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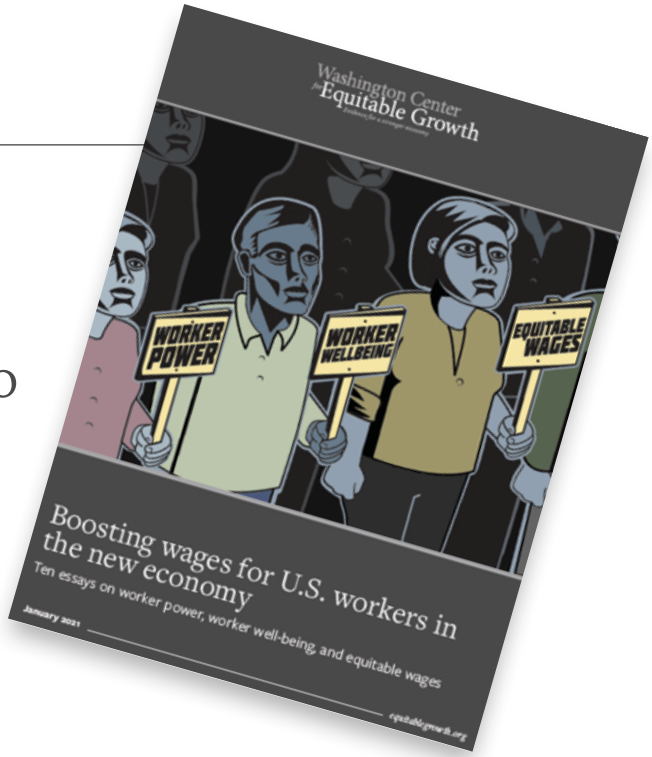

Addressing gender and racial disparities in the U.S. labor market to boost wages and power innovation

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By Equitable Growth

Overview

Gender and racial disparities exist at each stage of the innovation process. From education and training to the practice of invention, and then onto the commercialization of invention, these disparities are costly to the U.S. economy. The disparities for women and African Americans also can lead to increased income and wealth inequalities at each stage of the innovation process for those who are unable to participate fully. Reducing barriers to participation in the innovation process could affect productivity, as well as both the level and the distribution of income.

Four policies are necessary to help close these racial and gender innovation divides:

- Improve mentoring programs with additional government policymaking and fiscal support
- Facilitate early education exposure to invention opportunities
- Engage in blind patent reviews by patent examiners
- Address the climate in high-tech workplace to attract and retain women and African Americans in the places where invention and innovation happen

This factsheet outlines why the benefits of innovation are not evenly distributed and describes the policies for addressing these gaps, based on the essay "Addressing gender and racial disparities in the U.S. labor market to boost wages and power innovation," by the economist Lisa Cook at Michigan State University. The essay is part of Boosting Wages for U.S. Workers in the New Economy, a compilation of 10 essays from leading economic thinkers who explore alternative policies for boosting wages and living standards, rooted in different structures that contribute to stagnant and unequal wages.

Why the innovation process is important to U.S. economic growth and well-being

Across a number of measures, the science-based innovation workforce provides a tremendous boost to the overall economy, with better pay and job security going to those who work in the innovation sector. Fundamentally, innovation is critical for economic growth, wealth generation, and higher living standards. Innovation can substantially affect each component of economic growth—labor, capital, and total factor productivity.

Since the 1960s, both women and African Americans have obtained an increasing (though still not equal) share of bachelor's degrees and advanced degrees in fields most associated with invention—the so-called STEM fields of science, technology, engineering, and mathematics. Yet women and African Americans have not enjoyed their proportionate share of innovation's ample economic benefits. And the misallocation of talent has had clear costs for the U.S. economy: Cook and Yanyan Yang, now an economist at the University of Massachusetts Boston, estimate that Gross Domestic Product per capita could rise by 0.6 percent to 4.4 percent if more women and African Americans were included in the initial stages of the innovation process.[1]

Understanding the reasons for these racial and gender divides in innovation

Innovation typically begins with formal education or training, such as an apprenticeship, in a chosen technical field often, but not exclusively, in a STEM field. Next, workers in the innovation economy participate in actual invention in university or federal laboratories, corporate research facilities, government agencies, or less formal workspaces. Finally, innovation, or the commercialization of invention, occurs when inventors sell or license their patents or launch a new start-up or business unit to profit directly from the development of the invention.

Gender and racial disparities exist at each of these stages. Women and African Americans receive lower shares of doctorates awarded in engineering, the field most closely associated with patenting.[2] Once in the workplace, women and African American scientists and engineers are more likely to work in occupations other than science and engineering, such as in life sciences, rather than directly in S&E occupations that are a part of the innovation process.

These gaps also are reflected in patenting data: In an analysis of U.S. patent activity from 1970 to 2006, Cook and her colleagues have demonstrated that women produced 40 patents per million, and African Ameriacns produced 6 patents per million, compared with 235 patents per million for all U.S. inventors.[3]

Policies to increase participation and wages in the innovation economy

Creating a more inclusive innovation ecosystem will increase the participation of women, African Americans, and other underrepresented demographic groups at every stage of the innovation and commercialization process, from early education and training to the practice of invention and the later economic gains from those breakthroughs. Cook's essay explores four areas in which policymakers can make changes to resolve this problem in our society and our economy, particularly at the education and practice-of-invention stages.

Mentoring

The income, racial, and gender gaps in invention are primarily due to barriers in acquiring human capital, not differences in ability.[4] Researchers find that a propensity to patent is correlated with prior exposure to invention activity, and with multigenerational income and wealth disparities. Mentoring is one broadly suggested tool to address the gender and racial divides in STEM careers, with programs such as Makers + Mentors Network that are designed to make a difference.

Early education about invention

Children from high-income families who grow up around other inventors are more likely to patent, while children from low-income families with limited exposure to emerging technology are less likely to patent.[5] Exposing children to invention and innovation through programs such as the Spark Lab at the Smithsonian Institution could foster more representation for women and African Americans early in the education pipeline and eventually at high levels in STEM fields.

Blind patent reviews

Inequality in patent applications is a legacy of historic racial and gender discrimination that persists to this day. A recent paper in Nature finds that, all else being equal, patent applications with women as lead inventors are rejected

more often than those with men as lead inventors.[6] An easy fix would be for the U.S. Patent and Trademark Office to engage in the blind review of patent applications by patent examiners, so that names of patent applicants are not visible to reviewers, as this can help avoid the possibility of discrimination by race and/or gender.

High-tech workplace climates

Most patented inventions occur at firms. Therefore, at public companies, shareholders need to hold CEOs more accountable for workplace climate, and, for private companies, boards and CEOs should do the same. Congress also could play a role in bolstering the U.S. Equal Employment Opportunity Commission to investigate such complaints and help to minimize the frequency and intensity of hostile workplaces for women and African Americans.

Other policies to broaden participation in the innovation process

In addition, Cook has proposed solutions to address the commercialization phase of the innovation process, including collecting demographic data on inventors, enhancing the Small Business Administration's programs related to innovation to promote diversity and inclusion, and improving the climate in the fields and workspaces where these innovations take place.[7]

Taken together, these proposals could augment the participation of women and African Americans in the innovation process and grow their wages across the innovation sector. Doing so would boost innovation and thus the productivity of the U.S. economy, and ensure the fruits of economic growth are more broadly shared—thus reinforcing more sustainable economic growth.

Read the full essay

"Addressing gender and racial disparities in the U.S. labor market to boost wages and power innovation," by **Lisa Cook**

This essay is part of Boosting Wages for U.S. Workers in the New Economy, *a compilation of 10 essays from leading economic thinkers who explore alternative policies for boosting wages and living standards, rooted in different structures that contribute to stagnant and unequal wages.*

Endnotes

1 Lisa D. Cook and Yanyan Yang, "The Commercialization Gap in Pink and Black" (East Lansing, MI: Michigan State University, 2017).

2 National Science Foundation, National Center for Science and Engineering Statistics (NCSES), "Survey of Earned Doctorates" (2019), available at https://www.nsf.gov/statistics/srvydoctorates/.

3 Lisa D. Cook, "Inventing Social Networks: Evidence from African American 'Great Inventors." Working Paper (Michigan State University, 2007); Lisa D. Cook, "Violence and Economic Growth: Evidence from African American Patents, 1870-1940," *Journal of Economic Growth* 19 (2) (2014): 221–257; Lisa D. Cook and Chaleampong Kongchareon, "The Idea Gap in Pink and Black." Working Paper No. 16331 (National Bureau of Economic Research, 2010), available at https://www.nber.org/papers/w16331.

4 Alex Bell and others, "Who Becomes an Inventor in America? The Importance of Exposure to Innovation," *The Quarterly Journal of Economics* 134 (2) (2019): 647–713, available at https://doi.org/10.1093/qje/qjy028.

5 Cook, "Inventing Social Networks"; Cook, "Violence and Economic Growth"; Cook and Kongchareon, "The Idea Gap in Pink and Black."

6 Kyle Jensen, Balázs Kovács, and Olav Sorenson, "Gender differences in obtaining and maintaining patent rights," *Nature Biotechnology* 36 (2018): 307–309, available at https://www.nature.com/articles/nbt.4120.

7 Lisa D. Cook, "Policies to Broaden Participation in the Innovation Process" (Washington: The Hamilton Project, 2020), available at https://www.hamiltonproject.org/papers/policies_to_broaden_participation_in_the_innovation_process.