

Automation, Gender, and Race



These Martindale Center Policy Briefs on the Future of Work were prepared by teams of students and young professionals serving as Research Externs with the Lehigh University / United Nations Partnership working in affiliation with the International Labour Organization.

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Executive Summary

The rise of digital technologies has facilitated the increase of automation in the workplace; however, while increasing high-paying job opportunities that require highly skilled workers, automation will also result in a severe decrease in the need for medium to low-wage labor in the workforce (Ernst et al.). Furthermore, the rise in automation is expected to disproportionately negatively affect women in the workforce in low-wage sectors and in sectors where women already face barriers to entry (Madgavkar et al.). This risk is also considerable in occupational sectors with existing gender imbalances, both in spaces where women are disproportionately over-represented—office administration, for example—as well as in spaces where women are a minority, such as in science, technology, engineering, and mathematics (STEM) fields (Hayasaki). Automation is predicted to displace lower-paying forms of employment where the workforce is predominantly composed of women. For example, in a 2019 McKinsey Global Institute report, Madgavkar and colleagues predicted that 52% of all the employment opportunities women will lose will be within the service and clerical sectors.

Although automation may have the positive consequence of creating more higher-paying employment opportunities, individuals will have to upskill in order to achieve access to these new positions (Ernst et al.). However, the effort to upskill in order to adapt to an automated workplace likely will prove unfairly difficult for women as a result of long-standing systemic barriers. Due to patriarchal gender norms, a large share of the time women could use to update their skills may be spent on unpaid family care work in a way that does not affect men. Furthermore, other dangers of patriarchy, such as inhibited social mobility because of physical safety and barriers to access educational opportunities and STEM field technologies, may limit the efforts of women to participate in automated environments (Madgavkar et al.).

In the same way women face barriers to accessing opportunities in an automated environment, so do people of color. In the US people of color are minoritized in society at large and often face racial discrimination in the workplace (Triana). Prevailing social and economic systems result in socioeconomic inequalities that manifest themselves as racialized access to resources, such as education and training, and even inequalities in terms of access to job opportunities (Walters). Even in the context of automation, these long-standing social disparities are expected to perpetuate systemic racial discrimination in the workplace (Chessel). Due to the intersectional nature of systems of injustice, gender and racial inequalities may particularly place women of color at added risk of displacement due to automation (Crenshaw).

With these issues in mind, this paper intends to investigate what measures the US government might undertake in an effort to ensure that automation does not disproportionately displace women in the US labor force. In order to accomplish this, we will first elucidate the consequences of automation for women, in particular women of color. We will further highlight expected trends in this context, and finally we will make feasible recommendations based on empirical evidence.

Issues and Challenges

As the world changes, it comes as no surprise that the labor market shifts in response. For centuries, technological developments have been a driving force behind an ever-changing labor market, with outdated sectors declining as new jobs emerge (Brynjolfsson & McAfee). Today, technological developments in artificial intelligence (AI) are driving a new wave of evolution in the labor market, resulting in big changes in occupational demand. Often referred to as the Fourth Industrial Revolution, automation will play a key



role in defining the future of the labor force. As a result of the automation of tasks, there has been a decline in demand for certain jobs in categories such as office support, customer interaction, and predictable physical work (Madgavkar et al.). Meanwhile, these same technological developments have driven an increase in demand for technology professionals, care providers, and builders.

When looking at the issue from a gendered perspective, the jobs in decline are held roughly equally by men and women, where their difference in wages mirrors the national average (Madgavkar et al.). However, amongst growing jobs, those predominantly held by women are significantly lower paying than those predominantly held by men (Catalyst). This can be attributed to the fact that many of the emerging, technologically driven jobs are in areas with existing gender gaps, such as engineering, math, and computer science (Hayasaki). By examining expected job gains, a concern for gender equality in the labor force arises: “These technological changes will create new kinds of jobs while displacing others. Men will see nearly 4 million job losses and 1.4 million gains (approximately one new job created for every three lost). In comparison, women will face 3 million job losses and only 0.55 million gains (more than five jobs lost for every one gained)” (Hayasaki).

A recent World Economic Forum study reported that existing gender gaps in STEM-dominated fields would diminish women’s professional presence in the coming years (Rubery). When we expand this analysis and make the comparison between declining-job and growing-job wage gaps for race, the difference is even more stark. Emergent jobs predominantly held by people of color pay significantly less than those predominantly held by white workers (Census Bureau). Additionally, women of color face significant barriers which make it difficult for access into these emerging fields: “In 2017, while more American women held college degrees compared to American men, they only

accounted for 29% of workers employed in the STEM field..., [while] women of color only accounted for 11.5% of workers in STEM” (National Science Foundation).

Moving forward, it is important to examine the ways in which automation, AI, and machine learning will impact women, in particular, women of color. In the coming years, as we pursue higher levels of automation, “Jobs lost, gained, and changed imply that many millions of women may need not only to transition between occupations and sectors, but also to make substantial changes in the way they work in their existing jobs” (Madgavkar). In order to promote and uphold the principles of gender equity, it is crucial that we address growing disparities.

Policy Options

Given the complex nature of the relationship between automation, women, and race, it is essential that the US government move toward implementing policies that promote gender equity in the workplace, in order to combat possible externalities of automation and AI development, which may hurt progress toward gender equality more broadly. Policies that empower women, and women of color, are necessary to target current and future gender gaps. Taking action is critical, especially during a time in which the ongoing global pandemic has led to regressive effects on gender equity. Additionally, the world’s economic recovery following the global pandemic would benefit greatly if countries all around the world implement social and economic policies benefiting women, as “gender-parity improvements by 2030 could lead to \$13 trillion of incremental GDP in that year” (Madgavkar). However, these benefits can be achieved only if action takes place immediately. Some policies to consider include easier access to education, upskilling, and re-education for women and women of color (specifically STEM education); legislation providing improved maternal and paternal leave; strengthening childcare benefits for parents; ensuring that women and women of color have an active role in policy implementation; and promoting diverse working environments throughout the country.

In order for American women to successfully and equally transition to an economy changed by automation, easier access to education and skill training in fields that are projected to grow the most is an essential step toward decreasing gender gaps in the workforce. Worries exist that women will have “low representation in sectors where job growth is expected,” as a result of automation (Gutierrez). However, only “66 percent of executives saw addressing potential skill gaps related to

automation or digitization a top-ten priority” (Madgavkar). By promoting lifelong learning initiatives, whether through government subsidizing programs, giving tax break incentives to employers who promote opportunities for their workers to gain new trades and skills, or supporting NGOs, women can be given the opportunity to enter fast-growing sectors and learn skills that will benefit new kinds of careers.

Increases in flexibility will help all American workers to respond as developments in automation and AI alter the labor market; however, women often find themselves in inflexible positions due to the burden of childcare. Distributing unpaid care work, which currently typically falls on women, more equally among men and women would help with this burden. Women account for 75% of the share of unpaid care work around the world, according to the Bell Policy Center (Gutierrez). This imbalance often denies women the time to obtain new education and job training opportunities. Meaningful policies that can help distribute care revolve around expanding paternity leave on the federal level, encouraging companies to increase leave time, and incentivizing employers to provide additional benefits. Additionally, stronger leave benefits for parents could be implemented on a national level as can investing in easily accessible and affordable childcare facilities, which would allow for parents, especially mothers, to continue working, learning, and growing professionally after having children.

Because of the dynamic changing circumstances that surround development of automation and AI in the American economy, women, particularly women of color, must have an active voice in policy development and implementation, both inside the government and in the labor market. This should involve both government and business initiatives to provide reliable information to women and women of color about how automation will change the labor market and how the gender wage gap may worsen in the near future. Additionally, introducing women to STEM fields starting as early as elementary school, and continuing through government and private programs like STEM summer camps, could encourage interest in sciences and technology. The government also should incentivize underrepresented minorities, especially women, to pursue careers in STEM by subsidizing education and technical training or supplying direct payments while they transition to newly developed labor sectors. Finally, government and business leaders must take active steps to address the lack of diversity in the STEM workforce by promoting public diversity campaigns and inclusive programs to encourage women, especially women of color, to pursue education in STEM.

Conclusion

Ultimately, the rise in automation may hurt women, especially women of color, due to barriers to education in emerging fields and to industries and upskilling opportunities, which stem from broader systematic issues. COVID-19 has served as an accelerant of sorts, revealing more clearly to the nation the drastic disparities and socioeconomic barriers that are prevalent between genders and races in the United States. The Stanford Center on Poverty and Inequality estimates that to end gender segregation across occupations would take about a quarter of women in occupations dominated by women switching with men in male-dominated ones (Weeden). Clearly then, there is much to be done, especially as women have much lower representation in sectors where job growth from automation is expected (Gutierrez). The US government must start implementing policies that promote gender equity in the workplace and throughout the country through easier access to education, upskilling, and STEM programs in addition to better care policies and access to more accurate information. To both promote and implement policies that will better shape their future educational, childcare, and work environments, women, and women of color in particular, should have an active voice and play central roles. Such an approach will be vital in achieving UN Sustainable Development Goals like gender equality, quality education, and decent work and economic growth, which all correlate to creating more equitable society, communities, and workplaces.

References

1. Brynjolfsson, E., & McAfee, A. “The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. W. W. Norton & Company, 2014.
2. Catalyst. Women in Science, Technology, Engineering, and Mathematics (STEM): Quick Take. 4 August 2020.
3. Census Bureau. American Community Survey. The United States Census Bureau. 25 December 2018.
4. Chessell, Darren. “The Jobless Economy in a Post-Work Society: How Automation Will Transform the Labor Market.” *Psychosociological Issues in Human Resource Management*, Vol. 6, no. 2, 2018, pp. 74+.
5. Crenshaw, Kimberlé Williams, & Bonis. Oristelle. “Mapping the Margins: Intersectionality, Identity Politics, and Violence against Women of Color,” *Cahiers du Genre*, Vol. 39, no. 2, 2005, pp. 51–82.

6. Ernst, E., Merola, R., & Samaan, D. "The Economics of Artificial Intelligence: Implications for the Future of Work." International Labor Organization. *IZA Journal of Labor Policy*, 2018.
7. Gutierrez, L. "The Future of Work: COVID-19's Impact on Women." The Bell Policy Center. 17 November 2020.
8. Hayasaki, E. "Women vs. the Machine." *Foreign Policy*, No. 222, 2017, pp. 38–47.
9. Madgavkar, A., et al. *The Future of Women at Work: Transitions in the Age of Automation*. McKinsey & Company, 2019.
10. Marlar, J. *Assessing the Impact of New Technologies on the Labor Market: Key Constructs, Gaps, and Data Collection Strategies for the Bureau of Labor Statistics*. US Bureau of Labor Statistics. 2020.
11. National Science Foundation. *Women, Minorities, and Persons with Disabilities in Science and Engineering*. 2017.
12. Rubery, J. "A Gender Lens on the Future of Work." *Journal of International Affairs*, Vol. 72, no. 1, 2018, pp. 91–106.
13. Triana, M. et al. "Perceived Workplace Racial Discrimination and Its Correlates: A Meta Analysis." *Journal of Organizational Behavior*, Vol. 36, 2015, pp. 491–513.
14. Walters, Pamela Barnhouse. "Educational Access and the State: Historical Continuities and Discontinuities in Racial Inequality in American Education." *Sociology of Education*, Vol. 74, 2001, pp. 35–49.
15. Weeden, Kim. *State of the Union, 2018. Pathways*. Stanford Center on Poverty and Inequality, Annual Report. 2018.

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