INSTITUTE FOR WOMEN'S POLICY RESEARCH

WOMEN, AUTOMATION, and the Future of Work

From driverless cars to factories operated by robots and stores with self-checkout systems, automation and technology are changing the way we perceive and do work. But how do all these technological changes affect men and women differently?

According to *Women, Automation, and the Future of Work*, an Institute for Women's Policy Research (IWPR) report, technological change will affect men and women differently in a number of ways. The first study of its kind in the United States, this report estimates the risk of automation across occupations by gender and presents a comprehensive picture of what we know—and what we don't—about how the future of work will affect women workers.

This study finds that discussions about technological change and the future of work **must include gender** as part of the analysis. That's because the jobs most commonly held by women—cashiers, secretaries, and bookkeeping clerks, for example—face some of the highest risks of becoming automated in the future. And while men are not immune to the risks of technological change, women are even more likely to work in jobs where technology and automation threaten to displace them.

This report examines not only the impact of these technological shifts on the quantity of jobs but also the quality of jobs in the future. Drawing on occupational projections from the Bureau of Labor Statistics and recent research on the potential for automation across occupations, IWPR researchers developed a Future of Work Database to analyze the potential impact of technological changes on:

- the number of jobs
- the nature of work and how it's done
- the quality of work
- the future of work and family

By increasing our understanding of the potential impact of these technological changes, we can create more gender-aware policies that will increase equality and the quality of jobs in the coming decades.

Mind the (automation) gap

Like most other countries, the U.S. labor market is segregated by gender—with men and women often working in different occupations and sectors. Office and administrative work is disproportionately done by women (70 percent of workers in this field are women), whereas only 5 percent of truck drivers are women and women are less likely than men to work in factories. Even in industries with closer gender parity—such as retail—men and women work in different sub-sectors. For example, women are more likely to work as cashiers, whereas men are more likely to work as stock clerks and order fillers.

While studies projecting employment changes due to automation vary widely, these occupational gender differences mean that women are not only affected differently than men by technological shifts—but also disproportionately. The analysis finds that, due to the stark sex segregation within the U.S. labor market, women workers are concentrated at the extreme ends of the automation spectrum, with women overrepresented in jobs that are at both the highest and lowest risk of automation. **For every seven men who work in occupations that are most threatened by technological change—that is, that have a 90 percent or higher likelihood of being eliminated by technology—there are 10 women in such jobs.** Women workers are also concentrated in the jobs least likely to be replaced by technology—such as child care, elder care, and education—but these "safe" jobs often pay less at the same level of education than other jobs, and the quality of some of these "safe" jobs can be low, with lower pay and less access to benefits than many jobs at higher risk of automation. For women, technology is particularly likely to threaten good middle-skilled jobs, such as secretaries, bookkeepers, or accountants, that can represent pathways to the middle class.

Women make up less than half (47 percent) of the workforce, but they are **58 percent of people at the highest risk of losing their jobs to technology.**

Hispanic women face the highest risk of job automation with 1 in 3 working in high-risk occupations.

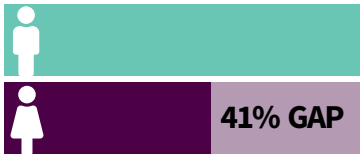
The occupations most at risk of automation for men have the lowest earnings. For women, there is **considerable risk in better paid occupations, as well as in lower paid ones.**

Technological change is **threatening clerical and secretarial jobs** that can provide pathways to the middle class for many women.

Let's get digital

While women are more likely than men to work with computers and digital media overall, the share of **women workers in the three largest high-tech occupations has fallen over the past 20 years**.

Women face a 41 percent gap with men in **earnings returns on digital skills.**



Working with computers and digital media is a major part of the jobs of many women—in fact, women are more likely than men to work with computers and digital media—but they are still significantly underrepresented in the highest-paid tech jobs. Even more disconcerting, the share of women workers in the three largest tech occupations—Computer Scientists and Systems Analysts, Software Developers, and Computer Support Specialists—fell over the last 20 years. The likelihood of working in computing jobs is shaped by race and gender dynamics: Hispanic women, for example, are 76 percent less likely to work in such jobs than suggested by their share of the workforce. Notably, however, even if women overall have not kept pace with men moving into these fields, the number of women of color in these three high tech jobs increased substantially during the same time period.

Earnings for both women and men increase with greater use of computers and digital media, but the returns are significantly higher for men than for women. The study finds that for women and men working at the same level of digitalization, women face an earnings gap in returns on digital skills of 41 percent.

For men, it is still possible to be paid well without being digitally literate. Unfortunately, the same cannot be said for most women. Many well-paying jobs that do not require high digital skills—such as carpenters or brick layers—are performed mostly by men.

Can I get an Uber?

Uber, Lyft, Care.com, TaskRabbit—the gig economy has opened new doors for men and women to find paid work. But how have these new technologies affected women and men, respectively?

Even though estimates of the share of employment in these jobs are low, a substantial number of workers perform such work, and women are about as likely as men to do gig work. Work found on the new digital platforms often comes with few or no benefits, but it can also offer new opportunities for women in fields where they are underrepresented, such as ridesharing and entrepreneurship.

Unequal pay and disparate working conditions between men and women also play out in the

Women are as likely as men to work through digital platforms but **platform work is highly gender segregated** and the more female-dominated platform work carries greater risks of on-line harassment.

gig economy. For example, in female-dominated care and domestic work platforms, the person offering the service is encouraged to market herself aggressively, which makes her an easy target for discrimination and online harassment. Penalties for changing schedules tend to be harsh, too.

Male-dominated platforms, such as ridesharing, mediate the hiring and dispatching process, which provides workers greater privacy protection than offered by more female-dominated platforms. Platform work, and the need for an online profile, also puts older and immigrant workers, many of whom speak English as a second language or have less familiarity with social media, at a disadvantage.

Are robots going to replace the need for human care?

Not anytime soon—and women are still most likely to care for children and aging parents. At the same time, our aging society has created a growing need for paid and unpaid elder care. A recent Centers for Disease Control and Prevention study estimates that the number of Americans with Alzheimer's disease and related dementias will triple between 2015 and 2060.

Though child and elder care have a low risk of being automated, the quality of the job is very low—personal care aides have median earnings of less than $22,000, which limits the economic well-being of women of color, who make up a disproportionate share of care workers.

Personal Care Aide is the **fastest growing occupation** in the United States, but has median annual earnings of **less than $22,000** for full-time, year-round work.

Where do we go from here?

Through smart policy and program interventions, we can increase the opportunities and reduce the risks of technological change.

Improving skills development

- Expand access to affordable postsecondary education and training, along with wraparound supports, for adult students seeking retraining.
- Enhance skill development, including digital literacy, for care workers; increase investments in the child and elder care infrastructure; and promote the development of technological solutions to improve the quality of care work.
- Increase access to on-the-job training to allow more workers to develop the skills that can prepare them to remain in the workforce and advance to new jobs as more job tasks become automated.
- Prepare for expected jobs losses in female-dominated jobs, such as office administration; expand supports for displaced workers; and help displaced workers identify and move into growing, well-paid fields to address expected job loss.

Creating new opportunities in the high-tech world

- Accelerate efforts among employers, job training programs, and postsecondary institutions to expand the representation of women and communities of color in the high-tech occupations that are redesigning the future.
- Improve the earnings of women so that they earn the same rewards for digital work as men.
- Support women's digital entrepreneurship and provide tools and supports to help them expand their businesses.
- Promote women's advancement to leadership positions and tackle gender and racial bias–algorithmic and otherwise—in recruitment and promotions.

Improving job quality and job and income security

- Provide opportunities for workers to participate in design and implementation of technological changes at their workplaces.
- Expand access to paid leave, child care, and other benefits and develop benefits that are portable and available to gig workers.
- Invest in smart technological solutions to reduce care burdens and work-family conflict and promote policies that facilitate a more equal division of care work between women and men.
- Encourage the development of new technologies that work with people; design technologies that complement people's work and allow them to focus on the more variable and challenging parts of their jobs.

This research underscores that it is possible to build a future of work that reduces inequalities, improves economic security, and ensures that women and communities of color reap the many benefits of technological change.

ABOUT THIS PROJECT

This executive summary presents an overview of findings from the report, *Women, Automation, and the Future of Work*, the first comprehensive gender analysis of the potential impact of technological change on women and men's employment in the United States, with an emphasis on the likely effects for women. It continues IWPR's gender analysis of the labor market and the divergent experiences of women of different races and ethnicities. The full report also reviews gender specific trends in the gig economy and contingent work arrangements, analyzes the earnings gains of working with computers and digital content for women compared with men, assesses the recent progress of women and people of color in the three largest technical occupations, and discusses the opportunities new technologies create for balancing work and family as well as the new risks. The report ends with policy recommendations for improving the outcomes of this wave of technological change, sometimes called the fourth industrial revolution. The full report, *Women, Automation, and the Future of Work*, (IWPR #C476) is available on IWPR.org.

This research was made possible by JPMorgan Chase Foundation through New Skills at Work. The five-year, $350 million initiative focuses on accelerating demand-driven skills training, creating more opportunities for workers to obtain well-paying jobs, and strengthening workforce systems to better serve jobseekers and employers.

About the Institute for Women's Policy Research

The Institute for Women's Policy Research (IWPR) conducts and communicates research to inspire public dialogue, shape policy, and improve the lives and opportunities of women of diverse backgrounds, circumstances, and experiences. The Institute's research strives to give voice to the needs of women from diverse ethnic and racial backgrounds across the income spectrum and to ensure that their perspectives enter the public debate on ending discrimination and inequality, improving opportunity, and increasing economic security for women and families. The Institute works with policymakers, scholars, and public interest groups to design, execute, and disseminate research and to build a diverse network of individuals and organizations that conduct and use women-oriented policy research. IWPR's work is supported by foundation grants, government grants and contracts, donations from individuals, and contributions from organizations and corporations. IWPR is a 501(c)(3) tax-exempt organization that also works in collaboration with the Program on Gender Analysis in Economics in the College of Arts and Sciences at American University.

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