



INSTITUTE FOR WOMEN'S POLICY RESEARCH
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**The Need to Promote Gender Diversity
in Entrepreneurship, Innovation, and Patenting**

Written Testimony Submitted to the House Small Business Committee

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The Institute for Women's Policy Research conducts and communicates research to inspire public dialogue, shape policy, and improve the lives and opportunities of women of diverse backgrounds, circumstances, and experiences. IWPR was founded by labor economist and MacArthur Fellow Heidi Hartmann, and has an interdisciplinary staff of scholars in economics, sociology, and psychology. As a nonpartisan organization, IWPR ensures the independence of its research through rigorous internal and peer review processes.

IWPR has been researching issues related to diversity in innovation since 2016 when it released *Equity in Innovation: Women Inventors and Patents*. Since then, IWPR has been conducting follow-up research to be released in two forthcoming reports: *Innovation and Intellectual Property Among Women Entrepreneurs*, and *Closing the Gender Gap in Patenting, Innovation, and Commercialization: Programs Promoting Equity and Inclusion*.

IWPR's research finds that women patent inventions at much lower rates than men, which means that potential innovations to improve technology, treat illness, and improve everyday life are being left on the table. IWPR's 2016 report found that under 20 percent of all U.S. patents list one or more women as inventors, and just under eight percent list a woman as the *primary* inventor. The study also cited research showing that patents secured by inventor teams that included both women and men are cited more often in other patent applications than single-gender teams. Including women on an R&D project may lead to higher quality, more useful patents, yet at the current rate of progress, men and women will not reach parity in patenting for over three quarters of a century—in the year 2092.

Part of the disparity in patent holdings is due to the relatively low application rates of women—between 2000 and 2016, female inventors submitted just one third the number of patent applications as their male counterparts. Once applications have been filed, however, patent allowance rates are closer to parity. Another part of the issue is women's underrepresentation in patent-intensive science, technology, engineering, and mathematics fields, such as engineering and computer science. In 2010, women held just 19 percent of engineering degrees and 21 percent of computer science degrees. Other challenges, such as the need for policies and programs to help female scientists maintain work-life balance and to learn about and finance the patenting process.

Previous research has found that intellectual property rights, including patents, can play an important role in business success. Many lenders consider patent ownership, or at least having a patent application filed, an important factor in making their funding decisions: patent holders are more likely to receive private equity financing from venture capitalists and typically receive funding more quickly than entrepreneurs who do not hold patents. Patents have also been linked to greater market value among established businesses. Higher rates of patenting or other intellectual property holdings among women business owners could improve their access to financing and help them achieve their growth aspirations and maximize revenues. Further, new IWPR research shows that intellectual property rights may be associated with higher firm revenues—women-owned businesses that had a patent pending had average revenues more than 16 times higher than those firms without intellectual property rights, for example.

These findings suggest that women’s underrepresentation among IP holders may put them at a disadvantage as business owners. IWPR’s research shows that women have made substantial progress in increasing their representation among business owners, increasing their share from 16.8 percent of all employer firms in 1997 to 20.8 percent in 2015, yet many women business owners lack access to start-up capital, including venture capital, which can be crucial to the success of their business ventures. And while women-owned businesses already engage in research and development activities and produce innovative products at rates nearing or surpassing those of men-owned firms, they are less likely to hold intellectual property rights, suggesting that their innovative power could be better marshalled to benefit their businesses and promote economic and social progress more broadly.

A diversity of standpoints helps promote multidimensional and more rigorous approaches to solving social problems. When significant portions of the population are not represented in the innovative process, social and economic progress suffers. The exclusion of women, people of color, and members of other disadvantaged groups from invention, patenting, and entrepreneurship leaves a vast reserve of untapped potential that could be harnessed to help find solutions to the pressing issues of the day.

IWPR’s latest report makes several research-based recommendations to help close the gender gap in patenting. First, we should increase women and girls’ access to programs that support innovation activities and entrepreneurship in highly profitable industries. Programs that encourage women’s business ownership can present data on industry segments most likely to provide strong business returns, along with information on how to enter those fields. In addition, communities, universities, and the public sector can implement programs likely to encourage and increase women’s participation in intellectual property development activities.

IWPR’s report, *Closing the Gender Gap in Patenting, Innovation, and Commercialization: Programs Promoting Equity and Inclusion*, profiles seven programs working to increase gender and racial/ethnic diversity in innovation and entrepreneurship, and identifies common program elements and promising practices. Programs featured in the report use a variety of approaches to promote relationships between women inventors and investors, provide education and coaching on the patent application process and other research and development activities, and guide women and communities of color through the process of commercializing innovation, to include market analysis, developing prototypes, and preparing pitch presentations. In addition, introducing girls and young women to inventing and intellectual property development through

science and math classes, after-school programs, and summer camps can highlight the benefits of developing intellectual property later in life.

We should also test and implement strategies to overcome implicit bias on the part of funders and investors. Women business owners' lower levels of funding can restrict the types of innovation firms can pursue, and IWPR's research shows that difficulty receiving funds is one of the primary reasons that women-owned businesses close. Venture capitalists and other investors have a major role to play in enabling women-owned firms to develop intellectual property and other innovations, and in helping women-owned businesses thrive more broadly. Investors should pursue intentional strategies to minimize the influence of bias in their investment decisions. For example, following formal or informal guidelines or quotas for investing across gender or racial/ethnic lines could help investors ensure they make equitable investment decisions. Additional research is needed to assess promising strategies for minimizing gender and racial/ethnic bias, unconscious or otherwise, in investment decisions.

Organizations and institutions can also take steps to support women entrepreneurs. Funds that target businesses owned by women and women of color can help mitigate bias and increase access to capital. A number of corporations and a handful of venture funds around the country target women entrepreneurs with promising product innovations. Programs and initiatives encouraging women's innovation should take steps to actively encourage participation of Hispanic, African American, and other underrepresented women.

Employers, funders, and educational institutions should also focus on increasing women's representation in patent-intensive STEM fields. Women's disparate participation in patenting has been linked to their underrepresentation in patent-intensive STEM fields such as engineering (Hunt et al. 2013). By pursuing strategies to increase women's participation in these fields, from early childhood exposure to science, to recruiting and retaining young women in patent-intensive college majors, women entrepreneurs will be more likely to innovate and to encourage and support other women's intellectual property development.

Finally, we need to improve data availability on women entrepreneurs, especially to allow disaggregation by gender, race and ethnicity. To track progress toward inclusion, large surveys and public agencies dealing with entrepreneurship and innovation should collect data on the gender and race/ethnicity of survey and program participants and make data available in a form that can be disaggregated.

Progress toward gender and racial/ethnic equity in innovation would also benefit society. Diverse contributions are essential to identifying and developing solutions to the pressing problems confronting individual communities and the world more broadly. An array of unique standpoints offer invaluable perspectives for innovation. By integrating more women and people of color into the innovation ecosystem, society will benefit from the contributions of more talented inventors and the ideas, products, and solutions they can develop if provided the opportunity.