancement in the securitization structure to determine whether these features are sufficient to absorb the pool losses, or whether a credit loss exists.

For beneficial interests in securitizations that are rated below "AA" at their acquisition, or that can be contractually prepaid or otherwise settled in such a way that the Firm would not recover substantially all of its recorded investment, the Firm evaluates impairment for credit losses when there is an adverse change in expected cash flows.

Allowance for credit losses
Based on its assessment, the Firm did not recognize an allowance for credit losses on impaired AFS securities as of January 1, 2020 or December 31, 2020.

HTM securities – credit risk

The adoption of the CECL accounting guidance requires management to estimate expected credit losses on HTM securities over the remaining expected life and recognize this estimate as an allowance for credit losses. As a result of the adoption of this guidance, the Firm recognized an allowance for credit losses on HTM obligations of U.S. states and municipalities of $10 million as a cumulative-effect adjustment to retained earnings as of January 1, 2020.

Credit quality indicator

The primary credit quality indicator for HTM securities is the risk rating assigned to each security. At December 31, 2020, all HTM securities were rated investment grade and were current and accruing, with approximately 98% rated at least AA+.

Allowance for credit losses

The allowance for credit losses on HTM obligations of U.S. states and municipalities and commercial mortgage-backed securities is calculated by applying statistical credit loss factors (estimated PD and LGD) to the amortized cost. The credit loss factors are derived using a weighted average of five internally developed eight-quarter macroeconomic scenarios, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the forecast period. Refer to Note 13 for further information on the eight-quarter macroeconomic forecast.

The allowance for credit losses on HTM collateralized loan obligations and U.S. residential mortgage-backed securities is calculated as the difference between the amortized cost and the present value of the cash flows expected to be collected, discounted at the security's effective interest rate. These cash flow estimates are developed based on expectations of underlying collateral performance derived using the eight-quarter macroeconomic forecast and the single year straight-line interpolation, as well as considering the structural features of the security.

The application of different inputs and assumptions into the calculation of the allowance for credit losses is subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for credit losses on HTM securities.

The allowance for credit losses on HTM securities was $78 million as of December 31, 2020, reflecting $68 million recognized in the provision for credit losses for the year ended December 31, 2020.

Selected impacts of investment securities on the Consolidated statements of income

Year ended December 31, (in millions)	**2020**	2019	2018
Realized gains	**$ 3,080**	$ 650	$ 211
Realized losses	**(2,278)**	(392)	(606)
Net investment securities gains/ (losses)	**$ 802**	$ 258	$ (395)
Provision for credit losses	**$ 68**	NA	NA

Contractual maturities and yields

The following table presents the amortized cost and estimated fair value at December 31, 2020, of JPMorgan Chase's investment securities portfolio by contractual maturity.

By remaining maturity December 31, 2020 (in millions)	Due in one year or less	Due after one year through five years	Due after five years through 10 years	Due after 10 years[(b)]	Total
Available-for-sale securities					
Mortgage-backed securities					
Amortized cost	$ –	$ 741	$ 7,797	$ 115,257	$ 123,795
Fair value	–	756	8,139	117,495	126,390
Average yield[(a)]	– %	1.66 %	1.67 %	2.57 %	2.51 %
U.S. Treasury and government agencies					
Amortized cost	$ 33,633	$ 110,033	$ 46,827	$ 9,417	$ 199,910
Fair value	33,678	111,014	47,675	9,584	201,951
Average yield[(a)]	0.42 %	0.53 %	0.79 %	0.48 %	0.57 %
Obligations of U.S. states and municipalities					
Amortized cost	$ 33	$ 203	$ 1,047	$ 17,710	$ 18,993
Fair value	33	211	1,111	19,041	20,396
Average yield[(a)]	4.11 %	4.59 %	4.84 %	4.80 %	4.80 %
Non-U.S. government debt securities					
Amortized cost	$ 8,282	$ 8,011	$ 5,615	$ 679	$ 22,587
Fair value	8,297	8,225	5,726	680	22,928
Average yield[(a)]	1.25 %	1.70 %	0.68 %	0.17 %	1.24 %
Corporate debt securities					
Amortized cost	$ –	$ 141	$ 74	$ –	$ 215
Fair value	–	139	77	–	216
Average yield[(a)]	– %	1.21 %	1.92 %	– %	1.45 %
Asset-backed securities					
Amortized cost	$ 554	$ 2,569	$ 5,987	$ 7,119	$ 16,229
Fair value	554	2,591	5,990	7,162	16,297
Average yield[(a)]	1.31 %	2.00 %	1.33 %	1.48 %	1.50 %
Total available-for-sale securities					
Amortized cost	$ 42,502	$ 121,698	$ 67,347	$ 150,182	$ 381,729
Fair value	42,562	122,936	68,718	153,962	388,178
Average yield[(a)]	0.59 %	0.65 %	1.00 %	2.64 %	1.49 %
Held-to-maturity securities					
Mortgage-backed securities					
Amortized cost	$ –	$ 158	$ 11,908	$ 102,791	$ 114,857
Fair value	–	160	12,707	104,963	117,830
Average yield[(a)]	– %	1.56 %	2.42 %	2.94 %	2.88 %
U.S. Treasury and government agencies					
Amortized cost	$ 501	$ 42,477	$ 10,206	$ –	$ 53,184
Fair value	501	42,511	10,222	–	53,234
Average yield[(a)]	1.86 %	0.60 %	0.94 %	– %	0.67 %
Obligations of U.S. states and municipalities					
Amortized cost	$ –	$ 65	$ 532	$ 12,211	$ 12,808
Fair value	–	67	565	12,638	13,270
Average yield[(a)]	– %	3.09 %	3.57 %	3.62 %	3.62 %
Asset-backed securities					
Amortized cost	$ –	$ –	$ 11,617	$ 9,433	$ 21,050
Fair value	–	–	11,658	9,480	21,138
Average yield[(a)]	– %	– %	1.40 %	1.33 %	1.37 %
Total held-to-maturity securities					
Amortized cost	$ 501	$ 42,700	$ 34,263	$ 124,435	$ 201,899
Fair value	501	42,738	35,152	127,081	205,472
Average yield[(a)]	1.86 %	0.60 %	1.65 %	2.88 %	2.19 %

(a) Average yield is computed using the effective yield of each security owned at the end of the period, weighted based on the amortized cost of each security. The effective yield considers the contractual coupon, amortization of premiums and accretion of discounts, and the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable. The effective yield excludes unscheduled principal prepayments; and accordingly, actual maturities of securities may differ from their contractual or expected maturities as certain securities may be prepaid. However, for certain callable debt securities, the average yield is calculated to the earliest call date.

(b) Substantially all of the Firm's U.S. residential MBS and collateralized mortgage obligations are due in 10 years or more, based on contractual maturity. The estimated weighted-average life, which reflects anticipated future prepayments, is approximately 5 years for agency residential MBS, 4 years for agency residential collateralized mortgage obligations and 3 years for nonagency residential collateralized mortgage obligations.

Note 11 – Securities financing activities

JPMorgan Chase enters into resale, repurchase, securities borrowed and securities loaned agreements (collectively, "securities financing agreements") primarily to finance the Firm's inventory positions, acquire securities to cover short sales, accommodate customers' financing needs, settle other securities obligations and to deploy the Firm's excess cash.

Securities financing agreements are treated as collateralized financings on the Firm's Consolidated balance sheets. Where appropriate under applicable accounting guidance, securities financing agreements with the same counterparty are reported on a net basis. Refer to Note 1 for further discussion of the offsetting of assets and liabilities. Fees received and paid in connection with securities financing agreements are recorded over the life of the agreement in interest income and interest expense on the Consolidated statements of income.

The Firm has elected the fair value option for certain securities financing agreements. Refer to Note 3 for further information regarding the fair value option. The securities financing agreements for which the fair value option has been elected are reported within securities purchased under resale agreements, securities loaned or sold under repurchase agreements, and securities borrowed on the Consolidated balance sheets. Generally, for agreements carried at fair value, current-period interest accruals are recorded within interest income and interest expense, with changes in fair value reported in principal transactions revenue. However, for financial instruments containing embedded derivatives that would be separately accounted for in accordance with accounting guidance for hybrid instruments, all changes in fair value, including any interest elements, are reported in principal transactions revenue.

Securities financing agreements not elected under the fair value option are measured at amortized cost. As a result of the Firm's credit risk mitigation practices described below, the Firm did not hold any allowance for credit losses with respect to resale and securities borrowed arrangements as of December 31, 2020 and 2019.

Credit risk mitigation practices

Securities financing agreements expose the Firm primarily to credit and liquidity risk. To manage these risks, the Firm monitors the value of the underlying securities (predominantly high-quality securities collateral, including government-issued debt and U.S. GSEs and government agencies MBS) that it has received from or provided to its counterparties compared to the value of cash proceeds and exchanged collateral, and either requests additional collateral or returns securities or collateral when appropriate. Margin levels are initially established based upon the counterparty, the type of underlying securities, and the permissible collateral, and are monitored on an ongoing basis.

In resale and securities borrowed agreements, the Firm is exposed to credit risk to the extent that the value of the securities received is less than initial cash principal advanced and any collateral amounts exchanged. In repurchase and securities loaned agreements, credit risk exposure arises to the extent that the value of underlying securities advanced exceeds the value of the initial cash principal received, and any collateral amounts exchanged.

Additionally, the Firm typically enters into master netting agreements and other similar arrangements with its counterparties, which provide for the right to liquidate the underlying securities and any collateral amounts exchanged in the event of a counterparty default. It is also the Firm's policy to take possession, where possible, of the securities underlying resale and securities borrowed agreements. Refer to Note 29 for further information regarding assets pledged and collateral received in securities financing agreements.

The table below summarizes the gross and net amounts of the Firm's securities financing agreements, as of December 31, 2020 and 2019. When the Firm has obtained an appropriate legal opinion with respect to a master netting agreement with a counterparty and where other relevant netting criteria under U.S. GAAP are met, the Firm nets, on the Consolidated balance sheets, the balances outstanding under its securities financing agreements with the same counterparty. In addition, the Firm exchanges securities and/or cash collateral with its counterparty to reduce the economic exposure with the counterparty, but such collateral is not eligible for net Consolidated balance sheet presentation. Where the Firm has obtained an appropriate legal opinion with respect to the counterparty master netting agreement, such collateral, along with securities financing balances that do not meet all these relevant netting criteria under U.S. GAAP, is presented in the table below as "Amounts not nettable on the Consolidated balance sheets," and reduces the "Net amounts" presented. Where a legal opinion has not been either sought or obtained, the securities financing balances are presented gross in the "Net amounts" below.

	2020				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets(b)	Net amounts(c)
Assets					
Securities purchased under resale agreements	**$ 666,467**	**$ (370,183)**	**$ 296,284**	**$ (273,206)**	**$ 23,078**
Securities borrowed	**193,700**	**(33,065)**	**160,635**	**(115,219)**	**45,416**
Liabilities					
Securities sold under repurchase agreements	**$ 578,060**	**$ (370,183)**	**$ 207,877**	**$ (191,980)**	**$ 15,897**
Securities loaned and other(a)	**41,366**	**(33,065)**	**8,301**	**(8,257)**	**44**

	2019				
December 31, (in millions)	Gross amounts	Amounts netted on the Consolidated balance sheets	Amounts presented on the Consolidated balance sheets	Amounts not nettable on the Consolidated balance sheets(b)	Net amounts(c)
Assets					
Securities purchased under resale agreements	$ 628,609	$ (379,463)	$ 249,146	$ (231,147) (d)	$ 17,999 (d)
Securities borrowed	166,718	(26,960)	139,758	(104,990)	34,768
Liabilities					
Securities sold under repurchase agreements	$ 555,172	$ (379,463)	$ 175,709	$ (151,566)	$ 24,143
Securities loaned and other(a)	36,649	(26,960)	9,689	(9,654)	35

(a) Includes securities-for-securities lending agreements of $3.4 billion and $3.7 billion at December 31, 2020 and 2019, respectively, accounted for at fair value, where the Firm is acting as lender. In the Consolidated balance sheets, the Firm recognizes the securities received at fair value within other assets and the obligation to return those securities within accounts payable and other liabilities.

(b) In some cases, collateral exchanged with a counterparty exceeds the net asset or liability balance with that counterparty. In such cases, the amounts reported in this column are limited to the related net asset or liability with that counterparty.

(c) Includes securities financing agreements that provide collateral rights, but where an appropriate legal opinion with respect to the master netting agreement has not been either sought or obtained. At December 31, 2020 and 2019, included $17.0 billion and $11.0 billion, respectively, of securities purchased under resale agreements; $42.1 billion and $31.9 billion, respectively, of securities borrowed; $14.5 billion and $22.7 billion, respectively, of securities sold under repurchase agreements; and $8 million and $7 million, respectively, of securities loaned and other.

(d) The prior period amounts have been revised to conform with the current period presentation.

The tables below present as of December 31, 2020 and 2019 the types of financial assets pledged in securities financing agreements and the remaining contractual maturity of the securities financing agreements.

	Gross liability balance			
	2020		2019	
December 31, (in millions)	Securities sold under repurchase agreements	Securities loaned and other	Securities sold under repurchase agreements	Securities loaned and other
Mortgage-backed securities:				
U.S. GSEs and government agencies	**$ 56,744**	**$ –**	$ 34,119	$ –
Residential - nonagency	**1,016**	**–**	1,239	–
Commercial - nonagency	**855**	**–**	1,612	–
U.S. Treasury, GSEs and government agencies	**315,834**	**143**	334,398	29
Obligations of U.S. states and municipalities	**1,525**	**2**	1,181	–
Non-U.S. government debt	**157,563**	**1,730**	145,548	1,528
Corporate debt securities	**22,849**	**1,864**	13,826	1,580
Asset-backed securities	**694**	**–**	1,794	–
Equity securities	**20,980**	**37,627**	21,455	33,512
Total	**$ 578,060**	**$ 41,366**	$ 555,172	$ 36,649

	Remaining contractual maturity of the agreements				
2020 (in millions)	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	**$ 238,667**	**$ 230,980**	**$ 70,777**	**$ 37,636**	**$ 578,060**
Total securities loaned and other	**37,887**	**1,647**	**500**	**1,332**	**41,366**

	Remaining contractual maturity of the agreements				
2019 (in millions)	Overnight and continuous	Up to 30 days	30 - 90 days	Greater than 90 days	Total
Total securities sold under repurchase agreements	$ 225,134	$ 195,816 (a)	$ 56,020 (a)	$ 78,202 (a)	$ 555,172
Total securities loaned and other	32,028	1,706	937	1,978	36,649

(a) The prior period amounts have been revised to conform with the current period presentation.

Transfers not qualifying for sale accounting

At December 31, 2020 and 2019, the Firm held $598 million and $743 million, respectively, of financial assets for which the rights have been transferred to third parties; however, the transfers did not qualify as a sale in accordance with U.S. GAAP. These transfers have been recognized as collateralized financing transactions. The transferred assets are recorded in trading assets and loans, and the corresponding liabilities are recorded predominantly in short-term borrowings on the Consolidated balance sheets.

Note 12 – Loans

Loan accounting framework

The accounting for a loan depends on management's strategy for the loan. The Firm accounts for loans based on the following categories:

- Originated or purchased loans held-for-investment (i.e., "retained")
- Loans held-for-sale
- Loans at fair value

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. Refer to Note 1 for further information.

The following provides a detailed accounting discussion of the Firm's loans by category:

Loans held-for-investment

Originated or purchased loans held-for-investment are recorded at the principal amount outstanding, net of the following: charge-offs; interest applied to principal (for loans accounted for on the cost recovery method); unamortized discounts and premiums; and net deferred loan fees or costs. Credit card loans also include billed finance charges and fees.

Interest income

Interest income on performing loans held-for-investment is accrued and recognized as interest income at the contractual rate of interest. Purchase price discounts or premiums, as well as net deferred loan fees or costs, are amortized into interest income over the contractual life of the loan as an adjustment of yield.

The Firm classifies accrued interest on loans, including accrued but unbilled interest on credit card loans, in accrued interest and accounts receivables on the Consolidated balance sheets. For credit card loans, accrued interest once billed is then recognized in the loan balances, with the related allowance recorded in the allowance for credit losses. Changes in the allowance for credit losses on accrued interest on credit card loans are recognized in the provision for credit losses and charge-offs are recognized by reversing interest income. Expected losses related to accrued interest on certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm's allowance for loan losses. For other loans, the Firm generally does not recognize an allowance for credit losses on accrued interest receivables, consistent with its policy to write them off no later than 90 days past due by reversing interest income.

Nonaccrual loans

Nonaccrual loans are those on which the accrual of interest has been suspended. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status and considered nonperforming when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest has been in default for a period of 90 days or more, unless the loan is both well-secured and in the process of collection. A loan is determined to be past due when the minimum payment is not received from the borrower by the contractually specified due date or for certain loans (e.g., residential real estate loans), when a monthly payment is due and unpaid for 30 days or more. Finally, collateral-dependent loans are typically maintained on nonaccrual status.

On the date a loan is placed on nonaccrual status, all interest accrued but not collected is reversed against interest income. In addition, the amortization of deferred amounts is suspended. Interest income on nonaccrual loans may be recognized as cash interest payments are received (i.e., on a cash basis) if the recorded loan balance is deemed fully collectible; however, if there is doubt regarding the ultimate collectibility of the recorded loan balance, all interest cash receipts are applied to reduce the carrying value of the loan (the cost recovery method). For consumer loans, application of this policy typically results in the Firm recognizing interest income on nonaccrual consumer loans on a cash basis.

A loan may be returned to accrual status when repayment is reasonably assured and there has been demonstrated performance under the terms of the loan or, if applicable, the terms of the restructured loan.

As permitted by regulatory guidance, credit card loans are generally exempt from being placed on nonaccrual status; accordingly, interest and fees related to credit card loans continue to accrue until the loan is charged off or paid in full.

Allowance for loan losses

The allowance for loan losses represents the estimated expected credit losses in the held-for-investment loan portfolio at the balance sheet date and is recognized on the balance sheet as a contra asset, which brings the amortized cost to the net carrying value. Changes in the allowance for loan losses are recorded in the provision for credit losses on the Firm's Consolidated statements of income. Refer to Note 13 for further information on the Firm's accounting policies for the allowance for loan losses.

Charge-offs

Consumer loans are generally charged off or charged down to the lower of the amortized cost or the net realizable value of the underlying collateral (i.e., fair value less estimated costs to sell), with an offset to the allowance for loan losses, upon reaching specified stages of delinquency in accordance with standards established by the FFIEC. Residential real estate loans, unmodified credit card loans and scored business banking loans are generally charged off no later than 180 days past due. Scored auto and modified credit card loans are charged off no later than 120 days past due.

Certain consumer loans are charged off or charged down to their net realizable value earlier than the FFIEC charge-off standards in certain circumstances as follows:

- Loans modified in a TDR that are determined to be collateral-dependent.
- Loans to borrowers who have experienced an event that suggests a loss is either known or highly certain are subject to accelerated charge-off standards (e.g., residential real estate and auto loans are charged off or charged down within 60 days of receiving notification of a bankruptcy filing).
- Auto loans upon repossession of the automobile.

Other than in certain limited circumstances, the Firm typically does not recognize charge-offs on the government-guaranteed portion of loans.

Wholesale loans are charged off when it is highly certain that a loss has been realized. The determination of whether to recognize a charge-off includes many factors, including the prioritization of the Firm's claim in bankruptcy, expectations of the workout/restructuring of the loan and valuation of the borrower's equity or the loan collateral.

When a loan is charged down to the lower of its amortized cost or the estimated net realizable value of the underlying collateral, the determination of the fair value of the collateral depends on the type of collateral (e.g., securities, real estate). In cases where the collateral is in the form of liquid securities, the fair value is based on quoted market prices or broker quotes. For illiquid securities or other financial assets, the fair value of the collateral is generally estimated using a discounted cash flow model.

For residential real estate loans, collateral values are based upon external valuation sources. When it becomes likely that a borrower is either unable or unwilling to pay, the Firm utilizes a broker's price opinion, appraisal and/or an automated valuation model of the home based on an exterior-only valuation ("exterior opinions"), which is then updated at least every twelve months, or more frequently depending on various market factors. As soon as practicable after the Firm receives the property in satisfaction of a debt (e.g., by taking legal title or physical possession), the Firm generally obtains an appraisal based on an inspection that includes the interior of the home ("interior appraisals"). Exterior opinions and interior appraisals are discounted based upon the Firm's experience with actual liquidation values as compared with the estimated values provided by exterior opinions and interior appraisals, considering state-specific factors.

For commercial real estate loans, collateral values are generally based on appraisals from internal and external valuation sources. Collateral values are typically updated every six to twelve months, either by obtaining a new appraisal or by performing an internal analysis, in accordance with the Firm's policies. The Firm also considers both borrower- and market-specific factors, which may result in obtaining appraisal updates or broker price opinions at more frequent intervals.

Loans held-for-sale

Loans held-for-sale are measured at the lower of cost or fair value, with valuation changes recorded in noninterest revenue. For consumer loans, the valuation is performed on a portfolio basis. For wholesale loans, the valuation is performed on an individual loan basis.

Interest income on loans held-for-sale is accrued and recognized based on the contractual rate of interest.

Loan origination fees or costs and purchase price discounts or premiums are deferred in a contra loan account until the related loan is sold. The deferred fees or costs and discounts or premiums are an adjustment to the basis of the loan and therefore are included in the periodic determination of the lower of cost or fair value adjustments and/or the gain or loss recognized at the time of sale.

Because these loans are recognized at the lower of cost or fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans held-for-sale are subject to the nonaccrual policies described above.

Loans at fair value

Loans for which the fair value option has been elected are measured at fair value, with changes in fair value recorded in noninterest revenue.

Interest income on these loans is accrued and recognized based on the contractual rate of interest. Changes in fair value are recognized in noninterest revenue. Loan origination fees are recognized upfront in noninterest revenue. Loan origination costs are recognized in the associated expense category as incurred.

Because these loans are recognized at fair value, the Firm's allowance for loan losses and charge-off policies do not apply to these loans. However, loans at fair value are subject to the nonaccrual policies described above.

Refer to Note 3 for further information on the Firm's elections of fair value accounting under the fair value option. Refer to Note 2 and Note 3 for further information on loans carried at fair value and classified as trading assets.

Loan classification changes

Loans in the held-for-investment portfolio that management decides to sell are transferred to the held-for-sale portfolio at the lower of cost or fair value on the date of transfer. Credit-related losses are charged against the allowance for loan losses; non-credit related losses such as those due to changes in interest rates or foreign currency exchange rates are recognized in noninterest revenue.

In the event that management decides to retain a loan in the held-for-sale portfolio, the loan is transferred to the held-for-investment portfolio at amortized cost on the date of transfer. These loans are subsequently assessed for impairment based on the Firm's allowance methodology. Refer to Note 13 for a further discussion of the methodologies used in establishing the Firm's allowance for loan losses.

Loan modifications

The Firm seeks to modify certain loans in conjunction with its loss mitigation activities. Through the modification, JPMorgan Chase grants one or more concessions to a borrower who is experiencing financial difficulty in order to minimize the Firm's economic loss and avoid foreclosure or repossession of the collateral, and to ultimately maximize payments received by the Firm from the borrower. The concessions granted vary by program and by borrower-specific characteristics, and may include interest rate reductions, term extensions, payment delays, principal forgiveness, or the acceptance of equity or other assets in lieu of payments. Such modifications are accounted for and reported as TDRs. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

Loans, except for credit card loans, modified in a TDR are generally placed on nonaccrual status, although in many cases such loans were already on nonaccrual status prior to modification. These loans may be returned to performing status (the accrual of interest is resumed) if the following criteria are met: (i) the borrower has performed under the modified terms for a minimum of six months and/or six payments, and (ii) the Firm has an expectation that repayment of the modified loan is reasonably assured based on, for example, the borrower's debt capacity and level of future earnings, collateral values, LTV ratios, and other current market considerations. In certain limited and well-defined circumstances in which the loan is current at the modification date, such loans are not placed on nonaccrual status at the time of modification.

Loans modified in TDRs are generally measured for impairment using the Firm's established asset-specific allowance methodology, which considers the expected re-default rates for the modified loans. A loan modified in a TDR generally remains subject to the asset-specific component of the allowance throughout its remaining life, regardless of whether the loan is performing and has been returned to accrual status. Refer to Note 13 for further discussion of the methodology used to estimate the Firm's asset-specific allowance.

The Firm has granted various forms of assistance to customers and clients impacted by the COVID-19 pandemic, including payment deferrals and covenant modifications. The majority of the Firm's COVID-19 related loan modifications have not been considered TDRs because:

- they represent short-term or other insignificant modifications, whether under the Firm's regular loan modification assessments or as permitted by regulatory guidance, or
- the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act.

To the extent that certain modifications do not meet any of the above criteria, the Firm accounts for them as TDRs.

As permitted by regulatory guidance, the Firm does not place loans with deferrals granted due to COVID-19 on nonaccrual status where such loans are not otherwise reportable as nonaccrual. The Firm considers expected losses of principal and accrued interest associated with all COVID-19 related loan modifications in its allowance for credit losses.

Assistance provided in response to the COVID-19 pandemic could delay the recognition of delinquencies, nonaccrual status, and net charge-offs for those customers who would have otherwise moved into past due or nonaccrual status.

Foreclosed property

The Firm acquires property from borrowers through loan restructurings, workouts, and foreclosures. Property acquired may include real property (e.g., residential real estate, land, and buildings) and commercial and personal property (e.g., automobiles, aircraft, railcars, and ships).

The Firm recognizes foreclosed property upon receiving assets in satisfaction of a loan (e.g., by taking legal title or physical possession). For loans collateralized by real property, the Firm generally recognizes the asset received at foreclosure sale or upon the execution of a deed in lieu of foreclosure transaction with the borrower. Foreclosed assets are reported in other assets on the Consolidated balance sheets and initially recognized at fair value less estimated costs to sell. Each quarter the fair value of the acquired property is reviewed and adjusted, if necessary, to the lower of cost or fair value. Subsequent adjustments to fair value are charged/credited to noninterest revenue. Operating expense, such as real estate taxes and maintenance, are charged to other expense.

In response to the COVID-19 pandemic, the Firm has temporarily suspended certain foreclosure activities. This could delay recognition of foreclosed properties until the foreclosure moratoriums are lifted.

Loan portfolio

The Firm's loan portfolio is divided into three portfolio segments, which are the same segments used by the Firm to determine the allowance for loan losses: Consumer, excluding credit card; Credit card; and Wholesale. Within each portfolio segment the Firm monitors and assesses the credit risk in the following classes of loans, based on the risk characteristics of each loan class.

In conjunction with the adoption of CECL, the Firm revised its loan classes. Prior-period amounts have been revised to conform with the current presentation:

- The consumer, excluding credit card portfolio segment's residential mortgage and home equity loans and lending-related commitments have been combined into a residential real estate class.
- Upon adoption of CECL, the Firm elected to discontinue the pool-level accounting for PCI loans and to account for these loans on an individual loan basis. PCI loans are considered PCD loans under CECL and are subject to the Firm's nonaccrual and charge-off policies. PCD loans are now reported in the consumer, excluding credit card portfolio segment's residential real estate class.
- Risk-rated business banking and auto dealer loans and lending-related commitments held in CCB were reclassified from the consumer, excluding credit card portfolio segment, to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. The remaining scored auto and business banking loans and lending-related commitments have been combined into an auto and other class.
- The wholesale portfolio segment's classes, previously based on the borrower's primary business activity, have been revised to align with the loan classifications as defined by the bank regulatory agencies, based on the loan's collateral, purpose, and type of borrower.

Consumer, excluding credit card	Credit card	Wholesale[(c)]
• Residential real estate[(a)] • Auto and other[(b)]	• Credit card loans	• Secured by real estate • Commercial and industrial • Other[(d)]

(a) Includes scored mortgage and home equity loans held in CCB and AWM, and scored mortgage loans held in CIB and Corporate.
(b) Includes scored auto and business banking loans and overdrafts.
(c) Includes loans held in CIB, CB, AWM, Corporate as well as risk-rated business banking and auto dealer loans held in CCB for which the wholesale methodology is applied when determining the allowance for loan losses.
(d) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Wealth Management clients within AWM). Refer to Note 14 for more information on SPEs.

The following tables summarize the Firm's loan balances by portfolio segment.

December 31, 2020 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[b][c]
Retained	**$ 302,127**	**$ 143,432**	**$ 514,947**	**$ 960,506**
Held-for-sale	**1,305**	**784**	**5,784**	**7,873**
At fair value[a]	**15,147**	**–**	**29,327**	**44,474**
Total	**$ 318,579**	**$ 144,216**	**$ 550,058**	**$ 1,012,853**

December 31, 2019 (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total[b][c]
Retained	$ 294,999	$ 168,924	$ 481,678	$ 945,601
Held-for-sale	3,002	–	4,062	7,064
At fair value[a]	19,816	–	25,139	44,955
Total	$ 317,817	$ 168,924	$ 510,879	$ 997,620

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(b) Excludes $2.9 billion of accrued interest receivables at both December 31, 2020 and 2019. The Firm wrote off accrued interest receivables of $121 million and $50 million for the years ended December 31, 2020 and 2019, respectively.
(c) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2020 and 2019.

The following tables provide information about the carrying value of retained loans purchased, sold and reclassified to held-for-sale during the periods indicated. Loans that were reclassified to held-for-sale and sold in a subsequent period are excluded from the sales line of this table.

	2020			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	**$ 3,474** [b][c]	**$ –**	**$ 1,159**	**$ 4,633**
Sales	**352**	**–**	**17,916**	**18,268**
Retained loans reclassified to held-for-sale[a]	**2,084**	**787**	**1,580**	**4,451**

	2019			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 1,282 [b][c]	$ –	$ 1,291	$ 2,573
Sales	30,474	–	23,445	53,919
Retained loans reclassified to held-for-sale[a]	9,188	–	2,371	11,559

	2018			
Year ended December 31, (in millions)	Consumer, excluding credit card	Credit card	Wholesale	Total
Purchases	$ 2,543 [b][c]	$ –	$ 2,354	$ 4,897
Sales	9,984	–	16,741	26,725
Retained loans reclassified to held-for-sale[a]	36	–	2,276	2,312

(a) Reclassifications of loans to held-for-sale are non-cash transactions.
(b) Predominantly includes purchases of residential real estate loans, including the Firm's voluntary repurchases of certain delinquent loans from loan pools as permitted by Government National Mortgage Association ("Ginnie Mae") guidelines for the years ended December 31, 2020, 2019 and 2018. The Firm typically elects to repurchase these delinquent loans as it continues to service them and/or manage the foreclosure process in accordance with applicable requirements of Ginnie Mae, FHA, RHS, and/or VA.
(c) Excludes purchases of retained loans sourced through the correspondent origination channel and underwritten in accordance with the Firm's standards. Such purchases were $15.3 billion, $16.6 billion and $18.6 billion for the years ended December 31, 2020, 2019 and 2018, respectively.

Gains and losses on sales of loans

Net gains/(losses) on sales of loans and lending-related commitments (including adjustments to record loans and lending-related commitments held-for-sale at the lower of cost or fair value) recognized in noninterest revenue was $(43) million for the year ended December 31, 2020 of which $(36) million was related to loans. Net gains on sales of loans was $394 million for the year ended December 31, 2019. Gains and losses on sales of loans was not material for the year ended December 31, 2018. In addition, the sale of loans may also result in write downs, recoveries or changes in the allowance recognized in the provision for credit losses.

Consumer, excluding credit card loan portfolio

Consumer loans, excluding credit card loans, consist primarily of scored residential mortgages, home equity loans and lines of credit, auto and business banking loans, with a focus on serving the prime consumer credit market. The portfolio also includes home equity loans secured by junior liens, prime mortgage loans with an interest-only payment period, and certain payment-option loans that may result in negative amortization.

The following table provides information about retained consumer loans, excluding credit card, by class.

December 31, (in millions)	2020	2019
Residential real estate	$ 225,302	$ 243,317
Auto and other[(a)]	76,825	51,682
Total retained loans	**$ 302,127**	$ 294,999

(a) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP.

Delinquency rates are the primary credit quality indicator for consumer loans. Loans that are more than 30 days past due provide an early warning of borrowers who may be experiencing financial difficulties and/or who may be unable or unwilling to repay the loan. As the loan continues to age, it becomes more clear whether the borrower is likely to be unable or unwilling to pay. In the case of residential real estate loans, late-stage delinquencies (greater than 150 days past due) are a strong indicator of loans that will ultimately result in a foreclosure or similar liquidation transaction. In addition to delinquency rates, other credit quality indicators for consumer loans vary based on the class of loan, as follows:

- For residential real estate loans, the current estimated LTV ratio, or the combined LTV ratio in the case of junior lien loans, is an indicator of the potential loss severity in the event of default. Additionally, LTV or combined LTV ratios can provide insight into a borrower's continued willingness to pay, as the delinquency rate of high-LTV loans tends to be greater than that for loans where the borrower has equity in the collateral. The geographic distribution of the loan collateral also provides insight as to the credit quality of the portfolio, as factors such as the regional economy, home price changes and specific events such as natural disasters, will affect credit quality. The borrower's current or "refreshed" FICO score is a secondary credit quality indicator for certain loans, as FICO scores are an indication of the borrower's credit payment history. Thus, a loan to a borrower with a low FICO score (less than 660) is considered to be of higher risk than a loan to a borrower with a higher FICO score. Further, a loan to a borrower with a high LTV ratio and a low FICO score is at greater risk of default than a loan to a borrower that has both a high LTV ratio and a high FICO score.
- For scored auto and business banking loans, geographic distribution is an indicator of the credit performance of the portfolio. Similar to residential real estate loans, geographic distribution provides insights into the portfolio performance based on regional economic activity and events.

Residential real estate

The following table provides information on delinquency, which is the primary credit quality indicator for retained residential real estate loans.

	December 31, 2020									December 31, 2019
	Term loans by origination year						Revolving loans			
(in millions, except ratios)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total	Total
Loan delinquency(a)(b)										
Current	**$ 55,562**	**$ 31,820**	**$ 13,900**	**$ 20,410**	**$ 27,978**	**$ 50,232**	**$ 7,370**	**$ 15,792**	**$223,064**	$239,979
30–149 days past due	**9**	**25**	**20**	**22**	**29**	**674**	**21**	**245**	**1,045**	1,910
150 or more days past due	**3**	**14**	**10**	**18**	**18**	**844**	**22**	**264**	**1,193**	1,428
Total retained loans	**$ 55,574**	**$ 31,859**	**$ 13,930**	**$ 20,450**	**$ 28,025**	**$ 51,750**	**$ 7,413**	**$ 16,301**	**$225,302**	$243,317
% of 30+ days past due to total retained loans(c)	**0.02 %**	**0.12 %**	**0.22 %**	**0.20 %**	**0.17 %**	**2.86 %**	**0.58 %**	**3.12 %**	**0.98 %**	1.35 %

(a) Individual delinquency classifications include mortgage loans insured by U.S. government agencies as follows: current included $36 million and $17 million; 30–149 days past due included $16 million and $20 million; and 150 or more days past due included $24 million and $26 million at December 31, 2020 and 2019, respectively.

(b) At December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.

(c) At December 31, 2020 and 2019, residential real estate loans excluded mortgage loans insured by U.S. government agencies of $40 million and $46 million, respectively, that are 30 or more days past due. These amounts have been excluded based upon the government guarantee.

Approximately 35% of the total revolving loans are senior lien loans; the remaining balance are junior lien loans. The lien position the Firm holds is considered in the Firm's allowance for credit losses. Revolving loans that have been converted to term loans have higher delinquency rates than those that are still within the revolving period. That is primarily because the fully-amortizing payment that is generally required for those products is higher than the minimum payment options available for revolving loans within the revolving period.

Nonaccrual loans and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained residential real estate loans.

(in millions, except weighted-average data)	December 31, 2020	December 31, 2019
Nonaccrual loans[(a)(b)(c)(d)(e)]	**$ 5,313**	$ 2,780
90 or more days past due and government guaranteed[(f)]	**33**	38
Current estimated LTV ratios[(g)(h)]		
Greater than 125% and refreshed FICO scores:		
Equal to or greater than 660	**$ 10**	$ 31
Less than 660	**18**	38
101% to 125% and refreshed FICO scores:		
Equal to or greater than 660	**72**	134
Less than 660	**65**	132
80% to 100% and refreshed FICO scores:		
Equal to or greater than 660	**2,365**	5,953
Less than 660	**435**	764
Less than 80% and refreshed FICO scores:		
Equal to or greater than 660	**208,457**	219,469
Less than 660	**12,072**	14,681
No FICO/LTV available	**1,732**	2,052
U.S. government-guaranteed	**76**	63
Total retained loans	**$ 225,302**	$ 243,317
Weighted average LTV ratio[(g)(i)]	**54 %**	55 %
Weighted average FICO[(h)(i)]	**763**	758
Geographic region[(j)]		
California	**$ 73,444**	$ 82,147
New York	**32,287**	31,996
Florida	**13,981**	13,668
Texas	**13,773**	14,474
Illinois	**13,130**	15,587
Colorado	**8,235**	8,447
Washington	**7,917**	8,990
New Jersey	**7,227**	7,752
Massachusetts	**5,784**	6,210
Connecticut	**5,024**	4,954
All other[(k)]	**44,500**	49,092
Total retained loans	**$ 225,302**	$ 243,317

(a) Includes collateral-dependent residential real estate loans that are charged down to the lower of amortized cost or the fair value of the underlying collateral less costs to sell. The Firm reports, in accordance with regulatory guidance, residential real estate loans that have been discharged under Chapter 7 bankruptcy and not reaffirmed by the borrower ("Chapter 7 loans") as collateral-dependent nonaccrual TDRs, regardless of their delinquency status. At December 31, 2020, approximately 7% of Chapter 7 residential real estate loans were 30 days or more past due, respectively.

(b) At December 31, 2020, nonaccrual loans included $1.6 billion of PCD loans. Prior to the adoption of CECL, nonaccrual loans excluded PCI loans as the Firm recognized interest income on each pool of PCI loans as each of the pools was performing.

(c) Generally, all consumer nonaccrual loans have an allowance. In accordance with regulatory guidance, certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.

(d) Interest income on nonaccrual loans recognized on a cash basis was $161 million and $166 million for the years ended December 31, 2020 and 2019, respectively.

(e) Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic. Includes loans to customers that have exited COVID-19 payment deferral programs and are 90 or more days past due, predominantly all of which were also at least 150 days past due and therefore considered collateral-dependent. Collateral-dependent loans are charged down to the lower of amortized cost or fair value of the underlying collateral less costs to sell.

(f) These balances are excluded from nonaccrual loans as the loans are guaranteed by U.S government agencies. Typically the principal balance of the loans is insured and interest is guaranteed at a specified reimbursement rate subject to meeting agreed-upon servicing guidelines. At December 31, 2020 and 2019, these balances included $33 million and $34 million, respectively, of loans that are no longer accruing interest based on the agreed-upon servicing guidelines. For the remaining balance, interest is being accrued at the guaranteed reimbursement rate. There were no loans that were not guaranteed by U.S. government agencies that are 90 or more days past due and still accruing interest at December 31, 2020 and 2019.

(g) Represents the aggregate unpaid principal balance of loans divided by the estimated current property value. Current property values are estimated, at a minimum, quarterly, based on home valuation models using nationally recognized home price index valuation estimates incorporating actual data to the extent available and forecasted data where actual data is not available. Current estimated combined LTV for junior lien home equity loans considers all available lien positions, as well as unused lines, related to the property.

(h) Refreshed FICO scores represent each borrower's most recent credit score, which is obtained by the Firm on at least a quarterly basis.

(i) Excludes loans with no FICO and/or LTV data available.

(j) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2020.

(k) At December 31, 2020 and 2019, included mortgage loans insured by U.S. government agencies of $76 million and $63 million, respectively. These amounts have been excluded from the geographic regions presented based upon the government guarantee.

Loan modifications

Modifications of residential real estate loans, where the Firm grants concessions to borrowers who are experiencing financial difficulty are generally accounted for and reported as TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act. The carrying value of new TDRs was $819 million, $490 million and $736 million for the years ended December 31, 2020, 2019 and 2018, respectively. There were no additional commitments to lend to borrowers whose residential real estate loans have been modified in TDRs.

Nature and extent of modifications

The Firm's proprietary modification programs as well as government programs, including U.S. GSE programs, generally provide various concessions to financially troubled borrowers including, but not limited to, interest rate reductions, term or payment extensions and delays of principal and/or interest payments that would otherwise have been required under the terms of the original agreement.

The following table provides information about how residential real estate loans were modified in TDRs under the Firm's loss mitigation programs described above during the periods presented. This table excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act.

Year ended December 31,	**2020**	2019	2018
Number of loans approved for a trial modification	**5,522**	5,872	7,175
Number of loans permanently modified	**6,850**	4,918	7,853
Concession granted:[(a)]			
Interest rate reduction	**50 %**	77 %	54 %
Term or payment extension	**49**	71	62
Principal and/or interest deferred	**14**	13	29
Principal forgiveness	**2**	5	7
Other[(b)]	**66**	63	51

(a) Represents concessions granted in permanent modifications as a percentage of the number of loans permanently modified. The sum of the percentages exceeds 100% because predominantly all of the modifications include more than one type of concession. Concessions offered on trial modifications are generally consistent with those granted on permanent modifications.

(b) Includes variable interest rate to fixed interest rate modifications and payment delays that meet the definition of a TDR for the years ended December 31, 2020, 2019 and 2018.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the various concessions granted in modifications of residential real estate loans under the loss mitigation programs described above and about redefaults of certain loans modified in TDRs for the periods presented. The following table presents only the financial effects of permanent modifications and do not include temporary concessions offered through trial modifications. This table also excludes Chapter 7 loans where the sole concession granted is the discharge of debt, loans with short-term or other insignificant modifications that are not considered concessions, and loans for which the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act.

Year ended December 31, (in millions, except weighted - average data)	2020	2019	2018
Weighted-average interest rate of loans with interest rate reductions – before TDR	**5.09 %**	5.68 %	5.50 %
Weighted-average interest rate of loans with interest rate reductions – after TDR	**3.28**	3.81	3.60
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – before TDR	**22**	20	21
Weighted-average remaining contractual term (in years) of loans with term or payment extensions – after TDR	**39**	39	38
Charge-offs recognized upon permanent modification	**$ 5**	$ 1	$ 2
Principal deferred	**16**	19	30
Principal forgiven	**5**	7	17
Balance of loans that redefaulted within one year of permanent modification[(a)]	**$ 199**	$ 166	$ 161

(a) Represents loans permanently modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The dollar amounts presented represent the balance of such loans at the end of the reporting period in which such loans defaulted. For residential real estate loans modified in TDRs, payment default is deemed to occur when the loan becomes two contractual payments past due. In the event that a modified loan redefaults, it will generally be liquidated through foreclosure or another similar type of liquidation transaction. Redefaults of loans modified within the last twelve months may not be representative of ultimate redefault levels.

At December 31, 2020, the weighted-average estimated remaining lives of residential real estate loans permanently modified in TDRs were 6 years. The estimated remaining lives of these loans reflect estimated prepayments, both voluntary and involuntary (i.e., foreclosures and other forced liquidations).

Active and suspended foreclosure

At December 31, 2020 and 2019, the Firm had residential real estate loans, excluding those insured by U.S. government agencies, with a carrying value of $846 million and $1.2 billion, respectively, that were not included in REO, but were in the process of active or suspended foreclosure.

Auto and other

The following table provides information on delinquency, which is the primary credit quality indicator for retained auto and other consumer loans.

	December 31, 2020									December 31, 2019
	Term Loans by origination year						Revolving loans			
(in millions, except ratios)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total	Total
Loan delinquency[a]										
Current	**$46,169** [b]	**$12,829**	**$ 7,367**	**$ 4,521**	**$ 2,058**	**$ 742**	**$ 2,517**	**$ 158**	**$76,361**	$51,005
30-119 days past due	**97**	**107**	**77**	**53**	**42**	**23**	**30**	**17**	**446**	667
120 or more days past due	**—**	**—**	**—**	**1**	**—**	**1**	**8**	**8**	**18**	10
Total retained loans	**$46,266**	**$12,936**	**$ 7,444**	**$ 4,575**	**$ 2,100**	**$ 766**	**$ 2,555**	**$ 183**	**$76,825**	$51,682
% of 30+ days past due to total retained loans	**0.21 %**	**0.83 %**	**1.03 %**	**1.18 %**	**2.00 %**	**3.13 %**	**1.49 %**	**13.66 %**	**0.60 %**	1.31 %

(a) At December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(b) At December 31, 2020, included $19.2 billion of loans in Business Banking under the PPP. PPP loans are guaranteed by the SBA. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

Nonaccrual and other credit quality indicators

The following table provides information on nonaccrual and other credit quality indicators for retained auto and other consumer loans.

	Total Auto and other	
(in millions, except ratios)	**December 31, 2020**	December 31, 2019
Nonaccrual loans[a][b][c]	**151**	146
Geographic region[d]		
California	**$ 12,302**	$ 7,795
New York	**8,824**	3,706
Texas	**8,235**	5,457
Florida	**4,668**	3,025
Illinois	**3,768**	2,443
New Jersey	**2,646**	1,798
Arizona	**2,465**	1,347
Ohio	**2,163**	1,490
Pennsylvania	**1,924**	1,721
Colorado	**1,910**	1,247
All other	**27,920**	21,653
Total retained loans	**$ 76,825**	$ 51,682

(a) There were no loans that were 90 or more days past due and still accruing interest at December 31, 2020 and 2019.
(b) All nonaccrual auto and other consumer loans generally have an allowance. Certain nonaccrual loans that are considered collateral-dependent have been charged down to the lower of amortized cost or the fair value of their underlying collateral less costs to sell. If the value of the underlying collateral improves subsequent to the charge down, the related allowance may be negative.
(c) Interest income on nonaccrual loans recognized on a cash basis was not material for the years ended December 31, 2020 and 2019.
(d) The geographic regions presented in this table are ordered based on the magnitude of the corresponding loan balances at December 31, 2020.

Loan modifications

Certain other consumer loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

The impact of these modifications, as well as new TDRs, were not material to the Firm for the years ended December 31, 2020, 2019 and 2018. Additional commitments to lend to borrowers whose loans have been modified in TDRs as of December 31, 2020 and 2019 were not material.

Credit card loan portfolio

The credit card portfolio segment includes credit card loans originated and purchased by the Firm. Delinquency rates are the primary credit quality indicator for credit card loans as they provide an early warning that borrowers may be experiencing difficulties (30 days past due); information on those borrowers that have been delinquent for a longer period of time (90 days past due) is also considered. In addition to delinquency rates, the geographic distribution of the loans provides insight as to the credit quality of the portfolio based on the regional economy.

While the borrower's credit score is another general indicator of credit quality, the Firm does not view credit scores as a primary indicator of credit quality because the borrower's credit score tends to be a lagging indicator. The distribution of such scores provides a general indicator of credit quality trends within the portfolio; however, the score does not capture all factors that would be predictive of future credit performance. Refreshed FICO score information, which is obtained at least quarterly, for a statistically significant random sample of the credit card portfolio is indicated in the following table. FICO is considered to be the industry benchmark for credit scores.

The Firm generally originates new card accounts to prime consumer borrowers. However, certain cardholders' FICO scores may decrease over time, depending on the performance of the cardholder and changes in the credit score calculation.

The following table provides information on delinquency, which is the primary credit quality indicator for retained credit card loans.

	December 31, 2020			December 31, 2019
(in millions, except ratios)	Within the revolving period	Converted to term loans[b]	Total	Total
Loan delinquency[a]				
Current and less than 30 days past due and still accruing	$ **139,783**	$ **1,239**	$ **141,022**	$ 165,767
30–89 days past due and still accruing	**997**	**94**	**1,091**	1,550
90 or more days past due and still accruing	**1,277**	**42**	**1,319**	1,607
Total retained loans	$ **142,057**	$ **1,375**	$ **143,432**	$ 168,924
Loan delinquency ratios				
% of 30+ days past due to total retained loans	**1.60 %**	**9.89 %**	**1.68 %**	1.87 %
% of 90+ days past due to total retained loans	**0.90**	**3.05**	**0.92**	0.95

(a) At December 31, 2020, loans under payment deferral programs offered in response to the COVID-19 pandemic which are still within their deferral period and performing according to their modified terms are generally not considered delinquent.
(b) Represents TDRs.

Other credit quality indicators

The following table provides information on other credit quality indicators for retained credit card loans.

(in millions, except ratios)	December 31, 2020	December 31, 2019
Geographic region[a]		
California	$ **20,921**	$ 25,783
Texas	**14,544**	16,728
New York	**11,919**	14,544
Florida	**9,562**	10,830
Illinois	**8,006**	9,579
New Jersey	**5,927**	7,165
Ohio	**4,673**	5,406
Pennsylvania	**4,476**	5,245
Colorado	**4,092**	4,763
Michigan	**3,553**	4,164
All other	**55,759**	64,717
Total retained loans	$ **143,432**	$ 168,924
Percentage of portfolio based on carrying value with estimated refreshed FICO scores		
Equal to or greater than 660	**85.9 %**	84.0 %
Less than 660	**13.9**	15.4
No FICO available	**0.2**	0.6

(a) The geographic regions presented in the table are ordered based on the magnitude of the corresponding loan balances at December 31, 2020.

Loan modifications

The Firm may offer one of a number of loan modification programs granting concessions to credit card borrowers who are experiencing financial difficulty. The Firm grants concessions for most of the credit card loans under long-term programs. These modifications involve placing the customer on a fixed payment plan, generally for 60 months, and typically include reducing the interest rate on the credit card. Substantially all modifications under the Firm's long-term programs are considered to be TDRs. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs.

If the cardholder does not comply with the modified payment terms, then the credit card loan continues to age and will ultimately be charged-off in accordance with the Firm's standard charge-off policy. In most cases, the Firm does not reinstate the borrower's line of credit.

Financial effects of modifications and redefaults

The following table provides information about the financial effects of the concessions granted on credit card loans modified in TDRs and redefaults for the periods presented. For all periods disclosed, new enrollments were less than 1% of total retained credit card loans.

Year ended December 31, (in millions, except weighted-average data)	**2020**	2019	2018
Balance of new TDRs[(a)]	**$ 818**	$ 961	$ 866
Weighted-average interest rate of loans – before TDR	**18.04 %**	19.07 %	17.98 %
Weighted-average interest rate of loans – after TDR	**4.64**	4.70	5.16
Balance of loans that redefaulted within one year of modification[(b)]	**$ 110**	$ 148	$ 116

(a) Represents the outstanding balance prior to modification.
(b) Represents loans modified in TDRs that experienced a payment default in the periods presented, and for which the payment default occurred within one year of the modification. The amounts presented represent the balance of such loans as of the end of the quarter in which they defaulted.

For credit card loans modified in TDRs, payment default is deemed to have occurred when the borrower misses two consecutive contractual payments. Defaulted modified credit card loans remain in the modification program and continue to be charged off in accordance with the Firm's standard charge-off policy.

Wholesale loan portfolio

Wholesale loans include loans made to a variety of clients, ranging from large corporate and institutional clients to high-net-worth individuals.

The primary credit quality indicator for wholesale loans is the internal risk rating assigned to each loan. Risk ratings are used to identify the credit quality of loans and differentiate risk within the portfolio. Risk ratings on loans consider the PD and the LGD. The PD is the likelihood that a loan will default. The LGD is the estimated loss on the loan that would be realized upon the default of the borrower and takes into consideration collateral and structural support for each credit facility.

Management considers several factors to determine an appropriate internal risk rating, including the obligor's debt capacity and financial flexibility, the level of the obligor's earnings, the amount and sources for repayment, the level and nature of contingencies, management strength, and the industry and geography in which the obligor operates. The Firm's internal risk ratings generally align with the qualitative characteristics (e.g., borrower capacity to meet financial commitments and vulnerability to changes in the economic environment) defined by S&P and Moody's, however the quantitative characteristics (e.g., PD and LGD) may differ as they reflect internal historical experiences and assumptions. The Firm generally considers internal ratings with qualitative characteristics equivalent to BBB-/Baa3 or higher as investment grade, and these ratings have a lower PD and/or lower LGD than non-investment grade ratings.

Noninvestment-grade ratings are further classified as noncriticized and criticized, and the criticized portion is further subdivided into performing and nonaccrual loans, representing management's assessment of the collectibility of principal and interest. Criticized loans have a higher PD than noncriticized loans. The Firm's definition of criticized aligns with the U.S. banking regulatory definition of criticized exposures, which consist of special mention, substandard and doubtful categories.

Risk ratings are reviewed on a regular and ongoing basis by Credit Risk Management and are adjusted as necessary for updated information affecting the obligor's ability to fulfill its obligations.

As noted above, the risk rating of a loan considers the industry in which the obligor conducts its operations. As part of the overall credit risk management framework, the Firm focuses on the management and diversification of its industry and client exposures, with particular attention paid to industries with actual or potential credit concern. Refer to Note 4 for further detail on industry concentrations.

The following tables provide information on internal risk rating, which is the primary credit quality indicator for retained wholesale loans.

December 31, (in millions, except ratios)	Secured by real estate 2020	Secured by real estate 2019	Commercial and industrial 2020	Commercial and industrial 2019	Other[b] 2020	Other[b] 2019	Total retained loans 2020	Total retained loans 2019
Loans by risk ratings								
Investment-grade	**$ 90,147**	$ 96,611	**$ 71,917** [a]	$ 80,489	**$ 217,209**	$ 186,344	**$ 379,273** [a]	$ 363,444
Noninvestment- grade:								
Noncriticized	**26,129**	22,493	**57,870**	60,437	**33,053**	27,591	**117,052**	110,521
Criticized performing	**3,234**	1,131	**10,991**	4,399	**1,079**	1,126	**15,304**	6,656
Criticized nonaccrual	**483**	183	**1,931**	844	**904**	30	**3,318**	1,057
Total noninvestment- grade	**29,846**	23,807	**70,792**	65,680	**35,036**	28,747	**135,674**	118,234
Total retained loans	**$ 119,993**	$ 120,418	**$ 142,709**	$ 146,169	**$ 252,245**	$ 215,091	**$ 514,947**	$ 481,678
% of investment-grade to total retained loans	**75.13 %**	80.23 %	**50.39 %**	55.07 %	**86.11 %**	86.63 %	**73.65 %**	75.45 %
% of total criticized to total retained loans	**3.10**	1.09	**9.05**	3.59	**0.79**	0.54	**3.62**	1.60
% of criticized nonaccrual to total retained loans	**0.40**	0.15	**1.35**	0.58	**0.36**	0.01	**0.64**	0.22

Secured by real estate

	December 31, 2020									December 31, 2019
	Term loans by origination year						Revolving loans			
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total	Total
Loans by risk ratings										
Investment-grade	**$ 16,560**	**$ 19,575**	**$ 12,192**	**$ 11,017**	**$ 13,439**	**$ 16,266**	**$ 1,098**	**$ –**	**$ 90,147**	$ 96,611
Noninvestment-grade	**3,327**	**4,339**	**4,205**	**2,916**	**2,575**	**11,994**	**489**	**1**	**29,846**	23,807
Total retained loans	**$ 19,887**	**$ 23,914**	**$ 16,397**	**$ 13,933**	**$ 16,014**	**$ 28,260**	**$ 1,587**	**$ 1**	**$ 119,993**	$ 120,418

Commercial and industrial

	December 31, 2020									December 31, 2019
	Term loans by origination year						Revolving loans			
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total	Total
Loans by risk ratings										
Investment-grade	**$ 21,211** [a]	**$ 7,304**	**$ 2,934**	**$ 1,748**	**$ 1,032**	**$ 1,263**	**$ 36,424**	**$ 1**	**$ 71,917**	$ 80,489
Noninvestment-grade	**15,060**	**8,636**	**5,131**	**2,104**	**497**	**2,439**	**36,852**	**73**	**70,792**	65,680
Total retained loans	**$ 36,271**	**$ 15,940**	**$ 8,065**	**$ 3,852**	**$ 1,529**	**$ 3,702**	**$ 73,276**	**$ 74**	**$ 142,709**	$ 146,169

Other[b]

	December 31, 2020									December 31, 2019
	Term loans by origination year						Revolving loans			
(in millions)	2020	2019	2018	2017	2016	Prior to 2016	Within the revolving period	Converted to term loans	Total	Total
Loans by risk ratings										
Investment-grade	**$ 31,389**	**$ 10,169**	**$ 6,994**	**$ 6,206**	**$ 3,553**	**$ 12,595**	**$ 145,524**	**$ 779**	**$ 217,209**	$ 186,344
Noninvestment-grade	**5,009**	**2,220**	**1,641**	**550**	**146**	**636**	**24,710**	**124**	**35,036**	28,747
Total retained loans	**$ 36,398**	**$ 12,389**	**$ 8,635**	**$ 6,756**	**$ 3,699**	**$ 13,231**	**$ 170,234**	**$ 903**	**$ 252,245**	$ 215,091

(a) At December 31, 2020, included $8.0 billion of loans under the PPP, of which $7.4 billion is included in commercial and industrial. PPP loans are guaranteed by the SBA and considered investment-grade. Other than in certain limited circumstances, the Firm typically does not recognize charge-offs, classify as nonaccrual nor record an allowance for loan losses on these loans.

(b) Includes loans to financial institutions, states and political subdivisions, SPEs, nonprofits, personal investment companies and trusts, as well as loans to individuals and individual entities (predominantly Wealth Management clients within AWM). Refer to Note 14 for more information on SPEs.

The following table presents additional information on retained loans secured by real estate within the Wholesale portfolio, which consists of loans secured wholly or substantially by a lien or liens on real property at origination. Multifamily lending includes financing for acquisition, leasing and construction of apartment buildings. Other commercial lending largely includes financing for acquisition, leasing and construction, largely for office, retail and industrial real estate. Included in secured by real estate loans is $6.4 billion and $6.3 billion as of December 31, 2020 and 2019, respectively, of construction and development loans made to finance land development and on-site construction of commercial, industrial, residential, or farm buildings.

December 31, (in millions, except ratios)	Multifamily		Other Commercial		Total retained loans secured by real estate	
	2020	2019	**2020**	2019	**2020**	2019
Retained loans secured by real estate	**$ 73,078**	$ 73,840	**$ 46,915**	$ 46,578	**$ 119,993**	$ 120,418
Criticized	**1,144**	340	**2,573**	974	**3,717**	1,314
% of total criticized to total retained loans secured by real estate	**1.57 %**	0.46 %	**5.48 %**	2.09 %	**3.10 %**	1.09 %
Criticized nonaccrual	**$ 56**	$ 28	**$ 427**	$ 155	**$ 483**	$ 183
% of criticized nonaccrual loans to total retained loans secured by real estate	**0.08 %**	0.04 %	**0.91 %**	0.33 %	**0.40 %**	0.15 %

The following table provides additional information about retained wholesale loans, including geographic distribution, delinquency and net charge-offs.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2020	2019	**2020**	2019	**2020**	2019	**2020**	2019
Loans by geographic distribution[(a)]								
Total U.S.	**$116,990**	$117,836	**$109,273**	$111,954	**$180,583**	$150,512	**$406,846**	$380,302
Total non-U.S.	**3,003**	2,582	**33,436**	34,215	**71,662**	64,579	**108,101**	101,376
Total retained loans	**$119,993**	$120,418	**$142,709**	$146,169	**$252,245**	$215,091	**$514,947**	$481,678
Loan delinquency[(b)]								
Current and less than 30 days past due and still accruing	**$118,894**	$120,119	**$140,100**	$144,839	**$249,713**	$214,641	**$508,707**	$479,599
30–89 days past due and still accruing	**601**	115	**658**	449	**1,606**	415	**2,865**	979
90 or more days past due and still accruing[(c)]	**15**	1	**20**	37	**22**	5	**57**	43
Criticized nonaccrual	**483**	183	**1,931**	844	**904**	30	**3,318**	1,057
Total retained loans	**$119,993**	$120,418	**$142,709**	$146,169	**$252,245**	$215,091	**$514,947**	$481,678
Net charge-offs/(recoveries)	**$ 10**	$ 44	**$ 737**	$ 335	**$ 52**	$ 36	**$ 799**	$ 415
% of net charge-offs/(recoveries) to end-of-period retained loans	**0.01 %**	0.04 %	**0.52 %**	0.23 %	**0.02 %**	0.02 %	**0.16 %**	0.09 %

(a) The U.S. and non-U.S. distribution is determined based predominantly on the domicile of the borrower.
(b) The credit quality of wholesale loans is assessed primarily through ongoing review and monitoring of an obligor's ability to meet contractual obligations rather than relying on the past due status, which is generally a lagging indicator of credit quality. Generally excludes loans under payment deferral programs offered in response to the COVID-19 pandemic.
(c) Represents loans that are considered well-collateralized and therefore still accruing interest.

Nonaccrual loans

The following table provides information on retained wholesale nonaccrual loans.

December 31, (in millions)	Secured by real estate		Commercial and industrial		Other		Total retained loans	
	2020	2019	**2020**	2019	**2020**	2019	**2020**	2019
Nonaccrual loans[(a)]								
With an allowance	**$ 351**	$ 169	**$ 1,667**	$ 688	**$ 800**	$ 28	**$ 2,818**	$ 885
Without an allowance[(b)]	**132**	14	**264**	156	**104**	2	**500**	172
Total nonaccrual loans[(c)]	**$ 483**	$ 183	**$ 1,931**	$ 844	**$ 904**	$ 30	**$ 3,318**	$ 1,057

(a) Loans that were modified in response to the COVID-19 pandemic continue to be risk-rated in accordance with the Firm's overall credit risk management framework. As of December 31, 2020, predominantly all of these loans were considered performing.
(b) When the discounted cash flows, collateral value or market price equals or exceeds the amortized cost of the loan, the loan does not require an allowance. This typically occurs when the loans have been partially charged off and/or there have been interest payments received and applied to the loan balance.
(c) Interest income on nonaccrual loans recognized on a cash basis were not material for the years ended December 31, 2020 and 2019.

Loan modifications

Certain loan modifications are considered to be TDRs as they provide various concessions to borrowers who are experiencing financial difficulty. Loans with short-term or other insignificant modifications that are not considered concessions are not TDRs nor are loans for which the Firm has elected to apply the option to suspend the application of accounting guidance for TDRs as provided by the CARES Act and extended by the Consolidated Appropriations Act. The carrying value of TDRs was $954 million and $501 million as of December 31, 2020 and 2019, respectively. The carrying value of new TDRs was $734 million, $407 million and $718 million for the years ended December 31, 2020, 2019 and 2018, respectively. The impact of these modifications, as well as new TDRs, were not material to the Firm for the years ended December 31, 2020, 2019 and 2018.

Note 13 – Allowance for credit losses

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption of this guidance established a single allowance framework for all financial assets measured at amortized cost and certain off-balance sheet credit exposures. This framework requires that management's estimate reflects credit losses over the instrument's remaining expected life and considers expected future changes in macroeconomic conditions. Refer to Note 1 for further information.

JPMorgan Chase's allowance for credit losses comprises:

- the allowance for loan losses, which covers the Firm's retained loan portfolios (scored and risk-rated) and is presented separately on the Consolidated balance sheets,
- the allowance for lending-related commitments, which is presented on the Consolidated balance sheets in accounts payable and other liabilities, and
- the allowance for credit losses on investment securities, which covers the Firm's HTM and AFS securities and is recognized within Investment Securities on the Consolidated balance sheets.

The income statement effect of all changes in the allowance for credit losses is recognized in the provision for credit losses.

Determining the appropriateness of the allowance for credit losses is complex and requires significant judgment by management about the effect of matters that are inherently uncertain. At least quarterly, the allowance for credit losses is reviewed by the CRO, the CFO and the Controller of the Firm. Subsequent evaluations of credit exposures, considering the macroeconomic conditions, forecasts and other factors then prevailing, may result in significant changes in the allowance for credit losses in future periods.

The Firm's policies used to determine its allowance for loan losses and its allowance for lending-related commitments are described in the following paragraphs. Refer to Note 10 for a description of the policies used to determine the allowance for credit losses on investment securities.

Methodology for allowances for loan losses and lending-related commitments

The allowance for loan losses and allowance for lending-related commitments represents expected credit losses over the remaining expected life of retained loans and lending-related commitments that are not unconditionally cancellable. The Firm does not record an allowance for future draws on unconditionally cancellable lending-related commitments (e.g., credit cards). Expected losses related to accrued interest on credit card loans and certain performing, modified loans to borrowers impacted by COVID-19 are considered in the Firm's allowance for loan losses. However, the Firm does not record an allowance on other accrued interest receivables, due to its policy to write these receivables off no later than 90 days past due by reversing interest income.

The expected life of each instrument is determined by considering its contractual term, expected prepayments, cancellation features, and certain extension and call options. The expected life of funded credit card loans is generally estimated by considering expected future payments on the credit card account, and determining how much of those amounts should be allocated to repayments of the funded loan balance (as of the balance sheet date) versus other account activity. This allocation is made using an approach that incorporates the payment application requirements of the Credit Card Accountability Responsibility and Disclosure Act of 2009, generally paying down the highest interest rate balances first.

The estimate of expected credit losses includes expected recoveries of amounts previously charged off or expected to be charged off, even if such recoveries result in a negative allowance.

Collective and Individual Assessments

When calculating the allowance for loan losses and the allowance for lending-related commitments, the Firm assesses whether exposures share similar risk characteristics. If similar risk characteristics exist, the Firm estimates expected credit losses collectively, considering the risk associated with a particular pool and the probability that the exposures within the pool will deteriorate or default. The assessment of risk characteristics is subject to significant management judgment. Emphasizing one characteristic over another or considering additional characteristics could affect the allowance.

- Relevant risk characteristics for the consumer portfolio include product type, delinquency status, current FICO scores, geographic distribution, and, for collateralized loans, current LTV ratios.
- Relevant risk characteristics for the wholesale portfolio include LOB, geography, risk rating, delinquency status, level and type of collateral, industry, credit enhancement, product type, facility purpose, tenor, and payment terms.

The majority of the Firm's credit exposures share risk characteristics with other similar exposures, and as a result are collectively assessed for impairment ("portfolio-based component"). The portfolio-based component covers consumer loans, performing risk-rated loans and certain lending-related commitments.

If an exposure does not share risk characteristics with other exposures, the Firm generally estimates expected credit losses on an individual basis, considering expected repayment and conditions impacting that individual exposure ("asset-specific component"). The asset-specific component covers modified PCD loans, loans modified or reasonably expected to be modified in a TDR, collateral-dependent loans, as well as, risk-rated loans that have been placed on nonaccrual status.

Portfolio-based component

The portfolio-based component begins with a quantitative calculation that considers the likelihood of the borrower changing delinquency status or moving from one risk rating to another. The quantitative calculation covers expected credit losses over an instrument's expected life and is estimated by applying credit loss factors to the Firm's estimated exposure at default. The credit loss factors incorporate the probability of borrower default as well as loss severity in the event of default. They are derived using a weighted average of five internally developed macroeconomic scenarios over an eight-quarter forecast period, followed by a single year straight-line interpolation to revert to long run historical information for periods beyond the eight-quarter forecast period. The five macroeconomic scenarios consist of a central, relative adverse, extreme adverse, relative upside and extreme upside scenario, and are updated by the Firm's central forecasting team. The scenarios take into consideration the Firm's overarching economic outlook, internal perspectives from subject matter experts across the Firm, and market consensus and involve a governed process that incorporates feedback from senior management across LOBs, Corporate Finance and Risk Management.

The COVID-19 pandemic has stressed many MEVs to degrees not experienced in recent history, which has created additional challenges in the use of modeled credit loss estimates and increased the reliance on management judgment. In periods where certain MEVs are outside the range of historical experience on which the Firm's models have been trained, the Firm makes adjustments to appropriately address these economic circumstances. The Firm also considers the impact of other events, such as government unemployment benefits or other stimulus programs, when determining whether adjustments are necessary.

The quantitative calculation is adjusted to take into consideration model imprecision, emerging risk assessments, trends and other subjective factors that are not yet reflected in the calculation. These adjustments are accomplished in part by analyzing the historical loss experience, including during stressed periods, for each major product or model. Management applies judgment in making this adjustment, including taking into account uncertainties associated with the economic and political conditions, quality of underwriting standards, borrower behavior, credit concentrations or deterioration within an industry, product or portfolio, as well as other relevant internal and external factors affecting the credit quality of the portfolio. In certain instances, the interrelationships between these factors create further uncertainties.

Throughout 2020, the Firm made adjustments to its quantitative calculation which placed significant weighting on its adverse scenarios, as a result of continued uncertainty related to the COVID-19 pandemic.

The application of different inputs into the quantitative calculation, and the assumptions used by management to adjust the quantitative calculation, are subject to significant management judgment, and emphasizing one input or assumption over another, or considering other inputs or assumptions, could affect the estimate of the allowance for loan losses and the allowance for lending-related commitments.

Asset-specific component

To determine the asset-specific component of the allowance, collateral-dependent loans (including those loans for which foreclosure is probable) and larger, nonaccrual risk-rated loans in the wholesale portfolio segment are generally evaluated individually, while smaller loans (both scored and risk-rated) are aggregated for evaluation using factors relevant for the respective class of assets.

The Firm generally measures the asset-specific allowance as the difference between the amortized cost of the loan and the present value of the cash flows expected to be collected, discounted at the loan's original effective interest rate. Subsequent changes in impairment are generally recognized as an adjustment to the allowance for loan losses. For collateral-dependent loans, the fair value of collateral less estimated costs to sell is used to determine the charge-off amount for declines in value (to reduce the amortized cost of the loan to the fair value of collateral) or the amount of negative allowance that should be recognized (for recoveries of prior charge-offs associated with improvements in the fair value of collateral).

The asset-specific component of the allowance for loan losses for loans that have been or are expected to be modified in TDRs incorporates the effect of the modification on the loan's expected cash flows (including forgone interest, principal forgiveness, as well as other concessions), and also the potential for redefault. For residential real estate loans modified in or expected to be modified in TDRs, the Firm develops product-specific probability of default estimates, which are applied at a loan level to compute expected losses. In developing these probabilities of default, the Firm considers the relationship between the credit quality characteristics of the underlying loans and certain assumptions about housing prices and unemployment, based upon industry-wide data. The Firm also considers its own historical loss experience to-date based on actual redefaulted modified loans. For credit card loans modified in or expected to be modified in TDRs, expected losses incorporate projected delinquencies and charge-offs based on the Firm's historical experience by type of modification program. For wholesale loans modified or expected to be modified in TDRs, expected losses incorporate management's expectation of the borrower's ability to repay under the modified terms.

Estimating the timing and amounts of future cash flows is highly judgmental as these cash flow projections rely upon estimates such as loss severities, asset valuations, default rates (including redefault rates on modified loans), the amounts and timing of interest or principal payments (including any expected prepayments) or other factors that are reflective of current and expected market conditions. These estimates are, in turn, dependent on factors such as the duration of current overall economic conditions, industry-, portfolio-, or borrower-specific factors, the expected outcome of insolvency proceedings as well as, in certain circumstances, other economic factors. All of these estimates and assumptions require significant management judgment and certain assumptions are highly subjective.

Allowance for credit losses and related information

The table below summarizes information about the allowances for loan losses and lending-related commitments, and includes a breakdown of loans and lending-related commitments by impairment methodology. Refer to Note 10 for further information on the allowance for credit losses on investment securities.

The adoption of the CECL accounting guidance resulted in a change in the accounting for PCI loans, which are considered PCD loans. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

(Table continued on next page)

Year ended December 31, (in millions)	2020[e] Consumer, excluding credit card	Credit card	Wholesale	Total
Allowance for loan losses				
Beginning balance at January 1,	$ 2,538	$ 5,683	$ 4,902	$ 13,123
Cumulative effect of a change in accounting principle	297	5,517	(1,642)	4,172
Gross charge-offs	805	5,077	954	6,836
Gross recoveries collected	(631)	(791)	(155)	(1,577)
Net charge-offs	174	4,286	799	5,259
Write-offs of PCI loans[a]	NA	NA	NA	NA
Provision for loan losses	974	10,886	4,431	16,291
Other	1	–	–	1
Ending balance at December 31,	$ 3,636	$ 17,800	$ 6,892	$ 28,328
Allowance for lending-related commitments				
Beginning balance at January 1,	$ 12	$ –	$ 1,179	$ 1,191
Cumulative effect of a change in accounting principle	133	–	(35)	98
Provision for lending-related commitments	42	–	1,079	1,121
Other	–	–	(1)	(1)
Ending balance at December 31,	$ 187	$ –	$ 2,222	$ 2,409
Total allowance for credit losses	$ 3,823	$ 17,800	$ 9,114	$ 30,737
Allowance for loan losses by impairment methodology				
Asset-specific[b]	$ (7)	$ 633	$ 682	$ 1,308
Portfolio-based	3,643	17,167	6,210	27,020
PCI	NA	NA	NA	NA
Total allowance for loan losses	$ 3,636	$ 17,800	$ 6,892	$ 28,328
Loans by impairment methodology				
Asset-specific[b]	$ 16,648	$ 1,375	$ 3,606	$ 21,629
Portfolio-based	285,479	142,057	511,341	938,877
PCI	NA	NA	NA	NA
Total retained loans	$ 302,127	$ 143,432	$ 514,947	$ 960,506
Collateral-dependent loans				
Net charge-offs	$ 133	$ –	$ 76	$ 209
Loans measured at fair value of collateral less cost to sell	4,956	–	188	5,144
Allowance for lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 114	$ 114
Portfolio-based	187	–	2,108	2,295
Total allowance for lending-related commitments[c]	$ 187	$ –	$ 2,222	$ 2,409
Lending-related commitments by impairment methodology				
Asset-specific	$ –	$ –	$ 577	$ 577
Portfolio-based[d]	37,783	–	426,871	464,654
Total lending-related commitments	$ 37,783	$ –	$ 427,448	$ 465,231

(a) Prior to the adoption of CECL, write-offs of PCI loans were recorded against the allowance for loan losses when actual losses for a pool exceeded estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan was recognized when the underlying loan was removed from a pool.
(b) Includes modified PCD loans and loans that have been modified or are reasonably expected to be modified in a TDR. Also includes risk-rated loans that have been placed on nonaccrual status for the wholesale portfolio segment. The asset-specific credit card allowance for loans modified, or reasonably expected to be modified, in a TDR is calculated based on the loans' original contractual interest rates and does not consider any incremental penalty rates.
(c) The allowance for lending-related commitments is reported in accounts payable and other liabilities on the Consolidated balance sheets.
(d) At December 31, 2020, 2019 and 2018, lending-related commitments excluded $19.5 billion, $9.8 billion and $8.7 billion, respectively, for the consumer, excluding credit card portfolio segment; $658.5 billion, $650.7 billion and $605.4 billion, respectively, for the credit card portfolio segment; and $22.4 billion, $24.1 billion and $24.8 billion, respectively, for the wholesale portfolio segment, which were not subject to the allowance for lending-related commitments.
(e) Excludes HTM securities, which had an allowance for credit losses of $78 million and a provision for credit losses of $68 million as of and for the year ended December 31, 2020.

(table continued from previous page)

2019				2018			
Consumer, excluding credit card	Credit card	Wholesale	Total	Consumer, excluding credit card	Credit card	Wholesale	Total
$ 3,434	$ 5,184	$ 4,827	$ 13,445	$ 3,892	$ 4,884	$ 4,828	$ 13,604
NA	NA	NA	NA	NA	NA	NA	NA
902	5,436	472	6,810	977	5,011	361	6,349
(536)	(588)	(57)	(1,181)	(827)	(493)	(173)	(1,493)
366	4,848	415	5,629	150	4,518	188	4,856
151	–	–	151	187	–	–	187
(378)	5,348	479	5,449	(121)	4,818	188	4,885
(1)	(1)	11	9	–	–	(1)	(1)
$ 2,538	$ 5,683	$ 4,902	$ 13,123	$ 3,434	$ 5,184	$ 4,827	$ 13,445
$ 12	$ –	$ 1,043	$ 1,055	$ 12	$ –	$ 1,056	$ 1,068
NA	NA	NA	NA	NA	NA	NA	NA
–	–	136	136	–	–	(14)	(14)
–	–	–	–	–	–	1	1
$ 12	$ –	$ 1,179	$ 1,191	$ 12	$ –	$ 1,043	$ 1,055
$ 2,550	$ 5,683	$ 6,081	$ 14,314	$ 3,446	$ 5,184	$ 5,870	$ 14,500
$ 75	$ 477	$ 295	$ 847	$ 143	$ 440	$ 350	$ 933
1,476	5,206	4,607	11,289	1,503	4,744	4,477	10,724
987	–	–	987	1,788	–	–	1,788
$ 2,538	$ 5,683	$ 4,902	$ 13,123	$ 3,434	$ 5,184	$ 4,827	$ 13,445
$ 5,961	$ 1,452	$ 1,123	$ 8,536	$ 6,665	$ 1,319	$ 1,459	$ 9,443
268,675	167,472	480,555	916,702	305,077	155,297	475,561	935,935
20,363	–	–	20,363	24,034	–	3	24,037
$ 294,999	$ 168,924	$ 481,678	$ 945,601	$ 335,776	$ 156,616	$ 477,023	$ 969,415
$ 46	$ –	$ 36	$ 82	$ 16	$ –	$ 29	$ 45
2,053	–	87	2,140	2,076	–	206	2,282
$ –	$ –	$ 102	$ 102	$ –	$ –	$ 99	$ 99
12	–	1,077	1,089	12	–	944	956
$ 12	$ –	$ 1,179	$ 1,191	$ 12	$ –	$ 1,043	$ 1,055
$ –	$ –	$ 474	$ 474	$ –	$ –	$ 469	$ 469
30,417	–	392,967	423,384	26,502	–	374,996	401,498
$ 30,417	$ –	$ 393,441	$ 423,858	$ 26,502	$ –	$ 375,465	$ 401,967

Discussion of changes in the allowance during 2020

The increase in the allowance for loan losses and lending-related commitments was primarily driven by an increase in the provision for credit losses, reflecting the deterioration in and uncertainty around the future macroeconomic environment as a result of the impact of the COVID-19 pandemic.

As of December 31, 2020, the Firm's central case reflected U.S. unemployment rates of approximately 7% through the second quarter of 2021 and remaining above 5% until the second half of 2022. This compared with relatively low levels of unemployment of approximately 4% throughout 2020 and 2021 in the Firm's January 1, 2020 central case.

Further, while the Firm's January 1, 2020 central case U.S. GDP forecast reflected a 1.7% expansion in 2020, actual U.S. GDP contracted approximately 2.5% in 2020. As of December 31, 2020, the Firm's central case assumptions reflect a return to pre-pandemic GDP levels in the fourth quarter of 2021.

Due to elevated uncertainty in the near term outlook, driven by the potential for increased infection rates and related lock downs resulting from the pandemic, as well as the prospect that government and other consumer relief measures set to expire may not be extended, the Firm has placed significant weighting on its adverse scenarios. These scenarios incorporate more punitive macroeconomic factors than the central case assumptions, resulting in weighted average U.S. unemployment rates remaining elevated throughout 2021 and 2022, ending the fourth quarter of 2022 at approximately 6%, and in U.S. GDP ending 2022 approximately 0.9% higher than fourth quarter 2019 actual pre-pandemic levels.

The Firm's central case assumptions reflected U.S. unemployment rates and U.S. real GDP as follows:

	Assumptions at January 1, 2020		
	2Q20	4Q20[b]	2Q21
U.S. unemployment rate[a]	3.7%	3.8%	4.0%
Cumulative change in U.S. real GDP from 12/31/2019	0.9%	1.7%	2.4%

	Assumptions at December 31, 2020		
	2Q21	4Q21	2Q22
U.S. unemployment rate[a]	6.8%	5.7%	5.1%
Cumulative change in U.S. real GDP from 12/31/2019	(1.9)%	0.6%	2.0%

(a) Reflects quarterly average of forecasted U.S. unemployment rate.
(b) 4Q20 actual U.S. unemployment rate (quarterly average) was 6.8%. 4Q20 actual cumulative change in U.S. real GDP from 4Q19 was (2.5%).

Subsequent changes to this forecast and related estimates will be reflected in the provision for credit losses in future periods.

Note 14 – Variable interest entities

Refer to Note 1 on page 167 for a further description of JPMorgan Chase's accounting policies regarding consolidation of VIEs.

The following table summarizes the most significant types of Firm-sponsored VIEs by business segment. The Firm considers a "sponsored" VIE to include any entity where: (1) JPMorgan Chase is the primary beneficiary of the structure; (2) the VIE is used by JPMorgan Chase to securitize Firm assets; (3) the VIE issues financial instruments with the JPMorgan Chase name; or (4) the entity is a JPMorgan Chase–administered asset-backed commercial paper conduit.

Line of Business	*Transaction Type*	*Activity*	*2020 Form 10-K page references*
CCB	Credit card securitization trusts	Securitization of originated credit card receivables	253-254
	Mortgage securitization trusts	Servicing and securitization of both originated and purchased residential mortgages	254-256
CIB	Mortgage and other securitization trusts	Securitization of both originated and purchased residential and commercial mortgages, and other consumer loans	254-256
	Multi-seller conduits	Assist clients in accessing the financial markets in a cost-efficient manner and structures transactions to meet investor needs	256
	Municipal bond vehicles	Financing of municipal bond investments	256-257

The Firm's other business segments are also involved with VIEs (both third-party and Firm-sponsored), but to a lesser extent, as follows:

- Asset & Wealth Management: AWM sponsors and manages certain funds that are deemed VIEs. As asset manager of the funds, AWM earns a fee based on assets managed; the fee varies with each fund's investment objective and is competitively priced. For fund entities that qualify as VIEs, AWM's interests are, in certain cases, considered to be significant variable interests that result in consolidation of the financial results of these entities.
- Commercial Banking: CB provides financing and lending-related services to a wide spectrum of clients, including certain third-party-sponsored entities that may meet the definition of a VIE. CB does not control the activities of these entities and does not consolidate these entities. CB's maximum loss exposure, regardless of whether the entity is a VIE, is generally limited to loans and lending-related commitments which are reported and disclosed in the same manner as any other third-party transaction.
- Corporate: Corporate is involved with entities that may meet the definition of VIEs; however these entities are generally subject to specialized investment company accounting, which does not require the consolidation of investments, including VIEs. In addition, Treasury and CIO invest in securities generally issued by third parties which may meet the definition of VIEs (e.g., issuers of asset-backed securities). In general, the Firm does not have the power to direct the significant activities of these entities and therefore does not consolidate these entities. Refer to Note 10 for further information on the Firm's investment securities portfolio.

In addition, CIB also invests in and provides financing and other services to VIEs sponsored by third parties. Refer to page 258 of this Note for more information on the VIEs sponsored by third parties.

Significant Firm-sponsored variable interest entities

Credit card securitizations

CCB's Card business may securitize originated credit card loans, primarily through the Chase Issuance Trust (the "Trust"). The Firm's continuing involvement in credit card securitizations includes servicing the receivables, retaining an undivided seller's interest in the receivables, retaining certain senior and subordinated securities and maintaining escrow accounts.

The Firm consolidates the assets and liabilities of its sponsored credit card trusts as it is considered to be the primary beneficiary of these securitization trusts based on the Firm's ability to direct the activities of these VIEs through its servicing responsibilities and other duties, including making decisions as to the receivables that are transferred into those trusts and as to any related modifications and workouts. Additionally, the nature and extent of the Firm's other continuing involvement with the trusts, as indicated above, obligates the Firm to absorb losses and gives the Firm the right to receive certain benefits from these VIEs that could potentially be significant.

The underlying securitized credit card receivables and other assets of the securitization trusts are available only for payment of the beneficial interests issued by the securitization trusts; they are not available to pay the Firm's other obligations or the claims of the Firm's creditors.

The agreements with the credit card securitization trusts require the Firm to maintain a minimum undivided interest in the credit card trusts (generally 5%). As of December 31, 2020 and 2019, the Firm held undivided interests in Firm-sponsored credit card securitization trusts of \$5.4 billion and \$5.3 billion, respectively. The Firm maintained an average undivided interest in principal receivables owned by those trusts of approximately 39% and 50% for the years ended December 31, 2020 and

2019. The Firm did not retain any senior securities and retained $1.5 billion and $3.0 billion of subordinated securities in certain of its credit card securitization trusts as of December 31, 2020 and 2019, respectively. The Firm's undivided interests in the credit card trusts and securities retained are eliminated in consolidation.

Firm-sponsored mortgage and other securitization trusts
The Firm securitizes (or has securitized) originated and purchased residential mortgages, commercial mortgages and other consumer loans primarily in its CCB and CIB businesses. Depending on the particular transaction, as well as the respective business involved, the Firm may act as the servicer of the loans and/or retain certain beneficial interests in the securitization trusts.

The following table presents the total unpaid principal amount of assets held in Firm-sponsored private-label securitization entities, including those in which the Firm has continuing involvement, and those that are consolidated by the Firm. Continuing involvement includes servicing the loans, holding senior interests or subordinated interests (including amounts required to be held pursuant to credit risk retention rules), recourse or guarantee arrangements, and derivative contracts. In certain instances, the Firm's only continuing involvement is servicing the loans. The Firm's maximum loss exposure from retained and purchased interests is the carrying value of these interests. Refer to Securitization activity on page 259 of this Note for further information regarding the Firm's cash flows associated with and interests retained in nonconsolidated VIEs, and pages 259-260 of this Note for information on the Firm's loan sales and securitization activity related to U.S. GSEs and government agencies.

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2020 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	**$ 49,644**	**$ 1,693**	**$ 41,265**	**$ 574**	**$ 724**	**$ –**	**$ 1,298**
Subprime	**12,896**	**46**	**12,154**	**9**	**–**	**–**	**9**
Commercial and other[b]	**119,732**	**–**	**92,351**	**955**	**1,549**	**262**	**2,766**
Total	**$ 182,272**	**$ 1,739**	**$ 145,770**	**$ 1,538**	**$ 2,273**	**$ 262**	**$ 4,073**

	Principal amount outstanding			JPMorgan Chase interest in securitized assets in nonconsolidated VIEs[c][d][e]			
December 31, 2019 (in millions)	Total assets held by securitization VIEs	Assets held in consolidated securitization VIEs	Assets held in nonconsolidated securitization VIEs with continuing involvement	Trading assets	Investment securities	Other financial assets	Total interests held by JPMorgan Chase
Securitization-related[a]							
Residential mortgage:							
Prime/Alt-A and option ARMs	$ 60,348	$ 2,796	$ 48,734	$ 535	$ 625	$ –	$ 1,160
Subprime	14,661	–	13,490	7	–	–	7
Commercial and other[b]	111,903	–	80,878	785	773	241	1,799
Total	$ 186,912	$ 2,796	$ 143,102	$ 1,327	$ 1,398	$ 241	$ 2,966

(a) Excludes U.S. GSEs and government agency securitizations and re-securitizations, which are not Firm-sponsored. Refer to pages 259-260 of this Note for information on the Firm's loan sales and securitization activity related to U.S. GSEs and government agencies.
(b) Consists of securities backed by commercial real estate loans and non-mortgage-related consumer receivables purchased from third parties.
(c) Excludes the following: retained servicing (refer to Note 15 for a discussion of MSRs); securities retained from loan sales and securitization activity related to U.S. GSEs and government agencies; interest rate and foreign exchange derivatives primarily used to manage interest rate and foreign exchange risks of securitization entities (refer to Note 5 for further information on derivatives); senior and subordinated securities of $105 million and $40 million, respectively, at December 31, 2020, and $106 million and $94 million, respectively, at December 31, 2019, which the Firm purchased in connection with CIB's secondary market-making activities.
(d) Includes interests held in re-securitization transactions.
(e) As of December 31, 2020 and 2019, 73% and 63%, respectively, of the Firm's retained securitization interests, which are predominantly carried at fair value and include amounts required to be held pursuant to credit risk retention rules, were risk-rated "A" or better, on an S&P-equivalent basis. The retained interests in prime residential mortgages consisted of $1.3 billion and $1.1 billion of investment-grade retained interests, and $41 million and $72 million of noninvestment-grade retained interests at December 31, 2020 and 2019, respectively. The retained interests in commercial and other securitization trusts consisted of $2.0 billion and $1.2 billion of investment-grade retained interests, and $753 million and $575 million of noninvestment-grade retained interests at December 31, 2020 and 2019, respectively.

Residential mortgage
The Firm securitizes residential mortgage loans originated by CCB, as well as residential mortgage loans purchased from third parties by either CCB or CIB. CCB generally retains servicing for all residential mortgage loans it originated or purchased, and for certain mortgage loans purchased by CIB. For securitizations of loans serviced by CCB, the Firm has the power to direct the significant activities of the VIE because it is responsible for decisions related to loan modifications and workouts. CCB may also retain an interest upon securitization.

In addition, CIB engages in underwriting and trading activities involving securities issued by Firm-sponsored securitization trusts. As a result, CIB at times retains senior and/or subordinated interests (including residual interests and amounts required to be held pursuant to credit risk retention rules) in residential mortgage securitizations at the time of securitization, and/or reacquires positions in the secondary market in the normal course of business. In certain instances, as a result of the positions retained or reacquired by CIB or held by Treasury and CIO or CCB, when considered together with the servicing arrangements entered into by CCB, the Firm is deemed to be the primary beneficiary of certain securitization trusts. Refer to the table on page 257 of this Note for more information on consolidated residential mortgage securitizations.

The Firm does not consolidate residential mortgage securitizations (Firm-sponsored or third-party-sponsored) when it is not the servicer (and therefore does not have the power to direct the most significant activities of the trust) or does not hold a beneficial interest in the trust that could potentially be significant to the trust. Refer to the table on page 257 of this Note for more information on the consolidated residential mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated residential mortgage securitizations.

Commercial mortgages and other consumer securitizations
CIB originates and securitizes commercial mortgage loans, and engages in underwriting and trading activities involving the securities issued by securitization trusts. CIB may retain unsold senior and/or subordinated interests (including amounts required to be held pursuant to credit risk retention rules) in commercial mortgage securitizations at the time of securitization but, generally, the Firm does not service commercial loan securitizations. Treasury and CIO may choose to invest in these securitizations as well. For commercial mortgage securitizations the power to direct the significant activities of the VIE generally is held by the servicer or investors in a specified class of securities ("controlling class"). The Firm generally does not retain an interest in the controlling class in its sponsored commercial mortgage securitization transactions. Refer to the table on page 257 of this Note for more information on the consolidated commercial mortgage securitizations, and the table on the previous page of this Note for further information on interests held in nonconsolidated securitizations.

Re-securitizations
The Firm engages in certain re-securitization transactions in which debt securities are transferred to a VIE in exchange for new beneficial interests. These transfers occur in connection with both U.S. GSEs and government agency sponsored VIEs, which are backed by residential mortgages. The Firm's consolidation analysis is largely dependent on the Firm's role and interest in the re-securitization trusts.

The following table presents the principal amount of securities transferred to re-securitization VIEs.

Year ended December 31, (in millions)	2020	2019	2018
Transfers of securities to VIEs			
U.S. GSEs and government agencies	**$ 46,123**	$ 25,852	$ 15,532

Most re-securitizations with which the Firm is involved are client-driven transactions in which a specific client or group of clients is seeking a specific return or risk profile. For these transactions, the Firm has concluded that the decision-making power of the entity is shared between the Firm and its clients, considering the joint effort and decisions in establishing the re-securitization trust and its assets, as well as the significant economic interest the client holds in the re-securitization trust; therefore the Firm does not consolidate the re-securitization VIE.

The Firm did not transfer any private label securities to re-securitization VIEs during 2020, 2019 and 2018, respectively, and retained interests in any such Firm-sponsored VIEs as of December 31, 2020 and 2019 were immaterial.

Additionally, the Firm may invest in beneficial interests of third-party-sponsored re-securitizations and generally purchases these interests in the secondary market. In these circumstances, the Firm does not have the unilateral ability to direct the most significant activities of the re-securitization trust, either because it was not involved in the initial design of the trust, or the Firm is involved with an independent third-party sponsor and demonstrates shared power over the creation of the trust; therefore, the Firm does not consolidate the re-securitization VIE.

The following table presents information on the Firm's interests in nonconsolidated re-securitization VIEs.

December 31, (in millions)	Nonconsolidated re-securitization VIEs 2020	2019
U.S. GSEs and government agencies		
Interest in VIEs	**$ 2,631**	$ 2,928

As of December 31, 2020 and 2019, the Firm did not consolidate any U.S. GSE and government agency re-securitization VIEs or any Firm-sponsored private-label re-securitization VIEs.

Multi-seller conduits

Multi-seller conduit entities are separate bankruptcy remote entities that provide secured financing, collateralized by pools of receivables and other financial assets, to customers of the Firm. The conduits fund their financing facilities through the issuance of highly rated commercial paper. The primary source of repayment of the commercial paper is the cash flows from the pools of assets. In most instances, the assets are structured with deal-specific credit enhancements provided to the conduits by the customers (i.e., sellers) or other third parties. Deal-specific credit enhancements are generally structured to cover a multiple of historical losses expected on the pool of assets, and are typically in the form of overcollateralization provided by the seller. The deal-specific credit enhancements mitigate the Firm’s potential losses on its agreements with the conduits.

To ensure timely repayment of the commercial paper, and to provide the conduits with funding to provide financing to customers in the event that the conduits do not obtain funding in the commercial paper market, each asset pool financed by the conduits has a minimum 100% deal-specific liquidity facility associated with it provided by JPMorgan Chase Bank, N.A. JPMorgan Chase Bank, N.A. also provides the multi-seller conduit vehicles with uncommitted program-wide liquidity facilities and program-wide credit enhancement in the form of standby letters of credit. The amount of program-wide credit enhancement required is based upon commercial paper issuance and approximates 10% of the outstanding balance of commercial paper.

The Firm consolidates its Firm-administered multi-seller conduits, as the Firm has both the power to direct the significant activities of the conduits and a potentially significant economic interest in the conduits. As administrative agent and in its role in structuring transactions, the Firm makes decisions regarding asset types and credit quality, and manages the commercial paper funding needs of the conduits. The Firm’s interests that could potentially be significant to the VIEs include the fees received as administrative agent and liquidity and program-wide credit enhancement provider, as well as the potential exposure created by the liquidity and credit enhancement facilities provided to the conduits. Refer to page 257 of this Note for further information on consolidated VIE assets and liabilities.

In the normal course of business, JPMorgan Chase makes markets in and invests in commercial paper issued by the Firm-administered multi-seller conduits. The Firm held $13.5 billion and $16.3 billion of the commercial paper issued by the Firm-administered multi-seller conduits at December 31, 2020 and 2019, respectively, which have been eliminated in consolidation. The Firm’s investments reflect the Firm’s funding needs and capacity and were not driven by market illiquidity. Other than the amounts required to be held pursuant to credit risk retention rules, the Firm is not obligated under any agreement to purchase the commercial paper issued by the Firm-administered multi-seller conduits.

Deal-specific liquidity facilities, program-wide liquidity and credit enhancement provided by the Firm have been eliminated in consolidation. The Firm or the Firm-administered multi-seller conduits provide lending-related commitments to certain clients of the Firm-administered multi-seller conduits. The unfunded commitments were $12.2 billion and $8.9 billion at December 31, 2020 and 2019, respectively, and are reported as off-balance sheet lending-related commitments in other unfunded commitments to extend credit. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Municipal bond vehicles

Municipal bond vehicles or tender option bond (“TOB”) trusts allow institutions to finance their municipal bond investments at short-term rates. In a typical TOB transaction, the trust purchases highly rated municipal bond(s) of a single issuer and funds the purchase by issuing two types of securities: (1) puttable floating-rate certificates (“floaters”) and (2) inverse floating-rate residual interests (“residuals”). The floaters are typically purchased by money market funds or other short-term investors and may be tendered, with requisite notice, to the TOB trust. The residuals are retained by the investor seeking to finance its municipal bond investment. TOB transactions where the residual is held by a third-party investor are typically known as customer TOB trusts, and non-customer TOB trusts are transactions where the Residual is retained by the Firm. Customer TOB trusts are sponsored by a third party; refer to page 258 of this Note for further information. The Firm serves as sponsor for all non-customer TOB transactions. The Firm may provide various services to a TOB trust, including remarketing agent, liquidity or tender option provider, and/or sponsor.

J.P. Morgan Securities LLC may serve as a remarketing agent on the floaters for TOB trusts. The remarketing agent is responsible for establishing the periodic variable rate on the floaters, conducting the initial placement and remarketing tendered floaters. The remarketing agent may, but is not obligated to, make markets in floaters. Floaters held by the Firm were not material during 2020 and 2019.

JPMorgan Chase Bank, N.A. or J.P. Morgan Securities LLC often serves as the sole liquidity or tender option provider for the TOB trusts. The liquidity provider’s obligation to perform is conditional and is limited by certain events ("Termination Events"), which include bankruptcy or failure to pay by the municipal bond issuer or credit enhancement provider, an event of taxability on the municipal bonds or the immediate downgrade of the municipal bond to below investment grade. In addition, the liquidity provider's exposure is typically further limited by the high credit quality of the underlying municipal bonds, the excess collateralization in the vehicle, or, in certain transactions, the reimbursement agreements with the Residual holders.

Holders of the floaters may "put," or tender, their floaters to the TOB trust. If the remarketing agent cannot successfully remarket the floaters to another investor, the liquidity provider either provides a loan to the TOB trust for the TOB trust's purchase of the floaters, or it directly purchases the tendered floaters.

TOB trusts are considered to be variable interest entities. The Firm consolidates non-customer TOB trusts because as the Residual holder, the Firm has the right to make decisions that significantly impact the economic performance of the municipal bond vehicle, and it has the right to receive benefits and bear losses that could potentially be significant to the municipal bond vehicle.

Consolidated VIE assets and liabilities

The following table presents information on assets and liabilities related to VIEs consolidated by the Firm as of December 31, 2020 and 2019.

	Assets				Liabilities		
December 31, 2020 (in millions)	Trading assets	Loans	Other[b]	Total assets[c]	Beneficial interests in VIE assets[d]	Other[e]	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	$ –	$ 11,962	$ 148	$ 12,110	$ 4,943	$ 3	$ 4,946
Firm-administered multi-seller conduits	2	23,787	188	23,977	10,523	33	10,556
Municipal bond vehicles	1,930	–	2	1,932	1,902	–	1,902
Mortgage securitization entities[a]	–	1,694	94	1,788	210	108	318
Other	2	176	249	427	–	89	89
Total	**$ 1,934**	**$ 37,619**	**$ 681**	**$ 40,234**	**$ 17,578**	**$ 233**	**$ 17,811**

	Assets				Liabilities		
December 31, 2019 (in millions)	Trading assets	Loans	Other[b]	Total assets[c]	Beneficial interests in VIE assets[d]	Other[e]	Total liabilities
VIE program type							
Firm-sponsored credit card trusts	$ –	$ 14,986	$ 266	$ 15,252	$ 6,461	$ 6	$ 6,467
Firm-administered multi-seller conduits	1	25,183	355	25,539	9,223	36	9,259
Municipal bond vehicles	1,903	–	4	1,907	1,881	3	1,884
Mortgage securitization entities[a]	66	2,762	64	2,892	276	130	406
Other	663	–	192	855	–	272	272
Total	$ 2,633	$ 42,931	$ 881	$ 46,445	$ 17,841	$ 447	$ 18,288

(a) Includes residential and commercial mortgage securitizations.
(b) Includes assets classified as cash and other assets on the Consolidated balance sheets.
(c) The assets of the consolidated VIEs included in the program types above are used to settle the liabilities of those entities. The assets and liabilities include third-party assets and liabilities of consolidated VIEs and exclude intercompany balances that eliminate in consolidation.
(d) The interest-bearing beneficial interest liabilities issued by consolidated VIEs are classified in the line item on the Consolidated balance sheets titled, "Beneficial interests issued by consolidated variable interest entities." The holders of these beneficial interests generally do not have recourse to the general credit of JPMorgan Chase. Included in beneficial interests in VIE assets are long-term beneficial interests of $5.2 billion and $6.7 billion at December 31, 2020 and 2019, respectively. Refer to Note 20 for additional information on interest-bearing long-term beneficial interests.
(e) Includes liabilities classified as accounts payable and other liabilities on the Consolidated balance sheets.

VIEs sponsored by third parties

The Firm enters into transactions with VIEs structured by other parties. These include, for example, acting as a derivative counterparty, liquidity provider, investor, underwriter, placement agent, remarketing agent, trustee or custodian. These transactions are conducted at arm's-length, and individual credit decisions are based on the analysis of the specific VIE, taking into consideration the quality of the underlying assets. Where the Firm does not have the power to direct the activities of the VIE that most significantly impact the VIE's economic performance, or a variable interest that could potentially be significant, the Firm generally does not consolidate the VIE, but it records and reports these positions on its Consolidated balance sheets in the same manner it would record and report positions in respect of any other third-party transaction.

Tax credit vehicles

The Firm holds investments in unconsolidated tax credit vehicles, which are limited partnerships and similar entities that own and operate affordable housing, energy, and other projects. These entities are primarily considered VIEs. A third party is typically the general partner or managing member and has control over the significant activities of the tax credit vehicles, and accordingly the Firm does not consolidate tax credit vehicles. The Firm generally invests in these partnerships as a limited partner and earns a return primarily through the receipt of tax credits allocated to the projects. The maximum loss exposure, represented by equity investments and funding commitments, was $24.9 billion and $19.1 billion, of which $8.7 billion and $5.5 billion was unfunded at December 31, 2020 and 2019, respectively. In order to reduce the risk of loss, the Firm assesses each project and withholds varying amounts of its capital investment until the project qualifies for tax credits. Refer to Note 25 for further information on affordable housing tax credits. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Customer municipal bond vehicles (TOB trusts)

The Firm may provide various services to customer TOB trusts, including remarketing agent, liquidity or tender option provider. In certain customer TOB transactions, the Firm, as liquidity provider, has entered into a reimbursement agreement with the Residual holder. In those transactions, upon the termination of the vehicle, the Firm has recourse to the third-party Residual holders for any shortfall. The Firm does not have any intent to protect Residual holders from potential losses on any of the underlying municipal bonds. The Firm does not consolidate customer TOB trusts, since the Firm does not have the power to make decisions that significantly impact the economic performance of the municipal bond vehicle. The Firm's maximum exposure as a liquidity provider to customer TOB trusts at December 31, 2020 and 2019, was $6.7 billion and $5.5 billion, respectively. The fair value of assets held by such VIEs at December 31, 2020 and 2019 was $10.5 billion and $8.6 billion, respectively. Refer to Note 28 for more information on off-balance sheet lending-related commitments.

Loan securitizations

The Firm has securitized and sold a variety of loans, including residential mortgage, credit card, and commercial mortgage. The purposes of these securitization transactions were to satisfy investor demand and to generate liquidity for the Firm.

For loan securitizations in which the Firm is not required to consolidate the trust, the Firm records the transfer of the loan receivable to the trust as a sale when all of the following accounting criteria for a sale are met: (1) the transferred financial assets are legally isolated from the Firm's creditors; (2) the transferee or beneficial interest holder can pledge or exchange the transferred financial assets; and (3) the Firm does not maintain effective control over the transferred financial assets (e.g., the Firm cannot repurchase the transferred assets before their maturity and it does not have the ability to unilaterally cause the holder to return the transferred assets).

For loan securitizations accounted for as a sale, the Firm recognizes a gain or loss based on the difference between the value of proceeds received (including cash, beneficial interests, or servicing assets received) and the carrying value of the assets sold. Gains and losses on securitizations are reported in noninterest revenue.

Securitization activity

The following table provides information related to the Firm's securitization activities for the years ended December 31, 2020, 2019 and 2018, related to assets held in Firm-sponsored securitization entities that were not consolidated by the Firm, and where sale accounting was achieved at the time of the securitization.

	2020		2019		2018	
Year ended December 31, (in millions)	Residential mortgage[d]	Commercial and other[e]	Residential mortgage[d]	Commercial and other[e]	Residential mortgage[d]	Commercial and other[e]
Principal securitized	**$ 7,103**	**$ 6,624**	$ 9,957	$ 9,390	$ 6,431	$ 10,159
All cash flows during the period:[a]						
Proceeds received from loan sales as financial instruments[b][c]	**$ 7,321**	**$ 6,865**	$ 10,238	$ 9,544	$ 6,449	$ 10,218
Servicing fees collected	**211**	**1**	287	2	319	2
Cash flows received on interests	**801**	**239**	507	237	411	301

(a) Excludes re-securitization transactions.
(b) Predominantly includes Level 2 assets.
(c) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.
(d) Represents prime mortgages. Excludes loan securitization activity related to U.S. GSEs and government agencies.
(e) Includes commercial mortgage and other consumer loans.

Key assumptions used to value retained interests originated during the year are shown in the table below.

Year ended December 31,	**2020**	2019	2018
Residential mortgage retained interest:			
Weighted-average life (in years)	**4.7**	4.8	7.6
Weighted-average discount rate	**8.2 %**	7.4 %	3.6 %
Commercial mortgage retained interest:			
Weighted-average life (in years)	**6.9**	6.4	5.3
Weighted-average discount rate	**3.0 %**	4.1 %	4.0 %

Loans and excess MSRs sold to U.S. government-sponsored enterprises and loans in securitization transactions pursuant to Ginnie Mae guidelines

In addition to the amounts reported in the securitization activity tables above, the Firm, in the normal course of business, sells originated and purchased mortgage loans and certain originated excess MSRs on a nonrecourse basis, predominantly to U.S. GSEs. These loans and excess MSRs are sold primarily for the purpose of securitization by the U.S. GSEs, who provide certain guarantee provisions (e.g., credit enhancement of the loans). The Firm also sells loans into securitization transactions pursuant to Ginnie Mae guidelines; these loans are typically insured or guaranteed by another U.S. government agency. The Firm does not consolidate the securitization vehicles underlying these transactions as it is not the primary beneficiary. For a limited number of loan sales, the Firm is obligated to share a portion of the credit risk associated with the sold loans with the purchaser. Refer to Note 28 for additional information about the Firm's loan sales- and securitization-related indemnifications. Refer to Note 15 for additional information about the impact of the Firm's sale of certain excess MSRs.

The following table summarizes the activities related to loans sold to the U.S. GSEs, and loans in securitization transactions pursuant to Ginnie Mae guidelines.

Year ended December 31, (in millions)	2020	2019	2018
Carrying value of loans sold	$ 81,153	$ 92,349	$ 44,609
Proceeds received from loan sales as cash	$ 45	$ 73	$ 9
Proceeds from loan sales as securities[(a)(b)]	80,186	91,422	43,671
Total proceeds received from loan sales[(c)]	$ 80,231	$ 91,495	$ 43,680
Gains/(losses) on loan sales[(d)(e)]	$ 6	$ 499	$ (93)

(a) Includes securities from U.S. GSEs and Ginnie Mae that are generally sold shortly after receipt or retained as part of the Firm's investment securities portfolio.
(b) Included in level 2 assets.
(c) Excludes the value of MSRs retained upon the sale of loans.
(d) Gains/(losses) on loan sales include the value of MSRs.
(e) The carrying value of the loans accounted for at fair value approximated the proceeds received upon loan sale.

Options to repurchase delinquent loans

In addition to the Firm's obligation to repurchase certain loans due to material breaches of representations and warranties as discussed in Note 28, the Firm also has the option to repurchase delinquent loans that it services for Ginnie Mae loan pools, as well as for other U.S. government agencies under certain arrangements. The Firm typically elects to repurchase delinquent loans from Ginnie Mae loan pools as it continues to service them and/or manage the foreclosure process in accordance with the applicable requirements, and such loans continue to be insured or guaranteed. When the Firm's repurchase option becomes exercisable, such loans must be reported on the Consolidated balance sheets as a loan with a corresponding liability. Refer to Note 12 for additional information.

The following table presents loans the Firm repurchased or had an option to repurchase, real estate owned, and foreclosed government-guaranteed residential mortgage loans recognized on the Firm's Consolidated balance sheets as of December 31, 2020 and 2019. Substantially all of these loans and real estate are insured or guaranteed by U.S. government agencies.

December 31, (in millions)	2020	2019
Loans repurchased or option to repurchase[(a)]	$ 1,413	$ 2,941
Real estate owned	9	41
Foreclosed government-guaranteed residential mortgage loans[(b)]	64	198

(a) Predominantly all of these amounts relate to loans that have been repurchased from Ginnie Mae loan pools.
(b) Relates to voluntary repurchases of loans, which are included in accrued interest and accounts receivable.

Loan delinquencies and liquidation losses

The table below includes information about components of and delinquencies related to nonconsolidated securitized financial assets held in Firm-sponsored private-label securitization entities, in which the Firm has continuing involvement as of December 31, 2020 and 2019.

	Securitized assets		90 days past due		Net liquidation losses	
As of or for the year ended December 31, (in millions)	2020	2019	2020	2019	2020	2019
Securitized loans						
Residential mortgage:						
Prime/ Alt-A & option ARMs	$ 41,265	$ 48,734	$ 4,988	$ 2,449	$ 212	$ 579
Subprime	12,154	13,490	2,406	1,813	179	532
Commercial and other	92,351	80,878	5,958	187	30	445
Total loans securitized	$ 145,770	$ 143,102	$ 13,352	$ 4,449	$ 421	$ 1,556

Note 15 – Goodwill and Mortgage servicing rights

Goodwill

Goodwill is recorded upon completion of a business combination as the difference between the purchase price and the fair value of the net assets acquired, and can be adjusted up to one year from the acquisition date as more information is obtained about the fair value of assets acquired and liabilities assumed. Subsequent to initial recognition, goodwill is not amortized but is tested for impairment during the fourth quarter of each fiscal year, or more often if events or circumstances, such as adverse changes in the business climate, indicate that there may be an impairment.

The goodwill associated with each business combination is allocated to the related reporting units, which are determined based on how the Firm's businesses are managed and how they are reviewed. The following table presents goodwill attributed to the business segments.

December 31, (in millions)	2020	2019	2018
Consumer & Community Banking[(a)]	$ 31,311	$ 30,133	$ 30,084
Corporate & Investment Bank[(a)]	7,913	7,901	7,721
Commercial Banking	2,985	2,982	2,860
Asset & Wealth Management[(a)]	7,039	6,807	6,806
Total goodwill	$ 49,248	$ 47,823	$ 47,471

(a) In 2020, goodwill of $959 million was transferred from CCB to CIB and $51 million from AWM to CCB related to business realignments. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 32 for additional information on these realignments.

The following table presents changes in the carrying amount of goodwill.

Year ended December 31, (in millions)	2020	2019	2018
Balance at beginning of period	$ 47,823	$ 47,471	$ 47,507
Changes during the period from:			
Business combinations[(a)]	1,412	349	–
Other[(b)]	13	3	(36)
Balance at December 31,	$ 49,248	$ 47,823	$ 47,471

(a) For 2020, represents estimated goodwill associated with the acquisitions of cxLoyalty in CCB and 55ip in AWM. For 2019, represents goodwill associated with the acquisition of InstaMed. This goodwill was allocated to CIB, CB and CCB.
(b) Primarily relates to foreign currency adjustments.

Goodwill impairment testing

The Firm's goodwill was not impaired at December 31, 2020, 2019 and 2018.

Effective January 1, 2020, the Firm adopted new accounting guidance related to goodwill impairment testing. The adoption of the guidance requires recognition of an impairment loss when the estimated fair value of a reporting unit falls below its carrying value. It eliminated the requirement that an impairment loss be recognized only if the estimated implied fair value of the goodwill is below its carrying value.

The goodwill impairment test is performed by comparing the current fair value of each reporting unit with its carrying value. If the fair value is in excess of the carrying value, then the reporting unit's goodwill is considered not to be impaired. If the fair value is less than the carrying value, then an impairment charge is recognized for the amount by which the reporting unit's carrying value exceeds its fair value, up to the amount of goodwill allocated to that reporting unit.

The Firm uses the reporting units' allocated capital plus goodwill and other intangible assets as a proxy for the carrying values of equity for the reporting units in the goodwill impairment testing. Reporting unit equity is determined on a similar basis as the allocation of capital to the LOBs which takes into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. Proposed LOB capital levels are incorporated into the Firm's annual budget process, which is reviewed by the Firm's Board of Directors. Allocated capital is further reviewed periodically and updated as needed.

The primary method the Firm uses to estimate the fair value of its reporting units is the income approach. This approach projects cash flows for the forecast period and uses the perpetuity growth method to calculate terminal values. These cash flows and terminal values are then discounted using an appropriate discount rate. Projections of cash flows are based on the reporting units' earnings forecasts which are reviewed with senior management of the Firm. The discount rate used for each reporting unit represents an estimate of the cost of equity for that reporting unit and is determined considering the Firm's overall estimated cost of equity (estimated using the Capital Asset Pricing Model), as adjusted for the risk characteristics specific to each reporting unit (for example, for higher levels of risk or uncertainty associated with the business or management's forecasts and assumptions). To assess the reasonableness of the discount rates used for each reporting unit, management compares the discount rate to the estimated cost of equity for publicly traded institutions with similar businesses and risk characteristics. In addition, the weighted average cost of equity (aggregating the various reporting units) is compared with the Firm's overall estimated cost of equity to ensure reasonableness. The valuations derived from the discounted cash flow analysis are then compared with market-based trading and transaction multiples for relevant competitors. Trading and transaction comparables are used as general indicators to assess the overall reasonableness of the estimated fair values, although precise conclusions generally cannot be drawn due to the differences that naturally exist between the Firm's businesses and competitor institutions.

Management also takes into consideration a comparison between the aggregate fair values of the Firm's reporting units and JPMorgan Chase's market capitalization. In evaluating this comparison, management considers several factors, including (i) a control premium that would exist in a market transaction, (ii) factors related to the level of execution risk that would exist at the Firmwide level that do not exist at the reporting unit level and (iii) short-term market volatility and other factors that do not directly affect the value of individual reporting units.

Unanticipated declines in business performance, increases in credit losses, increases in capital requirements, as well as deterioration in economic or market conditions, adverse regulatory or legislative changes or increases in the estimated market cost of equity, could cause the estimated fair values of the Firm's reporting units to decline in the future, which could result in a material impairment charge to earnings in a future period related to some portion of the associated goodwill.

Mortgage servicing rights

MSRs represent the fair value of expected future cash flows for performing servicing activities for others. The fair value considers estimated future servicing fees and ancillary revenue, offset by estimated costs to service the loans, and generally declines over time as net servicing cash flows are received, effectively amortizing the MSR asset against contractual servicing and ancillary fee income. MSRs are either purchased from third parties or recognized upon sale or securitization of mortgage loans if servicing is retained.

As permitted by U.S. GAAP, the Firm has elected to account for its MSRs at fair value. The Firm treats its MSRs as a single class of servicing assets based on the availability of market inputs used to measure the fair value of its MSR asset and its treatment of MSRs as one aggregate pool for risk management purposes. The Firm estimates the fair value of MSRs using an option-adjusted spread ("OAS") model, which projects MSR cash flows over multiple interest rate scenarios in conjunction with the Firm's prepayment model, and then discounts these cash flows at risk-adjusted rates. The model considers portfolio characteristics, contractually specified servicing fees, prepayment assumptions, delinquency rates, costs to service, late charges and other ancillary revenue, and other economic factors. The Firm compares fair value estimates and assumptions to observable market data where available, and also considers recent market activity and actual portfolio experience.

The fair value of MSRs is sensitive to changes in interest rates, including their effect on prepayment speeds. MSRs typically decrease in value when interest rates decline because declining interest rates tend to increase prepayments and therefore reduce the expected life of the net servicing cash flows that comprise the MSR asset. Conversely, securities (e.g., mortgage-backed securities), and certain derivatives (e.g., those for which the Firm receives fixed-rate interest payments) increase in value when interest rates decline. JPMorgan Chase uses combinations of derivatives and securities to manage the risk of changes in the fair value of MSRs. The intent is to offset any interest-rate related changes in the fair value of MSRs with changes in the fair value of the related risk management instruments.

The following table summarizes MSR activity for the years ended December 31, 2020, 2019 and 2018.

As of or for the year ended December 31, (in millions, except where otherwise noted)	2020	2019	2018
Fair value at beginning of period	**$ 4,699**	$ 6,130	$ 6,030
MSR activity:			
Originations of MSRs	**944**	1,384	931
Purchase of MSRs	**248**	105	315
Disposition of MSRs[(a)]	**(176)**	(789)	(636)
Net additions/(Dispositions)	**1,016**	700	610
Changes due to collection/realization of expected cash flows	**(899)**	(951)	(740)
Changes in valuation due to inputs and assumptions:			
Changes due to market interest rates and other[(b)]	**(1,568)**	(893)	300
Changes in valuation due to other inputs and assumptions:			
Projected cash flows (e.g., cost to service)	**(54)**	(333) [(e)]	15
Discount rates	**199**	153	24
Prepayment model changes and other[(c)]	**(117)**	(107)	(109)
Total changes in valuation due to other inputs and assumptions	**28**	(287)	(70)
Total changes in valuation due to inputs and assumptions	**(1,540)**	(1,180)	230
Fair value at December 31,	**$ 3,276**	$ 4,699	$ 6,130
Change in unrealized gains/(losses) included in income related to MSRs held at December 31,	**$ (1,540)**	$ (1,180)	$ 230
Contractual service fees, late fees and other ancillary fees included in income	**1,325**	1,639	1,778
Third-party mortgage loans serviced at December 31, (in billions)	**448.0**	522.0	521.0
Servicer advances, net of an allowance for uncollectible amounts, at December 31, (in billions)[(d)]	**1.8**	2.0	3.0

(a) Includes excess MSRs transferred to agency-sponsored trusts in exchange for stripped mortgage backed securities ("SMBS"). In each transaction, a portion of the SMBS was acquired by third parties at the transaction date; the Firm acquired the remaining balance of those SMBS as trading securities.
(b) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(c) Represents changes in prepayments other than those attributable to changes in market interest rates.
(d) Represents amounts the Firm pays as the servicer (e.g., scheduled principal and interest, taxes and insurance), which will generally be reimbursed within a short period of time after the advance from future cash flows from the trust or the underlying loans. The Firm's credit risk associated with these servicer advances is minimal because reimbursement of the advances is typically senior to all cash payments to investors. In addition, the Firm maintains the right to stop payment to investors if the collateral is insufficient to cover the advance. However, certain of these servicer advances may not be recoverable if they were not made in accordance with applicable rules and agreements.
(e) The decrease in projected cash flows was largely related to default servicing assumption updates.

The following table presents the components of mortgage fees and related income (including the impact of MSR risk management activities) for the years ended December 31, 2020, 2019 and 2018.

Year ended December 31, (in millions)	2020	2019	2018
CCB mortgage fees and related income			
Net production revenue	**$ 2,629**	$ 1,618	$ 268
Net mortgage servicing revenue:			
Operating revenue:			
Loan servicing revenue	**1,367**	1,533	1,835
Changes in MSR asset fair value due to collection/realization of expected cash flows	**(899)**	(951)	(740)
Total operating revenue	**468**	582	1,095
Risk management:			
Changes in MSR asset fair value due to market interest rates and other[a]	**(1,568)**	(893)	300
Other changes in MSR asset fair value due to other inputs and assumptions in model[b]	**28**	(287)	(70)
Change in derivative fair value and other	**1,522**	1,015	(341)
Total risk management	**(18)**	(165)	(111)
Total net mortgage servicing revenue	**450**	417	984
Total CCB mortgage fees and related income	**3,079**	2,035	1,252
All other	**12**	1	2
Mortgage fees and related income	**$ 3,091**	$ 2,036	$ 1,254

(a) Represents both the impact of changes in estimated future prepayments due to changes in market interest rates, and the difference between actual and expected prepayments.
(b) Represents the aggregate impact of changes in model inputs and assumptions such as projected cash flows (e.g., cost to service), discount rates and changes in prepayments other than those attributable to changes in market interest rates (e.g., changes in prepayments due to changes in home prices).

The table below outlines the key economic assumptions used to determine the fair value of the Firm's MSRs at December 31, 2020 and 2019, and outlines the sensitivities of those fair values to immediate adverse changes in those assumptions, as defined below.

December 31, (in millions, except rates)	2020	2019
Weighted-average prepayment speed assumption (constant prepayment rate)	**14.90 %**	11.67 %
Impact on fair value of 10% adverse change	**$ (206)**	$ (200)
Impact on fair value of 20% adverse change	**(392)**	(384)
Weighted-average option adjusted spread[a]	**7.19 %**	7.93 %
Impact on fair value of 100 basis points adverse change	**$ (134)**	$ (169)
Impact on fair value of 200 basis points adverse change	**(258)**	(326)

(a) Includes the impact of operational risk and regulatory capital.

Changes in fair value based on variations in assumptions generally cannot be easily extrapolated, because the relationship of the change in the assumptions to the change in fair value are often highly interrelated and may not be linear. In this table, the effect that a change in a particular assumption may have on the fair value is calculated without changing any other assumption. In reality, changes in one factor may result in changes in another, which would either magnify or counteract the impact of the initial change.

Note 16 – Premises and equipment

Premises and equipment, including leasehold improvements, are carried at cost less accumulated depreciation and amortization. JPMorgan Chase computes depreciation using the straight-line method over the estimated useful life of an asset. For leasehold improvements, the Firm uses the straight-line method computed over the lesser of the remainder of the lease term, or estimated useful life of the improvements.

JPMorgan Chase capitalizes certain costs associated with the acquisition or development of internal-use software. Once the software is ready for its intended use, these costs are amortized on a straight-line basis over the software's expected useful life and reviewed for impairment on an ongoing basis.

Note 17 – Deposits

At December 31, 2020 and 2019, noninterest-bearing and interest-bearing deposits were as follows.

December 31, (in millions)	2020	2019
U.S. offices		
Noninterest-bearing (included **$9,873** and $22,637 at fair value)[a]	**$ 572,711**	$ 395,667
Interest-bearing (included **$2,567** and $2,534 at fair value)[a]	**1,197,032**	876,156
Total deposits in U.S. offices	**1,769,743**	1,271,823
Non-U.S. offices		
Noninterest-bearing (included **$1,486** and $1,980 at fair value)[a]	**23,435**	20,087
Interest-bearing (included **$558** and $1,438 at fair value)[a]	**351,079**	270,521
Total deposits in non-U.S. offices	**374,514**	290,608
Total deposits	**$ 2,144,257**	$1,562,431

(a) Includes structured notes classified as deposits for which the fair value option has been elected. Refer to Note 3 for further discussion.

At December 31, 2020 and 2019, time deposits in denominations of $250,000 or more were as follows.

December 31, (in millions)	2020	2019
U.S. offices	**$ 33,812**	$ 44,127
Non-U.S. offices	**50,523**	50,840
Total	**$ 84,335**	$ 94,967

At December 31, 2020, the maturities of interest-bearing time deposits were as follows.

December 31, 2020 (in millions)	U.S.	Non-U.S.	**Total**
2021	$ 44,785	$ 48,142	$ 92,927
2022	1,451	175	1,626
2023	259	7	266
2024	210	36	246
2025	197	633	830
After 5 years	451	298	749
Total	$ 47,353	$ 49,291	$ 96,644

Note 18 - Leases

Firm as lessee

At December 31, 2020, JPMorgan Chase and its subsidiaries were obligated under a number of noncancelable leases, predominantly operating leases for premises and equipment used primarily for business purposes. These leases generally have terms of 20 years or less, determined based on the contractual maturity of the lease, and include periods covered by options to extend or terminate the lease when the Firm is reasonably certain that it will exercise those options. All leases with lease terms greater than twelve months are reported as a lease liability with a corresponding right-of-use ("ROU") asset. None of these lease agreements impose restrictions on the Firm's ability to pay dividends, engage in debt or equity financing transactions or enter into further lease agreements. Certain of these leases contain escalation clauses that will increase rental payments based on maintenance, utility and tax increases, which are non-lease components. The Firm elected not to separate lease and non-lease components of a contract for its real estate leases. As such, real estate lease payments represent payments on both lease and non-lease components.

Operating lease liabilities and ROU assets are recognized at the lease commencement date based on the present value of the future minimum lease payments over the lease term. The future lease payments are discounted at a rate that represents the Firm's collateralized borrowing rate for financing instruments of a similar term and are included in accounts payable and other liabilities. The operating lease ROU asset, included in premises and equipment, also includes any lease prepayments made, plus initial direct costs incurred, less any lease incentives received. Rental expense associated with operating leases is recognized on a straight-line basis over the lease term, and generally included in occupancy expense in the Consolidated statements of income.

The following tables provide information related to the Firm's operating leases:

December 31, (in millions, except where otherwise noted)	2020	2019
Right-of-use assets	$ 8,006	$ 8,190
Lease liabilities	8,508	8,505
Weighted average remaining lease term (in years)	8.7	8.8
Weighted average discount rate	3.48 %	3.68 %
Supplemental cash flow information		
Cash paid for amounts included in the measurement of lease liabilities - operating cash flows	$ 1,626	$ 1,572
Supplemental non-cash information		
Right-of-use assets obtained in exchange for operating lease obligations	$ 1,350	$ 1,413

Year ended December 31, (in millions)	2020	2019
Rental expense		
Gross rental expense	$ 2,094	$ 2,057
Sublease rental income	(166)	(184)
Net rental expense	$ 1,928	$ 1,873

The following table presents future payments under operating leases as of December 31, 2020:

Year ended December 31, (in millions)	
2021	$ 1,606
2022	1,435
2023	1,270
2024	1,123
2025	947
After 2025	3,602
Total future minimum lease payments	9,983
Less: Imputed interest	(1,475)
Total	$ 8,508

In addition to the table above, as of December 31, 2020, the Firm had additional future operating lease commitments of $1.2 billion that were signed but had not yet commenced. These operating leases will commence between 2021 and 2023 with lease terms up to 25 years.

Firm as lessor

The Firm provides auto and equipment lease financing to its customers through lease arrangements with lease terms that may contain renewal, termination and/or purchase options. Generally, the Firm's lease financings are operating leases. These assets subject to operating leases are recognized in other assets on the Firm's Consolidated balance sheets and are depreciated on a straight-line basis over the lease term to reduce the asset to its estimated residual value. Depreciation expense is included in technology, communications and equipment expense in the Consolidated statements of income. The Firm's lease income is generally recognized on a straight-line basis over the lease term and is included in other income in the Consolidated statements of income.

On a periodic basis, the Firm assesses leased assets for impairment, and if the carrying amount of the leased asset exceeds the undiscounted cash flows from the lease payments and the estimated residual value upon disposition of the leased asset, an impairment loss is recognized.

The risk of loss on auto and equipment leased assets relating to the residual value of the leased assets is monitored through projections of the asset residual values at lease origination and periodic review of residual values, and is mitigated through arrangements with certain manufacturers or lessees.

The following table presents the carrying value of assets subject to leases reported on the Consolidated balance sheets:

December 31, (in millions)	2020	2019
Carrying value of assets subject to operating leases, net of accumulated depreciation	**$ 21,155**	$ 23,587
Accumulated depreciation	**6,388**	6,121

The following table presents the Firm's operating lease income and the related depreciation expense on the Consolidated statements of income:

Year ended December 31, (in millions)	2020	2019	2018
Operating lease income	**$ 5,539**	$ 5,455	$ 4,540
Depreciation expense	**4,257**	4,157	3,522

The following table presents future receipts under operating leases as of December 31, 2020:

Year ended December 31, (in millions)	
2021	$ 3,686
2022	2,084
2023	613
2024	52
2025	24
After 2025	34
Total future minimum lease receipts	$ 6,493

Note 19 – Accounts payable and other liabilities

Accounts payable and other liabilities consist of brokerage payables, which include payables to customers and payables related to security purchases that did not settle, as well as other accrued expenses, such as income tax payables, operating lease liabilities, credit card rewards liability, and litigation reserves.

The following table details the components of accounts payable and other liabilities.

December 31, (in millions)	2020	2019
Brokerage payables	**$ 140,291**	$ 118,375
Other payables and liabilities[(a)]	**92,308**	92,032
Total accounts payable and other liabilities	**$ 232,599**	$ 210,407

(a) Includes credit card rewards liability of $7.7 billion and $6.4 billion at December 31, 2020 and 2019, respectively.

Note 20 – Long-term debt

JPMorgan Chase issues long-term debt denominated in various currencies, predominantly U.S. dollars, with both fixed and variable interest rates. Included in senior and subordinated debt below are various equity-linked or other indexed instruments, which the Firm has elected to measure at fair value. Changes in fair value are recorded in principal transactions revenue in the Consolidated statements of income, except for unrealized gains/(losses) due to DVA which are recorded in OCI. The following table is a summary of long-term debt carrying values (including unamortized premiums and discounts, issuance costs, valuation adjustments and fair value adjustments, where applicable) by remaining contractual maturity as of December 31, 2020.

By remaining maturity at December 31, (in millions, except rates)		2020				2019
		Under 1 year	1-5 years	After 5 years	**Total**	Total
Parent company						
Senior debt:	Fixed rate	**$ 9,225**	**$ 49,987**	**$ 114,296**	**$ 173,508**	$ 161,198
	Variable rate	**1,580**	**8,644**	**8,353**	**18,577**	18,615
	Interest rates[a]	**1.33-4.63%**	**0.50-4.50%**	**0.17-6.40%**	**0.17-6.40%**	0.15-6.40%
Subordinated debt:	Fixed rate	**$ –**	**$ 5,678**	**$ 13,577**	**$ 19,255**	$ 15,155
	Variable rate	**–**	**–**	**9**	**9**	9
	Interest rates[a]	**–%**	**3.38-7.75%**	**2.96-8.00%**	**2.96-8.00%**	3.38-8.00%
	Subtotal	**$ 10,805**	**$ 64,309**	**$ 136,235**	**$ 211,349**	$ 194,977
Subsidiaries						
Federal Home Loan Banks advances:	Fixed rate	**$ 7**	**$ 45**	**$ 71**	**$ 123**	$ 135
	Variable rate	**3,000**	**11,000**	**–**	**14,000**	28,500
	Interest rates[a]	**0.57-0.60%**	**0.19-0.24%**	**4.66-7.73%**	**0.19-7.73%**	1.67-8.31% [h]
Senior debt:	Fixed rate	**$ 1,067**	**$ 3,157**	**$ 11,534**	**$ 15,758**	$ 19,597
	Variable rate	**12,055**	**18,448**	**7,608**	**38,111**	45,861
	Interest rates[a]	**–%**	**7.28%**	**1.00-1.30%**	**1.00-7.28%**	1.00-9.43%
Subordinated debt:	Fixed rate	**$ –**	**$ 309**	**$ –**	**$ 309**	$ 305
	Variable rate	**–**	**–**	**–**	**–**	–
	Interest rates[a]	**– %**	**8.25 %**	**– %**	**8.25 %**	8.25 %
	Subtotal	**$ 16,129**	**$ 32,959**	**$ 19,213**	**$ 68,301**	$ 94,398
Junior subordinated debt:	Fixed rate	**$ –**	**$ –**	**$ 738**	**$ 738**	$ 693
	Variable rate	**–**	**–**	**1,297**	**1,297**	1,430
	Interest rates[a]	**–%**	**–%**	**0.71-8.75%**	**0.71-8.75%**	2.41-8.75%
	Subtotal	**$ –**	**$ –**	**$ 2,035**	**$ 2,035**	$ 2,123
Total long-term debt[b][c][d]		**$ 26,934**	**$ 97,268**	**$ 157,483**	**$ 281,685** [f][g]	$ 291,498
Long-term beneficial interests:	Fixed rate	**$ 625**	**$ 1,744**	**$ –**	**$ 2,369**	$ 2,990
	Variable rate	**1,924**	**650**	**210**	**2,784**	3,748
	Interest rates	**0.36-2.77%**	**0.00-2.39%**	**0.00-3.75%**	**0.00-3.75%**	0.00-4.06%
Total long-term beneficial interests[e]		**$ 2,549**	**$ 2,394**	**$ 210**	**$ 5,153**	$ 6,738

(a) The interest rates shown are the range of contractual rates in effect at December 31, 2020 and 2019, respectively, including non-U.S. dollar fixed- and variable-rate issuances, which excludes the effects of the associated derivative instruments used in hedge accounting relationships, if applicable. The use of these derivative instruments modifies the Firm's exposure to the contractual interest rates disclosed in the table above. Including the effects of the hedge accounting derivatives, the range of modified rates in effect at December 31, 2020, for total long-term debt was (0.40)% to 7.28%, versus the contractual range of 0.17% to 8.75% presented in the table above. The interest rate ranges shown exclude structured notes accounted for at fair value.

(b) Included long-term debt of $17.2 billion and $32.0 billion secured by assets totaling $166.4 billion and $186.1 billion at December 31, 2020 and 2019, respectively. The amount of long-term debt secured by assets does not include amounts related to hybrid instruments.

(c) Included $76.8 billion and $75.7 billion of long-term debt accounted for at fair value at December 31, 2020 and 2019, respectively.

(d) Included $16.1 billion and $14.0 billion of outstanding zero-coupon notes at December 31, 2020 and 2019, respectively. The aggregate principal amount of these notes at their respective maturities is $45.3 billion and $39.7 billion, respectively. The aggregate principal amount reflects the contractual principal payment at maturity, which may exceed the contractual principal payment at the Firm's next call date, if applicable.

(e) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs. Also included $41 million and $36 million accounted for at fair value at December 31, 2020 and 2019, respectively. Excluded short-term commercial paper and other short-term beneficial interests of $12.4 billion and $11.1 billion at December 31, 2020 and 2019, respectively.

(f) At December 31, 2020, long-term debt in the aggregate of $151.3 billion was redeemable at the option of JPMorgan Chase, in whole or in part, prior to maturity, based on the terms specified in the respective instruments.

(g) The aggregate carrying values of debt that matures in each of the five years subsequent to 2020 is $26.9 billion in 2021, $18.4 billion in 2022, $32.2 billion in 2023, $29.6 billion in 2024 and $17.1 billion in 2025.

(h) Prior-period amounts have been revised to conform with the current presentation.

The weighted-average contractual interest rates for total long-term debt excluding structured notes accounted for at fair value were 2.89% and 3.13% as of December 31, 2020 and 2019, respectively. In order to modify exposure to interest rate and currency exchange rate movements, JPMorgan Chase utilizes derivative instruments, primarily interest rate and cross-currency interest rate swaps, in conjunction with some of its debt issuances. The use of these instruments modifies the Firm's interest expense on the associated debt. The modified weighted-average interest rates for total long-term debt, including the effects of related derivative instruments, were 1.58% and 3.19% as of December 31, 2020 and 2019, respectively.

JPMorgan Chase & Co. has guaranteed certain long-term debt of its subsidiaries, including structured notes. These guarantees rank on parity with the Firm's other unsecured and unsubordinated indebtedness. The amount of such guaranteed long-term debt and structured notes was $13.8 billion and $14.4 billion at December 31, 2020 and 2019, respectively.

The Firm's unsecured debt does not contain requirements that would call for an acceleration of payments, maturities or changes in the structure of the existing debt, provide any limitations on future borrowings or require additional collateral, based on unfavorable changes in the Firm's credit ratings, financial ratios, earnings or stock price.

Note 21 – Preferred stock

At December 31, 2020 and 2019, JPMorgan Chase was authorized to issue 200 million shares of preferred stock, in one or more series, with a par value of $1 per share. In the event of a liquidation or dissolution of the Firm, JPMorgan Chase’s preferred stock then outstanding takes precedence over the Firm’s common stock with respect to the payment of dividends and the distribution of assets.

The following is a summary of JPMorgan Chase’s non-cumulative preferred stock outstanding as of December 31, 2020 and 2019.

	Shares[(a)] December 31,		Carrying value (in millions) December 31,					Floating annualized rate of three-month LIBOR/Term SOFR plus:	Dividend declared per share[(c)] Year ended December 31,			
	2020	2019	2020	2019	Issue date	Contractual rate in effect at December 31, 2020	Earliest redemption date[(b)]		2020	2019	2018	
Fixed-rate:												
Series P	–	–	$ –	$ –	2/5/2013	– %	3/1/2018	NA	$–	$545.00	$545.00	
Series T	–	–	–	–	1/30/2014	–	3/1/2019	NA	–	167.50	670.00	
Series W	–	–	–	–	6/23/2014	–	9/1/2019	NA	–	472.50	630.00	
Series Y	–	143,000	–	1,430	2/12/2015	–	3/1/2020	NA	**153.13**	612.52	612.52	
Series AA	**142,500**	142,500	**1,425**	1,425	6/4/2015	**6.100**	9/1/2020	NA	**610.00**	610.00	610.00	
Series BB	**115,000**	115,000	**1,150**	1,150	7/29/2015	**6.150**	9/1/2020	NA	**615.00**	615.00	615.00	
Series DD	**169,625**	169,625	**1,696**	1,696	9/21/2018	**5.750**	12/1/2023	NA	**575.00**	575.00	111.81	(d)
Series EE	**185,000**	185,000	**1,850**	1,850	1/24/2019	**6.000**	3/1/2024	NA	**600.00**	511.67	NA	(e)
Series GG	**90,000**	90,000	**900**	900	11/7/2019	**4.750**	12/1/2024	NA	**506.67**	NA	NA	(f)
Fixed-to-floating-rate:												
Series I	**293,375**	293,375	**$ 2,934**	$ 2,934	4/23/2008	**LIBOR + 3.47%**	4/30/2018	LIBOR + 3.47%	**$428.03**	$593.23	$646.38	(g)
Series Q	**150,000**	150,000	**1,500**	1,500	4/23/2013	**5.150**	5/1/2023	LIBOR + 3.25	**515.00**	515.00	515.00	
Series R	**150,000**	150,000	**1,500**	1,500	7/29/2013	**6.000**	8/1/2023	LIBOR + 3.30	**600.00**	600.00	600.00	
Series S	**200,000**	200,000	**2,000**	2,000	1/22/2014	**6.750**	2/1/2024	LIBOR + 3.78	**675.00**	675.00	675.00	
Series U	**100,000**	100,000	**1,000**	1,000	3/10/2014	**6.125**	4/30/2024	LIBOR + 3.33	**612.50**	612.50	612.50	
Series V	**250,000**	250,000	**2,500**	2,500	6/9/2014	**LIBOR + 3.32%**	7/1/2019	LIBOR + 3.32	**436.85**	534.09	500.00	(h)
Series X	**160,000**	160,000	**1,600**	1,600	9/23/2014	**6.100**	10/1/2024	LIBOR + 3.33	**610.00**	610.00	610.00	
Series Z	**200,000**	200,000	**2,000**	2,000	4/21/2015	**LIBOR + 3.80%**	5/1/2020	LIBOR + 3.80	**453.52**	530.00	530.00	(i)
Series CC	**125,750**	125,750	**1,258**	1,258	10/20/2017	**4.625**	11/1/2022	LIBOR + 2.58	**462.50**	462.50	462.50	
Series FF	**225,000**	225,000	**2,250**	2,250	7/31/2019	**5.000**	8/1/2024	SOFR + 3.38	**500.00**	251.39	NA	(j)
Series HH	**300,000**	–	**3,000**	–	1/23/2020	**4.600**	2/1/2025	SOFR + 3.125	**470.22**	NA	NA	(k)
Series II	**150,000**	–	**1,500**	–	2/24/2020	**4.000**	4/1/2025	SOFR + 2.745	**341.11**	NA	NA	(l)
Total preferred stock	**3,006,250**	2,699,250	**$ 30,063**	$ 26,993								

(a) Represented by depositary shares.
(b) Fixed-to-floating rate notes convert to a floating rate at the earliest redemption date.
(c) Dividends are declared quarterly. Dividends are payable quarterly on fixed-rate preferred stock. Dividends are payable semiannually on fixed-to-floating-rate preferred stock while at a fixed rate, and payable quarterly after converting to a floating rate.
(d) Dividends in the amount of $111.81 per share were declared on December 1, 2018 and include dividends from the original issue date of September 21, 2018 through November 30, 2018.
(e) Dividends in the amount of $211.67 per share were declared on April 12,2019 and include dividends from the original issue date of January 24, 2019 through May 31, 2019. Dividends in the amount of $150.00 per share were declared thereafter on July 10, 2019 and October 9, 2019.
(f) No dividends were declared for Series GG from the original issue date of November 7, 2019 through December 31, 2019.
(g) The dividend rate for Series I preferred stock became floating and payable quarterly starting on April 30, 2018; prior to which the dividend rate was fixed at 7.90% or $395.00 per share payable semi annually.
(h) The dividend rate for Series V preferred stock became floating and payable quarterly starting on July 1, 2019; prior to which the dividend rate was fixed at 5% or $250.00 per share payable semi annually. The Firm declared a dividend of $144.11 and $139.98 per share on outstanding Series V preferred stock on August 15, 2019 and November 15, 2019, respectively.
(i) Prior to May 1, 2020, the dividend rate was fixed at 5.3%.
(j) Dividends in the amount of $126.39 per share were declared on September 9, 2019 and include dividends from the original issue date of July 31, 2019 through October 31, 2019. Dividends in the amount of $125.00 per share were declared thereafter on December 10, 2019.
(k) Dividends in the amount of $125.22 per share were declared on March 13, 2020 and include dividends from the original issue date of January 23, 2020 through April 30, 2020. Dividends in the amount of $115.00 per share were declared quarterly thereafter.
(l) Dividends in the amount of $141.11 per share were declared on May 15, 2020 and include dividends from the original issue date of February 24, 2020 through June 30, 2020. Dividends in the amount of $100.00 per share were declared quarterly thereafter.

Each series of preferred stock has a liquidation value and redemption price per share of $10,000, plus accrued but unpaid dividends. The aggregate liquidation value was $30.5 billion at December 31, 2020.

On March 1, 2020, the Firm redeemed all $1.43 billion of its 6.125% non-cumulative preferred stock, Series Y.

On December 1, 2019, the Firm redeemed all $900 million of its 5.45% non-cumulative preferred stock, Series P.

On October 30, 2019, the Firm redeemed $1.37 billion of its fixed-to-floating rate non-cumulative perpetual preferred stock, Series I.

On September 1, 2019, the Firm redeemed all $880 million of its 6.30% non-cumulative preferred stock, Series W.

On March 1, 2019, the Firm redeemed all $925 million of its 6.70% non-cumulative preferred stock, Series T.

Redemption rights

Each series of the Firm's preferred stock may be redeemed on any dividend payment date on or after the earliest redemption date for that series. All outstanding preferred stock series except Series I may also be redeemed following a "capital treatment event," as described in the terms of each series. Any redemption of the Firm's preferred stock is subject to non-objection from the Board of Governors of the Federal Reserve System (the "Federal Reserve").

Note 22 – Common stock

At December 31, 2020 and 2019, JPMorgan Chase was authorized to issue 9.0 billion shares of common stock with a par value of $1 per share.

Common shares issued (reissuances from treasury) by JPMorgan Chase during the years ended December 31, 2020, 2019 and 2018 were as follows.

Year ended December 31, (in millions)	2020	2019	2018
Total issued – balance at January 1	**4,104.9**	4,104.9	4,104.9
Treasury – balance at January 1	**(1,020.9)**	(829.1)	(679.6)
Repurchase	**(50.0)**	(213.0)	(181.5)
Reissuance:			
Employee benefits and compensation plans	**14.2**	20.4	21.7
Warrant exercise	**—**	—	9.4
Employee stock purchase plans	**1.2**	0.8	0.9
Total reissuance	**15.4**	21.2	32.0
Total treasury – balance at December 31	**(1,055.5)**	(1,020.9)	(829.1)
Outstanding at December 31	**3,049.4**	3,084.0	3,275.8

There were no warrants to purchase shares of common stock ("Warrants") outstanding at December 31, 2020 and December 31, 2019 as any Warrants that were not exercised on or before October 29, 2018 have expired.

On March 15, 2020, in response to the economic disruptions caused by the COVID-19 pandemic, the Firm temporarily suspended repurchases of its common stock. Subsequently, the Federal Reserve directed all large banks, including the Firm, to discontinue net share repurchases through the end of 2020. On December 18, 2020, the Federal Reserve announced that all large banks, including the Firm, could resume share repurchases commencing in the first quarter of 2021, subject to certain restrictions. The Firm's Board of Directors has authorized a new common share repurchase program for up to $30 billion.

The following table sets forth the Firm's repurchases of common stock for the years ended December 31, 2020, 2019 and 2018. There were no Warrants repurchased during 2018.

Year ended December 31, (in millions)	2020	2019	2018
Total number of shares of common stock repurchased	**50.0**	213.0	181.5
Aggregate purchase price of common stock repurchases	**$ 6,397**	$24,121	$19,983

The authorization to repurchase common shares is utilized at management's discretion, and the timing of purchases and the exact amount of common shares that may be repurchased is subject to various factors, including market conditions; legal and regulatory considerations affecting the amount and timing of repurchase activity; the Firm's capital position (taking into account goodwill and intangibles); internal capital generation; and alternative investment opportunities. The repurchase program does not include specific price targets or timetables; may be suspended by management at any time; and may be executed through open market purchases or privately negotiated transactions, or utilizing Rule 10b5-1 plans, which are written trading plans that the Firm may enter into from time to time under Rule 10b5-1 of the Securities Exchange Act of 1934 and which allow the Firm to repurchase its common shares during periods when it may otherwise not be repurchasing common shares —for example, during internal trading blackout periods.

As of December 31, 2020, approximately 62.1 million shares of common stock were reserved for issuance under various employee incentive, compensation, option and stock purchase plans, and directors' compensation plans.

Note 23 – Earnings per share

Basic earnings per share ("EPS") is calculated using the two-class method. Under the two-class method, all earnings (distributed and undistributed) are allocated to common stock and participating securities. JPMorgan Chase grants RSUs under its share-based compensation programs, predominantly all of which entitle recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to dividends paid to holders of the Firm's common stock. These unvested RSUs meet the definition of participating securities based on their respective rights to receive nonforfeitable dividends, and they are treated as a separate class of securities in computing basic EPS. Participating securities are not included as incremental shares in computing diluted EPS; refer to Note 9 for additional information.

Diluted EPS incorporates the potential impact of contingently issuable shares, including awards which require future service as a condition of delivery of the underlying common stock. Diluted EPS is calculated under both the two-class and treasury stock methods, and the more dilutive amount is reported. For each of the periods presented in the table below, diluted EPS calculated under the two-class method was more dilutive.

The following table presents the calculation of net income applicable to common stockholders and basic and diluted EPS for the years ended December 31, 2020, 2019 and 2018.

Year ended December 31, (in millions, except per share amounts)	**2020**	2019	2018
Basic earnings per share			
Net income	**$ 29,131**	$ 36,431	$ 32,474
Less: Preferred stock dividends	**1,583**	1,587	1,551
Net income applicable to common equity	**27,548**	34,844	30,923
Less: Dividends and undistributed earnings allocated to participating securities	**138**	202	214
Net income applicable to common stockholders	**$ 27,410**	$ 34,642	$ 30,709
Total weighted-average basic shares outstanding	**3,082.4**	3,221.5	3,396.4
Net income per share	**$ 8.89**	$ 10.75	$ 9.04
Diluted earnings per share			
Net income applicable to common stockholders	**$ 27,410**	$ 34,642	$ 30,709
Total weighted-average basic shares outstanding	**3,082.4**	3,221.5	3,396.4
Add: Dilutive impact of SARs and employee stock options, unvested PSUs and nondividend-earning RSUs, and warrants	**5.0**	8.9	17.6
Total weighted-average diluted shares outstanding	**3,087.4**	3,230.4	3,414.0
Net income per share	**$ 8.88**	$ 10.72	$ 9.00

Note 24 – Accumulated other comprehensive income/(loss)

AOCI includes the after-tax change in unrealized gains and losses on investment securities, foreign currency translation adjustments (including the impact of related derivatives), fair value changes of excluded components on fair value hedges, cash flow hedging activities, net loss and prior service costs/(credit) related to the Firm's defined benefit pension and OPEB plans, and fair value option-elected liabilities arising from changes in the Firm's own credit risk (DVA).

Year ended December 31, (in millions)	Unrealized gains/(losses) on investment securities	Translation adjustments, net of hedges	Fair value hedges	Cash flow hedges	Defined benefit pension and OPEB plans	DVA on fair value option elected liabilities	Accumulated other comprehensive income/(loss)
Balance at December 31, 2017	$ 2,164	$ (470)	$ –	$ 76	$ (1,521)	$ (368)	$ (119)
Cumulative effect of changes in accounting principles[(a)]	896	(277)	(54)	16	(414)	(79)	88
Net change	(1,858)	20	(107)	(201)	(373)	1,043	(1,476)
Balance at December 31, 2018	$ 1,202	$ (727)	$ (161)	$ (109)	$ (2,308)	$ 596	$ (1,507)
Net change	2,855	20	30	172	964	(965)	3,076
Balance at December 31, 2019	$ 4,057	$ (707)	$ (131)	$ 63	$ (1,344)	$ (369)	$ 1,569
Net change	**4,123**	**234**	**19**	**2,320**	**212**	**(491)**	**6,417**
Balance at December 31, 2020	**$ 8,180** [(b)]	**$ (473)**	**$ (112)**	**$ 2,383**	**$ (1,132)**	**$ (860)**	**$ 7,986**

(a) Represents the adjustment to AOCI as a result of the accounting standards adopted in the first quarter of 2018. Refer to Note 1 for additional information.
(b) Includes after-tax net unamortized unrealized gains of $3.3 billion related to AFS securities that have been transferred to HTM. Refer to Note 10 for further information.

The following table presents the pre-tax and after-tax changes in the components of OCI.

Year ended December 31, (in millions)	2020 Pre-tax	2020 Tax effect	2020 After-tax	2019 Pre-tax	2019 Tax effect	2019 After-tax	2018 Pre-tax	2018 Tax effect	2018 After-tax
Unrealized gains/(losses) on investment securities:									
Net unrealized gains/(losses) arising during the period	**$ 6,228**	**$ (1,495)**	**$ 4,733**	$ 4,025	$ (974)	$ 3,051	$ (2,825)	$ 665	$ (2,160)
Reclassification adjustment for realized (gains)/losses included in net income[(a)]	**(802)**	**192**	**(610)**	(258)	62	(196)	395	(93)	302
Net change	**5,426**	**(1,303)**	**4,123**	3,767	(912)	2,855	(2,430)	572	(1,858)
Translation adjustments[(b)]:									
Translation	**1,407**	**(103)**	**1,304**	(49)	33	(16)	(1,078)	156	(922)
Hedges	**(1,411)**	**341**	**(1,070)**	46	(10)	36	1,236	(294)	942
Net change	**(4)**	**238**	**234**	(3)	23	20	158	(138)	20
Fair value hedges, net change[(c)]:	**25**	**(6)**	**19**	39	(9)	30	(140)	33	(107)
Cash flow hedges:									
Net unrealized gains/(losses) arising during the period	**3,623**	**(870)**	**2,753**	122	(28)	94	(245)	58	(187)
Reclassification adjustment for realized (gains)/losses included in net income[(d)]	**(570)**	**137**	**(433)**	103	(25)	78	(18)	4	(14)
Net change	**3,053**	**(733)**	**2,320**	225	(53)	172	(263)	62	(201)
Defined benefit pension and OPEB plans, net change:	**214**	**(2)**	**212**	1,157	(193)	964	(450)	77	(373)
DVA on fair value option elected liabilities, net change:	**$ (648)**	**$ 157**	**$ (491)**	$ (1,264)	$ 299	$ (965)	$ 1,364	$ (321)	$ 1,043
Total other comprehensive income/(loss)	**$ 8,066**	**$ (1,649)**	**$ 6,417**	$ 3,921	$ (845)	$ 3,076	$ (1,761)	$ 285	$ (1,476)

(a) The pre-tax amount is reported in Investment securities gains/(losses) in the Consolidated statements of income.

(b) Reclassifications of pre-tax realized gains/(losses) on translation adjustments and related hedges are reported in other income/expense in the Consolidated statements of income. During the year ended December 31, 2020, the Firm reclassified a net pre-tax gain of $6 million to other income related to the liquidation of legal entities, $3 million related to net investment hedge gains and $3 million related to cumulative translation adjustments. During the year ended December 31, 2019, the Firm reclassified net pre-tax gains of $7 million to other income and $1 million to other expense, respectively. These amounts, which related to the liquidation of certain legal entities, are comprised of $18 million related to net investment hedge gains and $10 million related to cumulative translation adjustments. During the year ended December 31, 2018, the Firm reclassified a net pre-tax loss of $168 million to other expense related to the liquidation of certain legal entities, $17 million related to net investment hedge losses and $151 million related to cumulative translation adjustments.

(c) Represents changes in fair value of cross-currency swaps attributable to changes in cross-currency basis spreads, which are excluded from the assessment of hedge effectiveness and recorded in other comprehensive income. The initial cost of cross-currency basis spreads is recognized in earnings as part of the accrual of interest on the cross-currency swap.

(d) The pre-tax amounts are primarily recorded in noninterest revenue, net interest income and compensation expense in the Consolidated statements of income.

Note 25 – Income taxes

JPMorgan Chase and its eligible subsidiaries file a consolidated U.S. federal income tax return. JPMorgan Chase uses the asset and liability method to provide income taxes on all transactions recorded in the Consolidated Financial Statements. This method requires that income taxes reflect the expected future tax consequences of temporary differences between the carrying amounts of assets or liabilities for book and tax purposes. Accordingly, a deferred tax asset or liability for each temporary difference is determined based on the tax rates that the Firm expects to be in effect when the underlying items of income and expense are realized. JPMorgan Chase's expense for income taxes includes the current and deferred portions of that expense. A valuation allowance is established to reduce deferred tax assets to the amount the Firm expects to realize.

Due to the inherent complexities arising from the nature of the Firm's businesses, and from conducting business and being taxed in a substantial number of jurisdictions, significant judgments and estimates are required to be made. Agreement of tax liabilities between JPMorgan Chase and the many tax jurisdictions in which the Firm files tax returns may not be finalized for several years. Thus, the Firm's final tax-related assets and liabilities may ultimately be different from those currently reported.

Effective tax rate and expense

The following table presents a reconciliation of the applicable statutory U.S. federal income tax rate to the effective tax rate.

Effective tax rate

Year ended December 31,	**2020**	2019	2018
Statutory U.S. federal tax rate	**21.0 %**	21.0 %	21.0 %
Increase/(decrease) in tax rate resulting from:			
U.S. state and local income taxes, net of U.S. federal income tax benefit	**2.5**	3.5	4.0
Tax-exempt income	**(1.6)**	(1.4)	(1.5)
Non-U.S. earnings	**1.4**	1.8	0.6
Business tax credits	**(6.3)**	(4.4)	(3.5)
Tax audit resolutions	**–**	(2.3)	(0.1)
Impact of the TCJA[(a)]	**–**	–	(0.7)
Other, net	**0.7**	–	0.5
Effective tax rate	**17.7 %**	18.2 %	20.3 %

(a) Represents changes in the estimates related to the remeasurement of certain deferred taxes and the deemed repatriation tax on non-U.S. earnings under SEC Staff Accounting Bulletin No. 118 which was completed in 2018.

The following table reflects the components of income tax expense/(benefit) included in the Consolidated statements of income.

Income tax expense/(benefit)

Year ended December 31, (in millions)	**2020**	2019	2018
Current income tax expense/(benefit)			
U.S. federal	**$ 5,759**	$ 3,284	$ 2,854
Non-U.S.	**2,705**	2,103	2,077
U.S. state and local	**1,793**	1,778	1,638
Total current income tax expense/ (benefit)	**10,257**	7,165	6,569
Deferred income tax expense/(benefit)			
U.S. federal	**(3,184)**	709	1,359
Non-U.S.	**(126)**	20	(93)
U.S. state and local	**(671)**	220	455
Total deferred income tax expense/(benefit)	**(3,981)**	949	1,721
Total income tax expense	**$ 6,276**	$ 8,114	$ 8,290

Total income tax expense includes $72 million, $1.1 billion and $54 million of tax benefits recorded in 2020, 2019, and 2018, respectively, resulting from the resolution of tax audits.

Tax effect of items recorded in stockholders' equity

The preceding table does not reflect the tax effect of certain items that are recorded each period directly in stockholders' equity. The tax effect of all items recorded directly to stockholders' equity resulted in a decrease of $827 million and $862 million in 2020 and 2019, respectively, and an increase of $172 million in 2018.

Results from Non-U.S. earnings

The following table presents the U.S. and non-U.S. components of income before income tax expense.

Year ended December 31, (in millions)	**2020**	2019	2018
U.S.	**$ 26,904**	$ 36,670	$ 33,052
Non-U.S.[(a)]	**8,503**	7,875	7,712
Income before income tax expense	**$ 35,407**	$ 44,545	$ 40,764

(a) For purposes of this table, non-U.S. income is defined as income generated from operations located outside the U.S.

The Firm will recognize any U.S. income tax expense it may incur on global intangible low tax income as income tax expense in the period in which the tax is incurred.

Affordable housing tax credits

The Firm recognized $1.5 billion of tax credits and other tax benefits associated with investments in affordable housing projects within income tax expense for each of the three years ended 2020, 2019 and 2018. The amount of amortization of such investments reported in income tax expense was $1.2 billion, $1.1 billion and $1.2 billion, respectively. The carrying value of these investments, which are reported in other assets on the Firm's Consolidated balance sheets, was $9.7 billion and $8.6 billion at December 31, 2020 and 2019, respectively. The amount of commitments related to these investments, which are reported in accounts payable and other liabilities on the Firm's Consolidated balance sheets, was $3.8 billion and $2.8 billion at December 31, 2020 and 2019, respectively.

Deferred taxes

Deferred income tax expense/(benefit) results from differences between assets and liabilities measured for financial reporting purposes versus income tax return purposes. Deferred tax assets are recognized if, in management's judgment, their realizability is determined to be more likely than not. If a deferred tax asset is determined to be unrealizable, a valuation allowance is established. The significant components of deferred tax assets and liabilities are reflected in the following table.

December 31, (in millions)	2020	2019
Deferred tax assets		
Allowance for loan losses	**$ 7,270**	$ 3,400
Employee benefits	**1,104**	1,039
Accrued expenses and other	**3,332**	2,767
Non-U.S. operations	**849**	949
Tax attribute carryforwards	**757**	605
Gross deferred tax assets	**13,312**	8,760
Valuation allowance	**(560)**	(557)
Deferred tax assets, net of valuation allowance	**$ 12,752**	$ 8,203
Deferred tax liabilities		
Depreciation and amortization	**$ 3,329**	$ 2,852
Mortgage servicing rights, net of hedges	**2,184**	2,354
Leasing transactions	**5,124**	5,598
Other, net	**6,025**	4,683
Gross deferred tax liabilities	**16,662**	15,487
Net deferred tax (liabilities)/assets	**$ (3,910)**	$ (7,284)

JPMorgan Chase has recorded deferred tax assets of $757 million at December 31, 2020, in connection with U.S. federal and non-U.S. NOL carryforwards, FTC carryforwards, and state and local capital loss carryforwards. At December 31, 2020, total U.S. federal NOL carryforwards were $799 million, non-U.S. NOL carryforwards were $139 million, FTC carryforwards were $444 million, state and local capital loss carryforwards were $1.1 billion, and other federal tax attributes were $393 million. If not utilized, a portion of the U.S. federal NOL carryforwards and other U.S. federal tax attributes will expire between 2022 and 2037 whereas others have an unlimited carryforward period. Similarly, certain non-U.S. NOL carryforwards will expire between 2026 and 2036 whereas others have an unlimited carryforward period. The FTC carryforwards will expire between 2029 and 2030, and the state and local capital loss carryforwards will expire between 2021 and 2022.

The valuation allowance at December 31, 2020, was due to the state and local capital loss carryforwards, FTC carryforwards, and certain non-U.S. deferred tax assets, including NOL carryforwards.

Unrecognized tax benefits

At December 31, 2020, 2019 and 2018, JPMorgan Chase's unrecognized tax benefits, excluding related interest expense and penalties, were $4.3 billion, $4.0 billion and $4.9 billion, respectively, of which $3.1 billion, $2.8 billion and $3.8 billion, respectively, if recognized, would reduce the annual effective tax rate. Included in the amount of unrecognized tax benefits are certain items that would not affect the effective tax rate if they were recognized in the Consolidated statements of income. These unrecognized items include the tax effect of certain temporary differences, the portion of gross state and local unrecognized tax benefits that would be offset by the benefit from associated U.S. federal income tax deductions, and the portion of gross non-U.S. unrecognized tax benefits that would have offsets in other jurisdictions. JPMorgan Chase is presently under audit by a number of taxing authorities, most notably by the Internal Revenue Service as summarized in the Tax examination status table below. As JPMorgan Chase is presently under audit by a number of taxing authorities, it is reasonably possible that over the next 12 months the resolution of these examinations may increase or decrease the gross balance of unrecognized tax benefits by as much as approximately $300 million. Upon settlement of an audit, the change in the unrecognized tax benefit would result from payment or income statement recognition.

The following table presents a reconciliation of the beginning and ending amount of unrecognized tax benefits.

Year ended December 31, (in millions)	2020	2019	2018
Balance at January 1,	**$ 4,024**	$ 4,861	$ 4,747
Increases based on tax positions related to the current period	**685**	871	980
Increases based on tax positions related to prior periods	**362**	10	649
Decreases based on tax positions related to prior periods	**(705)**	(706)	(1,249)
Decreases related to cash settlements with taxing authorities	**(116)**	(1,012)	(266)
Balance at December 31,	**$ 4,250**	$ 4,024	$ 4,861

After-tax interest expense/(benefit) and penalties related to income tax liabilities recognized in income tax expense were $147 million, $(52) million and $192 million in 2020, 2019 and 2018, respectively.

At December 31, 2020 and 2019, in addition to the liability for unrecognized tax benefits, the Firm had accrued $966 million and $817 million, respectively, for income tax-related interest and penalties.

Tax examination status

JPMorgan Chase is continually under examination by the Internal Revenue Service, by taxing authorities throughout the world, and by many state and local jurisdictions throughout the U.S. The following table summarizes the status of significant income tax examinations of JPMorgan Chase and its consolidated subsidiaries as of December 31, 2020.

	Periods under examination	Status
JPMorgan Chase – U.S.	2009 – 2013	Field examination of amended returns
JPMorgan Chase – U.S.	2014 - 2016	Field Examination
JPMorgan Chase – New York State	2012 - 2014	Field Examination
JPMorgan Chase – New York City	2012 - 2014	Field Examination
JPMorgan Chase – California	2011 - 2012	Field Examination
JPMorgan Chase – U.K.	2006 – 2018	Field examination of certain select entities

Note 26 – Restricted cash, other restricted assets and intercompany funds transfers

Restricted cash and other restricted assets

Certain of the Firm's cash and other assets are restricted as to withdrawal or usage. These restrictions are imposed by various regulatory authorities based on the particular activities of the Firm's subsidiaries.

The business of JPMorgan Chase Bank, N.A. is subject to examination and regulation by the OCC. The Bank is a member of the U.S. Federal Reserve System, and its deposits in the U.S. are insured by the FDIC, subject to applicable limits.

The Firm is required to maintain cash reserves at certain non-US central banks.

The Firm is also subject to rules and regulations established by other U.S. and non U.S. regulators. As part of its compliance with the respective regulatory requirements, the Firm's broker-dealers (principally J.P. Morgan Securities LLC in the U.S and J.P. Morgan Securities plc in the U.K.) are subject to certain restrictions on cash and other assets.

The following table presents the components of the Firm's restricted cash:

December 31, (in billions)		2020		2019
Cash reserves – Federal Reserve Banks[(a)]	$	–	$	26.6
Segregated for the benefit of securities and cleared derivative customers		19.3		16.0
Cash reserves at non-U.S. central banks and held for other general purposes		5.1		3.9
Total restricted cash[(b)]	**$**	**24.4**	$	46.5

(a) Effective March 26, 2020, the Federal Reserve eliminated reserve requirements for depository institutions

(b) Comprises $22.7 billion and $45.3 billion in deposits with banks, and $1.7 billion and $1.2 billion in cash and due from banks on the Consolidated balance sheets as of December 31, 2020 and 2019, respectively.

Also, as of December 31, 2020 and 2019, the Firm had the following other restricted assets:

- Cash and securities pledged with clearing organizations for the benefit of customers of $37.2 billion and $24.7 billion, respectively.
- Securities with a fair value of $1.3 billion and $8.8 billion, respectively, were also restricted in relation to customer activity.

Intercompany funds transfers

Restrictions imposed by U.S. federal law prohibit JPMorgan Chase & Co. ("Parent Company") and certain of its affiliates from borrowing from banking subsidiaries unless the loans are secured in specified amounts. Such secured loans provided by any banking subsidiary to the Parent Company or to any particular affiliate, together with certain other transactions with such affiliate (collectively referred to as "covered transactions"), are generally limited to 10% of the banking subsidiary's total capital, as determined by the risk-based capital guidelines; the aggregate amount of covered transactions between any banking subsidiary and all of its affiliates is limited to 20% of the banking subsidiary's total capital.

The Parent Company's two principal subsidiaries are JPMorgan Chase Bank, N.A. and JPMorgan Chase Holdings LLC, an intermediate holding company (the "IHC"). The IHC holds the stock of substantially all of JPMorgan Chase's subsidiaries other than JPMorgan Chase Bank, N.A. and its subsidiaries. The IHC also owns other assets and owes intercompany indebtedness to the holding company. The Parent Company is obligated to contribute to the IHC substantially all the net proceeds received from securities issuances (including issuances of senior and subordinated debt securities and of preferred and common stock).

The principal sources of income and funding for the Parent Company are dividends from JPMorgan Chase Bank, N.A. and dividends and extensions of credit from the IHC. In addition to dividend restrictions set forth in statutes and regulations, the Federal Reserve, the OCC and the FDIC have authority under the Financial Institutions Supervisory Act to prohibit or to limit the payment of dividends by the banking organizations they supervise, including the Parent Company and its subsidiaries that are banks or bank holding companies, if, in the banking regulator's opinion, payment of a dividend would constitute an unsafe or unsound practice in light of the financial condition of the banking organization. The IHC is prohibited from paying dividends or extending credit to the Parent Company if certain capital or liquidity "thresholds" are breached or if limits are otherwise imposed by the Parent Company's management or Board of Directors.

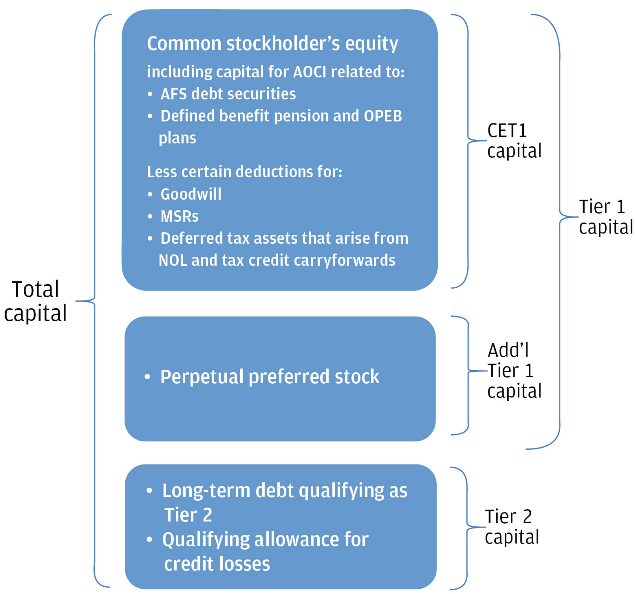
At January 1, 2021, the Parent Company's banking subsidiaries could pay, in the aggregate, approximately $13 billion in dividends to their respective bank holding companies without the prior approval of their relevant banking regulators. The capacity to pay dividends in 2021 will be supplemented by the banking subsidiaries' earnings during the year.

Note 27 – Regulatory capital

The Federal Reserve establishes capital requirements, including well-capitalized standards, for the consolidated financial holding company. The OCC establishes similar minimum capital requirements and standards for the Firm's principal IDI subsidiary, JPMorgan Chase Bank, N.A.

The capital rules under Basel III establish minimum capital ratios and overall capital adequacy standards for large and internationally active U.S. bank holding companies and banks, including the Firm and its IDI subsidiaries, including JPMorgan Chase Bank, N.A. Two comprehensive approaches are prescribed for calculating RWA: a standardized approach ("Basel III Standardized"), and an advanced approach ("Basel III Advanced"). For each of the risk-based capital ratios, the capital adequacy of the Firm and JPMorgan Chase Bank, N.A. is evaluated against the lower of the Standardized or Advanced approaches compared to their respective minimum capital ratios.

The three components of regulatory capital under the Basel III rules are as illustrated below:



Under the risk-based capital and leverage-based guidelines of the Federal Reserve, JPMorgan Chase is required to maintain minimum ratios for CET1 capital, Tier 1 capital, Total capital, Tier 1 leverage and the SLR. Failure to meet these minimum requirements could cause the Federal Reserve to take action. IDI subsidiaries are also subject to these capital requirements established by their respective primary regulators.

The following table presents the minimum and well-capitalized ratios to which the Firm and its IDI subsidiaries were subject as of December 31, 2020 and 2019.

	Standardized Minimum capital ratios		Advanced Minimum capital ratios		Well-capitalized ratios	
	BHC(a)(b)(c)	IDI(c)(d)	BHC(a)(c)	IDI(c)(d)	BHC(e)	IDI(f)
Capital ratios						
CET1 capital	11.3 %	7.0 %	10.5 %	7.0 %	NA	6.5 %
Tier 1 capital	12.8	8.5	12.0	8.5	6.0	8.0
Total capital	14.8	10.5	14.0	10.5	10.0	10.0
Tier 1 leverage	4.0	4.0	4.0	4.0	NA	5.0
SLR	NA	NA	5.0	6.0	NA	6.0

Note: The table above is as defined by the regulations issued by the Federal Reserve, OCC and FDIC and to which the Firm and its IDI subsidiaries are subject.

(a) Represents the minimum capital ratios applicable to the Firm. The CET1, Tier 1 and Total capital minimum capital ratios each include a respective minimum requirement plus a GSIB surcharge of 3.5% as calculated under Method 2; plus a 3.3% SCB for Basel III Standardized ratios and a fixed 2.5% capital conservation buffer for Basel III Advanced ratios. The countercyclical buffer is currently set to 0% by the federal banking agencies.

(b) For the period ended December 31, 2019, the CET1, Tier 1, Total, Tier 1 leverage and SLR minimum capital ratios under Basel III Standardized applicable to the Firm were 10.5%, 12.0%, 14.0%, 4.0%, and 5.0%, respectively.

(c) Represents minimum SLR requirement of 3.0%, as well as supplementary leverage buffer requirements of 2.0% and 3.0% for BHC and IDI, respectively.

(d) Represents requirements for JPMorgan Chase's IDI subsidiaries. The CET1, Tier 1 and Total capital minimum capital ratios include a fixed capital conservation buffer requirement of 2.5% that is applicable to the IDI subsidiaries. The IDI subsidiaries are not subject to the GSIB surcharge.

(e) Represents requirements for bank holding companies pursuant to regulations issued by the Federal Reserve.

(f) Represents requirements for IDI subsidiaries pursuant to regulations issued under the FDIC Improvement Act.

Current Expected Credit Losses

Effective January 1, 2020, the Firm adopted the Financial Instruments – Credit Losses guidance under U.S. GAAP. As permitted under the U.S. capital rules issued by the federal banking agencies in 2019, the Firm initially elected to phase-in the January 1, 2020 ("day 1") CECL adoption impact to retained earnings of $2.7 billion to CET1 capital, at 25% per year in each of 2020 to 2023. As part of their response to the impact of the COVID-19 pandemic, on March 31, 2020, the federal banking agencies issued an interim final rule (issued as final on August 26, 2020) that provided the option to delay the effects of CECL on regulatory capital for two years, followed by a three-year transition period.

The final rule provides a uniform approach for estimating the effects of CECL compared to the legacy incurred loss model during the first two years of the transition period (the "day 2" transition amount), whereby the Firm may exclude from CET1 capital 25% of the change in the allowance for credit losses (excluding allowances on PCD loans). The cumulative day 2 transition amount as at December 31, 2021 that is not recognized in CET1 capital, as well as the $2.7 billion day 1 impact, will be phased into CET1 capital at 25% per year beginning January 1, 2022. The Firm has elected to apply the CECL capital transition provisions, and accordingly, for the year ended December 31, 2020, the capital metrics of the Firm exclude $5.7 billion, which is the $2.7 billion day 1 impact to retained earnings and 25% of the $12.2 billion increase in the allowance for credit losses (excluding allowances on PCD loans).

The impacts of the CECL capital transition provisions have also been incorporated into Tier 2 capital, adjusted average assets, and total leverage exposure. Refer to Note 1 for further information on the CECL accounting guidance.

The following tables present the risk-based and leverage-based capital metrics for JPMorgan Chase and JPMorgan Chase Bank, N.A. under both the Basel III Standardized and Basel III Advanced Approaches. As of December 31, 2020, the capital metrics are presented applying the CECL capital transition provisions. As of December 31, 2020 and 2019, JPMorgan Chase and JPMorgan Chase Bank, N.A. were well-capitalized and met all capital requirements to which each was subject.

	Basel III Standardized		Basel III Advanced	
December 31, 2020 (in millions, except ratios)	JPMorgan Chase & Co.[c]	JPMorgan Chase Bank, N.A.[c]	JPMorgan Chase & Co.[c]	JPMorgan Chase Bank, N.A.[c]
Risk-based capital metrics:				
CET1 capital	**$ 205,078**	**$ 234,235**	**$ 205,078**	**$ 234,235**
Tier 1 capital	**234,844**	**234,237**	**234,844**	**234,237**
Total capital	**269,923**	**252,045**	**257,228**	**239,673**
Risk-weighted assets	**1,560,609**	**1,492,138**	**1,484,431**	**1,343,185**
CET1 capital ratio	**13.1 %**	**15.7 %**	**13.8 %**	**17.4 %**
Tier 1 capital ratio	**15.0**	**15.7**	**15.8**	**17.4**
Total capital ratio	**17.3**	**16.9**	**17.3**	**17.8**
Leverage-based capital metrics:				
Adjusted average assets[a]	**$ 3,353,319**	**$ 2,970,285**	**$ 3,353,319**	**$ 2,970,285**
Tier 1 leverage ratio	**7.0 %**	**7.9 %**	**7.0 %**	**7.9 %**
Total leverage exposure[b]	**NA**	**NA**	**$ 3,401,542**	**$ 3,688,797**
SLR[b]	**NA**	**NA**	**6.9 %**	**6.3 %**

	Basel III Standardized		Basel III Advanced	
December 31, 2019 (in millions, except ratios)	JPMorgan Chase & Co.	JPMorgan Chase Bank, N.A.	JPMorgan Chase & Co.	JPMorgan Chase Bank, N.A.
Risk-based capital metrics:				
CET1 capital	$ 187,753	$ 206,848	$ 187,753	$ 206,848
Tier 1 capital	214,432	206,851	214,432	206,851
Total capital	242,589	224,390	232,112	214,091
Risk-weighted assets	1,515,869	1,457,689	1,397,878	1,269,991
CET1 capital ratio	12.4 %	14.2 %	13.4 %	16.3 %
Tier 1 capital ratio	14.1	14.2	15.3	16.3
Total capital ratio	16.0	15.4	16.6	16.9
Leverage-based capital metrics:				
Adjusted average assets[a]	$ 2,730,239	$ 2,353,432	$ 2,730,239	$ 2,353,432
Tier 1 leverage ratio	7.9 %	8.8 %	7.9 %	8.8 %
Total leverage exposure	NA	NA	$ 3,423,431	$ 3,044,509
SLR	NA	NA	6.3 %	6.8 %

(a) Adjusted average assets, for purposes of calculating the leverage ratio, includes total quarterly average assets adjusted for on-balance sheet assets that are subject to deduction from Tier 1 capital, predominantly goodwill and other intangible assets.

(b) As of December 31, 2020, JPMorgan Chase's total leverage exposure for purposes of calculating the SLR, excludes on-balance sheet amounts of U.S. Treasury securities and deposits at Federal Reserve Banks, as provided by the interim final rule issued by the Federal Reserve on April 1, 2020. On June 1, 2020, the Federal Reserve, OCC and FDIC issued an interim final rule that provides IDI subsidiaries with an option to apply this temporary exclusion subject to certain restrictions. As of December 31, 2020, JPMorgan Chase Bank, N.A. has not elected to apply this exclusion.

(c) As of December 31, 2020, the capital metrics for the Firm reflect the exclusion of assets purchased from money market mutual fund clients pursuant to nonrecourse advances provided under the MMLF. Additionally, loans originated under the PPP for the Firm and JPMorgan Chase Bank, N.A. receive a zero percent risk weight.

Note 28 – Off-balance sheet lending-related financial instruments, guarantees, and other commitments

JPMorgan Chase provides lending-related financial instruments (e.g., commitments and guarantees) to address the financing needs of its customers and clients. The contractual amount of these financial instruments represents the maximum possible credit risk to the Firm should the customer or client draw upon the commitment or the Firm be required to fulfill its obligation under the guarantee, and should the customer or client subsequently fail to perform according to the terms of the contract. Most of these commitments and guarantees have historically been refinanced, extended, cancelled, or expired without being drawn or a default occurring. As a result, the total contractual amount of these instruments is not, in the Firm's view, representative of its expected future credit exposure or funding requirements.

To provide for expected credit losses in wholesale and certain consumer lending-related commitments, an allowance for credit losses on lending-related commitments is maintained. Refer to Note 13 for further information regarding the allowance for credit losses on lending-related commitments, including the impact of the Firm's adoption of CECL accounting guidance on January 1, 2020. The following table summarizes the contractual amounts and carrying values of off-balance sheet lending-related financial instruments, guarantees and other commitments at December 31, 2020 and 2019. The amounts in the table below for credit card and home equity lending-related commitments represent the total available credit for these products. The Firm has not experienced, and does not anticipate, that all available lines of credit for these products will be utilized at the same time. The Firm can reduce or cancel credit card lines of credit by providing the borrower notice or, in some cases as permitted by law, without notice. In addition, the Firm typically closes credit card lines when the borrower is 60 days or more past due. The Firm may reduce or close HELOCs when there are significant decreases in the value of the underlying property, or when there has been a demonstrable decline in the creditworthiness of the borrower.

In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied in determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

Off–balance sheet lending-related financial instruments, guarantees and other commitments

	Contractual amount						Carrying value[j]	
	2020					2019	2020	2019
By remaining maturity at December 31, (in millions)	Expires in 1 year or less	Expires after 1 year through 3 years	Expires after 3 years through 5 years	Expires after 5 years	Total	Total		
Lending-related								
Consumer, excluding credit card:								
Residential Real Estate[a]	**$ 26,788**	**$ 1,597**	**$ 3,962**	**$ 13,700**	**$ 46,047**	$ 30,217	**148**	12
Auto and other	**10,471**	**1**	**8**	**792**	**11,272**	9,952	**—**	—
Total consumer, excluding credit card	**37,259**	**1,598**	**3,970**	**14,492**	**57,319**	40,169	**148**	12
Credit card[b]	**658,506**	**—**	**—**	**—**	**658,506**	650,720	**—**	—
Total consumer[b][c]	**695,765**	**1,598**	**3,970**	**14,492**	**715,825**	690,889	**148**	12
Wholesale:								
Other unfunded commitments to extend credit[d][e]	**96,490**	**174,335**	**128,736**	**16,267**	**415,828**	380,307	**2,148**	952
Standby letters of credit and other financial guarantees[d]	**17,478**	**7,986**	**4,051**	**1,467**	**30,982**	34,242	**443**	618
Other letters of credit[d]	**2,982**	**45**	**26**	**—**	**3,053**	2,961	**14**	4
Total wholesale[c]	**116,950**	**182,366**	**132,813**	**17,734**	**449,863**	417,510	**2,605**	1,574
Total lending-related	**$ 812,715**	**$ 183,964**	**$ 136,783**	**$ 32,226**	**$ 1,165,688**	$1,108,399	**$ 2,753**	$ 1,586
Other guarantees and commitments								
Securities lending indemnification agreements and guarantees[f]	**$ 250,418**	**$ —**	**$ —**	**$ —**	**$ 250,418**	$ 204,827	**$ —**	$ —
Derivatives qualifying as guarantees	**2,489**	**541**	**12,182**	**39,203**	**54,415**	53,089	**322**	159
Unsettled resale and securities borrowed agreements	**95,084**	**1,764**	**—**	**—**	**96,848**	117,951	**2**	—
Unsettled repurchase and securities loaned agreements	**104,289**	**612**	—	—	**104,901**	73,351	**(1)**	—
Loan sale and securitization-related indemnifications:								
Mortgage repurchase liability	**NA**	**NA**	**NA**	**NA**	**NA**	NA	**84**	59
Loans sold with recourse	**NA**	**NA**	**NA**	**NA**	**889**	944	**23**	27
Exchange & clearing house guarantees and commitments[g]	**142,003**	**—**	**—**	**—**	**142,003**	206,432	**—**	—
Other guarantees and commitments [e][h]	**2,457**	**574**	**758**	**2,541**	**6,330**	6,334 [i]	**52**	(66)

(a) Includes certain commitments to purchase loans from correspondents.
(b) Also includes commercial card lending-related commitments primarily in CB and CIB.
(c) Predominantly all consumer and wholesale lending-related commitments are in the U.S.
(d) At December 31, 2020 and 2019, reflected the contractual amount net of risk participations totaling $72 million and $76 million, respectively, for other unfunded commitments to extend credit; $8.5 billion and $9.8 billion, respectively, for standby letters of credit and other financial guarantees; and $357 million and $546 million, respectively, for other letters of credit. In regulatory filings with the Federal Reserve these commitments are shown gross of risk participations.
(e) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans, which resulted in a corresponding reclassification of commitments from Other guarantees and commitments to Wholesale other unfunded commitments to extend credit. Prior-period amounts have been revised to conform with the current presentation.
(f) At December 31, 2020 and 2019, collateral held by the Firm in support of securities lending indemnification agreements was $264.3 billion and $216.2 billion, respectively. Securities lending collateral primarily consists of cash, G7 government securities, and securities issued by U.S. GSEs and government agencies.
(g) At December 31, 2020 and 2019, includes guarantees to the Fixed Income Clearing Corporation under the sponsored member repo program and commitments and guarantees associated with the Firm's membership in certain clearing houses.
(h) At December 31, 2020 and 2019, primarily includes letters of credit hedged by derivative transactions and managed on a market risk basis, and unfunded commitments related to certain tax-oriented equity investments.
(i) Prior-period amounts have been revised to conform with the current presentation.
(j) For lending-related products, the carrying value represents the allowance for lending-related commitments and the guarantee liability; for derivative-related products, and lending-related commitments for which the fair value option was elected, the carrying value represents the fair value.

Other unfunded commitments to extend credit

Other unfunded commitments to extend credit generally consist of commitments for working capital and general corporate purposes, extensions of credit to support commercial paper facilities and bond financings in the event that those obligations cannot be remarketed to new investors, as well as committed liquidity facilities to clearing organizations. The Firm also issues commitments under multipurpose facilities which could be drawn upon in several forms, including the issuance of a standby letter of credit.

Guarantees

U.S. GAAP requires that a guarantor recognize, at the inception of a guarantee, a liability in an amount equal to the fair value of the obligation undertaken in issuing the guarantee. U.S. GAAP defines a guarantee as a contract that contingently requires the guarantor to pay a guaranteed party based upon: (a) changes in an underlying asset, liability or equity security of the guaranteed party; or (b) a third party's failure to perform under a specified agreement. The Firm considers the following off–balance sheet arrangements to be guarantees under U.S. GAAP: standby letters of credit and other financial guarantees, securities lending indemnifications, certain indemnification agreements included within third-party contractual arrangements, certain derivative contracts and the guarantees under the sponsored member repo program.

As required by U.S. GAAP, the Firm initially records guarantees at the inception date fair value of the non-contingent obligation assumed (e.g., the amount of consideration received or the net present value of the premium receivable). For these obligations, the Firm records this fair value amount in other liabilities with an offsetting entry recorded in cash (for premiums received), or other assets (for premiums receivable). Any premium receivable recorded in other assets is reduced as cash is received under the contract, and the fair value of the liability recorded at inception is amortized into income as lending and deposit-related fees over the life of the guarantee contract. The lending-related contingent obligation is recognized based on expected credit losses in addition to, and separate from, any non-contingent obligation.

Non-lending-related contingent obligations are recognized when the liability becomes probable and reasonably estimable. These obligations are not recognized if the estimated amount is less than the carrying amount of any non-contingent liability recognized at inception (adjusted for any amortization). Examples of non-lending-related contingent obligations include indemnifications provided in sales agreements, where a portion of the sale proceeds is allocated to the guarantee, which adjusts the gain or loss that would otherwise result from the transaction. For these indemnifications, the initial liability is amortized to income as the Firm's risk is reduced (i.e., over time or when the indemnification expires).

The contractual amount and carrying value of guarantees and indemnifications are included in the table on page 284.

For additional information on the guarantees, see below.

Standby letters of credit and other financial guarantees

Standby letters of credit and other financial guarantees are conditional lending commitments issued by the Firm to guarantee the performance of a client or customer to a third party under certain arrangements, such as commercial paper facilities, bond financings, acquisition financings, trade and similar transactions.

The following table summarizes the contractual amount and carrying value of standby letters of credit and other financial guarantees and other letters of credit arrangements as of December 31, 2020 and 2019.

Standby letters of credit, other financial guarantees and other letters of credit

December 31, (in millions)	2020 Standby letters of credit and other financial guarantees	2020 Other letters of credit	2019 Standby letters of credit and other financial guarantees	2019 Other letters of credit
Investment-grade[(a)]	**$ 22,850**	**$ 2,263**	$ 26,880	$ 2,137
Noninvestment-grade[(a)]	**8,132**	**790**	7,362	824
Total contractual amount	**$ 30,982**	**$ 3,053**	$ 34,242	$ 2,961
Allowance for lending-related commitments	**$ 80**	**$ 14**	$ 216	$ 4
Guarantee liability	**363**	**—**	402	—
Total carrying value	**$ 443**	**$ 14**	$ 618	$ 4
Commitments with collateral	**$ 17,238**	**$ 498**	$ 17,853	$ 728

(a) The ratings scale is based on the Firm's internal risk ratings. Refer to Note 12 for further information on internal risk ratings.

Securities lending indemnifications
Through the Firm's securities lending program, counterparties' securities, via custodial and non-custodial arrangements, may be lent to third parties. As part of this program, the Firm provides an indemnification in the lending agreements which protects the lender against the failure of the borrower to return the lent securities. To minimize its liability under these indemnification agreements, the Firm obtains cash or other highly liquid collateral with a market value exceeding 100% of the value of the securities on loan from the borrower. Collateral is marked to market daily to help assure that collateralization is adequate. Additional collateral is called from the borrower if a shortfall exists, or collateral may be released to the borrower in the event of overcollateralization. If a borrower defaults, the Firm would use the collateral held to purchase replacement securities in the market or to credit the lending client or counterparty with the cash equivalent thereof.

The cash collateral held by the Firm may be invested on behalf of the client in indemnified resale agreements, whereby the Firm indemnifies the client against the loss of principal invested. To minimize its liability under these agreements, the Firm obtains collateral with a market value exceeding 100% of the principal invested.

Derivatives qualifying as guarantees
The Firm transacts in certain derivative contracts that have the characteristics of a guarantee under U.S. GAAP. These contracts include written put options that require the Firm to purchase assets upon exercise by the option holder at a specified price by a specified date in the future. The Firm may enter into written put option contracts in order to meet client needs, or for other trading purposes. The terms of written put options are typically five years or less.

Derivatives deemed to be guarantees also includes stable value contracts, commonly referred to as "stable value products", that require the Firm to make a payment of the difference between the market value and the book value of a counterparty's reference portfolio of assets in the event that market value is less than book value and certain other conditions have been met. Stable value products are transacted in order to allow investors to realize investment returns with less volatility than an unprotected portfolio. These contracts are typically longer-term or may have no stated maturity, but allow the Firm to elect to terminate the contract under certain conditions.

The notional value of derivatives guarantees generally represents the Firm's maximum exposure. However, exposure to certain stable value products is contractually limited to a substantially lower percentage of the notional amount.

The fair value of derivative guarantees reflects the probability, in the Firm's view, of whether the Firm will be required to perform under the contract. The Firm reduces exposures to these contracts by entering into offsetting transactions, or by entering into contracts that hedge the market risk related to the derivative guarantees.

The following table summarizes the derivatives qualifying as guarantees as of December 31, 2020 and 2019.

(in millions)	**December 31, 2020**	December 31, 2019
Notional amounts		
Derivative guarantees	**$ 54,415**	$ 53,089
Stable value contracts with contractually limited exposure	**27,752**	28,877
Maximum exposure of stable value contracts with contractually limited exposure	**2,803**	2,967
Fair value		
Derivative payables	**322**	159

In addition to derivative contracts that meet the characteristics of a guarantee, the Firm is both a purchaser and seller of credit protection in the credit derivatives market. Refer to Note 5 for a further discussion of credit derivatives.

Unsettled securities financing agreements

In the normal course of business, the Firm enters into resale and securities borrowed agreements. At settlement, these commitments result in the Firm advancing cash to and receiving securities collateral from the counterparty. The Firm also enters into repurchase and securities loaned agreements. At settlement, these commitments result in the Firm receiving cash from and providing securities collateral to the counterparty. Such agreements settle at a future date. These agreements generally do not meet the definition of a derivative, and therefore, are not recorded on the Consolidated balance sheets until settlement date. These agreements predominantly have regular-way settlement terms. Refer to Note 11 for a further discussion of securities financing agreements.

Loan sales- and securitization-related indemnifications

Mortgage repurchase liability
In connection with the Firm's mortgage loan sale and securitization activities with U.S. GSEs the Firm has made representations and warranties that the loans sold meet certain requirements, and that may require the Firm to repurchase mortgage loans and/or indemnify the loan purchaser if such representations and warranties are breached by the Firm.

Private label securitizations
The liability related to repurchase demands associated with private label securitizations is separately evaluated by the Firm in establishing its litigation reserves.

Refer to Note 30 for additional information regarding litigation.

Loans sold with recourse
The Firm provides servicing for mortgages and certain commercial lending products on both a recourse and nonrecourse basis. In nonrecourse servicing, the principal credit risk to the Firm is the cost of temporary servicing advances of funds (i.e., normal servicing advances). In recourse servicing, the servicer agrees to share credit risk

with the owner of the mortgage loans, such as Fannie Mae or Freddie Mac or a private investor, insurer or guarantor. Losses on recourse servicing predominantly occur when foreclosure sales proceeds of the property underlying a defaulted loan are less than the sum of the outstanding principal balance, plus accrued interest on the loan and the cost of holding and disposing of the underlying property. The Firm's securitizations are predominantly nonrecourse, thereby effectively transferring the risk of future credit losses to the purchaser of the mortgage-backed securities issued by the trust. At December 31, 2020 and 2019, the unpaid principal balance of loans sold with recourse totaled $889 million and $944 million, respectively. The carrying value of the related liability that the Firm has recorded in accounts payable and other liabilities on the Consolidated balance sheets, which is representative of the Firm's view of the likelihood it will have to perform under its recourse obligations, was $23 million and $27 million at December 31, 2020 and 2019, respectively.

Other off-balance sheet arrangements

Indemnification agreements – general

In connection with issuing securities to investors outside the U.S., the Firm may agree to pay additional amounts to the holders of the securities in the event that, due to a change in tax law, certain types of withholding taxes are imposed on payments on the securities. The terms of the securities may also give the Firm the right to redeem the securities if such additional amounts are payable. The Firm may also enter into indemnification clauses in connection with the licensing of software to clients ("software licensees") or when it sells a business or assets to a third party ("third-party purchasers"), pursuant to which it indemnifies software licensees for claims of liability or damages that may occur subsequent to the licensing of the software, or third-party purchasers for losses they may incur due to actions taken by the Firm prior to the sale of the business or assets. It is difficult to estimate the Firm's maximum exposure under these indemnification arrangements, since this would require an assessment of future changes in tax law and future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to be remote.

Merchant charge-backs

Under the rules of payment networks, the Firm, in its role as a merchant acquirer, retains a contingent liability for disputed processed credit and debit card transactions that result in a charge-back to the merchant. If a dispute is resolved in the cardholder's favor, Merchant Services will (through the cardholder's issuing bank) credit or refund the amount to the cardholder and will charge back the transaction to the merchant. If Merchant Services is unable to collect the amount from the merchant, Merchant Services will bear the loss for the amount credited or refunded to the cardholder. Merchant Services mitigates this risk by withholding future settlements, retaining cash reserve accounts or obtaining other collateral. In addition, Merchant Services recognizes a valuation allowance that covers the payment or performance risk to the Firm related to charge-backs. The carrying value of the valuation allowance was $12 million and $11 million at December 31, 2020 and 2019, respectively.

For the years ended December 31, 2020, 2019 and 2018, Merchant Services processed an aggregate volume of $1,597.3 billion, $1,511.5 billion, and $1,366.1 billion, respectively.

Clearing Services – Client Credit Risk

The Firm provides clearing services for clients by entering into securities purchases and sales and derivative contracts with CCPs, including ETDs such as futures and options, as well as OTC-cleared derivative contracts. As a clearing member, the Firm stands behind the performance of its clients, collects cash and securities collateral (margin) as well as any settlement amounts due from or to clients, and remits them to the relevant CCP or client in whole or part. There are two types of margin: variation margin is posted on a daily basis based on the value of clients' derivative contracts and initial margin is posted at inception of a derivative contract, generally on the basis of the potential changes in the variation margin requirement for the contract.

As a clearing member, the Firm is exposed to the risk of nonperformance by its clients, but is not liable to clients for the performance of the CCPs. Where possible, the Firm seeks to mitigate its risk to the client through the collection of appropriate amounts of margin at inception and throughout the life of the transactions. The Firm can also cease providing clearing services if clients do not adhere to their obligations under the clearing agreement. In the event of nonperformance by a client, the Firm would close out the client's positions and access available margin. The CCP would utilize any margin it holds to make itself whole, with any remaining shortfalls required to be paid by the Firm as a clearing member.

The Firm reflects its exposure to nonperformance risk of the client through the recognition of margin receivables from clients and margin payables to CCPs; the clients' underlying securities or derivative contracts are not reflected in the Firm's Consolidated Financial Statements.

It is difficult to estimate the Firm's maximum possible exposure through its role as a clearing member, as this would require an assessment of transactions that clients may execute in the future. However, based upon historical experience, and the credit risk mitigants available to the Firm, management believes it is unlikely that the Firm will have to make any material payments under these arrangements and the risk of loss is expected to be remote.

Refer to Note 5 for information on the derivatives that the Firm executes for its own account and records in its Consolidated Financial Statements.

Exchange & Clearing House Memberships
The Firm is a member of several securities and derivative exchanges and clearing houses, both in the U.S. and other countries, and it provides clearing services to its clients. Membership in some of these organizations requires the Firm to pay a pro rata share of the losses incurred by the organization as a result of the default of another member. Such obligations vary with different organizations. These obligations may be limited to the amount (or a multiple of the amount) of the Firm's contribution to the guarantee fund maintained by a clearing house or exchange as part of the resources available to cover any losses in the event of a member default. Alternatively, these obligations may also include a pro rata share of the residual losses after applying the guarantee fund. Additionally, certain clearing houses require the Firm as a member to pay a pro rata share of losses that may result from the clearing house's investment of guarantee fund contributions and initial margin, unrelated to and independent of the default of another member. Generally a payment would only be required should such losses exceed the resources of the clearing house or exchange that are contractually required to absorb the losses in the first instance. In certain cases, it is difficult to estimate the Firm's maximum possible exposure under these membership agreements, since this would require an assessment of future claims that may be made against the Firm that have not yet occurred. However, based on historical experience, management expects the risk of loss to the Firm to be remote. Where the Firm's maximum possible exposure can be estimated, the amount is disclosed in the table on page 284, in the Exchange & clearing house guarantees and commitments line.

Sponsored member repo program
The Firm acts as a sponsoring member to clear eligible overnight resale and repurchase agreements through the Government Securities Division of the Fixed Income Clearing Corporation ("FICC") on behalf of clients that become sponsored members under the FICC's rules. The Firm also guarantees to the FICC the prompt and full payment and performance of its sponsored member clients' respective obligations under the FICC's rules. The Firm minimizes its liability under these overnight guarantees by obtaining a security interest in the cash or high-quality securities collateral that the clients place with the clearing house; therefore, the Firm expects the risk of loss to be remote. The Firm's maximum possible exposure, without taking into consideration the associated collateral, is included in the Exchange & clearing house guarantees and commitments line on page 284. Refer to Note 11 for additional information on credit risk mitigation practices on resale agreements and the types of collateral pledged under repurchase agreements.

Guarantees of subsidiaries
In the normal course of business, the Parent Company may provide counterparties with guarantees of certain of the trading and other obligations of its subsidiaries on a contract-by-contract basis, as negotiated with the Firm's counterparties. The obligations of the subsidiaries are included on the Firm's Consolidated balance sheets or are reflected as off-balance sheet commitments; therefore, the Parent Company has not recognized a separate liability for these guarantees. The Firm believes that the occurrence of any event that would trigger payments by the Parent Company under these guarantees is remote.

The Parent Company has guaranteed certain long-term debt and structured notes of its subsidiaries, including JPMorgan Chase Financial Company LLC ("JPMFC"), a 100%-owned and consolidated finance subsidiary. All securities issued by JPMFC are fully and unconditionally guaranteed by the Parent Company and no other subsidiary of the parent company guarantees these securities. These guarantees, which rank on a parity with the Firm's unsecured and unsubordinated indebtedness, are not included in the table on page 284 of this Note. Refer to Note 20 for additional information.

Note 29 – Pledged assets and collateral

Pledged assets

The Firm pledges financial assets that it owns to maintain potential borrowing capacity at discount windows with Federal Reserve banks, various other central banks and FHLBs. Additionally, the Firm pledges assets for other purposes, including to collateralize repurchase and other securities financing agreements, to cover short sales and to collateralize derivative contracts and deposits. Certain of these pledged assets may be sold or repledged or otherwise used by the secured parties and are parenthetically identified on the Consolidated balance sheets as assets pledged.

The following table presents the Firm's pledged assets.

December 31, (in billions)	2020	2019
Assets that may be sold or repledged or otherwise used by secured parties	**$ 166.6**	$ 125.2
Assets that may not be sold or repledged or otherwise used by secured parties	**113.9**	80.2
Assets pledged at Federal Reserve banks and FHLBs	**455.3**	478.9
Total pledged assets	**$ 735.8**	$ 684.3

Total pledged assets do not include assets of consolidated VIEs; these assets are used to settle the liabilities of those entities. Refer to Note 14 for additional information on assets and liabilities of consolidated VIEs. Refer to Note 11 for additional information on the Firm's securities financing activities. Refer to Note 20 for additional information on the Firm's long-term debt. The significant components of the Firm's pledged assets were as follows.

December 31, (in billions)	2020	2019
Investment securities	**$ 80.2**	$ 35.9
Loans	**420.5**	460.4
Trading assets and other	**235.1**	188.0
Total pledged assets	**$ 735.8**	$ 684.3

Collateral

The Firm accepts financial assets as collateral that it is permitted to sell or repledge, deliver or otherwise use. This collateral is generally obtained under resale and other securities financing agreements, prime brokerage-related held-for-investment customer receivables and derivative contracts. Collateral is generally used under repurchase and other securities financing agreements, to cover short sales, and to collateralize derivative contracts and deposits.

The following table presents the fair value of collateral accepted.

December 31, (in billions)	2020	2019
Collateral permitted to be sold or repledged, delivered, or otherwise used	**$ 1,451.7**	$ 1,282.5
Collateral sold, repledged, delivered or otherwise used	**1,038.9**	1,000.5 [(a)]

(a) Includes collateral repledged to the Federal Reserve under the Federal Reserve's open market operations.

Note 30 – Litigation

Contingencies

As of December 31, 2020, the Firm and its subsidiaries and affiliates are defendants, putative defendants or respondents in numerous legal proceedings, including private, civil litigations and regulatory/government investigations. The litigations range from individual actions involving a single plaintiff to class action lawsuits with potentially millions of class members. Investigations involve both formal and informal proceedings, by both governmental agencies and self-regulatory organizations. These legal proceedings are at varying stages of adjudication, arbitration or investigation, and involve each of the Firm's lines of business and several geographies and a wide variety of claims (including common law tort and contract claims and statutory antitrust, securities and consumer protection claims), some of which present novel legal theories.

The Firm believes the estimate of the aggregate range of reasonably possible losses, in excess of reserves established, for its legal proceedings is from $0 to approximately $1.5 billion at December 31, 2020. This estimated aggregate range of reasonably possible losses was based upon information available as of that date for those proceedings in which the Firm believes that an estimate of reasonably possible loss can be made. For certain matters, the Firm does not believe that such an estimate can be made, as of that date. The Firm's estimate of the aggregate range of reasonably possible losses involves significant judgment, given:

- the number, variety and varying stages of the proceedings, including the fact that many are in preliminary stages,
- the existence in many such proceedings of multiple defendants, including the Firm, whose share of liability (if any) has yet to be determined,
- the numerous yet-unresolved issues in many of the proceedings, including issues regarding class certification and the scope of many of the claims, and
- the attendant uncertainty of the various potential outcomes of such proceedings, including where the Firm has made assumptions concerning future rulings by the court or other adjudicator, or about the behavior or incentives of adverse parties or regulatory authorities, and those assumptions prove to be incorrect.

In addition, the outcome of a particular proceeding may be a result which the Firm did not take into account in its estimate because the Firm had deemed the likelihood of that outcome to be remote. Accordingly, the Firm's estimate of the aggregate range of reasonably possible losses will change from time to time, and actual losses may vary significantly.

Set forth below are descriptions of the Firm's material legal proceedings.

Advisory and Other Activities. In November 2020, JPMorgan Chase Bank, N.A. entered into a resolution with the Office of the Comptroller of the Currency ("OCC") regarding historical deficiencies in internal controls and internal audit for certain fiduciary activities. In connection with the resolution, JPMorgan Chase Bank, N.A. paid a $250 million Civil Money Penalty. The OCC found that JPMorgan Chase Bank, N.A. has remediated the deficiencies that led to the penalty.

Amrapali. India's Enforcement Directorate ("ED") is investigating JPMorgan India Private Limited in connection with investments made in 2010 and 2012 by two offshore funds formerly managed by JPMorgan Chase entities into residential housing projects developed by the Amrapali Group ("Amrapali"). In 2017, numerous creditors filed civil claims against Amrapali including petitions brought by home buyers relating to delays in delivering or failure to deliver residential units. The home buyers' petitions have been overseen by the Supreme Court of India since 2017 pursuant to its jurisdiction over public interest litigation. In July 2019, the Supreme Court of India issued an order making preliminary findings that Amrapali and other parties, including unspecified JPMorgan Chase entities and the offshore funds that had invested in the projects, violated certain currency control and money laundering provisions, and ordering the ED to conduct a further inquiry under India's Prevention of Money Laundering Act ("PMLA") and Foreign Exchange Management Act ("FEMA"). In May 2020, the Enforcement Directorate issued a provisional attachment order as part of the criminal PMLA proceedings freezing approximately $25 million held by JPMorgan India Private Limited. In June 2020, the funds were transferred to an account held by the Supreme Court of India. A separate civil proceeding relating to alleged FEMA violations is ongoing. The Firm is responding to and cooperating with the investigation.

Federal Republic of Nigeria Litigation. JPMorgan Chase Bank, N.A. operated an escrow and depository account for the Federal Government of Nigeria ("FGN") and two major international oil companies. The account held approximately $1.1 billion in connection with a dispute among the clients over rights to an oil field. Following the settlement of the dispute, JPMorgan Chase Bank, N.A. paid out the monies in the account in 2011 and 2013 in accordance with directions received from its clients. In November 2017, the Federal Republic of Nigeria ("FRN") commenced a claim in the English High Court for approximately $875 million in payments made out of the accounts. The FRN, claiming to be the same entity as the FGN, alleges that the payments were instructed as part of a complex fraud not involving JPMorgan Chase Bank, N.A., but that JPMorgan Chase Bank, N.A. was or should have been on notice that the payments may be fraudulent. JPMorgan Chase Bank, N.A. applied for summary judgment and was unsuccessful. The claim is ongoing and a trial has been scheduled to commence in February 2022.

Foreign Exchange Investigations and Litigation. The Firm previously reported settlements with certain government authorities relating to its foreign exchange ("FX") sales and trading activities and controls related to those activities. Among those resolutions, in May 2015, the Firm pleaded guilty to a single violation of federal antitrust law. In January 2017, the Firm was sentenced, with judgment entered thereafter and a term of probation ending in January 2020. The term of probation has concluded, with the Firm remaining in good standing throughout the probation period. The Department of Labor granted the Firm a five-year exemption of disqualification that allows the Firm and its affiliates to continue to rely on the Qualified Professional Asset Manager exemption under the Employee Retirement Income Security Act ("ERISA") until January 2023. The Firm will need to reapply in due course for a further exemption to cover the remainder of the ten-year disqualification period. A South Africa Competition Commission matter is the remaining FX-related governmental inquiry, and is currently pending before the South Africa Competition Tribunal.

In August 2018, the United States District Court for the Southern District of New York granted final approval to the Firm's settlement of a consolidated class action brought by U.S.-based plaintiffs, which principally alleged violations of federal antitrust laws based on an alleged conspiracy to manipulate foreign exchange rates and also sought damages on behalf of persons who transacted in FX futures and options on futures. Certain members of the settlement class filed requests to the Court to be excluded from the class, and certain of them filed a complaint against the Firm and a number of other foreign exchange dealers in November 2018. A number of these actions remain pending. Further, putative class actions have been filed against the Firm and a number of other foreign exchange dealers on behalf of certain consumers who purchased foreign currencies at allegedly inflated rates and purported indirect purchasers of FX instruments; these actions also remain pending in the District Court. In 2020, the Court approved a settlement by the Firm and 11 other defendants of a class action filed by purported indirect purchasers for a total of $10 million. In addition, some FX-related individual and putative class actions based on similar alleged underlying conduct have been filed outside the U.S., including in the U.K., Israel and Australia.

Interchange Litigation. Groups of merchants and retail associations filed a series of class action complaints alleging that Visa and Mastercard, as well as certain banks, conspired to set the price of credit and debit card interchange fees and enacted related rules in violation of antitrust laws. In 2012, the parties initially settled the cases for a cash payment, a temporary reduction of credit card interchange, and modifications to certain credit card network rules. In 2017, after the approval of that settlement was reversed on appeal, the case was remanded to the United States District Court for the Eastern District of New York for further proceedings consistent with the appellate decision.

The original class action was divided into two separate actions, one seeking primarily monetary relief and the other seeking primarily injunctive relief. In September 2018, the parties to the class action seeking monetary relief finalized an agreement which amends and supersedes the prior settlement agreement. Pursuant to this settlement, the defendants collectively contributed an additional $900 million to the approximately $5.3 billion previously held in escrow from the original settlement. In December 2019, the amended agreement was approved by the District Court. Certain merchants appealed the District Court's approval order, and those appeals are pending. Based on the percentage of merchants that opted out of the amended class settlement, $700 million has been returned to the defendants from the settlement escrow in accordance with the settlement agreement. The class action seeking primarily injunctive relief continues separately.

In addition, certain merchants have filed individual actions raising similar allegations against Visa and Mastercard, as well as against the Firm and other banks, and some of those actions remain pending.

LIBOR and Other Benchmark Rate Investigations and Litigation. JPMorgan Chase has responded to inquiries from various governmental agencies and entities around the world relating primarily to the British Bankers Association's London Interbank Offered Rate ("LIBOR") for various currencies and the European Banking Federation's Euro Interbank Offered Rate ("EURIBOR"). The Swiss Competition Commission's investigation relating to EURIBOR, to which the Firm and other banks are subject, continues. In December 2016, the European Commission issued a decision against the Firm and other banks finding an infringement of European antitrust rules relating to EURIBOR. The Firm has filed an appeal of that decision with the European General Court, and that appeal is pending.

In addition, the Firm has been named as a defendant along with other banks in a series of individual and putative class actions related to benchmarks, including U.S. dollar LIBOR during the period that it was administered by the BBA and, in a separate consolidated putative class action, during the period that it was administered by ICE Benchmark Administration. These actions have been filed, or consolidated for pre-trial purposes, in the United States District Court for the Southern District of New York. In these actions, plaintiffs make varying allegations that in various periods, starting in 2000 or later, defendants either individually or collectively manipulated various benchmark rates by submitting rates that were artificially low or high. Plaintiffs allege that they transacted in loans, derivatives or other financial instruments whose values are affected by changes in these rates and assert a variety of claims including antitrust claims seeking treble damages.

In actions related to U.S. dollar LIBOR during the period that it was administered by the BBA, the Firm has resolved certain of these actions, and others are in various stages of litigation. The District Court dismissed certain claims, including antitrust claims brought by some plaintiffs whom the District Court found did not have standing to assert such claims, and permitted certain claims to proceed, including antitrust, Commodity Exchange Act, Section 10(b) of the Securities Exchange Act and common law claims. The plaintiffs whose antitrust claims were dismissed for lack of standing have filed an appeal. The District Court granted class certification of antitrust claims related to bonds and interest rate swaps sold directly by the defendants and denied class certification motions filed by other plaintiffs. In the consolidated putative class action related to the time period that U.S. dollar LIBOR was administered by ICE Benchmark Administration, the District Court granted defendants' motion to dismiss plaintiffs' complaint, and the plaintiffs have appealed. The Firm's settlements of putative class actions related to Swiss franc LIBOR, the Singapore Interbank Offered Rate and the Singapore Swap Offer Rate ("SIBOR"), and the Australian Bank Bill Swap Reference Rate, and one of the putative class actions related to U.S. dollar LIBOR remain subject to court approval. In the class actions related to SIBOR and Swiss franc LIBOR, the District Court concluded that the Court lacked subject matter jurisdiction, and plaintiffs' appeals of those decisions are pending.

In addition to the actions pending or consolidated in the Southern District of New York, in August 2020, a group of individual plaintiffs filed a lawsuit asserting antitrust claims in the United States District Court for the Northern District of California, alleging that the Firm and other defendants were engaged in an unlawful agreement to set LIBOR and conspired to monopolize the market for LIBOR-based consumer loans and credit cards. The complaint seeks injunctive relief and monetary damages.

Metals and U.S. Treasuries Investigations and Litigation and Related Inquiries. The Firm previously reported that it and/or certain of its subsidiaries had entered into resolutions with the U.S. Department of Justice ("DOJ"), the U.S. Commodity Futures Trading Commission ("CFTC") and the U.S. Securities and Exchange Commission ("SEC"), which, collectively, resolved those agencies' respective investigations relating to historical trading practices by former employees in the precious metals and U.S. treasuries markets and related conduct from 2008 to 2016.

The Firm entered into a Deferred Prosecution Agreement ("DPA") with the DOJ in which it agreed to the filing of a criminal information charging JPMorgan Chase & Co. with two counts of wire fraud and agreed, along with JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC, to certain terms and obligations as set forth therein. Under the terms of the DPA, the criminal information will be dismissed after three years, provided that JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC fully comply with all of their obligations.

Across the three resolutions with the DOJ, CFTC and SEC, JPMorgan Chase & Co., JPMorgan Chase Bank, N.A. and J.P. Morgan Securities LLC agreed to pay a total monetary amount of approximately $920 million. A portion of the total monetary amount includes victim compensation payments.

Several putative class action complaints have been filed in the United States District Court for the Southern District of New York against the Firm and certain former employees, alleging a precious metals futures and options price manipulation scheme in violation of the Commodity Exchange Act. Some of the complaints also allege unjust enrichment and deceptive acts or practices under the General Business Law of the State of New York. The Court consolidated these putative class actions in February 2019, and the consolidated action is stayed through May 2021. In addition, several putative class actions have been filed in the United States District Courts for the Northern District of Illinois and Southern District of New York against the Firm, alleging manipulation of U.S. Treasury futures and options, and bringing claims under the Commodity Exchange Act. Some of the complaints also allege unjust enrichment. The actions in the Northern District of Illinois have been transferred to the Southern District of New York. The Court consolidated these putative class actions in October 2020 and set a deadline of February 2021 for the filing of a consolidated complaint. Two putative class action complaints have also been filed under the Securities Exchange Act of 1934 in the United States District Court for the Eastern District of New York against the Firm and certain individual defendants on behalf of shareholders who acquired shares during the putative class period alleging that certain SEC filings of the Firm were materially false or misleading in that they did not disclose certain information relating to the above-referenced investigations. Plaintiffs have filed a stipulation seeking consolidation of the actions and the appointment of co-lead plaintiffs and counsel, which is pending Court approval.

Wendel. Since 2012, the French criminal authorities have been investigating a series of transactions entered into by senior managers of Wendel Investissement ("Wendel") during the period from 2004 through 2007 to restructure their shareholdings in Wendel. JPMorgan Chase Bank, N.A., Paris branch provided financing for the transactions to a number of managers of Wendel in 2007. JPMorgan Chase has cooperated with the investigation. The investigating judges issued an *ordonnance de renvoi* in November 2016, referring JPMorgan Chase Bank, N.A. to the French *tribunal correctionnel* for alleged complicity in tax fraud. In January 2018, the Paris Court of Appeal issued a decision cancelling the *mise en examen* of JPMorgan Chase Bank, N.A. The Court of Cassation, France's highest court, ruled in September 2018 that a *mise en examen* is a prerequisite for an *ordonnance de renvoi* and in January 2020 ordered the annulment of the *ordonnance de renvoi* referring JPMorgan Chase Bank, N.A. to the French *tribunal correctionnel*. The Court of Appeal found in January 2021 that it had no power to take further action against JPMorgan Chase following the Court of Cassation's ruling. At the opening of a trial of the managers of Wendel in January 2021, the *tribunal correctionnel* directed the criminal authorities to clarify whether a further investigation should be opened against JPMorgan Chase, pending which the trial was postponed. In addition, a number of the managers have commenced civil proceedings against JPMorgan Chase Bank, N.A. The claims are separate, involve different allegations and are at various stages of proceedings.

* * *

In addition to the various legal proceedings discussed above, JPMorgan Chase and its subsidiaries are named as defendants or are otherwise involved in a substantial number of other legal proceedings. The Firm believes it has meritorious defenses to the claims asserted against it in its currently outstanding legal proceedings and it intends to defend itself vigorously. Additional legal proceedings may be initiated from time to time in the future.

The Firm has established reserves for several hundred of its currently outstanding legal proceedings. In accordance with the provisions of U.S. GAAP for contingencies, the Firm accrues for a litigation-related liability when it is probable that such a liability has been incurred and the amount of the loss can be reasonably estimated. The Firm evaluates its outstanding legal proceedings each quarter to assess its litigation reserves, and makes adjustments in such reserves, upward or downward, as appropriate, based on management's best judgment after consultation with counsel. The Firm's legal expense was $1.1 billion, $239 million and $72 million for the years ended December 31, 2020, 2019 and 2018, respectively. There is no assurance that the Firm's litigation reserves will not need to be adjusted in the future.

In view of the inherent difficulty of predicting the outcome of legal proceedings, particularly where the claimants seek very large or indeterminate damages, or where the matters present novel legal theories, involve a large number of parties or are in early stages of discovery, the Firm cannot state with confidence what will be the eventual outcomes of the currently pending matters, the timing of their ultimate resolution or the eventual losses, fines, penalties or consequences related to those matters. JPMorgan Chase believes, based upon its current knowledge and after consultation with counsel, consideration of the material legal proceedings described above and after taking into account its current litigation reserves and its estimated aggregate range of possible losses, that the other legal proceedings currently pending against it should not have a material adverse effect on the Firm's consolidated financial condition. The Firm notes, however, that in light of the uncertainties involved in such proceedings, there is no assurance that the ultimate resolution of these matters will not significantly exceed the reserves it has currently accrued or that a matter will not have material reputational consequences. As a result, the outcome of a particular matter may be material to JPMorgan Chase's operating results for a particular period, depending on, among other factors, the size of the loss or liability imposed and the level of JPMorgan Chase's income for that period.

Note 31 – International operations

The following table presents income statement and balance sheet-related information for JPMorgan Chase by major international geographic area. The Firm defines international activities for purposes of this footnote presentation as business transactions that involve clients residing outside of the U.S., and the information presented below is based predominantly on the domicile of the client, the location from which the client relationship is managed, booking location or the location of the trading desk. However, many of the Firm's U.S. operations serve international businesses.

As the Firm's operations are highly integrated, estimates and subjective assumptions have been made to apportion revenue and expense between U.S. and international operations. These estimates and assumptions are consistent with the allocations used for the Firm's segment reporting as set forth in Note 32.

The Firm's long-lived assets for the periods presented are not considered by management to be significant in relation to total assets. The majority of the Firm's long-lived assets are located in the U.S.

As of or for the year ended December 31, (in millions)	Revenue[c]	Expense[d]	Income before income tax expense	Net income	Total assets	
2020						
Europe/Middle East/Africa	**$ 16,566**	**$ 10,987**	**$ 5,579**	**$ 3,868**	**$ 530,687**	(e)
Asia-Pacific	**9,289**	**5,558**	**3,731**	**2,630**	**252,553**	
Latin America/Caribbean	**2,740**	**1,590**	**1,150**	**837**	**61,980**	
Total international	**28,595**	**18,135**	**10,460**	**7,335**	**845,220**	
North America[a]	**90,948**	**66,001**	**24,947**	**21,796**	**2,540,851**	
Total	**$ 119,543**	**$ 84,136**	**$ 35,407**	**$ 29,131**	**$ 3,386,071**	
2019[b]						
Europe/Middle East/Africa	$ 15,887	$ 9,860	$ 6,027	$ 4,158	$ 391,369	(e)
Asia-Pacific	7,254	5,060	2,194	1,467	183,023	
Latin America/Caribbean	2,405	1,561	844	609	47,820	
Total international	25,546	16,481	9,065	6,234	622,212	
North America[a]	89,853	54,373	35,480	30,197	2,065,167	
Total	$ 115,399	$ 70,854	$ 44,545	$ 36,431	$ 2,687,379	
2018[b]						
Europe/Middle East/Africa	$ 16,459	$ 10,032	$ 6,427	$ 4,569	$ 424,935	(e)
Asia-Pacific	6,991	4,884	2,107	1,481	171,547	
Latin America/Caribbean	2,365	1,301	1,064	744	43,871	
Total international	25,815	16,217	9,598	6,794	640,353	
North America[a]	82,968	51,802	31,166	25,680	1,982,179	
Total	$ 108,783	$ 68,019	$ 40,764	$ 32,474	$ 2,622,532	

(a) Substantially reflects the U.S.
(b) Prior-period amounts have been revised to conform with the current presentation.
(c) Revenue is composed of net interest income and noninterest revenue.
(d) Expense is composed of noninterest expense and the provision for credit losses.
(e) Total assets for the U.K. were approximately $353 billion, $309 billion and $299 billion at December 31, 2020, 2019 and 2018, respectively.

Note 32 – Business segments

The Firm is managed on an LOB basis. There are four major reportable business segments – Consumer & Community Banking, Corporate & Investment Bank, Commercial Banking and Asset & Wealth Management. In addition, there is a Corporate segment.The business segments are determined based on the products and services provided, or the type of customer served, and they reflect the manner in which financial information is currently evaluated by the Firm's Operating Committee. Segment results are presented on a managed basis. Refer to Segment results of this footnote for a further discussion of JPMorgan Chase's business segments.

The following is a description of each of the Firm's business segments, and the products and services they provide to their respective client bases.

Consumer & Community Banking

Consumer & Community Banking offers services to consumers and businesses through bank branches, ATMs, digital (including mobile and online) and telephone banking. CCB is organized into Consumer & Business Banking (including Consumer Banking, J.P. Morgan Wealth Management and Business Banking), Home Lending (including Home Lending Production, Home Lending Servicing and Real Estate Portfolios) and Card & Auto. Consumer & Business Banking offers deposit and investment products, payments and services to consumers, and lending, deposit, and cash management and payment solutions to small businesses. Home Lending includes mortgage origination and servicing activities, as well as portfolios consisting of residential mortgages and home equity loans. Card & Auto issues credit cards to consumers and small businesses and originates and services auto loans and leases.

Corporate & Investment Bank

The Corporate & Investment Bank, which consists of Banking and Markets & Securities Services, offers a broad suite of investment banking, market-making, prime brokerage, and treasury and securities products and services to a global client base of corporations, investors, financial institutions, merchants, government and municipal entities. Banking offers a full range of investment banking products and services in all major capital markets, including advising on corporate strategy and structure, capital-raising in equity and debt markets, as well as loan origination and syndication. Banking also includes Wholesale Payments, which provides payments services enabling clients to manage payments and receipts globally, and cross-border financing. Markets & Securities Services includes Markets, a global market-maker across products, including cash and derivative instruments, which also offers sophisticated risk management solutions, prime brokerage, and research. Markets & Securities Services also includes Securities Services, a leading global custodian which provides custody, fund accounting and administration, and securities lending products principally for asset managers, insurance companies and public and private investment funds.

Commercial Banking

Commercial Banking provides comprehensive financial solutions, including lending, wholesale payments, investment banking and asset management products across three primary client segments: Middle Market Banking, Corporate Client Banking and Commercial Real Estate Banking. Other includes amounts not aligned with a primary client segment.

Middle Market Banking covers small and midsized companies, local governments and nonprofit clients.

Corporate Client Banking covers large corporations.

Commercial Real Estate Banking covers investors, developers, and owners of multifamily, office, retail, industrial and affordable housing properties.

Asset & Wealth Management

Asset & Wealth Management, with client assets of $3.7 trillion, is a global leader in investment and wealth management.

Asset Management
Offers multi-asset investment management solutions across equities, fixed income, alternatives and money market funds to institutional and retail investors providing for a broad range of clients' investment needs.

Wealth Management
Provides retirement products and services, brokerage, custody, trusts and estates, loans, mortgages, deposits and investment management to high net worth clients.

The majority of AWM's client assets are in actively managed portfolios.

Corporate

The Corporate segment consists of Treasury and Chief Investment Office and Other Corporate, which includes corporate staff functions and expense that is centrally managed. Treasury and CIO is predominantly responsible for measuring, monitoring, reporting and managing the Firm's liquidity, funding, capital, structural interest rate and foreign exchange risks. The major Other Corporate functions include Real Estate, Technology, Legal, Corporate Finance, Human Resources, Internal Audit, Risk Management, Compliance, Control Management, Corporate Responsibility and various Other Corporate groups.

Segment results

The following table provides a summary of the Firm's segment results as of or for the years ended December 31, 2020, 2019 and 2018, on a managed basis. The Firm's definition of managed basis starts with the reported U.S. GAAP results and includes certain reclassifications to present total net revenue for the Firm (and each of the reportable business segments) on an FTE basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in the managed results on a basis comparable to taxable investments and securities. This allows management to assess the comparability of revenue from year-to-year arising from both taxable and tax-exempt sources. The corresponding income tax impact related to tax-exempt items is recorded within income tax expense/(benefit). These adjustments have no impact on net income as reported by the Firm as a whole or by the LOBs.

Business segment capital allocation

Each business segment is allocated capital by taking into consideration a variety of factors including capital levels of similarly rated peers and applicable regulatory capital requirements. ROE is measured and internal targets for expected returns are established as key measures of a business segment's performance.

The Firm's allocation methodology incorporates Basel III Standardized RWA, Basel III Advanced RWA, the GSIB surcharge, and a simulation of capital in a severe stress environment. The assumptions and methodologies used to allocate capital are periodically assessed and as a result, the capital allocated to the LOBs may change from time to time.

Business segment changes

In the fourth quarter of 2020, the Firm transferred certain assets, liabilities, revenue, expense and headcount associated with certain wealth management clients from AWM to the J.P. Morgan Wealth Management business unit within CCB. Prior-period amounts have been revised to conform with the current presentation, including the transfer of approximately 1,650 technology and support staff during the second and third quarters of 2020. Ultra-high-net-worth and certain high-net-worth client relationships remained in AWM.

In the first quarter of 2020, the Firm began reporting a Wholesale Payments business unit within CIB following a realignment of the Firm's wholesale payments businesses. The Wholesale Payments business comprises:

- Merchant Services, which was realigned from CCB to CIB
- Treasury Services and Trade Finance in CIB. Trade Finance was previously reported in Lending in CIB.

In connection with the alignment of Wholesale Payments, the assets, liabilities and headcount associated with the Merchant Services business were realigned to CIB from CCB, and the revenue and expenses of the Merchant Services business are reported across CCB, CIB and CB based primarily on client relationships. In the fourth quarter of 2020, payment processing-only clients along with the associated revenue and expenses were realigned to CIB's Wholesale Payments business from CCB and CB. Payment processing-only clients are those that only use payment services offered by Merchant Services, and in general do not currently utilize other services offered by the Firm. Prior-period amounts have been revised to reflect this realignment and revised allocation methodology.

Segment results and reconciliation[(a)]

(Table continued on next page)

As of or for the year ended December 31, (in millions, except ratios)	Consumer & Community Banking[(b)]			Corporate & Investment Bank			Commercial Banking			Asset & Wealth Management		
	2020	2019	2018	**2020**	2019	2018	**2020**	2019	2018	**2020**	2019	2018
Noninterest revenue	**$ 17,740**	$ 17,796	$ 15,338	**$ 35,120**	$30,060	$ 27,854	**$ 3,067**	$ 2,710	$ 2,620	**$ 10,822**	$ 10,236	$ 10,052
Net interest income	**33,528**	37,337	35,933	**14,164**	9,205	9,528	**6,246**	6,554	6,716	**3,418**	3,355	3,375
Total net revenue	**51,268**	55,133	51,271	**49,284**	39,265	37,382	**9,313**	9,264	9,336	**14,240**	13,591	13,427
Provision for credit losses	**12,312**	4,954	4,754	**2,726**	277	(60)	**2,113**	296	129	**263**	59	52
Noninterest expense	**27,990**	28,276	27,168	**23,538**	22,444	21,876	**3,798**	3,735	3,627	**9,957**	9,747	9,575
Income/(loss) before income tax expense/(benefit)	**10,966**	21,903	19,349	**23,020**	16,544	15,566	**3,402**	5,233	5,580	**4,020**	3,785	3,800
Income tax expense/(benefit)	**2,749**	5,362	4,642	**5,926**	4,590	3,767	**824**	1,275	1,316	**1,028**	918	855
Net income/(loss)	**$ 8,217**	$ 16,541	$ 14,707	**$ 17,094**	$11,954	$ 11,799	**$ 2,578**	$ 3,958	$ 4,264	**$ 2,992**	$ 2,867	$ 2,945
Average equity	**$ 52,000**	$ 52,000	$ 51,000	**$ 80,000**	$80,000	$ 70,000	**$ 22,000**	$ 22,000	$ 20,000	**$ 10,500**	$ 10,500	$ 9,000
Total assets	**496,705**	541,367	560,177	**1,097,219**	914,705	909,292	**228,932**	220,514	220,229	**203,384**	173,175	161,047
Return on equity	**15 %**	31 %	28 %	**20 %**	14 %	16 %	**11 %**	17 %	20 %	**28 %**	26 %	32 %
Overhead ratio	**55**	51	53	**48**	57	59	**41**	40	39	**70**	72	71

(Table continued from previous page)

As of or for the year ended December 31, (in millions, except ratios)	Corporate			Reconciling Items[(a)]			Total[(b)]		
	2020	2019	2018	**2020**	2019	2018	**2020**	2019	2018
Noninterest revenue	**$ 1,199**	$ (114)	$ (263)	**$ (2,968)**	$ (2,534)	$ (1,877)	**$ 64,980**	$ 58,154	$ 53,724
Net interest income	**(2,375)**	1,325	135	**(418)**	(531)	(628)	**54,563**	57,245	55,059
Total net revenue	**(1,176)**	1,211	(128)	**(3,386)**	(3,065)	(2,505)	**119,543**	115,399	108,783
Provision for credit losses	**66**	(1)	(4)	**–**	–	–	**17,480**	5,585	4,871
Noninterest expense	**1,373**	1,067	902	**–**	–	–	**66,656**	65,269	63,148
Income/(loss) before income tax expense/(benefit)	**(2,615)**	145	(1,026)	**(3,386)**	(3,065)	(2,505)	**35,407**	44,545	40,764
Income tax expense/(benefit)	**(865)**	(966)	215	**(3,386)**	(3,065)	(2,505)	**6,276**	8,114	8,290
Net income/(loss)	**$ (1,750)**	$ 1,111	$ (1,241)	**$ –**	$ –	$ –	**$ 29,131**	$ 36,431	$ 32,474
Average equity	**$ 72,365**	$ 68,407	$ 79,222	**$ –**	$ –	$ –	**$ 236,865**	$ 232,907	$ 229,222
Total assets	**1,359,831**	837,618	771,787	**NA**	NA	NA	**3,386,071**	2,687,379	2,622,532
Return on equity	**NM**	NM	NM	**NM**	NM	NM	**12 %**	15 %	13 %
Overhead ratio	**NM**	NM	NM	**NM**	NM	NM	**56**	57	58

(a) Segment results on a managed basis reflect revenue on a FTE basis with the corresponding income tax impact recorded within income tax expense/(benefit). These adjustments are eliminated in reconciling items to arrive at the Firm's reported U.S. GAAP results.
(b) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

Note 33 – Parent Company

The following tables present Parent Company-only financial statements.

Statements of income and comprehensive income

Year ended December 31, (in millions)	2020	2019	2018
Income			
Dividends from subsidiaries and affiliates:			
Bank and bank holding company	$ 6,000	$ 26,000	$ 32,501
Non-bank[a]	–	–	2
Interest income from subsidiaries	63	223	216
Other income from subsidiaries:			
Bank and bank holding company	2,019	2,738	515
Non-bank	(569)	197	(444)
Other income	205	(1,731)	888
Total income	7,718	27,427	33,678
Expense			
Interest expense/(income) to subsidiaries and affiliates[a]	(8,830)	(5,303)	2,291
Other interest expense	14,150	13,246	4,581
Noninterest expense	2,222	1,992	1,793
Total expense	7,542	9,935	8,665
Income before income tax benefit and undistributed net income of subsidiaries	176	17,492	25,013
Income tax benefit	1,324	2,033	1,838
Equity in undistributed net income of subsidiaries	27,631	16,906	5,623
Net income	$ 29,131	$ 36,431	$ 32,474
Other comprehensive income, net	6,417	3,076	(1,476)
Comprehensive income	$ 35,548	$ 39,507	$ 30,998

Balance sheets

December 31, (in millions)	2020	2019
Assets		
Cash and due from banks	$ 54	$ 32
Deposits with banking subsidiaries	6,811	5,309
Trading assets	1,775	3,011
Advances to, and receivables from, subsidiaries:		
Bank and bank holding company	27	2,358
Non-bank	86	84
Investments (at equity) in subsidiaries and affiliates:		
Bank and bank holding company	508,602	471,207
Non-bank	1,011	1,044
Other assets	10,058	10,699
Total assets	$ 528,424	$ 493,744
Liabilities and stockholders' equity		
Borrowings from, and payables to, subsidiaries and affiliates[a]	$ 25,150	$ 23,410
Short-term borrowings	924	2,616
Other liabilities	9,612	9,288
Long-term debt[b][c]	213,384	197,100
Total liabilities[c]	249,070	232,414
Total stockholders' equity	279,354	261,330
Total liabilities and stockholders' equity	$ 528,424	$ 493,744

Statements of cash flows

Year ended December 31, (in millions)	2020	2019	2018
Operating activities			
Net income	$ 29,131	$ 36,431	$ 32,474
Less: Net income of subsidiaries and affiliates[a]	33,631	42,906	38,125
Parent company net loss	(4,500)	(6,475)	(5,651)
Cash dividends from subsidiaries and affiliates[a]	6,000	26,000	32,501
Other operating adjustments	15,357	9,862	(4,400)
Net cash provided by/(used in) operating activities	16,857	29,387	22,450
Investing activities			
Net change in:			
Advances to and investments in subsidiaries and affiliates, net	(2,663)	(6) [e]	8,036
All other investing activities, net	24	71	63
Net cash provided by/(used in) investing activities	(2,639)	65	8,099
Financing activities			
Net change in:			
Borrowings from subsidiaries and affiliates[a]	1,425	2,941	(2,273)
Short-term borrowings	(20)	(56)	(678)
Proceeds from long-term borrowings	37,312	25,569	25,845
Payments of long-term borrowings	(34,194)	(21,226)	(21,956)
Proceeds from issuance of preferred stock	4,500	5,000	1,696
Redemption of preferred stock	(1,430)	(4,075)	(1,696)
Treasury stock repurchased	(6,517)	(24,001)	(19,983)
Dividends paid	(12,690)	(12,343)	(10,109)
All other financing activities, net	(1,080)	(1,290)	(1,526)
Net cash used in financing activities	(12,694)	(29,481)	(30,680)
Net decrease in cash and due from banks and deposits with banking subsidiaries	1,524	(29)	(131)
Cash and due from banks and deposits with banking subsidiaries at the beginning of the year	5,341	5,370	5,501
Cash and due from banks and deposits with banking subsidiaries at the end of the year	$ 6,865	$ 5,341	$ 5,370
Cash interest paid	$ 5,445	$ 7,957	$ 6,911
Cash income taxes paid, net[d]	5,366	3,910	1,782

(a) Affiliates include trusts that issued guaranteed capital debt securities ("issuer trusts").
(b) At December 31, 2020, long-term debt that contractually matures in 2021 through 2025 totaled $10.8 billion, $10.0 billion, $19.1 billion, $21.8 billion, and $13.5 billion, respectively.
(c) Refer to Notes 20 and 28 for information regarding the Parent Company's guarantees of its subsidiaries' obligations.
(d) Represents payments, net of refunds, made by the Parent Company to various taxing authorities and includes taxes paid on behalf of certain of its subsidiaries that are subsequently reimbursed. The reimbursements were $8.3 billion, $6.4 billion, and $1.2 billion for the years ended December 31, 2020, 2019, and 2018, respectively.
(e) As a result of the merger of Chase Bank USA, N.A. with and into JPMorgan Chase Bank, N.A., JPMorgan Chase Bank, N.A. distributed $13.5 billion to the Parent company as a return of capital, which the Parent company contributed to the IHC.

Selected quarterly financial data (unaudited)

As of or for the period ended (in millions, except per share, ratio, headcount data and where otherwise noted)	2020 4th quarter	2020 3rd quarter	2020 2nd quarter	2020 1st quarter	2019 4th quarter	2019 3rd quarter	2019 2nd quarter	2019 1st quarter
Selected income statement data								
Total net revenue[a]	$ 29,224	$ 29,147	$ 32,980	$ 28,192	$ 28,285	$ 29,291	$ 28,747	$ 29,076
Total noninterest expense[a]	16,048	16,875	16,942	16,791	16,293	16,372	16,256	16,348
Pre-provision profit[b]	13,176	12,272	16,038	11,401	11,992	12,919	12,491	12,728
Provision for credit losses	(1,889)	611	10,473	8,285	1,427	1,514	1,149	1,495
Income before income tax expense	15,065	11,661	5,565	3,116	10,565	11,405	11,342	11,233
Income tax expense	2,929	2,218	878	251	2,045	2,325	1,690	2,054
Net income	$ 12,136	$ 9,443	$ 4,687	$ 2,865	$ 8,520	$ 9,080	$ 9,652	$ 9,179
Earnings per share data								
Net income: Basic	$ 3.80	$ 2.93	$ 1.39	$ 0.79	$ 2.58	$ 2.69	$ 2.83	$ 2.65
Diluted	3.79	2.92	1.38	0.78	2.57	2.68	2.82	2.65
Average shares: Basic	3,079.7	3,077.8	3,076.3	3,095.8	3,140.7	3,198.5	3,250.6	3,298.0
Diluted	3,085.1	3,082.8	3,081.0	3,100.7	3,148.5	3,207.2	3,259.7	3,308.2
Market and per common share data								
Market capitalization	$ 387,492	$ 293,451	$ 286,658	$ 274,323	$ 429,913	$ 369,133	$ 357,479	$ 328,387
Common shares at period-end	3,049.4	3,048.2	3,047.6	3,047.0	3,084.0	3,136.5	3,197.5	3,244.0
Book value per share	81.75	79.08	76.91	75.88	75.98	75.24	73.88	71.78
TBVPS[b]	66.11	63.93	61.76	60.71	60.98	60.48	59.52	57.62
Cash dividends declared per share	0.90	0.90	0.90	0.90	0.90	0.90	0.80	0.80
Selected ratios and metrics								
ROE[c]	19 %	15 %	7 %	4 %	14 %	15 %	16 %	16 %
ROTCE[b][c]	24	19	9	5	17	18	20	19
ROA[b]	1.42	1.14	0.58	0.40	1.22	1.30	1.41	1.39
Overhead ratio	55	58	51	60	58	56	57	56
Loans-to-deposits ratio[d]	47	49	52	57	64	64	65	66
Firm LCR (average)	110	114	117	114	116	115	113	111
JPMorgan Chase Bank, N.A. LCR (average)	160	157	140	117	116	112	112	109
CET1 capital ratio[e]	13.1	13.1	12.4	11.5	12.4	12.3	12.2	12.1
Tier 1 capital ratio[e]	15.0	15.0	14.3	13.3	14.1	14.1	14.0	13.8
Total capital ratio[e]	17.3	17.3	16.7	15.5	16.0	15.9	15.8	15.7
Tier 1 leverage ratio[e]	7.0	7.0	6.9	7.5	7.9	7.9	8.0	8.1
SLR[e]	6.9	7.0	6.8	6.0	6.3	6.3	6.4	6.4
Selected balance sheet data (period-end)								
Trading assets[d]	$ 503,126	$ 505,822	$ 491,716	$ 510,923	$ 369,687	$ 457,274	$ 485,567	$ 495,021
Investment Securities	589,999	531,136	558,791	471,144	398,239	394,251	307,264	267,365
Loans[d]	1,012,853	989,740	1,009,382	1,049,610	997,620	980,019	990,775	990,515
Total assets	3,386,071	3,246,076	3,213,616	3,139,431	2,687,379	2,764,661	2,727,379	2,737,188
Deposits	2,144,257	2,001,416	1,931,029	1,836,009	1,562,431	1,525,261	1,524,361	1,493,441
Long-term debt	281,685	279,175	317,003	299,344	291,498	296,472	288,869	290,893
Common stockholders' equity	249,291	241,050	234,403	231,199	234,337	235,985	236,222	232,844
Total stockholders' equity	279,354	271,113	264,466	261,262	261,330	264,348	263,215	259,837
Headcount	255,351	256,358	256,710	256,720	256,981	257,444	254,983	255,998
Credit quality metrics								
Allowance for loan losses and lending- related commitments	$ 30,737	$ 33,637	$ 34,301	$ 25,391	$ 14,314	$ 14,400	$ 14,295	$ 14,591
Allowance for loan losses to total retained loans	2.95 %	3.26 %	3.27 %	2.32 %	1.39 %	1.42 %	1.39 %	1.43 %
Nonperforming assets[d]	$ 10,906	$ 11,462	$ 9,715	$ 7,062	$ 5,054	$ 5,993	$ 5,260	$ 5,616
Net charge-offs	1,050	1,180	1,560	1,469	1,494	1,371	1,403	1,361
Net charge-off rate	0.44 %	0.49 %	0.64 %	0.62 %	0.63 %	0.58 %	0.60 %	0.58 %

Effective January 1, 2020, the Firm adopted the Financial Instruments – Credit Losses ("CECL") accounting guidance. Refer to Note 1 for further information.

(a) In the second quarter of 2020, the Firm reclassified certain spend-based credit card reward costs from marketing expense to be a reduction of card income, with no effect on net income. Prior-period amounts have been revised to conform with the current presentation.

(b) Pre-provision profit, TBVPS and ROTCE are each non-GAAP financial measures. Tangible common equity ("TCE") is also a non-GAAP financial measure. Refer to Explanation and Reconciliation of the Firm's Use of Non-GAAP Financial Measures on pages 62–64 for a further discussion of these measures.

(c) Quarterly ratios are based on annualized amounts.

(d) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

(e) The capital metrics reflect the relief provided by the Federal Reserve Board in response to the COVID-19 pandemic, including the CECL capital transition provisions that became effective in the first quarter of 2020. The SLR reflects the temporary exclusions of U.S. Treasury securities and deposits at Federal Reserve Banks that became effective in the second quarter of 2020. Refer to Regulatory Developments Relating to the COVID-19 Pandemic on pages 52-53 and Capital Risk Management on pages 91-101 for additional information.

Distribution of assets, liabilities and stockholders' equity; interest rates and interest differentials

Consolidated average balance sheets, interest and rates

Provided below is a summary of JPMorgan Chase's consolidated average balances, interest and rates on a taxable-equivalent basis for the years 2018 through 2020. Income computed on a taxable-equivalent basis is the income reported in the Consolidated statements of income, adjusted to present interest income and rates earned on assets exempt from income taxes (i.e., federal taxes) on a basis comparable with other taxable investments. The incremental tax rate used for calculating the taxable-equivalent adjustment was approximately 24% in 2020, 2019 and 2018.

(Table continued on next page)

(Unaudited)	2020		
Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	Average balance	Interest[h]	Rate
Assets			
Deposits with banks	$ 444,058	$ 749	0.17 %
Federal funds sold and securities purchased under resale agreements	275,926	2,436	0.88
Securities borrowed	143,472	(302)	(0.21) [j]
Trading assets – debt instruments[a]	322,936	7,869	2.44
Taxable securities	476,650	7,843	1.65
Non-taxable securities[b]	33,287	1,437	4.32
Total investment securities	509,937	9,280	1.82 [k]
Loans[a]	1,004,597	43,886 [i]	4.37
All other interest-earning assets[a][c]	78,784	1,023	1.30
Total interest-earning assets	2,779,710	64,941	2.34
Allowance for loan losses	(25,775)		
Cash and due from banks	22,241		
Trading assets – equity and other instruments[a]	118,055		
Trading assets – derivative receivables	76,572		
Goodwill, MSRs and other intangible assets	51,934		
All other noninterest-earning assets[a]	180,411		
Total assets	$ 3,203,148		
Liabilities			
Interest-bearing deposits	$ 1,389,224	$ 2,357	0.17 %
Federal funds purchased and securities loaned or sold under repurchase agreements	255,421	1,058	0.41
Short-term borrowings[d]	38,853	372	0.96
Trading liabilities – debt and all other interest-bearing liabilities[e][f]	205,255	195	0.10 [j]
Beneficial interests issued by consolidated VIEs	19,216	214	1.12
Long-term debt	254,400	5,764	2.27
Total interest-bearing liabilities	2,162,369	9,960	0.46
Noninterest-bearing deposits	517,527		
Trading liabilities – equity and other instruments[f]	32,628		
Trading liabilities – derivative payables	61,593		
All other liabilities, including the allowance for lending-related commitments	162,267		
Total liabilities	2,936,384		
Stockholders' equity			
Preferred stock	29,899		
Common stockholders' equity	236,865		
Total stockholders' equity	266,764 [g]		
Total liabilities and stockholders' equity	$ 3,203,148		
Interest rate spread			1.88 %
Net interest income and net yield on interest-earning assets		$ 54,981	1.98

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(b) Represents securities that are tax-exempt for U.S. federal income tax purposes.
(c) Includes brokerage-related held-for-investment customer receivables, which are classified in accrued interest and accounts receivable, and all other interest-earning assets, which are classified in other assets on the Consolidated Balance Sheets.
(d) Includes commercial paper.
(e) All other interest-bearing liabilities include brokerage-related customer payables.

Within the Consolidated average balance sheets, interest and rates summary, the principal amounts of nonaccrual loans have been included in the average loan balances used to determine the average interest rate earned on loans. Refer to Note 12 for additional information on nonaccrual loans, including interest accrued.

(Table continued from previous page)

2019			2018		
Average balance	Interest[h]	Rate	Average balance	Interest[h]	Rate
$ 280,004	$ 3,887	1.39 %	$ 405,514	$ 5,907	1.46 %
275,429	6,146	2.23	217,150	3,819	1.76
131,291	1,574	1.20	115,082	913	0.79
294,958	9,189	3.12	208,266	7,206	3.46
284,127	7,962	2.80	194,232	5,653	2.91
35,748	1,655	4.63	42,456	1,987	4.68
319,875	9,617	3.01 [k]	236,688	7,640	3.23 [k]
989,943	52,012 [i]	5.25	977,406	49,208 [i]	5.03
53,779	2,146	3.99	52,551	2,035	3.87
2,345,279	84,571	3.61	2,212,657	76,728	3.47
(13,331)			(13,269)		
20,645			21,694		
114,323			118,152		
53,786			60,734		
53,683			54,669		
167,456			154,261		
$ 2,741,841			$ 2,608,898		
$ 1,115,848	$ 8,957	0.80 %	$ 1,045,037	$ 5,973	0.57 %
227,994	4,630	2.03	189,282	3,066	1.62
52,426	1,248	2.38	54,993	1,144	2.08
182,105	2,585	1.42	177,788	2,387	1.34
22,501	568	2.52	21,079	493	2.34
247,968	8,807	3.55	243,246	7,978	3.28
1,848,842	26,795	1.45	1,731,425	21,041	1.22
407,219			411,424		
31,085			34,667		
42,560			43,075		
151,717			132,836		
2,481,423			2,353,427		
27,511			26,249		
232,907			229,222		
260,418 [g]			255,471 [g]		
$ 2,741,841			$ 2,608,898		
		2.16 %			2.25 %
	$ 57,776	2.46		$ 55,687	2.52

(f) The combined balance of trading liabilities – debt and equity instruments was $106.5 billion, $101.0 billion and $107.0 billion for the years ended December 31, 2020, 2019 and 2018, respectively.

(g) The ratio of average stockholders' equity to average assets was 8.3%, 9.5% and 9.8% for the years ended December 31, 2020, 2019 and 2018, respectively. The return on average stockholders' equity, based on net income, was 10.9%, 14.0% and 12.7% for the years ended December 31, 2020, 2019 and 2018, respectively.

(h) Interest includes the effect of related hedging derivatives. Taxable-equivalent amounts are used where applicable.

(i) Fees and commissions on loans included in loan interest amounted to $1.0 billion for the year ended December 31, 2020, and $1.2 billion each for the years ended December 31, 2019 and 2018.

(j) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(k) The annualized rate for securities based on amortized cost was 1.85%, 3.05% and 3.25% for the years ended December 31, 2020, 2019 and 2018, respectively, and does not give effect to changes in fair value that are reflected in AOCI.

Interest rates and interest differential analysis of net interest income – U.S. and non-U.S.

Presented below is a summary of interest and rates segregated between U.S. and non-U.S. operations for the years 2018 through 2020. The segregation of U.S. and non-U.S. components is based on the location of the office recording the transaction. Intercompany funding generally consists of dollar-denominated deposits originated in various locations that are centrally managed by Treasury and CIO.

(Table continued on next page)

(Unaudited) Year ended December 31, (Taxable-equivalent interest and rates; in millions, except rates)	2020 Average balance	Interest	Rate
Interest-earning assets			
Deposits with banks:			
U.S.	$ 294,669	$ 768	0.26 %
Non-U.S.	149,389	(19)	(0.01)
Federal funds sold and securities purchased under resale agreements:			
U.S.	141,409	1,341	0.95
Non-U.S.	134,517	1,095	0.81
Securities borrowed:[(a)]			
U.S.	100,026	(305)	(0.30)
Non-U.S.	43,446	3	0.01
Trading assets – debt instruments: [(b)]			
U.S.	216,025	5,056	2.34
Non-U.S.	106,911	2,813	2.63
Investment securities:			
U.S.	475,832	8,703	1.83
Non-U.S.	34,105	577	1.69
Loans:[(b)]			
U.S.	909,850	41,708	4.58
Non-U.S.	94,747	2,178	2.30
All other interest-earning assets, predominantly U.S.[(b)]	78,784	1,023	1.30
Total interest-earning assets	2,779,710	64,941	2.34
Interest-bearing liabilities			
Interest-bearing deposits:			
U.S.	1,068,857	2,288	0.21
Non-U.S.	320,367	69	0.02
Federal funds purchased and securities loaned or sold under repurchase agreements:			
U.S.	204,958	863	0.42
Non-U.S.	50,463	195	0.39
Trading liabilities – debt, short-term and all other interest-bearing liabilities:[(a)(c)]			
U.S.	151,120	(30)	(0.02)
Non-U.S.	92,988	597	0.64
Beneficial interests issued by consolidated VIEs, predominantly U.S.	19,216	214	1.12
Long-term debt:			
U.S.	247,623	5,704	2.30
Non-U.S.	6,777	60	0.89
Intercompany funding:			
U.S.	(46,327)	(1,254)	–
Non-U.S.	46,327	1,254	–
Total interest-bearing liabilities	2,162,369	9,960	0.46
Noninterest-bearing liabilities[(d)]	617,341		
Total investable funds	$ 2,779,710	$ 9,960	0.36 %
Net interest income and net yield:		$ 54,981	1.98 %
U.S.		49,242	2.25
Non-U.S.		5,739	0.97
Percentage of total assets and liabilities attributable to non-U.S. operations:			
Assets			23.5
Liabilities			20.9

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.

(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.

(c) Includes commercial paper.

(d) Represents the amount of noninterest-bearing liabilities funding interest-earning assets.

Refer to the “Net interest income” discussion in Consolidated Results of Operations on pages 54-56 for further information.

(Table continued from previous page)

2019			2018		
Average balance	Interest	Rate	Average balance	Interest	Rate
$ 165,066	$ 3,588	2.17 %	$ 305,117	$ 5,703	1.87 %
114,938	299	0.26	100,397	204	0.20
150,205	4,068	2.71	102,144	2,427	2.38
125,224	2,078	1.66	115,006	1,392	1.21
92,625	1,423	1.54	77,027	825	1.07
38,666	151	0.39	38,055	88	0.23
200,811	6,157	3.07	121,967	4,229	3.47
94,147	3,032	3.22	86,299	2,977	3.45
287,961	8,963	3.11	200,883	6,943	3.46
31,914	654	2.05	35,805	697	1.95
898,570	49,058	5.46	882,314	46,227	5.24
91,373	2,954	3.23	95,092	2,981	3.13
53,779	2,146	3.99	52,551	2,035	3.87
2,345,279	84,571	3.61	2,212,657	76,728	3.47
850,493	6,896	0.81	802,786	4,562	0.57
265,355	2,061	0.78	242,251	1,411	0.58
164,284	3,989	2.43	117,754	2,562	2.18
63,710	641	1.01	71,528	504	0.70
147,247	2,574	1.75	147,512	2,225	1.51
87,284	1,259	1.44	85,269	1,306	1.53
22,501	568	2.52	21,079	493	2.34
241,914	8,766	3.62	239,718	7,954	3.32
6,054	41	0.68	3,528	24	0.68
(42,947)	(1,414)	–	(51,933)	(746)	–
42,947	1,414	–	51,933	746	–
1,848,842	26,795	1.45	1,731,425	21,041	1.22
496,437			481,232		
$ 2,345,279	$ 26,795	1.14 %	$ 2,212,657	$ 21,041	0.95 %
	$ 57,776	2.46 %		$ 55,687	2.52 %
	52,217	2.86		50,236	2.95
	5,559	1.07		5,451	1.05
		24.5			24.7
		22.1			22.3

Changes in net interest income, volume and rate analysis

The table below presents an attribution of net interest income between volume and rate. The attribution between volume and rate is calculated using annual average balances for each category of assets and liabilities shown in the table and the corresponding annual rates (refer to pages 300–304 for more information on average balances and rates). In this analysis, when the change cannot be isolated to either volume or rate, it has been allocated to volume. The annual rates include the impact of changes in market rates, as well as the impact of any change in composition of the various products within each category of asset or liability. This analysis is calculated separately for each category without consideration of the relationship between categories (for example, the net spread between the rates earned on assets and the rates paid on liabilities that fund those assets). As a result, changes in the granularity or groupings considered in this analysis would produce a different attribution result, and due to the complexities involved, precise allocation of changes in interest rates between volume and rates is inherently complex and judgmental.

(Unaudited)	**2020 versus 2019**			2019 versus 2018		
	Increase/(decrease) due to change in:			Increase/(decrease) due to change in:		
Year ended December 31, (On a taxable-equivalent basis; in millions)	Volume	Rate	Net change	Volume	Rate	Net change
Interest-earning assets						
Deposits with banks:						
U.S.	**$ 333**	**$ (3,153)**	**$ (2,820)**	$ (3,030)	$ 915	$ (2,115)
Non-U.S.	**(8)**	**(310)**	**(318)**	35	60	95
Federal funds sold and securities purchased under resale agreements:						
U.S.	**(83)**	**(2,644)**	**(2,727)**	1,304	337	1,641
Non-U.S.	**81**	**(1,064)**	**(983)**	168	518	686
Securities borrowed:[(a)]						
U.S.	**(24)**	**(1,704)**	**(1,728)**	236	362	598
Non-U.S.	**(1)**	**(147)**	**(148)**	2	61	63
Trading assets – debt instruments:[(b)]						
U.S.	**365**	**(1,466)**	**(1,101)**	2,416	(488)	1,928
Non-U.S.	**336**	**(555)**	**(219)**	253	(198)	55
Investment securities:						
U.S.	**3,426**	**(3,686)**	**(260)**	2,723	(703)	2,020
Non-U.S.	**38**	**(115)**	**(77)**	(79)	36	(43)
Loans:[(b)]						
U.S.	**557**	**(7,907)**	**(7,350)**	890	1,941	2,831
Non-U.S.	**74**	**(850)**	**(776)**	(122)	95	(27)
All other interest-earning assets, predominantly U.S.[(b)]	**324**	**(1,447)**	**(1,123)**	48	63	111
Change in interest income	**5,418**	**(25,048)**	**(19,630)**	4,844	2,999	7,843
Interest-bearing liabilities						
Interest-bearing deposits:						
U.S.	**495**	**(5,103)**	**(4,608)**	407	1,927	2,334
Non-U.S.	**25**	**(2,017)**	**(1,992)**	165	485	650
Federal funds purchased and securities loaned or sold under repurchase agreements:						
U.S.	**176**	**(3,302)**	**(3,126)**	1,133	294	1,427
Non-U.S.	**(51)**	**(395)**	**(446)**	(85)	222	137
Trading liabilities – debt, short-term and all other interest-bearing liabilities: [(a)(c)]						
U.S.	**2**	**(2,606)**	**(2,604)**	(5)	354	349
Non-U.S.	**36**	**(698)**	**(662)**	30	(77)	(47)
Beneficial interests issued by consolidated VIEs, predominantly U.S.	**(37)**	**(317)**	**(354)**	37	38	75
Long-term debt:						
U.S.	**131**	**(3,193)**	**(3,062)**	93	719	812
Non-U.S.	**6**	**13**	**19**	17	–	17
Intercompany funding:						
U.S.	**(89)**	**249**	**160**	293	(961)	(668)
Non-U.S.	**89**	**(249)**	**(160)**	(293)	961	668
Change in interest expense	**783**	**(17,618)**	**(16,835)**	1,792	3,962	5,754
Change in net interest income	**$ 4,635**	**$ (7,430)**	**$ (2,795)**	$ 3,052	$ (963)	$ 2,089

(a) Negative interest income and yield are related to the impact of current interest rates combined with the fees paid on client-driven securities borrowed balances. The negative interest expense related to prime brokerage customer payables is recognized in interest expense and reported within trading liabilities - debt and all other interest-bearing liabilities.
(b) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans and other assets. Prior-period amounts have been revised to conform with the current presentation.
(c) Includes commercial paper.

2020 Form 10-K: Annual report on Form 10-K for year ended December 31, 2020, filed with the U.S. Securities and Exchange Commission.

ABS: Asset-backed securities

AFS: Available-for-sale

ALCO: Asset Liability Committee

Amortized cost: Amount at which a financing receivable or investment is originated or acquired, adjusted for accretion or amortization of premium, discount, and net deferred fees or costs, collection of cash, charge-offs, foreign exchange, and fair value hedge accounting adjustments. For AFS securities, amortized cost is also reduced by any impairment losses recognized in earnings. Amortized cost is not reduced by the allowance for credit losses, except where explicitly presented net.

AOCI: Accumulated other comprehensive income/(loss)

ARM: Adjustable rate mortgage(s)

AUC: Assets under custody

AUM: "Assets under management": Represent assets managed by AWM on behalf of its Private Banking, Institutional and Retail clients. Includes "Committed capital not Called."

Auto loan and lease origination volume: Dollar amount of auto loans and leases originated.

AWM: Asset & Wealth Management

Beneficial interests issued by consolidated VIEs: Represents the interest of third-party holders of debt, equity securities, or other obligations, issued by VIEs that JPMorgan Chase consolidates.

Benefit obligation: Refers to the projected benefit obligation for pension plans and the accumulated postretirement benefit obligation for OPEB plans.

BHC: Bank holding company

CB: Commercial Banking

CBB: Consumer & Business Banking

CCAR: Comprehensive Capital Analysis and Review

CCB: Consumer & Community Banking

CCO: Chief Compliance Officer

CCP: "Central counterparty" is a clearing house that interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer and thereby ensuring the future performance of open contracts. A CCP becomes a counterparty to trades with market participants through novation, an open offer system, or another legally binding arrangement.

CDS: Credit default swaps

CECL: Current Expected Credit Losses

CEO: Chief Executive Officer

CET1 Capital: Common equity Tier 1 capital

CFTC: Commodity Futures Trading Commission

CFO: Chief Financial Officer

CFP: Contingency funding plan

Chase Bank USA, N.A.: Chase Bank USA, National Association

CIB: Corporate & Investment Bank

CIO: Chief Investment Office

Client assets: Represent assets under management as well as custody, brokerage, administration and deposit accounts.

Client deposits and other third-party liabilities: Deposits, as well as deposits that are swept to on-balance sheet liabilities (e.g., commercial paper, federal funds purchased and securities loaned or sold under repurchase agreements) as part of client cash management programs.

CLO: Collateralized loan obligations

CLTV: Combined loan-to-value

Collateral-dependent: A loan is considered to be collateral-dependent when repayment of the loan is expected to be provided substantially through the operation or sale of the collateral when the borrower is experiencing financial difficulty, including when foreclosure is deemed probable based on borrower delinquency.

Commercial Card: provides a wide range of payment services to corporate and public sector clients worldwide through the commercial card products. Services include procurement, corporate travel and entertainment, expense management services, and business-to-business payment solutions.

Credit cycle: A period of time over which credit quality improves, deteriorates and then improves again (or vice versa). The duration of a credit cycle can vary from a couple of years to several years.

Credit derivatives: Financial instruments whose value is derived from the credit risk associated with the debt of a third-party issuer (the reference entity) which allow one party (the protection purchaser) to transfer that risk to another party (the protection seller). Upon the occurrence of a credit event by the reference entity, which may include, among other events, the bankruptcy or failure to pay its obligations, or certain restructurings of the debt of the reference entity, neither party has recourse to the reference entity. The protection purchaser has recourse to the protection seller for the difference between the face value of the CDS contract and the fair value at the time of settling the credit derivative contract. The determination as to whether a credit event has occurred is generally made by the relevant International Swaps and Derivatives Association ("ISDA") Determinations Committee.

Criticized: Criticized loans, lending-related commitments and derivative receivables that are classified as special mention, substandard and doubtful categories for regulatory purposes.

CRO: Chief Risk Officer

CTC: CIO, Treasury and Corporate

CVA: Credit valuation adjustment

Debit and credit card sales volume: Dollar amount of card member purchases, net of returns.

Deposit margin/deposit spread: Represents net interest income expressed as a percentage of average deposits.

Distributed denial-of-service attack: The use of a large number of remote computer systems to electronically send a high volume of traffic to a target website to create a service outage at the target. This is a form of cyberattack.

Dodd-Frank Act: Wall Street Reform and Consumer Protection Act

DVA: Debit valuation adjustment

EC: European Commission

Eligible HQLA: Eligible high-quality liquid assets, for purposes of calculating the LCR, is the amount of unencumbered HQLA that satisfy certain operational considerations as defined in the LCR rule.

Eligible LTD: Long-term debt satisfying certain eligibility criteria

Embedded derivatives: are implicit or explicit terms or features of a financial instrument that affect some or all of the cash flows or the value of the instrument in a manner similar to a derivative. An instrument containing such terms or features is referred to as a “hybrid.” The component of the hybrid that is the non-derivative instrument is referred to as the “host.” For example, callable debt is a hybrid instrument that contains a plain vanilla debt instrument (i.e., the host) and an embedded option that allows the issuer to redeem the debt issue at a specified date for a specified amount (i.e., the embedded derivative). However, a floating rate instrument is not a hybrid composed of a fixed-rate instrument and an interest rate swap.

ERISA: Employee Retirement Income Security Act of 1974

EPS: Earnings per share

ETD: “Exchange-traded derivatives”: Derivative contracts that are executed on an exchange and settled via a central clearing house.

Expense categories:
- Volume- and revenue-related expenses generally correlate with changes in the related business/ transaction volume or revenue. Examples of volume- and revenue-related expenses include commissions and incentive compensation, depreciation expense related to operating lease assets, and brokerage expense related to equities trading transaction volume.
- Investments include expenses associated with supporting medium- to longer-term strategic plans of the Firm. Examples of investments include initiatives in technology (including related compensation), marketing, and compensation for new bankers and client advisors.
- Structural expenses are those associated with the day-today cost of running the bank and are expenses not covered by the above two categories. Examples of structural expenses include employee salaries and benefits, as well as noncompensation costs such as real estate and all other expenses.

EU: European Union

Fannie Mae: Federal National Mortgage Association

FASB: Financial Accounting Standards Board

FCA: Financial Conduct Authority

FCC: Firmwide Control Committee

FDIA: Federal Depository Insurance Act

FDIC: Federal Deposit Insurance Corporation

Federal Reserve: The Board of the Governors of the Federal Reserve System

FFIEC: Federal Financial Institutions Examination Council

FHA: Federal Housing Administration

FHLB: Federal Home Loan Bank

FICC: The Fixed Income Clearing Corporation

FICO score: A measure of consumer credit risk provided by credit bureaus, typically produced from statistical models by Fair Isaac Corporation utilizing data collected by the credit bureaus.

FINRA: Financial Industry Regulatory Authority

Firm: JPMorgan Chase & Co.

Forward points: Represents the interest rate differential between two currencies, which is either added to or subtracted from the current exchange rate (i.e., “spot rate”) to determine the forward exchange rate.

FRBB: Federal Reserve Bank of Boston

FRBNY: Federal Reserve Bank of New York

FRC: Firmwide Risk Committee

Freddie Mac: Federal Home Loan Mortgage Corporation

Free standing derivatives: a derivative contract entered into either separate and apart from any of the Firm’s other financial instruments or equity transactions. Or, in conjunction with some other transaction and is legally detachable and separately exercisable.

FSB: Financial Stability Board

FTE: Fully taxable equivalent

FVA: Funding valuation adjustment

FX: Foreign exchange

G7: Group of Seven nations: Countries in the G7 are Canada, France, Germany, Italy, Japan, the U.K. and the U.S.

G7 government bonds: Bonds issued by the government of one of the G7 nations.

Ginnie Mae: Government National Mortgage Association

GSIB: Global systemically important banks

Headcount-related expense: Includes salary and benefits (excluding performance-based incentives), and other noncompensation costs related to employees.

HELOC: Home equity line of credit

Home equity – senior lien: Represents loans and commitments where JPMorgan Chase holds the first security interest on the property.

Home equity – junior lien: Represents loans and commitments where JPMorgan Chase holds a security interest that is subordinate in rank to other liens.

Households: A household is a collection of individuals or entities aggregated together by name, address, tax identifier and phone number.

HQLA: "High-quality liquid assets" consist of cash and certain high-quality liquid securities as defined in the LCR rule.

HTM: Held-to-maturity

IBOR: Interbank Offered Rate

ICAAP: Internal capital adequacy assessment process

IDI: Insured depository institutions

IHC: JPMorgan Chase Holdings LLC, an intermediate holding company

Investment-grade: An indication of credit quality based on JPMorgan Chase's internal risk assessment. The Firm considers ratings of BBB-/Baa3 or higher as investment-grade.

IPO: Initial public offering

ISDA: International Swaps and Derivatives Association

JPMorgan Chase: JPMorgan Chase & Co.

JPMorgan Chase Bank, N.A.: JPMorgan Chase Bank, National Association

JPMorgan Securities: J.P. Morgan Securities LLC

Loan-equivalent: Represents the portion of the unused commitment or other contingent exposure that is expected, based on historical portfolio experience, to become drawn prior to an event of a default by an obligor.

LCR: Liquidity coverage ratio

LDA: Loss Distribution Approach

LGD: Loss given default

LIBOR: London Interbank Offered Rate

LLC: Limited Liability Company

LOB: Line of business

LOB CROs: Line of Business and CTC Chief Risk Officers

Loss emergence period: Represents the time period between the date at which the loss is estimated to have been incurred and the ultimate realization of that loss.

LTIP: Long-term incentive plan

LTV: "Loan-to-value": For residential real estate loans, the relationship, expressed as a percentage, between the principal amount of a loan and the appraised value of the collateral (i.e., residential real estate) securing the loan.

Origination date LTV ratio

The LTV ratio at the origination date of the loan. Origination date LTV ratios are calculated based on the actual appraised values of collateral (i.e., loan-level data) at the origination date.

Current estimated LTV ratio

An estimate of the LTV as of a certain date. The current estimated LTV ratios are calculated using estimated collateral values derived from a nationally recognized home price index measured at the metropolitan statistical area ("MSA") level. These MSA-level home price indices consist of actual data to the extent available and forecasted data where actual data is not available. As a result, the estimated collateral values used to calculate these ratios do not represent actual appraised loan-level collateral values; as such, the resulting LTV ratios are necessarily imprecise and should therefore be viewed as estimates.

Combined LTV ratio

The LTV ratio considering all available lien positions, as well as unused lines, related to the property. Combined LTV ratios are used for junior lien home equity products.

Managed basis: A non-GAAP presentation of Firmwide financial results that includes reclassifications to present revenue on a fully taxable-equivalent basis. Management also uses this financial measure at the segment level, because it believes this provides information to enable investors to understand the underlying operational performance and trends of the particular business segment and facilitates a comparison of the business segment with the performance of competitors.

Master netting agreement: A single agreement with a counterparty that permits multiple transactions governed by that agreement to be terminated or accelerated and settled through a single payment in a single currency in the event of a default (e.g., bankruptcy, failure to make a required payment or securities transfer or deliver collateral or margin when due).

MBS: Mortgage-backed securities

MD&A: Management's discussion and analysis

Measurement alternative: Measures equity securities without readily determinable fair values at cost less impairment (if any), plus or minus observable price changes from an identical or similar investment of the same issuer.

Merchant Services: offers merchants payment processing capabilities, fraud and risk management, data and analytics, and other payments services. Through Merchant Services, merchants of all sizes can accept payments via credit and debit cards and payments in multiple currencies.

MEV: Macroeconomic variable

MMLF: Money Market Mutual Fund Liquidity Facility

Moody's: Moody's Investor Services

Mortgage origination channels:

Retail – Borrowers who buy or refinance a home through direct contact with a mortgage banker employed by the Firm using a branch office, the Internet or by phone. Borrowers are frequently referred to a mortgage banker by a banker in a Chase branch, real estate brokers, home builders or other third parties.

Correspondent – Banks, thrifts, other mortgage banks and other financial institutions that sell closed loans to the Firm.

Mortgage product types:

Alt-A

Alt-A loans are generally higher in credit quality than subprime loans but have characteristics that would disqualify the borrower from a traditional prime loan. Alt-A lending characteristics may include one or more of the following: (i) limited documentation; (ii) a high CLTV ratio; (iii) loans secured by non-owner occupied properties; or (iv) a debt-to-income ratio above normal limits. A substantial proportion of the Firm's Alt-A loans are those where a borrower does not provide complete documentation of his or her assets or the amount or source of his or her income.

Option ARMs

The option ARM real estate loan product is an adjustable-rate mortgage loan that provides the borrower with the option each month to make a fully amortizing, interest-only or minimum payment. The minimum payment on an option ARM loan is based on the interest rate charged during the introductory period. This introductory rate is usually significantly below the fully indexed rate. The fully indexed rate is calculated using an index rate plus a margin. Once the introductory period ends, the contractual interest rate charged on the loan increases to the fully indexed rate and adjusts monthly to reflect movements in the index. The minimum payment is typically insufficient to cover interest accrued in the prior month, and any unpaid interest is deferred and added to the principal balance of the loan. Option ARM loans are subject to payment recast, which converts the loan to a variable-rate fully amortizing loan upon meeting specified loan balance and anniversary date triggers.

Prime

Prime mortgage loans are made to borrowers with good credit records who meet specific underwriting requirements, including prescriptive requirements related to income and overall debt levels. New prime mortgage borrowers provide full documentation and generally have reliable payment histories.

Subprime

Subprime loans are loans that, prior to mid-2008, were offered to certain customers with one or more high risk characteristics, including but not limited to: (i) unreliable or poor payment histories; (ii) a high LTV ratio of greater than 80% (without borrower-paid mortgage insurance); (iii) a high debt-to-income ratio; (iv) an occupancy type for the loan is other than the borrower's primary residence; or (v) a history of delinquencies or late payments on the loan.

MSA: Metropolitan statistical areas

MSR: Mortgage servicing rights

Multi-asset: Any fund or account that allocates assets under management to more than one asset class.

NA: Data is not applicable or available for the period presented.

NAV: Net Asset Value

Net Capital Rule: Rule 15c3-1 under the Securities Exchange Act of 1934.

Net charge-off/(recovery) rate: Represents net charge-offs/(recoveries) (annualized) divided by average retained loans for the reporting period.

Net interchange income includes the following components:

- **Interchange income**: Fees earned by credit and debit card issuers on sales transactions.
- **Reward costs**: The cost to the Firm for points earned by cardholders enrolled in credit card rewards programs generally tied to sales transactions.
- **Partner payments**: Payments to co-brand credit card partners based on the cost of loyalty program rewards earned by cardholders on credit card transactions.

Net mortgage servicing revenue: Includes operating revenue earned from servicing third-party mortgage loans, which is recognized over the period in which the service is provided; changes in the fair value of MSRs; the impact of risk management activities associated with MSRs; and gains and losses on securitization of excess mortgage servicing. Net mortgage servicing revenue also includes gains and losses on sales and lower of cost or fair value adjustments of certain repurchased loans insured by U.S. government agencies.

Net production revenue: Includes fees and income recognized as earned on mortgage loans originated with the intent to sell, and the impact of risk management activities associated with the mortgage pipeline and warehouse loans. Net production revenue also includes gains and losses on sales and lower of cost or fair value adjustments on mortgage loans held-for-sale (excluding certain repurchased loans insured by U.S. government agencies), and changes in the fair value of financial instruments measured under the fair value option.

Net revenue rate: Represents Credit Card net revenue (annualized) expressed as a percentage of average loans for the period.

Net yield on interest-earning assets: The average rate for interest-earning assets less the average rate paid for all sources of funds.

NFA: National Futures Association

NM: Not meaningful

NOL: Net operating loss

Nonaccrual loans: Loans for which interest income is not recognized on an accrual basis. Loans (other than credit card loans and certain consumer loans insured by U.S. government agencies) are placed on nonaccrual status when full payment of principal and interest is not expected, regardless of delinquency status, or when principal and interest have been in default for a period of 90 days or more unless the loan is both well-secured and in the process of collection. Collateral-dependent loans are typically maintained on nonaccrual status.

Nonperforming assets: Nonperforming assets include nonaccrual loans, nonperforming derivatives and certain assets acquired in loan satisfaction, predominantly real estate owned and other commercial and personal property.

NOW: Negotiable Order of Withdrawal

NSFR: Net Stable Funding Ratio

OAS: Option-adjusted spread

OCC: Office of the Comptroller of the Currency

OCI: Other comprehensive income/(loss)

OPEB: Other postretirement employee benefit

OTTI: Other-than-temporary impairment

Over-the-counter ("OTC") derivatives: Derivative contracts that are negotiated, executed and settled bilaterally between two derivative counterparties, where one or both counterparties is a derivatives dealer.

Over-the-counter cleared ("OTC-cleared") derivatives: Derivative contracts that are negotiated and executed bilaterally, but subsequently settled via a central clearing house, such that each derivative counterparty is only exposed to the default of that clearing house.

Overhead ratio: Noninterest expense as a percentage of total net revenue.

Parent Company: JPMorgan Chase & Co.

Participating securities: Represents unvested share-based compensation awards containing nonforfeitable rights to dividends or dividend equivalents (collectively, "dividends"), which are included in the earnings per share calculation using the two-class method. JPMorgan Chase grants RSUs to certain employees under its share-based compensation programs, which entitle the recipients to receive nonforfeitable dividends during the vesting period on a basis equivalent to the dividends paid to holders of common stock. These unvested awards meet the definition of participating securities. Under the two-class method, all earnings (distributed and undistributed) are allocated to each class of common stock and participating securities, based on their respective rights to receive dividends.

PCA: Prompt corrective action

PCD: **"Purchased credit deteriorated"** assets represent acquired financial assets that as of the date of acquisition have experienced a more-than-insignificant deterioration in credit quality since origination, as determined by the Firm.

PCI: "Purchased credit-impaired" loans represented certain loans that were acquired and deemed to be credit-impaired on the acquisition date. The superseded FASB guidance allowed purchasers to aggregate credit-impaired loans acquired in the same fiscal quarter into one or more pools, provided that the loans had common risk characteristics (e.g., product type, LTV ratios, FICO scores, past due status, geographic location). A pool was then accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows.

PD: Probability of default

PDCF: Primary Dealer Credit Facility

PPP: Paycheck Protection Program

PPPL Facility: Paycheck Protection Program Lending Facility

PRA: Prudential Regulation Authority

Pre-provision profit/(loss): Represents total net revenue less noninterest expense. The Firm believes that this financial measure is useful in assessing the ability of a lending institution to generate income in excess of its provision for credit losses.

Pretax margin: Represents income before income tax expense divided by total net revenue, which is, in management's view, a comprehensive measure of pretax performance derived by measuring earnings after all costs are taken into consideration. It is one basis upon which management evaluates the performance of AWM against the performance of their respective competitors.

Principal transactions revenue: Principal transactions revenue is driven by many factors, including:

- the bid-offer spread, which is the difference between the price at which a market participant is willing and able to sell an instrument to the Firm and the price at which another market participant is willing and able to buy it from the Firm, and vice versa; and

- realized and unrealized gains and losses on financial instruments and commodities transactions, including those accounted for under the fair value option, primarily used in client-driven market-making activities, and on private equity investments.
  - Realized gains and losses result from the sale of instruments, closing out or termination of transactions, or interim cash payments.
  - Unrealized gains and losses result from changes in valuation.

In connection with its client-driven market-making activities, the Firm transacts in debt and equity instruments, derivatives and commodities, including physical commodities inventories and financial instruments that reference commodities.

Principal transactions revenue also includes realized and unrealized gains and losses related to:

- derivatives designated in qualifying hedge accounting relationships, primarily fair value hedges of commodity and foreign exchange risk;
- derivatives used for specific risk management purposes, primarily to mitigate credit risk and foreign exchange risk.

PSUs: Performance share units

REIT: "Real estate investment trust": A special purpose investment vehicle that provides investors with the ability to participate directly in the ownership or financing of real-estate related assets by pooling their capital to purchase and manage income property (i.e., equity REIT) and/or mortgage loans (i.e., mortgage REIT). REITs can be publicly or privately held and they also qualify for certain favorable tax considerations.

Regulatory VaR: Daily aggregated VaR calculated in accordance with regulatory rules.

REO: Real estate owned

Reported basis: Financial statements prepared under U.S. GAAP, which excludes the impact of taxable-equivalent adjustments.

Retained loans: Loans that are held-for-investment (i.e., excludes loans held-for-sale and loans at fair value).

Revenue wallet: Proportion of fee revenue based on estimates of investment banking fees generated across the industry (i.e., the revenue wallet) from investment banking transactions in M&A, equity and debt underwriting, and loan syndications. Source: Dealogic, a third-party provider of investment banking competitive analysis and volume-based league tables for the above noted industry products.

RHS: Rural Housing Service of the U.S. Department of Agriculture

Risk-rated portfolio: Credit loss estimates are based on estimates of the probability of default ("PD") and loss severity given a default. The probability of default is the likelihood that a borrower will default on its obligation; the loss given default ("LGD") is the estimated loss on the loan that would be realized upon the default and takes into consideration collateral and structural support for each credit facility.

ROA: Return on assets

ROE: Return on equity

ROTCE: Return on tangible common equity

ROU assets: Right-of-use assets

RSU(s): Restricted stock units

RWA: "Risk-weighted assets": Basel III establishes two comprehensive approaches for calculating RWA (a Standardized approach and an Advanced approach) which include capital requirements for credit risk, market risk, and in the case of Basel III Advanced, also operational risk. Key differences in the calculation of credit risk RWA between the Standardized and Advanced approaches are that for Basel III Advanced, credit risk RWA is based on risk-sensitive approaches which largely rely on the use of internal credit models and parameters, whereas for Basel III Standardized, credit risk RWA is generally based on supervisory risk-weightings which vary primarily by counterparty type and asset class. Market risk RWA is calculated on a generally consistent basis between Basel III Standardized and Basel III Advanced.

S&P: Standard and Poor's 500 Index

SAR(s): Stock appreciation rights

SCB: Stress Capital Buffer

Scored portfolios: Consumer loan portfolios that predominantly include residential real estate loans, credit card loans, auto loans to individuals and certain small business loans.

SEC: Securities and Exchange Commission

Securities financing agreements: Include resale, repurchase, securities borrowed and securities loaned agreements

Seed capital: Initial JPMorgan capital invested in products, such as mutual funds, with the intention of ensuring the fund is of sufficient size to represent a viable offering to clients, enabling pricing of its shares, and allowing the manager to develop a track record. After these goals are achieved, the intent is to remove the Firm's capital from the investment.

Shelf securities: Securities registered with the SEC under a shelf registration statement that have not been issued, offered or sold. These securities are not included in league tables until they have actually been issued.

Single-name: Single reference-entities

SLR: Supplementary leverage ratio

SMBS: Stripped mortgage-backed securities

SOFR: Secured Overnight Financing Rate

SPEs: Special purpose entities

Structural interest rate risk: Represents interest rate risk of the non-trading assets and liabilities of the Firm.

Structured notes: Structured notes are financial instruments whose cash flows are linked to the movement in one or more indexes, interest rates, foreign exchange rates, commodities prices, prepayment rates, or other market variables. The notes typically contain embedded (but not separable or detachable) derivatives. Contractual cash flows for principal, interest, or both can vary in amount and timing throughout the life of the note based on non-traditional indexes or non-traditional uses of traditional interest rates or indexes.

Taxable-equivalent basis: In presenting results on a managed basis, the total net revenue for each of the business segments and the Firm is presented on a tax-equivalent basis. Accordingly, revenue from investments that receive tax credits and tax-exempt securities is presented in managed basis results on a level comparable to taxable investments and securities; the corresponding income tax impact related to tax-exempt items is recorded within income tax expense.

TBVPS: Tangible book value per share

TCE: Tangible common equity

TDR: "Troubled debt restructuring" is deemed to occur when the Firm modifies the original terms of a loan agreement by granting a concession to a borrower that is experiencing financial difficulty. Loans with short-term and other insignificant modifications that are not considered concessions are not TDRs.

TLAC: Total loss-absorbing capacity

U.K.: United Kingdom

Unaudited: Financial statements and information that have not been subjected to auditing procedures sufficient to permit an independent certified public accountant to express an opinion.

U.S.: United States of America

U.S. government agencies: U.S. government agencies include, but are not limited to, agencies such as Ginnie Mae and FHA, and do not include Fannie Mae and Freddie Mac which are U.S. government-sponsored enterprises ("U.S. GSEs"). In general, obligations of U.S. government agencies are fully and explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government in the event of a default.

U.S. GAAP: Accounting principles generally accepted in the U.S.

U.S. GSE(s): "U.S. government-sponsored enterprises" are quasi-governmental, privately-held entities established or chartered by the U.S. government to serve public purposes as specified by the U.S. Congress to improve the flow of credit to specific sectors of the economy and provide certain essential services to the public. U.S. GSEs include Fannie Mae and Freddie Mac, but do not include Ginnie Mae or FHA. U.S. GSE obligations are not explicitly guaranteed as to the timely payment of principal and interest by the full faith and credit of the U.S. government.

U.S. LCR: Liquidity coverage ratio under the final U.S. rule.

U.S. Treasury: U.S. Department of the Treasury

VA: U.S. Department of Veterans Affairs

VaR: "Value-at-risk" is a measure of the dollar amount of potential loss from adverse market moves in an ordinary market environment.

VCG: Valuation Control Group

VGF: Valuation Governance Forum

VIEs: Variable interest entities

Warehouse loans: Consist of prime mortgages originated with the intent to sell that are accounted for at fair value and classified as loans.

Investment securities portfolio

Refer to Note 10 for information regarding the investment securities portfolio as of December 31, 2020 and 2019, and for the years ended December 31, 2020 and 2019.

(Unaudited) **December 31, (in millions)**	**2018** Amortized cost	 Fair value
Available-for-sale securities		
Mortgage-backed securities: U.S. GSEs and government agencies	$ 69,026	$ 68,646
U.S. Treasury and government agencies	55,771	56,059
All other AFS securities	103,972	105,689
Total available-for-sale securities	**$ 228,769**	**$ 230,394**
Held-to-maturity securities		
Mortgage-backed securities: U.S. GSEs and government agencies	26,610	26,544
All other HTM securities	4,824	4,914
Total held-to-maturity securities	**$ 31,434**	**$ 31,458**
Total investment securities	**$ 260,203**	**$ 261,852**

Loan portfolio

Effective January 1, 2020, the Firm adopted the CECL accounting guidance. The adoption resulted in a change in the accounting for PCI loans, which are considered PCD loans under CECL. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

Additionally, in the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.

The table below presents loans by portfolio segment and loan class that are presented in Note 12.

(Unaudited) December 31, (in millions)	**2020**	2019	2018	2017	2016
U.S. consumer, excluding credit card loans					
Residential real estate	**$ 241,578**	$ 266,135	$ 296,677	$ 291,054	$ 281,774
Auto and other	**76,825**	51,682	52,324	55,296	63,380
Total U.S. consumer, excluding credit card loans	**318,403**	317,817	349,001	346,350	345,154
Non-U.S. consumer, excluding credit card loans					
Residential real estate	**176**	–	–	836	1,976
Auto and other	**–**	–	–	–	–
Total Non-U.S. consumer, excluding credit card loans	**176**	–	–	836	1,976
Total consumer, excluding credit card loans					
Residential real estate	**241,754**	266,135	296,677	291,890	283,750
Auto and other	**76,825**	51,682	52,324	55,296	63,380
Total consumer, excluding credit card loans	**318,579**	317,817	349,001	347,186	347,130
Credit card Loans					
U.S. credit card loans	**144,103**	168,787	156,312	149,107	141,447
Non-U.S. credit card loans	**113**	137	320	404	369
Total credit card loans	**144,216**	168,924	156,632	149,511	141,816
Total consumer loans	**462,795**	486,741	505,633	496,697	488,946
U.S. wholesale loans					
Secured by real estate	**124,887**	126,735	121,169	120,078	112,134
Commercial and industrial	**112,911**	115,389	138,374	115,537	110,555
Other	**185,945**	154,633	136,609	120,608	111,509
Total U.S. wholesale loans	**423,743**	396,757	396,152	356,223	334,198
Non-U.S. wholesale loans					
Secured by real estate	**3,090**	2,837	2,709	2,625	2,905
Commercial and industrial	**44,076**	38,214	37,035	36,438	35,673
Other	**79,149**	73,071	74,231	67,446	61,109
Total non-U.S. wholesale loans	**126,315**	114,122	113,975	106,509	99,687
Total wholesale loans					
Secured by real estate	**127,977**	129,572	123,878	122,703	115,039
Commercial and industrial	**156,987**	153,603	175,409	151,975	146,228
Other	**265,094**	227,704	210,840	188,054	172,618
Total wholesale loans	**550,058**	510,879	510,127	462,732	433,885
Total loans(a)	**$ 1,012,853**	$ 997,620	$ 1,015,760	$ 959,429	$ 922,831
Memo:					
Loans held-for-sale	**$ 7,873**	$ 7,064	$ 11,988	$ 3,351	$ 2,628
Loans at fair value	**44,474**	44,955	34,357	31,240	30,296
Total loans held-for-sale and loans at fair value	**$ 52,347**	$ 52,019	$ 46,345	$ 34,591	$ 32,924

(a) Loans (other than those for which the fair value option has been elected) are presented net of unamortized discounts and premiums and net deferred loan fees or costs. These amounts were not material as of December 31, 2020, 2019, 2018, 2017 and 2016.

Maturities and sensitivity to changes in interest rates

The table below sets forth wholesale loan maturities and the distribution between fixed and floating interest rates based on the stated terms of the loan agreements. The table below also presents loans by loan class that are presented in Note 12. The table does not include the impact of derivative instruments.

(Unaudited) December 31, 2020 (in millions)	Within 1 year [(a)]	1-5 years	After 5 years	Total
U.S.				
Secured by real estate	**$ 4,847**	**$ 25,575**	**$ 94,465**	**$ 124,887**
Commercial and industrial	**35,318**	**72,084**	**5,509**	**112,911**
Other	**81,462**	**73,964**	**30,519**	**185,945**
Total U.S.	**121,627**	**171,623**	**130,493**	**423,743**
Non-U.S.				
Secured by real estate	**907**	**1,797**	**386**	**3,090**
Commercial and industrial	**13,307**	**26,460**	**4,309**	**44,076**
Other	**55,249**	**20,142**	**3,758**	**79,149**
Total non-U.S.	**69,463**	**48,399**	**8,453**	**126,315**
Total wholesale loans	**$191,090**	**$ 220,022**	**$138,946**	**$ 550,058**
Loans at fixed interest rates		**$ 36,693**	**$ 31,548**	
Loans at variable interest rates		**183,329**	**107,398**	
Total wholesale loans		**$ 220,022**	**$138,946**	

(a) Includes demand loans and overdrafts.

Risk elements

The following tables set forth nonperforming assets, contractually past-due assets, and accruing restructured loans by portfolio segment and loan class that are presented in Note 12.

(Unaudited) December 31, (in millions)	2020	2019	2018	2017	2016
Nonperforming assets					
U.S. nonaccrual loans:					
Consumer, excluding credit card loans	**$ 6,467**	$ 3,366	$ 3,853	$ 4,463	$ 4,662
Credit card loans	**NA**	NA	NA	NA	NA
Total U.S. nonaccrual consumer loans	**6,467**	3,366	3,853	4,463	4,662
Wholesale:					
Secured by real estate	**966**	267	483	251	253
Commercial and industrial	**1,249**	759	700	887	1,487
Other	**897**	33	35	126	127
Total U.S. wholesale nonaccrual loans	**3,112**	1,059	1,218	1,264	1,867
Total U.S. nonaccrual loans	**9,579**	4,425	5,071	5,727	6,529
Non-U.S. nonaccrual loans:					
Consumer, excluding credit card loans	–	–	–	–	–
Credit card loans	**NA**	NA	NA	NA	NA
Total non-U.S. nonaccrual consumer loans	–	–	–	–	–
Wholesale:					
Secured by real estate	**18**	–	67	81	35
Commercial and industrial	**856**	209	395	807	459
Other	**120**	3	9	21	79
Total non-U.S. wholesale nonaccrual loans	**994**	212	471	909	573
Total non-U.S. nonaccrual loans	**994**	212	471	909	573
Total nonaccrual loans	**10,573**	4,637	5,542	6,636	7,102
Derivative receivables	**56**	30	60	130	223
Assets acquired in loan satisfactions	**277**	387	299	353	429
Nonperforming assets	**$ 10,906**	$ 5,054	$ 5,901	$ 7,119	$ 7,754
Memo:					
Loans held-for-sale	**$ 284**	$ 7	$ –	$ –	$ 162
Loans at fair value	**1,507**	647	931	693	219
Total loans held-for-sale and loans at fair value	**$ 1,791**	$ 654	$ 931	$ 693	$ 381

(Unaudited) December 31, (in millions)	2020	2019	2018	2017	2016
Contractually past-due loans[(a)]					
U.S. loans:					
Consumer, excluding credit card loans[(b)]	**$ –**	$ –	$ –	$ –	$ –
Credit card loans	**1,317**	1,605	1,442	1,378	1,143
Total U.S. consumer loans	**1,317**	1,605	1,442	1,378	1,143
Wholesale:					
Secured by real estate	**15**	1	11	10	9
Commercial and industrial	**20**	36	166	67	90
Other	**19**	5	7	62	24
Total U.S. wholesale loans	**54**	42	184	139	123
Total U.S. loans	**1,371**	1,647	1,626	1,517	1,266
Non-U.S. loans:					
Consumer, excluding credit card loans	**–**	–	–	–	–
Credit card loans	**2**	2	3	1	2
Total non-U.S. consumer loans	**2**	2	3	1	2
Wholesale:					
Secured by real estate	**–**	–	–	–	–
Commercial and industrial	**–**	1	2	1	9
Other	**3**	–	2	1	–
Total non-U.S. wholesale loans	**3**	1	4	2	9
Total non-U.S. loans	**5**	3	7	3	11
Total contractually past due loans	**$ 1,376**	$ 1,650	$ 1,633	$ 1,520	$ 1,277

(a) Represents accruing loans past-due 90 days or more as to principal and interest, which are not characterized as nonaccrual loans. Prior to the adoption of CECL, excluded PCI loans which were accounted for on a pool basis. Since each pool was accounted for as a single asset with a single composite interest rate and an aggregate expectation of cash flows, the past-due status of the pools, or that of individual loans within the pools, was not meaningful. The Firm recognized interest income on each pool of loans as each of the pools was performing.
(b) At December 31, 2020, 2019, 2018, 2017 and 2016, excluded mortgage loans 90 or more days past due and insured by U.S. government agencies of $364 million, $193 million, $1.6 billion, $2.7 billion and $2.7 billion, respectively. At December 31, 2016, student loans insured by U.S. government agencies under the Federal Family Education Loan Program of $263 million were also excluded prior to sale of the student loan portfolio in 2017. These amounts have been excluded from nonaccrual loans based upon the government guarantee.

(Unaudited) December 31, (in millions)	2020	2019	2018	2017	2016
Accruing restructured loans[(a)]					
U.S.:					
Consumer, excluding credit card loans	**$ 3,007**	$ 3,600	$ 4,171	$ 4,972	$ 5,528
Credit card loans[(b)]	**1,375**	1,452	1,319	1,215	1,240
Total U.S. consumer loans	**4,382**	5,052	5,490	6,187	6,768
Wholesale:					
Secured by real estate	**16**	14	9	6	18
Commercial and industrial	**202**	34	59	129	64
Other	**61**	2	4	2	–
Total U.S. wholesale loans	**279**	50	72	137	82
Total U.S.	**4,661**	5,102	5,562	6,324	6,850
Non-U.S.:					
Consumer, excluding credit card loans	**–**	–	–	–	–
Credit card loans[(b)]	**–**	–	–	–	–
Total non-U.S. consumer loans	**–**	–	–	–	–
Wholesale:					
Secured by real estate	**–**	30	–	–	–
Commercial and industrial	**75**	2	45	21	17
Other	**4**	3	–	–	–
Total non-U.S. wholesale loans	**79**	35	45	21	17
Total non-U.S.	**79**	35	45	21	17
Total accruing restructured notes	**$ 4,740**	$ 5,137	$ 5,607	$ 6,345	$ 6,867

(a) Represents performing loans modified in TDRs in which an economic concession was granted by the Firm and the borrower has demonstrated its ability to repay the loans according to the terms of the restructuring. As defined in U.S. GAAP, concessions include the reduction of interest rates or the deferral of interest or principal payments, resulting from deterioration in the borrowers' financial condition. Excludes nonaccrual assets and contractually past-due assets, which are included in the sections above.
(b) Includes credit card loans that have been modified in a TDR.

Refer to Credit and Investment Risk Management on pages 110–134, and Note 12 for a discussion of nonaccrual loans, past-due loan accounting policies, and accruing restructured loans.

Impact of nonaccrual loans and accruing restructured loans on interest income

The negative impact on interest income from nonaccrual loans represents the difference between the amount of interest income that would have been recorded on such nonaccrual loans according to their original contractual terms had they been performing and the amount of interest that actually was recognized on a cash basis. The negative impact on interest income from accruing restructured loans represents the difference between the amount of interest income that would have been recorded on such loans according to their original contractual terms and the amount of interest that actually was recognized under the modified terms. The following table sets forth this data for the years specified. The change in forgone interest income from 2018 through 2020 was primarily driven by the change in the levels of nonaccrual loans.

(Unaudited) Year ended December 31, (in millions)	**2020**	2019	2018
Nonaccrual loans			
U.S.:			
Consumer, excluding credit card:			
Gross amount of interest that would have been recorded at the original terms	**$ 330**	$ 242	$ 296
Interest that was recognized in income	**(174)**	(160)	(171)
Total U.S. consumer, excluding credit card	**156**	82	125
Credit card:			
Gross amount of interest that would have been recorded at the original terms	**NA**	NA	NA
Interest that was recognized in income	**NA**	NA	NA
Total U.S. credit card	**NA**	NA	NA
Total U.S. consumer	**156**	82	125
Wholesale:			
Gross amount of interest that would have been recorded at the original terms	**104**	77	73
Interest that was recognized in income	**(60)**	(40)	(32)
Total U.S. wholesale	**44**	37	41
Negative impact — U.S.	**200**	119	166
Non-U.S.:			
Consumer, excluding credit card:			
Gross amount of interest that would have been recorded at the original terms	**—**	—	—
Interest that was recognized in income	**—**	—	—
Total non-U.S. consumer, excluding credit card	**—**	—	—
Credit card:			
Gross amount of interest that would have been recorded at the original terms	**NA**	NA	NA
Interest that was recognized in income	**NA**	NA	NA
Total non-U.S. credit card	**NA**	NA	NA
Total non-U.S. consumer	**—**	—	—
Wholesale:			
Gross amount of interest that would have been recorded at the original terms	**59**	12	13
Interest that was recognized in income	**(23)**	(5)	(3)
Total non-U.S. wholesale	**36**	7	10
Negative impact — non-U.S.	**36**	7	10
Total negative impact on interest income	**$ 236**	$ 126	$ 176

(Unaudited) Year ended December 31, (in millions)	2020	2019	2018
Accruing restructured loans			
U.S.:			
Consumer, excluding credit card:			
Gross amount of interest that would have been recorded at the original terms	$ 241	$ 279	$ 326
Interest that was recognized in income	(151)	(192)	(215)
Total U.S. consumer, excluding credit card	90	87	111
Credit card:			
Gross amount of interest that would have been recorded at the original terms	255	265	227
Interest that was recognized in income	(69)	(72)	(65)
Total U.S. credit card	186	193	162
Total U.S. consumer	276	280	273
Wholesale:			
Gross amount of interest that would have been recorded at the original terms	3	5	7
Interest that was recognized in income	(2)	(3)	(6)
Total U.S. wholesale	1	2	1
Negative impact — U.S.	277	282	274
Non-U.S.:			
Consumer, excluding credit card:			
Gross amount of interest that would have been recorded at the original terms	—	—	—
Interest that was recognized in income	—	—	—
Total non-U.S. consumer, excluding credit card	—	—	—
Credit card:			
Gross amount of interest that would have been recorded at the original terms	—	—	—
Interest that was recognized in income	—	—	—
Total non-U.S. credit card	—	—	—
Total non-U.S. consumer	—	—	—
Wholesale:			
Gross amount of interest that would have been recorded at the original terms	—	—	—
Interest that was recognized in income	—	—	—
Total non-U.S. wholesale	—	—	—
Negative impact — non-U.S.	—	—	—
Total negative impact on interest income	$ 277	$ 282	$ 274

Cross-border outstandings

Cross-border disclosure is based on the FFIEC guidelines governing the determination of cross-border risk.

The reporting of country exposure under the FFIEC bank regulatory requirements provides information on the distribution, by country and sector, of claims on, and liabilities to, U.S. and foreign residents held by U.S. banks and bank holding companies and is used by the regulatory agencies to determine the presence of credit and related risks, including transfer and country risk. Country location under the FFIEC bank regulatory reporting is based on where the entity or counterparty is legally established.

JPMorgan Chase's total cross-border exposures may fluctuate from period to period due to client activity and market flows. Refer to Country Risk Management on pages 143-144 for a further discussion of JPMorgan Chase's country risk exposure.

The following table lists all countries in which JPMorgan Chase's cross-border outstandings exceed 0.75% of consolidated assets as of the dates specified.

Cross-border outstandings exceeding 0.75% of total assets

(Unaudited) (in millions)	December 31,	Governments	Banks	Other[(a)]	Net local country assets	Total cross-border outstandings[(b)]	Commitments[(c)]	**Total exposure**
Germany	**2020**	**$ 6,165**	**$ 842**	**$ 23,614**	**$ 55,882**	**$ 86,503**	**$ 73,712**	**$ 160,215**
	2019	9,757	4,175	8,709	12,143	34,784	54,817	89,601
	2018	12,793	7,769	15,393	30,054	66,009	67,973	133,982
Cayman Islands	**2020**	**$ 22**	**$ 329**	**$ 123,644**	**$ 32**	**$ 124,027**	**$ 85,830**	**$ 209,857**
	2019	15	367	89,124	–	89,506	114,398	203,904
	2018	1	308	105,857	20	106,186	45,073	151,259
Japan	**2020**	**$ 61**	**$ 11,263**	**$ 3,739**	**$ 55,200**	**$ 70,263**	**$ 31,360**	**$ 101,623**
	2019	191	4,863	3,495	45,654	54,203	42,049	96,252
	2018	282	9,803	4,167	41,948	56,200	51,901	108,101
France	**2020**	**$ 10,580**	**$ 7,019**	**$ 19,686**	**$ 2,476**	**$ 39,761**	**$ 114,307**	**$ 154,068**
	2019	9,445	5,294	12,746	2,697	30,182	107,178	137,360
	2018	12,556	3,499	21,571	2,771	40,397	105,845	146,242
Italy	**2020**	**$ 10,645**	**$ 4,169**	**$ 5,174**	**$ 1,052**	**$ 21,040**	**$ 49,832**	**$ 70,872**
	2019	10,567	2,192	6,095	881	19,735	49,456	69,191
	2018	9,401	4,098	5,145	1,375	20,019	61,326	81,345
Ireland	**2020**	**$ 125**	**$ 301**	**$ 15,679**	**$ –**	**$ 16,105**	**$ 6,460**	**$ 22,565**
	2019	381	319	18,061	–	18,761	9,520	28,281
	2018	185	45	19,439	–	19,669	5,585	25,254
China: Mainland	**2020**	**$ 2,295**	**$ 8,439**	**$ 14,924**	**$ 2,633**	**$ 28,291**	**$ 8,827**	**$ 37,118**
	2019	179	5,168	7,207	1,382	13,936	11,111	25,047
	2018	980	6,728	5,318	1,617	14,643	14,435	29,078

(a) Consists primarily of non-banking financial institutions.

(b) Outstandings include loans and accrued interest receivable, interest-bearing deposits with banks, acceptances, resale agreements, other monetary assets, cross-border trading debt and equity instruments, fair value of foreign exchange and derivative contracts, and local country assets, net of local country liabilities. The amounts associated with foreign exchange and derivative contracts are presented after taking into account the impact of legally enforceable master netting agreements.

(c) Commitments include outstanding letters of credit, undrawn commitments to extend credit, and the gross notional value of credit derivatives where JPMorgan Chase is a protection seller.

The adoption of the CECL accounting guidance resulted in a change in the accounting for PCI loans, which are considered PCD loans. In conjunction with the adoption of CECL, the Firm reclassified risk-rated loans and lending-related commitments from the consumer, excluding credit card portfolio segment to the wholesale portfolio segment, to align with the methodology applied when determining the allowance. Prior-period amounts have been revised to conform with the current presentation. Refer to Note 1 for further information.

The following tables summarize the changes in the allowance for loan losses and the allowance for lending-related commitments, as well as loan loss analysis during the periods indicated. Refer to Allowance for credit losses on pages 132-133, and Note 13 for a further discussion.

Allowance for loan losses

(Unaudited) Year ended December 31, (in millions)	2020	2019	2018	2017	2016
Balance at beginning of year	$ 13,123	$ 13,445	$ 13,604	$ 13,776	$ 13,555
Cumulative effect of a change in accounting principle	4,172	NA	NA	NA	NA
U.S. charge-offs					
U.S. consumer, excluding credit card	805	902	977	1,727	1,434
U.S. credit card	5,077	5,436	5,011	4,521	3,799
Total U.S. consumer charge-offs	5,882	6,338	5,988	6,248	5,233
U.S. wholesale:					
Secured by real estate	16	53	28	36	43
Commercial and Industrial	530	282	160	102	267
Other	72	27	121	28	16
Total U.S. wholesale charge-offs	618	362	309	166	326
Total U.S. charge-offs	6,500	6,700	6,297	6,414	5,559
Non-U.S. charge-offs					
Non-U.S. consumer, excluding credit card	—	—	—	—	—
Non-U.S. credit card	—	—	—	—	—
Total non-U.S. consumer charge-offs	—	—	—	—	—
Non-U.S. wholesale:					
Secured by real estate	—	1	1	2	—
Commercial and Industrial	315	78	51	90	135
Other	21	31	—	6	3
Total non-U.S. wholesale charge-offs	336	110	52	98	138
Total non-U.S. charge-offs	336	110	52	98	138
Total charge-offs	6,836	6,810	6,349	6,512	5,697
U.S. recoveries					
U.S. consumer, excluding credit card	(631)	(536)	(827)	(612)	(570)
U.S. credit card	(791)	(588)	(493)	(398)	(357)
Total U.S. consumer recoveries	(1,422)	(1,124)	(1,320)	(1,010)	(927)
U.S. wholesale:					
Secured by real estate	(5)	(10)	(11)	(16)	(29)
Commercial and Industrial	(97)	(21)	(78)	(65)	(15)
Other	(22)	(18)	(38)	(17)	(9)
Total U.S. wholesale recoveries	(124)	(49)	(127)	(98)	(53)
Total U.S. recoveries	(1,546)	(1,173)	(1,447)	(1,108)	(980)
Non-U.S. recoveries					
Non-U.S. consumer, excluding credit card	—	—	—	—	—
Non-U.S. credit card	—	—	—	—	—
Total non-U.S. consumer recoveries	—	—	—	—	—
Non-U.S. wholesale:					
Secured by real estate	—	—	—	(1)	—
Commercial and Industrial	(12)	(4)	(45)	(2)	(9)
Other	(19)	(4)	(1)	(14)	(16)
Total non-U.S. wholesale recoveries	(31)	(8)	(46)	(17)	(25)
Total non-U.S. recoveries	(31)	(8)	(46)	(17)	(25)
Total recoveries	(1,577)	(1,181)	(1,493)	(1,125)	(1,005)
Net charge-offs	5,259	5,629	4,856	5,387	4,692
Write-offs of PCI loans[(a)]	NA	151	187	86	156
Provision for loan losses	16,291	5,449	4,885	5,300	5,080
Other	1	9	(1)	1	(11)
Balance at year-end	$ 28,328	$ 13,123	$ 13,445	$ 13,604	$ 13,776

(a) Prior to the adoption of CECL, write-offs of PCI loans were recorded against the allowance for loan losses when actual losses for a pool exceeded estimated losses that were recorded as purchase accounting adjustments at the time of acquisition. A write-off of a PCI loan was recognized when the underlying loan was removed from a pool.

Summary of loan and lending-related commitments loss experience

Allowance for lending-related commitments

(Unaudited) Year ended December 31, (in millions)	**2020**	2019	2018	2017	2016
Balance at beginning of year	**$ 1,191**	$ 1,055	$ 1,068	$ 1,078	$ 786
Cumulative effect of a change in accounting principles	**98**	NA	NA	NA	NA
Provision for lending-related commitments	**1,121**	136	(14)	(10)	281
Other	**(1)**	–	1	–	11
Balance at year-end	**$ 2,409**	$ 1,191	$ 1,055	$ 1,068	$ 1,078

Loan loss analysis

(Unaudited) As of or for the year ended December 31, (in millions, except ratios)	**2020**	2019	2018	2017	2016
Balances					
Loans – average[(a)]	**$ 1,004,597**	$ 989,943	$ 977,406	$ 936,618	$ 892,954
Loans – year-end[(a)]	**1,012,853**	997,620	1,015,760	959,429	922,831
Net charge-offs	**5,259**	5,629	4,856	5,387	4,692
Allowance for loan losses:					
U.S.	**$ 27,343**	$ 12,303	$ 12,692	$ 12,552	$ 12,738
Non-U.S.	**985**	820	753	1,052	1,038
Total allowance for loan losses	**$ 28,328**	$ 13,123	$ 13,445	$ 13,604	$ 13,776
Nonaccrual loans[(a)]	**$ 10,573**	$ 4,637	$ 5,542	$ 6,636	$ 7,102
Ratios					
Net charge-offs to:					
Loans retained – average	**0.55 %**	0.60 %	0.52 %	0.60 %	0.54 %
Allowance for loan losses	**18.56**	42.89	36.12	39.60	34.06
Allowance for loan losses to:					
Loans retained – year-end[(b)]	**2.95**	1.39	1.39	1.47	1.55
Nonaccrual loans retained	**323**	329	292	229	205

(a) In the third quarter of 2020, the Firm reclassified certain fair value option elected lending-related positions from trading assets to loans. Prior-period amounts have been revised to conform with the current presentation.
(b) For factors which influenced management's judgment in determining the amount of the additions to the allowance, refer to Critical Accounting Estimates Used by the Firm on pages 152-155 and Note 13. Refer to Provision for credit losses on page 55 for a more detailed discussion of the 2019 through 2020 provision for credit losses.

Deposits

The following table provides a summary of the average balances and average interest rates of JPMorgan Chase's various deposits for the years indicated.

(Unaudited) Year ended December 31,	Average balances			Average interest rates		
(in millions, except interest rates)	**2020**	2019	2018	**2020**	2019	2018
U.S. offices						
Noninterest-bearing	**$ 495,722**	$ 386,116	$ 391,325	**NA**	NA	NA
Interest-bearing						
Demand[(a)]	**269,888**	195,350	177,403	**0.25 %**	1.42 %	1.09 %
Savings[(b)]	**739,916**	602,728	585,885	**0.13**	0.46	0.32
Time	**59,053**	52,415	39,498	**1.10**	2.56	1.94
Total interest-bearing deposits	**1,068,857**	850,493	802,786	**0.21**	0.81	0.57
Total deposits in U.S. offices	**1,564,579**	1,236,609	1,194,111	**0.15**	0.56	0.38
Non-U.S. offices						
Noninterest-bearing	**21,805**	21,103	20,099	**NA**	NA	NA
Interest-bearing						
Demand	**267,545**	217,979	210,978	**—**	0.59	0.45
Savings	**—**	—	—	**NM**	NM	NM
Time	**52,822**	47,376	31,273	**0.13**	1.64	1.48
Total interest-bearing deposits	**320,367**	265,355	242,251	**0.02**	0.78	0.58
Total deposits in non-U.S. offices	**342,172**	286,458	262,350	**0.02**	0.72	0.54
Total deposits	**$ 1,906,751**	$ 1,523,067	$ 1,456,461	**0.12 %**	0.59 %	0.41 %

(a) Includes Negotiable Order of Withdrawal ("NOW") accounts, and certain trust accounts.
(b) Includes Money Market Deposit Accounts ("MMDAs").

At December 31, 2020, other U.S. time deposits in denominations of $100,000 or more totaled $21.8 billion, substantially all of which mature in three months or less. In addition, the table below presents the maturities for U.S. time certificates of deposit in denominations of $100,000 or more.

(Unaudited) By remaining maturity at December 31, 2020 (in millions)	Three months or less	Over three months but within six months	Over six months but within 12 months	Over 12 months	Total
U.S. time certificates of deposit ($100,000 or more)	**$ 9,551**	**$ 5,080**	**$ 2,108**	**$ 800**	**$ 17,539**

Short-term and other borrowed funds

The following table provides a summary of JPMorgan Chase's short-term and other borrowed funds for the years indicated.

(Unaudited) As of or for the year ended December 31, (in millions, except rates)	**2020**	2019	2018
Federal funds purchased and securities loaned or sold under repurchase agreements:			
Balance at year-end	**$ 215,209**	$ 183,675	$ 182,320
Average daily balance during the year	**255,421**	227,994	189,282
Maximum month-end balance	**298,464**	251,829	201,340
Weighted-average rate at December 31	**0.04 %**	1.77 %	2.18 %
Weighted-average rate during the year	**0.41**	2.03	1.62
Commercial paper:			
Balance at year-end	**$ 12,031**	$ 14,754	$ 30,059
Average daily balance during the year	**12,129**	22,977	27,834
Maximum month-end balance	**14,582**	30,007	30,470
Weighted-average rate at December 31	**0.26 %**	2.16 %	2.71 %
Weighted-average rate during the year	**1.12**	2.66	2.27
Other borrowed funds:[(a)]			
Balance at year-end	**$ 97,393**	$ 73,312	$ 101,513
Average daily balance during the year	**106,887**	106,348	108,436
Maximum month-end balance	**122,860**	128,488	125,544
Weighted-average rate at December 31	**1.00 %**	1.85 %	2.23 %
Weighted-average rate during the year	**1.29**	2.05	2.06
Short-term beneficial interests:[(b)]			
Commercial paper and other borrowed funds:			
Balance at year-end	**$ 12,425**	$ 11,103	$ 6,527
Average daily balance during the year	**13,441**	12,511	4,756
Maximum month-end balance	**14,793**	16,016	6,527
Weighted-average rate at December 31	**0.21 %**	1.92 %	2.53 %
Weighted-average rate during the year	**0.71**	2.39	2.10

(a) Includes interest-bearing securities sold but not yet purchased of $64.2 billion, $47.1 billion and $62.3 billion at December 31, 2020, 2019 and 2018, respectively.
(b) Included on the Consolidated balance sheets in beneficial interests issued by consolidated VIEs.

Federal funds purchased represent overnight funds. Securities loaned or sold under repurchase agreements generally mature between one and ninety days. Commercial paper generally is issued in amounts not less than $100,000, and with maturities of 270 days or less. Other borrowed funds consist of demand notes, term federal funds purchased, and various other borrowings that generally have maturities of one year or less.

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on behalf of the undersigned, thereunto duly authorized.

JPMorgan Chase & Co.
(Registrant)

By: /s/ JAMES DIMON

(James Dimon
Chairman and Chief Executive Officer)

February 23, 2021

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacity and on the date indicated. JPMorgan Chase & Co. does not exercise the power of attorney to sign on behalf of any Director.

	Capacity	Date
/s/ JAMES DIMON (James Dimon)	Director, Chairman and Chief Executive Officer (Principal Executive Officer)	
/s/ LINDA B. BAMMANN (Linda B. Bammann)	Director	
/s/ STEPHEN B. BURKE (Stephen B. Burke)	Director	
/s/ TODD A. COMBS (Todd A. Combs)	Director	
/s/ JAMES S. CROWN (James S. Crown)	Director	February 23, 2021
/s/ TIMOTHY P. FLYNN (Timothy P. Flynn)	Director	
/s/ MELLODY HOBSON (Mellody Hobson)	Director	
/s/ MICHAEL A. NEAL (Michael A. Neal)	Director	
/s/ PHEBE N. NOVAKOVIC (Phebe N. Novakovic)	Director	
/s/ VIRGINIA M. ROMETTY (Virginia M. Rometty)	Director	
/s/ JENNIFER PIEPSZAK (Jennifer Piepszak)	Executive Vice President and Chief Financial Officer (Principal Financial Officer)	
/s/ NICOLE GILES (Nicole Giles)	Managing Director and Firmwide Controller (Principal Accounting Officer)	

Exhibit 4.6

DESCRIPTION OF SECURITIES OF JPMORGAN CHASE & CO. REGISTERED PURSUANT TO SECTION 12 OF THE SECURITIES EXCHANGE ACT OF 1934

As of the filing date of the Annual Report on Form 10-K to which this Exhibit is attached (the “Form 10-K”), the following outstanding securities issued by JPMorgan Chase & Co. are registered pursuant to Section 12 of the Securities Exchange Act of 1934: (i) common stock; (ii) five series of preferred stock represented by depositary shares; (iii) the Alerian MLP Index ETN due May 24, 2024; and (iv) JPMorgan Chase & Co.’s guarantee of the Callable Step-Up Fixed Rate Notes due April 26, 2028 issued by JPMorgan Chase Financial Company LLC. All references herein to “JPMorgan Chase,” “we” or “us” are to JPMorgan Chase & Co.

DESCRIPTION OF COMMON STOCK

The following summary is not complete. You should refer to the applicable provisions of our Restated Certificate of Incorporation and our By-laws, each of which are incorporated by reference as Exhibits to the Form 10-K, and to the Delaware General Corporation Law (“DGCL”), for a complete statement of the terms and rights of our common stock, par value $1.00 per share, which we refer to herein as common stock. We encourage you to read our Restated Certificate of Incorporation, which we refer to herein as our certificate of incorporation, By-laws and the relevant provisions of the DGCL for additional information.

Authorized Shares

We are authorized to issue up to 9,000,000,000 shares of common stock.

Dividends

Holders of common stock are entitled to receive dividends if, as and when declared by our board of directors out of funds legally available for payment, subject to the rights of holders of our preferred stock.

Voting Rights

Each holder of common stock is entitled to one vote per share. Subject to the rights, if any, of the holders of any series of preferred stock under its applicable certificate of designations and applicable law, all voting rights are vested in the holders of shares of our common stock. Holders of shares of our common stock have noncumulative voting rights, which means that the holders of more than 50% of the shares voting for the election of directors can elect 100% of the directors and the holders of the remaining shares will not be able to elect any directors.

Rights Upon Liquidation

In the event of our voluntary or involuntary liquidation, dissolution or winding-up, the holders of our common stock will be entitled to share equally in any of our assets available for distribution after we have paid in full all of our debts and after the holders of all series of our outstanding preferred stock have received their liquidation preferences in full.

Miscellaneous

The issued and outstanding shares of common stock are fully paid and nonassessable. Holders of shares of our common stock are not entitled to preemptive rights or to the benefit of any sinking funds. Our common stock is not convertible into shares of any other class of our capital stock. Computershare Inc. is the transfer agent, registrar and dividend disbursement agent for our common stock.

Listing

Our common stock is listed on the New York Stock Exchange (“NYSE”) under the trading symbol “JPM”.

DESCRIPTION OF LISTED PREFERRED STOCK

The following summary is not complete. You should refer to our certificate of incorporation and to the Certificate of Designations, Powers, Preferences and Rights relating to each series of Listed Preferred Stock (as defined below), which we refer to herein as a certificate of designations, for the complete terms of that series of preferred stock. Copies of our certificate of incorporation and the certificate of designations for each series of Listed Preferred Stock are incorporated by reference as Exhibits to the Form 10-K. We encourage you to read our certificate of incorporation and the relevant certificates of designations for additional information.

Authorized Shares

Under our certificate of incorporation, our board of directors is authorized, without further stockholder action, to issue up to 200,000,000 shares of preferred stock, $1 par value per share, which we refer herein to as preferred stock, in one or more series, and to determine the voting powers and the designations, preferences and relative, participating, optional or other special rights, and qualifications, limitations or restrictions of each series. We may amend our certificate of incorporation to increase or decrease the number of authorized shares of preferred stock in a manner permitted by our certificate of incorporation and the DGCL.

Outstanding Preferred Stock

As of the filing date of the Form 10-K, we have 17 series of preferred stock issued and outstanding. The shares of each series of our preferred stock are represented by depositary shares, with each depositary share representing a fractional interest in a share of preferred stock of the relevant series. Of the 17 series of our issued and outstanding preferred stock, depositary shares representing the following five series of preferred stock are registered pursuant to Section 12 of the Securities Exchange Act of 1934, with each depositary share representing a 1/400th interest in a share of preferred stock of the relevant series:

- 6.10% Non-Cumulative Preferred Stock, Series AA;
- 6.15% Non-Cumulative Preferred Stock, Series BB;
- 5.75% Non-Cumulative Preferred Stock, Series DD;
- 6.00% Non-Cumulative Preferred Stock, Series EE; and
- 4.75 Non-Cumulative Preferred Stock, Series GG.

We refer to the above five series of preferred stock herein collectively as the "Listed Preferred Stock".

The Listed Preferred Stock is fully paid and nonassessable.

The terms of the depositary shares are summarized below under "Description of Depositary Shares".

Ranking

The Listed Preferred Stock ranks, as to payment of dividends and distribution of assets upon our liquidation, dissolution or winding-up, on a parity with any series of preferred stock ranking on a parity with the Listed Preferred Stock and senior to our common stock and to any series of preferred stock ranking junior to the Listed Preferred Stock. The Listed Preferred Stock is subordinate to our existing and future indebtedness.

Dividend Rights

Holders of the Listed Preferred Stock are entitled to receive, when, as and if declared by our board of directors or any duly authorized committee of our board, cash dividends at the rates and on the dates described below under "Specific Terms of Listed Preferred Stock". We will pay each dividend to the holders of record as they appear on our stock register on record dates determined by our board of directors or a duly authorized committee of our board. Dividends on the Listed Preferred Stock are noncumulative. If a dividend is not declared on any series of Listed Preferred Stock, because the dividends are noncumulative, then the right of holders of that series to receive that dividend will be lost, and we will have no obligation to pay the dividend for that dividend period, whether or not dividends are declared for any future dividend period.

We may not declare or pay or set aside for payment full dividends on any series of preferred stock ranking, as to dividends, equally with or junior to a series of Listed Preferred Stock unless we have previously declared and paid or set aside for payment, or we contemporaneously declare and pay or set aside for payment, full dividends on that series of Listed Preferred Stock for the most recently completed dividend period. When dividends are not paid in full on a particular series of Listed Preferred Stock and any other series of preferred stock ranking on a parity as to dividends with that series, all dividends declared and paid upon the shares of that series of Listed Preferred Stock and any other series of preferred stock ranking on a parity as to dividends with the that series will be declared and paid pro rata. For purposes of calculating the pro rata allocation of partial dividend payments, we will allocate dividend payments based on the ratio between the then-current dividends due on shares of that Listed Preferred Stock and (i) in the case of any series of non-cumulative preferred stock ranking on a parity as to dividends with that Listed Preferred Stock, the aggregate of the current and unpaid dividends due on such series of preferred stock and (ii) in the case of any series of cumulative preferred stock ranking on a parity as to dividends with that Listed Preferred Stock, the aggregate of the current and accumulated and unpaid dividends due on such series of preferred stock.

In addition, unless full dividends on all outstanding shares of the Listed Preferred Stock have been declared and paid or a sum sufficient for the payment thereof set aside for such payment in respect of the applicable most recently completed dividend period, with respect to a particular series of Listed Preferred Stock:

- no dividend (other than a dividend in common stock or in any other capital stock ranking junior to that Listed Preferred Stock as to dividends and upon liquidation, dissolution or winding-up) will be declared or paid or a sum sufficient for the payment thereof set aside for such payment or other distribution declared or made upon our common stock or upon any other capital stock ranking junior to that Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up, and

- no common stock or other capital stock ranking junior or equally with that Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up will be redeemed, purchased or otherwise acquired for any consideration (or any moneys be paid to or made available for a sinking fund for the redemption of any shares of any such capital stock) by us, except:

(1) by conversion into or exchange for capital stock ranking junior to that Listed Preferred Stock;

(2) as a result of reclassification into capital stock ranking junior to that Listed Preferred Stock;

(3) through the use of the proceeds of a substantially contemporaneous sale of shares of capital stock ranking junior to that Listed Preferred Stock or, in the case of capital stock ranking on a parity with that Listed Preferred Stock, through the use of the proceeds of a substantially contemporaneous sale of other shares of capital stock ranking on a parity with that Listed Preferred Stock;

(4) in the case of capital stock ranking on a parity with that Listed Preferred Stock, pursuant to pro rata offers to purchase all or a pro rata portion of the shares of that Listed Preferred Stock and such capital stock ranking on a parity with that Listed Preferred Stock;

(5) in connection with the satisfaction of our obligations pursuant to any contract entered into in the ordinary course prior to the beginning of the most recently completed dividend period; or

(6) any purchase, redemption or other acquisition of capital stock ranking junior to that Listed Preferred Stock pursuant to any of our or our subsidiaries' employee, consultant or director incentive or benefit plans or arrangements (including any employment, severance or consulting arrangements) adopted before or after the issuance of that Listed Preferred Stock).

However, the foregoing will not restrict our ability or the ability of any of our affiliates to engage in underwriting, stabilization, market-making or similar transactions in our capital stock in the ordinary course of business. Subject to the conditions described above, and not otherwise, dividends (payable in cash, capital stock, or otherwise), as may be determined by our board of directors or a duly authorized committee of our board, may be declared and paid on our common stock and any other capital stock ranking junior to or on a parity with the Listed Preferred Stock from time to time out of any assets legally available for such payment, and the holders of the Listed Preferred Stock will not be entitled to participate in those dividends.

As used herein, "junior to a series of Listed Preferred Stock" and like terms refer to our common stock and any other class or series of our capital stock over which the Listed Preferred Stock has preference or priority, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require; "parity preferred stock" and "on a parity with a series of Listed Preferred Stock" and like terms refer to any class or series of our capital stock that ranks on a parity with the shares of a particular series of Listed Preferred Stock, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require; and "senior to a series of Listed Preferred Stock" and like terms refer to any class or series of our capital stock that ranks senior to a particular series of Listed Preferred Stock, either as to dividends or upon liquidation, dissolution or winding-up, or both, as the context may require.

We will compute the amount of dividends payable by annualizing the applicable dividend rate and dividing by the number of dividend periods in a year, except that the amount of dividends payable for any period greater or less than a full dividend period, other than the initial dividend period, will be computed on the basis of a 360-day year consisting of twelve 30-day months and, for any period less than a full month, the actual number of days elapsed in the period. Dollar amounts resulting from that calculation will be rounded to the nearest cent, with one-half cent being rounded upward.

Rights Upon Liquidation

In the event of our voluntary or involuntary liquidation, dissolution or winding-up, holders of each series of Listed Preferred Stock will be entitled to receive and to be paid out of our assets legally available for distribution to our stockholders the amount of $10,000 per share, plus any declared and unpaid dividends, without accumulation of undeclared dividends, before we make any distribution of assets to the holders of our common stock or any other class or series of shares ranking junior to the Listed Preferred Stock of such series. After the payment to such holders of the full preferential amounts to which they are entitled, such holders will have no right or claim to any of our remaining assets.

If, upon our voluntary or involuntary liquidation, dissolution or winding-up, we fail to pay in full the amounts payable with respect to a particular series of Listed Preferred Stock, and any stock having the same rank as that series, the holders of that series and of that other stock will share ratably in any such distribution of our assets in proportion to the full respective distributions to which they are entitled. For any series of Listed Preferred Stock, neither the sale of all or substantially all of our property or business, nor our merger or consolidation into or with any other entity will be considered a liquidation, dissolution or winding-up, voluntary of or involuntary, of us.

Because we are a holding company, our rights and the rights of our creditors and our stockholders, including the holders of the Listed Preferred Stock, to participate in the assets of any of our subsidiaries upon that subsidiary's liquidation, dissolution, winding-up or recapitalization may be subject to the prior claims of that subsidiary's creditors, except to the extent that we are a creditor with recognized claims against the subsidiary.

Holders of the Listed Preferred Stock are subordinate to all of our indebtedness and to other non-equity claims on us and our assets, including in the event that we enter into a receivership, insolvency, liquidation or similar proceeding. In addition, holders of the Listed Preferred Stock may be fully subordinated to interests held by the U.S. government in the event that we enter into a receivership, insolvency, liquidation or similar proceeding.

Redemption

We may redeem each series of Listed Preferred Stock on the dates and at the redemption prices set forth below under "Specific Terms of Listed Preferred Stock". In addition, we may redeem each series of Listed Preferred Stock in whole, but not in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends, following the occurrence of a capital treatment event. For these purposes, "capital treatment event" means the good faith determination by JPMorgan Chase that, as a result of any:

- amendment to, or change or any announced prospective change in, the laws or regulations of the United States or any political subdivision of or in the United States that is enacted or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock;
- proposed change in those laws or regulations that is announced or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock; or
- official administrative decision or judicial decision or administrative action or other official pronouncement interpreting or applying those laws or regulations that is announced or becomes effective after the initial issuance of any shares of such series of Listed Preferred Stock,

there is more than an insubstantial risk that JPMorgan Chase will not be entitled to treat an amount equal to the full liquidation amount of all shares of such series of Listed Preferred Stock then outstanding as "additional Tier 1 capital" (or its equivalent) for purposes of the capital adequacy guidelines or regulations of the appropriate federal banking agency, as then in effect and applicable, for as long as any share of such series of Listed Preferred Stock is outstanding. Redemption of any Listed Preferred Stock is subject to our receipt of any required approvals from the Federal Reserve Board or any other regulatory authority.

If we elect to redeem shares of a series of Listed Preferred Stock, we will provide notice by first class mail, postage prepaid, addressed to the holders of record of such shares to be redeemed. Such mailing will be at least 30 days and not more than 60 days before the date fixed for redemption. Any notice so mailed will be conclusively presumed to have been duly given, whether or not the holder receives such notice, but failure to duly give such notice by mail, or any defect in such notice or in the mailing thereof, to any holder of shares of the series designated for redemption will not affect the validity of the proceedings for the redemption of any other shares of that series. Each notice of redemption will state:

- the redemption date;
- the number of shares of the series of Listed Preferred Stock to be redeemed and, if fewer than all the shares held by such holder are to be redeemed, the number of such shares to be redeemed from such holder;
- the redemption price;
- the place or places where the certificates representing such shares are to be surrendered for payment of the redemption price; and
- that dividends on the shares to be redeemed will cease to accrue on the redemption date.

Notwithstanding the foregoing, if the series of Listed Preferred Stock is held in book-entry form through The Depository Trust Company, or "DTC", we may give such notice in any manner permitted or required by DTC. For each series of Listed Preferred Stock, neither the holders of a series nor the holders of the related depositary shares have the right to require redemption of such series of Listed Preferred Stock.

In the case of any redemption of only part of the shares a series of Listed Preferred Stock at the time outstanding, the shares of the series to be redeemed will be selected either pro rata from the holders of record of that series in proportion to the number of shares held by such holders or by lot. From and after the redemption date, dividends will cease to accumulate on the shares of Listed Preferred Stock called for redemption up to the redemption date and all rights of the holders of those shares, except the right to receive the redemption price, will cease.

In the event that we fail to pay full dividends, including accumulated but unpaid dividends, if any, on any series of Listed Preferred Stock, we may not redeem that series in part and we may not purchase or acquire any shares of that series, except by a purchase or exchange offer made on the same terms to all holders of that series.

Preemptive and Conversion Rights

The Listed Preferred Stock is not subject to any preemptive rights and is not convertible into property or shares of any other class or series of our capital stock.

Depositary, Transfer Agent, and Registrar

Computershare Inc. is the depositary, transfer agent and registrar for each series of the Listed Preferred Stock and the related depositary shares.

Voting Rights

Except as indicated below or except as expressly required by applicable law, the holders of the Listed Preferred Stock are not entitled to vote. Each share of Listed Preferred Stock a series is entitled to one vote on matters on which holders of that series are entitled to vote. The voting power of each series of Listed Preferred Stock depends on the number of shares in that series, and not on the aggregate liquidation preference or initial offering price of the shares of that series.

If, at any time or times, the equivalent of an aggregate of six quarterly dividends, whether or not consecutive, for any series of Listed Preferred Stock has not been paid, the number of directors constituting our board of directors will be automatically increased by two and the holders of each outstanding series of Listed Preferred Stock with such voting rights, together with holders of such other shares of any other class or series of parity preferred stock outstanding at the time upon which like voting rights have been conferred and are exercisable, which we refer to as "voting parity stock," voting together as a class, will be entitled to elect those additional two directors, which we refer to as "preferred directors," at that annual meeting and at each subsequent annual meeting of stockholders until full dividends have been paid for at least four quarterly consecutive dividend periods. At that time such right will terminate, except as expressly provided in the applicable certificate of designations or by law, subject to revesting. Upon any termination of the right of the holders of the Listed Preferred Stock and voting parity stock as a class to vote for directors as provided above, the preferred directors will cease to be qualified as directors, the term of office of all preferred directors then in office will terminate immediately and the authorized number of directors will be reduced by the number of preferred directors elected. Any preferred director may be removed and replaced at any time, with cause as provided by law or without cause by the affirmative vote of the holders of shares of the Listed Preferred Stock, voting together as a class with the holders of shares of voting parity stock, to the extent the voting rights of such holders described above are then exercisable. Any vacancy created by removal with or without cause may be filled only as described in the preceding sentence. If the office of any preferred director becomes vacant for any reason other than removal, the remaining preferred director may choose a successor who will hold office for the unexpired term in respect of which such vacancy occurred.

So long as any shares of a particular series of Listed Preferred Stock remains outstanding, we will not, without the affirmative vote of the holders of at least 66 2/3% in voting power of that series and any voting parity stock, voting together as a class, authorize, create or issue any capital stock ranking senior to that series as to dividends or upon liquidation, dissolution or winding-up, or reclassify any authorized capital stock into any such shares of such capital stock or issue any obligation or security convertible into or evidencing the right to purchase any such shares of capital stock. So long as any shares of a particular series of Listed Preferred Stock remain outstanding, we will not, without the affirmative vote of the holders of at least 66 2/3% in voting power of that series, amend, alter or repeal any provision of the applicable certificate of designations or our certificate of incorporation, including by merger, consolidation or otherwise, so as to adversely affect the powers, preferences or special rights of that series.

Notwithstanding the foregoing, none of the following will be deemed to adversely affect the powers, preferences or special rights of any series of Listed Preferred Stock:

- any increase in the amount of authorized common stock or authorized preferred stock, or any increase or decrease in the number of shares of any series of preferred stock, or the authorization, creation and issuance of other classes or series of capital stock, in each case ranking on a parity with or junior to that series of Listed Preferred Stock as to dividends or upon liquidation, dissolution or winding-up;
- a merger or consolidation of JPMorgan Chase with or into another entity in which the shares of that series remain outstanding; and
- a merger or consolidation of JPMorgan Chase with or into another entity in which the shares of the that series are converted into or exchanged for preference securities of the surviving entity or any entity, directly or indirectly, controlling such surviving entity and such new preference securities have powers, preferences and special rights that are not materially less favorable than that series;

provided that if the amendment would adversely affect such series but not any other series of preferred stock outstanding, then the amendment will only need to be approved by holders of at least two-thirds of the shares of the series of Listed Preferred Stock adversely affected.

In exercising the voting rights described above or when otherwise granted voting rights by operation of law or by us, each share of Listed Preferred Stock with respect to a series will be entitled to one vote (equivalent to $1/400^{th}$ of a vote per relevant depositary share).

If we redeem or call for redemption all outstanding shares of a series of Listed Preferred Stock and irrevocably deposit in trust sufficient funds to effect such redemption, at or prior to the time when the act with respect to which such vote would otherwise be required or upon which the holders of such series will be entitled to vote will be effected, the voting provisions described above will not apply.

Our board of directors may also from time to time, without notice to or consent of holders of a series of Listed Preferred Stock, issue additional shares of such series. Delaware law provides that the holders of preferred stock will have the right to vote separately as a class on any amendment to our certificate of incorporation (including any certificate of designations) that would increase or decrease the aggregate number of authorized shares of such class, increase or decrease the par value of such class or adversely affect the powers, preferences and special rights of the shares of preferred stock. Notwithstanding the foregoing, as permitted by law, our certificate of incorporation provides that any increase or decrease in our authorized capital stock may be adopted by the affirmative vote of holders of capital stock representing not less than a majority of the voting power represented by the outstanding shares of our capital stock entitled to vote. If any proposed amendment would alter or change the powers, preferences or special rights of one or more series of preferred stock so as to affect them adversely, but would not so affect the entire class of preferred stock, only the shares of the series so affected will be considered a separate class for purposes of this vote on the amendment. This right is in addition to any voting rights that may be provided for in our certificate of incorporation (including any certificate of designations).

Under regulations adopted by the Federal Reserve Board, if the holders of any series of our preferred stock become entitled to vote for the election of directors because dividends on that series are in arrears, that series may then be deemed a “class of voting securities.” In such a case, a holder of 25% or more of the series, or a holder of 5% or more if that holder would also be considered to exercise a “controlling influence” over JPMorgan Chase, may then be subject to regulation as a bank holding company in accordance with the Bank Holding Company Act. In addition, (1) any other bank holding company may be required to obtain the prior approval of the Federal Reserve Board to acquire or retain 5% or more of that series, and (2) any person other than a bank holding company may be required to provide notice to the Federal Reserve Board prior to acquiring or retaining 10% or more of that series.

Description of Depositary Shares

The following summary of the terms of the depositary shares representing each series of the Listed Preferred Stock is not complete. You should refer to each of the deposit agreements among us, the depositary, and the holders from time to time of the depositary receipts evidencing the depositary shares relating to each series of the Listed Preferred Stock for the complete terms of those depositary shares. Each of those deposit agreements has been filed as an exhibit to a Current Report on Form 8-K filed in connection with the issuance of the depositary shares representing each series of the Listed Preferred Stock.

General. Each depositary share represents a 1/400th interest in a share of the relevant series of Listed Preferred Stock, and is evidenced by depositary receipts. In connection with the issuance of each series of Listed Preferred Stock, we deposited shares of that series of Listed Preferred Stock with Computershare Inc., as depositary under the deposit agreement relating to that series of Listed Preferred Stock. Subject to the terms of each deposit agreement, the depositary shares are entitled to all the powers, preferences and special rights of the relevant series of Listed Preferred Stock, as applicable, in proportion to the applicable fraction of a share of Listed Preferred Stock those depositary shares represent.

Dividends and Other Distributions. Each dividend payable on a depositary share will be in an amount equal to 1/400th of the dividend declared and payable on the related share of the Listed Preferred Stock.

The depositary will distribute all dividends and other cash distributions received on the relevant series of Listed Preferred Stock to the holders of record of the related depositary receipts in proportion to the number of depositary shares held by each holder. In the event of a distribution other than in cash, the depositary will distribute property received by it to the holders of record of the depositary receipts as nearly as practicable in proportion to the number of depositary shares held by each holder, unless the depositary determines that this distribution is not feasible, in which case the depositary may, with our approval, adopt a method of distribution that it deems practicable, including the sale of the property and distribution of the net proceeds of that sale to the holders of the depositary receipts.

Record dates for the payment of dividends and other matters relating to the depositary shares will be the same as the corresponding record dates for the related shares of Listed Preferred Stock.

The amount paid as dividends or otherwise distributable by the depositary with respect to the depositary shares or the underlying Listed Preferred Stock will be reduced by any amounts required to be withheld by us or the depositary on account of taxes or other governmental charges.

Redemption of Depositary Shares. If we redeem a series of Listed Preferred Stock, in whole or in part, the corresponding depositary shares also will be redeemed with the proceeds received by the depositary from the redemption of the Listed Preferred Stock held by the depositary. The redemption price per depositary share will be 1/400th of the redemption price per share payable with respect to the Listed Preferred Stock, plus any declared and unpaid dividends, without accumulation of undeclared dividends.

If we redeem shares of a series of Listed Preferred Stock held by the depositary, the depositary will redeem, as of the same redemption date, the number of depositary shares representing those shares of the Listed Preferred Stock so redeemed. If we redeem less than all of the outstanding depositary shares, the depositary will select pro rata or by lot those depositary shares to be redeemed. The depositary will mail notice of redemption to record holders of the depositary receipts not less than 30 and not more than 60 days prior to the date fixed for redemption of the Listed Preferred Stock and the related depositary shares.

The redemption of depositary shares that are held in book-entry form through DTC will be effected in accordance with the applicable procedures of DTC.

Voting the Listed Preferred Stock. Because each depositary share represents a 1/400th interest in a share of Listed Preferred Stock, holders of depositary receipts will be entitled to 1/400th of a vote per depositary share under those limited circumstances in which holders of the Listed Preferred Stock are entitled to a vote.

When the depositary receives notice of any meeting at which the holders of a series of Listed Preferred Stock are entitled to vote, the depositary will mail the information contained in the notice to the record holders of the depositary shares relating to that Listed Preferred Stock. Each record holder of the depositary shares on the record date, which will be the same date as the record date for the applicable Listed Preferred Stock, may instruct the depositary to vote the amount of the Listed Preferred Stock represented by the holder's depositary shares. To the extent practicable, the depositary will vote the amount of the Listed Preferred Stock represented by depositary shares in accordance with the instructions it receives. We will agree to take all actions that the depositary determines are necessary to enable the depositary to vote as instructed. If the depositary does not receive specific instructions from the holders of any depositary shares representing the Listed Preferred Stock, it will abstain from voting with respect to such shares.

Withdrawal of Listed Preferred Stock. Underlying shares of Listed Preferred Stock may be withdrawn from the depositary arrangement upon surrender of depositary receipts at the depositary's office and upon payment of the taxes, charges and fees provided for in the deposit agreement. Subject to the terms of the relevant deposit agreement, the holder of depositary receipts will receive the appropriate number of shares of Listed Preferred Stock represented by such depositary shares. Only whole shares of Listed Preferred Stock may be withdrawn; if a holder holds an amount other than a whole multiple of 400 depositary shares, the depositary will deliver along with the withdrawn shares of Listed Preferred Stock a new depositary receipt evidencing the excess number of depositary shares. Holders of withdrawn shares of Listed Preferred Stock will not be entitled to redeposit such shares or to receive depositary shares.

Form and Notices. Each series of Listed Preferred Stock was issued in registered form to the depositary, and the depositary shares representing that Listed Preferred Stock were issued in book-entry only form through DTC. The depositary will forward to the holders of depositary shares all reports, notices, and communications from us that are delivered to the depositary and that we are required to furnish to the holders of the Listed Preferred Stock.

Amendment and Termination of the Deposit Agreement. We and the depositary may amend any form of depositary receipt evidencing depositary shares and any provision of any deposit agreement at any time regarding any depositary shares. However, any amendment that materially and adversely alters the rights of the holders of depositary shares representing a particular series of Listed Preferred Stock or would be materially and adversely inconsistent with the rights granted to holders of that underlying Listed Preferred Stock pursuant to our certificate of incorporation will not be effective unless the amendment has been approved by the holders of at least a majority of the related depositary shares then outstanding. The deposit agreement relating to the depositary shares representing a particular series of Listed Preferred Stock may be terminated by us or by the depositary only if:

- all such outstanding depositary shares have been redeemed; or
- there has been a final distribution of the relevant underlying Listed Preferred Stock in connection with our liquidation, dissolution or winding up and the preferred stock has been distributed to the holders of depositary receipts.

Charges of Depositary. We will pay all transfer and other taxes and governmental charges arising solely from the existence of the depositary arrangements regarding any depositary shares. We also pay charges of the depositary in connection with the initial deposit of each series of Listed Preferred Stock and any redemption of the Listed Preferred Stock. Holders of depositary receipts will pay transfer and other taxes and governmental charges and other charges with respect to their depositary receipts as expressly provided in the deposit agreement.

Resignation and Removal of Depositary. With respect to the depositary shares representing each series of Listed Preferred Stock, the depositary may resign at any time by delivering a notice to us of its election to do so. We may remove the depositary at any time. Any such resignation or removal will take effect upon the appointment of a successor depositary and its acceptance of its appointment. We must appoint a successor depositary within 60 days after delivery of the notice of resignation or removal.

Miscellaneous. The depositary will forward to holders of applicable depositary receipts all reports and communications from us that we deliver to the depositary and that we are required to furnish to the holders of the relevant Listed Preferred Stock.

Neither we nor the depositary will be liable if either of us is prevented or delayed by law or any circumstance beyond our control in performing our respective obligations under any deposit agreement. Our obligations and those of the depositary will be limited to performing in good faith our respective duties under any deposit agreement. Neither we nor the depositary will be obligated to prosecute or defend any legal proceeding relating to any depositary shares or Listed Preferred Stock unless satisfactory indemnity is furnished. We and the depositary may rely upon written advice of counsel or accountants, or upon information provided by persons presenting preferred stock for deposit, holders of depositary receipts or other persons we believe to be competent, and on documents we believe to be genuine.

Specific Terms of Listed Preferred Stock

6.10% Non-Cumulative Preferred Stock, Series AA

On June 4, 2015, we issued an aggregate of 142,500 shares of 6.10% Non-Cumulative Preferred Stock, Series AA, $1 par value, with a liquidation preference of $10,000 per share (the “Series AA Preferred Stock”). Shares of the Series AA Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series AA Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 6.10% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on September 1, 2015. Dividends on the Series AA Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series AA Preferred Stock may be redeemed on any dividend payment date on or after September 1, 2020, in whole or in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series AA Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series AA Preferred Stock are listed on the NYSE under the trading symbol “JPM PR G”.

6.15% Non-Cumulative Preferred Stock, Series BB

On July 29, 2015, we issued an aggregate of 115,000 shares of 6.15% Non-Cumulative Preferred Stock, Series BB, $1 par value, with a liquidation preference of $10,000 per share (the “Series BB Preferred Stock”). Shares of the Series BB Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series BB Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 6.15% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on December 1, 2015. Dividends on the Series BB Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series BB Preferred Stock may be redeemed on any dividend payment date on or after September 1, 2020, in whole or in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series BB Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series BB Preferred Stock are listed on the NYSE under the trading symbol “JPM PR H”.

5.75% Non-Cumulative Preferred Stock, Series DD

On September 21, 2018, we issued an aggregate of 169,625 shares of 5.75% Non-Cumulative Preferred Stock, Series DD, $1 par value, with a liquidation preference of $10,000 per share (the “Series DD Preferred Stock”). Shares of the Series DD Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series DD Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 5.75% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on December 1, 2018. Dividends on the Series DD Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series DD Preferred Stock may be redeemed on any dividend payment date on or after December 1, 2023, in whole or in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series DD Preferred Stock following the occurrence of a “capital treatment event,” as described above.

Listing. The depositary shares representing the Series DD Preferred Stock are listed on the NYSE under the trading symbol “JPM PR D”.

6.00% Non-Cumulative Preferred Stock, Series EE

On January 24, 2019, we issued an aggregate of 185,000 shares of 6.00% Non-Cumulative Preferred Stock, Series EE, $1 par value, with a liquidation preference of $10,000 per share (the “Series EE Preferred Stock”). Shares of the Series EE Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series EE Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 6.00% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on June 1, 2019. Dividends on the Series EE Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series EE Preferred Stock may be redeemed on any dividend payment date on or after March 1, 2024, in whole or in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series EE Preferred Stock following the occurrence of a "capital treatment event," as described above.

Listing. The depositary shares representing the Series EE Preferred Stock are listed on the NYSE under the trading symbol "JPM PR C".

4.75% Non-Cumulative Preferred Stock, Series GG

On November 7, 2019, we issued an aggregate of 90,000 shares of 4.75% Non-Cumulative Preferred Stock, Series GG, $1 par value, with a liquidation preference of $10,000 per share (the "Series GG Preferred Stock"). Shares of the Series GG Preferred Stock are represented by depositary shares, each representing a 1/400th interest in a share of preferred stock of the series.

Dividends. Dividends on the Series GG Preferred Stock are payable when, as, and if declared by our board of directors or a duly authorized committee of our board, at a rate of 4.75% per annum, payable quarterly in arrears, on March 1, June 1, September 1 and December 1 of each year, beginning on March 1, 2020. Dividends on the Series GG Preferred Stock are neither mandatory nor cumulative.

Redemption. The Series GG Preferred Stock may be redeemed on any dividend payment date on or after December 1, 2024, in whole or in part, at a redemption price equal to $10,000 per share (equivalent to $25 per depositary share), plus any declared and unpaid dividends. We may also redeem the Series GG Preferred Stock following the occurrence of a "capital treatment event," as described above.

Listing. The depositary shares representing the Series GG Preferred Stock are listed on the NYSE under the trading symbol "JPM PR J".

DESCRIPTION OF THE ALERIAN MLP INDEX ETNS DUE MAY 24, 2024

The following description of our Alerian MLP Index ETNs due May 24, 2024 (the "Alerian ETNs") is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the indenture dated May 25, 2001 (as may be amended or supplemented from time to time, the "2001 Indenture"), between JPMorgan Chase, as issuer, and Deutsche Bank Trust Company Americas (formerly known as Bankers Trust Company), as trustee (the "Trustee"), which is incorporated by reference as an Exhibit to the Form 10-K. We encourage you to read the 2001 Indenture for additional information.

General

In June 2012, the maximum number of Alerian ETNs authorized for issuance was set at 129,000,000, resulting in a maximum aggregate principal amount of $2,455,722,690. All of the Alerian ETNs authorized for issuance were issued as of June 2012. 10,000,000 Alerian ETNs were retired on December 16, 2015. Accordingly, since the retirement of these notes, the maximum number of Alerian ETNs authorized for issuance is 119,000,000 with an aggregate principal amount of $2,265,356,590, all of which has been issued and remain outstanding as of December 31, 2019.

The Alerian ETNs are linked to the Alerian MLP Index (the "Index") and are our unsecured and unsubordinated obligations and will rank *pari passu* with all of our other unsecured and unsubordinated obligations. The Alerian ETNs do not guarantee any return of principal at, or prior to, maturity or upon early repurchase. **Any payment on the Alerian ETNs is subject to the credit risk of JPMorgan Chase & Co.**

The Alerian ETNs are part of a series of our debt securities entitled "Global Medium-Term Notes, Series E" (the "Series E Notes") that we may issue under the 2001 Indenture from time to time. For more information about the Series E Notes, please see the section titled "General Terms of the Series E Notes" below.

The Alerian ETNs are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or by any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Unless otherwise specified, references herein to "holders" mean those in whose names the Alerian ETNs are registered on the books that we or the Trustee, or any successor trustee, as applicable, maintain for this purpose, and not those who own beneficial interests in the Alerian ETNs (registered in street name or otherwise).

Please see "Certain Defined Terms" below for an explanation of any capitalized terms used herein that are not otherwise defined.

The Index

The return of the Alerian ETNs is linked to the performance of the Index. The Index measures the composite performance of energy-oriented Master Limited Partnerships, or MLPs, and is calculated and maintained by S&P Dow Jones Indices LLC (the "Index Calculation Agent"), in consultation with GKD Index Partners, LLC (the "Index Sponsor"), using a float-adjusted, market capitalization methodology. MLPs are limited partnerships primarily engaged in the exploration, marketing, mining, processing, production, refining, storage, or transportation of any mineral or natural resource.

Denominations

The Alerian ETNs are denominated in U.S. dollars in minimum denominations equal to the $19.03661 per note (the "Principal Amount"), which is the amount equal to the Initial VWAP Level (defined below), *divided* by ten.

Coupon Payments and the Accrued Tracking Fee

For each Alerian ETN a holder holds on the applicable Coupon Record Date, holders will receive on each Coupon Payment Date the "Coupon Amount," which is an amount in cash equal to the difference between (a) the Reference Distribution Amount (defined below), calculated as of the corresponding Coupon Valuation Date and (b) the Accrued Tracking Fee (defined below), calculated as of the corresponding Coupon Valuation Date.

The Accrued Tracking Fee accrues on a daily basis at a rate of 0.85% per annum, applied to the Daily Note Value as of the Index Business Day immediately preceding the corresponding Coupon Valuation Date. The Daily Note Value reflects the cumulative performance of the VWAP Level of the Index since April 1, 2009, which we refer to as the Inception Date. If the Daily Note Value increases, the Accrued Tracking Fee will increase, and if the Daily Note Value decreases, the Accrued Tracking Fee will decrease. The Daily Note Value is published on the Bloomberg Professional® service ("Bloomberg") under the ticker symbol "AMJIVWAP" and on Bloomberg.com under the ticker symbol "AMJIVWAP:IND."

On any Index Business Day, the VWAP Level reflects the weighted VWAPs of the Index Components, and the VWAP of each Index Component is the volume-weighted average price of one share of that Index Component as determined by the VWAP Calculation Agent based on the Primary Exchange for that Index Component.

To the extent the Reference Distribution Amount on any Coupon Valuation Date is less than the Accrued Tracking Fee on the corresponding Coupon Valuation Date, there will be no coupon payment made on the corresponding Coupon Payment Date, and an amount equal to the difference between the Accrued Tracking Fee and the Reference Distribution Amount (the "Tracking Fee Shortfall") will be included in the Accrued Tracking Fee for the next Coupon Valuation Date. This will be in addition to the accrual at a rate of 0.85% per annum over the quarter that has elapsed since the previous date of determination. This process will be repeated to the extent necessary until the Reference Distribution Amount for a Coupon Valuation Date is greater than the Accrued Tracking Fee for the corresponding Coupon Valuation Date (which includes the accumulated Tracking Fee Shortfall from all prior quarters). This process may also restart as necessary on a subsequent Coupon Valuation Date. Coupon payments on the Alerian ETNs will be payable quarterly in arrears on the fifteenth Index Business Day following each Coupon Valuation Date, *provided* that the final Coupon Payment Date will be the Maturity Date. The final Coupon Amount will be included in the Cash Settlement Amount.

Holders will receive no coupon payment on a Coupon Payment Date if the Reference Distribution Amount on the relevant Coupon Valuation Date is less than the Accrued Tracking Fee on the relevant Coupon Valuation Date.

On each Index Business Day, the Note Calculation Agent will calculate the value of the Coupon Amount as of the immediately preceding Index Business Day (treating that immediately preceding Index Business Day as if it were a Coupon Valuation Date), which we refer to as the interim accrued Coupon Amount, and will publish the interim accrued Coupon Amount on Bloomberg under the ticker symbol "AMJEU" and on Bloomberg.com under the ticker symbol "AMJEU:IND." While the interim accrued Coupon Amount is calculated and published in connection with each such Index Business Day, the actual Coupon Amount will be calculated and paid only once each quarter.

Payment Upon Early Repurchase

Subject to a holder's compliance with the procedures and the potential postponements and adjustments as described under "Market Disruption Events" below, that holder may submit a request once a week (generally on or before 11:00 a.m., New York City time, on Thursday) during the term of the Alerian ETNs to have us repurchase that holder's Alerian ETNs, *provided* that holder requests that we repurchase a minimum of 50,000 Alerian ETNs. If a holder requests that we repurchase that holder's Alerian ETNs, subject to the notification requirements and the other terms and conditions set forth under "Repurchase Requirements" below, for each Alerian ETN that holder will receive a cash payment on the relevant Repurchase Date equal to the Repurchase Amount. If the Repurchase Amount is $0 or less, the payment upon early repurchase will be $0. Because the Repurchase Amount is based on the value of the Index at the end of a five-day measurement period that begins after a repurchase request is received, holders will not know the Repurchase Amount they will receive at the time they elect to request that we repurchase their Alerian ETNs.

The Repurchase Amount is calculated by adjusting the Principal Amount to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the deduction of the Accrued Tracking Fee;
- the deduction of the Repurchase Fee;

- the addition of other adjustments representing accrued but unpaid coupons, which include the following:
  - the Coupon Amount with respect to the Coupon Valuation Date immediately preceding the applicable Repurchase Valuation Date (generally the last Index Business Day of the week in which a repurchase is requested) if, on the last Index Business Day in the Repurchase Measurement Period the Coupon Ex-Date with respect to that Coupon Amount has not yet occurred. The Repurchase Measurement Period is a five-Index Business Day period commencing on the Repurchase Valuation Date during which the Final VWAP Level will be determined;
  - an Adjusted Coupon Amount, if any, that reflects certain cash distributions on the Index Components with ex-dividend dates from and excluding the immediately preceding Coupon Valuation Date to and including the applicable Repurchase Valuation Date, less the Accrued Tracking Fee; and
  - certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

For purposes of determining the Cash Settlement Amount, the Final VWAP Level will be the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Repurchase Measurement Period, as calculated by the VWAP Calculation Agent.

The Repurchase Fee Amount is equal to 0.125% of the Principal Amount, adjusted to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the deduction of the Accrued Tracking Fee; and
- the addition of certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

Accordingly, the Repurchase Fee Amount will vary based on the performance of the Index, the Accrued Tracking Fee and certain cash distributions on the Index Components with ex-dividend dates during the Repurchase Measurement Period.

Holders may lose some or all of their investment upon early repurchase. Because the Accrued Tracking Fee reduces their final payment, holders will likely lose some or all of their principal amount upon early repurchase if the Final VWAP Level is less than the Initial VWAP Level or if the Final VWAP Level is not greater than the Initial VWAP Level by an amount that is sufficient to offset the negative effect of the Accrued Tracking Fee and the Repurchase Fee.

Repurchase Requirements

To exercise the right to have us repurchase a holder's Alerian ETNs on a weekly basis, that holder must instruct that holder's broker or other person through whom that holder holds the Alerian ETNs to take the following steps:

- Send a notice of repurchase, substantially in the specified form (a "Repurchase Notice"), to us via email at ETN_Repurchase@jpmorgan.com by no later than 11:00 a.m., New York City time, during the term of the Alerian ETNs, each week on the Business Day immediately preceding the applicable Repurchase Valuation Date (generally Thursday);
- If we receive that holder's Repurchase Notice by the time specified in the preceding bullet point, we will respond by sending that holder a confirmation of repurchase, substantially in the specified form (a "Repurchase Confirmation");
- Deliver the signed Repurchase Confirmation, in the specified form, to us via facsimile to (917) 456-3471, by 4:00 p.m., New York City time, on the Business Day on which that holder submitted that holder's Repurchase Notice. We or our affiliate must acknowledge receipt in order for that holder's Repurchase Confirmation to be effective;
- Instruct DTC custodian for that holder to book a delivery versus payment trade with respect to that holder's Alerian ETNs on the relevant Repurchase Valuation Date at a price equal to the applicable Repurchase Amount; and
- Cause that holder's DTC custodian to deliver the trade as booked for settlement via DTC at or prior to 10:00 a.m. New York City time on the relevant Repurchase Date.

Different brokerage firms may have different deadlines for accepting instructions from their customers. Accordingly, holders should consult the brokerage firm through which they own their interest in the offered Alerian ETNs in respect of such deadlines. If we do not receive a holder's Repurchase Notice by 11:00 a.m., or a holder's Repurchase Confirmation by 4:00 p.m., on the Business Day immediately preceding the applicable Repurchase Valuation Date, that holder's Repurchase Notice will not be effective and we will not repurchase that holder's Alerian ETNs on the relevant Repurchase Date.

The Note Calculation Agent will, in its sole discretion, resolve any questions that may arise as to the validity of a Repurchase Notice and the timing of receipt of a Repurchase Notice or as to whether and when the required deliveries have been made. Once given, a Repurchase Notice may not be revoked.

Expiration of Repurchase Rights

If we do not receive a holder's Repurchase Notice by 11:00 a.m., New York City time (as described under the first bullet point in "Repurchase Requirements" above), or a holder's Repurchase Confirmation by 4:00 p.m., New York City time (as described under the third bullet point in "Repurchase Requirements" above) on the Business Day immediately preceding the applicable Repurchase

Valuation Date (generally Thursday), that holder's Repurchase Notice will not be effective and we will not repurchase that holder's Alerian ETNs on the relevant Repurchase Date. Any Repurchase Notice for which we (or our affiliate) receive a valid Repurchase Confirmation in accordance with the procedures described above will be irrevocable.

Payment at Maturity

For each Alerian ETN, unless earlier repurchased, holders will receive at maturity a cash payment equal to the Cash Settlement Amount. If the Cash Settlement Amount is $0 or less, the payment at maturity will be $0.

The Cash Settlement Amount is calculated by adjusting the Principal Amount to reflect:

- the return of the Index from the Initial VWAP Level to the Final VWAP Level;
- the addition of the final Coupon Amount, if any,
- the deduction of the Accrued Tracking Fee; and
- the addition of certain cash distributions on the Index Components with ex-dividend dates during the Final Measurement Period.

The Final Measurement Period is a five Index Business Day period near the Maturity Date of the Alerian ETNs during which the Final VWAP Level will be determined.

For purposes of determining the Cash Settlement Amount, the Final VWAP Level will be the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Final Measurement Period, as calculated by the VWAP Calculation Agent. The Initial VWAP Level is the arithmetic mean of the VWAP Levels measured on each Index Business Day over a three Index Business Day period ending on the Inception Date, as calculated by the VWAP Calculation Agent.

Holders may lose some or all of their investment at maturity. Because the Accrued Tracking Fee reduces their final payment, holders will likely lose some or all of their principal amount at maturity if the Final VWAP Level is less than the Initial VWAP Level or if the Final VWAP Level is not greater than the Initial VWAP Level by an amount that is sufficient to offset the negative effects of the Accrued Tracking Fee.

Note Calculation Agent

J.P. Morgan Securities LLC, or JPMS (the "Note Calculation Agent"), will make all necessary calculations and determinations in connection with the Alerian ETNs, including calculations and determinations relating to any payments on the Alerian ETNs, other those to be made by the VWAP Calculation Agent described below.

VWAP Calculation Agent

The JPMorgan Global Index Research Group (the "VWAP Calculation Agent"), one of our affiliates, will on each day that is not a Disrupted Day (as defined below) act as the VWAP Calculation Agent. The VWAP Calculation Agent will determine the VWAP of any Index Component, the VWAP Level and the Final VWAP Level on any Index Business Day on which such VWAP, VWAP Level and Final VWAP Level are to be determined during the term of the Alerian ETNs.

Market Disruption Events

To the extent a Disrupted Day (as defined below) exists with respect to an Index Component on an Averaging Date (as defined below), the VWAP and published share weighting with respect to such Index Component (and only with respect to such Index Component) for such Averaging Date will be determined by the Note Calculation Agent or one of its affiliates on the first succeeding Index Business Day that is not a Disrupted Day (the "Deferred Averaging Date") with respect to such Index Component irrespective of whether pursuant to such determination, the Deferred Averaging Date would fall on a date originally scheduled to be an Averaging Date. For the avoidance of doubt, if the postponement described in the preceding sentence results in the VWAP of a particular Index Component being calculated on a day originally scheduled to be an Averaging Date, for purposes of determining the VWAP Levels on the Index Business Days during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, the Note Calculation Agent or one of its affiliates, as the case may be, will apply the VWAP and the published share weighting with respect to such Index Component for such Deferred Averaging Date to the calculation of the VWAP Level (i) on the date(s) of the original disruption with respect to such Index Component and (ii) such Averaging Date.

In no event, however, will any postponement pursuant to the immediately preceding paragraph result in the final Averaging Date with respect to any Index Component occurring more than three Index Business Days following the day originally scheduled to be the final Averaging Date. If the third Index Business Day following the date originally scheduled to be the final Averaging Date is not an Index Business Day or is a Disrupted Day with respect to such Index Component, the Note Calculation Agent or one of its affiliates, will determine the VWAP and share weighting with respect to any Index Component required to be determined for the purpose of calculating the applicable VWAP Level based on its good faith estimate of the VWAP and share weighting of each such Index Component that would have prevailed on the Primary Exchange on such third Index Business Day but for such suspension or limitation.

An “Averaging Date” means each of the Index Business Days during the Final Measurement Period or the Repurchase Measurement Period, as applicable, subject to adjustment as described herein.

A “Disrupted Day” with respect to any Index Component is any Index Business Day on which the Primary Exchange or any Related Exchange fails to open for trading during its regular trading session or on which a Market Disruption Event has occurred and is continuing, and, in both cases, the occurrence of which is determined by the Note Calculation Agent to have a material effect on the VWAP Level.

With respect to an Index Component, a “Market Disruption Event,” means:

(a) the occurrence or existence of a condition specified below:

(i) any suspension, absence or limitation of trading on the Primary Exchange for trading in the Index Component, whether by reason of movements in price exceeding limits permitted by the Primary Exchange or otherwise;

(ii) any suspension, absence or limitation of trading on the Related Exchange for trading in futures or options contracts related to the Index Component, whether by reason of movements in price exceeding limits permitted by such Related Exchange or otherwise; or

(iii) any event (other than an event described in (b) below) that disrupts or impairs (as determined by the Note Calculation Agent) the ability of market participants in general (A) to effect transactions in, or obtain market values for the relevant Index Component or (B) to effect transactions in, or obtain market values for, futures or options contracts relating to the relevant Index Component; or

(b) the closure on any Index Business Day of the Primary Exchange or any Related Exchange prior to its Scheduled Closing Time unless such earlier closing time is announced by the Primary Exchange or such Related Exchange at least one hour prior to the earlier of (i) the actual closing time for the regular trading session on the Primary Exchange or such Related Exchange on such Index Business Day and (ii) the submission deadline for orders to be entered into the Primary Exchange or such Related Exchange system for execution at the close of trading on such Index Business Day;

in each case determined by the Note Calculation Agent in its sole discretion; and

(c) a determination by the Note Calculation Agent in its sole discretion that the applicable event described above materially interfered with our ability or the ability of any of our affiliates to adjust or unwind all or a material portion of any hedge with respect to the Alerian ETNs.

For purposes of the above definition:

(a) a limitation on the hours or number of days of trading will not constitute a Market Disruption Event if it results from an announced change in the regular business hours of the Primary Exchange or Related Exchange, and

(b) for purposes of clause (a) above, limitations pursuant to the rules of any Primary Exchange or Related Exchange similar to NYSE Rule 80B or Nasdaq Rule 4120 (or any applicable rule or regulation enacted or promulgated by any other self-regulatory organization or any government agency of scope similar to NYSE Rule 80B or Nasdaq Rule 4120 as determined by the Note Calculation Agent) on trading during significant market fluctuations will constitute a suspension, absence or material limitation of trading.

“Scheduled Closing Time” means, with respect to the Primary Exchange or the Related Exchange, on any Index Business Day, the scheduled weekday closing time of the Primary Exchange or such Related Exchange on such Index Business Day, without regard to after hours or any other trading outside of the regular trading session hours.

Discontinuation of the Index; Alteration of Method of Calculation

If the Index Calculation Agent discontinues publication of or otherwise fails to publish the Index, or the Index Calculation Agent does not make the Index Components, their share weighting and/or the Index Divisor available to the VWAP Calculation Agent, and the Index Sponsor, the Index Calculation Agent or another entity publishes a successor or substitute index that the Note Calculation Agent determines to be comparable to the discontinued Index and for which the Index Components, their share weighting, and/or the Index Divisor are available to the VWAP Calculation Agent (such index being referred to herein as a “successor index”), then the VWAP Level for such successor index will be determined by the VWAP Calculation Agent by reference to the sum of the products of the VWAPs of the components underlying such successor index on the Primary Exchanges and each such component's respective weighting within the successor index (which sum will be adjusted by any index divisor used by such successor index) on the dates and at the times as of which the VWAP Levels for such successor index are to be determined.

Upon any selection by the Note Calculation Agent of a successor Index, the Note Calculation Agent will cause written notice thereof to be furnished to the Trustee, to us and to the holders of the Alerian ETNs.

If the Index Calculation Agent discontinues publication of the Index or does not make the Index Components, their share weightings and/or Index Divisor available to the VWAP Calculation Agent prior to, and such discontinuation or unavailability is continuing on the Calculation Date or any Index Business Day during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, or any other relevant date on which the VWAP Level is to be determined and the Note Calculation Agent determines that no successor index is available at such time, or the Note Calculation Agent has previously selected a successor index and publication of such successor index is discontinued prior to, and such discontinuation is continuing on the Calculation Date or any Index Business Day during the Final Measurement Period or during the Repurchase Measurement Period, as applicable, or any other relevant date on which the VWAP Level is to be determined, then the Note Calculation Agent will determine the relevant VWAP Levels using the VWAP and published share weighting of each Index Component included in the Index or successor index, as applicable, immediately prior to such discontinuation or unavailability, as adjusted for certain corporate actions. In such event, the Note Calculation Agent will cause notice thereof to be furnished to the Trustee, to us and to the holders of the Alerian ETNs.

Notwithstanding these alternative arrangements, discontinuation of the publication of the Index or successor index, as applicable, may adversely affect the value of the Alerian ETNs.

If at any time the method of calculating the Index or a successor index, or the value thereof, is changed in a material respect, or if the Index or a successor index is in any other way modified so that the VWAP Level of the Index or such successor index does not, in the opinion of the Note Calculation Agent, fairly represent the VWAP Level of the Index or such successor index had such changes or modifications not been made, then the Note Calculation Agent will make such calculations and adjustments as, in the good faith judgment of the Note Calculation Agent, may be necessary in order to arrive at a VWAP level of an index comparable to the Index or such successor index, as the case may be, as if such changes or modifications had not been made, and the Note Calculation Agent will calculate the VWAP Levels for the Index or such successor index with reference to the Index or such successor index, as adjusted. The Note Calculation Agent will accordingly calculate any values that reference the VWAP Levels based on the relevant VWAP Levels calculated by the Note Calculation Agent, as adjusted. Accordingly, if the method of calculating the Index or a successor index is modified so that the level of the Index or such successor index is a fraction of what it would have been if there had been no such modification (*e.g.*, due to a split in the index), which, in turn, causes the VWAP Level of the Index or such successor index to be a fraction of what it would have been if there had been no such modification, then the Note Calculation Agent will make such calculations and adjustments in order to arrive at a VWAP Level for the Index or such successor index as if it had not been modified (*e.g.*, as if such split had not occurred).

Payment upon an Event of Default

In case an event of default with respect to the Alerian ETNs shall have occurred and be continuing, the amount declared due and payable per Alerian ETN upon any acceleration of the Alerian ETNs will be determined by the Note Calculation Agent and will be an amount in cash equal to the Repurchase Amount, calculated as if the date of acceleration were the first Index Business Day in the Repurchase Measurement Period and the four Index Business Days immediately succeeding the date of acceleration were the corresponding Index Business Days in the accelerated Repurchase Measurement Period. For purposes of this calculation the Repurchase Fee Amount shall be zero.

If the maturity of the Alerian ETNs is accelerated because of an event of default as described above, we will, or will cause the Note Calculation Agent to, provide written notice to the Trustee at its New York office, on which notice the Trustee may conclusively rely, and to DTC, as holder of the Alerian ETNs, of the cash amount due with respect to the Alerian ETNs as promptly as possible and in no event later than two Business Days after the date of acceleration.

Listing

The Alerian ETNs have been listed on the NYSE Arca under the ticker symbol "AMJ." No assurance can be given as to the continued listing of the Alerian ETNs for their term or of the liquidity or trading market for the Alerian ETNs.

Book-Entry Only Issuance — The Depository Trust Company

DTC will act as securities depositary for the Alerian ETNs. The Alerian ETNs have been issued only as fully registered securities registered in the name of Cede & Co. (DTC's nominee). One or more fully registered global note certificates, representing the total aggregate principal amount of the Alerian ETNs, have been issued and have been deposited with DTC. We will not issue definitive notes in exchange for the global notes except in limited circumstances.

Registrar, Transfer Agent and Paying Agent

The Bank of New York Mellon or one of its affiliates will act as registrar and transfer agent for the Alerian ETNs. The Bank of New York Mellon will also act as paying agent and may designate additional paying agents.

Reissuances or Reopening Issuances

We may in our sole discretion, "reopen" or reissue the Alerian ETNs based upon market conditions and VWAP Levels at that time. These further issuances, if any, will be consolidated to form a single sub-series with the originally issued Alerian ETNs and will have the same CUSIP number and will trade interchangeably with the Alerian ETNs immediately upon settlement. Any Alerian ETNs bearing the same CUSIP number that are issued pursuant to any future additional issuances of Alerian ETNs bearing the same CUSIP number will increase the aggregate principal amount of the outstanding Alerian ETNs. The price of any additional offering will be determined at the time of pricing of that offering.

Certain Defined Terms

Key Defined Terms

A "Business Day" means any day other than a day on which the banking institutions in The City of New York are authorized or required by law, regulation or executive order to close or a day on which transactions in dollars are not conducted.

The "Calculation Date" is May 15, 2024, unless such day is not an Index Business Day, in which case the Calculation Date will be the next Index Business Day, subject to adjustments and subject to postponement in the event of a Market Disruption Event as described under "Market Disruption Events."

The "Daily Note Value" means, as of any date of determination, an amount per Alerian ETN equal to the product of:

- the Principal Amount; and
- a fraction, the numerator of which is equal to the VWAP Level as of such date and the denominator of which is equal to the Initial VWAP Level.

An "ex-dividend date" means, with respect to a distribution on an Index Component, the first Business Day on which transactions in such Index Component trade on the Primary Exchange without the right to receive such distribution.

An "Exchange Business Day" means any day on which the primary exchange or market for trading of the Alerian ETNs is scheduled to be open for trading.

The "Final Measurement Period" means the five Index Business Days from and including the Calculation Date, subject to adjustments and subject to postponement in the event of a Market Disruption Event as described under "Market Disruption Events."

The "Final VWAP Level" is the arithmetic mean of the VWAP Levels measured on each Index Business Day in the Final Measurement Period or during any applicable Repurchase Measurement Period, as applicable, as calculated by the VWAP Calculation Agent.

An "Index Business Day" means any day on which each Primary Exchange and each Related Exchange are scheduled to be open for trading.

An "Index Component" means each energy-oriented Master Limited Partnership included in the Index (collectively, the "Index Components").

The "Index Divisor," as of any date of determination, is the divisor used by the Index Calculation Agent to calculate the level of the Index.

The "Initial Issue Date," is April 6, 2009.

The "Initial VWAP Level" is 190.36605, which is the arithmetic mean of the VWAP Levels measured on each Index Business Day during the period from and including March 30, 2009 to and including April 1, 2009, as calculated by the VWAP Calculation Agent.

The "Maturity Date" is May 24, 2024, subject to postponement in the event of a Market Disruption Event as described under "Market Disruption Events."

A "Primary Exchange" means, with respect to each Index Component, the primary exchange or market of trading of such Index Component.

The "Quarterly Tracking Fee" means, as of any date of determination, an amount per Alerian ETN equal to the product of:

- 0.2125% (equivalent to 0.85% per annum) and
- the Daily Note Value as of the immediately preceding Index Business Day.

A "record date" means, with respect to a distribution on an Index Component, the date on which a holder of the Index Component must be registered as a unitholder of such Index Component in order to be entitled to receive such distribution.

A "Related Exchange" means, with respect to each Index Component, each exchange or quotation system where trading has a material effect (as determined by the Note Calculation Agent) on the overall market for futures or options contracts relating to such Index Component.

Additional Key Coupon Payment Terms

The "Coupon Ex-Date" means, with respect to a Coupon Amount, the first Exchange Business Day on which the Alerian ETNs trade without the right to receive such Coupon Amount. Under current NYSE Arca practice, the Coupon Ex-Date will generally be the Exchange Business Day immediately preceding the applicable Coupon Record Date.

The "Coupon Payment Date" means the 15th Index Business Day following each Coupon Valuation Date, *provided* that the final Coupon Payment Date will be the Maturity Date.

The "Coupon Record Date" means the 9th Index Business Day following each Coupon Valuation Date.

The "Coupon Valuation Date" means the 15th of February, May, August and November of each calendar year during the term of the Alerian ETNs or if such date is not an Index Business Day, then the first Index Business Day following such date, beginning on May 15, 2009, provided that the final Coupon Valuation Date will be the Calculation Date.

The "Reference Distribution Amount" means:

- as of the first Coupon Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component, for those cash distributions whose ex-dividend date occurs during the period from and excluding the Initial Issue Date to and including the first Coupon Valuation Date; and
- as of any other Coupon Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component for those cash distributions whose ex-dividend date occurs during the period from and excluding the immediately preceding Coupon Valuation Date to and including such Coupon Valuation Date.

Notwithstanding the foregoing, with respect to cash distributions for an Index Component which is scheduled to be paid prior to the applicable Coupon Ex-Date, *if*, *and only if*, the issuer of such Index Component fails to pay the distribution to holders of such Index Component by the scheduled payment date for such distribution, such distribution will be assumed to be zero for the purposes of calculating the applicable Reference Distribution Amount.

The "Reference Holder" means, as of any date of determination, a hypothetical holder of a number of shares of each Index Component equal to:

- the published share weighting of that Index Component as of that date, *divided* by
- the product of:
  - the Index Divisor as of that date, and
  - ten.

Additional Key Early Repurchase Terms

The "Adjusted Coupon Amount" means, with respect to any applicable Repurchase Valuation Date, a coupon payment, if any, in an amount in cash equal to the difference between:

- the Adjusted Reference Distribution Amount, calculated as of the applicable Repurchase Valuation Date; and
- the Adjusted Tracking Fee, calculated as of such Repurchase Valuation Date.

The "Adjusted Reference Distribution Amount" means, as of any applicable Repurchase Valuation Date, an amount equal to the gross cash distributions that a Reference Holder would have been entitled to receive in respect of the Index Components held by such Reference Holder on the record date with respect to any Index Component, for cash distributions with the applicable ex-dividend date occurring during the period from and excluding the immediately preceding Coupon Valuation Date (or if the Repurchase Valuation Date occurs prior to the first Coupon Valuation Date, the period from and excluding the Initial Issue Date) to and including the applicable Repurchase Valuation Date.

The "Adjusted Tracking Fee" means, as of any applicable Repurchase Valuation Date, an amount equal to:

- the Tracking Fee Shortfall as of the immediately preceding Coupon Valuation Date plus
- the product of:
  - the Quarterly Tracking Fee as of such Repurchase Valuation Date; and
  - a fraction, the numerator of which is the total number of calendar days from and excluding the immediately preceding Coupon Valuation Date (or if the Repurchase Valuation Date occurs prior to the first Coupon Valuation Date, the period from and excluding the Initial Issue Date) to and including such Repurchase Valuation Date, and the denominator of which is 90.

The "Repurchase Date" means the third Calculation Date following the last Index Business Day in any applicable Repurchase Measurement Period, subject to postponement in the event of a Market Disruption Event as described under "Market Disruption Events."

The “Repurchase Fee” is equal to 0.125%.

The “Repurchase Valuation Date” means the last Index Business Day of each week, generally Friday. This day is also the first Index Business Day following the date that the applicable Repurchase Notice and Repurchase Confirmation are delivered. Any applicable Repurchase Valuation Date is subject to adjustments as described under “Market Disruption Events.”

General Terms of the Series E Notes

In this “General Terms of the Series E Notes” section, all references to the “debt securities” refer to Series E Notes issued by JPMorgan Chase.

The following description of the terms of the debt securities contains certain general terms that may apply to the debt securities, including the Alerian ETNs.

We have summarized below the material provisions of the 2001 Indenture and the debt securities issued under the 2001 Indenture. These descriptions are only summaries, and each investor should refer to the 2001 Indenture, which describes completely the terms and definitions summarized below and contains additional information regarding the debt securities issued under it. Where appropriate, we use parentheses to refer you to the particular sections of the 2001 Indenture. Any reference to particular sections or defined terms of the 2001 Indenture in any statement under this heading qualifies the entire statement and incorporates by reference the applicable section or definition into that statement.

The debt securities will be our direct, unsecured general obligations and will have the same rank in liquidation as all of our other unsecured and unsubordinated debt.

We are a holding company and conduct substantially all of our operations through subsidiaries. As a result, claims of the holders of the debt securities will generally have a junior position to claims of creditors of our subsidiaries, except to the extent that JPMorgan Chase & Co. may be recognized, and receives payment, as a creditor of those subsidiaries. Claims of our subsidiaries' creditors other than JPMorgan Chase & Co. include substantial amounts of long-term debt, deposit liabilities, federal funds purchased, securities loaned or sold under repurchase agreements, commercial paper and other borrowed funds.

Events of Default and Waivers

An “Event of Default” with respect to a series of debt securities issued under the 2001 Indenture is defined in the 2001 Indenture as:

- default for 30 days in the payment of interest on any debt securities of that series;
- default in the payment of principal or other amounts payable on any debt securities of that series when due, at maturity, upon redemption, by declaration, or otherwise;
- failure by us for 90 days to perform any other covenants or warranties contained in the 2001 Indenture applicable to that series after written notice has been given by the trustee to us or given by holders of at least 25% in aggregate principal amount of the outstanding securities of all series affected thereby to us and the trustee;
- specified events of our bankruptcy, insolvency, winding up or liquidation, whether voluntary or involuntary; or
- any other event of default provided in the applicable supplemental indentures to the 2001 Indenture or form of security. (Section 5.01)

If a default in the payment of principal, interest or other amounts payable on the debt securities, or a failure in the performance of any covenant or agreement, or any other Event of Default provided in the applicable supplemental indentures to the 2001 Indenture or form of security, with respect to one or more (but in the case of a default in performance of a covenant or agreement, or in a manner provided in a supplemental indenture or form of security, less than all) series of debt securities occurs and is continuing, either the Trustee or the holders of not less than 25% in aggregate principal amount of the debt securities of such series then outstanding, treated as one class, by written notice, may declare the principal of all outstanding debt securities of such series and any interest accrued thereon, to be due and payable immediately. If a default in the performance of any covenant or agreement with respect to all series of debt securities, or in a manner provided in a supplemental indenture or form of security with respect to all series of debt securities, or due to specified events of our bankruptcy, insolvency, winding up or liquidation, occurs and is continuing, either the Trustee or the holders of not less than 25% in aggregate principal amount of all debt securities then outstanding, treated as one class, by written notice, may declare the principal of all outstanding debt securities and any interest accrued thereon, to be due and payable immediately. Subject to certain conditions such declarations may be annulled and past defaults may be waived by the holders of a majority in aggregate principal amount of the outstanding debt securities of the series affected. (Sections 5.01 and 5.10)

An Event of Default with respect to one series of debt securities does not necessarily constitute an Event of Default with respect to any other series of debt securities. The 2001 Indenture requires the Trustee to provide notice of default with respect to the debt securities within 90 days, unless the default is cured, but provides that the Trustee may withhold notice to the holders of the debt securities of any default if the board of directors, the executive committee, or a trust committee of directors or Trustees and/or responsible officers of the Trustee determines in good faith that it is in the interest of the holders of the debt securities of the applicable series to do so. The Trustee may not withhold notice of a default in the payment of principal of, interest on or any other amounts due under, such debt securities. (Section 5.11)

The 2001 Indenture provides that the holders of a majority in aggregate principal amount of outstanding debt securities of each series affected, with all such series voting as a single class, may direct the time, method, and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred on the Trustee. The Trustee may decline to act if the direction is contrary to law and in certain other circumstances set forth in the 2001 Indenture. (Section 5.09) The Trustee is not obligated to exercise any of its rights or powers under the 2001 Indenture at the request or direction of the holders of debt securities unless the holders offer the Trustee security or indemnity satisfactory to it against the costs, expenses and liabilities incurred therein or thereby. (Section 6.02(d))

No holder of any debt security of any affected series has the right to institute any action for remedy unless such holder has previously given to the Trustee written notice of default, the Trustee has failed to take action for 60 days after the holders of not less than 25% in aggregate principal amount of the debt securities of each affected series make written request upon the Trustee to institute such action and have offered reasonable indemnity in connection with the same and the holders of a majority in aggregate principal amount of the debt securities of each affected series (voting as a single class) have not given direction to the Trustee that is inconsistent with the written request referred to above. (Section 5.06)

However, the right of any holder of a debt security or coupon to receive payment of the principal of and interest on that debt security or coupon on or after its due date, or to institute suit for the enforcement of any such payment, may not be impaired or affected without the consent of that holder. (Section 5.07)

The 2001 Indenture requires us to file annually with the Trustee a written statement as to whether or not we have knowledge of a default. (Section 3.05)

Covenant Breach

Under the 2001 Indenture, a “Covenant Breach” would occur with respect to a series of debt securities if we fail to perform or breach any of the covenants contained in the 2001 Indenture (other than a failure to pay principal or interest on the debt securities) and that failure or breach continues for 90 days after the Trustee or the holders of at least 25% in aggregate principal amount of the outstanding debt securities give written notice of that failure or breach. Neither the Trustee nor the holders of the debt securities will be entitled to accelerate the maturity of the debt securities as a result of any Covenant Breach.

If a Covenant Breach or Event of Default with respect to the debt securities occurs and is continuing, the Trustee may in its discretion proceed to protect and enforce its rights and the rights of the holders of the debt securities by such appropriate judicial proceedings as the Trustee deems most effectual to protect and enforce any such rights, whether for the specific enforcement of any covenant or agreement in the 2001 Indenture or in aid of the exercise of any power granted in the 2001 Indenture, or to enforce any other proper remedy.

Modification of the 2001 Indenture

The 2001 Indenture contains provisions permitting us and the Trustee to modify the 2001 Indenture or the rights of the holders of debt securities with the consent of the holders of not less than a majority in aggregate principal amount of each outstanding series of debt securities affected by the modification. Each holder of an affected debt security must consent to a modification that would:

- extend the final maturity date of the principal of, or of any interest on, or other amounts payable under any debt security;
- reduce the principal amount of, rate of interest on, or any other amounts due under any debt security;
- change the currency or currency unit of payment of any debt security or certain provisions of the 2001 Indenture applicable to debt securities in foreign currencies;
- change the method in which amounts of payments of principal, interest or other amounts are determined on any debt security;
- reduce any amount payable upon redemption of any debt security;
- adversely affect the terms on which debt securities are convertible into or exchangeable or payable in other securities, instruments, contracts, currencies, commodities or other forms of property;
- impair the right of a holder to institute suit for the payment of a debt security or, if the debt securities provide, any right of repurchase at the option of the holder of a debt security; or
- reduce the percentage of debt securities of any series, the consent of the holders of which is required for any modification. (Section 8.02)

The 2001 Indenture also permits us and the Trustee to amend the 2001 Indenture in certain circumstances without the consent of the holders of debt securities to evidence our merger or the replacement of the Trustee, to cure any ambiguity or to correct or supplement any defective or inconsistent provision, to make any change to the 2001 Indenture or our debt securities that we deem necessary or desirable and that does not materially and adversely affect the interests of holders of the debt securities and for certain other purposes. (Section 8.01)

Consolidations, Mergers and Sales of Assets

We may not merge or consolidate with any other entity or sell, convey or transfer all or substantially all of our assets to any other entity (other than the sale, conveyance or transfer of all or substantially all of our assets to one or more of our direct or indirect subsidiaries), unless:

- either we are the continuing corporation or the successor entity or the entity to whom those assets are sold, conveyed or transferred is a United States corporation or limited liability company that expressly assumes the due and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities issued under the 2001 Indenture and the due and punctual performance and observance of all the covenants and conditions of the 2001 Indenture binding upon us, and
- we or the successor entity will not, immediately after the merger or consolidation, sale, conveyance or transfer, be in default in the performance of any covenant or condition of the 2001 Indenture binding on us. (Section 9.01)

There are no covenants or other provisions in the 2001 Indenture that would afford holders of debt securities additional protection in the event of a recapitalization transaction, a change of control of JPMorgan Chase & Co. or a highly leveraged transaction. The merger covenant described above would apply only if the recapitalization transaction, change of control or highly leveraged transaction were structured to include a merger or consolidation of JPMorgan Chase & Co. or a sale or conveyance of all or substantially all of our assets. However, we may provide specific protections, such as a put right or increased interest, for particular debt securities, which we would describe in the applicable prospectus supplement.

Concerning the Trustee, Paying Agent, Registrar and Transfer Agent

Our subsidiaries and we have a wide range of banking relationships with Deutsche Bank Trust Company Americas, The Bank of New York Mellon and The Bank of New York Mellon, London Branch. The Bank of New York Mellon and, for notes settled through Euroclear Bank SA/NV or Clearstream Banking, S.A., Luxembourg, The Bank of New York Mellon, London Branch, will be the paying agents, registrars, authenticating agents and transfer agents for debt securities issued under the 2001 Indenture.

Deutsche Bank Trust Company Americas is initially serving as the trustee for other securities issued by us or JPMorgan Financial, including the debt securities issued under the 2001 Indenture, the debt securities issued under JPMorgan Financial's indenture for debt securities, to which we are a guarantor, and the warrants issued under JPMorgan Financial's warrant indenture, to which we are a guarantor. Consequently, if an actual or potential event of default occurs with respect to any of these securities, the Trustee may be considered to have a conflicting interest for purposes of the Trust Indenture Act of 1939, as amended. In that case, the Trustee may be required to resign under the 2001 Indenture, and we would be required to appoint a successor trustee. For this purpose, a "potential" event of default means an event that would be an event of default if the requirements for giving us default notice or for the default having to exist for a specific period of time were disregarded.

Governing Law and Judgments

The debt securities and the 2001 Indenture will be governed by, and construed in accordance with, the laws of the State of New York. (Section 11.08)

DESCRIPTION OF JPMORGAN CHASE FINANCIAL COMPANY LLC'S CALLABLE STEP-UP FIXED RATE NOTES DUE APRIL 26, 2028, FULLY AND UNCONDITIONALLY GUARANTEED BY JPMORGAN CHASE & CO.

The following description of the Callable Step-Up Fixed Rate Notes due April 26, 2028 (the "Callable Notes") is a summary and does not purport to be complete. It is subject to and qualified in its entirety by reference to the indenture dated February 19, 2016 (as may be amended or supplemented from time to time, the "2016 Indenture"), among JPMorgan Chase Financial Company LLC, as issuer ("JPMorgan Financial" or the "Issuer"), JPMorgan Chase, as guarantor (the "Guarantor"), and Deutsche Bank Trust Company Americas, as trustee (the "Trustee"), which is incorporated by reference as an Exhibit to the Form 10-K. We encourage you to read the 2016 Indenture for additional information.

General

As of December 31, 2019, $5,000,000 aggregate principal amount of the Callable Notes were outstanding.

The Callable Notes are unsecured and unsubordinated obligations of JPMorgan Financial, the payment of which is fully and unconditionally guaranteed by JPMorgan Chase & Co. The Callable Notes will rank *pari passu* with all of the Issuer's other unsecured and unsubordinated obligations. JPMorgan Chase & Co.'s guarantee of the Callable Notes will rank *pari passu* with all of JPMorgan Chase & Co.'s other unsecured and unsubordinated obligations. **Any payment on the Callable Notes issued by JPMorgan Financial is subject to the credit risk of JPMorgan Finance Callable Notes, and the credit risk of JPMorgan Chase & Co., as guarantor of the Callable Notes.**

The Callable Notes are part of a series of the Issuer's debt securities entitled "Global Medium-Term Notes, Series A" (the "Series A Notes") that the Issuer may issue under the 2016 Indenture from time to time. For more information about the Series A Notes, please see the section titled "— General Terms of the Series A Notes" below.

The Callable Notes are not bank deposits and are not insured by the Federal Deposit Insurance Corporation or by any other governmental agency, nor are they obligations of, or guaranteed by, a bank.

Unless otherwise specified, references herein to "holders" mean those in whose names the Callable Notes are registered on the books that the Issuer or the Trustee, or any successor trustee, as applicable, maintain for this purpose, and not those who own beneficial interests in the Callable Notes (registered in street name or otherwise).

Key Terms of the Callable Notes

We issued the Callable Notes on April 26, 2016, in minimum denominations of $1,000 and in integral multiples of $1,000 thereafter. The Maturity Date of the Callable Notes is April 26, 2028. Interest on the Callable Notes is payable semiannually on April 26th and October 26th of each year, beginning on October 26, 2016 to and including the Maturity Date (each, an "Interest Payment Date"), subject to any earlier redemption, at the Interest Rate specified below:

For the applicable interest period, the "Interest Rate" will be equal to:

From (and including)	To (but excluding)	Interest Rate
April 26, 2016	April 26, 2021	3.00% per annum
April 26, 2021	April 26, 2023	3.25% per annum
April 26, 2023	April 26, 2025	3.50% per annum
April 26, 2025	April 26, 2027	4.00% per annum
April 26, 2027	April 26, 2028	5.00% per annum

The dates above refer to originally scheduled Interest Payment Dates.

On April 26th and October 26th of each year, beginning on April 26, 2021 and ending on the Maturity Date (each, a "Redemption Date"), the Issuer may redeem the holders' Callable Notes, in whole but not in part, at a price equal to the principal amount being redeemed *plus* any accrued and unpaid interest. Any accrued and unpaid interest on the Callable Notes redeemed will be paid to the person who is the holder of record on such Callable Notes at the close of business one (1) business day prior to the applicable Redemption Date. To redeem the Callable Notes, the Issuer will mail a notice of redemption to DTC, as holder of the Callable Notes, by first-class mail, postage prepaid, at least 5 business days and not more than 15 business days prior to the applicable Redemption Date.

Calculation Agent

JPMS (the "Calculation Agent") will make all necessary calculations and determinations in connection with the Callable Notes, including calculations and determinations relating to any payments on the Callable Notes.

Payment upon an Event of Default

In case an event of default with respect to the Callable Notes shall have occurred and be continuing, the amount declared due and payable per $1,000 principal amount note upon any acceleration of the Callable Notes will be determined by the Calculation Agent and will be an amount in cash equal to $1,000 per $1,000 principal amount note *plus* accrued and unpaid interest, calculated as if the date of acceleration were the Maturity Date. In such case, interest will be calculated on the basis of a 360-day year and the actual number of days in such adjusted Interest Period and will be based on the Interest Rate on the applicable date immediately preceding such adjusted Interest Period.

If the maturity of the Callable Notes is accelerated because of an event of default as described above, the Issuer will, or will cause the Calculation Agent to, provide written notice to the Trustee at its New York office, on which notice the Trustee may conclusively rely, and to DTC of the cash amount due with respect to the Callable Notes as promptly as possible and in no event later than two business days after the date of acceleration.

Listing

The Callable Notes are listed and admitted to trading on the NYSE under the trading symbol "JPM/28." No assurance can be given as to the continued listing for the term of the Callable Notes, or the liquidity or trading market for the Callable Notes.

Book-Entry Only Issuance — The Depository Trust Company

DTC will act as securities depositary for the Callable Notes. The Callable Notes have been issued only as fully registered securities registered in the name of Cede & Co. (DTC's nominee). One or more fully registered global note certificates, representing the total aggregate principal amount of the Callable Notes, have been issued and have been deposited with DTC. We will not issue definitive notes in exchange for the global notes except in limited circumstances.

Registrar, Transfer Agent and Paying Agent

The Bank of New York Mellon or one of its affiliates will act as registrar and transfer agent for the Callable Notes. The Bank of New York Mellon will also act as paying agent for the Callable Notes and may designate additional paying agents.

Reopening Issuances

The Issuer may, in its sole discretion, "reopen" the Callable Notes based upon market conditions at that time. These further issuances, if any, will be consolidated with, have the same CUSIP number as and trade interchangeably with the respective originally issued Callable Notes immediately upon settlement and, consequently, will increase the aggregate principal amount of such outstanding Callable Notes. The price of any additional offering will be determined at the time of pricing of that offering.

General Terms of the Series A Notes

In this "General Terms of the Series A Notes" section, all references to the "debt securities" refer to Series A Notes issued by JPMorgan Chase Financial Company LLC.

The following description of the terms of the debt securities contains certain general terms that may apply to the debt securities, including the Callable Notes.

We have summarized below the material provisions of the 2016 Indenture and the debt securities and guarantees issued under the 2016 Indenture.

These descriptions are only summaries, and each investor should refer to the 2016 Indenture, which describes completely the terms and definitions summarized below and contains additional information regarding the debt securities issued under it. Where appropriate, we use parentheses to refer you to the particular sections of the 2016 Indenture. Any reference to particular sections or defined terms of the 2016 Indenture in any statement under this heading qualifies the entire statement and incorporates by reference the applicable section or definition into that statement.

The debt securities will be the Issuer's direct, unsecured general obligations, the payment on which is fully and unconditionally guaranteed by the Guarantor, and will have the same rank in liquidation as all of the Issuer's other unsecured and unsubordinated debt.

The Guarantor is a holding company and conducts substantially all of its operations through subsidiaries. As a result, claims of the holders of the debt securities against the Guarantor under the guarantee will generally have a junior position to claims of creditors of the Guarantor's subsidiaries, except to the extent that the Guarantor may be recognized, and receives payment, as a creditor of those subsidiaries. Claims of the Guarantor's subsidiaries' creditors other than the Guarantor include substantial amounts of long-term debt, deposit liabilities, federal funds purchased, securities loaned or sold under repurchase agreements, commercial paper and other borrowed funds.

Events of Default and Waivers

An "Event of Default" with respect to a series of debt securities issued under the 2016 Indenture is defined in the 2016 Indenture as:

- default in the payment of interest on any debt securities of that series and continuance of such default for 30 days;
- default in the payment of principal or other amounts payable on any debt securities of that series when due, at maturity, upon redemption, by declaration, or otherwise;
- default in the performance, or breach, of any other covenants or warranties applicable to the Issuer contained in the 2016 Indenture applicable to that series, and continuation of such default or breach for 90 days after written notice has been given by the Trustee to the Issuer and the Guarantor or given by holders of at least 25% in aggregate principal amount of the outstanding securities of all series affected thereby to the Issuer, the Guarantor and the Trustee;
- certain events of the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation, whether voluntary or involuntary;
- the guarantee ceases to be in full force and effect, other than in accordance with the 2016 Indenture, or the Guarantor denies or disaffirms its obligations under the guarantee, *provided* that no Event of Default with respect to the guarantee will occur as a result of, or because it is related directly or indirectly to, the insolvency of the Guarantor or the commencement of proceedings under Title 11 of the United States Code, or the appointment of a receiver for the Guarantor under Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, or the Federal Deposit Insurance Corporation having

separately repudiated the Guarantee in receivership, or the commencement of or certain other events of the Guarantor's bankruptcy, insolvency, resolution, receivership, winding up or liquidation; or

- any other event of default provided in the applicable supplemental indentures to the 2016 Indenture or form of security. (Section 5.01)

If an Event of Default occurs and is continuing because of a default in the payment of principal, interest or other amounts payable on the debt securities, a failure in the performance, or breach, of any covenant or agreement applicable to the Issuer, the guarantee ceasing to be in full force and effect, or any other event of default provided in the applicable supplemental indentures to the 2016 Indenture or form of security, either the Trustee or the holders of not less than 25% in aggregate principal amount of the debt securities of such series then outstanding, treated as one class, by written notice to the Issuer and the Guarantor, may declare the principal of all outstanding debt securities of such series and any interest accrued thereon, to be due and payable immediately. If a default due to specified events of the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation, occurs and is continuing, the principal of all outstanding debt securities and any interest accrued thereon will automatically, and without any declaration or other action on the part of the Trustee or any holder, become immediately due and payable. Subject to certain conditions such declarations may be annulled and past defaults may be waived by the holders of a majority in aggregate principal amount of the outstanding debt securities of the series affected. (Sections 5.01 and 5.10)

Events of bankruptcy, insolvency, resolution, receivership, winding up or liquidation relating to the Guarantor will not constitute an Event of Default with respect to any series of debt securities. In addition, failure by the Guarantor to perform any of its covenants or warranties (other than a payment default) will not constitute an Event of Default with respect to any series of debt securities. Therefore, events of bankruptcy, resolution, receivership, insolvency, winding up or liquidation relating to the Guarantor (in the absence of any such event occurring with respect to the Issuer) will not permit any of the debt securities to be declared due and payable and the Trustee is not authorized to exercise any remedy against the Issuer or the Guarantor upon the occurrence or continuation of these events with respect to the Guarantor. Instead, even if an event of bankruptcy, insolvency, resolution, receivership, winding up or liquidation relating to the Guarantor has occurred, the Trustee and the holders of debt securities of a series will not be able to declare the relevant debt securities to be immediately due and payable unless there is an Event of Default with respect to that series as described above, such as the Issuer's bankruptcy, insolvency, receivership, winding up or liquidation or a payment default by the Issuer or the Guarantor on the relevant debt securities. **The value holders receive on any series of debt securities may be significantly less than what holders would have otherwise received had the Issuer's debt securities been declared due and payable immediately or the Trustee been authorized to exercise any remedy against the Issuer or the Guarantor upon the occurrence or continuation of these events with respect to the Guarantor.**

An Event of Default with respect to one series of debt securities does not necessarily constitute an Event of Default with respect to any other series of debt securities. The 2016 Indenture requires the Trustee to provide notice of default with respect to the debt securities within 90 days, unless the default is cured, but provides that the Trustee may withhold notice to the holders of the debt securities of any default if the board of directors, the executive committee, or a trust committee of directors or Trustees and/or responsible officers of the Trustee determines in good faith that it is in the interest of the holders of the debt securities of the applicable series to do so. The Trustee may not withhold notice of a default in the payment of principal of, interest on or any other amounts due under, such debt securities. (Section 5.11)

The 2016 Indenture provides that the holders of a majority in aggregate principal amount of outstanding debt securities of each series affected, with all such series voting as a single class, may direct the time, method, and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred on the Trustee. The Trustee may decline to act if the direction is contrary to law and in certain other circumstances set forth in the 2016 Indenture. (Section 5.09) The Trustee is not obligated to exercise any of its rights or powers under the 2016 Indenture at the request or direction of the holders of debt securities unless the holders offer the Trustee security or indemnity satisfactory to it against the costs, expenses and liabilities incurred therein or thereby. (Section 6.02(d))

No holder of any debt security of any affected series has the right to institute any action for remedy unless such holder has previously given to the Trustee written notice of default, the Trustee has failed to take action for 60 days after the holders of not less than 25% in aggregate principal amount of the debt securities of each affected series make written request upon the Trustee to institute such action and have offered reasonable indemnity in connection with the same and the holders of a majority in aggregate principal amount of the debt securities of each affected series (voting as a single class) have not given direction to the Trustee that is inconsistent with the written request referred to above. (Section 5.06)

However, the right of any holder of a debt security or coupon to receive payment of the principal of and interest on that debt security or coupon on or after its due date, or to institute suit for the enforcement of any such payment, may not be impaired or affected without the consent of that holder. (Section 5.07)

The 2016 Indenture requires the Issuer and the Guarantor to file annually with the Trustee a written statement as to whether or not the Issuer or the Guarantor, as the case may be, has knowledge of a default. (Section 3.05)

Modification of the 2016 Indenture

The 2016 Indenture contains provisions permitting the Issuer, the Guarantor and the Trustee to modify the 2016 Indenture or the rights of the holders of debt securities with the consent of the holders of not less than a majority in aggregate principal amount of each outstanding series of debt securities affected by the modification. Each holder of an affected debt security must consent to a modification that would:

- extend the final maturity date of the principal of, or of any interest on, or other amounts payable under any debt security;
- reduce the principal amount of, rate of interest on, or any other amounts due under any debt security;
- change the currency or currency unit of payment of any debt security or certain provisions of the 2016 Indenture applicable to debt securities in foreign currencies;
- change the method in which amounts of payments of principal, interest or other amounts are determined on any debt security;
- reduce any amount payable upon redemption of any debt security;
- impair the right of a holder to institute suit for the payment of a debt security or, if the debt securities provide, any right of repurchase at the option of the holder of a debt security;
- reduce the percentage of debt securities of any series, the consent of the holders of which is required for any modification; or
- make any change in the guarantee that would adversely affect the holders of the debt securities of such series or release the Guarantor from the guarantee other than pursuant to the terms of the 2016 Indenture. (Section 8.02)

The 2016 Indenture also permits the Issuer, the Guarantor and the Trustee to amend the 2016 Indenture in certain circumstances without the consent of the holders of debt securities to evidence the Issuer's or the Guarantor's merger or the replacement of the Trustee, to cure any ambiguity or to correct or supplement any defective or inconsistent provision, to make any change to the 2016 Indenture or the Issuer's debt securities that the Issuer deems necessary or desirable and that does not materially and adversely affect the interests of holders of the debt securities and for certain other purposes. (Section 8.01)

Consolidations, Mergers, Sales and Transfers of Assets

Neither the Issuer nor the Guarantor may merge or consolidate with any other entity or sell, convey or transfer all or substantially all of their respective assets to any other entity, unless:

- with respect to the Issuer:
  - either the Issuer is the continuing company in the case of a merger or consolidation or the successor entity in the case of a merger or consolidation (including an affiliate of the Guarantor) or the entity to whom those assets are sold, conveyed or transferred in the case of a sale, conveyance or transfer is a United States corporation or limited liability company that expressly assumes the due and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities and the due and punctual performance and observance of all the covenants and conditions of the 2016 Indenture binding upon the Issuer, and
  - no Event of Default and no event which, with notice or lapse of time or both, would become an Event of Default has occurred or would be continuing, immediately after the merger or consolidation, or the sale, conveyance or transfer, and

- with respect to the Guarantor:
  - either the Guarantor is the continuing corporation in the case of a merger or consolidation or the successor corporation in the case of a merger or consolidation or the entity to whom those assets are sold, conveyed or transferred in the case of a sale, conveyance or transfer is a United States corporation that expressly assumes the full and unconditional guarantee of the full and punctual payment of the principal of, any interest on, or any other amounts due under the debt securities and the due and punctual performance and observance of all the covenants and conditions of the 2016 Indenture binding upon the Guarantor, and
  - no Event of Default and no event which, with notice or lapse of time or both, would become an Event of Default has occurred or would be continuing, immediately after the merger or consolidation, or the sale, conveyance or transfer. (Sections 9.01 and 9.02)

Any transfer of material assets of the Guarantor to any other entity that occurs as a result of, or because it is related directly or indirectly to, any proceedings relative to the Guarantor under Title 11 of the United States Code or under a receivership under Title II of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 or under any other applicable federal or state bankruptcy, insolvency, resolution or other similar law will be deemed to be a sale, conveyance or transfer of all or substantially all of the Guarantor's assets.

There are no covenants or other provisions in the 2016 Indenture that would afford holders of debt securities additional protection in the event of a recapitalization transaction involving the Issuer or the Guarantor, a change of control of the Issuer or the Guarantor or a highly leveraged transaction involving the Issuer or the Guarantor. The merger covenant described above would apply only if the recapitalization transaction, change of control or highly leveraged transaction were structured to include a merger or consolidation of the Issuer or the Guarantor or a sale or conveyance of all or substantially all of the Issuer's or the Guarantor's assets. However, the

Issuer may provide specific protections, such as a put right or increased interest, for particular debt securities, which the Issuer would describe in the applicable prospectus supplement.

JPMorgan Chase Guarantee

The Guarantor will fully and unconditionally guarantee the full and punctual payment of the principal of, interest on, and all other amounts payable under the debt securities when the same becomes due and payable, whether at maturity, upon redemption, repurchase at the option of the holders of the applicable debt securities or upon acceleration. If for any reason the Issuer does not make any required payment in respect of the Issuer's debt securities when due, the Guarantor will on demand pay the unpaid amount at the same place and in the same manner that applies to payments made by the Issuer under the 2016 Indenture. The guarantee is of payment and not of collection. (Section 14.01)

The Guarantor's obligations under the guarantee are unconditional and absolute. However, (1) the Guarantor will not be liable for any amount of payment that the Issuer is excused from making or any amount in excess of the amount actually due and owing by the Issuer, and (2) any defense or counterclaims available to the Issuer (except those resulting solely from, or on account of, the Issuer's insolvency or the Issuer's status as debtor or subject of a bankruptcy or insolvency proceeding) will also be available to the Guarantor to the same extent as these defense or counterclaims are available to the Issuer, whether or not asserted by the Issuer. (Section 14.02)

Concerning the Trustee, Paying Agent, Registrar and Transfer Agent

We, the Guarantor and certain of their affiliates have a wide range of banking relationships with Deutsche Bank Trust Company Americas, The Bank of New York Mellon and The Bank of New York Mellon, London Branch. The Bank of New York Mellon and, for notes settled through Euroclear Bank SA/NV or Clearstream Banking, S.A., Luxembourg, The Bank of New York Mellon, London Branch, will be the paying agents, authenticating agents, registrars and transfer agents for debt securities issued under the 2016 Indenture.

Deutsche Bank Trust Company Americas is initially serving as the Trustee for the debt securities issued under our 2016 Indenture, to which JPMorgan Chase acts as a guarantor, the warrants issued under our warrant indenture, to which JPMorgan Chase acts as a guarantor, and the debt securities issued under JPMorgan Chase's indenture. Consequently, if an actual or potential event of default occurs with respect to any of these securities, the Trustee may be considered to have a conflicting interest for purposes of the Trust Indenture Act of 1939, as amended. In that case, the Trustee may be required to resign under the 2016 Indenture, and the Issuer would be required to appoint a successor trustee. For this purpose, a "potential" event of default means an event that would be an event of default if the requirements for giving the Issuer default notice or for the default having to exist for a specific period of time were disregarded.

Governing Law and Judgments

The debt securities and the 2016 Indenture, including the guarantee, will be governed by, and construed in accordance with, the laws of the State of New York. (Section 11.08)

Exhibit 10.17

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF JANUARY 19, 2021
RESTRICTED STOCK UNIT AWARD
OPERATING COMMITTEE

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of January 19, 2021 ("Grant Date") awarding Restricted Stock Units ("RSUs") pu[1]rsuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan ("Plan"). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in "Definitions" below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as "JPMorgan Chase" and together with its subsidiaries as the "Firm".

Form and Purpose of Award

Each RSU represents a non-transferable right to receive one share of Common Stock as of the applicable vesting date as set forth in your Award Agreement.

The purpose of this award is to motivate your future performance for services to be provided during the vesting period and to align your interests with those of the Firm and its shareholders.

Dividend Equivalents

If dividends are paid on Common Stock while RSUs under this award are outstanding, you will be paid an amount equal to the dividend paid on one share of Common Stock, multiplied by the number of RSUs outstanding under this award as of the dividend record date.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date(s), provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability". However, vesting and the number of RSUs in which you vest are subject to these terms and conditions (including, but not limited to, sections captioned "Recapture Provisions", "Remedies" and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you during the vesting period ("At Risk RSUs") may be cancelled if the Chief Executive Officer of JPMorgan Chase ("CEO") determines in his or her sole discretion that cancellation of all or portion of the At Risk RSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm's performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are net income, total net revenue, return on equity, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase's annual pre-tax pre-provision income at the Firm level is negative.
- Awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

In the event that your employment terminates due to "Job Elimination", "Full Career Eligibility", Government Office" or "Disability" thereby entitling you to continued vesting in your award (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply to your At Risk RSUs pursuant to the subsection captioned "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity".

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase ("Committee"). In the case of an award to the CEO, all such determinations shall be made by the Committee and ratified by the Board.

Vesting Period

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The period from the Grant Date to the last vesting date is the "vesting period" (see subsections captioned "--Amendment" pursuant to which the Firm may extend the vesting period and "--No Ownership Rights/Other Limitations" pursuant to which the Firm may place restrictions on delivered shares of Common Stock following a vesting date).

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2020 and to this award. You can access this policy as currently in effect through the following link:

https://about.jpmorganchase.com/about/governance/corporate-governance-principles

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your outstanding RSUs under this award and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed (including shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", any RSUs outstanding under this award will be cancelled effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions", "Your Obligations" and "Remedies"), you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

• Job Elimination

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and
- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

• Full Career Eligibility

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- the sum of your age and Recognized Service (as defined below) on your date of termination equaled or exceeded 60 and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award you do not either perform services in any capacity (including self-employment) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and

- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the age and service requirements.

Additional advance notice requirements may apply for employees subject to notice period policies (see "Notice Period" below).

- ### Government Office

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

- ### Disability

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to "Full Career Eligibility", prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for "Full Career Eligibility", and receive written consent to such continued vesting,
- with respect to "Disability", you must satisfy the notice and documentation described above and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding, on the authorized form of the Firm, that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date, and
- in all cases, complied with all other terms of the Award Agreement. (See section captioned "Your Obligations".)

Death

If you die while you are eligible to vest in RSUs under this award, the RSUs will immediately vest and will be distributed in shares of Common Stock (after applicable tax withholding) to your designated beneficiary on file with the Firm's Stock Administration Department, or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation, then to your estate. Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement" and "--Notice Period."

- ### Non-Solicitation of Employees and Customers

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination, (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

- ### Confidential Information

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- ### Non-Disparagement

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- ### Cooperation

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- ### Compliance with Award Agreement

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- ### Notice Period

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "--Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- ### Cancellation

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions" and "Termination of Employment", your outstanding RSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. JPMorgan Chase is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also subsection captioned "--No Ownership Rights/Other Limitations".

• Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
  - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment, or
  - you violated any of the provisions as set forth above in the section captioned "Your Obligations", or
  - you violated the employment restrictions set forth in the subsection "--Full Career Eligibility" or "--Government Office" following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned "Recapture Provisions".

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm's employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase's rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm's intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under "Bonus Recoupment".

• Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares, dividend equivalents and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award, shares that vest under this award, and/or dividend equivalents, and (iii) retaining shares that vest under this award or dividend equivalents until you pay any taxes associated with the award, vested shares and/or the dividend equivalents directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in "No Ownership Rights/Other Limitations" described below.

No Ownership Rights/Other Limitations: RSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the RSUs have vested. Shares will be issued in accordance with JPMorgan Chase's procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding RSUs has been suspended, then you agree that such RSUs may be cancelled in whole or part. (See Sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions", "Termination of Employment" and "Remedies", as well as the subsection captioned "--Amendment" permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the "Right to Set Off" subsection above). (See Sections captioned "Bonus Recoupment" and "Remedies".)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is "at-will" and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares and cash hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered to you during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following (i) each applicable vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award and (ii) each date that JPMorgan Chase specifies for payment of dividends declared on its Common Stock, shall be the payment date(s) for purposes of distributing dividend equivalent payments.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any RSUs outstanding under this award for such corporate events.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under "No Ownership Rights/Other Limitations", in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase RSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the "Recovery" section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned "Government Office Requirements", acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled "--Job Elimination" or "--Full Career Eligibility", then acceleration shall apply, to the extent required, to the full outstanding award.

Notwithstanding accelerated distribution pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of each applicable vesting date, including, but not limited to, repayment obligations set forth in the section captioned "Remedies" and the employment restrictions in the sections captioned "Protection-Based Vesting" and "Government Office Requirements" and the subsection "--Full Career Eligibility".

Use of Personal Data: By accepting this award, you have acknowledged that the Firm may process your personal data (including sensitive personal data) for purposes, including but not limited to (i) determining your compensation, (ii) payroll activities, including, but not limited to, tax withholding and regulatory reporting, which tax and regulatory reporting and withholding may include, but is not limited to, the United States, your work country (including countries to which you travel on Firm business) and country of residence, (iii) registration of shares and units, (iv) establishing a brokerage account on your behalf, and (v) all other lawful purposes related to your employment and this award and that the Firm may provide such data to third party vendors with whom it has contracted to provide such services and/or other bodies, including regulators, supervisory bodies, law enforcement and other government agencies. You are acknowledging and agreeing that your personal data will be transferred to, and processed in, countries and locations that do not have the same data privacy laws and statutory protection for personal data as your work country, country of residence, or country of nationality. If your personal data is subject to data privacy laws or statutory protection for personal data and they so provide for termination of the foregoing authorization, you may terminate the authorization at any time except with respect to tax and regulatory reporting and subject always to the Firm's legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of RSUs, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Outstanding Awards: The Administrative provisions set forth above shall apply to any award of RSUs outstanding as of the date hereof, and such awards are hereby amended.

Definitions

"**Cause**" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"**Financial Services Company**" means a business enterprise that employs you in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) and engages in:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- advising on, or investing in, private equity or real estate, or

- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

"Firmwide Financial Threshold" means a cumulative return on tangible common equity for calendar years 2021, 2022 and 2023 of not less than 15%. Cumulative return on tangible common equity means (i) the sum of the Firm's reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

"Government Office" means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

"Line of Business" means a business unit of the Firm (or one or more business units designated below under the definition "Line of Business Financial Threshold" of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

"Line of Business Financial Threshold" means the financial threshold set forth below for the following Lines of Business based on the Firm's management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income[1]
Consumer Lending	Annual negative pre-tax pre-loan loss reserve income[2]
Commercial Banking	Annual negative pre-tax, pre-loan loss reserve income[2]
Corporate Investment Bank	Annual negative pre-tax pre-provision income[1] for CIB overall or annual negative allocated product revenues (excluding CVA and DVA) for: ◦ • Fixed Income • Equities • Securities Services • Global Investment Banking • Wholesale Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income[2]
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income[1] at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve incom[e]
[1]Pre-tax pre-provision income means Revenue less Expenses [2]Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

"Not-for-Profit Organization" means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals.

"Recognized Service" means the period of service as an employee set forth in the Firm's applicable service-related policies.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:
"Government Office Requirements" does not apply to you if you satisfy the subsection captioned "--Full Career Eligibility" as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:
Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days' advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned "Definitions"), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm's sole discretion.
- Confirmation, in a form of satisfactory to the firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See Section captioned "Definitions".)

Portion of Your Awards Subject to Continued Vesting:
Subject to the conditions below, the percentage of your outstanding awards that will continue to vest in accordance with this award's original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of each award subject to continued vesting above is referred to as the "CV Award" and the portion not subject to continued vesting will be cancelled on the date your employment terminates.

Conditions for Continued Vesting of Awards:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to receive in full your CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be entitled to retain any portion of the CV Award with a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

Satisfaction of Conditions:
If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity") will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:
If you do not satisfy the above "Conditions for Continued Vesting of Awards", any outstanding RSUs under each CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as RSUs on the date you failed to satisfy the "Condition for Continued Vesting of Awards" but for their accelerated distribution (as described in the subsection captioned "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity"). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF JANUARY 19, 2021
RESTRICTED STOCK UNIT AWARD
OPERATING COMMITTEE

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of January 19, 2021 (“Grant Date”) awarding Restricted Stock Units (“RSUs”) pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan (“Plan”). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in “Definitions” below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as “JPMorgan Chase” and together with its subsidiaries as the “Firm”.

Form and Purpose of Award

Each RSU represents a non-transferable right to receive one share of Common Stock as of the applicable vesting date as set forth in your Award Agreement.

The purpose of this award is to motivate your future performance for services to be provided during the vesting period and to align your interests with those of the Firm and its shareholders.

Dividend Equivalents

This award is not eligible for dividend equivalent payments.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date(s), provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections “--Job Elimination”, “--Full Career Eligibility”, “--Government Office” or “--Disability”. However, vesting and the number of RSUs in which you vest are subject to these terms and conditions (including, but not limited to, sections captioned “Recapture Provisions”, “Remedies” and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you during the vesting period (“At Risk RSUs”) may be cancelled if the Chief Executive Officer of JPMorgan Chase (“CEO”) determines in his or her sole discretion that cancellation of all or portion of the At Risk RSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm’s performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are net income, total net revenue, return on equity, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase’s annual pre-tax pre-provision income at the Firm level is negative.
- Awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

In the event that your employment terminates due to “Job Elimination”, ”Full Career Eligibility”, Government Office” or “Disability” thereby entitling you to continued vesting in your award (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply to your At Risk RSUs pursuant to the subsection captioned “Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity”.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase (“Committee”). In the case of an award to the CEO, all such determinations shall be made by the Committee and ratified by the Board.

Vesting Period

The period from the Grant Date to the last vesting date is the "vesting period" (see subsections captioned "--Amendment" pursuant to which the Firm may extend the vesting period and "--No Ownership Rights/Other Limitations" pursuant to which the Firm may place restrictions on delivered shares of Common Stock following a vesting date).

Holding Requirement

As of each vesting date, you shall be entitled to a distribution equal to the Fair Market Value of the number of RSUs vesting on such date, less the number being withheld to satisfy tax withholding obligations. You agree that the distribution made to you will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such distribution for a twelve month period commencing with the vesting date. Such restrictions shall lapse in event of your death.

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2019 and to this award. You can access this policy as currently in effect through the following link:

https://about.jpmorganchase.com/about/governance/corporate-governance-principles

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

EMEA Malus and Clawback Policy - Identified Staff

In consideration of grant of this award, and without prejudice to any other provision of this Award Agreement, you agree that you are subject to the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff (and any applicable supplement(s) to that policy) or successor policy as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 2018 and to this award. You can access this policy as currently in effect in My Rewards through the following link: https://myrewards.jpmorganchase.com

See section captioned "Administrative Provisions" for additional information.

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your outstanding RSUs under this award and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed (including shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", any RSUs outstanding under this award will be cancelled effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions", "Your Obligations" and "Remedies"), you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

- ## Job Elimination

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- the Firm terminated your employment because your job was eliminated, and
- after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
- you satisfied the Release/Certification Requirements set forth below.

- ## Full Career Eligibility

In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

- you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
- your Recognized Service (as defined below) on your date of termination equaled or exceeded 15 years, or your combined Recognized Service with the Firm and external professional experience (as attested by you to the Firm) equaled or exceeded 30 years, and
- you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
- continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
- for 36 months from the date of grant of this award you do not either perform services in any capacity (including self-employment) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
- you satisfied the Release/Certification Requirements set forth below.

After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the service requirement.

Additional advance notice requirements may apply for employees subject to notice period policies (see "Notice Period" below).

- ## Government Office

In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

- ## Disability

In the event that

- your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
- you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to "Full Career Eligibility", prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for "Full Career Eligibility", and receive written consent to such continued vesting,

- with respect to "Disability", you must satisfy the notice and documentation described above and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding, on the authorized form of the Firm, that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date, and
- in all cases, complied with all other terms of the Award Agreement. (See section captioned "Your Obligations".)

Death

If you die while you are eligible to vest in RSUs under this award, the RSUs will immediately vest and will be distributed in shares of Common Stock (after applicable tax withholding) to your designated beneficiary on file with the Firm's Stock Administration Department, or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation, then to your estate. Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement" and "--Notice Period."

• Non-Solicitation of Employees and Customers

During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination, (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

• Confidential Information

You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

• Non-Disparagement

You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- ## Cooperation

You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- ## Compliance with Award Agreement

You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- ## Notice Period

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "--Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- ## Cancellation

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions" and "Termination of Employment", your outstanding RSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. JPMorgan Chase is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also subsection captioned "--No Ownership Rights/Other Limitations".

- ## Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares of Common Stock previously distributed under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
    - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment, or
    - you violated any of the provisions as set forth above in the section captioned "Your Obligations", or
    - you violated the employment restrictions set forth in the subsection "--Full Career Eligibility" or "--Government Office" following the termination of your employment.

- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned "Recapture Provisions".

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm's employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase's rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm's intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under "Bonus Recoupment" and "EMEA Malus and Clawback Policy - Identified Staff".

- ## Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

EMEA Malus and Clawback Policy: The provisions of the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff set out the terms and conditions applying to the grant of this award which ensure that the Firm is able to meet its regulatory obligations to operate malus (reduce) and/or clawback (recover) to awards in certain circumstances. These include, but are not limited to, where (i) there is a material downturn in the Firm's financial performance or (ii) where the Firm is required to hold more capital. The circumstances in which the events at (i) and (ii) would occur are analogous to some of the circumstances considered under the existing Firmwide terms and conditions, in particular the Bonus Recoupment Policy and the Protection Based Vesting provisions.

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and/or vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in "No Ownership Rights/Other Limitations" described below.

No Ownership Rights/Other Limitations: RSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the RSUs have vested. Shares will be issued in accordance with JPMorgan Chase's procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding RSUs has been suspended, then you agree that such RSUs may be cancelled in whole or part. (See Sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions", "Termination of Employment" and "Remedies", as well as the subsection captioned "--Amendment" permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the "Right to Set Off" subsection above). (See Sections captioned "Bonus Recoupment" and "Remedies".)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is "at-will" and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered to you during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following each applicable vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any RSUs outstanding under this award for such corporate events.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under "No Ownership Rights/Other Limitations", in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase RSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the "Recovery" section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned "Government Office Requirements", acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled "--Job Elimination" or "--Full Career Eligibility", then acceleration shall apply, to the extent required, to the full outstanding award.

Notwithstanding accelerated distribution pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of each applicable vesting date, including, but not limited to, repayment obligations set forth in the section captioned "Remedies" and the employment restrictions in the sections captioned "Protection-Based Vesting" and "Government Office Requirements" and the subsection "--Full Career Eligibility".

Use of Personal Data: By accepting this award, you have acknowledged that the Firm may process your personal data (including sensitive personal data) for purposes, including but not limited to (i) determining your compensation, (ii) payroll activities, including, but not limited to, tax withholding and regulatory reporting, which tax and regulatory reporting and withholding may include, but is not limited to, the United States, your work country (including countries to which you travel on Firm business) and country of residence, (iii) registration of shares and units, (iv) establishing a brokerage account on your behalf, and (v) all other lawful purposes related to your employment and this award and that the Firm may provide such data to third party vendors with whom it has contracted to provide such services and/or other bodies, including regulators, supervisory bodies, law enforcement and other government agencies. You are acknowledging and agreeing that your personal data will be transferred to, and processed in, countries and locations that do not have the same data privacy laws and statutory protection for personal data as your work country, country of residence, or country of nationality. If your personal data is subject to data privacy laws or statutory protection for personal data and they so provide for termination of the foregoing authorization, you may terminate the authorization at any time except with respect to tax and regulatory reporting and subject always to the Firm's legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of RSUs, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Outstanding Awards**: The Administrative provisions set forth above shall apply to any award of RSUs outstanding as of the date hereof, and such awards are hereby amended.**

Definitions

"**Cause**" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"**Financial Services Company**" means a business enterprise that employs you in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) and engages in:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- advising on, or investing in, private equity or real estate, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

"Firmwide Financial Threshold" means a cumulative return on tangible common equity for calendar years 2020, 2021 and 2022 of not less than 15%. Cumulative return on tangible common equity means (i) the sum of the Firm's reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

"Government Office" means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

"Line of Business" means a business unit of the Firm (or one or more business units designated below under the definition "Line of Business Financial Threshold" of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

"Line of Business Financial Threshold" means the financial threshold set forth below for the following Lines of Business based on the Firm's management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income[1]
Consumer Lending	Annual negative pre-tax pre-loan loss reserve income[2]
Commercial Banking	Annual negative pre-tax, pre-loan loss reserve income[2]
Corporate Investment Bank	Annual negative pre-tax pre-provision income[1] for CIB overall or annual negative allocated product revenues (excluding CVA and DVA) for: • Fixed Income • Equities • Securities Services • Global Investment Banking • Wholesale Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income[2]
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income[1] at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income[2]
[1]Pre-tax pre-provision income means Revenue less Expenses [2]Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

"Not-for-Profit Organization" means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals.

"Recognized Service" means the period of service as an employee set forth in the Firm's applicable service-related policies.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

"Government Office Requirements" does not apply to you if you satisfy the subsection captioned "--Full Career Eligibility" as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days' advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned "Definitions"), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm's sole discretion.
- Confirmation, in a form of satisfactory to the firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See Section captioned "Definitions".)

Portion of Your Awards Subject to Continued Vesting:

Subject to the conditions below, the percentage of your outstanding awards that will continue to vest in accordance with this award's original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of each award subject to continued vesting above is referred to as the "CV Award" and the portion not subject to continued vesting will be cancelled on the date your employment terminates.

Conditions for Continued Vesting of Awards:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to receive in full your CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be entitled to retain any portion of the CV Award with a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity") will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above "Conditions for Continued Vesting of Awards", any outstanding RSUs under each CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as RSUs on the date you failed to satisfy the "Condition for Continued Vesting of Awards" but for their accelerated distribution (as described in the subsection captioned "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity"). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF _________, 20__
PERFORMANCE SHARE UNIT AWARD
OPERATING COMMITTEE
(Protection-Based Vesting Provisions)

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of _________, 20__ ("Grant Date") awarding performance share units ("PSUs") pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan ("Plan"). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement and Plan. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in "Definitions" below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as "JPMorgan Chase", and together with its subsidiaries as the "Firm".

Form and Purpose of Award

Each PSU represents a non-transferable right to receive one share of Common Stock as of the vesting date as set forth in your Award Agreement.

The purpose of this award is to further emphasize sustained long-term performance and to align your interests with those of the Firm and its shareholders.

Protection-Based Vesting

This award is intended and expected to vest on the vesting date, provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability". However, vesting and the number of PSUs that will vest are subject to these terms and conditions (including, but not limited to, sections captioned "Number to Vest on Vesting Date", "Capital Ratio Performance Threshold", "Recapture Provisions", "Remedies" and the following protection-based vesting provision).

Up to a total of fifty percent of your award (including any associated Reinvested Dividend Equivalent Share Units) that would otherwise be distributable to you on the vesting date ("At Risk PSUs") may be cancelled if the Chief Executive Officer of JPMorgan Chase ("CEO") determines in his or her sole discretion that cancellation of all or portion of the At Risk PSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm's performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are: net income, total net revenue, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase's annual pre-tax pre-provision income at the Firm level is negative.
- RSU awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

For avoidance of doubt, cancellation of the At Risk PSUs, in whole or part, for one or more of the above factors may occur prior to the end of the Performance Period and the maximum number of At Risk PSUs subject to cancellation prior to the end of the Performance Period will be up to fifty percent of the Target Award Number.

In the event that your employment terminates due to "Job Elimination", "Full Career Eligibility", "Government Office" or "Disability" thereby entitling you to continued vesting in your award, (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase ("Committee"). In the case of an award to any current or former CEO, all such determinations shall be made by the Committee and ratified by the Board.

Number to Vest on the Vesting Date

Subject to any cancellation in whole or part of your award pursuant to these terms and conditions:

Performance calculation: On the vesting date, you will vest in a number of PSUs derived by multiplying the Target Award Number by the Award Payout Percentage determined using the Performance Table. See sections captioned "Calculation of Performance Ranking" and "Definitions".

You will also vest in additional shares of Common Stock as calculated under the section captioned, "Reinvested Dividend Equivalent Share Units". Delivery of vested shares to your account will be made not later than the date specified in the last sentence of the subsection captioned "Section 409A Compliance".

Reinvested Dividend Equivalent Share Units

If dividends are paid on Common Stock during the Vesting Period while the award is outstanding, you will receive on the vesting date additional units representing shares of Common Stock as calculated in this section. The number, if any, will be based on the dividends that would have been paid during the Vesting Period as of each dividend payment date on the actual number of shares of Common Stock distributable to you resulting from the vesting of the PSUs, if any, and treated as reinvested in additional shares of Common Stock on each dividend payment based on the Fair Market Value of one share of Common Stock on each dividend payment date ("Reinvested Dividend Equivalent Share Units").

Holding Requirement

As of the vesting date set forth in your Award Agreement, you shall be entitled to be issued a number of shares of the Common Stock of JPMorgan Chase equal to the number of PSUs, if any, plus any additional Reinvested Dividend Equivalent Share Units, vesting on such date, less the number withheld to satisfy tax withholding obligations. The net number of shares issued to you will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such shares for a two year period commencing as of the vesting date and ending as of the second anniversary of the vesting date. Such restrictions shall only lapse, prior to the expiration of the two year holding period, in the event of your death or for an accelerated distribution for ethics or conflict reasons. See section captioned, "Death" and subsection captioned, "Accelerated Distribution for Ethics or Conflict Reasons Resulting from Employment by a Government Entity".

Calculation of Performance Ranking

For purposes of the Performance Ranking, the ranking of the Firm and of each Performance Company for the Performance Period shall be determined and calculated by the Calculation Agent, using the definitions of "Average Tangible Common Equity" (if otherwise applicable), "Calculated PSUs", "Firm Reported ROTCE", "Performance Table" (including its footnote) and "ROTCE" as set forth in the "Definitions" section of these terms and conditions. See section captioned "Definitions". Except for Firm Reported ROTCE, calculations will be expressed as a decimal to the second place (i.e. xx.yy%), rounded to the nearest hundredth. See section captioned, "Definitions--Performance Table" in the event of a tie. All performance based calculations as set forth herein are binding and conclusive on you and your successors.

Capital Ratio Performance Threshold

Unvested PSUs are subject to reduction if the Firm's Common Equity Tier 1 (CET1) capital ratio at any year end falls below a predetermined threshold of ____%.

If the Firm's CET1 capital ratio at any year end during the Performance Period is below this predetermined threshold, up to one-third of the Target Award Number of PSUs will be subject to downward adjustment by the CMDC for each such year.

Vesting Period

The period from the Grant Date to the vesting date is the "Vesting Period". (See "Administrative Provision--Amendment" pursuant to which the Firm may extend the vesting period and "No Ownership Rights/Other Limitations" pursuant to which the Firm may place restrictions on delivered shares of Common Stock following the vesting date and section captioned, "Holding Period" above.)

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 20___ and to this award. You can access this policy as currently in effect through the following link:

https://about.jpmorganchase.com/about/governance/corporate-governance-principles

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your award (for the avoidance of doubt, including any associated Reinvested Dividend Equivalent Share Units as well as the Calculated PSUs) and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of the vesting date) of the gross number of shares of Common Stock previously distributed (including vested shares subject to the Holding Requirements and shares withheld for tax purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", this award (for avoidance of doubt, including any associated Reinvested Dividend Equivalent Share Units) will be cancelled in full effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Number to Vest on Vesting Date", "Bonus Recoupment", "Recapture Provisions", "Your Obligations" and "Remedies") you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

- ### Job Elimination

  In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

  - the Firm terminated your employment because your job was eliminated, and
  - after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
  - you satisfied the Release/Certification Requirements set forth below.

- ### Full Career Eligibility

  In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

  - you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
  - the sum of your age and Recognized Service (as defined below) on your date of termination equaled or exceeded 60, and
  - you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
  - continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
  - for 36 months from the date of grant of this award, you do not either perform services in any capacity (including self-employment) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
  - you satisfied the Release/Certification Requirements set forth below.

  After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the age and service requirements.

  Additional advance notice requirements may apply for employees subject to notice period policies. (See "Notice Period" below.)

- ## Government Office

  In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

- ## Disability

  In the event that

  - your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase-sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
  - you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to Full Career Eligibility, prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for Full Career Eligibility, and receive written consent to such continued vesting,
- with respect to Disability, you must satisfy the notice and documentation described above and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to the vesting date while the employment restrictions are outstanding on the authorized form of the Firm that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date, and
- in all cases, otherwise complied with all other terms of the Award Agreement. (See section captioned "Your Obligations" below.)

Death

If you die while you are eligible to vest in this award, your designated beneficiary on file with the Firm's Stock Administration Department (or your estate or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation) may be entitled to receive a distribution of a number of shares of Common Stock associated with your award. The Award Payout Percentage in the case of death is based on the Number to Vest on the Vesting Date calculation described above using the average performance of all completed calendar years, multiplied by one-third of the Target Award Number of PSUs for each completed calendar year in the Performance Period, and using the Award Payout Percentage equal to 100 percent for any remaining calendar years in the Performance Period.

In addition, your beneficiary or your estate shall receive additional shares of Common Stock, i.e. Reinvested Dividend Equivalent Share Units, as set forth in the section captioned, "Reinvested Dividend Equivalent Share Units" but based on dividend equivalents up to the date of your death.

Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement", and "--Notice Period".

- ## Non-Solicitation of Employees and Customers

  During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

- **Confidential Information**

  You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

  Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- **Non-Disparagement**

  You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- **Cooperation**

  You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- **Compliance with Award Agreement**

  You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- **Notice Period**

  If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

  After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

  Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "-- Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- **Cancellation**

  In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions" and "Termination of Employment", your outstanding PSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. The Firm is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also "Administrative Provisions-No Ownership Rights/Other Limitations".

- ## Recovery

In addition, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date or acceleration date) of the gross number of shares of Common Stock previously distributed, including vested shares subject to the Holding Requirements, under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
  - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment;
  - you violated any of the provisions as set forth above in the section captioned "Your Obligations;" or
  - you violated the employment restrictions set forth in the subsection "Full Career Eligibility" or "Government Office" following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned "Recapture Provisions".

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm's employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase's rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm's intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under "Bonus Recoupment".

- ## Right to an Injunction

You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt or obligation owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in "No Ownership Rights/Other Limitations" described below.

No Ownership Rights/Other Limitations: PSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the number of PSUs have been determined, if any, and have vested. Shares will be issued in accordance with JPMorgan Chase's procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding PSUs has been suspended, then you agree that such PSUs may be cancelled in whole or part. (See Sections captioned "Protection-Based Vesting", "Bonus Recoupment", "Recapture Provisions", "Termination of Employment" and "Remedies", as well as the subsection captioned "--Amendment" permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the "Right to Set Off" subsection above). (See sections captioned "Bonus Recoupment" and "Remedies".)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is "at-will" and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following the vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any PSUs outstanding under this award for such corporate events.

Other Equitable Adjustments: The Committee may make adjustments (up or down) to the award as it deems to be equitable, to maintain the intended economics of the award in light of changed circumstances, which may include unusual or non-recurring events affecting the Firm (or the Performance Companies) or its financial statements in each case resulting from changes in accounting methods, practices or policies, changes in capital structure by reason of legal or regulatory requirements and such other changed circumstances, as the Committee may deem appropriate.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under "No Ownership Rights/Other Limitations", in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase PSUs, the Firm may accelerate the distribution of all or part of your outstanding award, including Reinvested Dividend Equivalent Share Units, effective on or before the required divestiture date and waive the Holding Requirement; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the "Recovery" section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned "Government Office Requirements", acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled "Job Elimination" or "Full Career Eligibility", then acceleration shall apply, to the extent required, to the full outstanding award. Subject to the two foregoing sections, the number of shares of Common Stock to be received on acceleration shall be determined using the methodology set forth under the section captioned "Death".

To the extent you have vested shares under this award subject to the Holding Requirement and become subject to divestiture requirement as forth herein, the Firm may waive the holding period to the extent required.

Notwithstanding an accelerated distribution or waiver of the Holding Requirement pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the original vesting period and shares had been distributed as scheduled as of the vesting date, including, but not limited to, repayment obligations set forth in the section captioned "Remedies" and the employment restrictions in the sections captioned "Protection-Based Vesting" and "Government Office Requirements" and the subsection "Full Career Eligibility".

Use of Personal Data: By accepting this award, you have acknowledged that the Firm may process your personal data (including sensitive personal data) for purposes, including but not limited to (i) determining your compensation, (ii) payroll activities, including, but not limited to, tax withholding and regulatory reporting, which tax and regulatory reporting and withholding may include, but is not limited to, the United States and its political subdivisions, (if not the United States) your work country and its political subdivisions (including countries to which you travel on Firm business) and your country of residence or nationality,(iii) registration of shares, (iv) establishing a brokerage account on your behalf, and (v) all other lawful purposes related to your employment and this award, and that the Firm may provide such data to third party vendors with whom it has contracted to provide such services and/or other bodies, including regulators, supervisory bodies, law enforcement and other government agencies. You are acknowledging and agreeing that your personal data will be transferred to and processed in countries and locations that do not have the same data privacy laws and statutory protection for personal data as your work country, country of residence, or country of nationality. If your personal data is subject to data privacy laws or statutory protection for personal data and they so provide for termination of the foregoing authorization, you may terminate the authorization at any time except with respect to tax and regulatory reporting and subject always to the Firm's legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of restricted stock units or of performance based share units, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Definitions

"Average Tangible Common Equity" means annual average common stockholders' equity less annual average goodwill and annual average identifiable intangible assets. Annual averages of the components of Average Tangible Common Equity will be calculated using quarterly balances as reported in publically available financial disclosures. In the event that quarterly balances are not available, annual year end balances will be used. **This calculation is used solely for purposes of the Performance Ranking.**

"Award Payout Percentage" means the applicable percentage specified in the footnote to the Performance Table.

"Calculated PSUs" means the number of PSUs determined by multiplying the Target Award Number (after giving effect to any cancellation thereof, in whole or in part) by the Award Payout Percentage corresponding to the Firm's Performance Ranking based on the three-year average performance for the Performance Period (both percentage and ranking, as set forth in the footnote to the Performance Table); provided that if the average of the Firm's Reported ROTCE for the Performance Period either equals or exceeds ___% or is less than ___% (without taking into account any rounding conventions used), _____ percent or _____, respectively as the case may be, shall be substituted for the Performance Period's Award Payout Percentage in calculating the number of PSUs to distribute. For avoidance of doubt, any cancellation of this award (in whole or in part) during the Performance Period will reduce the Target Award Number.

"Calculation Agent" means a third party entity not owned or controlled by the Firm, such as an accounting or consulting firm, retained from time to time by the Director of Human Resources or his/her delegate.

"Cause" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"Financial Services Company" means a business enterprise that employs you in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) and engages in:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- advising on, or investing in, private equity or real estate, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

"Firm Reported ROTCE" means the Firm's percentage return on tangible common equity for each year in the Performance Period (as calculated for use in its publicly available year-end financial disclosures without taking into account any rounding conventions used for financial reporting purposes).

"Firmwide Financial Threshold" means a cumulative return on tangible common equity for calendar years 20__, 20__ and 20__ of not less than ___%. Cumulative return on tangible common equity means (i) the sum of the Firm's reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

"Government Office" means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

"Line of Business" means a business unit of the Firm (or one or more business units designated below under the definition "Line of Business Financial Threshold" of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

"Line of Business Financial Threshold" means the financial threshold set forth below: for the following Lines of Business based on the Firm's management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income[1]
Consumer Lending	Annual negative pre-tax pre-loan loss reserve income[2]
Commercial Banking	Annual negative pre-tax, pre-loan loss reserve income[2]
Corporate Investment Bank	Annual negative pre-tax pre-provision income[1] for CIB overall and/or annual negative allocated product revenues (excluding CVA and DVA) for: • Fixed Income • Equities • Securities Services • Global Investment Banking • Wholesale Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income[2]
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income[1] at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income[2]

[1]Pre-tax pre-provision income means Revenue less Expenses

[2]Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)

"Not-for-Profit Organization" means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for purposes identical to those applicable to Section 501(c)(3) organization.

"Performance Companies" mean the following institutions which have business activities that overlap with a significant portion of the Firm's revenue mix: ____ and ___________.

If, during the Performance Period, one or more Performance Companies shall merge, engage in a spin-off or otherwise experience a material change in its revenue mix or business activities or its existence or its primary businesses shall terminate or cease due to receivership, bankruptcy, sale, or otherwise, then the Committee may eliminate such institution from the list of Performance Companies or make such other equitable adjustments, such as adding an acquirer or a new company to the list of Performance Companies, as it deems appropriate, with any such changes having effect for purposes of all calculations hereunder on a prospective basis from the date the applicable change is made.

"Performance Period" means calendar years 20__, 20__ and 20__.

"Performance Ranking" means the ranking of the average ROTCE of the Firm as compared to the ranking of the average ROTCE of the Performance Companies as specified in the footnote to the Performance Table for the Performance Period.

"Performance Table" means the table used in the calculation of PSUs for the Performance Period as set forth below:

Firm Reported ROTCE (average performance)	Award Payout Percentage
?__%	___%
__% to __%	Pay by relative ROTCE scale
<__%	___%

Performance Ranking [1] (average performance)	Award Payout Percentage[1]
______	__% to __%
______	__% to __%
______	__% to __%
______	__% to __%

1. The following sets forth the precise Award Payout Percentage corresponding to the Firm's Performance Ranking (when compared to Performance Companies): #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; #__ = __ %; etc.

If, after the calculation of the Performance Ranking, there is a tie, the tie shall be disregarded for purposes of determining the Award Payout Percentage. For example, in the case of a tie for the _______ ranking between the Firm and a Performance Company, the Firm shall be treated as having satisfied that ranking. In the case of that same tie among Performance Companies, the _____ and _____ rankings will be deemed to have been satisfied.

"Recognized Service" means the period of service as an employee set forth in the Firm's applicable service-related policies.

"ROTCE" means for the Firm and each of the Performance Companies a percentage derived by, for each year in the Performance Period, dividing (i) annual earnings from continuing operations less dividends on preferred stock as set forth in published financial disclosures by (ii) the Average Tangible Common Equity for the year. If, prior to the end of the vesting period, the Firm or any Performance Company restates its published financial statements for any year in the Performance Period, ROTCE for that year shall be recalculated for the Firm or Performance Company with the Performance Ranking adjusted, if necessary. This calculation is used solely for purposes of the Performance Ranking.

"Target Award Number" means the number of PSUs designated as such in the Award Agreement.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

"Government Office Requirements" does not apply to you if you satisfy the subsection captioned "--Full Career Eligibility" as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days' advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned "Definitions"), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm's sole discretion.
- Confirmation, in a form satisfactory to the Firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See section captioned "Definitions".)

Portion of Your Award Subject to Continued Vesting:

Subject to the conditions below, the percentage of this award that will continue to vest in accordance with this award's original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of this award subject to continued vesting above is referred to as the "CV Award" and the portion not subject to continued vesting will be cancelled as of the date your employment terminates.

Conditions for Continued Vesting of Award:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to be eligible to receive the CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be eligible to receive the CV Award if it has a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

For avoidance of doubt, the performance criteria and protection based vesting set forth in these terms and conditions continue to apply to a CV Award.

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned "--Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity") will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above "Conditions for Continued Vesting of Awards", any outstanding PSUs under the CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as PSUs on the date you failed to satisfy the "Conditions for Continued Vesting of Award" but for their accelerated distribution (as described in subsection captioned, "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity"). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

JPMORGAN CHASE & CO. LONG-TERM INCENTIVE PLAN
TERMS AND CONDITIONS OF ___________, 20___
PERFORMANCE SHARE UNIT AWARD
OPERATING COMMITTEE
(Protection-Based Vesting Provisions)

Award Agreement

These terms and conditions are made part of the Award Agreement dated as of ___________, 20__ ("Grant Date") awarding performance share units ("PSUs") pursuant to the terms of the JPMorgan Chase & Co. Long-Term Incentive Plan ("Plan"). To the extent the terms of the Award Agreement (all references to which will include these terms and conditions) conflict with the Plan, the Plan will govern. The Award Agreement, the Plan and Prospectus supersede any other agreement, whether written or oral, that may have been entered into by the Firm and you relating to this award.

This award was granted on the Grant Date subject to the Award Agreement and Plan. **Unless you decline by the deadline and in the manner specified in the Award Agreement, you will have agreed to be bound by these terms and conditions, effective as of the Grant Date.** If you decline the award, it will be cancelled as of the Grant Date.

Capitalized terms that are not defined in "Definitions" below or elsewhere in the Award Agreement will have the same meaning as set forth in the Plan.

JPMorgan Chase & Co. will be referred to throughout the Award Agreement as "JPMorgan Chase", and together with its subsidiaries as the "Firm".

Form and Purpose of Award

Each PSU represents a non-transferable right to receive one share of Common Stock following each vesting date as set forth in your Award Agreement.

The purpose of this award is to further emphasize sustained long-term performance and to align your interests with those of the Firm and its shareholders.

Protection-Based Vesting

This award is intended and expected to vest on each vesting date set forth in your Award Agreement, provided that you are continuously employed by the Firm through such vesting date, or you meet the requirements for continued vesting described under the subsections "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability". However, vesting and the number of PSUs that will vest are subject to these terms and conditions (including, but not limited to, sections captioned "Number of Performance Share Units at the end of Performance Period", "Capital Ratio Performance Threshold", "Recapture Provisions", "Remedies" and the following protection-based vesting provision).

Up to a total of fifty percent of your award that would otherwise be distributable to you as of any vesting date ("At Risk PSUs") may be cancelled if the Chief Executive Officer of JPMorgan Chase ("CEO") determines in his or her sole discretion that cancellation of all or portion of the At Risk PSUs is appropriate in light of any one or a combination of the following factors:

- Your performance in relation to the priorities for your position, or the Firm's performance in relation to the priorities for which you share responsibility as a member of the Operating Committee, have been unsatisfactory for a sustained period of time. Among the factors the CEO may consider in assessing performance are: net income, total net revenue, earnings per share and capital ratios of the Firm, both on an absolute basis and, as appropriate, relative to peer firms.
- For any calendar year ending during the vesting period, JPMorgan Chase's annual pre-tax pre-provision income at the Firm level is negative.
- RSU awards granted to participants in a Line of Business for which you exercise, or during the vesting period exercised, direct or indirect responsibility, were in whole or in part cancelled because the Line of Business did not meet its annual Line of Business Financial Threshold.
- The Firm does not meet the Firmwide Financial Threshold.

For avoidance of doubt, cancellation of the At Risk PSUs, in whole or part, for one or more of the above factors may occur prior to the end of the Performance Period and the maximum number of At Risk PSUs subject to cancellation prior to the end of the Performance Period will be up to fifty percent of the Target Award Number.

In the event that your employment terminates due to "Job Elimination", "Full Career Eligibility", "Government Office" or "Disability" thereby entitling you to continued vesting in your award, (or potentially acceleration due to satisfaction of the Government Office Requirements), the cancellation circumstances described above will continue to apply.

Any determination above with respect to protection-based vesting provisions is subject to ratification by the Compensation and Management Development Committee of the Board of Directors of JPMorgan Chase ("Committee"). In the case of an award to any current or former CEO, all such determinations shall be made by the Committee and ratified by the Board.

Number of Performance Share Units at End of Performance Period

Subject to any cancellation in whole or part of your award pursuant to these terms and conditions:

Performance calculation: The number of PSUs at the end of the Performance Period will be derived by multiplying the Target Award Number by the Award Payout Percentage determined using the Performance Table.

The number of PSUs determined above will be subject to the Qualitative Performance Factor (as detailed below), which if the Committee determines that such an adjustment is appropriate, will be applied following the end of each year during the Performance Period, to adjust downward one-third of the Target Award Number of PSUs for each calendar year in the Performance Period. Additionally, the Committee, in its discretion, may make a qualitative performance assessment based on the entire three year Performance Period and apply the Qualitative Performance Factor to the entire number of PSUs determined above.

See sections captioned "Calculation of Performance Ranking" and "Definitions".

Delivery of vested shares of common stock to your account will be made not later than the date specified in the last sentence of the subsection captioned "Section 409A Compliance".

Reinvested Dividend Equivalent Share Units

This award is not eligible for reinvested dividend equivalent share units.

Holding Requirement

The net number of shares of Common Stock (after tax and all other lawful withholdings) in which you have vested, if any, as of the vesting date will be held in an account in your name with restrictions preventing you from transferring, assigning, hedging, selling, pledging or otherwise encumbering such shares for (i) a twelve month period measured from each vesting date; and (ii) a two year period for such shares vesting on _______, 20__, with the holding periods running concurrently. Such restrictions shall only lapse, prior to the expiration of the two year holding period, in the event of your death or for an accelerated distribution for ethics or conflict reasons. See section captioned, "Death" and subsection captioned, "Accelerated Distribution for Ethics or Conflict Reasons Resulting from Employment by a Government Entity".

Calculation of Performance Ranking

For purposes of the Performance Ranking, the ranking of the Firm and of each Performance Company for the Performance Period shall be determined and calculated by the Calculation Agent, using the definitions of "Average Tangible Common Equity" (if otherwise applicable), "Calculated PSUs", "Firm Reported ROTCE", "Performance Table" (including its footnote) and "ROTCE" as set forth in the "Definitions" section of these terms and conditions. See section captioned "Definitions". Except for Firm Reported ROTCE, calculations will be expressed as a decimal to the second place (i.e. xx.yy%), rounded to the nearest hundredth. See section captioned, "Definitions--Performance Table" in the event of a tie. All performance based calculations as set forth herein are binding and conclusive on you and your successors.

Capital Ratio Performance Threshold

Unvested PSUs are subject to reduction if the Firm's Common Equity Tier 1 (CET1) capital ratio at any year end falls below a predetermined threshold of ____%.

If the Firm's CET1 capital ratio at any year end during the Performance Period is below this predetermined threshold, up to one-third of the Target Award Number of PSUs will be subject to downward adjustment by the CMDC for each such year.

Qualitative Performance

Determination of Qualitative Performance Factor. Annually during the Performance Period, the Committee will formally assess your qualitative performance based on four broad categories: (1) Client/Customer Focus; (2) Risk, Controls & Conduct; (3) Teamwork & Leadership; and (4) Business Results. If the Committee determines that your performance "Meets" expectations, no downward adjustment to one-third of the Target Award Number of PSUs for that year shall take place (and the Qualitative Performance Factor shall be 100%). If the Committee determines that your performance did "Not Meet" expectations, the Committee shall determine whether a downward adjustment is appropriate, and if so, to what extent. A downward adjustment could result in a Qualitative Performance Factor of between 0% and 99%, depending on the circumstances. During the Performance Period, a 0% Performance Factor for each year in the Performance Period would reduce your Target Award Number of PSUs to zero, resulting in the cancellation of award with no shares vesting.

Additionally, the Committee may, in its sole discretion, make such assessment of your qualitative performance based on your performance during the entire three year Performance Period and apply the Qualitative Performance Factor to the entire number of PSUs determined under section captioned "Number of Performance Share Units at End of the Performance Period". In the case of a Qualitative Performance Factor of 0%, the award would be cancelled.

The assessment will have regard to feedback solicited from the Chair of the UK Remuneration Committee to incorporate qualitative performance against local regulatory responsibilities as a "Senior Manager" of the relevant CIB UK-regulated entities.

The Qualitative Performance Factor shall only be applied, if applicable, in respect of a period of your employment with the Firm, or as soon as administratively practical.

Bonus Recoupment

In consideration of the grant of this award, you agree that you are subject to the JPMorgan Chase Bonus Recoupment Policy (or successor policy) as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year 20__ and to this award. You can access this policy as currently in effect through the following link:

https://about.jpmorganchase.com/about/governance/corporate-governance-principles

For the avoidance of doubt, nothing in these terms and conditions in any way limits the rights of the Firm under the JPMorgan Chase Bonus Recoupment Policy (or successor policy).

EMEA Malus and Clawback Policy - Identified Staff

In consideration of grant of this award, and without prejudice to any other provision of this Award Agreement, you agree that you are subject to the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff (and any applicable supplement(s) to that policy) or successor policy as in effect from time to time as it applies both to the cash incentive compensation awarded to you for performance year ____ and to this award. You can access this policy as currently in effect in My Rewards through the following link: https://myrewards.jpmorganchase.com

See section captioned "Administrative Provisions" for additional information.

Recapture Provisions (Detrimental Conduct, Risk-Related and Other Recapture Provisions)

Notwithstanding any terms of this Award Agreement to the contrary, JPMorgan Chase reserves the right in its sole discretion to cancel up to 100% of your award and, to the extent set forth in "Remedies" below, to recover from you up to an amount equal to the Fair Market Value (determined as of any vesting date) of the gross number of shares of Common Stock previously distributed (including vested shares subject to the Holding Requirements and shares withheld for tax or other lawful purposes) under this award if the Firm in its sole discretion determines that:

- you engaged in conduct detrimental to the Firm insofar as it causes material financial or reputational harm to the Firm or its business activities, or
- this award was based on materially inaccurate performance metrics, whether or not you were responsible for the inaccuracy, or
- this award was based on a material misrepresentation by you, or
- you improperly or with gross negligence failed to identify, raise or assess, in a timely manner and as reasonably expected, risks and/or concerns with respect to risks material to the Firm or its business activities, or
- your employment was terminated for Cause (see section captioned "Definitions" below) or, in the case of a determination after the termination of your employment, that your employment could have been terminated for Cause.

See section captioned "Remedies" for additional information.

Termination of Employment

Except as explicitly set forth below under the subsections captioned "--Job Elimination", "--Full Career Eligibility", "--Government Office" or "--Disability" or under the section captioned "Death", this award will be cancelled in full effective on the date your employment with the Firm terminates for any reason.

Subject to these terms and conditions (including, but not limited to, sections captioned "Protection-Based Vesting", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions", "Your Obligations" and "Remedies") you will be eligible to continue to vest (as you otherwise would vest if you were still employed by JPMorgan Chase) with respect to your award in accordance with its terms and conditions following the termination of your employment if one of the following circumstances applies to you:

- ### Job Elimination
  In the event that the Director of Human Resources or nominee in his or her sole discretion determines that
  - the Firm terminated your employment because your job was eliminated, and
  - after you are notified that your job will be eliminated, you provided such services as requested by the Firm in a cooperative and professional manner, and
  - you satisfied the Release/Certification Requirements set forth below.

- ## Full Career Eligibility

  In the event that the Director of Human Resources or nominee in his or her sole discretion determines that

  - you voluntarily terminated your employment with the Firm, had completed at least five years of continuous service with the Firm immediately preceding your termination date, and
  - your Recognized Service (as defined below) on your date of termination equaled or exceeded 15 years, or your combined Recognized Service with the Firm and external professional experience (as attested by you to the Firm) equaled or exceeded 30 years, and
  - you provided at least 180 days advance written notice to the Firm of your intention to voluntarily terminate your employment under this provision, during which notice period you provided such services as requested by the Firm in a cooperative and professional manner and you did not perform any services for any other employer, and
  - continued vesting shall be appropriate, which determination shall be made prior to your termination and will be based on your performance and conduct (before and after providing notice), and
  - for 36 months from the date of grant of this award, you do not either perform services in any capacity (including self-employment) for a Financial Services Company (as defined below) or work in your profession (whether or not for a Financial Services Company); provided that you may work for a government, education or Not-for-Profit Organization (as defined below), and
  - you satisfied the Release/Certification Requirements set forth below.

  After receipt of such advance written notice, the Firm may choose to have you continue to provide services during such 180-day period as a condition to continued vesting or shorten the length of the 180-day period at the Firm's sole discretion, but to a date no earlier than the date you would otherwise meet the service requirement.

  Additional advance notice requirements may apply for employees subject to notice period policies. (See "Notice Period" below.)

- ## Government Office

  In the event that you voluntarily terminate your employment with the Firm to accept a Government Office or become a candidate for an elective Government Office, as described at the end of these terms and conditions under the section captioned "Government Office Requirements". See also definition of Government Office in the section captioned "Definitions".

- ## Disability

  In the event that

  - your employment with the Firm terminates because (i) you are unable to return to work while you are receiving benefits under the JPMorgan Chase Long Term Disability Plan, or for non-U.S. employees, under the equivalent JPMorgan Chase-sponsored local country plan (in either case, "LTD Plan"), or (ii) if you are not covered by a LTD Plan, you are unable to return to work due to a long-term disability that would qualify for benefits under the applicable LTD Plan, as determined by the Firm or a third-party designated by the Firm; provided that you (x) request in writing continued vesting due to such disability within 30 days of the date your employment terminates, and (y) provide any requested supporting documentation and (z) receive the Firm's written consent to such treatment, and
  - you satisfied the Release/Certification Requirements set forth below.

Release/Certification

To qualify for continued vesting after termination of your employment under any of the foregoing circumstances:

- you must timely execute and deliver a release of claims in favor of the Firm, having such form and terms as the Firm shall specify,
- with respect to Full Career Eligibility, prior to the termination of your employment, you must confirm with management that you meet the eligibility criteria (including providing at least 180 days advance written notification), advise that you are seeking to be treated as an individual eligible for Full Career Eligibility, and receive written consent to such continued vesting,
- with respect to Disability, you must satisfy the notice and documentation described above and receive written consent to such continued vesting,
- with respect to "Full Career Eligibility" and "Government Office", it is your responsibility to take the appropriate steps to certify to the Firm prior to each vesting date while the employment restrictions are outstanding on the authorized form of the Firm that you have complied with the employment restrictions applicable to you (as described herein) from your date of termination of employment through the applicable vesting date, and
- in all cases, otherwise complied with all other terms of the Award Agreement. (See section captioned "Your Obligations" below.)

Death

If you die while you are eligible to vest in this award, your designated beneficiary on file with the Firm's Stock Administration Department (or your estate or if no beneficiary has been designated or survives you or if beneficiary designation is not recognized by local legislation) may be entitled to receive a distribution of a number of shares of Common Stock associated with your award.

Should you die after the end of the Performance Period, your beneficiary will receive shares of Common Stock equal to any outstanding PSUs.

Should you die during the Performance Period, your Beneficiary will receive shares of Common Stock based on the average performance of all completed calendar years, multiplied by one-third of the Target Award Number of PSUs for each completed calendar year in the Performance Period, and using the Award Payout Percentage equal to 100 percent for any remaining calendar years in the Performance Period.

Any shares will be distributed no later than the end of the calendar year immediately following the calendar year which contains your date of death; however, our administrative practice is to register such shares in the name of your beneficiary or estate within 60 days of the Firm's receipt of any required documentation.

Your Obligations

In consideration of the grant of this award, you agree to comply with and be bound by the obligations set forth below next to the subsections captioned "--Non-Solicitation of Employees and Customers", "--Confidential Information", "--Non-Disparagement", "--Cooperation", "--Compliance with Award Agreement", and "--Notice Period".

- ### Non-Solicitation of Employees and Customers

  During your employment by the Firm and for the longer of the (i) one year period following the termination of your employment or, (ii) if your award is not cancelled as of your termination date, the three year period from Grant Date, you will not directly or indirectly, whether on your own behalf or on behalf of any other party, without the prior written consent of the Director of Human Resources: (i) solicit, induce or encourage any of the Firm's then current employees to leave the Firm or to apply for employment elsewhere, unless such current employee has received official, written notice that his or her employment will be terminated due to job elimination (ii) hire any employee or former employee who was employed by the Firm at the date your employment terminated, unless the individual's employment terminated because his or her job was eliminated, or the individual's employment with the Firm has been terminated for more than six months, (iii) to the fullest extent enforceable under applicable law, solicit or induce or attempt to induce to leave the Firm, or divert or attempt to divert from doing business with the Firm, any then current customers, suppliers or other persons or entities that were serviced by you or whose names became known to you by virtue of your employment with the Firm, or otherwise interfere with the relationship between the Firm and such customers, suppliers or other persons or entities. This does not apply to publicly known institutional customers that you service after your employment with the Firm without the use of the Firm's confidential or proprietary information.

  These restrictions do not apply to authorized actions you take in the normal course of your employment with the Firm, such as employment decisions with respect to employees you supervise or business referrals in accordance with the Firm's policies.

- ### Confidential Information

  You will not, either during your employment with the Firm or thereafter, directly or indirectly (i) use or disclose to anyone any confidential information related to the Firm's business, or (ii) communicate with the press or other media about matters related to the Firm, its customers or employees, including matters and activities relating to your employment, or the employment of others, by the Firm, in the case of either (i) or (ii), except as explicitly permitted by the JPMorgan Chase Code of Conduct and applicable policies or law or legal process. In addition, following your termination of employment, you will not, without prior written authorization, access the Firm's private and internal information through telephonic, intranet or internet means. "Confidential information" shall have the same meaning for the Award Agreement as it has in the JPMorgan Chase Code of Conduct.

  Nothing in this award precludes you from reporting to the Firm's management or directors, the government, a regulator, a self-regulatory agency, your attorneys or a court, conduct you believe to be in violation of the law or concerns of any known or suspected Code of Conduct violation. It is also not intended to prevent you from responding truthfully to questions or requests from the government, a regulator or in a court of law.

- ### Non-Disparagement

  You will not, either during your employment with the Firm or thereafter, make or encourage others to make any public statement or release any information in verbal, written, electronic or any other form, that is intended to, or reasonably could be foreseen to, disparage, embarrass or criticize the Firm or its employees, officers, directors or shareholders as a group. This shall not preclude you from reporting to the Firm's management or directors or to the government or a regulator conduct you believe to be in violation of the law or the Firm's Code of Conduct or responding truthfully to questions or requests for information to the government, a regulator or in a court of law in connection with a legal or regulatory investigation or proceeding.

- ### Cooperation

  You will cooperate fully with and provide full and accurate information to the Firm and its counsel with respect to any matter (including any audit, tax proceeding, litigation, investigation or governmental proceeding) with respect to which you may have knowledge or information, subject to reimbursement for actual, appropriate and reasonable out-of-pocket expenses incurred by you.

- ### Compliance with Award Agreement

  You will provide the Firm with any information reasonably requested to determine compliance with the Award Agreement, and you authorize the Firm to disclose the terms of the Award Agreement to any third party who might be affected thereby, including your prospective employer.

- ## Notice Period

If you are subject to a notice period or become subject to a notice period after the Grant Date, whether by contract or by policy, that requires you to provide advance written notice of your intention to terminate your employment ("Notice Period"), then as consideration for this award and continued employment, you will provide the Firm with the necessary advance written notice that applies to you, as specified by such contract or policy.

After receipt of your notice, the Firm may choose to have you continue to provide services during the applicable Notice Period or may place you on a paid leave for all or part of the applicable Notice Period. During the Notice Period, you shall continue to devote your full time and loyalty to the Firm by providing services in a cooperative and professional manner and not perform any services for any other employer and shall receive your base salary and certain benefits until your employment terminates. You and the Firm may mutually agree to waive or modify the length of the Notice Period.

Regardless of whether a Notice Period applies to you, you must comply with the 180-day advance notice period described under the subsection captioned "-- Full Career Eligibility" in the event you wish to terminate employment under that same subsection.

Remedies

- ## Cancellation

In addition to the cancellation provisions described under the sections captioned "Protection-Based Vesting", "Qualitative Performance Factor", "Bonus Recoupment", "EMEA Malus and Clawback Policy - Identified Staff", "Recapture Provisions" and "Termination of Employment", your outstanding PSUs under this award may be cancelled if the Firm in its sole discretion determines that:

- you have failed to comply with any of the advance notice/cooperation requirements or employment restrictions applicable to your termination of employment, or
- you have failed to return the required forms specified under the section captioned "Release/Certification" by the specified deadline, or
- you have violated any of the provisions as set forth above in the section captioned "Your Obligations".

To the extent provided under the subsection captioned "--Amendment" below, JPMorgan Chase reserves the right to suspend vesting of this award and/or distribution of shares under this award, including, without limitation, during any period that JPMorgan Chase is evaluating whether this award is subject to cancellation and/or recovery and/or whether the conditions for distributions of shares under this award are satisfied. The Firm is not responsible for any price fluctuations during any period of suspension and, if applicable, suspended units will be reinstated consistent with Plan administration procedures. See also "Administrative Provisions-No Ownership Rights/Other Limitations".

- ## Recovery

In addition to cancellation of outstanding PSUs, you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date or acceleration date) of the gross number of shares of Common Stock previously distributed, including vested shares subject to the Holding Requirements, under this award as follows:

- Payment may be required with respect to any shares of Common Stock distributed within the three year period prior to a notice-of-recovery under this section, if the Firm in its sole discretion determines that:
  - you committed a fraudulent act, or engaged in knowing and willful misconduct related to your employment;
  - you violated any of the provisions as set forth above in the section captioned "Your Obligations;" or
  - you violated the employment restrictions set forth in the subsection "Full Career Eligibility" or "Government Office" following the termination of your employment.
- In addition, payment may be required with respect to any shares distributed within the one year period prior to notice-of-recovery under this section, if the Firm in its sole discretion determines appropriate pursuant to the provisions in the section captioned "Recapture Provisions".

Notice-of-recovery under this subsection is a written (including electronic) notice from the Firm to you either requiring payment under this subsection or stating that JPMorgan Chase is evaluating requiring payment under this subsection. Without limiting the foregoing, notice-of-recovery will be deemed provided if the Firm makes a good faith attempt to provide written (including electronic) notice at your last known address maintained in the Firm's employment records. For the avoidance of doubt, a notice-of-recovery that the Firm is evaluating requiring payment under this subsection shall preserve JPMorgan Chase's rights to require payment as set forth above in all respects and the Firm shall be under no obligation to complete its evaluation other than as the Firm may determine in its sole discretion.

For purposes of this subsection, shares distributed under this award include shares withheld for tax purposes. However, it is the Firm's intention that you only be required to pay the amounts under this subsection with respect to shares that are or may be retained by you following a determination of tax liability and that you will not be required to pay amounts with respect to shares representing irrevocable tax withholdings or tax payments previously made (whether by you or the Firm) that you will not be able to recover, recapture or reclaim (including as a tax credit, refund or other benefit). Accordingly, JPMorgan Chase will not require you to pay any amount that the Firm or its nominee in his or her sole discretion determines is represented by such withholdings or tax payments.

Payment may be made in shares of Common Stock or in cash. You agree that any repayment will be a lawful recovery under the terms and conditions of your Award Agreement and is not to be construed in any manner as a penalty.

Nothing in the section in any way limits your obligations under "Bonus Recoupment" and "EMEA Malus and Clawback Policy - Identified Staff".

- ### Right to an Injunction

  You acknowledge that a violation or attempted violation of the obligations set forth herein will cause immediate and irreparable damage to the Firm, and therefore agree that the Firm shall be entitled as a matter of right to an injunction, from any court of competent jurisdiction, restraining any violation or further violation of such obligations; such right to an injunction, however, shall be cumulative and in addition to whatever other remedies the Firm may have under law or equity.

Administrative Provisions

EMEA Malus and Clawback Policy: The provisions of the JPMorgan Chase EMEA Malus and Clawback Policy - Identified Staff set out the terms and conditions applying to the grant of this award which ensure that the Firm is able to meet its regulatory obligations to operate malus (reduce) and/or clawback (recover) to awards in certain circumstances. These include, but are not limited to, where (i) there is a material downturn in the Firm's financial performance or (ii) where the Firm is required to hold more capital. The circumstances in which the events at (i) and (ii) would occur are analogous to some of the circumstances considered under the existing Firmwide terms and conditions, in particular the Bonus Recoupment Policy and the Protection Based Vesting provisions.

Withholding Taxes: As a result of legal and/or tax obligations the Firm, in its sole discretion, may (i) retain from each distribution the number of shares of Common Stock required to satisfy applicable tax obligations or (ii) implement any other desirable or necessary procedures, so that appropriate withholding and other taxes are paid to the competent authorities with respect to the vested shares and the award. This may include but is not limited to (i) a market sale of a number of such shares on your behalf substantially equal to the withholding or other taxes, (ii) to the extent required by law, withhold from cash compensation, an amount equal to any withholding obligation with respect to the award and shares that vest under this award, and (iii) retaining shares that vest under this award until you pay any taxes associated with the award and vested shares directly to the competent authorities.

Right to Set Off: Although the Firm expects to settle this award in share(s) of Common Stock as of the applicable vesting date, as set forth in your Award Agreement, the Firm may, to the maximum extent permitted by applicable law (including Section 409A of the Code to the extent it is applicable to you), retain for itself funds or the Common Stock resulting from any vesting of this award to satisfy any obligation or debt that you owe to the Firm. Notwithstanding any account agreement with the Firm to the contrary, the Firm will not recoup or recover any amount owed from any funds or unrestricted securities held in your name and maintained at the Firm pursuant to such account agreement to satisfy any obligation or debt or obligation owed by you under this award without your consent. This restriction on the Firm does not apply to accounts described and authorized in "No Ownership Rights/Other Limitations" described below.

No Ownership Rights/Other Limitations: PSUs do not convey the rights of ownership of Common Stock and do not carry voting rights. No shares of Common Stock will be issued to you until after the number of PSUs have been determined, if any, and have vested. Shares will be issued in accordance with JPMorgan Chase's procedures for issuing stock. By accepting this award, you authorize the Firm, in its sole discretion, to establish on your behalf a brokerage account in your name with the Firm or book-entry account with our stock plan administrator and/or transfer agent and deliver to that account any vested shares derived from the award. You also acknowledge that should there be a determination that the cancellation provisions of this award apply during the period when the vesting of any outstanding PSUs has been suspended, then you agree that such PSUs may be cancelled in whole or part. (See Sections captioned "Protection-Based Vesting", "Qualitative Performance Factor", "Bonus Recoupment", "EMEA Malus & Clawback Policy - Identified Staff", "Recapture Provisions", "Termination of Employment" and "Remedies", as well as the subsection captioned "--Amendment" permitting suspension of vesting.)

With respect to any applicable vesting date, JPMorgan Chase may impose for any reason, as of such vesting date for such period as it may specify in its sole discretion, such restrictions on the Common Stock to be issued to you as it may deem appropriate, including, but not limited to, restricting the sale, transfer, pledging, assignment, hedging or encumbrance of such shares of Common Stock. Such restrictions described in the last sentence shall not impact your right to vote or receive dividends with respect to the Common Stock. By accepting this award, you acknowledge that during such specified period should there be a determination that the recovery provisions of this award apply, then you agree that you may be required to pay the Firm up to an amount equal to the Fair Market Value (determined as of the applicable vesting date) of the gross number of shares subject to such restrictions (notwithstanding the limitation set forth in the "Right to Set Off" subsection above). (See sections captioned "Bonus Recoupment" and "Remedies".)

Binding Agreement: The Award Agreement will be binding upon any successor in interest to JPMorgan Chase, by merger or otherwise.

Not a Contract of Employment: Nothing contained in the Award Agreement constitutes a contract of employment or continued employment. Employment is "at-will" and may be terminated by either you or JPMorgan Chase for any reason at any time. This award does not confer any right or entitlement to, nor does the award impose any obligation on the Firm to provide, the same or any similar award in the future and its value is not compensation for purposes of determining severance.

Section 409A Compliance: To the extent that Section 409A of the Code is applicable to this award, distributions of shares hereunder are intended to comply with Section 409A of the Code, and the Award Agreement, including these terms and conditions, shall be interpreted in a manner consistent with such intent.

Notwithstanding anything herein to the contrary, if you (i) are subject to taxation under the Code, (ii) are a specified employee as defined in the JPMorgan Chase 2005 Deferred Compensation Plan and (iii) have incurred a separation from service (as defined in that Plan with the exception of death) and if any units/shares under this award represent deferred compensation as defined in Section 409A and such shares are distributable (under the terms of this award) within six months following, and as a result of your separation from service, then those shares will be delivered during the first calendar month after the expiration of six full months from date of your separation from service. Further, if your award is not subject to a substantial risk of forfeiture as defined by regulations issued under Section 409A of the Code, then the remainder of each calendar year immediately following each vesting date set forth in your Award Agreement shall be a payment date for purposes of distributing the vested portion of the award.

Change in Outstanding Shares: In the event of any change in the outstanding shares of Common Stock by reason of any stock dividend or split, recapitalization, issuance of a new class of common stock, merger, consolidation, spin-off, combination or exchange of shares or other similar corporate change, or any distributions to stockholders of Common Stock other than regular cash dividends, the Committee will make an equitable substitution or proportionate adjustment, in the number or kind of shares of Common Stock or other securities issued or reserved for issuance pursuant to the Plan and to any PSUs outstanding under this award for such corporate events.

Other Equitable Adjustments: Except for the "Qualitative Performance Factor", the Committee may make adjustments (up or down) to the award as it deems to be equitable, to maintain the intended economics of the award in light of changed circumstances, which may include unusual or non-recurring events affecting the Firm (or the Performance Companies) or its financial statements in each case resulting from changes in accounting methods, practices or policies, changes in capital structure by reason of legal or regulatory requirements and such other changed circumstances, as the Committee may deem appropriate.

Interpretation/Administration: The Committee has sole and complete authority to interpret and administer this Award Agreement, including, without limitation, the power to (i) interpret the Plan and the terms of this Award Agreement; (ii) determine the reason for termination of employment; (iii) determine application of the post-employment obligations and cancellation and recovery provisions; (iv) decide all claims arising with respect to this award; and (v) delegate such authority as it deems appropriate. Any determination contemplated hereunder by the Committee, the Firm, the Director of Human Resources or their respective delegates or nominees shall be binding on all parties.

Notwithstanding anything herein to the contrary, the determinations of the Director of Human Resources, the Firm, the Committee and their respective delegates and nominees under the Plan and the Award Agreements are not required to be uniform. By way of clarification, the Committee, the Firm, the Director of Human Resources and their respective delegates and nominees shall be entitled to make non-uniform and selective determinations and modifications under Award Agreements and the Plan.

Amendment: The Committee or its nominee reserves the right to amend this Award Agreement in any manner, at any time and for any reason; provided, however, that no such amendment shall materially adversely affect your rights under this Award Agreement without your consent except to the extent that the Committee or its delegate considers advisable to (x) comply with applicable laws or changes in or interpretation of applicable laws, regulatory requirements and accounting rules or standards and/or (y) make a change in a scheduled vesting date or impose the restrictions described above under "No Ownership Rights/Other Limitations", in either case, to the extent permitted by Section 409A of the Code if it is applicable to you. This Award Agreement may not be amended except in writing signed by the Director of Human Resources of JPMorgan Chase.

Severability: If any portion of the Award Agreement is determined by the Firm to be unenforceable in any jurisdiction, any court or arbitrator of competent jurisdiction or the Director of Human Resources may reform the relevant provisions (e.g., as to length of service, time, geographical area or scope) to the extent the Firm (or court/arbitrator) considers necessary to make the provision enforceable under applicable law.

Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity: Upon receipt of satisfactory evidence that applicable United States federal, state, local, foreign or supranational ethics or conflict of interest laws or regulations require you to divest your interest in JPMorgan Chase PSUs, the Firm may accelerate the distribution of all or part of your outstanding award effective on or before the required divestiture date and waive the Holding Requirement; provided that no accelerated distribution shall occur if the Firm determines that such acceleration will violate Section 409A of the Code. Accelerated distribution under this paragraph does not impact the dates as set forth in the "Recovery" section above. The time period for recovery shall be determined by the originally scheduled vesting date or distribution date prior to any acceleration event.

If you have voluntarily terminated your employment and have satisfied the requirements of the section captioned "Government Office Requirements", acceleration shall apply (to extent required) to the percentage of your outstanding award that would continue to vest under that section. In the case of a termination of employment where the award is outstanding as a result of the subsections entitled "Job Elimination" or "Full Career Eligibility", then acceleration shall apply, to the extent required, to the full outstanding award. Subject to the two foregoing sections, the number of shares of Common Stock to be received on acceleration shall be determined using the methodology set forth under the section captioned "Death".

To the extent you have vested shares under this award subject to the Holding Requirement and become subject to divestiture requirement as forth herein, the Firm may waive the holding period to the extent required.

Notwithstanding an accelerated distribution or waiver of the Holding Requirement pursuant to the foregoing, you will remain subject to the applicable terms of your Award Agreement as if your award had remained outstanding for the duration of the vesting period and shares had been distributed as scheduled as of each vesting date, including, but not limited to, repayment obligations set forth in the section captioned "Remedies" and the employment restrictions in the sections captioned "Protection-Based Vesting" and "Government Office Requirements" and the subsection "Full Career Eligibility".

Use of Personal Data: By accepting this award, you have acknowledged that the Firm may process your personal data (including sensitive personal data) for purposes, including but not limited to (i) determining your compensation, (ii) payroll activities, including, but not limited to, tax withholding and regulatory reporting, which tax and regulatory reporting and withholding may include, but is not limited to, the United States and its political subdivisions, (if not the United States) your work country and its political subdivisions (including countries to which you travel on Firm business) and your country of residence or nationality,(iii) registration of shares, (iv) establishing a brokerage account on your behalf, and (v) all other lawful purposes related to your employment and this award, and that the Firm may provide such data to third party vendors with whom it has contracted to provide such services and/or other bodies, including regulators, supervisory bodies, law enforcement and other government agencies. You are acknowledging and agreeing that your personal data will be transferred to and processed in countries and locations that do not have the same data privacy laws and statutory protection for personal data as your work country, country of residence, or country of nationality. If your personal data is subject to data privacy laws or statutory protection for personal data and they so provide for termination of the foregoing authorization, you may terminate the authorization at any time except with respect to tax and regulatory reporting and subject always to the Firm's legal and regulatory obligations. In the event you terminate this authorization, your award will be cancelled.

Governing Law: This award shall be governed by and construed in accordance with the laws of the State of New York, without regard to conflicts of law principles.

Choice of Forum: By accepting this award under the Plan, you agree (and have agreed) that to the extent not otherwise subject to arbitration under an arbitration agreement between you and the Firm, any dispute arising directly or indirectly in connection with this award or the Plan shall be submitted to arbitration in accordance with the rules of the American Arbitration Association if so elected by the Firm in its sole discretion. In the event such a dispute is not subject to arbitration for any reason, you agree to accept the exclusive jurisdiction and venue of the United States District Court for the Southern District of New York with respect to any judicial proceeding in connection with this award or the Plan. You waive, to the fullest extent permitted by law, any objection to personal jurisdiction or to the laying of venue of such dispute and further agree not to commence any action arising out of or relating to this award or the Plan in any other forum.

Waiver of Jury Trial/Class Claims: By accepting this award, you agree, with respect to any claim brought in connection with your employment with the Firm in any forum (i) to waive the right to a jury trial and (ii) that any judicial proceeding or arbitration claim will be brought on an individual basis, and you hereby waive any right to submit, initiate, or participate in a representative capacity or as a plaintiff, claimant or member in a class action, collective action, or other representative or joint action.

Litigation: By accepting any award under the Plan, you agree (and have agreed) that in any action or proceeding by the Firm (other than a derivative suit in the right of the Firm) to enforce the terms and conditions of this Award Agreement or any other Award Agreement where the Firm is the prevailing party, the Firm shall be entitled to recover from you its reasonable attorney fees and expenses incurred in such action or proceeding. In addition, you agree that you are not entitled to, and agree not to seek, advancement of attorney fees and indemnification under the Firm's By-Laws in the event of such a suit by the Firm.

Non-transferability: Neither this award or any other outstanding awards of restricted stock units or of performance based share units, nor your interests or rights in any such awards, shall be assigned, pledged, transferred, hedged, hypothecated or subject to any lien. An award may be transferred following your death by will, the laws of descent or by a beneficiary designation on file with the Firm.

Definitions

"Average Tangible Common Equity" means annual average common stockholders' equity less annual average goodwill and annual average identifiable intangible assets. Annual averages of the components of Average Tangible Common Equity will be calculated using quarterly balances as reported in publically available financial disclosures. In the event that quarterly balances are not available, annual year end balances will be used. **This calculation is used solely for purposes of the Performance Ranking.**

"Award Payout Percentage" means the applicable percentage specified in the footnote to the Performance Table.

"Calculated PSUs" means the number of PSUs determined by multiplying the Target Award Number (after giving effect to any cancellation thereof, in whole or in part) by the Award Payout Percentage corresponding to the Firm's Performance Ranking based on the three-year average performance for the Performance Period (both percentage and ranking, as set forth in the footnote to the Performance Table); provided that if the average of the Firm's Reported ROTCE for the Performance Period either equals or exceeds ___% or is less than ___% (without taking into account any rounding conventions used), ____ percent or ____, respectively as the case may be, shall be substituted for the Performance Period's Award Payout Percentage in calculating the number of PSUs to distribute. For avoidance of doubt, any cancellation of this award (in whole or in part) during the Performance Period will reduce the Target Award Number.

"Calculation Agent" means a third party entity not owned or controlled by the Firm, such as an accounting or consulting firm, retained from time to time by the Director of Human Resources or his/her delegate.

"Cause" means a determination by the Firm that your employment terminated as a result of your (i) violation of any law, rule or regulation (including rules of self-regulatory bodies) related to the Firm's business, (ii) indictment or conviction of a felony, (iii) commission of a fraudulent act, (iv) violation of the JPMorgan Chase Code of Conduct or other Firm policies or misconduct related to your duties to the Firm (other than immaterial and inadvertent violations or misconduct), (v) grossly inadequate performance of the duties associated with your position or job function or failure to follow reasonable directives of your manager, or (vi) any act or failure to act that is injurious to the interests of the Firm or its relationship with a customer, client or an employee.

"Financial Services Company" means a business enterprise that employs you in any capacity (such as an employee, contractor, consultant, advisor, or self-employed individual, whether paid or unpaid) and engages in:

- commercial or retail banking, including, but not limited to, commercial, institutional and personal trust, custody and/or lending and processing services, originating and servicing mortgages, issuing and servicing credit cards, payment servicing or processing or merchant services,
- insurance, including but not limited to, guaranteeing against loss, harm, damage, illness, disability or death, providing and issuing annuities, acting as principal, agent or broker for purpose of the forgoing,
- financial, investment or economic advisory services, including but not limited to, investment banking services (such as advising on mergers or dispositions, underwriting, dealing in, or making a market in securities or other similar activities), brokerage services, investment management services, asset management services, and hedge funds,
- issuing, trading or selling instruments representing interests in pools of assets or in derivatives instruments,
- advising on, or investing in, private equity or real estate, or
- any similar activities that the Director of Human Resources or nominee determines in his or her sole discretion constitute financial services.

"Firm Reported ROTCE" means the Firm's percentage return on tangible common equity for each year in the Performance Period (as calculated for use in its publicly available year-end financial disclosures without taking into account any rounding conventions used for financial reporting purposes).

"Firmwide Financial Threshold" means a cumulative return on tangible common equity for calendar years 20__, 20__ and 20__ of not less than ____%. Cumulative return on tangible common equity means (i) the sum of the Firm's reported net income for all three calendar years, divided by (ii) reported year-end tangible equity averaged over the three years.

"Government Office" means (i) a full-time position in an elected or appointed office in local, state, or federal government (including equivalent positions outside the U.S. or in a supranational organization), not reasonably anticipated to be a full-career position, or (ii) conducting a bona fide full-time campaign for such an elective public office after formally filing for candidacy, where it is customary and reasonably necessary to campaign full-time for the office.

"Line of Business" means a business unit of the Firm (or one or more business units designated below under the definition "Line of Business Financial Threshold" of the Corporate Investment Bank). All Corporate Functions (including the functions of the Chief Investment Office) are considered a single Line of Business.

"Line of Business Financial Threshold" means the financial threshold set forth below: for the following Lines of Business based on the Firm's management reporting system:

Asset & Wealth Management	Annual negative pre-tax pre-provision income[1]
Consumer Lending	Annual negative pre-tax pre-loan loss reserve income[2]
Commercial Banking	Annual negative pre-tax, pre-loan loss reserve income[2]
Corporate Investment Bank	Annual negative pre-tax pre-provision income[1] for CIB overall or annual negative allocated product revenues (excluding CVA and DVA) for: • Fixed Income • Equities • Securities Services • Global Investment Banking • Wholesale Payments
Consumer Banking, U.S. Wealth Management and Business Banking	Annual negative pre-tax pre-loan loss reserve income[2]
Corporate Functions (including Chief Investment Office)	Annual negative pre-tax pre-provision income[1] at the Firm level
Home Lending	Annual negative pre-tax pre-loan loss reserve income[2]
[1]Pre-tax pre-provision income means Revenue less Expenses [2]Pre-tax pre-loan loss reserve income means Revenue less (Expenses plus Net Charge-offs)	

"Not-for-Profit Organization" means an entity exempt from tax under state law and under Section 501(c)(3) of the Code. Section 501(c)(3) only includes entities organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary or educational purposes, or to foster national or international amateur sports competition or for the prevention of cruelty to children or animals. Not-for-Profit Organization shall also mean entities outside the United States exempt from local and national tax laws because they are organized and operated exclusively for purposes identical to those applicable to Section 501(c)(3) organization.

"Performance Companies" mean the following institutions which have business activities that overlap with a significant portion of the Firm's revenue mix: ____, and ________________.

If, during the Performance Period, one or more Performance Companies shall merge, engage in a spin-off or otherwise experience a material change in its revenue mix or business activities or its existence or its primary businesses shall terminate or cease due to receivership, bankruptcy, sale, or otherwise, then the Committee may eliminate such institution from the list of Performance Companies or make such other equitable adjustments, such as adding an acquirer or a new company to the list of Performance Companies, as it deems appropriate, with any such changes having effect for purposes of all calculations hereunder on a prospective basis from the date the applicable change is made.

"Performance Period" means calendar years 20__, 20__ and 20__.

"Performance Ranking" means the ranking of the average ROTCE of the Firm as compared to the ranking of the average ROTCE of the Performance Companies as specified in the footnote to the Performance Table for the Performance Period.

"Performance Table" means the table used in the calculation of PSUs for the Performance Period as set forth below:

Firm Reported ROTCE (average performance)	Award Payout Percentage
?__%	__%
__% to __%	Pay by relative ROTCE scale
<__%	__%

Performance Ranking [1] (average performance)	Award Payout Percentage[1]
______	__% to __%
______	__% to __%
______	__% to __%
______	__% to __%

1. The following sets forth the precise Award Payout Percentage corresponding to the Firm's Performance Ranking (when compared to Performance Companies): #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; #__ = __%; etc.

If, after the calculation of the Performance Ranking, there is a tie, the tie shall be disregarded for purposes of determining the Award Payout Percentage. For example, in the case of a tie for the ____ ranking between the Firm and a Performance Company, the Firm shall be treated as having satisfied that ranking. In the case of that same tie among Performance Companies, the ____ and ____ rankings will be deemed to have been satisfied.

"Recognized Service" means the period of service as an employee set forth in the Firm's applicable service-related policies.

"ROTCE" means for the Firm and each of the Performance Companies a percentage derived by, for each year in the Performance Period, dividing (i) annual earnings from continuing operations less dividends on preferred stock as set forth in published financial disclosures by (ii) the Average Tangible Common Equity for the year. **If, prior to the end of the vesting period, the Firm or any Performance Company restates its published financial statements for any year in the Performance Period, ROTCE for that year shall be recalculated for the Firm or Performance Company with the Performance Ranking adjusted, if necessary. This calculation is used solely for purposes of the Performance Ranking.**

"Target Award Number" means the number of PSUs designated as such in the Award Agreement.

Government Office Requirements

You may be eligible to continue vesting in all or part of your award if you voluntarily resign to accept a Government Office (as defined above) or to become a candidate for an elective Government Office.

Full Career Eligibility:

"Government Office Requirements" does not apply to you if you satisfy the subsection captioned "--Full Career Eligibility" as of the date that you voluntarily terminate your employment with the Firm.

Eligibility:

Eligibility for continued vesting is conditioned on your providing the Firm:

- At least 60 days' advance written notice of your intention to resign to accept or pursue a Government Office (see section captioned "Definitions"), during which period you must perform in a cooperative and professional manner services requested by the Firm and not provide services for any other employer. The Firm may elect to shorten this notice period at the Firm's sole discretion.
- Confirmation, in a form satisfactory to the Firm, that vesting in this award pursuant to this provision would not violate any applicable law, regulation or rule.
- Documentation in a form satisfactory to the Firm that your resignation is for the purpose of accepting a Government Office or becoming a candidate for a Government Office. (See section captioned "Definitions".)

Portion of Your Award Subject to Continued Vesting:

Subject to the conditions below, the percentage of this award that will continue to vest in accordance with this award's original schedule will be based on your years of continuous service completed with the Firm immediately preceding your termination date, as follows:

- 50% if you have at least 3 but less than 4 years of continuous service,
- 75% if you have at least 4 but less than 5 years of continuous service, or
- 100% if you have 5 or more years of continuous service.

The portion of this award subject to continued vesting above is referred to as the "CV Award" and the portion not subject to continued vesting will be cancelled as of the date your employment terminates.

Conditions for Continued Vesting of Award:

- You must remain in a non-elective Government Office for two or more years after your employment with the Firm terminates to be eligible to receive the CV Award; provided that if your non-elective Government Office is for a period less than two years, you will be eligible to receive the CV Award if it has a vesting date during your period of Government Service; or
- In the case of resignation from the Firm to campaign for an elective Government Office, your name must be on the primary or final public ballot for the election. (If you are not elected, see below for employment restrictions.)

For avoidance of doubt, the performance criteria and protection based vesting set forth in these terms and conditions continue to apply to a CV Award.

Satisfaction of Conditions:

If your service in a Government Office ends two years or more after your employment with the Firm terminates, or in the case of resignation from the Firm to campaign for a Government Office, your name is on the primary or final public ballot for the election and you are not elected, any CV Awards then outstanding and any such awards that would have then been outstanding but for an accelerated distribution of shares (as described in the subsection captioned "--Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity") will be subject for the remainder of the applicable vesting period to the same terms and conditions of this Award Agreement, including employment restrictions during the vesting period, as if you had resigned from the Firm having met the requirements for Full Career Eligibility.

Failure to Satisfy Conditions:

If you do not satisfy the above "Conditions for Continued Vesting of Awards", any outstanding PSUs under the CV Award will be cancelled. You also will be required to repay the Fair Market Value of the number of shares (before tax and other withholdings) of Common Stock distributed to you that would have been outstanding as PSUs on the date you failed to satisfy the "Conditions for Continued Vesting of Award" but for their accelerated distribution (as described in subsection captioned, "Accelerated Distribution for Ethics or Conflict Reasons Resulting From Employment by a Government Entity"). Fair Market Value for this purpose will be determined as the date that the shares were distributed.

Exhibit 21

JPMorgan Chase & Co.

List of subsidiaries

While there are a number of subsidiaries that are required to be reported for various purposes to bank regulators, the following is a list of JPMorgan Chase & Co.'s significant legal entity subsidiaries as of December 31, 2020, as defined by SEC rules. The list includes the parent company of significant subsidiaries even if the parent company did not meet the definition of a significant subsidiary. Excluded from the list are subsidiaries that, if considered in the aggregate, would not constitute a significant subsidiary under SEC rules as of December 31, 2020.

Also included in the list are certain subsidiaries that have been designated as material legal entities for resolution planning purposes under the Dodd-Frank Act that did not meet the definition of a significant subsidiary under SEC rules.

December 31, 2020 Name	Organized Under The Laws Of
JPMorgan Chase Bank, National Association	United States
Paymentech, LLC	United States
J.P. Morgan International Finance Limited	United States
J.P. Morgan Bank Luxembourg S.A.	Luxembourg
JPMorgan Securities Japan Co., Ltd.	Japan
J.P. Morgan Capital Holdings Limited	United Kingdom
J.P. Morgan Securities PLC	United Kingdom
J.P. Morgan AG	Germany
JPMorgan Chase Holdings LLC	United States
J.P. Morgan Services India Private Limited	India
JPMorgan Asset Management Holdings Inc.	United States
JPMorgan Distribution Services, Inc.	United States
JPMorgan Asset Management International Limited	United Kingdom
JPMorgan Asset Management (UK) Limited	United Kingdom
JPMorgan Asset Management Holdings (Luxembourg) S.à r.l.	Luxembourg
JPMorgan Asset Management (Europe) S.à r.l.	Luxembourg
J.P. Morgan Investment Management Inc.	United States
J.P. Morgan Broker-Dealer Holdings Inc.	United States
J.P. Morgan Securities LLC	United States

Exhibit 22.2

JPMorgan Chase & Co.

JPMorgan Chase & Co. guarantee of subsidiary issuances

Securities	Guarantor
JPMorgan Chase Financial Company LLC issues, from time to time, its Global Medium-Term Notes, Series A, under the Indenture dated February 19, 2016 that are each fully and unconditionally guaranteed by JPMorgan Chase & Co. and are currently offered and sold pursuant to a Registration Statement on Form S-3 (Registration Statement Nos. 333-236659 and 333-236659-01), which was declared effective on April 8, 2020.	JPMorgan Chase & Co.

Exhibit 23

CONSENT OF INDEPENDENT REGISTERED PUBLIC ACCOUNTING FIRM

We hereby consent to the incorporation by reference in the Registration Statements on:

Form S-3
(No. 333-236659)
(No. 333-236659-01)
(No. 333-230098)

Form S-8
(No. 333-219702)
(No. 333-219701)
(No. 333-219699)
(No. 333-185584)
(No. 333-185582)
(No. 333-185581)
(No. 333-175681)
(No. 333-158325)
(No. 333-142109)
(No. 333-125827)
(No. 333-112967)

of JPMorgan Chase & Co. or its affiliates of our report dated February 23, 2021 relating to the financial statements and the effectiveness of internal control over financial reporting, which appears in this Form 10-K.

/s/ PricewaterhouseCoopers LLP
New York, New York
February 23, 2021

Exhibit 31.1

JPMorgan Chase & Co.

CERTIFICATION

I, James Dimon, certify that:

1. I have reviewed this Annual Report on Form 10-K of JPMorgan Chase & Co.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:
   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;
   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;
   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and
   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):
   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and
   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 23, 2021

/s/ James Dimon

James Dimon
Chairman and Chief Executive Officer

Exhibit 31.2

JPMorgan Chase & Co.

CERTIFICATION

I, Jennifer Piepszak, certify that:

1. I have reviewed this Annual Report on Form 10-K of JPMorgan Chase & Co.;
2. Based on my knowledge, this report does not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements made, in light of the circumstances under which such statements were made, not misleading with respect to the period covered by this report;
3. Based on my knowledge, the financial statements, and other financial information included in this report, fairly present in all material respects the financial condition, results of operations and cash flows of the registrant as of, and for, the periods presented in this report;
4. The registrant's other certifying officer and I are responsible for establishing and maintaining disclosure controls and procedures (as defined in Exchange Act Rules 13a-15(e) and 15d-15(e)) and internal control over financial reporting (as defined in Exchange Act Rules 13a-15(f) and 15d-15(f)) for the registrant and have:

   (a) Designed such disclosure controls and procedures, or caused such disclosure controls and procedures to be designed under our supervision, to ensure that material information relating to the registrant, including its consolidated subsidiaries, is made known to us by others within those entities, particularly during the period in which this report is being prepared;

   (b) Designed such internal control over financial reporting, or caused such internal control over financial reporting to be designed under our supervision, to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles;

   (c) Evaluated the effectiveness of the registrant's disclosure controls and procedures and presented in this report our conclusions about the effectiveness of the disclosure controls and procedures, as of the end of the period covered by this report based on such evaluation; and

   (d) Disclosed in this report any change in the registrant's internal control over financial reporting that occurred during the registrant's most recent fiscal quarter (the registrant's fourth quarter in the case of an annual report) that has materially affected, or is reasonably likely to materially affect, the registrant's internal control over financial reporting; and
5. The registrant's other certifying officer and I have disclosed, based on our most recent evaluation of internal control over financial reporting, to the registrant's auditors and the audit committee of the registrant's board of directors (or persons performing the equivalent function):

   (a) All significant deficiencies and material weaknesses in the design or operation of internal control over financial reporting which are reasonably likely to adversely affect the registrant's ability to record, process, summarize and report financial information; and

   (b) Any fraud, whether or not material, that involves management or other employees who have a significant role in the registrant's internal control over financial reporting.

Date: February 23, 2021

/s/ Jennifer Piepszak

Jennifer Piepszak
Executive Vice President and Chief Financial Officer

Exhibit 32

JPMorgan Chase & Co.

CERTIFICATION PURSUANT TO 18 U.S.C. SECTION 1350, AS ADOPTED PURSUANT TO SECTION 906 OF THE SARBANES-OXLEY ACT OF 2002

In connection with the Annual Report of JPMorgan Chase & Co. on Form 10-K for the period ended December 31, 2020 as filed with the Securities and Exchange Commission on the date hereof (the "Report"), each of the undersigned officers of JPMorgan Chase & Co., certify, pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002, that:

1. The Report fully complies with the requirements of Section 13(a) or 15(d) of the Securities Exchange Act of 1934; and
2. The information contained in the Report fairly presents, in all material respects, the financial condition and results of operations of JPMorgan Chase & Co.

Date: February 23, 2021 By: /s/ James Dimon

James Dimon
Chairman and Chief Executive Officer

Date: February 23, 2021 By: /s/ Jennifer Piepszak

Jennifer Piepszak
Executive Vice President and Chief Financial Officer

This certification accompanies this Annual Report and shall not be deemed "filed" for purposes of Section 18 of the Securities Exchange Act of 1934, or otherwise subject to the liability of that Section.

A signed original of this written statement required by Section 906 has been provided to, and will be retained by, JPMorgan Chase & Co. and furnished to the Securities and Exchange Commission or its staff upon request.