

THE IMPORTANCE OF COLLECTING DEMOGRAPHIC DATA

Dr. Rashawn Ray

David M. Rubenstein Fellow, The Brookings Institution

Chairwoman Velázquez, Ranking Member Chabot, and distinguished members of the Committee on Small Business, thank you for inviting me to testify on “Enhancing Patent Diversity for America’s Innovators.” I am a David M. Rubenstein Fellow at The Brookings Institution. I am also an Associate Professor of Sociology at the University of Maryland and the Executive Director of the Lab for Applied Social Science Research (LASSR). LASSR is a research center that regularly partners with government agencies, organizations, and corporations to conduct objective research evaluations and develop innovative research products such as our virtual reality work with law enforcement and incarcerated people.

My comments will center on the voluntary collection of demographic data. My written testimony will primarily focus on three specific questions: 1) What are public attitudes and behaviors regarding the collection of demographic data? 2) Is the collection of demographic data important? and 3) What do we know about United States Patent and Trademark Office (USPTO) patent assignees?

What are the Public Attitudes and Behaviors regarding Demographic Data?

A majority of Americans want to be in control of who collects data on them, what is collected, and for how long the data are stored.¹ However, context matters. For example, 90% of Americans view their social security number as very sensitive whereas only eight percent view their purchasing habits as very sensitive.² People are also willing to provide information about their political and religious views. At the same time, Americans are becoming accustomed to limited control over their information. About 80% of Americans report having awareness about the government collecting information about verbal, written, and online communication. Roughly 50% of people in a Pew survey reported having little to no control over that information. Overall, what most Americans desire is more transparency about what data is collected, how long it will be stored, and what those data will be used for.

People seem to be quite comfortable with credit card companies collecting and storing data on them, followed closely by the government. They are much less likely to be comfortable with websites they visit online as well as cable and cell phone companies collecting and storing information on them. In fact, over 50% of Americans think that the government should be able to store data for a few years or as long as they need to. Still, people are not confident about the

¹ Madden, Mary and Lee Raine. 2015. “America’s Views about Data Collection and Security.” Pew Research Center. < <https://www.pewresearch.org/internet/2015/05/20/americans-views-about-data-collection-and-security/>> (accessed on January 13, 2020).

² Madden, Mary. 2014. “Public Perceptions of Privacy and Security in the Post-Snowden Era.” Pew Research Center.” < <https://www.pewresearch.org/internet/2014/11/12/public-privacy-perceptions/>> (accessed on January 13, 2020).

privacy and security of their data from any source. Slightly less than one-third of Americans perceive the government will keep their data safe and private. This is comparable to views about cell phone and cable companies.

Over 50% of Americans say they have very little or no understanding about data protection laws,³ and 75% say there should be more regulation. People disapprove of the government collecting their phone and email records. Part of this simply has to do with a decline in public trust in social institutions.⁴ However, the public is much more likely to trust science and medicine than other social institutions.

Despite people’s attitudes about data collection, how do people actually behave? Do people actually voluntarily provide demographic information on a survey when asked? In short, yes. My experience collecting data is that people overwhelmingly answer demographic questions on surveys. I have conducted surveys and interviews with the general public, police officers, families, parents, employees of companies, members of religious organizations, government employees, protesters and march attendees, people who have lost large amounts of weight, people living in urban, suburban, and rural areas, people living in the Midwest, on the west coast, in the south, and in the northeast, and high risk groups. I have conducted these surveys and interviews in-person, online, on paper, and on tablets and other smart devices. I have asked demographic questions verbally too and the response rate is similar.

Generally, I have asked respondents about an assortment of topics ranging from discussions about police-community relations to marital and relationship issues to sexual assault on college campuses. No matter the topic, people still overwhelmingly volunteer their demographic information. I typically ask respondents their gender, age, race/ethnicity, national origin, sexual orientation, education level, household income, military or veteran status, and disability. I have also asked people about who lives in their household as well as their political and religious beliefs. In a typical survey, less than 5% of respondents refuse to answer demographic questions. I am also the co-editor of an academic publication, *Contexts Magazine: Sociology for the Public*, and have authors who publish on a range of topics. No matter how obscure, rarely do the researchers report having difficulty getting respondents to answer demographic questions.

Additionally, there are large datasets that social scientists commonly utilize such as the General Social Surveys, which has been asked since the 1970s. People regularly provide answers to demographic questions on these surveys. A government survey, such as the U.S Census, that

³ Auzier, Brooke And Lee Rainie. 2019. “Key Takeaways on Americans’ Views about Privacy, Surveillance and Data-sharing.” Pew Research Center. < <https://www.pewresearch.org/fact-tank/2019/11/15/key-takeaways-on-americans-views-about-privacy-surveillance-and-data-sharing/>> (accessed on January 13, 2020).

⁴ McGeeney, Kyley, Brian Kriz, Shawna Mullenax, Laura Kail, Gina Walejko, Monica Vines, Nancy Bates, and Yazmín García Trejo. 2019. “2020 Census Barriers, Attitudes, and Motivators Study Survey Report.” United States Census Bureau. < <https://www2.census.gov/programs-surveys/decennial/2020/program-management/final-analysis-reports/2020-report-cbams-study-survey.pdf>> (accessed January 13, 2020).

collects a series of demographic data is also useful to note.⁵ Ninety percent of Americans view the Census as very or somewhat important. And, over 80% of Americans say they definitely or probably will participate in it. Interestingly, I had to fill out a demographic data form to be here today. I did not think twice about filling it out, similar to most Americans. I think it is safe to say that Americans are more than willing to provide their demographic data.

Why is it Important to Collect Demographic Data?

Collecting demographic data is important for a few central reasons. First, more data is normally better because they help to eliminate false positives. For example, the lack of demographic data may inflate the likelihood of certain groups catching a deadly disease, having an early onset of dementia, or having a child with autism. These false positive may inadvertently funnel resources to the wrong areas. Second, the collection of demographic data allows for the determination of whether a sample is representative. If researchers are conducting a study on vaccines, for example, a representative sample is paramount. If there is under- or over-representation of certain groups, the analysis will likely over or underestimate the impact of those vaccines. Third, there is a long and torrid history of the consequences of not collecting demographic data on real life outcomes that have shifted public opinion. Certain groups have historically and systematically been left out of the data collection process. What many Americans desire more than anything is transparency, inclusion, and equity. Demographic data help to provide this. A lack of demographic data often leads to bad science, does a disservice to Americans, and inhibits the United States' ability in continuing to be innovative and comprehensive.

In the case of patents, demographic data could show us whether certain groups are more or less likely to apply and receive patents. Demographic data may show that the percentage of women and racial minorities who apply for patents are lower than their percentage in the U.S. population. But, demographic data may show that the percentage of women and racial minorities who apply for patents is on par with their percentage in certain STEM fields. Demographic data may show that people with lower levels of education are applying for patents but less likely to receive them. This may suggest that people with higher levels of education may have more knowledge and expertise about the patent process that leads to a higher level of success. We do have some information about inventors that is important to share that may help shed light on some of these propositions.

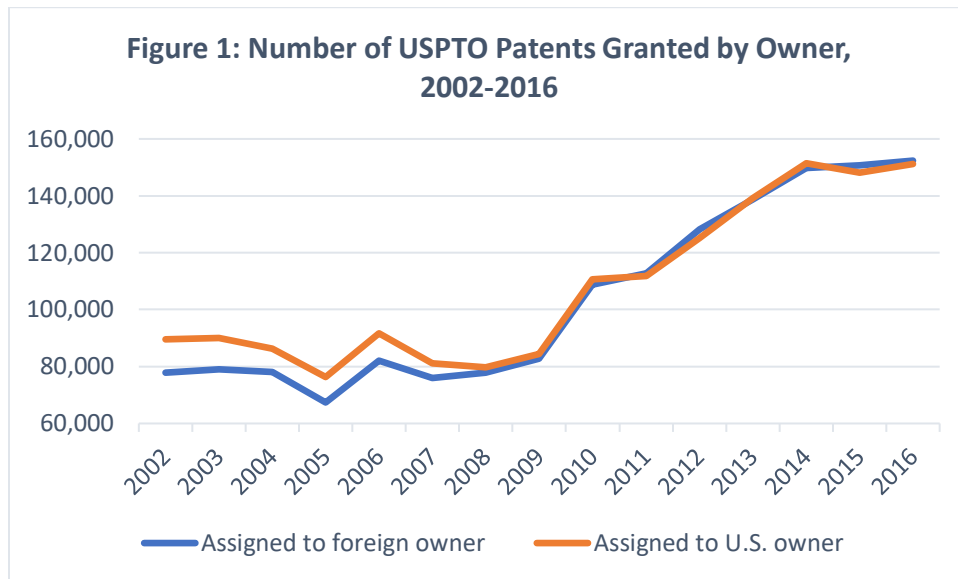
What do we know about who is Awarded Patents?

The National Science Foundation provides some data on patent assignees (inventors and owner of patents) from 2000-2016 from USPTO.⁶ I provide graphs for ease of use. Figure 1 shows the number of patents by U.S. versus foreign owners during this period. Though the number of assignees suggest parity between U.S. and foreign inventors, the percentages in Figure 2 suggest a different story. The percentage of U.S. inventors has decreased over time, while the percentage

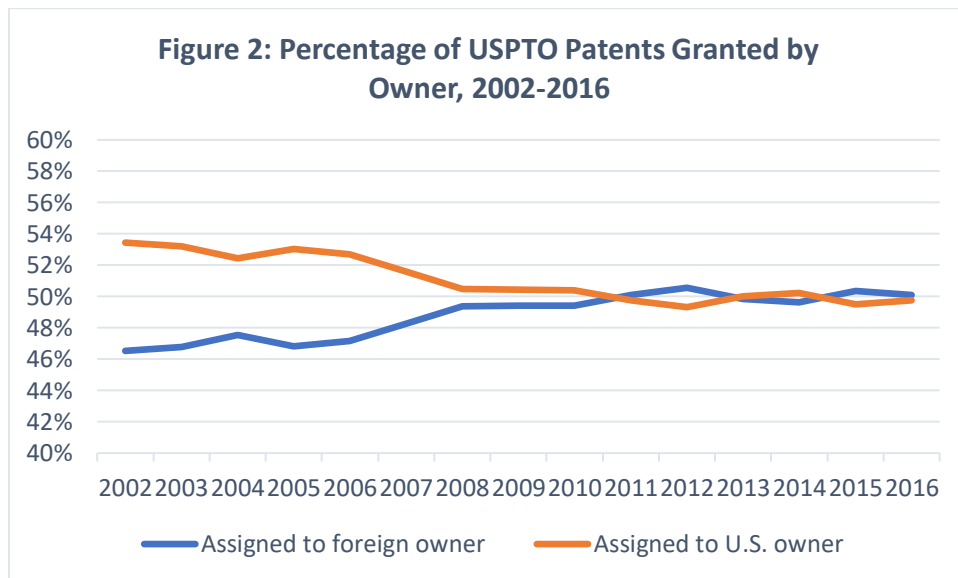
⁵ Pew Research Center. 2010. "Most View Census Positively, But Some Have Doubts." < <https://www.people-press.org/2010/01/20/most-view-census-positively-but-some-have-doubts/> > (accessed on January 13, 2020).

⁶ National Science Foundation. 2018. "Invention, Knowledge Transfer, and Innovation." < <https://www.nsf.gov/statistics/2018/nsb20181/report/sections/invention-knowledge-transfer-and-innovation/invention-united-states-and-comparative-global-trends> > (accessed on January 13, 2020).

of foreign inventors has increased. With additional demographic data, policymakers may want to know whether the proportion of U.S. versus foreign applicants shows a similar pattern.



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

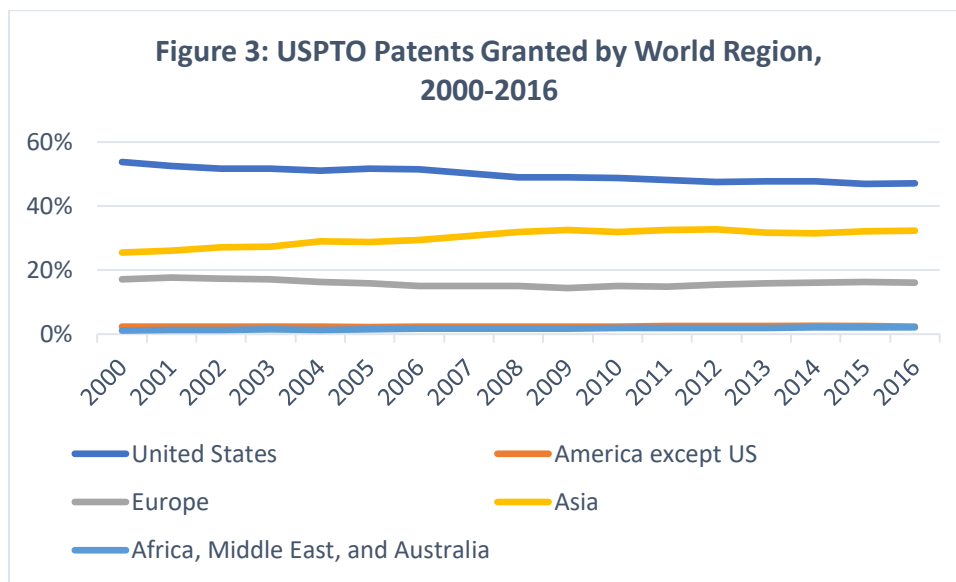


Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

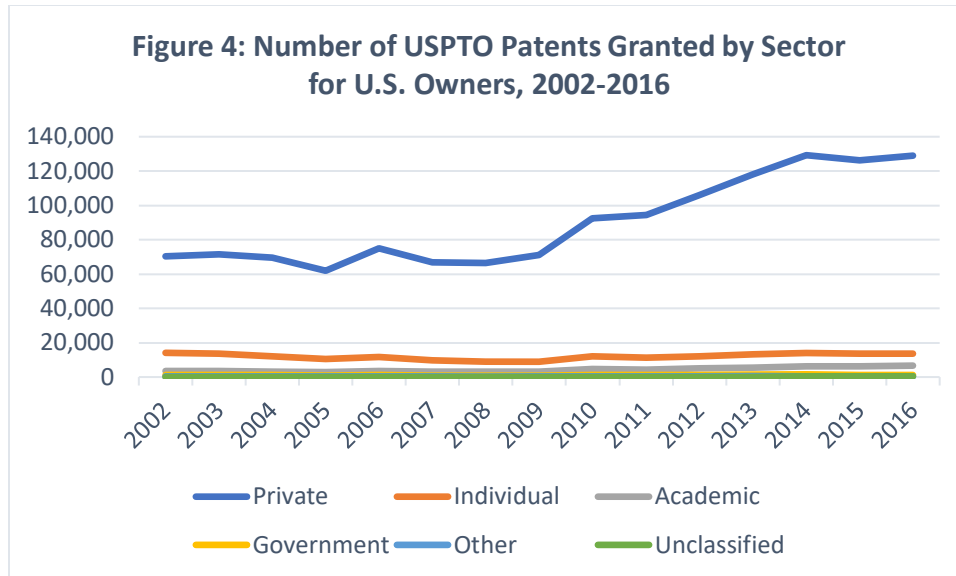
Figure 3 shows the percentage of USPTO patents granted by world region from 2000-2016. As noted above, the percentage of U.S. assignees has decreased over time. The rest of Northern, Southern, and Central America has stayed relatively stable at less than three percent. Besides the

U.S., most of the patent assignees from the Americas come from Canada. Africa, Middle East, and Australia has increased slightly from over one percent to over 2 percent. Israel is the main representative from this region. Europe has decreased slightly from 17.2% in 2000, dipping to 14.4% in 2009, and then increasing to 16.2% in 2016. Germany followed by the United Kingdom are the main assignees from Europe. Asia, primarily represented by inventors from Japan, have encompassed at least 25% of assignees each year. Asian inventors have represented nearly one-third of assignees every year since 2008. With additional demographic data, policymakers may want to know the educational trajectories (university affiliations) of assignees. That piece of demographic information may provide useful insights about inventors from other regions of the world.

Figure 4 shows the number of USPTO patent assignees for U.S. owners. It shows a substantial increase in the number of patents assigned to people in the private sector. The number of inventors classified as individuals has decreased over time. The number of patent assignees from the government remains low. The number of patents to U.S. universities has increased over the past 15 years. In 2016, slightly over one-third of patents to U.S. universities were for pharmaceuticals, biotechnology, and medical technology.



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

In addition to government records about national origin and sector of inventors, some researchers and organizations have aimed to gain information about gender and race by examining the names of inventors. More recent research has aimed to estimate women’s patent activity and impact by estimating their proportional representation on a patent based on the number of inventors listed. The Institute for Women’s Policy Research has done extensive research in this area.

Results show some notable trends as they pertain to gender.⁷ First, the number of women listed on patents still remains significantly low, despite increasing from less than 2,000 in the 1970s to over 20,000 by 2010. Second, the number of patents with no women listed also increased from the late 1970s to 2010. In 2010, nearly 100,000 patents had no women listed as inventors. Third, women inventors are more likely to be in the sectors of apparel and jewelry rather than technology and pharmaceuticals. Fourth, men are more likely to apply for patents relative to women.

However, the gender gap seems to not solely be about who applies for a patent. There is a gender gap in patent acceptance rates. While 73% of men had their patents accepted from 2002-2016, only 67% of women did. This means that women are nearly 10% less likely to have a patent accepted. When a woman is the primary assignee, the patent is rejected roughly 30% of the time, compared to slightly less than 20% when the main patent assignee is a man. These results are

⁷ Milli, Jessica Milli, Emma Williams-Baron, Meika Berlan, Jenny Xia, and Barbara Gault. 2016. “Equity in Innovation: Women Inventors and Patents.” Institute for Women’s Policy Research. <<https://iwpr.org/publications/equity-in-innovation-women-inventors-and-patents/>> (accessed January 13, 2020).

troubling considering that women-owned firms have increased four times that of men over the past 20 years but still represent roughly one-fifth of employer firms.⁸

An examination of race showed that less than 1,000 inventors of over 1 million were Black.⁹ Black and Hispanic college graduates are less than half as likely to hold a patent relative to their White counterparts.¹⁰ Children born in poverty are 10 times less likely than children born to the most affluent families to receive a patent. Still, Black and Hispanic men, compared to White and Asian men, are less likely to have their patents accepted. But, Black men are more likely than Black women to apply for patents. The intersection of race and gender matters in this context considering that minority women firms are mostly driving the increase in women-owned firms.

College degrees do play a role in patent applications and gender disparities. While the number of women obtaining degrees in biology and engineering increased from the late 1970s-2010, the number of women obtaining computer science degrees decreased. However, degree is not the only issue. There are leaks in the pipeline that cannot be adequately identified because the U.S government does not currently collect demographic data. It is clear that disparities extend from who applies to who is ultimately awarded a patent.

Collecting demographic data can help fill these important gaps, create more understanding and equity in the process,¹¹ and better streamline resources for trainings and funding so all Americans can assist the United States in continuing to be a major world innovator for new products that can help drive the economy and create jobs.

⁸ Williams-Baron, Emma, Jessica Milli, and Barbara Gault. 2018. "Innovation and Intellectual Property among Women Entrepreneurs." Institute for Women's Policy Research. < <https://iwpr.org/publications/innovation-intellectual-property-women-entrepreneurs/> > (accessed January 13, 2020).

⁹ Cook, Lisa D. and Chaleampong Kongcharoen. 2010. *The Idea Gap in Pink and Black*. Michigan State University. <https://www.msu.edu/~lisacook/pink_black_0810.pdf> (accessed January 13, 2020).

¹⁰ Fechner, Holly and Matthew S. Shapanka. 2018. Closing Diversity Gaps in Innovation: Gender, Race, and Income Disparities in Patenting and Commercialization of Inventions." *Technology and Innovation*, 19: 727-734.

¹¹ Shaw, Elyse Shaw and Cynthia Hess. 2018. "Closing the Gender Gap in Patenting, Innovation, and Commercialization: Programs Promoting Equity and Inclusion." Institute for Women's Policy Research. < <https://iwpr.org/publications/gender-diversity-patenting-program-scan/> > (accessed January 13, 2020).