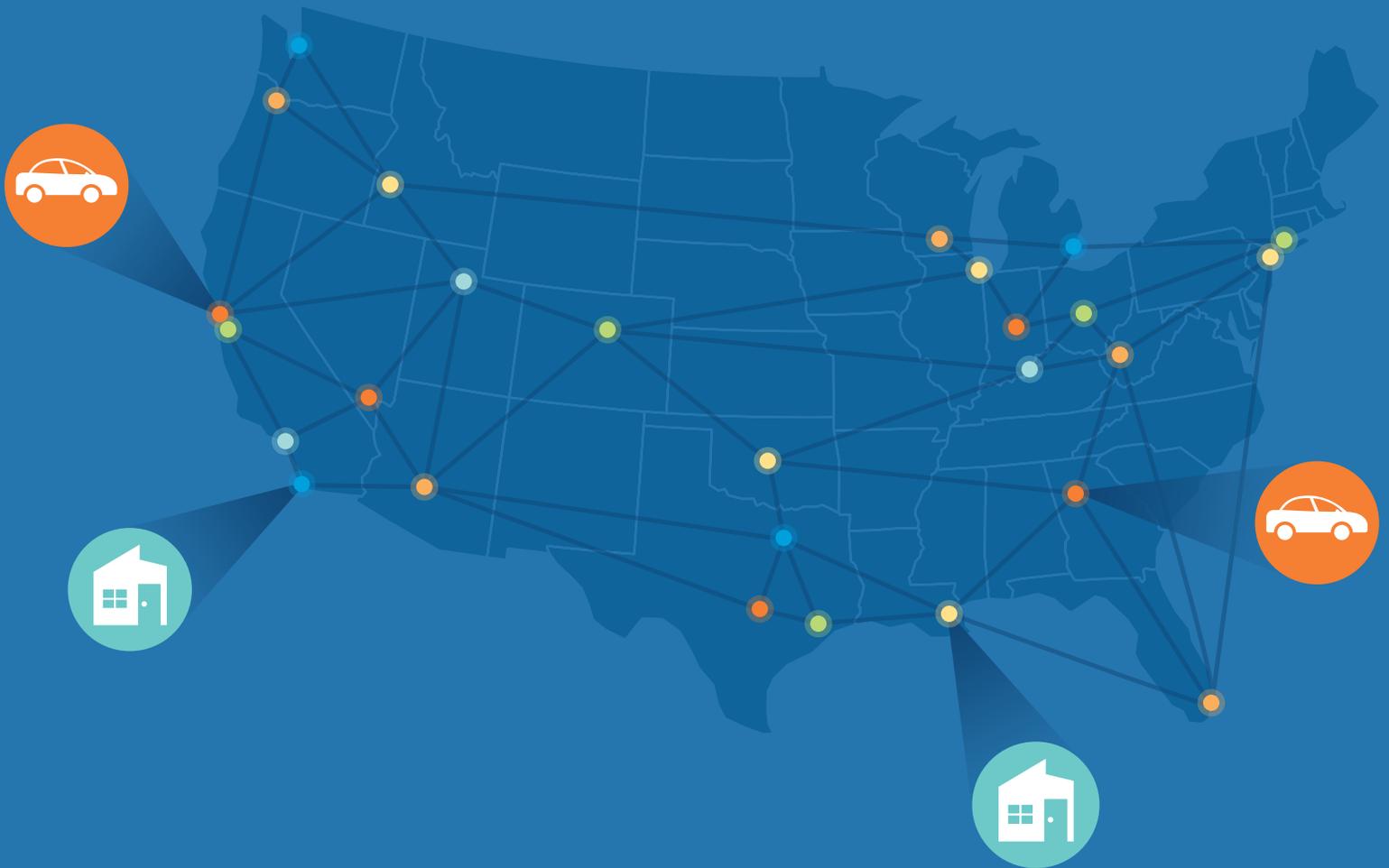


The Online Platform Economy in 27 Metro Areas

The experience of drivers and lessors



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Contact

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Executive Summary

A significant and growing fraction of families generate income through the Online Platform Economy. In recent JPMorgan Chase Institute research, we leveraged administrative banking records to track supply-side participation and revenues in the Online Platform Economy, and observed strong secular trends in two sectors between 2013 and 2018:

- Participation on transportation platforms—measured as the fraction of our sample generating income through a transportation platform in any given month—increased by a factor of 20, while average monthly revenues declined by half.
- Participation on leasing platforms tripled while average monthly revenues doubled.

We also reported large differences in participation rates across metropolitan areas.

In this follow-up research, we use geographic and temporal variation to explore these dynamics in more detail in order to get a better understanding of the viability of the transportation and leasing sectors of the Online Platform Economy as a potential source of income for participant families. We explore variation in characteristics of the Online Platform Economy over five years across 27 metropolitan areas in order to answer four questions (see box at right).

In answering these questions, we focus on transportation and leasing sectors of the Online Platform Economy, as they are most influenced by local supply and demand conditions, compared with non-transport work and selling (the other two sectors on which we have previously reported).

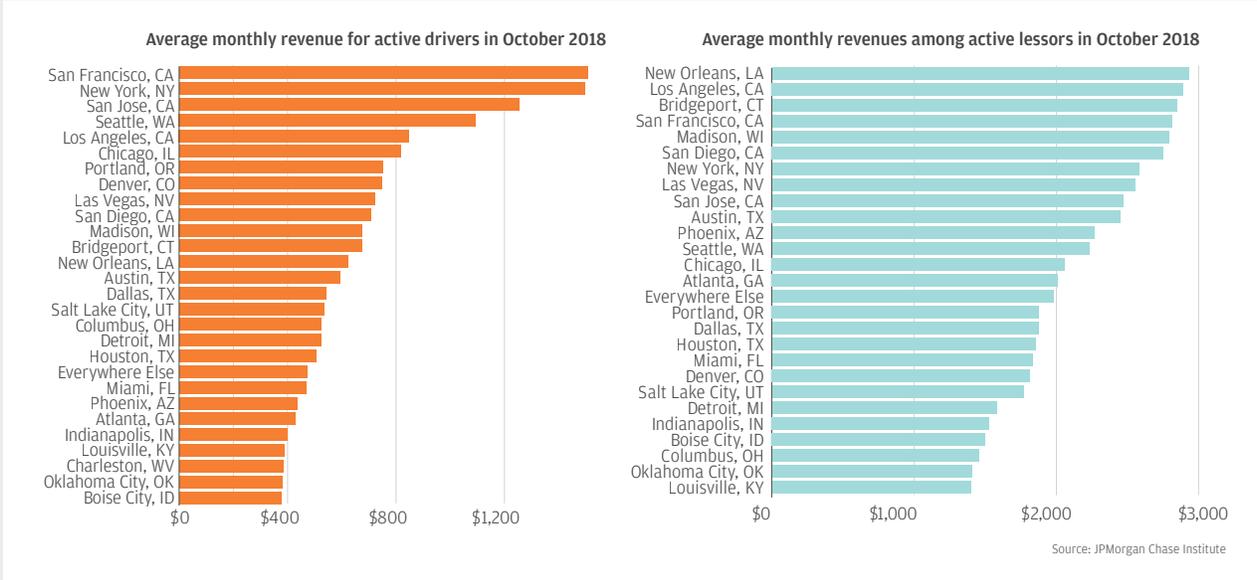
Our findings imply that there is still room for supply side growth in both sectors. However, they have implications for would-be full time drivers. More generally, they raise important questions about policy options to improve income prospects of current and potential participants in the Online Platform Economy.

Research Questions

- Given the geographic variation in platform participation, how do revenues vary across metro areas?
- What are local correlates of platform participation and revenues, which may point to factors accounting for the cross-area variation we see?
- What do the sample-wide secular trends in participation and revenues say about local metropolitan area trends—do they reflect changes in just a few metro areas, or do they tell a story that is consistent across metro areas?
- How do revenue prospects and participation rates interact—for example, did the increase in participation in the transportation sector create the decline in average monthly driver revenues?

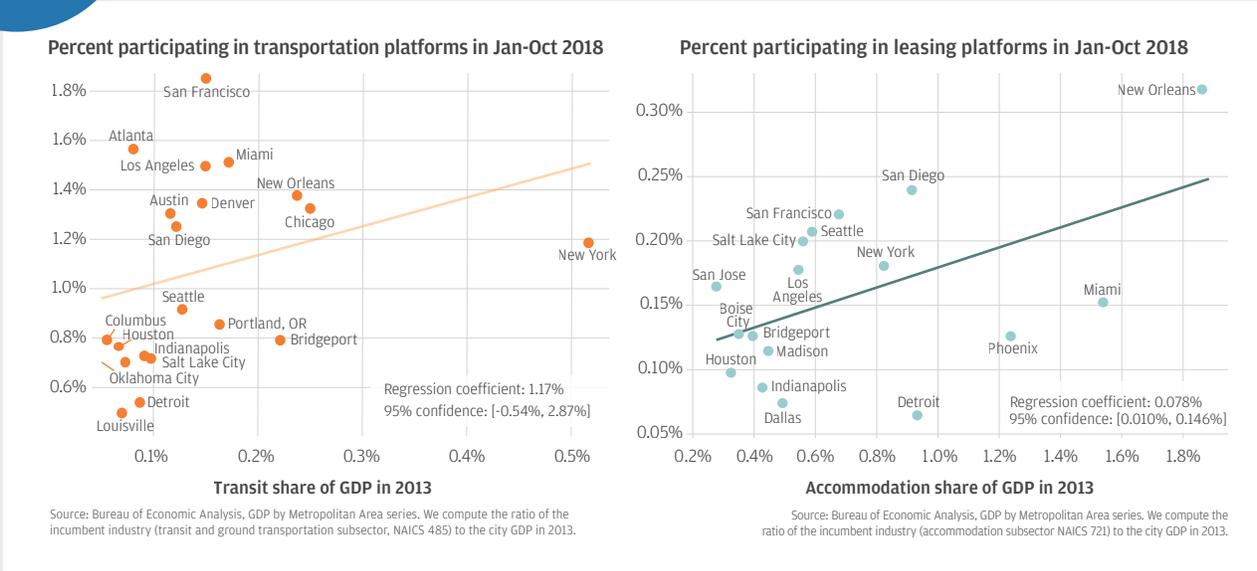
Finding One

There is significant variation across metropolitan areas in terms of participation rates, average monthly revenues, and levels of engagement in the leasing and transportation sectors of the Online Platform Economy. Participation and revenues are positively correlated but there are telling exceptions to that pattern.



Finding Two

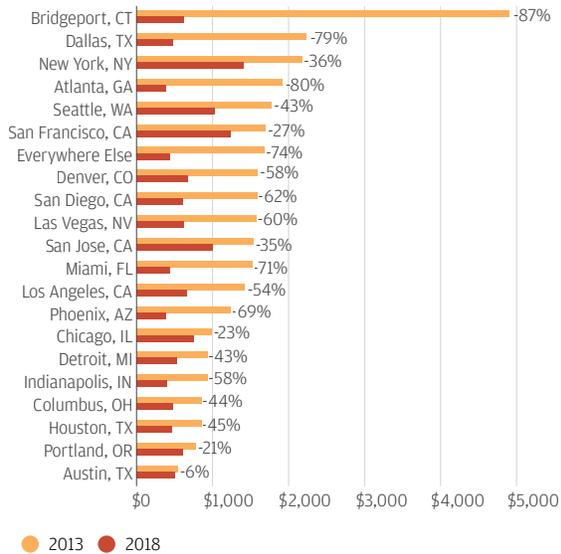
Metropolitan areas with larger incumbent industries as the Online Platform Economy emerged ended up with higher participation and higher average revenues in the corresponding platform sectors.



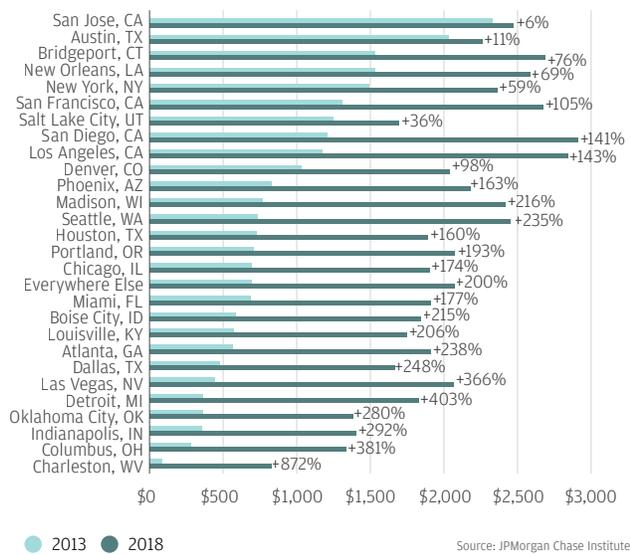
Finding Three

In almost every metro area, average monthly revenue declined for drivers and rose for lessors between 2013 and 2018, fully accounting for the secular trends in driver and lessor revenues, even as participation shares shifted across metro areas.

Change in average monthly revenues on transportation platforms from Jan-Oct 2013 to Jan-Oct 2018



Change in average monthly revenues on leasing platforms from Jan-Oct 2013 to Jan-Oct 2018



Source: JPMorgan Chase Institute

Finding Four

In both sectors but especially in transportation, participation tends to increase more in the months and places where average revenues are increasing more.

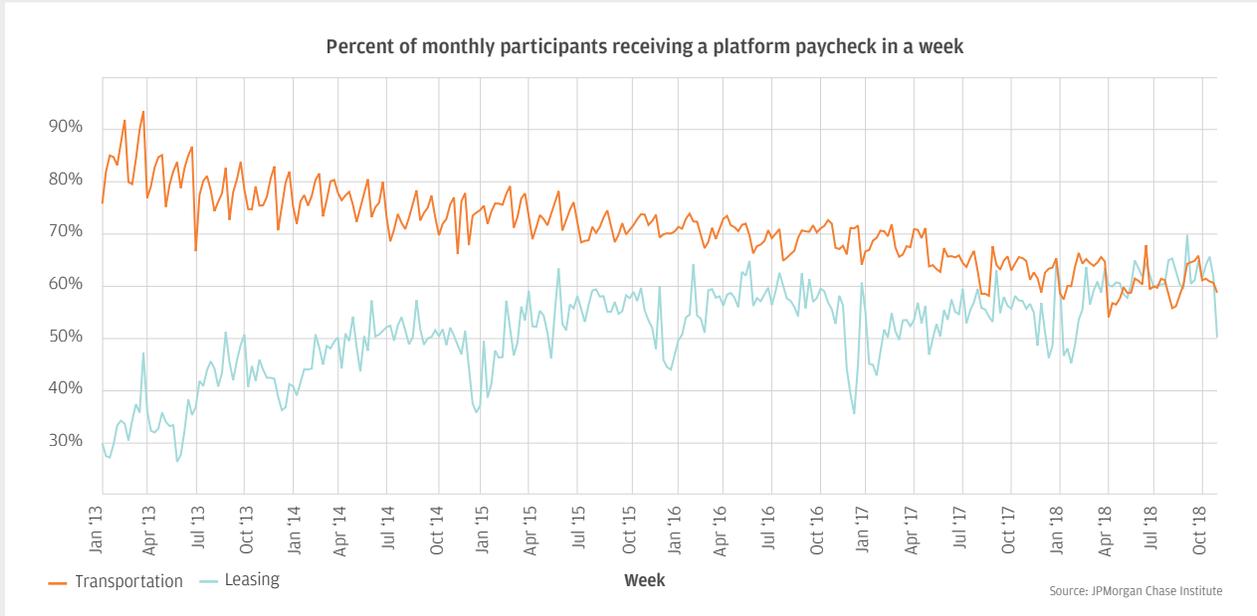
Within-city change in average revenues from one month to the next



Source: JPMorgan Chase Institute

Finding Five

At least 45 percent—and likely more—of the decline in average monthly driver revenues was accounted for by drivers participating more occasionally within the month. In the leasing sector, more frequent participation accounted for more than half of the rise in revenues.



Conclusion

Since 2013, the transportation and leasing sectors of the Online Platform Economy have grown significantly in terms of supply-side participation rates and total revenues paid to suppliers. Our results suggest that there is still room for supply-side growth in both the transportation and leasing sectors of the Online Platform Economy. Furthermore, our results raise questions about the potential effectiveness of policies to cap participation in an effort to improve revenue prospects for participants in the Online Platform Economy. As occasional engagement becomes more common in the transportation sector, important policy questions arise around what should be or can be done for would-be full-time drivers. In metro areas with large potential markets for transportation and leasing services, these sectors of the Online Platform Economy are robust alternatives for families looking to generate income, though the opportunities they present are almost certainly changing as the Online Platform Economy matures.

Introduction

A significant and growing fraction of families generate income through the Online Platform Economy. In recent JPMorgan Chase Institute research, we leveraged administrative banking records to track supply-side participation and revenues in four sectors—transportation, non-transport work, selling, and leasing, as summarized in Exhibit 1 (Farrell et al., 2018).¹ We observed strong secular trends in two of the sectors, starting in 2013. In Exhibit 2, we reproduce and extend these trends through October 2018.

- In the transportation sector, participation—measured as the fraction of our sample generating income in any given month—increased by more than a factor of 20, from 0.05 percent in 2013 to just over 1 percent in 2018, while average monthly revenues declined by half, from \$1,477 in the first 10 months of 2013 to \$754 in the first 10 months of 2018.
- In the leasing sector, participation tripled from 0.05 percent to 0.15 percent while average monthly revenues doubled from \$1,026 in the first 10 months of 2013 to \$2,242 in the first 10 months of 2018.

Understanding the trends in revenues is particularly complicated in part because of a challenge we noted in our previous research—

with administrative banking data we do not observe unit prices separately from quantities supplied. In the transportation sector for example, we cannot attribute how much of the decline in average monthly revenue per driver comes from changes in revenue per trip, in trips per hour, and in the number of hours participants spent driving per month. Adding to the challenge is the fact that these three trends are deeply interrelated. For example, a driver may respond to changing trip prices by choosing to spend fewer hours per month driving; conversely, if drivers spend more hours per month driving, that may put downward pressure on trip prices.

In previous research we also reported important differences in participation rates among these four sectors and across metropolitan areas, ranging from 2.9 percent in San Francisco to just 0.6 percent in Charleston, WV in October of 2017 (Farrell et al., 2018). Moreover, cities with the highest rates of participation in one sector did not necessarily have the highest rates in others. For example, New Orleans had the highest leasing participation rate across 26 metro areas examined, but was in the middle of the pack in terms of transportation participation.

Exhibit 1: The JPMorgan Chase Institute Online Platform Economy Dataset

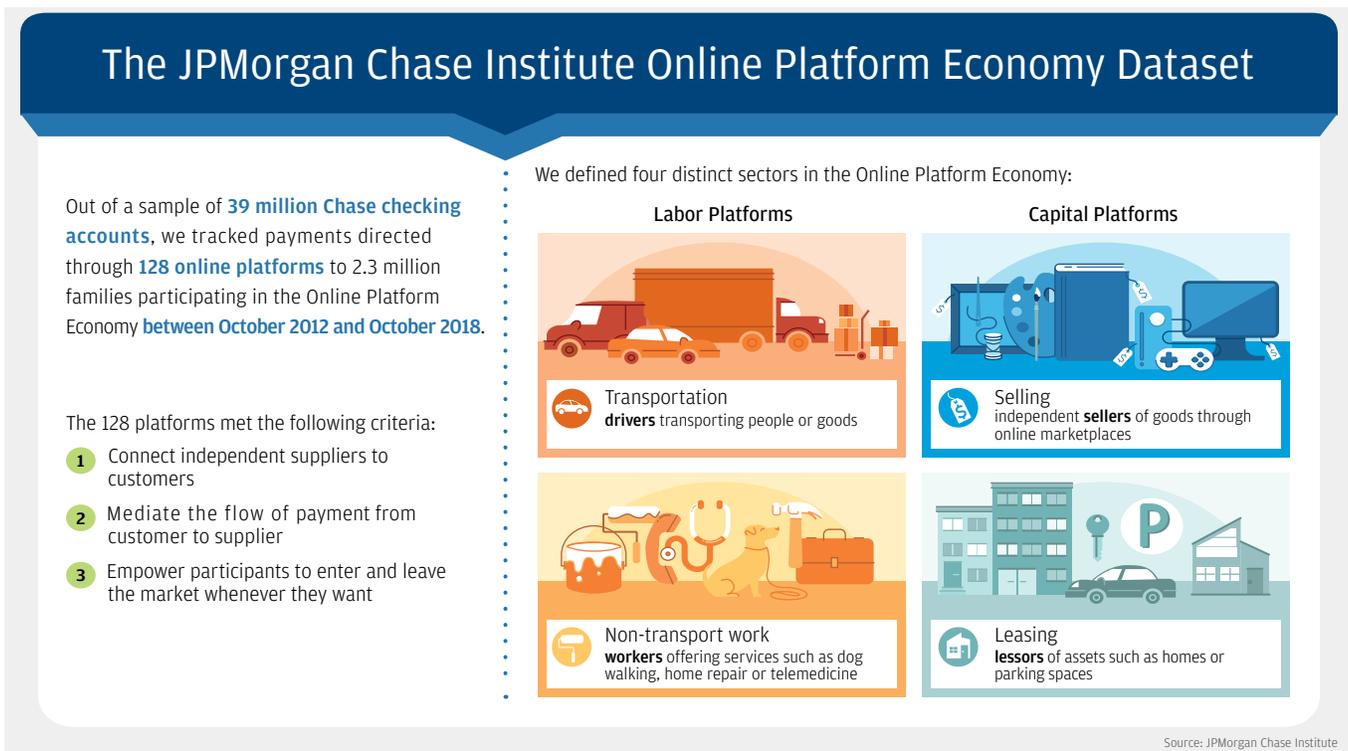
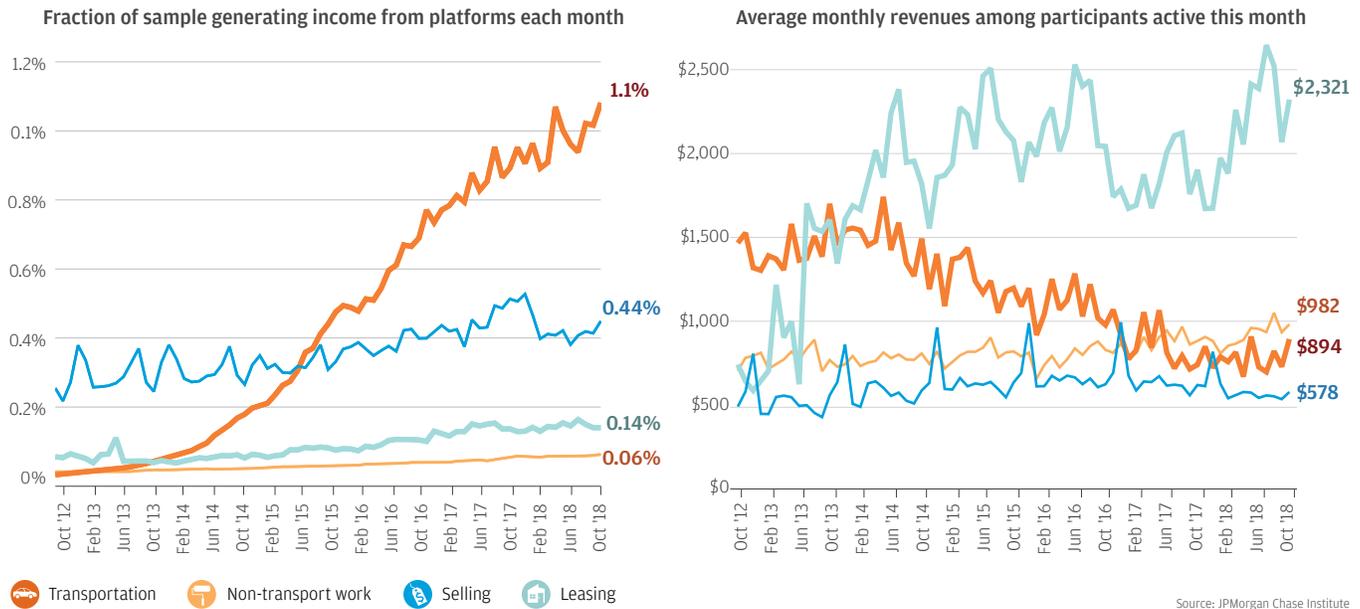


Exhibit 2: Supply-side participation has increased steadily in the transportation and leasing sectors, coinciding with decreasing average monthly transportation revenues and increasing leasing revenues



In this follow-up research, we use geographic and temporal variation to explore these dynamics in more detail, in order to better understand local correlates of participation in the Online Platform Economy and the viability of platform participation as a source of income. We explore variation in characteristics of the Online Platform Economy over six years across 27 metropolitan areas—along with a 28th residual group which we label “Everywhere Else”—in order to answer four questions.²

- Given the geographic variation in platform participation, how do revenues vary across metro areas?
- What are local correlates of platform participation and revenues, which may point to factors accounting for the cross-area variation we see?
- What do the sample-wide trends shown in Exhibit 2 say about local metropolitan area trends—do they reflect changes in just a few metro areas? Do they tell a story that is consistent across metro areas?
- How do revenue prospects and participation rates interact—for example, did the increase in participation in the transportation sector shown in Exhibit 2 precipitate the decline in average monthly driver revenues?

We focus on the transportation and leasing sectors, as they are most influenced by local supply and demand conditions, compared to the non-transport work and selling sectors, which may connect buyers and sellers in remote, purely online transactions. Importantly, we assign metro area based on where

the supply-side participant lives, which may not be where the customer lives or where services are provided. Our findings for the two sectors parallel each other closely, but the key questions and nuances are sufficiently distinct that in our discussion we will deal with each sector in turns. We also provide an Appendix that includes a variety of participation and revenue statistics for the non-transport work and selling sectors.

This study is the first to our knowledge exploring month-to-month cross-metropolitan area variation in platform participation and revenues, though a limited literature exists on demand- and supply-side factors that influence the Online Platform Economy, some of which leverages city-specific data.³

In characterizing the local correlates of platform participation and revenue, we focus on two sets of measures. The first set of measures is the prominence of incumbent transportation and accommodation industries in each metro area’s economy before the Online Platform Economy became established. These measures provide an indicator of the potential market size for platform transportation and leasing services, thereby pointing to the demand side of the Online Platform Economy. The second set of measures points to supply-side factors—specifically, local labor market conditions that would likely impact families’ willingness to try the Online Platform Economy as a source of income. These include the average number of hours required to earn the local median rent, and local employment-to-population ratios. We find that the demand-side characteristics are more reliable correlates, suggesting that in most metro areas there is likely to be room for the Online Platform Economy to absorb more participants.

In relating the sample-wide revenue trends in Exhibit 2 (declining for drivers, increasing for lessors) to local metropolitan area trends, we quantitatively decompose the trend into two components: within-area trends in average monthly revenues versus across-area shifts in platform participation. We find that the revenue trends shown in Exhibit 2 were mirrored within almost every one of the 28 areas, and in fact the within-area component fully accounts for the sample-wide fall in driver revenues and rise in lessor revenues.

In exploring direct interactions between participation rates and revenue prospects, we examine the correlation between changes in these two outcomes at multiple levels of temporal and spatial resolution. We find that in both sectors but especially in transportation, participation increases most sharply in the areas and months where average revenues are rising most sharply. Among the most important implications of this finding is that it calls into question hypotheses of a direct causal link between rising driver participation and falling average driver revenue. In almost every metro area, driver revenues fell over the five-year period, and participation rose, but the months (and even the quarters) when participation grew fastest were not the months (or quarters) when revenues fell fastest. We build on this and find that trends in the frequency of participation account for a significant fraction of trends in average monthly revenues in both sectors.

Our key findings are as follows:

1. There is significant variation across metropolitan areas in terms of participation rates, average monthly revenues, and levels of engagement in the leasing and transportation sectors of the Online Platform Economy. Participation and revenues are positively correlated, but there are telling exceptions to that pattern.
2. Metropolitan areas with larger incumbent industries as the Online Platform Economy emerged ended up with higher participation and higher average revenues in the corresponding platform sectors.
3. In almost every metro area, average monthly revenue declined for drivers and rose for lessors between 2013 and 2018, fully accounting for the sample-wide secular trends in driver and lessor revenues, even as participation shares shifted across metro areas.
4. In both sectors but especially in transportation, participation tends to increase more in the months and places where average revenues are increasing more.
5. At least 45 percent—and likely more—of the decline in average monthly driver revenues was accounted for by drivers participating more occasionally within the month. In the leasing sector, more frequent participation accounted for more than half of the rise in revenues.

Our results suggest that there is still room for supply-side growth in both sectors. However, especially in the transportation sector, the fact that trends in average monthly revenues largely reflect trends in the frequency of participation may have implications for would-be full time drivers. Taken together, our findings raise important questions about policy options to improve income prospects of current and potential participants in the Online Platform Economy.

Findings

Finding One

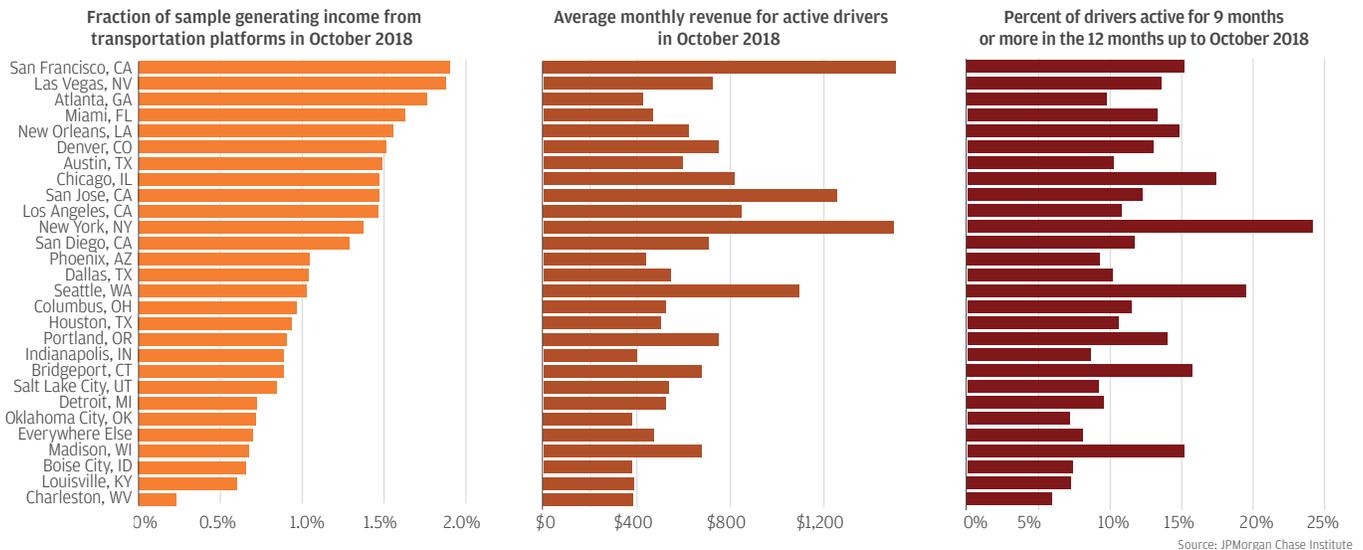
There is significant variation across metropolitan areas in terms of participation rates, average monthly revenues, and levels of engagement among participants in the leasing and transportation sectors of the Online Platform Economy. Participation and revenues are positively correlated, but there are telling exceptions to that pattern.

In previous JPMorgan Chase Institute Research, we reported variation in Online Platform Economy participation across 26 metropolitan areas in our sample (Farrell et al., 2018). We measure participation as the fraction of families in our sample generating any income off platforms in each month. In this section, we update those results to October 2018, extend them to other outcomes, and expand them to include one more metropolitan area (Austin, TX) as well as a residual group which we label “Everywhere Else.” We focus on the month of October because it typically does not display a seasonal peak or trough in terms of income or spending. The cross-metro variation we show is similar, no matter which month we choose.

Transportation Sector

The significant variation across cities in driver participation shown in the left panel of Exhibit 3—from just under two percent of families in San Francisco to less than a quarter of a percentage point in Charleston, WV—is similar to the variation in average monthly revenues per participant, in the middle panel. San Francisco was the highest revenue area (\$1,508 per driver in October 2018), and Charleston, WV the lowest (\$378 per driver). However, comparing these two panels illustrates that the variation across metro areas in terms of participation does not perfectly reflect variation in terms of revenues. In the right panel, we show variation in driver engagement—the fraction of October 2018 drivers who had also earned driving income in eight or more other months over the previous year. Patterns in engagement also reflect patterns in revenues; the highest revenue cities including San Francisco, San Jose, New York, and Seattle are also the cities with the most engaged drivers, and cities with very high rates of participation but low revenues like Las Vegas and Atlanta have relatively low levels of engagement. This pattern foreshadows a deeper finding we will discuss in later sections—average monthly revenues are to a great extent a reflection of how occasionally participants use transportation platforms to generate income.

Exhibit 3: Transportation sector participation, average revenue, and engagement varied widely across metro areas



The left and middle panels of Exhibit 3 indicate that metro areas with higher participation rates also tend to have higher revenues. Exhibit 4 shows that relationship directly; some of the variation around the pattern is telling. The regression coefficient implies that if one metro area has a participation rate 0.1 percentage point higher than another, then average monthly revenues are also about \$37 per month higher. This pattern challenges any simple hypothesis drawing a direct causal link from higher participation to lower revenues in the transportation sector. Furthermore, the variation around the pattern could point the way to a deeper understanding of supply- and demand-side factors that might be playing outsized roles in shaping the evolution of the Online Platform Economy in some metro areas, as we will discuss.

Leasing Sector

Exhibit 5 shows variation in leasing participation rates and average monthly revenues per lessor across the 28 metro areas in our study. As the left panel shows, participation on leasing platforms is still limited. Participation rates were highest in New Orleans, where only 0.34 percent of sample families generated any income on leasing platforms in October 2018. They were lowest in Detroit and Oklahoma City, where the corresponding fraction was less than 0.06 percent. As the middle panel shows, average monthly revenues generated are over \$1,000 in all cities, though they vary widely across cities (from \$2,929 in New Orleans to \$1,396 in Louisville). Since these are gross revenues, it is important to note that the operating costs of lessors may also be considerable.

The right panel also indicates wide variation across areas in terms of lessor engagement—the fraction of October 2018 lessors who had generated leasing revenues in eight or more other months going back to November 2017. In two metro areas—New Orleans and Portland—more than 20 percent of participants were highly engaged by this metric, whereas in three others—Dallas, Detroit, and Oklahoma City—that fraction was eight percent or less.

Exhibit 4: Metro areas with higher levels of driver participation tend to have higher average monthly revenues

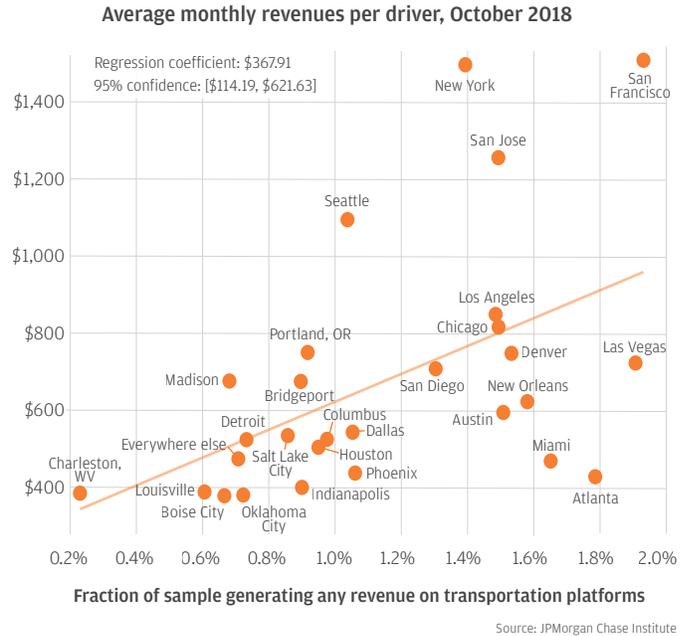


Exhibit 5: Leasing sector participation, average revenue, and engagement varied widely across metro areas

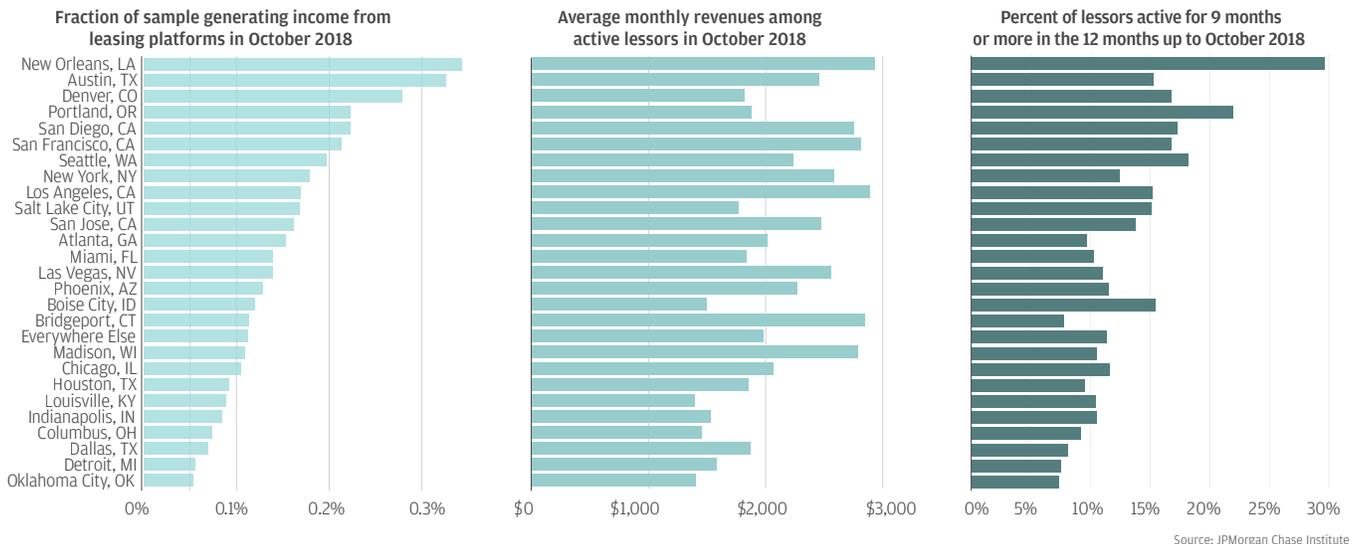


Exhibit 6 shows the relationship between leasing participation rates and average revenues directly. On average, an area with leasing participation rate 0.1 percentage point higher than another will have revenues \$402 higher.

There are a number of areas that stray from the overall pattern in Exhibit 6; in these areas, average monthly revenues are quite different from others with similar participation rates. As we discuss below, these areas may contain important lessons for others.

Lessons of these Patterns for Both Sectors

Exhibits 4 and 6 demonstrate that in both the transportation and leasing sectors of the Online Platform Economy, average monthly revenues per participant are higher in metro areas with a higher prevalence of participants. However, in both cases a number of metro areas stray from the overall pattern; these cities' experiences and choices may contain important lessons for their peers.

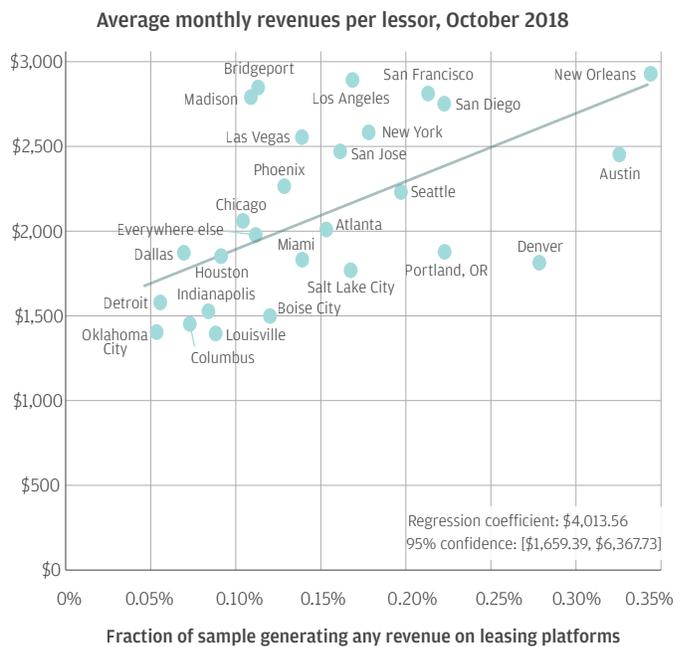
On transportation platforms (see Exhibit 4), among the metro areas with strikingly high revenues are New York and Seattle. Driver participation rates in New York are similar to those in Los Angeles, Chicago, and Denver but average monthly driver revenues are 20-25 percent higher; participation rates in Seattle and Portland are similar, but driver revenues in Seattle are more than 45 percent higher. Among those with surprisingly low revenues, Atlanta stands out—participation rates in Atlanta are as high as those in San Francisco, but driver revenues are among the lowest across the 28 areas.

On leasing platforms (see Exhibit 6), Los Angeles, San Diego, and San Francisco stand out for having higher revenues than other cities with similar rates of participation; Portland and Austin, for having lower.

What local characteristics or policy decisions might explain why these particular cities stand so far apart from the overall pattern? Listing and quantitatively testing every candidate explanation goes beyond the scope of this study, but several supply- and demand-side factors are likely to play a role.

On the supply side, regulation may be important. In the transportation sector, Seattle requires drivers to hold a King County for-hire driver's license and a City of Seattle business license, as well as pass a licensing examination. These requirements are much more demanding than anything necessary in Chicago or Los Angeles (SFCTA, 2017). They may create relatively higher fixed costs for potential participants, which would explain why those who do participate tend to be more engaged (see Exhibit 3) and to generate relatively higher revenues compared to other cities with similar participation rates. In the leasing sector, San Francisco requires lessors to obtain a valid Short-Term Residential Rental Certificate and Business Registration Certificate and to lease out only their primary residence, for a maximum of 90 days per year (San Francisco Business Portal, 2019). This may partially explain why participation remains relatively low even though average monthly revenue per lessor is among the highest in the nation. By contrast, Austin allows lessors to rent out non-owner-occupied properties for an unlimited number of days (City of Austin, 2019), which may explain why participation rates are so much higher than in other cities with similar average monthly revenues.

Exhibit 6: Average monthly leasing revenues are higher in metro areas with higher leasing participation rates



Regulation alone cannot explain every one of these special cases, however. For example, it likely does not explain why average monthly revenues among drivers in Atlanta are among the lowest of all 28 areas even as participation rates are among the highest. Demand-side factors may also play a role, including potential passengers' outside options as reflected in the availability of public transit options, vehicle ownership rates, and the density of the metro area. Vehicle ownership rates in Atlanta are among the highest of all metro areas in the United States, with 94 percent of households owning at least one vehicle. In New York and San Francisco, two cities with comparable participation rates to Atlanta and considerably higher average monthly driver revenues, vehicle ownership rates are far lower—70 percent and 88 percent, respectively (U.S. Census Bureau, 2017).

Demand-side factors are also strong candidates to explain some of the special cases in the leasing sector. Outside options available for potential lessees of short-term housing would likely be reflected in metro area population density, hotel occupancy rates, and average hotel room rates. San Francisco and Seattle have similar participation rates, but average lessor revenue is considerably higher in San Francisco; this may be related to the fact that San Francisco is more densely populated than Seattle and generally has higher hotel occupancy and room rates (U.S. Census Bureau, 2017; City of San Francisco, 2019; Kidder Mathews, 2019).

In addition to these illuminating exceptions, the general rule we have identified in this section is also important—for both the transportation and leasing sectors, metro areas with higher rates of participation also have higher average monthly revenues per participant. This positive association is consistent with evidence from platforms' own data, which indicates that drivers and lessors are highly responsive to demand-driven price changes (e.g. Hall et al, 2016; Chen and Sheldon, 2015; Zervas et al 2016). It calls into question any simple hypothesis drawing a direct causal link from high participation rates to low average revenue per participant. It also raises questions about local correlates of participation and revenues, which may motivate causal hypotheses to explain the spatial variation we have seen throughout this section. In the next section we further explore direct associations between each of a few key supply- and demand-side area characteristics on one hand, and participation and revenues on the other.

**Finding
Two**

Metropolitan areas with larger incumbent industries as the Online Platform Economy emerged ended up with higher participation and higher average revenues in the corresponding platform sectors.

As we discussed in the previous section, any number of local area characteristics may play a role in explaining cross-metro variation in platform participation and revenue. In this section, we focus on two sets of measures. The first is the prominence of incumbent transportation and accommodation industries in each metro area’s economy before the Online Platform Economy became established. These measures provide an indicator of the potential market size for new transportation and leasing service providers, thereby pointing at the demand side of the Online Platform Economy. However, it is important to note that the emergence of new platforms likely generated new demand for these services, and so the size of incumbent industries only suggests the size of the potential market (Hall et al, 2016; Schaller, 2018).

The second set of local characteristics we explore point to the supply side of the Online Platform Economy, comprising local labor market conditions that would likely impact families’ willingness to try platforms as a source of income. These include the average number of hours required to earn the local median rent, and local employment-to-population ratios. In previous research, we showed that families for whom we observed payroll income from a formal employer were 44 percent less likely to participate on transportation platforms compared with those for whom we did not, and that platform revenues and payroll income are countercyclical (Farrell and Greig, 2016; Farrell et al., 2018). These patterns fit with a finding reported by other researchers, that platform participation is one response to unemployment (Kousta, 2018). Do these family-level patterns add up to an area-level pattern, whereby areas with lower rates of formal employment would also have more participants in the Online Platform Economy? We also investigate cost of living as a potential correlate, because even if employment is high in a metro area, a high cost of living may cause families to consider turning to platforms to help make ends meet.

Transportation Sector

The incumbent industry measure we use for the transportation sector is the share of the metro area’s total GDP in 2013 which was generated in the “transit and ground transportation” subsector (NAICS 485). This subsector does not overlap perfectly with the transportation sector of the Online Platform Economy, because while both include passenger transportation, the “transit and ground transportation” subsector of the local economy does not include moving or delivery services. Nonetheless, a relatively large transit subsector likely indicates more potential customers for platform drivers.

As Exhibit 7 shows, platform activity accounted for a negligible fraction of the transit subsector of GDP in all cities in 2013, with the arguable exception of San Francisco, where many of the transportation platforms first launched.⁴ However, as Exhibit 8 shows, the relative size of that subsector in 2013 was an important predictor of the size that the Online Platform Economy transportation sector had achieved by 2017, as measured by both participation rates and average monthly revenues per driver.⁵ The left panel of Exhibit 8 suggests that if the transit subsector accounted for 0.1 percentage point more of one metro area’s total GDP than that of another metro area in 2013, then five years later, participation on transportation platforms was also 0.1 percentage point higher and average revenue per participant \$193 higher.

Exhibit 7: Transportation platforms accounted for a negligible fraction of the transit subsector of most metro areas' GDP in 2013

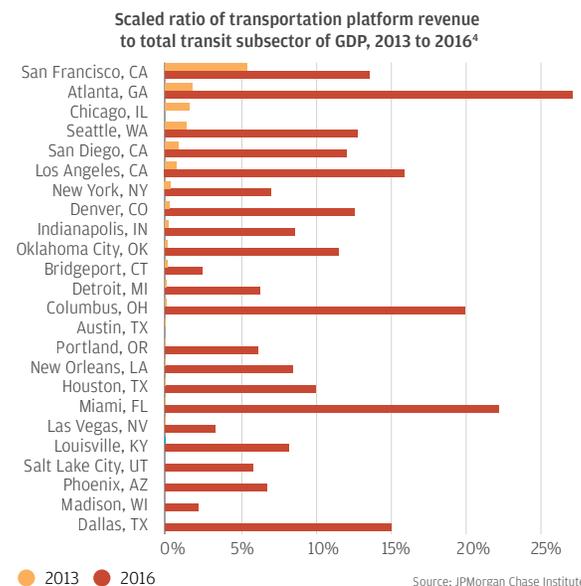
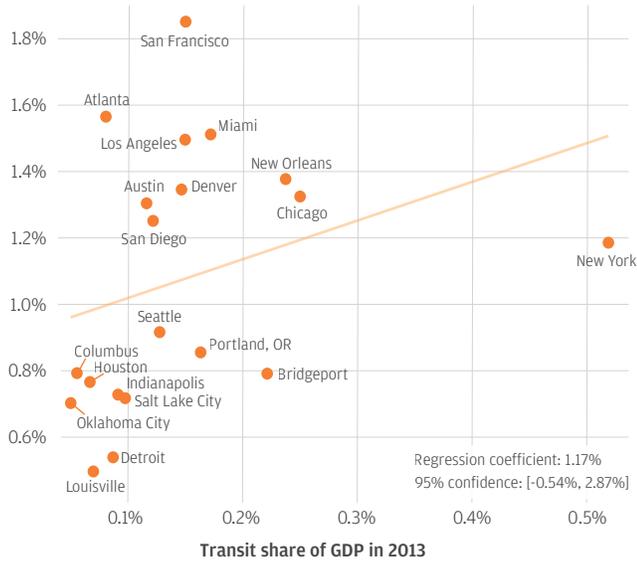
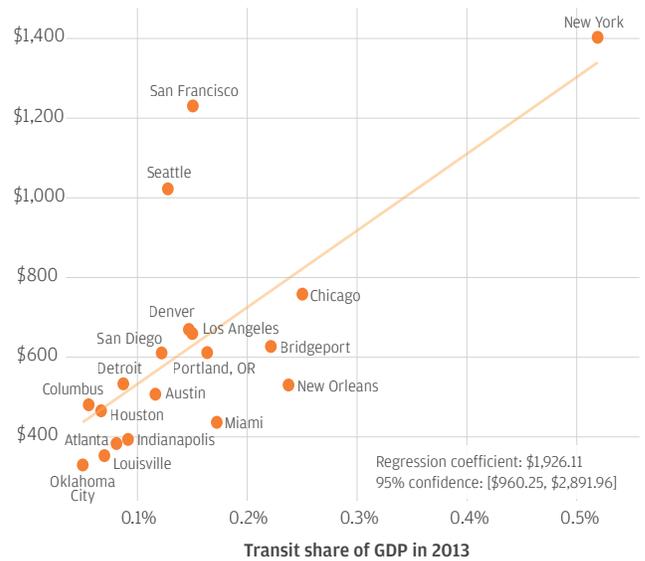


Exhibit 8: Transportation platform participation and average monthly revenues were highest in 2018 where initial potential market size was largest

Percent participating in transportation platforms in Jan-Oct 2018



Average monthly revenue in transportation platforms in Jan-Oct 2018

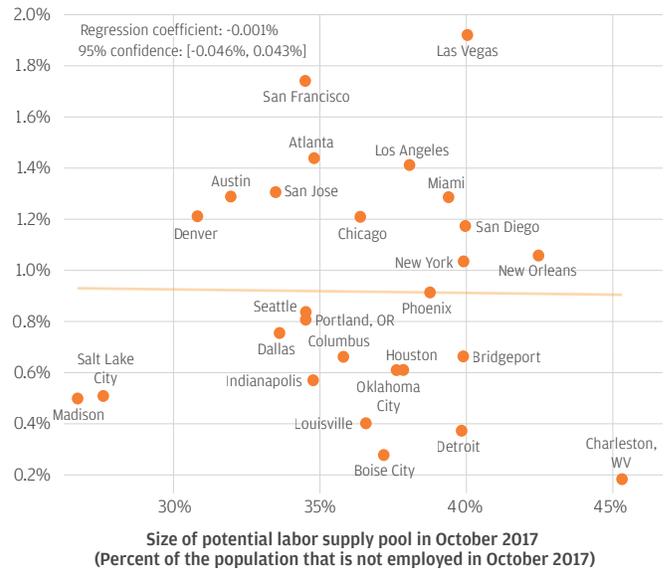


Source: Bureau of Economic Analysis, GDP by Metropolitan Area series. We compute the ratio of the incumbent industry (transit and ground transportation subsector, NAICS 485) to the city GDP in 2013.

Exhibit 9 indicates that although individual families are more likely to turn to transportation platforms to generate income when they do not have a traditional job, the rate of participation on these platforms is still sufficiently low (1.2 percent of even non-employed families) that this does not add up to a macro-level pattern. Driver participation rates are similar in areas with lower employment-to-population ratios to those with higher ratios. Similarly, average monthly driver revenues do not vary with employment-to-population ratios (see Exhibit 27 in Appendix). Whether this would continue to hold in the context of wider shocks like a deep recession remains an open empirical question.

Exhibit 9: Local employment-to-population ratios are not correlated with driver participation rates

Fraction of city sample generating transportation platform income

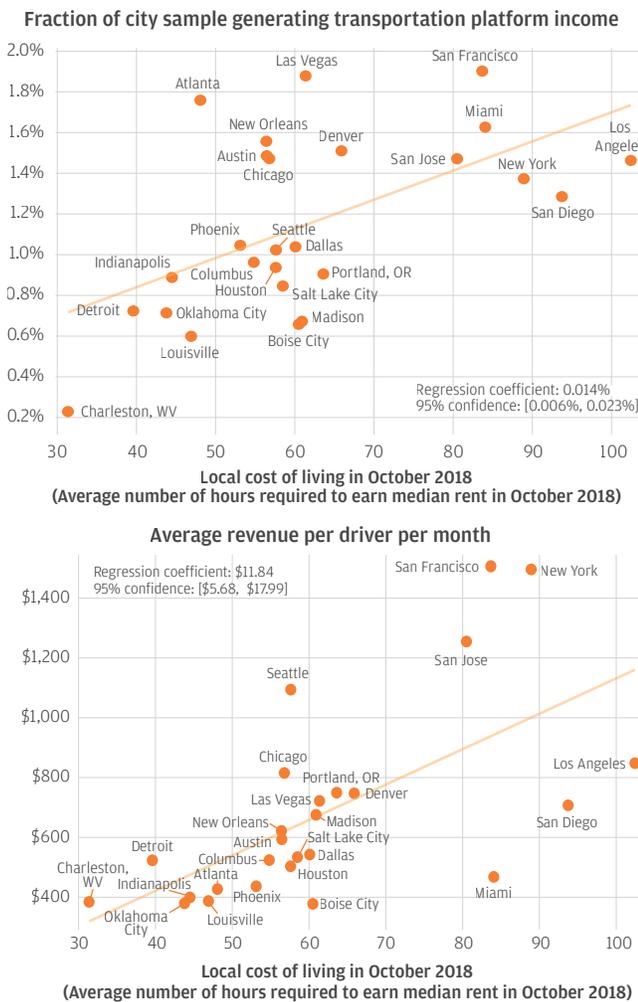


Source: Bureau of Labor Statistics, Local Area Unemployment Statistics and American Community Survey. We divide the count of the employed population in October 2017 by total civilian population over 18. We interpolate 2017 monthly population values assuming a linear growth rate over the year and using the growth rate for 2016 to 2017.

Driver participation rates in a metro area are not associated with formal employment rates. Whether this would still be true in a recession remains an open question.

In contrast to employment rates, however, Exhibit 10 shows that areas with higher cost of living also have higher rates of driver participation (top panel) and higher average driver revenues (bottom panel). If it takes 10 more hours for an average wage earner to cover the median rent in one metro area compared with another, then participation rates are on average 0.1 percentage point higher in the more expensive area. This pattern may indicate high costs of living drawing families into the Online Platform Economy to supplement their incomes. Importantly, however, in that example average monthly revenues per participant are also on average \$118 higher in the more expensive area. In fact, every local correlate we examined which is positively correlated with participation has also been positively correlated with revenues. These patterns call into doubt the hypothesis that factors drawing families onto transportation platforms might then put downward pressure on revenue potential for participants.

Exhibit 10: Local cost of living is positively correlated with driver participation rates and average driver revenues



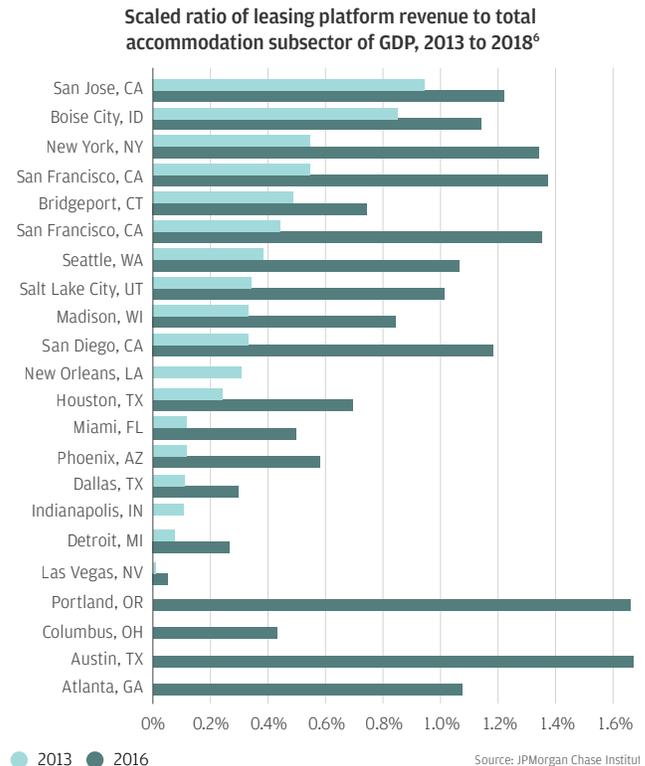
Source: Bureau of Labor Statistics, Current Employment Statistics and Zillow. We divide the median list price by the average wage in that metropolitan area.

Leasing Sector

For the leasing sector, we summarize potential market size with the share of 2013 GDP generated in the “accommodation” subsector (NAICS 721). This represents only a subset of the leasing sector of the Online Platform Economy. Leasing platforms facilitate many types of transactions, including not only short-term accommodations but also parking space leases, equipment rentals, car rentals, and others. However, a significant fraction of the earliest platform activity in this sector was likely to have been home sharing, and a relatively large accommodation subsector likely indicates more potential customers for lessors.

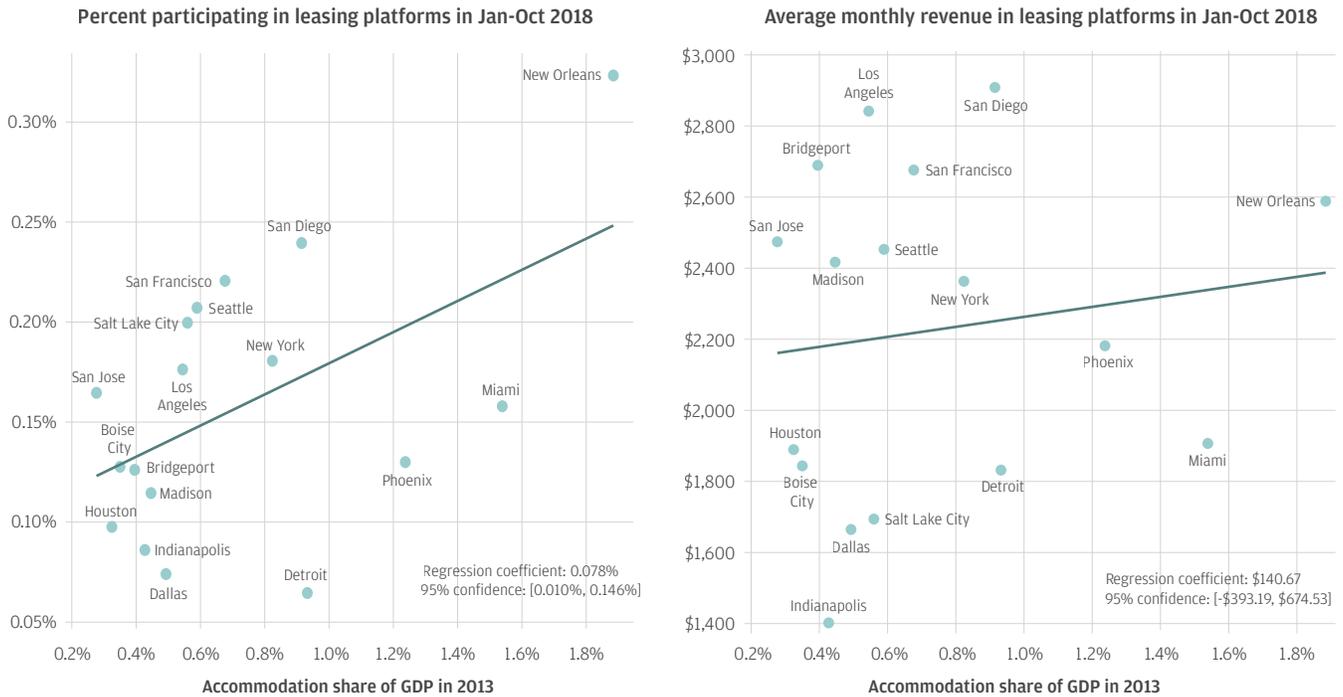
As Exhibit 11 shows, the entire leasing sector of the Online Platform Economy represented a negligible share of local accommodation income in 2013, and in fact remained negligible even into 2016.⁶ Nonetheless, as Exhibit 12 shows, this measure of potential market size was a strong predictor of the size that the Online Platform Economy leasing sector had achieved by 2018. If the accommodation subsector accounted for 0.1 percentage point more of a metro area’s GDP compared with that of another in 2013, then lessor participation rates five years later are on average 0.8 percentage point higher and average monthly revenues \$14 higher.

Exhibit 11: The leasing sector of the Online Platform Economy was a negligible fraction of local accommodation GDP in both 2013 and 2016



Source: JPMorgan Chase Institut

Exhibit 12: Leasing platform participation and average monthly revenues were highest where the potential market size was largest

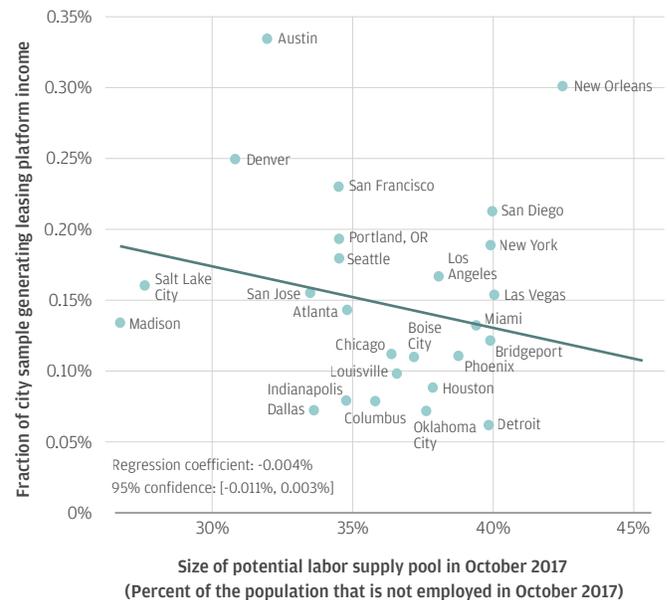


Source: Bureau of Economic Analysis, GDP by Metropolitan Area series. We compute the ratio of the incumbent industry (accommodation subsector NAICS 721) to the city GDP in 2013.

Families who need to cover gaps in employment income may turn to platforms on which they can lease out assets. However, Exhibit 13 indicates that this is not a plausible candidate explanation for variation across metro areas in terms of lessor participation rates. Areas with higher employment-to-population ratios have similar participation rates to those with lower ratios. The same is true for average monthly revenues (see Exhibit 27 in the Appendix).

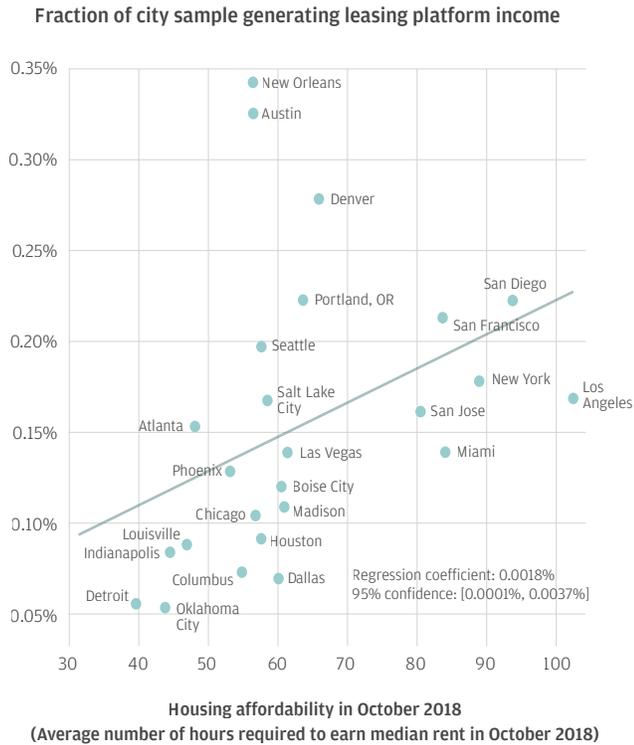
In contrast to employment rates, however, Exhibit 14 shows that cost of living is correlated with the size of the leasing sector of the Online Platform Economy. Importantly, our summary measure for cost of living is the number of hours of work at the average wage required to cover the median rent. Local housing costs almost certainly also reflect market prices for short term accommodation. Therefore, this indicator points to both the supply and demand sides of the leasing sector. It is strongly correlated with average monthly lessor revenues. The pattern in Exhibit 14 indicates that if it takes 10 more hours of work for the average wage earner to cover the median rent in one metro area compared with another, then leasing participation rates are on average 0.02 percentage points higher (left panel), and average revenues per participant are \$217 per month higher (right panel).

Exhibit 13: Local employment rates are not correlated with participation rates on leasing platforms



Source: Bureau of Labor Statistics, Local Area Unemployment Statistics and American Community Survey. We divide the count of the employed population in October 2017 by total civilian population over 18. We interpolate 2017 monthly population values assuming a linear growth rate over the year and using the growth rate for 2016 to 2017.

Exhibit 14: Local cost of living is positively correlated with lessor participation rates and average monthly revenues



Source: Bureau of Labor Statistics, Current Employment Statistics and Zillow. We divide the median list price by the average wage in that metropolitan area.

Lessons of These Patterns for Both Sectors

The results in this section indicate that the potential sizes of local platform markets are strong correlates of participation and revenues. Importantly, however, every local characteristic that was associated with higher levels of participation was also associated with higher average monthly revenues. This suggests that rising participation may not directly cause falling average revenues, which are two coincident trends we observed in prior research (Farrell et al, 2018). In the next section, we directly explore potential drivers of the revenue trends we have observed.

The size of the potential market is positively correlated with participation and average monthly revenues on transportation and leasing platforms.

Finding Three

In almost every metro area, average monthly revenue declined for drivers and rose for lessors between 2013 and 2018, fully accounting for the secular trends in driver and lessor revenues, even as participation shares shifted across metro areas.

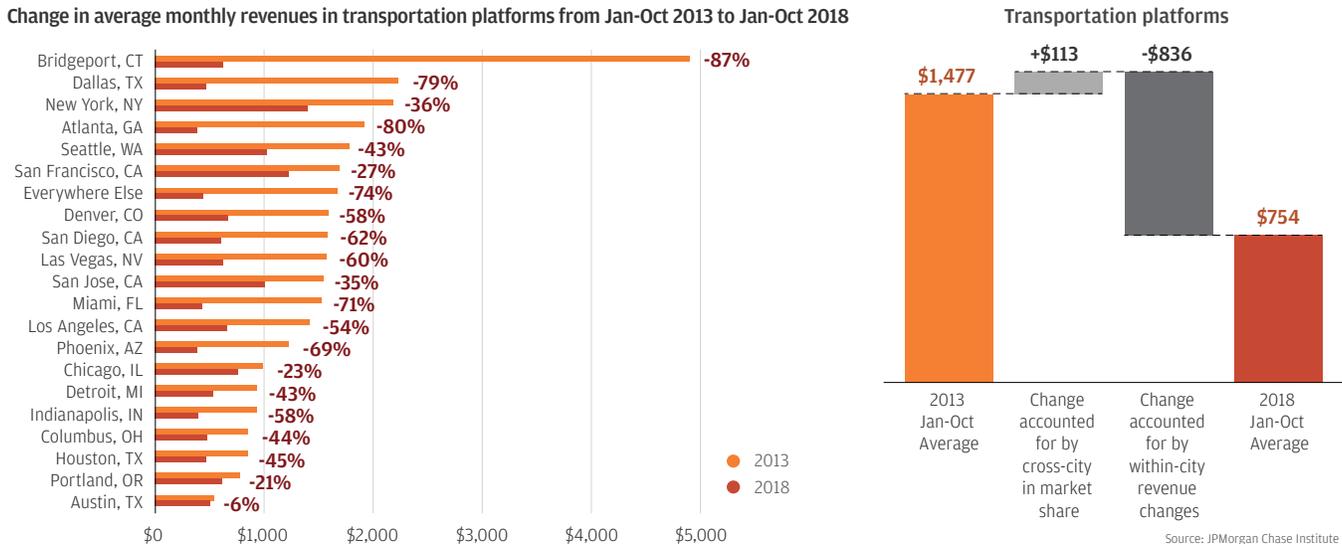
As we discussed in the context of Exhibit 2, average monthly driver revenues fell from \$1,477 to \$754 between the first ten months of 2013 and the first ten months of 2018, and average monthly lessor revenues rose from \$1,026 to \$2,242. What do these trends say about local metropolitan area changes? Do they reflect changes in just a few metro areas? Do they tell a story that is consistent across many areas? To explore these questions, we quantitatively separate the contributions to the sample-wide trend which were made by differences *between* metro areas in participation growth, versus changes *within* metro areas in average monthly revenues.

The potential importance of changes across metro areas in contributing to these trends is suggested in Exhibits 7 and 11, which showed that in 2013 the Online Platform Economy was highly localized to a relatively small number of metro areas, whereas over the subsequent few years it had expanded more broadly. Even if average monthly revenues had not changed in any locality, this compositional shift could by itself generate the overall revenue trends we observed, if there was a strong enough correlation between participation growth and revenue levels. As we illustrate in this section, however, this is in fact not what happened in either sector.

Transportation Sector

The left panel of Exhibit 15 shows changes in average monthly driver revenue in 20 of the 27 metro areas in our study. In the other seven, there were too few participants in 2013 to present the area average, and so those are rolled into the residual group which we label “Everywhere Else.” Revenues fell by 40 percent or more in 15 areas and did not increase in any area. In the right panel, we incorporate these local changes into a full quantitative decomposition of the overall trend. The second (light grey) bar indicates that if average monthly driver revenues had remained constant in every metro area, but the shift in participation across areas had occurred as observed, sample-wide average monthly revenues would in fact have grown by \$113 between the first ten months of 2013 and the first ten months of 2018. The third (dark grey) bar, therefore, indicates that net of this compositional effect, declines in local average driver revenues alone would have resulted in an overall average decline of \$836, 16 percent larger than the \$723 decline we actually observed.

Exhibit 15: Average monthly driver revenues fell in every one of 21 areas between 2013 and 2018, and local area trends more than fully account for the overall sample-wide trend

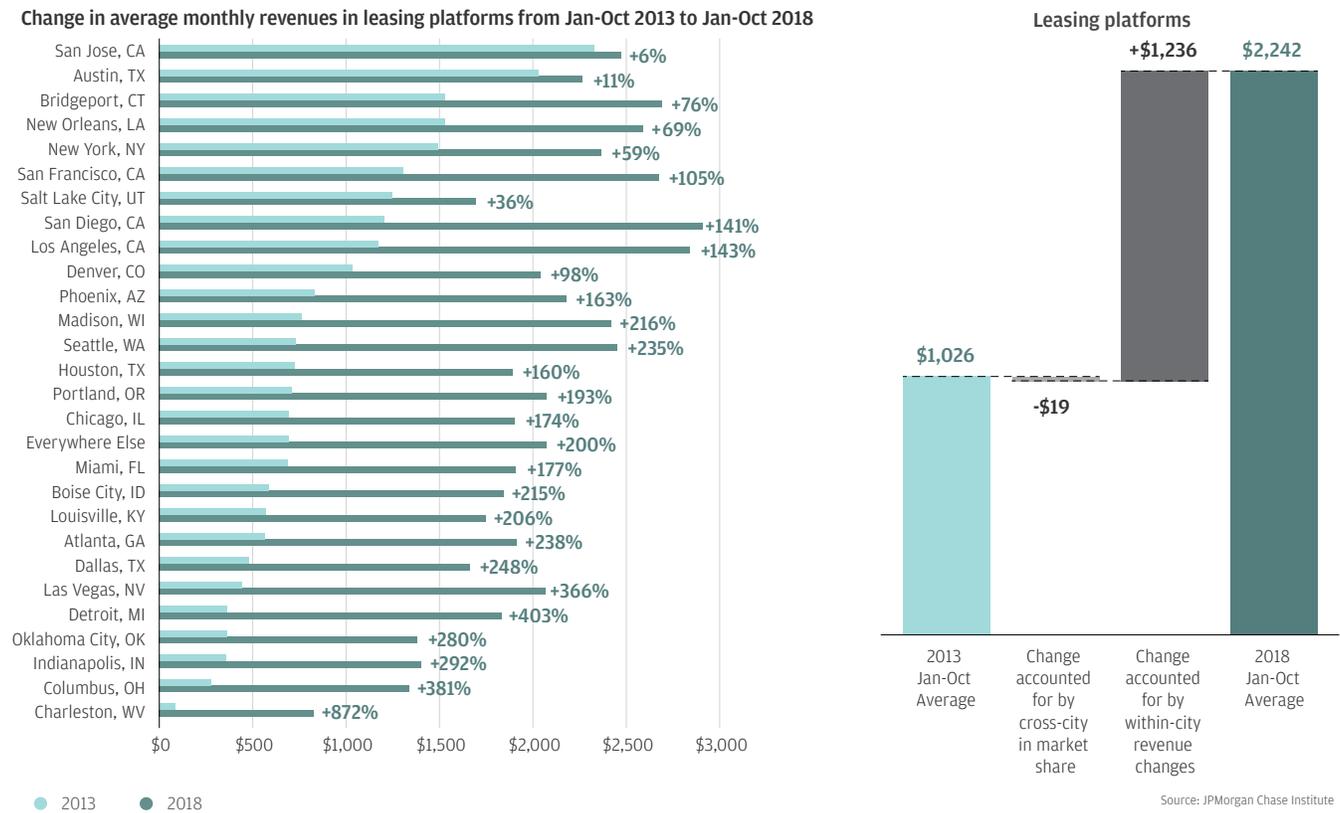


Leasing Sector

The left panel of Exhibit 16 shows changes in average monthly lessor revenue in each of the 28 areas in our study. Revenues doubled or more in 21 areas and increased in all 28. In the right panel, we incorporate these local changes into a full quantitative decomposition of the overall trend. The second (light grey) bar indicates that if average monthly lessor revenues had remained constant in every metro area, but the shift in participation across cities had occurred as observed, there would have been almost no change in sample-wide average monthly revenues by 2018. The third (dark grey) bar confirms the implication of this fact—local increases in average lessor revenues fully account for the sample-wide increase that we had previously reported.

Local increases in average lessor revenues fully account for the sample-wide increase in lessor revenues.

Exhibit 16: Average monthly lessor revenues increased in every area between 2013 and 2018, and local area trends fully account for the overall sample-wide trend



Lessons of These Patterns for Both Sectors

These patterns confirm that the changes in average monthly platform revenues—sharply increasing for lessors and steadily declining for drivers—represented widespread changes in the way that the Online Platform Economy figured into local economies across the country. In the next section, we investigate how the overall average trends in participation and in revenues interacted.

Finding Four

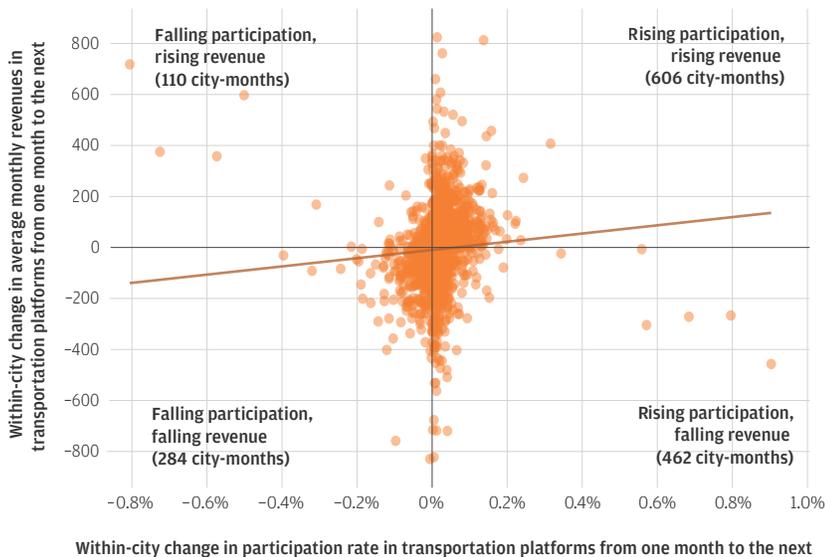
In both sectors but especially in transportation, participation tends to increase more in the months and places where average revenues are increasing more.

In the previous section, we observed that average monthly driver revenues declined, and average monthly lessor revenues increased, in almost every one of the 28 areas in our study. Participation rates also increased in every area (see Exhibit 26 in the appendix). How are participation and revenues linked? For example, did increasing participation on transportation platforms limit each participant’s revenue potential by putting downward pressure on trip prices or effective wages? In the leasing sector, did increasing revenue potential draw more participants into the market? In this section, we explore the relationship between local changes in revenues and local changes in participation.

Transportation Sector

In previous sections, we have discussed evidence that would call into question any simple hypothesis wherein increasing driver participation causes declining revenues. For example, metropolitan areas with higher rates of participation also have higher average monthly revenues per driver (see Exhibit 4). In Exhibit 17, we provide more direct evidence on this hypothesis, by comparing month-to-month changes in driver revenues to month-to-month changes in participation. The unit of analysis here is a metro area-month, with local changes in participation from the previous month to the current on the horizontal axis, and changes in local average monthly revenue over the same period on the vertical axis. Within each metro area, in the months when participation grew most sharply from the previous month, average monthly revenues also grew. Conversely, revenues tended to decline most sharply in months when participation declined. Rather than increases in participation limiting drivers’ revenue prospects, this pattern suggests that if anything, better revenue prospects, potentially generated by demand-side changes, draw in more drivers. It is possible that a monthly level of resolution is too high—for example, increasing revenue prospects might draw more participants, and then it may take time for that to feed back into downward pressure on revenues. This seems unlikely, since prices move so quickly in these markets. However, in the Appendix, we repeat this exercise at quarterly rather than monthly resolution. The pattern is similar—revenues do not tend to fall further during the quarters when participation rises the most.

Exhibit 17: Between 2013 and 2018, average monthly driver revenues tended to rise most sharply in the months and places where participation increased



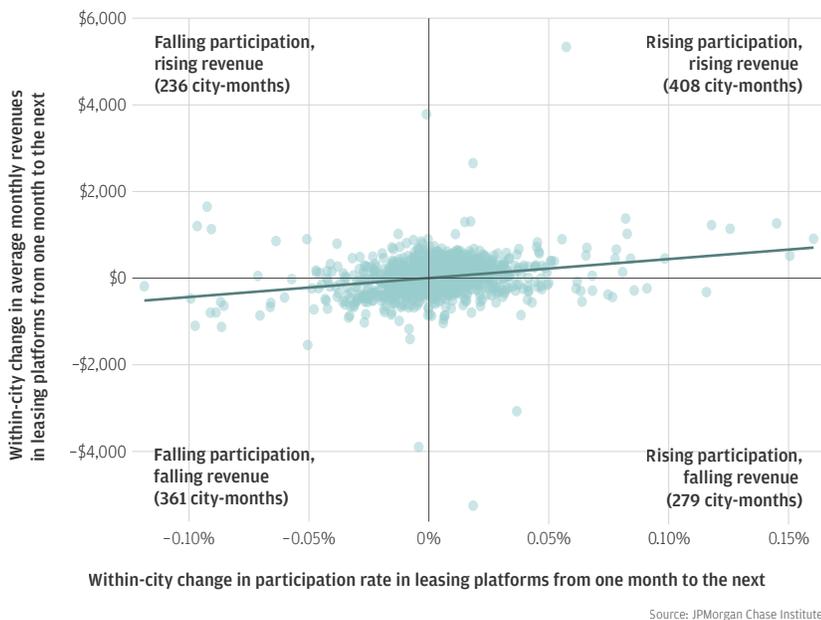
These results imply that in most or all of these metro areas, markets for transportation services can absorb more suppliers without putting downward pressure on their revenue prospects. This is consistent with findings reported by transportation platforms themselves that surges in demand lead to higher trip prices and increases in participation, without feeding back to significant reduction in demand (Hall et al 2016; Chen and Seldon 2015). Those findings would indicate that higher trip prices, like the metro area characteristics we examined in Finding 2, would drive up both participation rates and average revenue per participant.

Source: JPMorgan Chase Institute

Leasing Sector

As we discussed in the context of Exhibit 2, average monthly revenues per lessor increased sharply especially between early 2013 and mid-2014; participation rates also grew but only modestly. Was there a correlation there, whereby *increases* in revenue prospects were associated with *increases* in participation rates? In Exhibit 18, we develop evidence on this question by comparing month-to-month changes in lessor revenues to month-to-month changes in participation. The unit of analysis here is a metro area-month, with local changes in participation from the previous month to the current on the horizontal axis, and changes in local average monthly revenue over the same period on the vertical axis. The areas and months when participation grew most sharply were also likely to show higher than average revenue growth.

Exhibit 18: Between 2013 and 2018, average monthly lessor revenues tended to rise more sharply in the months and places where participation increased



Not only are revenues higher in metro areas with higher participation rates (see Exhibit 6), but the results in this section suggest that average monthly revenues per participant rise in the places and months with rising participation rates.

Lessons of These Patterns for Both Sectors

The results in this section indicate that participation in the transportation and leasing sectors tends to rise more sharply when average revenues are also rising. This suggests that in both sectors there is likely to be room for continued growth in supply-side participation in most metropolitan areas, and calls into question hypotheses that rising driver participation caused falling average revenues per driver. So then what could account for the steady decline in average monthly driver revenues? In the next section, we explore this question.

Finding Five

At least 45 percent—and likely more—of the decline in average monthly driver revenues was accounted for by drivers participating more occasionally within the month. In the leasing sector, more frequent participation accounted for more than half of the rise in revenues.

As we discussed in the context of Exhibits 3 and 5, variation in average monthly revenues across metropolitan areas in October 2018 reflects variation in participant engagement. In this section, we take that observation to the weekly level. Average platform revenues among participants active in a given month can be mechanically decomposed into two components—the fraction of each month’s participants who collect pay in each week of that month, times the average pay in that week. The first of these two components reflects levels of participant engagement in the Online Platform Economy, while the second likely reflects both engagement and revenue per unit supplied. In this section, we track these two components separately for each week starting with the first week of January 2013 and ending the last week of October 2018.

Transportation Sector

If increasing driver participation did not put downward pressure on revenue prospects, then what generated the secular declines across so many local markets? The bottom lines in Exhibit 19 show that average weekly revenues among all drivers active in a given month (light orange line), as well as among drivers active in that week (dark orange line) declined steadily from the end of 2013 until early 2018. However, the top (maroon) line also shows that among drivers active in a given month, a declining fraction were active in any week of that month, indicating a drop in driver engagement. In 2013, only about 80 percent of drivers who were active each month were also active in any week of that month; the other 20 percent almost certainly went without participating that week. By 2018, the fraction who were active each week had fallen to 60 percent.

Exhibit 19: Driver engagement within each month declined steadily from 2013 to 2018, as well as average weekly revenue

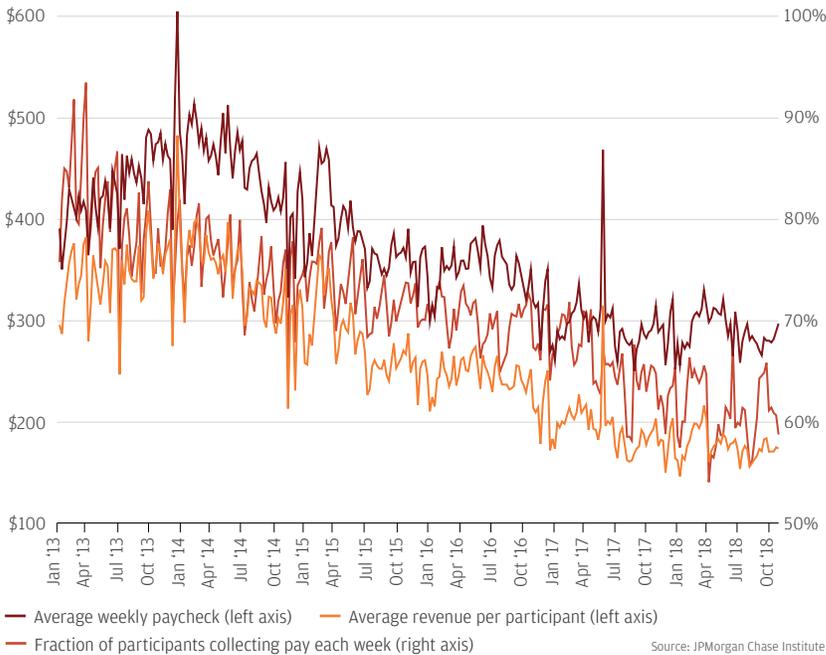


Exhibit 20: Declining driver engagement accounts for at least 45 percent of the decline in average revenues per participant per month

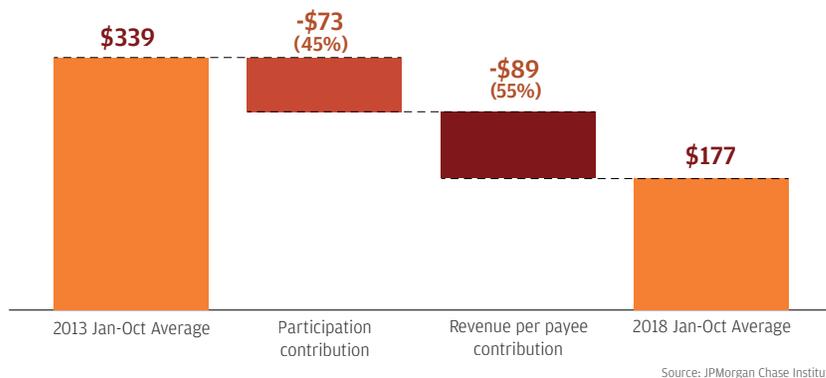


Exhibit 20 illustrates that this decline in participation at the weekly level accounts for 45 percent of the secular decline in average revenues among monthly active drivers. We cannot observe whether there is also a decline in hours driven within the weeks when drivers do participate, so 45 percent is a lower-bound estimate of the contribution of declining engagement.

An open question remains regarding the proximal causes of the observed decline in driver engagement. There are several possibilities. First, with the labor market strengthening, the opportunity cost of driver time is increasing, making drivers potentially less available and less willing to spend their time driving for transportation platforms. Second, platforms have continued to innovate and reduce opportunity costs by empowering drivers to fold deliveries and ride sharing into routes and times that they would already be traveling anyway—for example, by offering trips that overlap with their commute to work. These innovations would draw in more marginal participants who likely would engage in the Online Platform Economy less regularly and bring down average engagement rates. Finally, it could be that trip availability or trip prices may be falling or platform commissions may be rising, and these changes may have made drivers less willing to participate.

Leasing Sector

The top and bottom lines in Exhibit 21 show that average weekly revenues among all lessors active in a given month (turquoise line at bottom), as well as among lessors active in that week (dark teal line at top) increased sharply during 2013, and then fluctuated from 2014 to 2018. The middle (light teal) line shows that among lessors active in a given month, a steadily increasing fraction were active in each week of that month, indicating steadily rising lessor engagement. In 2013, about 40 percent of lessors who were active each month were active in any week of the month; by 2018, that fraction had risen to 60 percent.

As Exhibit 22 shows, the rise in weekly participation accounts for most of the secular rise in lessor revenues. If average weekly pay had remained constant over the period 2013 to 2018, but the fraction of each month's lessors collecting pay in each week had increased as observed, average revenues would have grown by \$155 per week, accounting for 53 percent of the actual observed increase. It may be that lessors are offering their assets on a more consistent basis. This may reflect an increase in the practice of acquiring assets primarily or exclusively for the purpose of leasing them out, rather than participants only occasionally leasing assets which are primarily for their own use.

Lessons of These Patterns for Both Sectors

The results in this section indicate that changes in the way that participants use platforms—as reflected in the frequency with which drivers and lessors engage with them—likely account for most of the changes in average monthly revenues that we have observed.

Exhibit 21: Lessor engagement within each month increased steadily from 2013 to 2018, whereas average weekly pay increased most sharply during 2013.

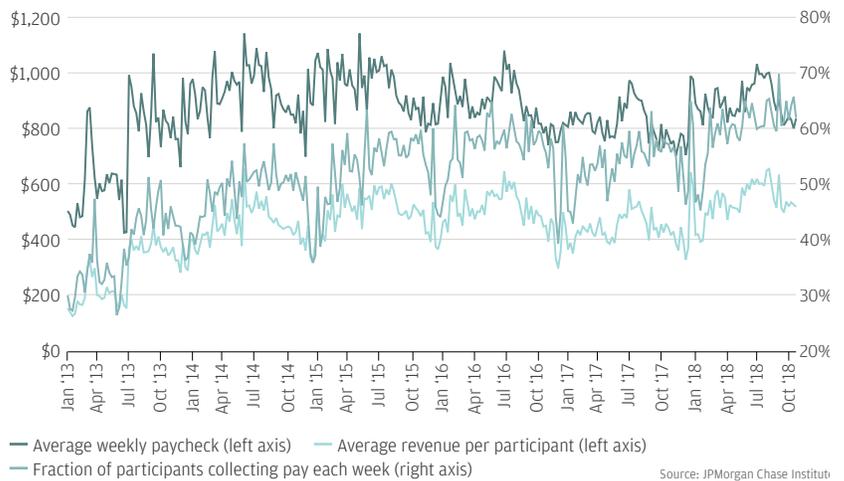
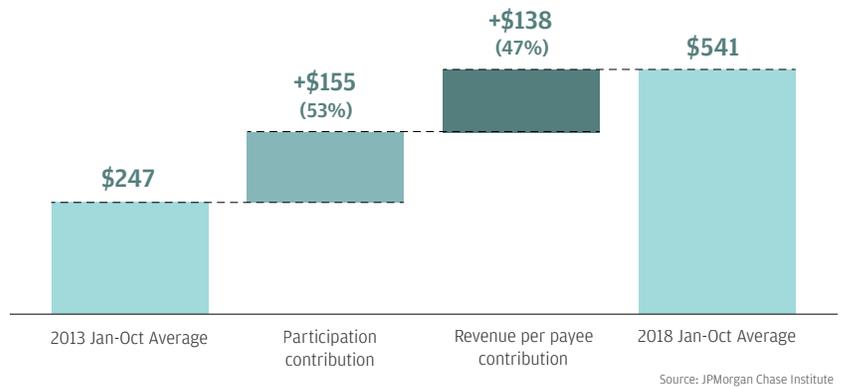


Exhibit 22: At least 53 percent of the increase in average weekly lessor revenues reflects lessors participating during more weeks within the month



Implications

Since 2013, the transportation and leasing sectors of the Online Platform Economy have grown significantly in terms of supply-side participation rates and total revenues paid to suppliers. In this study, we describe how the Online Platform Economy differs across 27 metro areas over 70 months. We use that geographic and temporal variation to get a better understanding of the viability of the transportation and leasing sectors of the Online Platform Economy as a potential source of income for participant families.

We draw four key lessons:

- 1. There is likely still room for supply-side growth in the transportation and leasing sectors of the Online Platform Economy.** Although rates of participation have grown in every metropolitan area we analyzed, our findings indicate that this expansion in participation has not put downward pressure on revenue prospects. Revenues are more influenced by the size of the potential market and availability of customers, rather than by competition from other potential drivers or lessors. In the current economic environment, there appears to be sufficient demand to absorb more potential participants. However, whether this would remain true in a recession, when demand for platform services would soften and supply would increase, remains an open empirical question.
- 2. There is reason to doubt that regulations to cap participation would be successful in improving revenues for drivers.** The size of a metro area's potential market for transportation services turned out to be more informative than local employment-to-population ratios for predicting the levels of participation and revenues it achieved. If a metro has a small potential market, therefore, revenues are likely to be relatively low. Cities where we saw relatively high barriers to entry did have higher average monthly revenues per participant and lower participation rates, but that simply reflected higher proportions of full-time drivers and probably did not mean any higher revenue prospects for a given level of engagement. Moreover, in the cities and months where average driver revenues were rising fastest, driver participation tended to grow, and when revenues were falling, driver participation tended to decline. Therefore, increasing barriers to entry through increased regulation may not be an effective way to increase driver revenues.
- 3. However, even if the number of participants does not appear to have a direct downward impact on revenue prospects, there are important considerations around types of engagement. Specifically, the increasing fraction of drivers who engage only occasionally raises important questions for policy.** The growth of the Online Platform Economy transportation sector, occurring amidst a strengthening labor market, has come alongside significant changes in how drivers use platforms. In 2013, 80 percent of drivers who generated revenue in any given month were active in any week of that month. By 2017, that fraction had fallen to 60 percent. How, if at all, does the presence of occasional drivers impact the revenue prospects of those who would prefer to use these platforms as a primary source of income? The opportunity cost of time is not constant—for example, a driver may be willing to fold a delivery into their commute even at a relatively low effective wage, whereas the effective wage would have to be considerably higher to justify quitting a primary job in order to drive full time. Could the growing fraction of occasional drivers eventually price would-be full time drivers out of the market? In that case, policy intervention would require value judgements weighing the preferences and interests of these different types of drivers, as well as those of their customers.
- 4. Although participation levels and average monthly revenues tend to be positively correlated, and both are predicted by the size of the corresponding incumbent industries in 2013, there may be important lessons to be uncovered by case studies of the exceptions to these patterns.** Metropolitan areas can learn from each other. Why are average monthly driver revenues so high in San Francisco, San Jose, New York and Seattle, and so low in Las Vegas, Atlanta, and Miami? Why is the Online Platform Economy leasing sector so much weaker in Detroit, Phoenix, and Miami—and so much stronger in New Orleans and San Diego—than would be expected based on the prominence of their accommodation industries prior to the emergence of the Online Platform Economy?

Appendix

Exhibit 23. Non-transport labor sector participation, average revenue, and engagement varied widely across metro areas

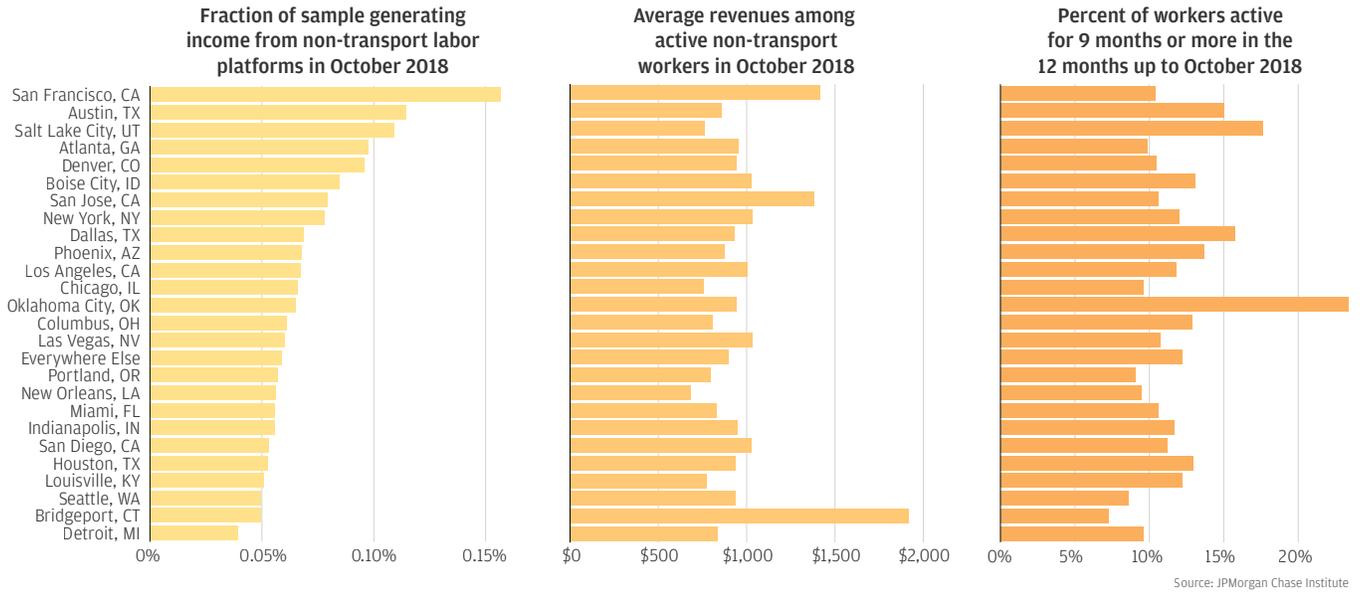


Exhibit 24. Selling sector participation, average revenue, and engagement varied widely across metro areas

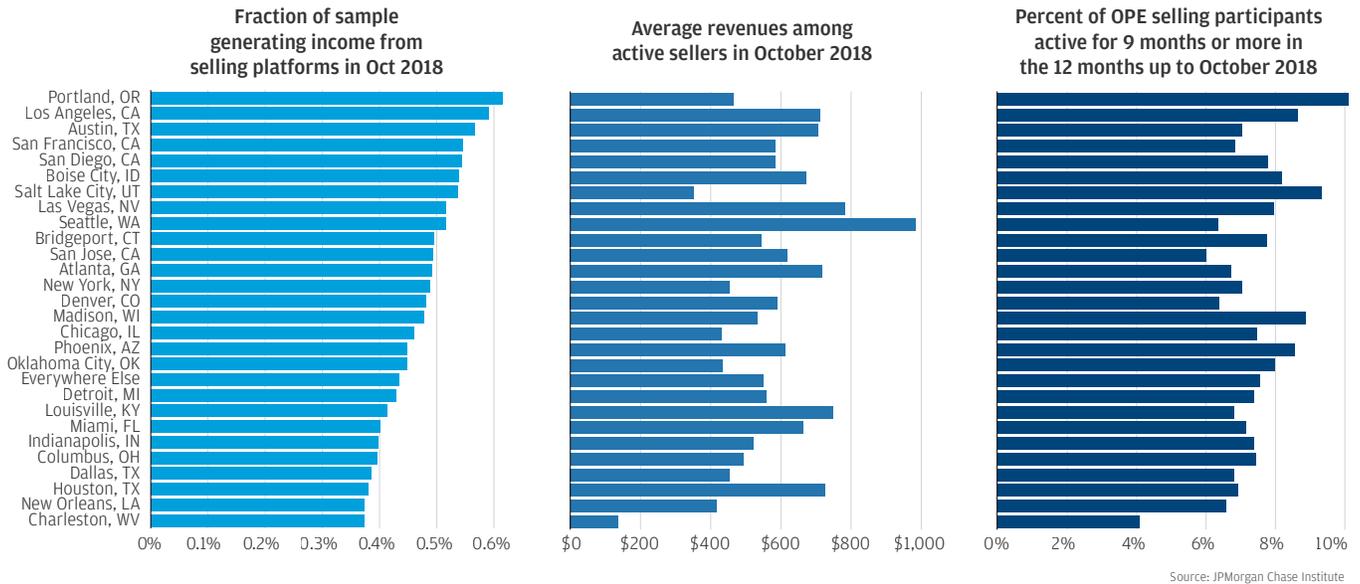


Exhibit 25. Between 2013 and 2018, average quarterly driver and lessor revenues did not fall more sharply in the quarters and places where participation increased most sharply

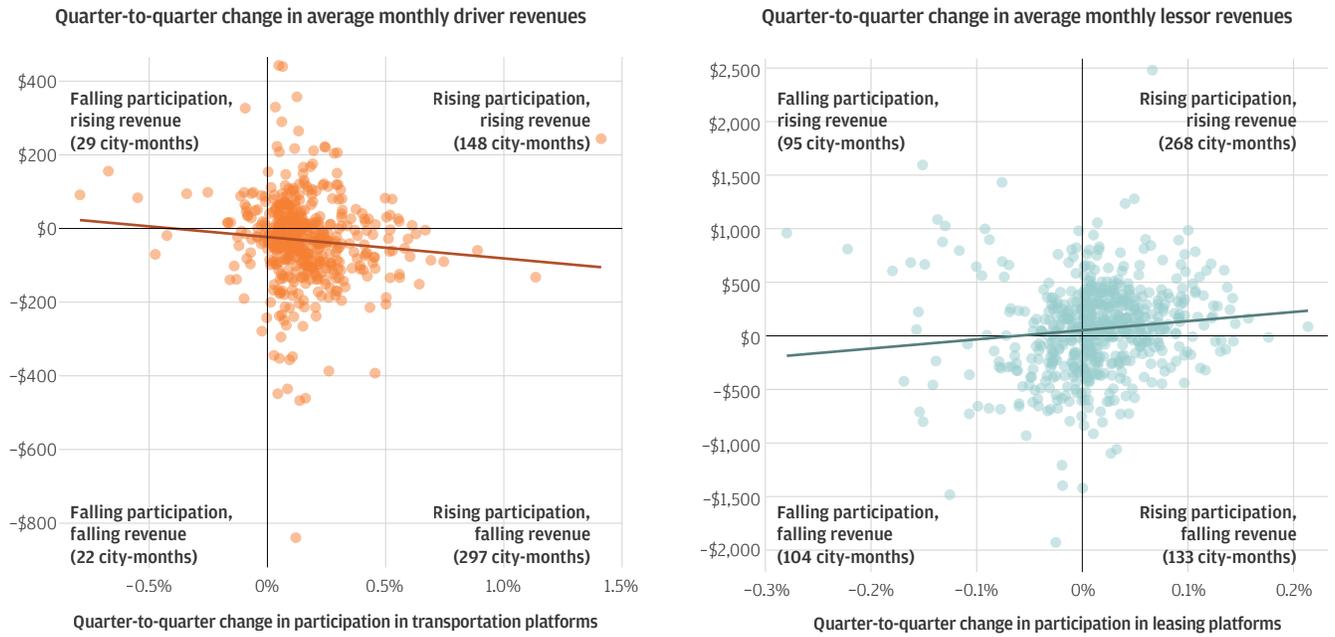
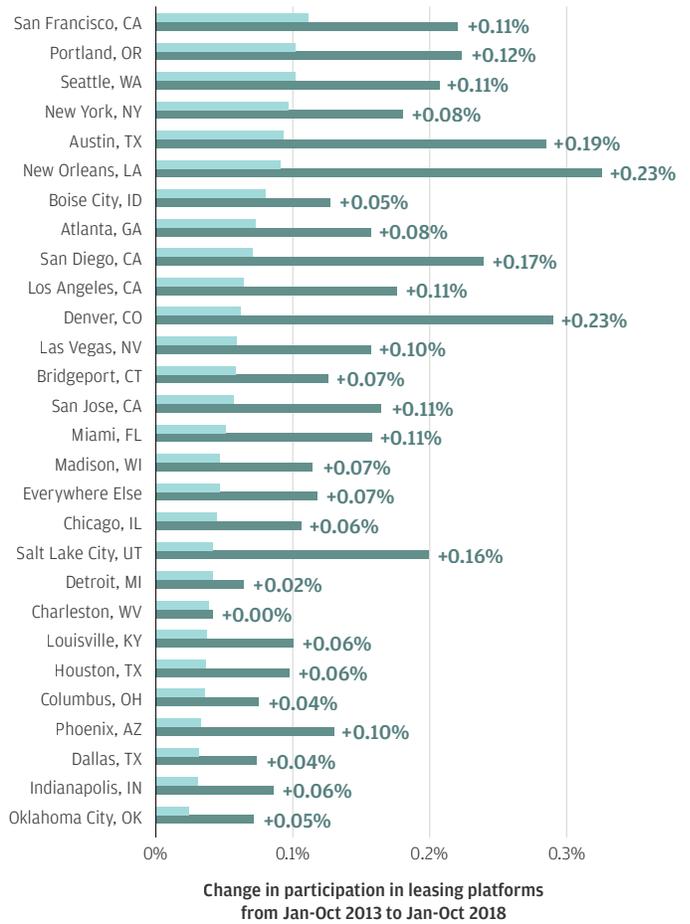
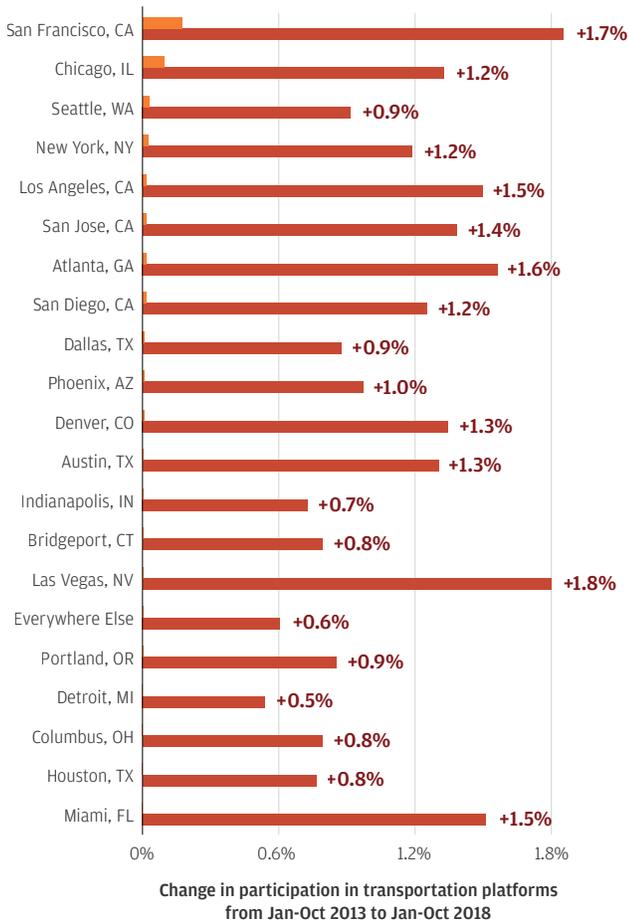
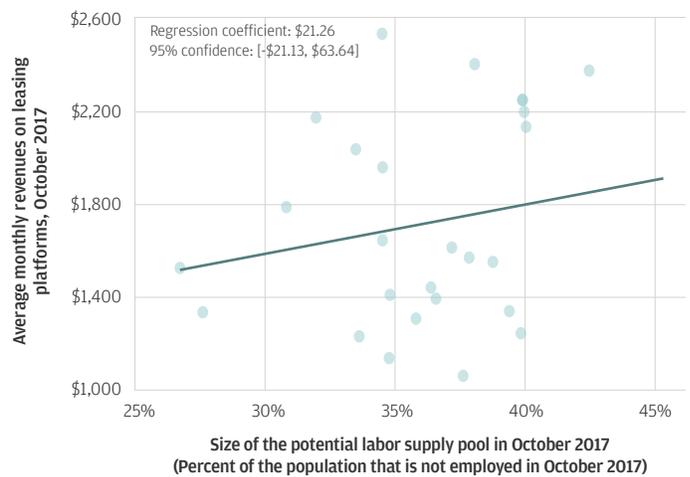
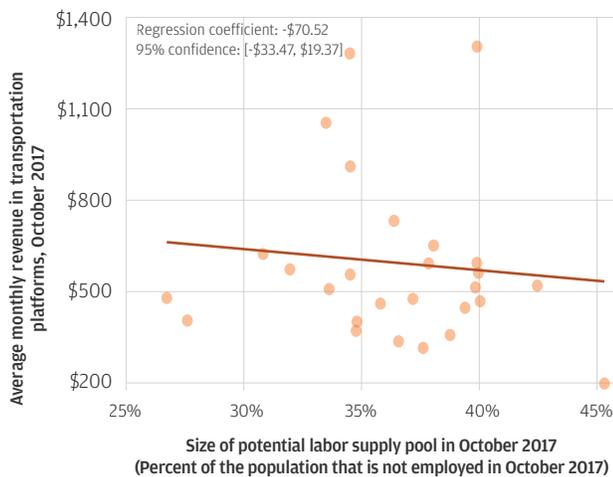


Exhibit 26. Driver and lessor participation rates increased in every area between 2013 and 2018, but some areas grew more than others



● 2013 ● 2018 Source: JPMorgan Chase Institute

Exhibit 27. Local employment-to-population ratios are not correlated with average revenues in the transportation or leasing sectors of the Online Platform Economy



Source: Bureau of Labor Statistics, Local Area Unemployment Statistics and American Community Survey. We divide the count of the employed population in October 2017 by total civilian population over 18. We interpolate 2017 monthly population values assuming a linear growth rate over the year and using the growth rate for 2016 to 2017.

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Endnotes

- 1 See Farrell et al., 2018 for a more complete description of the JPMorgan Chase Institute Online Platform Economy dataset.
- 2 The 27 cities represent about 97 percent of dollars earned in the transportation sector and 83 percent of dollars earned in the leasing sector in 2013. The metro area is defined as the Core-Based Statistical Area (CBSA) in which the participant lives, which may not always be where they earned platform revenue.
- 3 Farronato and Fradkin (2018) document that supply on one specific leasing platform—AirBnB—is higher in cities with high hotel room prices and constrained supply, where residents tend to be single and have fewer children, and where demand for accommodation is volatile and growing. They also document that home-sharing supply is more elastic in places and at times when hotel capacity constraints bind, and that it is twice as elastic as hotel supply. Zervas et al (2016) examines the impacts specifically of AirBnB on the hotel industry across cities in Texas. Several papers examine the impact of demand and supply factors on participation and revenue on the Uber platform specifically (e.g. Hall et al, 2018; Cohen et al, 2016; Chen and Sheldon, 2015).
- 4 We compute the ratio of total driver revenues in our sample to GDP in the transit subsector, and then scale by the ratio of the count of families in our sample to the count of families in the American Community Survey. The numerator and denominator of the revenue to GDP ratios are not perfectly aligned for three reasons. First, as we have discussed, the transportation sector of the Online Platform Economy and the transit industry (NAICS 485) do not perfectly overlap. Second, driver revenues are gross revenues and not net profits. Finally, any under-reporting by drivers of platform profits will result in a falsely low denominator. These factors suggest that the near-zero share in 2013, and the still minority shares in 2017 are if anything overstatements of the extent to which the transportation sector of the Online Platform Economy had penetrated local markets.
- 5 Las Vegas is not shown in Exhibit 8 because the passenger and ground transportation subsector of its local economy is 1.3 percent—almost three times that of New York, the next highest metro area. Therefore, including Las Vegas on the chart would compress the other 26 areas to such a degree as to render the chart very difficult to read.
- 6 We compute the ratio of total lessor revenues in our sample to GDP in the accommodation subsector, and then scale by the ratio of the count of families in our sample to the count of families in the American Community Survey. The numerator and denominator of the revenue to GDP ratios are not perfectly aligned for three reasons. First, as we have discussed, the leasing sector of the Online Platform Economy and the accommodation industry (NAICS 721`) do not perfectly overlap. Second, lessor revenues are gross revenues and not net profits; operating costs of lessors are likely to be considerable. Finally, any under-reporting by lessors of platform profits will result in a falsely low denominator. These factors suggest that the near-zero shares are if anything overstatements of the extent to which the leasing sector of the Online Platform Economy had penetrated local accommodation markets.

Suggested Citation

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