

Diversity and Labor Market Outcomes in the Economics Profession

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Abstract

While the lack of gender and racial diversity in economics in academia (for students and professors) is well-established, less is known about the overall placement and earnings of economists by gender and race. Understanding demand-side factors is important, as improvements in the supply side by diversifying the pipeline alone may not be enough to improve equity in the profession. Using the Survey of Earned Doctorates (SED) linked to Longitudinal Employer-Household Dynamics (LEHD) jobs data, we examine placements and earnings for economists working in the U.S. after receiving a PhD by gender and race. We find enormous dispersion in pay for economists within and across sectors that grows over time. Female PhD economists earn about 12 percent less than their male colleagues on average; Black PhD economists earn about 15 percent less than their white counterparts on average; and overall underrepresented minority PhD economists earn about 8 percent less than their white counterparts. These pay disparities are attenuated in some sectors and when controlling for rank of PhD granting institution and employer.

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I. Introduction

“Why does diversity matter? What makes it important for the economics profession to become more inclusive? The first reason is basic fairness.Beyond fairness, the lack of diversity harms the field because it wastes talent. ...Diversity is important in insuring that the research that is done within economics appropriately reflects society’s priorities. ... Diverse groups outperform in solving complex problems ...” Janet Yellen, September 23, 2019.

A large and growing literature documents the lack of gender and racial diversity in economics over multiple dimensions from choice of undergraduate major, to graduate field, to post-PhD placement and promotion in the profession.¹ The American Economic Association (AEA), among others, has taken actions to increase diversity in the profession, but greater diversity remains an elusive goal.² Only a third of economics PhDs are awarded to women, a share unchanged since the 1990s. Economics also ranks near the bottom in the share of doctorates awarded to underrepresented minority students.³ As succinctly captured in the quote from Yellen (2019), changing this status quo is important not only from a fairness perspective, but also for improving the profession by broadening the set of perspectives within the profession.

Within this larger context of diversity in the economics profession, we focus on post-PhD placements and earnings by gender and race. We document the placements and earnings of PhD economists by race and gender in multiple sectors of the economy. This allows us to provide a more complete view of the economics profession and to present evidence that suggests that some sectors have stronger institutional barriers to advancement for underrepresented groups in the economics profession than others. Recognizing the systemic issues within the economics profession, we present results without covariates as the baseline, including descriptive results on both placements and earnings. We then extend these results to look at earnings by sector and controlling for PhD program rank and post-PhD employer.

¹ This large literature encompasses many aspects of diversity in academia: as students and professors in economics (Allgood et al. (2019), Bayer and Rouse (2016), Bedard, Lee, and Royer (2021), Collins (2000), Darity (2010), Ginther and Kahn (2004, 2021), Kahn (1993, 1995), Lundberg and Stearns (2019), Price (2009), Sharpe (2018)); as invited seminar speakers (Doleac, Hengel, and Pancotti (2021)); as participants in economics conferences and seminars (Chari and Goldsmith-Pinkham (2017), Cunningham and Zavadny (2015), Dupas et al. (2021)); as represented in economics textbooks (Stevenson and Zlotnik (2018)); on an economics informal job website (Wu (2018)); in economics publications (Hengel (2022)). In contrast, Kleemans and Thornton (2021) do not find evidence of gender bias in NBER membership and Donald and Hamermesh (2006) do not find evidence of gender bias on the AEA executive board (and, in fact, find a positive preference for female candidates).

² The AEA established the Committee on the Status of Women in the Economics Profession (CSWEP) and the Committee on the Status of Minority Groups in the Economics Profession (CSMGEP). The AEA Summer Economics Fellows Program “aims to enhance the careers of underrepresented minorities and women during their years as senior graduate students or junior faculty members” (Chevalier (2021), p. 746); an analogous program is aimed at undergraduates. The AEA also has a mentoring program. The National Economic Association (NEA) promotes the professional lives of minorities within economics. The American Society of Hispanic Economists (ASHE) promotes greater representation of Hispanics in the profession.

³ Source: National Center for Science and Engineering Statistics. 2010-2019. “Survey of Earned Doctorates: Doctorate Recipients from U.S. Universities”. National Science Foundation. <https://www.nsf.gov/statistics/srvydoctorates/#tabs-2> (accessed December 4, 2021)

Our unique contribution to this literature is the breadth of our data on placements and earnings and earnings growth after receiving an economics PhD. We match data on PhD economists from the US Survey of Earned Doctorates (SED) to a national database of jobs, tracking economists' placements and earnings over the first 10 years of their post-PhD careers. Thus, we are able to provide a detailed look at the careers of economists not only in academia but also in government and industry. This wider focus is especially important as the share of PhD economists' placements in academia is falling while the share in industry is rising. As one dramatic example, Athey and Luca (2019) note that Amazon, which hired over 150 economists between 2014-2019, now employs more economists than the largest economics departments.

Thus, our matched data allows us a unique opportunity to survey the changing US labor market for PhD economists. This represents an expansion in scope (covering more than academia) and size relative to existing work. Bedard, Lee, and Royer (2021) summarize the current literature as "all existing research relies on cross-sectional data, short early career panels, or panels specific to a narrow set of institutions (p. 69)." They collected data for the top 50 academic institutions as ranked in the 2017 US News and World Report and have 254 women and 1,102 men in their sample. While our sample has broader coverage, their sample contains more historical information (they are able to trace 20 years of history).

Our paper builds upon our earlier work which focused on PhD economists in the federal government. Foster et al. (2020) find earnings gaps for female economists in the federal government that are largely explained by differences in experience (female economists tend to be younger). They also find larger earnings gaps for minorities regardless of gender. Earnings gaps between white men and other groups are larger for economists who subsequently left federal government for academia or the private sector. Wessel, Barcena, and Salwati (2021) combine data from multiple sources including the Federal Reserve System, Office of Personnel Management, and three Congressional support offices that conduct research to create a sample of about 2,300 PhD economists working in the federal government. They estimate their sample covers 95% of the PhD economists in the federal government and find 26% of federal PhD economists identify as minorities and 29% as women in 2020.

Our paper is also related to the recent work by Schultz and Stansbury (2022) examining socioeconomic diversity in Economics (also using the SED).⁴ They find that economics is less socioeconomically diverse than other PhD fields. Schultz and Stansbury (2022) show that economists are the least likely to be first-generation college students and are the most likely to have at least one parent with a graduate degree, compared to all other PhD fields. They find the share of first-generation students in top economics programs is especially small, about 5 percent, compared to 17 percent in programs below the top 15. As Jones and Sloan (2021) show, most tenure-track faculty at PhD-granting institutions in the U.S. come from the top 15 PhD programs. These faculty are drawn from a population that is even less diverse than the profession generally. We do not investigate the issue of socioeconomic diversity directly in this paper, but our

⁴ Rennane et al. (2022) use the SED and the Survey of Doctorate Recipients to examine academic (tenure versus non-tenure) and non-academic career paths for PhD recipients in STEM fields.

descriptive results on the role of PhD program rank in determining earnings after the PhD provide some related information.

While our paper does not delve into mechanisms, we briefly highlight research in this area. Much of the work with respect to gender uses a “leaky pipeline” analogy to illustrate the pattern of fewer and fewer women at each stage of an academic career (see for example, Ginther and Kahn (2004)).⁵ Kolpin and Singell (1996) find that women have lower initial placements than similarly qualified men, as indicated by their subsequent productivity. Ginther and Kahn (2004) find that female economists are less likely to get tenure at their first academic job, even when controlling for publication record and family characteristics. Since an important component of hiring and promotion is publication, work also focuses on gaps there. Hengel (2022) documents the paucity (less than 8 percent) of female authors in the top four economic journals over 1950-2015 and finds evidence that female authors are held to higher standards (as measured by clarity of abstracts) in the refereeing process. Card et al. (2020) summarize the existing evidence on gender biases in the evaluation of economic research as “mixed” (p. 270). In their analysis of 30,000 submissions to four economics journals they find similarly mixed results: on the one hand, they find no difference in how the genders treat papers by male and female authors; on the other hand, they find that female authors are held to a higher standard (as measured by future citations).

Once published, economics papers with female authors are less likely to be cited by related papers (Koffi, 2021) and female co-authors are less likely to get credit for their contribution (Sarsons, 2017). Women also have more narrow co-authoring networks (McDowell et al., 2006). As author credit for publications is critical to promotion in academia, these disadvantages may drive the higher gender pay gaps we find in academia relative to other sectors. Lundberg and Stearns (2019) provide an excellent overview of the “stalled progress” for women in the profession and focusing on differential assessments of men and women, they highlight the importance of implicit bias in promotion and tenure decisions.

Turning to race and ethnicity, we follow CSMGEP in designating the following demographic groups as part of underrepresented minorities in economics: Black, Hispanic, American Indian/Native Alaskan (AIAN) and add Native Hawaiian/Other Pacific Islanders (NHPI).⁶ Price (2009) notes that when the supply of Black economists increased, the number of Black economics professors remained unchanged. Thus, he notes that the challenge for Black economists is not only a “pipeline” but a “color-line.” Darity and Kreeger (2014) and Simms and Conrad (2019) take a case-study approach as they examine the experiences of Black economics graduate students at MIT and Stanford University, respectively, and note the importance of institutional support. In a recent survey of minorities in economics, the most commonly cited challenges with advancement in the profession were a lack of mentoring and role models, and a sense of isolation (Bayer, Hoover, and Washington, 2020). Several respondents also cited a lack

⁵ Halim, Powers, and Thornton (2022) provide an overview of the literature on the *undergraduate* economics gender gap. Results from their randomized control trial highlight the importance of grades for female participation.

⁶ Hoover and Washington (2021, p. 764, footnote 5). Following standard practice, Asian economists are not included in this definition of underrepresented minority students because Asians as a group are well represented in economics. However, we acknowledge that subgroups within Asian could be underrepresented in economics.

of information regarding non-academic opportunities for economists, with students from blue-collar backgrounds indicating greater interest in non-academic jobs.

Logan and Myers (2020) discuss the importance of networks in building citations and note that the *Review of Black Political Economy* was not indexed in the *Journal of Economic Literature* for decades. Doleac, Hengel, and Pancotti (2021) note the importance of presentations and find underrepresented minority economists accounted for only 1.1 percent of invited seminar speakers in their sample covering 2014-2019. Dupas et al. (2021) note the underrepresentation of economists by race and ethnicity (and sexuality and disability status) at top economic departments precludes them from including these characteristics in their analysis of seminar and conference culture since they “would lack the statistical power to say much of interest” (p.4).

In sum, while much of this research focuses on supply-side issues of underrepresentation, understanding demand-side factors is also important, as improvements in the supply side by diversifying the pipeline may not be enough to improve diversity in the profession. ‘Demand-side’ factors, such as implicit bias in placements and promotions, further hamper efforts to improve equity and inclusion within the profession. While we do not attempt to identify the mechanisms in this paper, we hope that future work could build on our descriptive results.

To preview some of our results, consistent with the existing literature, we find low shares of female and underrepresented minority economists in our sample of economists who received their PhD in the period 2001-2017. In terms of placements by sector, we find the highest representation for female economists in government (38 percent) and the lowest in academia (33 percent) for 2017. For underrepresented minorities, the placement shares are uniformly low: about 5 percent for the combined category of AIAN/Hispanic/NHPI economists over all sectors and ranging from 3 percent (industry) to 5 percent (government) for Black economists. Moving beyond placement to look at earnings, we find female economists earn about 12 percent less than their male colleagues on average. Black economists earn about 15 percent less than their white counterparts; overall, underrepresented minorities earn about 8 percent less than their white counterparts. Black female and underrepresented minority female economists do not appear to face a double penalty, but instead earn at similar levels to white women.

This paper proceeds as follows. We describe our data and matching methodology in Section II. In Section III we present results from descriptive exercises on the initial placements for PhD economists in the labor market. Given the novel scope of our data, we start with an overview of the labor market more generally before providing results by gender and race. We follow the same strategy in Section IV, where we focus on earnings with a series of descriptive exercises including Mincer regressions on wage gaps by gender and race for PhD economists across sectors. Section V concludes.

II. Data

A key contribution of this paper is our uniquely comprehensive data on economists’ employment and earnings in the US after receiving a PhD. Our analysis dataset is Survey of

Earned Doctorates microdata on economists who received a PhD between 2001 and 2017 linked to longitudinal US earnings and employment microdata housed at the US Census Bureau. Our data allow us to trace US earnings and employment histories following attainment of a PhD of about 12,500 economists. In this section, we briefly describe our data sources and matched sample.

Survey of Earned Doctorates

Our data on PhD economists come from the Survey of Earned Doctorates (SED) produced by the National Center for Science and Engineering Statistics (NCSES). The SED is an annual census conducted since 1957 of all individuals receiving a research doctorate from an accredited U.S. institution in a given academic year. Due to the availability of comprehensive lists of doctorate-granting institutions and the institutions' high levels of participation in the survey, coverage of PhD-granting departments is nearly complete. Graduate schools collect the survey data from degree recipients at the time of doctorate completion, and response rates are very high, over 90 percent. Thus, the SED data provide nearly complete coverage of all individuals who received an economics PhD in the U.S. We have a subset of these data for our paper covering 2001-2017.

We use the following variables from the SED: doctoral degree received, year of receipt, granting institution, field of study, sex, citizenship, ethnicity, and race. An important measurement characteristic of the SED is that race and ethnicity are only reported for U.S. citizens and permanent residents. Moreover, the SED publishes all responses for Hispanic ethnicity as Hispanic and then uses only non-Hispanic data for the race categories (and we adhere to this convention).⁷ We use the PhD granting institution from the SED to create a measure of program granting institution rank based on the program's Research Papers in Economics (RePEc) citation rankings. For our descriptive results, we bin our sample into graduates from top five, top 6-20, and non-top 20 programs.⁸ These rankings are intended to help capture the significance of hierarchies in the economics profession with its emphasis on rank of PhD granting institutions, rank of employment institution, number of citations, and placement of publications in top 5 journals (Fourcade et al. (2015), Kleemans and Thornton (2021)).

Using SED published figures, there are about one thousand economics PhD recipients per year. Focusing on 2017, of these about one-third are awarded to female students (34 percent). Among economics degrees, U.S. citizens and permanent residents account for less than half the PhDs granted. Within this group, the share of American Indian or Alaska Natives recipients is less than half a percent; Asian recipients is 16 percent; Black recipients is 4 percent; Hispanics recipients is 7 percent; and White recipients is 63 percent in 2017.⁹

⁷ Appendix A provides more details on the SED, including how we define economists using field information, the exact wording of questions for variables used in this paper, and the relationship between citizenship, ethnicity, and race. Thus, when we report results for "white economists" for example, we are by construction referring to "non-Hispanic white economists" as is made clear in Figure A3.

⁸ These bins are defined using the RePEc institution ranks as of June 2021. The list of programs in the top 5 and top 20 categories can be found in Table B3.

⁹ NHPI is included in "other race or race not reported" in SED (see for example page 26 of SED 2017).

Since our analysis is post-PhD and thus encompasses the entirety of pipeline issues, it seems the most relevant comparison group is the US adult population. Doleac, Hengel, and Pancotti (2021) discuss relevant comparison groups and note “our view is that the optimal target for the share of seminar speakers [the subject of their paper] who are women or URM is not the current composition of the profession but the composition we aspire to achieve (p. 59).” Thus, we present total adult population shares by way of comparison: female (51.4 percent); AIAN (1.1 percent), Asian (6.1 percent), Black (12.0 percent), Hispanic (16.8 percent), NHPI (0.2 percent), and White (64.1 percent).¹⁰ By way of further comparison, gender parity of PhD recipients is already achieved (and surpassed) for some fields outside of economics such as biology and sociology in 2017 so that 47 percent of PhD recipients across all fields are female but this is not the case for racial parity (see Appendix B).¹¹

Finally, we expand the definition of the economics field used in SED public tabulations slightly to include agricultural and environmental economists. The impact of this broader definition is documented in Appendix A (see Figure A1) where we discuss detailed measurement issues.

Longitudinal Employer-Household Dynamics data

Our data on earnings and employment after the PhD are primarily from the US Census Bureau’s Longitudinal Employer-Household Dynamics (LEHD) data. LEHD data includes quarterly earnings records collected by state unemployment insurance (UI) programs, linked to establishment-level data from the Quarterly Census of Employment and Wages (QCEW) data. LEHD employment coverage is quite broad, covering over 95 percent of private-sector workers and almost all state and local government employment (see Abowd et al. (2009) for a description of LEHD data and methods).

We use LEHD data for all private-sector and public-sector employers in all available states, from 2001 forward. As the LEHD wage record data have some coverage gaps (particularly federal workers) we supplement the LEHD data with Internal Revenue Service (IRS) form W-2 data to obtain earnings for jobs not covered in LEHD data. These two data sources together provide near-universal coverage of US earnings. Information on placements/employers for economists comes from the QCEW.

Matched SED/LEHD sample

We use personal identifiers called Protected Identification Keys (PIKs) assigned to individuals by the Census Bureau’s Person Identification Validation System (PVS) to link SED respondents to LEHD and W2 earnings histories following graduation. Our sample of PhD economists is therefore different from the SED in two important respects. First, we cannot link earnings records for SED respondents who are not assigned a PIK. Our SED microdata contain

¹⁰ The comparison is crude because we are not restricting based on citizenship status. Sources: Gender: <https://www.census.gov/data/tables/time-series/demo/popest/2010s-national-detail.html>. Race (race alone) and ethnicity: Figure 5, [Improved Race, Ethnicity Measures Show U.S. is More Multiracial \(census.gov\)](#)

¹¹ Appendix B compares Economics to All Fields over time for citizenship, ethnicity, and race.

degree records for approximately 20,500 PhD economists. We are able to assign a PIK to approximately 19,000 (93 percent).

Second, we can only characterize post-PhD earnings for those economists who work in the US after graduation. This restriction further narrows our sample to 12,500 PhD economists (61 percent). Thus, when comparing our data to the SED, it is important to note that our sample is less than two-thirds of all economics PhDs granted by US institutions. The majority of economics PhDs granted by US institutions are awarded to temporary visa holders. Since most leave the country after receiving their degrees, we are unable to match them to our earnings data after they leave the US. Presumably many of these temporary visa holders obtained post-PhD employment outside of the US. But many do remain in the US for work following graduation. Economists who were temporary residents at the time of graduation account for 45 percent of our sample of PhD economists working in the US.¹²

Gender, ethnicity, and race measurement

As is common in this literature we will use all respondents when stratifying by gender, but for results by race and ethnicity we use only the subset of doctorate recipients who are U.S. citizens or permanent residents at the time of graduation.¹³ We recognize these groups do not encompass all notions of diversity in the profession, especially as almost half of economists working in the US are foreign-born. The unique challenges facing foreign-born economists working in the US are worthy of further study but are beyond the scope of our analysis.

Some demographic groups are so small, even with our large sample, that we must pool respondents for many analyses. Due to small sample sizes, we cannot report results separately for AIAN and NHPI economists and thus they appear in a combined category with Hispanic economists. We also pool those who report two or more races and those who report no race, both very small categories. In some analyses it is necessary to further group race and ethnicity into an underrepresented minority (URM) category which combines AIAN, Black, Hispanic, NHPI, two or more races, and race not reported respondents. Ideally, we would be able to produce statistics for all race/ethnicity categories separately to capture the unique experiences of each group. Further, it would be ideal if we could also produce statistics that also take into account the importance of gender and for all race categories together.¹⁴

III. Placements for PhD Economists

In this section, we first provide descriptive statistics on placements for all PhD economists in our sample and then turn to results by gender and race. We categorize the

¹² For further discussion of how our matched sample compares to the SED, see Appendix B.

¹³ SED public use tabulations also adopt this practice of stratifying race and ethnicity for US citizens only. See Appendix B for sex, citizenship, race and ethnicity for economists in the published SED tables.

¹⁴ An intersectional lens can reveal important differences and thus the annual CSMGEP report also reports race by gender. Sharpe (2018) finds that the growth in the number of economics undergraduate degrees from 1996-2005 to 2006-2015 was higher for men than women (42% versus 30%) and roughly similar for Blacks and Whites (25% versus 24%) but an intersectional view reveals that growth for Black women was only 1%.

placements of our 12,500 economists into six categories: academia, consulting, government, finance, technology, and other industry.¹⁵ We also take into consideration the ranking of the granting PhD program.

Table 1 shows initial placements for economists working in the US from 2001-2017, with the first four columns examining how placements have changed over time.¹⁶ Across all cohorts, academia is the most common destination for PhD economists; however, that share is falling, from 64 percent of 2001-2005 graduates to 56 percent of 2014-2017 graduates. For 2014-2017 graduates, the next most frequent placement is consulting (13 percent), followed by government (11 percent), then finance (10 percent), other (7 percent), and lastly technology firms (6 percent). While the share of academic placements has declined since the early 2000s, there are growing shares of economists with initial placements in government, consulting, and tech. Government jobs for economists in particular grew during this time period, from 5 to 11 percent of initial placements, despite a shrinking US public sector and growing supply of new PhDs.

How initial placements for the 2014-2017 cohort vary by PhD program rank is shown in columns 5-7 of Table 1. While one might assume graduates of top programs are more likely to place in academia, in fact only 56 percent of top-5 PhD program graduates in 2014-2017 placed in academia, similar to the 54 percent share for graduates from programs outside the top-20. There is some interesting heterogeneity across *non-academic* placements, especially in tech firms. The most striking is that 9 percent of top-5 graduates placed in tech firms, making it the third most common placement for top-5 graduates. By comparison, tech firms were only 4 percent of placements for graduates of programs outside the top-20. The recent dominance of technology firms in recruiting candidates from top programs may partly explain the growing interest academics have shown in understanding what economists at tech companies do.

The last three columns of Table 1 examine how much mobility there is across sectors in the profession, by looking at the share of initial placements working in that sector 10 years later. We restrict this analysis to those economists with 10 years post-PhD employment for whom we observe their initial placement. Academia, government, and finance are the ‘stickiest’ placements, with 84 percent, 80 percent, and 80 percent, respectively remaining in the same sector 10 years later. By contrast, only half or less than half of consulting, tech, and other industry initial placements are in the same sector 10 years later. Despite conventional wisdom that initial academic placements are preferred because the ‘door only swings one way’, the door very much does not: academia is a common destination for industry switchers. Nor is this driven by economists who initially placed in a non-academic job and quickly switched into academia. In

¹⁵ These sectors are defined using NAICS codes as follows: Academia (61, Educational Services), Consulting (54, Professional, Scientific, and Technical Services but excluding 541511-541519), Government (92, Public Administration), Finance (52, Finance and Insurance), Technology (454110, E-Commerce; 511210, Software Publishers, 517311-519190, Internet Publishing; 541511-541519 Computer System Design; 485310 Taxi Service; and 721100, Traveler Accommodation), and Other Industry (all other NAICS codes). Over 95 percent of those in Academia are employed in NAICS 6113, Colleges and Universities, with the remaining employed in community colleges and other educational services.

¹⁶ Specifically, Table 1 shows initial placements for those whose initial placement was in the US. Initial placement here means the employer who was the main source of income in the year after they received their PhD, which may differ from the initial placement reported to SED.

unreported results we find only about half of these switches occurred in the first five years after the initial placement.

In sum, we find a decreasing share of placements in academia. In the non-academic labor market for economics PhDs about one-third worked in the private sector, chiefly at consulting firms and banking or finance. Another 10 percent work in government, at places like the Census Bureau and the Federal Reserve Board. We also find that hiring of economists by tech firms increased in recent years, especially at top departments. Nine percent of US placements of economics PhDs from the top five economics departments were at technology firms in 2014-2017, a higher share than placements in either finance or government.

Placements by Gender and Race

Before looking at placements, we first note the low shares of female and underrepresented minority economists in our sample of economists who received their PhD between 2001-2017. Table B2 shows the demographics of our sample of PhD economists. Approximately one-third are female. Temporary residents account for 45 percent of PhD economists; within the remaining category of US citizens and permanent residents where we can classify race and ethnicity, AIAN, Hispanic, and NHPI account for 3 percent, Asian for 7 percent, Black for 2 percent, and White for 42 percent.

Turning to placements by gender and race, we must roll up non-academic jobs into broader groups to handle the issue with small sample sizes.¹⁷ As we want to allow for some differential mobility across sectors, we move away from initial placements here and take a cross-section of all economists working in 2017.¹⁸ From the first row of Table 2, we see the shares of women employed in academia, industry, and government are 33 percent, 36 percent, and 38 percent respectively. Thus, the overall lack of diversity by gender is slightly less pronounced in government and more pronounced in academia.

The share of temporary visa holders varies across sectors (almost half of industry economists, less than 20 percent of government), so race is reported here as the share of US citizens/residents to make comparisons across columns easier. We start with the combined category of AIAN, Hispanic, and NHPI economists. These account for roughly 5 percent across all three categories with academia only slightly higher than industry and government. Asian economists account for 9 percent in academia, 17 percent in industry, and 14 percent in government. Black economists represent 4 percent of economists in academia, 3 percent in industry, and 5 percent in government. Finally, white economists account for 77 percent in academia, 71 percent in industry, and 76 percent in government. Thus, the lack of diversity by race and ethnicity appears to be pervasive across all three sectors.

¹⁷ We use the term ‘industry’ to describe jobs for economists that are not in academia (NAICS 61, education) or government (NAICS 92, public sector), the majority of which are consulting, finance, and increasingly technology jobs. If an economist works more than one job during the calendar year, we determine the sector using the employer that was the primary source of earnings in that year. All earnings discussed in this section are real 2015 earnings.

¹⁸ Using all jobs in the latest year of our data also has the benefit of maximizing the sample size for this analysis, which allows us to report finer race categories than we could otherwise.

For comparison, we highlight results from CSWEP and CSMGEP annual reports which provide detailed analyses of the state of the profession.¹⁹ In the most recent CSWEP report, Chevalier (2021, table 6) reports that women from Top 10 schools are more likely to have a public sector placement than men (24 percent versus 18 percent), but that women from top 11-20 were more likely to go into the private sector than men (53 percent versus 41 percent). In the most recent CSMGEP report, Hoover and Washington (2021) find “representation of minority faculty in economics (across all academic positions) totals about 7.2 percent, far less than the 31.7 percent that Black, Latinx, and Native Americans make up in the population (p.770)” but also note caveats based upon the low response rate to the Universal Academic Questionnaire.

IV. Earnings for PhD Economists

Our objective in this section is to provide some basic descriptive statistics on earnings and earnings growth for US economists before exploring differences by race and gender. An advantage of our data is that we can show entire earnings distributions for economists working in the US and see how these distributions evolve. As we show in this section, earnings growth for early-career economists varies widely across and within sectors, resulting in large dispersions in economist pay in mid-career. Here we examine earnings in economists’ initial placements and 10 years later. Because we need to observe a decade of early-career earnings growth for this analysis, in this section we restrict to economists who received their PhD between 2001 and 2007.²⁰

One of the most important determinates of earnings for economists is sector. Figure 1 shows the annual earnings distributions for economists employed in academia, government, and industry. Figure 1(a) shows earnings in initial placements, with economists working in industry generally having the highest earnings, followed by those in government, then academia. Industry is the most heterogeneous sector and not surprisingly also has the most dispersion in earnings; the difference between the 75th and 25th percentile is about \$54,000 a year, compared to \$46,000 in academia, and \$36,000 in government. Compared to mid-career earnings, however, these initial differences in earnings for economists are relatively small.

¹⁹ These reports are published in *AEA Papers and Proceedings* as are the results from the Universal Academic Questionnaire (UAQ). UAQ results include demographic distributions of faculty by sex, Black or Hispanic, and Asian at three tiers of academic institutions: PhD institutions, MA institutions, and BA institutions. For the academic year 2020-2021, 14.8% of full professors are female, 7.2% of full professors are Black or Hispanic and 10.2% are Asian and all three groups have higher percentages for lower levels (associate and assistant professors) on the tenure track (Scott and Siegfried 2021).

²⁰ Most surveys of pay in the economics profession focus on academia. The AEA’s UAQ reports the mean salaries for nine categories of academics for type of professor (professor, associate, assistant) and type of institution (PhD schools, MA schools, and BA schools). Ranging from highest to lowest these are for academic year 2008-09: full professor at PhD school (\$147,921) and assistant professor at BA school (\$70,853) (Scott and Siegfried 2009). However, the SED also publishes median postgraduation earnings for PhD recipients with commitments located in the U.S. These are published for four categories, and the first available year, 2009, has the following ranking: Academia (\$75,000), Non-Profits (\$85,000), Government (\$95,000), and Industry (\$105,000) (see NCSES 2010, Table 45).

Figure 1(b) shows the same earnings distributions for economists 10 years into their careers. A notable feature of this second panel is the much faster early-career wage growth for economists in industry. Median earnings for industry economists increase from \$108,600 in their initial placement to \$174,100 10 years later. To put these differences in wage growth in perspective, the median industry economist earns 30 percent more than the median academic economist in their initial placement, but 10 years later earns 60 percent more.

Comparing panels (a) and (b) one also notes a large increase in earnings dispersion, reflecting within-sector differences in early-career earnings growth. The fairly normal earnings distributions in initial placements are now also flatter and more skewed. Mid-career academic and government economists have right-skewed earnings distributions, indicating that wage gains have been uneven and concentrated among economists in the right tail. Mid-career industry economists have a much flatter, unusual left-skewed earnings distribution, indicating even larger dispersion in earnings gains, but favoring a larger share of industry economists. The broad takeaway from Figure 1 is that there is substantial heterogeneity in early-career wage growth both within and across sectors which results in large pay disparities across the profession for mid-career economists.

We next explore sources of heterogeneity in earnings growth *within* sectors. An obvious factor is whether the economist graduated from a top program in economics.²¹ Figure 2 shows the same one- and 10-year earnings distributions as Figure 1, but this time within academia by program rank.²² Figure 2(a) shows that PhD program rank impacts initial placement earnings, with top program graduates earning more. Program rank has a more pronounced impact on earnings growth in academia, as shown in Figure 2(b). Ten years into their careers, the median graduate from a top five PhD program now earns almost *twice* what the median graduate from a program outside the top 20 earns. However, there is also now enormous dispersion in mid-career earnings for top candidates working in academia. The 75th percentile of top PhD program graduates earn almost twice as much as their former classmates in the 25th percentile by mid-career.²³

PhD program rank matters for earnings in industry too, but wage disparities are smaller. Figure 3 shows earnings distributions in industry by program rank. Comparing Figures 2 and 3, in both academia and industry, PhD program rank impacts initial placement earnings. However, in academia the earnings gap between top graduates and everyone else grows markedly in the first ten years of their careers. For economists in industry initial earnings gaps are smaller and shrink slightly by mid-career. These different dynamics mean that earnings penalties for remaining in academia after the PhD are generally much larger for graduates of non-top PhD programs. The median top-5 program graduate in academia earns 90 percent of what the median top-5 graduate working in industry earns 10 years after graduation, the median top-20 graduate

²¹ Another source of variation is employer pay premiums (e.g., private business school vs. public four-year college, hedge fund vs. non-profit); we control for employer fixed effects in the next section when we estimate pay gaps.

²² In exploratory analysis we tried other program rankings (such as Coupe, 2003) with similar results; PhD programs that have higher fixed effects in earnings regressions are generally top-ranked schools in most ranking regimes.

²³ Mid-career top-5 program graduates at the 75th percentile earn \$102,600 (80 percent) more in their academic jobs than their fellow top-5 program graduates in the 25th percentile. For top 6-20 graduates, the 75th percentile earns 90 percent more than the 25th percentile, almost twice as much. See Table 3.

earns only 70 percent, graduates outside the top-20, 63 percent. However, risk-averse top-5 graduates may also prefer industry placements, as there is much less dispersion in outcomes. Table 3 provides more moments from the distributions in Figures 1-3.

To sum up, in academia, the earnings gap between top graduates and everyone else grows markedly in the first ten years of their careers. For economists in industry, earnings gaps are smaller for initial placements and shrink slightly during the first 10 years of economists' careers. Our data do not allow us to easily explore mechanisms driving these different dynamics in academia and industry. However, one plausible mechanism is that graduates of top programs develop professional networks in graduate school that are more advantageous for promotion and wage growth within academia than outside of it, particularly connections to journal editors and senior coauthors.

Earnings by Gender and Race

We now turn to earnings by race and gender in the economics profession. We start with distributions analogous to those above. Unfortunately, small samples preclude us from showing these stratifications by race and thus we can only present results by gender for this exercise. We show these results in Figure 4 which shows economist earnings by sex 10 years after receiving a PhD for government, industry, and academia. For academia, we further disaggregate by granting program: top-20 programs and non-top-20 programs.

As most of the dispersion in earnings in academia is among graduates from top programs, that is also unsurprisingly where we find the largest gaps between men and women. For academics from schools outside the top 20, the median woman earns 9 percent less than the median man. For graduates from schools in the top 20, the median woman earns 26 percent less. In industry, the left-skewness of the earnings distributions means that the gender gap narrows at higher points in the distribution; the gender gap manifests as a fatter left tail instead of a thinner right tail. The general takeaway from Figure 4 is that where there is more dispersion in mid-career earnings, gender gaps are also larger, and that average differences can mask larger or smaller gaps at different points of the wage distribution.

In order to be able to expand our analyses to include race, we turn to regression analysis. Specifically, we pool the data over time and control for experience with a series of human-capital Mincer-style regressions (Mincer (1978)) of the form²⁴:

$$y_{it} = \alpha + \beta Female_i + \delta Exp_{it} + \mu Exp_{it}^2 + P_i + E_{it} + \varepsilon_{it} \quad (1)$$

$$y_{it} = \alpha + \gamma Race_i + \delta Exp_{it} + \mu Exp_{it}^2 + P_i + E_{it} + \varepsilon_{it} \quad (2)$$

$$y_{it} = \alpha + \beta Female_i + \gamma Race_i + \pi Female_i * Race_i + \delta Exp_{it} + \mu Exp_{it}^2 + P_i + E_{it} + \varepsilon_{it} \quad (3)$$

Where y_{it} is individual i 's log real annual earnings in year t , and $Female_i$ is an indicator that the economist is female, $Race_i$ is a set of mutually exclusive race/ethnicity/citizenship indicators, and Exp_{it} is experience, measured in years since PhD completion. Another

²⁴ More flexible functional forms, including adding additional polynomial terms or a spline of experience with breakpoints at 5 and 10 years have no effect on the coefficients of interest.

advantage of the Mincer regressions relative to the comparison of income distributions is the ability to estimate earnings gaps comparing within PhD program and within post-PhD employer with PhD program (P_i) and employer (E_{it}) fixed effects. We run each of these three equations for all sectors and for each of the three main sectors: academia, government, and industry. For the results by sector, we pool AIAN, Black, Hispanic, NHPI, and two or more races/race not reported into an under-represented minority category (URM).

Table 4 shows estimates from these regressions for all economists, controlling for sex only (as in equation (1)); controlling for race only (as in equation (2)), and controlling for both sex and race (as in equation (3)). Female economists earn 12 percent less than male economists in the baseline specification with only experience controls (column 1). Black economists have 15 percent lower earnings relative to white economists in the baseline specification. AIAN/Hispanic/NHPI earn about 5 percent less than their white counterparts. We next look at regressions controlling for sex and race.

When interacted with sex, the coefficient for Black economist is larger, indicating a 20 percent earnings gap relative to white men, but the interaction between Black and female is positive and almost as large in magnitude as the coefficient on the Black variable. This implies that although Black men are disadvantaged relative to white men, the earnings of Black women are similar to that of their white female counterparts. Alternatively, this pattern could indicate that Black economists are uniformly disadvantaged relative to white men, but Black women do not face an additional earnings penalty from being female.

As the disadvantages facing underrepresented groups in the profession likely impact both PhD program and selection into higher-paying employers, controlling for these factors understates the earnings impact of gender and race.²⁵ For these reasons, we believe the full statistical impact of sex and race on labor market earnings is best estimated by the specifications that do not control for PhD program type and employer type; i.e., the specification in column 1. However, the specifications with program and sector controls are instructive to see how much of these gaps can be explained by selection into better programs and higher-paying employers. We expect employer match, in particular, to play an important role in earnings differences, given the differences in the earnings distribution by industry seen in the previous section. We turn to the results controlling for sorting across program and employer next.

Accounting for PhD program and employer effects accounts for only a small portion of the gap for females; in the specification with both controls, the women earn 10 percent less than their male colleagues on average (column 4). In specifications with program and employer effects, the coefficient for Black economists is reduced by two-thirds, with Black economists earning 5 percent less than their white colleagues. However, the effect of race on earnings is more severe for Black men. In the lower panel where we stratify by both race and gender, Black men earn 20 percent less than white male colleagues in the baseline, in the full fixed effect model this gap is still 10 percent. Gender by race interactions are insignificant for other URM groups. AIAN/Hispanic/NHPI economists have a 5-6 percent gap in earnings across all specifications. Asian economists earn a small premium relative to white economists in the baseline

²⁵ Here we are mindful of Darity's (1982) criticism that "Empirical studies of the earnings gap typically fail to model racism as a process..." (footnote 5, p. 77).

specification; with both sets of fixed effects, Asian economists earn 2 percent less than white economists.

Using the regression with program and employer controls, the largest pay gaps in the economics profession are for women and Black men, who both make 10 percent less than their white male colleagues controlling for experience, PhD program, and employer. Graduates of top programs working in the US are slightly less likely to be female or URM, and more likely to be Asian.²⁶ This distribution is partly why controlling for program effects generally lowers wage gaps for women and URM economists but raises them for Asians. While earnings gaps are larger in the baseline specification, the overall picture of larger wage gaps for women and Black men remains the same. In this pooled regression the program and employer fixed effects appear to explain very little of the earnings gap for women, somewhat more earnings gaps by race, but the amount sorting into PhD program and employer matters for earnings differences varies by sector, as we describe next.

We now turn to wage gaps within sectors. We face an issue of small cells when we look at differences in pay across sectors for AIAN, Blacks, Hispanics, and NHPI economists. Thus, in our regressions by sector, we need to pool AIAN, Black, Hispanic, NHPI economists, and those indicating multiple races into a pooled underrepresented minority (URM) group. Table 5 repeats the regressions in Table 4 with these groups collapsed. Predictably, this flattens the heterogeneity in wage gaps by race we see in Table 4, with URM economists having a 5-6 percent wage gap in the full fixed effect specification. In interpreting our results by sector, it is important to keep in mind that effects are likely heterogeneous across groups within this category.

Table 6 shows estimates from the Mincer regressions but now only for economists employed in academia. On average, women earn 15 percent less than men with similar experience in academia (column 1). Controlling for PhD program lowers these gaps slightly and controlling for sorting across employers lowers the gap slightly more. In our specification controlling for work experience and both program and employer fixed effects, the wage gap for women in academia is 12 percent. On average, URM economists earn 9 percent less than their white colleagues in the baseline specification but as in Table 4, the race by gender stratification shows this effect to be driven by URM men, while the coefficient on earnings of URM women is positive, indicating their earnings are closer to that of white women. Program and employer fixed effects explain about half of the URM wage gap.

Tables 7 and 8 show these same regression estimates for economists within industry and government, respectively. In industry, women earn 12 percent less than men in the baseline regression but accounting for different employers lowers this by one-third, to 9 percent. URM economists earn 10 percent less than whites, with no notable differences by gender, and the wage gap disappears when both employer and program effects are added. As seen in the earnings distributions, industry earnings are more equal across PhD program ranks, especially with experience. The remaining differences in industry earnings by race group appears to be driven primarily by sorting into different employers. In government, women earn 9 percent less in the baseline model but only 4 percent less in the model with both fixed effects, and URM economists earn 5 percent less than whites in most specifications.

²⁶ Table B2 shows the demographics of our sample by PhD program rank.

Summing up the results from Tables 6-8, on average, women earn 15 percent less than men with similar experience in academia, 12 percent less in industry, and nine percent less in the public sector.²⁷ Controlling for PhD program lowers these gaps slightly (top PhD programs skew male) but controlling for sorting across employers lowers the gap by more. In our specification controlling for work experience and both program and employer fixed effects, the wage gaps for women in academia, industry, and government are 12 percent, 9 percent, and 4 percent, respectively. In other words, sorting of women to less well-paying employers accounts for over half the gender wage gap within government, one-fourth of the gap in industry, and two-tenths of the gap in academia. Academia has both the largest pay gap for women generally, and the largest share of that gap that is unexplained after controlling for PhD program, employer, and experience.

For URM economists, PhD program and employer sorting explain almost one-half of the wage gap in industry and academia. Controlling for experience, program, and employer fixed effects, wage gaps for URM economists are fairly similar across sectors, with male URM economists earning about 5-9 percent less than their white male colleagues.

V. Conclusion

We have added to the literature documenting the lack of diversity in economics by providing information on post-PhD placement and earnings by race and gender for multiple sectors of the economy. Using Survey of Earned Doctorates data linked to Longitudinal Employer-Household Dynamics employment and earnings data, we examine placements and earnings for US economists in the first ten years of their careers, by gender and race. We find enormous dispersion in pay for economists within and across sectors that grows over time.

Consistent with previous work demonstrating the lack of diversity in economics we find relatively low shares of female and underrepresented minority economists in our sample of PhD economists. Reminding readers of the caveat that our statistics by race cover only about half of PhD economists, the shares in our sample are: 33 percent female economists, 2 percent Black economists; and 4 percent AIAN/Hispanic/NHPI economists. Diving deeper into the data to consider issues of equity, female economists earn about 12 percent less than their male colleagues on average. Black economists earn about 15 percent less than their white counterparts. AIAN/Hispanic/NHPI economists earn about 5 percent less than their white counterparts. These pay gaps suggest that equity and inclusion issues could be tightly tied to the diversity issue since they may serve to dissuade potential economists. While the earnings gaps estimated in this paper are new, the underlying disparities in the profession that these gaps reflect are well known, as were documented by the 2018 AEA Professional Climate Survey (Allgood et al. (2019)). The exploration of heterogeneity in earnings gaps across individual and job characteristics in this paper gives us another window into the inequalities in the economics profession.

²⁷ In unreleased results, we test whether the wage penalty is statistically significantly larger for women in academia than in other sectors and find that it is.

Acknowledging the issues with diversity along the entire pipeline, we need to be careful in how we interpret results that control for PhD program and employer. As one of our colleagues aptly put it “the road to earnings inequality is long” and parsing out the impact of each stage on the earnings gap is beyond the scope of this paper. We have attempted to describe one part of this long road, but a full accounting would include the entire educational experience, as well as other socioeconomic factors including health and access to wealth. Moreover, we acknowledge that our measures of race only crudely capture the lived experience of underrepresented economists.²⁸

While we have used some measures related to education and employment, in future work, we could include other characteristics of PhD economists at the time of their graduation. For example, we could look at marital status, number of, and student debt (from both undergraduate and graduate studies). These are all asked by the SED and could help provide insights into people’s job preferences. We could also examine most-PhD family structure changes, particularly timing and number of children, using additional Census data.

Our ability to combine the rich data collected in the Survey of Earned Doctorates with the near universe of employment and earnings from the Longitudinal Employer-Household Dynamics has enabled us to provide a view into the labor market dynamics of the economics profession for PhD economists. With the caveats concerning our linked sample, we are able to provide a unique view into the placement and earnings of PhD economists by gender and race. We hope that our contribution with its focus on descriptive statistics provides a useful framework for other research into diversity, equity, and inclusion in our profession.

²⁸ Logan (2022) notes that “Race is not a variable in an econometric model or in a dataset, either – it is also a dynamic experiential condition that is both acted out and acted upon” (p. 83).

References

- Abowd, John M, Bryce E Stephens, Lars Vilhuber, Fredrik Andersson, Kevin L McKinney, Marc Roemer, and Simon Woodcock (2009). “The LEHD infrastructure files and the creation of the Quarterly Workforce Indicators.” In Producer Dynamics: New Evidence from Micro Data, edited by Timothy Dunn, J. Bradford Jensen, and Mark J. Roberts. University of Chicago Press, 149–230.
- Allgood, Sam, Lee Badgett, Amanda Bayer, Marianne Bertrand, Sandra E. Black, Nick Bloom, and Lisa D. Cook (2019). “AEA Professional Climate Survey: Final Report.” Tech. rep., Nashville: American Economic Association Committee on Equity, Diversity and Professional Conduct.
- Athey, Susan, and Michael Luca (2019). “Economists (and Economics) in Tech Companies.” *Journal of Economic Perspectives* 33(1): 209-30.
- Bayer, Amanda and Cecilia Elena Rouse (2016). “Diversity in the Economics Profession: A New Attack on an Old Problem.” *Journal of Economic Perspective*, 30 (4): 221–42.
- Bayer, Amanda, Gary Hoover, and Ebonya Washington (2020). “How You Can Work to Increase the Presence and Improve the Experience of Black, Latinx, and Native American People in the Economics Profession.” *Journal of Economic Perspectives* 34 (3): 193-219.
- Bedard, Kelly, Maxine Lee, and Heather Royer (2021). “Using Longitudinal Data to Explore the Gender Gap for Academic Economists.” *AEA Papers and Proceedings* 111: 69-73.
- Card, David, Stefano Della Vigna, Patricia Funk, and Nagore Iriberry. (2020). “Are Referees and Editors in Economics Gender Neutral?” *Quarterly Journal of Economics* 135 (1):269–327.
- Chari, Anusha and Paul Goldsmith-Pinkham (2017). “Gender Representation in Economics Across Topics and Time: Evidence from the NBER Summer Institute.” Technical Report, National Bureau of Economic Research.
- Chevalier, Judith (2021). “Report: Committee on the Status of Women in the Economics Profession (CSWEP).” *AEA Papers and Proceedings* 111: 742-63.
- Collins, Susan (2000). “Minority Groups in the Economics Profession,” *Journal of Economic Perspectives* 14(2): 133-148.
- Cunningham, Rosemary and Madeline Zavodny (2015). “Looking for Women on the AEA Program.” CSWEP Newsletter (3).
- Coupé, Tom, (2003). “Revealed performances: Worldwide rankings of economists and economics departments, 1990–2000.” *Journal of the European Economic Association* 1(6):1309-1345.
- Darity, William, A. Jr. (2010). “Notes from the Back of the Academic Bus,” in The Future of Diversity eds. Daniel Little and Satya P. Mohanty, Palgrave Macmillan, New York City.

- Darity, William, A. Jr. (1982). "The Human-Capital Approach to Black-White Earnings Inequality: Some Unsettled Questions," *The Journal of Human Resources* 17(1): 72-93.
- Darity, William, A. Jr. and Arden Kreeger (2014). "The Desegregation of an Elite Economics Department's PhD Program: Black Americans at MIT," *History of Political Economy* 46 (Annual Supplement): 317-36.
- Doleac, Jennifer L, Erin Hengel, and Elizabeth Pancotti. 2021. "Diversity in Economics Seminars: Who Gives Invited Talks?" *AEA Papers and Proceedings* 111: 55-59.
- Donald, Stephen G. and Daniel S. Hamermesh (2006), "What is Discrimination? Gender in the American Economic Association, 1935-2004," *American Economic Review* 96(4): 1283-92.
- Dupas, Pascaline, Alicia Sasser Modestino, Muriel Niederle, Justin Wolfers, and the Seminar Dynamics Collective (2021), "Gender and the Dynamics of Economic Seminars." *NBER Working Paper* 28494.
- Foster, Lucia, Julia Manzella, Erika McEntarfer, and Danielle H Sandler. (2020). "Employment and Earnings for Federal Government Economists: Empirical Evidence by Gender and Race." *AEA Papers and Proceedings* 110: 210-14.
- Fourcade, Marion, Etienne Ollion, and Yann Algan. 2015. "The Superiority of Economists." *Journal of Economic Perspectives* 29 (1): 89-114.
- Ginther, Donna K and Shulamit Kahn. (2021). "Women in Academic Economics: Have We Made Progress?" *AEA Papers and Proceedings*, 111: 138-42.
- Ginther, Donna K and Shulamit Kahn. (2004). "Women in economics: moving up or falling off the academic career ladder?" *Journal of Economic Perspectives* 18 (3):193-214.
- Halim, Daniel, Elizabeth T. Powers, and Rebecca Thornton. 2022. "Gender Differences in Economics Course-Taking and Majoring: Findings from an RCT." *AEA Papers and Proceedings* 112: 597-602. DOI: 10.1257/pandp.20221120
- Hengel, Erin. (2022). "Publishing while female: Are women held to higher standards? Evidence from peer review. Draft https://www.erinhengel.com/research/publishing_female.pdf
- Hoover, Gary A. and Ebonya Washington (2021). "Report: Committee on the Status of Minority Groups in the Economics Profession (CSMGEP)." *AEA Papers and Proceedings* 111: 764-79.
- Jones, Todd and Arielle Sloan (2021). "The Academic Origins of Economics Faculty." *IZA Working Paper* No. 14965.
- Kahn, Shulamit (1993). "Gender Differences in Academic Career Paths of Economists." *American Economic Review* 83 (2):52-56.
- Kahn, Shulamit (1995). "Women in the Economics Profession." *Journal of Economic Perspectives* 9 (4):193-206.

- Kleemans, Marieke and Rebecca L. Thornton (2021). "Who Belongs? The Determinants of Selective Membership into the National Bureau of Economic Research." *American Economic Association Papers and Proceedings* 111: 117-122.
- Koffi, Marlene (2021), "Innovative Ideas and Gender Inequality," *Canadian Labour Economics Forum Working Paper Series*, 35.
- Kolpin, Van W and Larry D Singell Jr. (1996). "The gender composition and scholarly performance of economics departments: A test for employment discrimination." *ILR Review* 49 (3):408–423.
- Logan, Trevon (2022). "American Enslavement and the Recovery of Black Economic History," *Journal of Economic Perspectives*, 36(2), Spring, 81-98.
- Logan, Trevon and Samuel L. Myers Jr. (2020). "The Failure of Economics and the Marginalization of Research on Race," in Publishing and Measuring Success in Economics, eds. Sebastian Galiani and Ugo Panizza, CEPR Press, London.
- Lundberg, Shelly and Jenna Stearns (2019). "Women in economics: Stalled progress." *Journal of Economic Perspectives* 33 (1):3–22.
- McDowell, John M, Larry D Singell Jr, and Mark Stater. (2006). "Two to tango? Gender differences in the decisions to publish and coauthor." *Economic Inquiry* 44 (1):153–168.
- Mincer, Jacob A. (1974): Schooling, Experience, and Earnings, New York: NBER Press.
- National Center for Science and Engineering Statistics (NCSES), National Science Foundation (2020), Doctorate Recipients from U.S. Universities: 2019, NSF-21-308. Alexandria VA. Published December 2020. Available at <https://ncses.nsf.gov/pubs/nsf21308>.
- Price, Gregory N. (2009). "The Problem of the 21st century: Economics Faculty and the Color Line." *The Journal of Socio-Economics* 38 (2):331–343.
- Rennane, Stephanie, Hannah Achenson-Field, Kathryn A. Edwards, Grace Gahlon, and Melanie A. Zaber (2022), "Leak or Link? The Overrepresentation of Women in Non-Tenure-Track Academic Positions in STEM. doi: 10.1371/journal.pone.0267561.
- Sarsons, Heather. (2017). "Recognition for Group Work: Gender Differences in Academia." In *American Economic Association Papers and Proceedings* 107: 141–145.
- Schultz, Robert, and Anna Stansbury (2022). "Socioeconomic Diversity of Economics PhDs." Working Paper 22-4. Peterson Institute for International Economics. <https://www.piie.com/publications/working-papers/socioeconomic-diversity-economics-phds>.
- Scott, Charles E., and John J. Siegfried. 2021. "American Economic Association 2020–2021 Universal Academic Questionnaire Summary Statistics." *AEA Papers and Proceedings*, 111: 647-49.

- Sharpe, Rhonda Vonshay (2018). “We’ve to Build the Pipeline. What’s the Problem? What’s Next? The Remix.” *The Review of Black Political Economy* 45(3) 191–215.
- Simms, Margaret C. and Cecilia A. Conrad (2019). “Diversity in the Dismal Science,” *The Review of Black Political Economy* 46(4) 362-78.
- Stevenson, Betsey, and Hanna Zlotnik (2018). “Representations of Men and Women in Introductory Economics Textbooks.” *AEA Papers and Proceedings* 108: 180–85.
- Wessel, David, Lorena Hernandez Barcena, and Nasiha Salwati (2021). “Gender and Racial Diversity of Federal Government Economics: 2020 Data,” Hutchins Center on Fiscal and Monetary Policy.
- Wu, Alice H. (2018). “Gendered language on the economics job market rumors forum.” *AEA Papers and Proceedings* 108: 175–79.
- Yellen, Janet (2019). Opening remarks delivered at “The Gender and Racial Diversity of the Federal Government's Economists” hosted by the Hutchins Center on Fiscal & Monetary Policy at Brookings on September 23, 2019. <https://www.brookings.edu/research/former-fed-chair-janet-yellen-on-gender-and-racial-diversity-of-the-federal-governments-economists/>

Figure 1(a): Economist earnings by sector, one year after receiving PhD

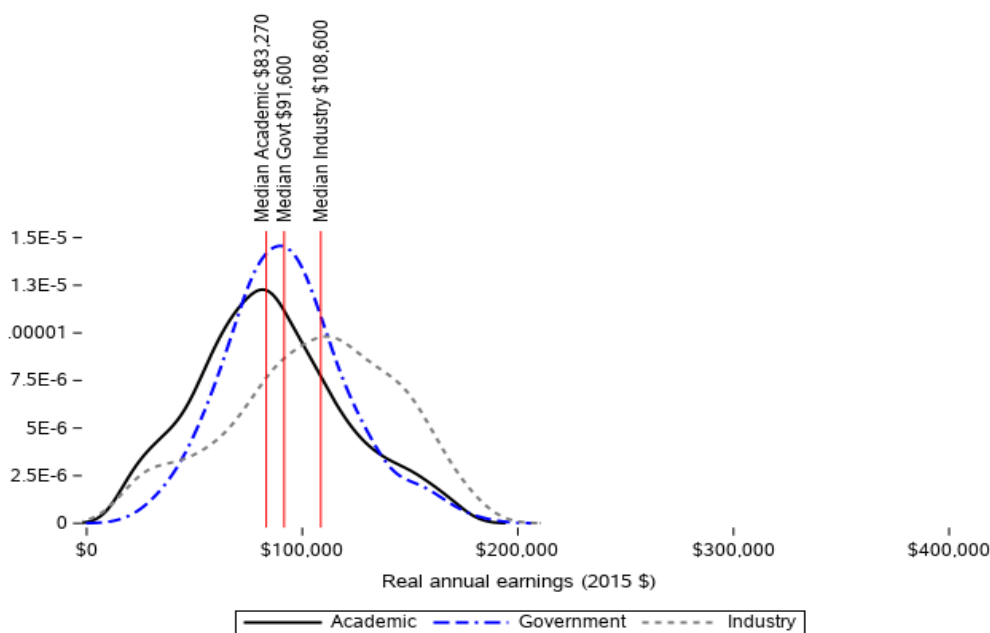
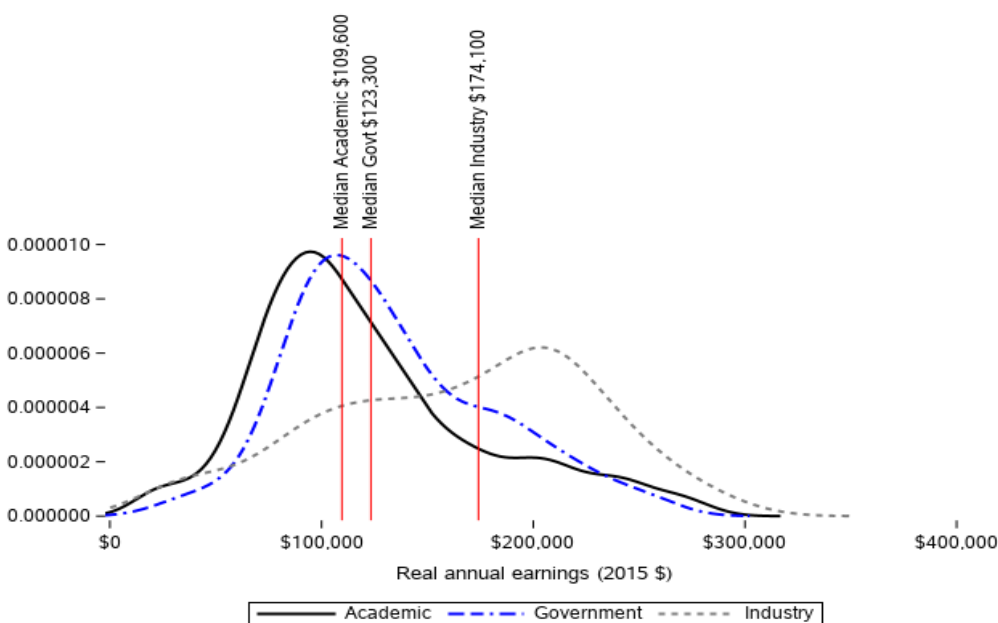


Figure 1(b): Economist earnings by sector, 10 years after receiving PhD



Source: Authors calculations from matched SED/LEHD microdata, 2001-2007 SED graduates only. *Notes:* Academic sector is defined as all economists working in NAICS 61 (almost all of whom work in colleges and universities), government is those employed in NAICS 92 (which includes the Federal Reserve Board and other federal agencies) and industry is all other sectors.

Figure 2(a): Economist earnings in academia by program rank, one year after receiving PhD

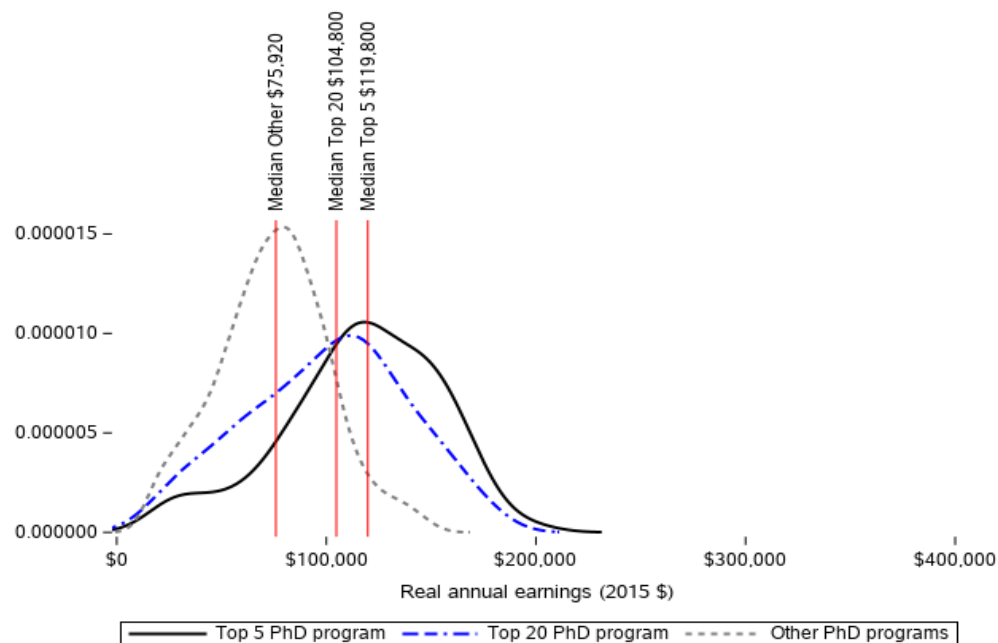
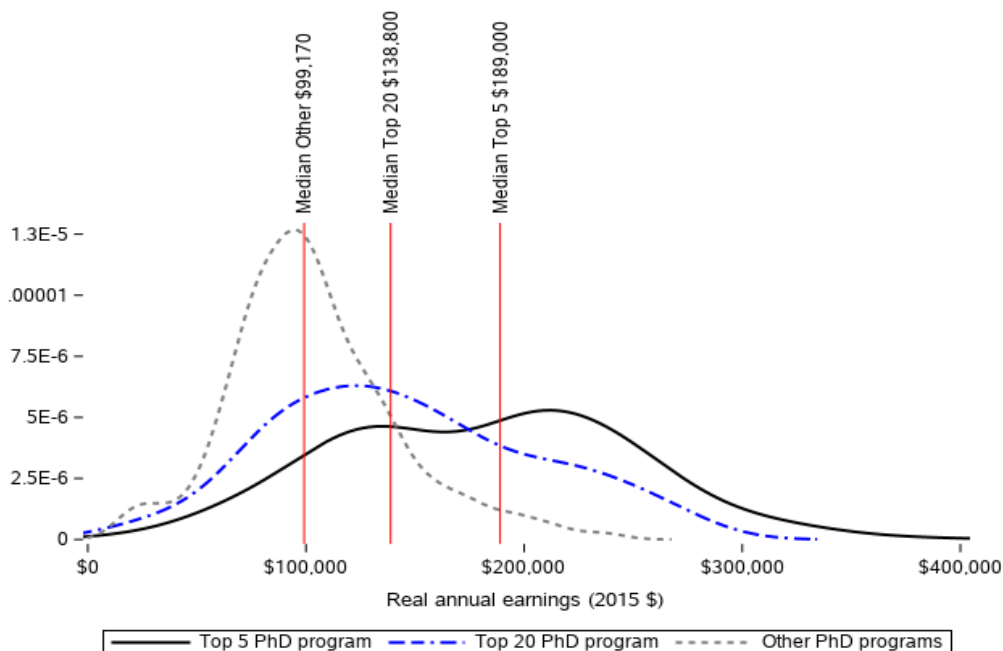


Figure 2(b): Economist earnings in academia by program rank, 10 years after receiving PhD



Source: Authors calculations from matched SED/LEHD microdata, 2001-2007 SED graduates only. *Notes:* Academia is defined as all economists working in NAICS 61, almost all of whom work in colleges and universities.

Figure 3(a): Economist earnings in industry by program rank, one year after receiving PhD

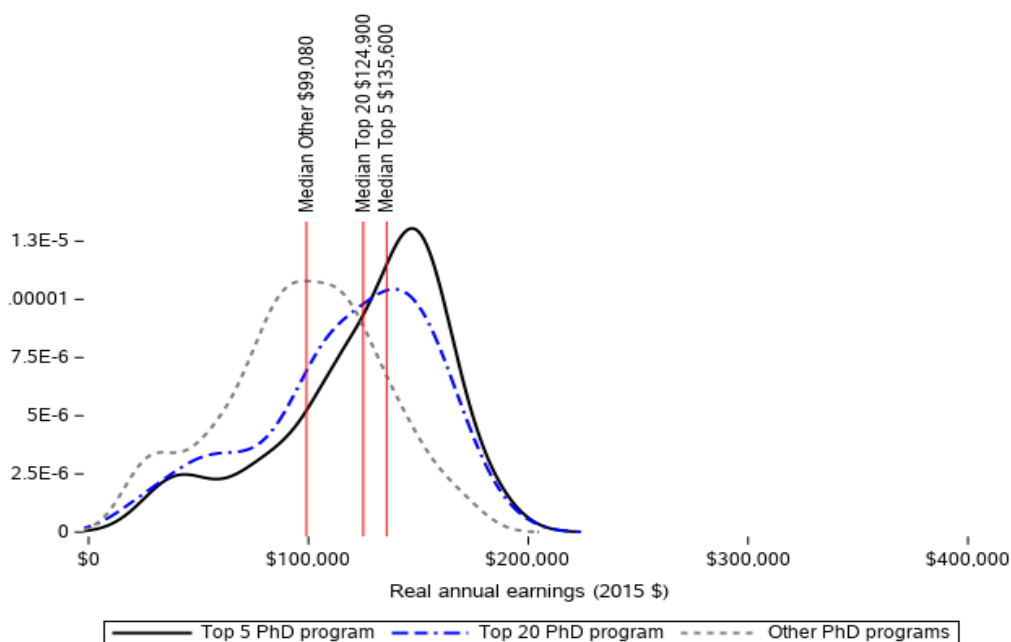
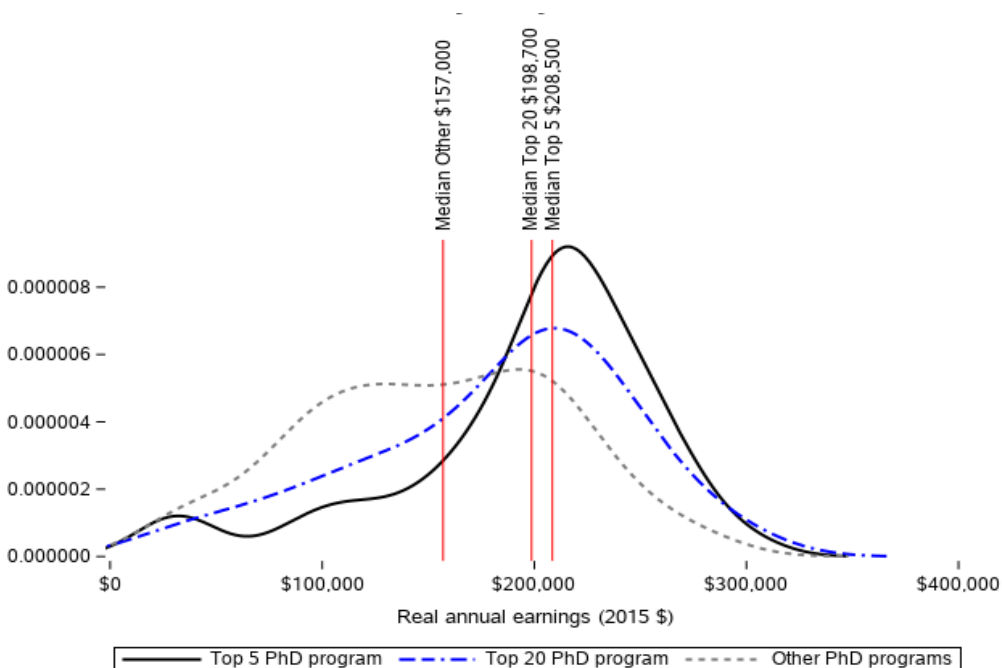


Figure 3(b): Economist earnings in industry by program rank, 10 years after receiving PhD



Source: Authors calculations from matched SED/LEHD microdata, 2001-2007 SED graduates only. *Notes:* Industry is defined as all economists who work outside of NAICS 61 or 92, who are concentrated in consulting and finance.

Figure 4: Economist earnings by sex, 10 years after receiving PhD

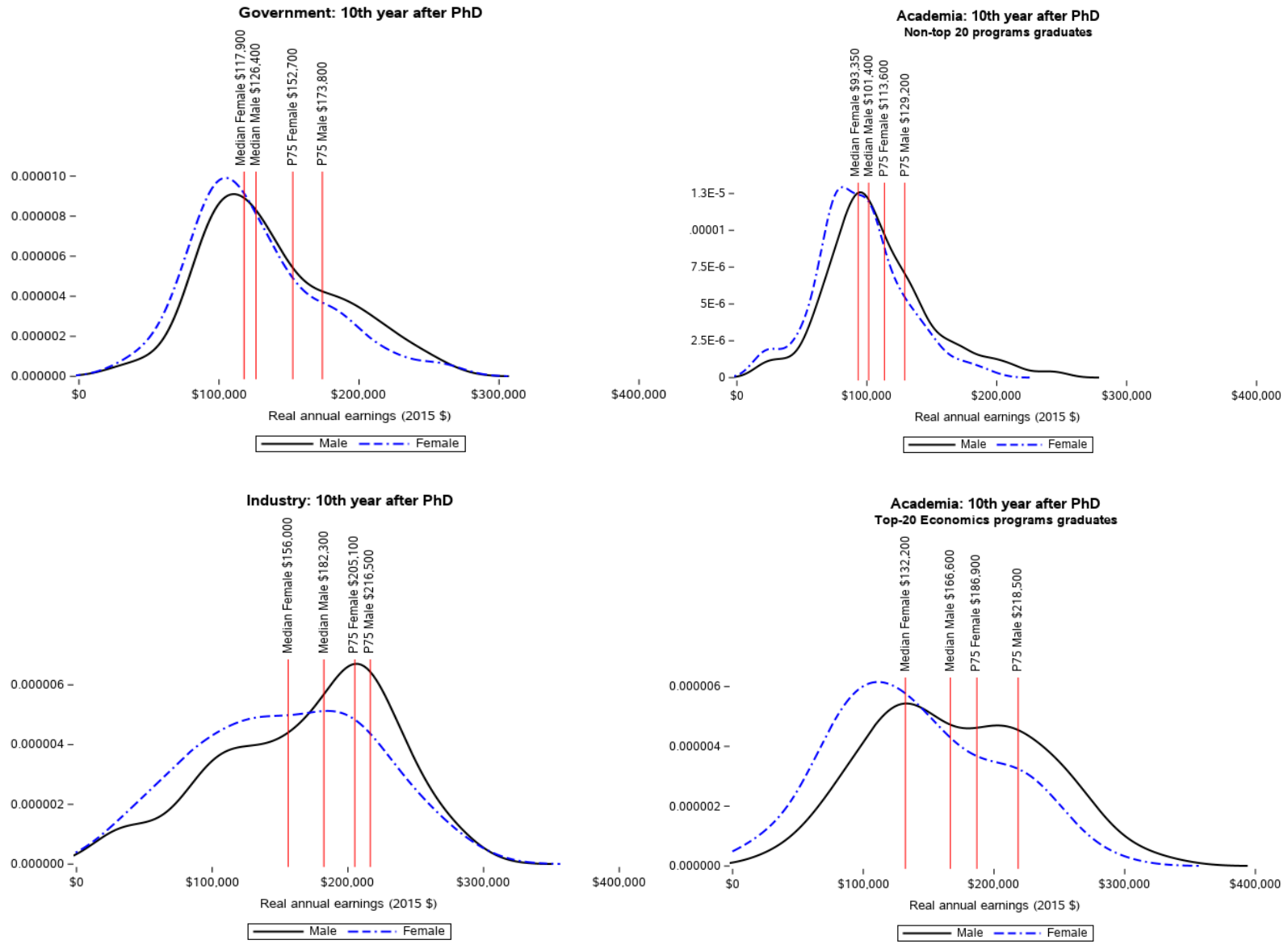


Table 1: Initial Placements and Career Mobility

Initial Placement	Across cohorts (2001-2017)				By program rank (2014-2017 cohort)			Ten years later (2001-2007 cohort)		
	2001-2005	2006-2009	2010-2013	2014-2017	Top 5	Top 6-20	Other	Stay	Move	Destination
Academia	63.64	58.62	60.00	55.56	55.56	50.00	54.17	84.21	5.26	Gov't
Consult	9.09	10.34	11.67	12.50	13.33	14.29	10.42	50.00	13.33	Academia
Gov't	4.55	8.62	10.00	11.11	6.67	11.43	10.42	80.00	16.00	Academia
Finance	9.09	8.62	8.33	9.72	4.44	5.71	12.50	80.00	8.00	Academia
Other Ind	9.09	6.90	6.67	6.94	4.44	7.14	6.25	45.00	25.00	Academia
Tech	3.64	3.45	5.00	5.56	8.89	7.14	4.17	40.00	20.00	Academia
N	2,200	2,900	3,000	3,600	450	700	2,400	3,100		

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Shares are rounded using Census rounding rules and columns may not sum to 100 percent. Share academic placements are monotonically decreasing over time in unrounded data. 'Move' and 'Destination' columns show only the most frequent industry destination and the share of initial placements working in that sector 10 years later.

Table 2: Demographics of PhD Economists Employed in the US in 2017

Demographic Group	Percentage of Demographic Group in Category		
	Academia	Industry	Government
Female	32.81	35.90	38.46
Race/Ethnicity			
<i>Temporary Resident</i>	<i>39.06</i>	<i>46.15</i>	<i>19.23</i>
AIAN, Hispanic, NHPI	5.13	4.76	4.76
Asian	8.97	16.66	14.29
Black	3.85	3.33	4.76
White	76.93	71.42	76.19
Two or More /Not Reported	2.56	3.81	2.86
N	6,400	3,900	1,300

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Shares are rounded using Census rounding rules (and thus may not sum to 100 percent in categories). Shares by race/ethnicity are for the share of workers in the sector who are US citizens and permanent residents only. Academic sector is defined as all economists working in NAICS 61 (almost all of whom work in colleges and universities), government is those employed in NAICS 92 (which includes the Federal Reserve Board and other federal agencies) and industry is all other sectors.

Table 3: Earnings Distribution Moments for Figures 1-3

	P25	P50	P75	Dispersion P75-P25	Pct. diff P75-P25
Initial year after PhD (Fig. 1a)					
Academia	62,210	83,270	107,800	45,590	73%
Government	73,880	91,600	110,100	36,220	49%
Industry	80,060	108,600	134,300	54,240	68%
10 years after PhD (Fig. 1b)					
Academia	84,430	109,600	150,000	65,570	78%
Government	98,170	123,300	166,700	68,530	70%
Industry	116,600	174,100	213,800	97,200	83%
Academia: initial year after PhD (Fig. 2a)					
Top-5 PhD	94,430	119,800	146,800	52,370	55%
Top 6-20 PhD	74,100	104,800	127,800	53,700	72%
Non-top 20	54,140	75,920	92,850	35,710	62%
Academia: 10 years after PhD (Fig. 2b)					
Top-5 PhD	127,600	189,000	230,200	102,600	80%
Top 6-20 PhD	99,920	138,800	189,800	89,880	90%
Non-top 20	79,000	99,170	125,300	46,300	59%
Industry: initial year after PhD (Fig. 3a)					
Top-5 PhD	107,000	135,600	152,000	45,000	42%
Top 6-20 PhD	95,720	124,900	147,200	51,480	54%
Non-top 20	74,900	99,080	122,600	47,700	64%
Industry: 10 years after PhD (Fig. 3b)					
Top-5 PhD	175,900	208,500	237,000	61,100	35%
Top 6-20 PhD	141,100	198,700	230,100	89,000	63%
Non-top 20	107,000	157,000	203,000	96,000	90%

Source: Authors calculations from matched SED/LEHD microdata, 2001-2007 SED graduates only. *Notes:* Industry is defined as all economists who work outside of NAICS 61 or 92, who are concentrated in consulting and finance. Dispersion P75-P25 is the absolute difference in dollars between the 75 and 25 percentiles. Pct. diff is the percentage difference ('P75 is X% higher than P25') calculated as $(P75-P25)/P25$.

Table 4: Mincer Regressions – All Economists

Regressions controlling for Sex	(1)	(2)	(3)	(4)
Female	-0.123*** (0.00361)	-0.114*** (0.00461)	-0.102*** (0.00308)	-0.0983*** (0.00415)
Regressions controlling for Race				
AIAN/Hispanic/NHPI	-0.0453*** (0.0108)	-0.0660*** (0.0140)	-0.0454*** (0.00911)	-0.0630*** (0.0125)
Asian	0.0315*** (0.00703)	-0.00597 (0.00841)	-0.0237*** (0.00602)	-0.0222** (0.00752)
Black	-0.153*** (0.0118)	-0.0813*** (0.0201)	-0.0586*** (0.0107)	-0.0533** (0.0194)
Non-Citizen	-0.00640 (0.00370)	-0.0222*** (0.00474)	-0.0612*** (0.00330)	-0.0486*** (0.00445)
Two+ Races	-0.0229 (0.0133)	-0.0504** (0.0159)	-0.0350** (0.0113)	-0.0336* (0.0143)
Regressions controlling for Sex and Race				
Female	-0.134*** (0.00548)	-0.134*** (0.00705)	-0.104*** (0.00464)	-0.106*** (0.00630)
AIAN/Hispanic/NHPI	-0.0474*** (0.0133)	-0.0583** (0.0181)	-0.0447*** (0.0113)	-0.0628*** (0.0161)
Female*AIAN/Hispanic/NHPI	0.0251 (0.0225)	0.0215 (0.0282)	0.0162 (0.0187)	0.0313 (0.0251)
Asian	0.0737*** (0.00959)	0.0290** (0.0112)	0.0124 (0.00821)	0.00220 (0.00998)
Female*Asian	-0.0343* (0.0141)	-0.0218 (0.0169)	-0.0352** (0.0120)	-0.0137 (0.0150)
Black	-0.207*** (0.0143)	-0.127*** (0.0254)	-0.115*** (0.0128)	-0.0988*** (0.0244)
Female*Black	0.175*** (0.0251)	0.150*** (0.0411)	0.178*** (0.0227)	0.141*** (0.0397)
Non-Citizen	-0.00439 (0.00449)	-0.0318*** (0.00560)	-0.0560*** (0.00390)	-0.0485*** (0.00516)
Female*Non-Citizen	0.0147 (0.00783)	0.0452*** (0.00998)	0.00496 (0.00659)	0.0182* (0.00890)
Two+ Races	-0.0366* (0.0156)	-0.0534** (0.0189)	-0.0478*** (0.0134)	-0.0483** (0.0171)
Female*Two+ Races	0.0405 (0.0292)	0.0144 (0.0345)	0.0455 (0.0247)	0.0504 (0.0306)
Exp Controls	X	X	X	X
Program FE		X		X
Employer FE			X	X
N	82,500	46,000	81,500	45,500
R-sq	0.081	0.169	0.513	0.495

Source: Authors calculations from matched SED/LEHD microdata. Notes: Exp controls include experience and experience squared. Observation count and R-sq reflect the regressions by sex and race results.

Table 5: Mincer Regressions – All Economists (Combined Race Categories)

Regressions controlling for Sex	(1)	(2)	(3)	(4)
Female	-0.123*** (0.00361)	-0.114*** (0.00461)	-0.102*** (0.00308)	-0.0983*** (0.00415)
Regressions controlling for Race				
Asian	0.0315*** (0.00703)	-0.00598 (0.00841)	-0.0237*** (0.00602)	-0.0221** (0.00752)
URM	-0.0754*** (0.00714)	-0.0639*** (0.00967)	-0.0466*** (0.00620)	-0.0510*** (0.00881)
Non-Citizen	-0.00640 (0.00370)	-0.0222*** (0.00474)	-0.0612*** (0.00330)	-0.0486*** (0.00445)
Regressions controlling for Sex and Race				
Female	-0.134*** (0.00548)	-0.134*** (0.00705)	-0.104*** (0.00464)	-0.106*** (0.00630)
Asian	0.0737*** (0.00959)	0.0290** (0.0112)	0.0125 (0.00822)	0.00227 (0.00998)
Female*Asian	-0.0343* (0.0141)	-0.0217 (0.0169)	-0.0352** (0.0120)	-0.0136 (0.0150)
URM	-0.0976*** (0.00860)	-0.0706*** (0.0120)	-0.0678*** (0.00746)	-0.0637*** (0.0110)
Female*URM	0.0781*** (0.0152)	0.0461* (0.0200)	0.0723*** (0.0129)	0.0559** (0.0180)
Non-Citizen	-0.00439 (0.00449)	-0.0317*** (0.00560)	-0.0560*** (0.00390)	-0.0485*** (0.00516)
Female*Non-Citizen	0.0146 (0.00783)	0.0452*** (0.00998)	0.00488 (0.00659)	0.0182* (0.00890)
Exp Controls	X	X	X	X
Program FE		X		X
Employer FE			X	X
N	82,500	46,000	81,500	45,500
R-sq	0.081	0.169	0.513	0.495

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Exp controls include experience and experience squared. Observation count and R-sq reflect the regressions by sex and race results. URM includes AIAN/Hispanic/NHPI, Black, Two or more races, and race non-response.

Table 6: Mincer Regressions – Academic Economists

Regressions controlling for Sex	(1)	(2)	(3)	(4)
Female	-0.146*** (0.00469)	-0.135*** (0.00615)	-0.114*** (0.00434)	-0.119*** (0.00606)
Regressions controlling for Race				
Asian	-0.00328 (0.0102)	-0.0572*** (0.0125)	-0.0582*** (0.00938)	-0.0555*** (0.0120)
URM	-0.0870*** (0.00933)	-0.0636*** (0.0131)	-0.0548*** (0.00895)	-0.0522*** (0.0130)
Non-Citizen	-0.00814 (0.00473)	-0.0120 (0.00619)	-0.0620*** (0.00443)	-0.0427*** (0.00625)
Regressions controlling for Sex and Race				
Female	-0.131*** (0.00704)	-0.132*** (0.00949)	-0.104*** (0.00658)	-0.119*** (0.00942)
Asian	0.0851*** (0.0134)	0.0161 (0.0158)	0.0165 (0.0123)	0.0164 (0.0151)
Female*Asian	-0.155*** (0.0205)	-0.140*** (0.0253)	-0.133*** (0.0189)	-0.146*** (0.0243)
URM	-0.123*** (0.0113)	-0.0877*** (0.0163)	-0.0759*** (0.0109)	-0.0624*** (0.0164)
Female*URM	0.124*** (0.0195)	0.0984*** (0.0269)	0.0764*** (0.0183)	0.0644* (0.0266)
Non-Citizen	0.00885 (0.00567)	-0.00876 (0.00724)	-0.0534*** (0.00526)	-0.0431*** (0.00724)
Female*Non-Citizen	-0.0318** (0.0100)	0.00666 (0.0131)	-0.00588 (0.00919)	0.0190 (0.0129)
Exp Controls	X	X	X	X
Program FE		X		X
Employer FE			X	X
N	46,000	25,000	46,000	25,000
R-sq	0.082	0.226	0.363	0.379

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Exp controls include experience and experience squared. Observation count and R-sq reflect the regressions by sex and race results. URM includes AIAN/Hispanic/NHPI, Black, Two or more races, and race non-response.

Table 7: Mincer Regressions – Industry Economists

Regressions controlling for Sex	(1)	(2)	(3)	(4)
Female	-0.120*** (0.00649)	-0.118*** (0.00822)	-0.102*** (0.00534)	-0.0902*** (0.00701)
Regressions controlling for Race				
Asian	-0.0268* (0.0120)	-0.0284 (0.0145)	-0.0398*** (0.00996)	-0.0386** (0.0126)
URM	-0.0971*** (0.0136)	-0.0807*** (0.0172)	-0.0470*** (0.0114)	-0.0257 (0.0150)
Non-Citizen	-0.0577*** (0.00677)	-0.0617*** (0.00849)	-0.0703*** (0.00582)	-0.0665*** (0.00740)
Regressions controlling for Sex and Race				
Female	-0.159*** (0.0110)	-0.167*** (0.0134)	-0.118*** (0.00913)	-0.107*** (0.0115)
Asian	-0.00687 (0.0165)	-0.00294 (0.0195)	-0.0181 (0.0138)	-0.0474** (0.0169)
Female*Asian	0.0261 (0.0243)	0.0149 (0.0293)	0.00229 (0.0200)	0.0568* (0.0253)
URM	-0.0987*** (0.0163)	-0.0575** (0.0212)	-0.0591*** (0.0134)	-0.0248 (0.0181)
Female*URM	0.0121 (0.0293)	-0.0283 (0.0359)	0.0392 (0.0246)	0.000634 (0.0315)
Non-Citizen	-0.0732*** (0.00825)	-0.0888*** (0.0100)	-0.0722*** (0.00689)	-0.0686*** (0.00866)
Female*Non-Citizen	0.0762*** (0.0143)	0.109*** (0.0179)	0.0344** (0.0116)	0.0322* (0.0150)
Exp Controls	X	X	X	X
Program FE		X		X
Employer FE			X	X
N	27,000	15,500	26,000	15,000
R-sq	0.093	0.151	0.669	0.649

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Exp controls include experience and experience squared. Observation count and R-sq reflect the regressions by sex and race results. URM includes AIAN/Hispanic/NHPI, Black, Two or more races, and race non-response.

Table 8: Mincer Regressions – Government Economists

Regressions controlling for Sex	(1)	(2)	(3)	(4)
Female	-0.0862*** (0.00813)	-0.0935*** (0.00988)	-0.0489*** (0.00643)	-0.0378*** (0.00834)
Regressions controlling for Race				
Asian	0.0370** (0.0127)	-0.00413 (0.0143)	0.0688*** (0.00988)	0.0536*** (0.0119)
URM	-0.0421** (0.0138)	-0.0662*** (0.0193)	-0.0247* (0.0108)	-0.0513** (0.0163)
Non-Citizen	0.0325** (0.0109)	0.102*** (0.0132)	-0.0514*** (0.00948)	-0.0388*** (0.0116)
Regressions controlling for Sex and Race				
Female	-0.111*** (0.0103)	-0.103*** (0.0124)	-0.0849*** (0.00802)	-0.0752*** (0.0104)
Asian	0.0322 (0.0187)	-0.00190 (0.0209)	0.0419** (0.0146)	0.0141 (0.0174)
Female*Asian	0.0543* (0.0257)	0.0421 (0.0285)	0.0814*** (0.0201)	0.101*** (0.0238)
URM	-0.0785*** (0.0163)	-0.0909*** (0.0240)	-0.0583*** (0.0129)	-0.0812*** (0.0205)
Female*URM	0.109*** (0.0299)	0.0685 (0.0396)	0.101*** (0.0234)	0.0837* (0.0332)
Non-Citizen	0.0220 (0.0130)	0.102*** (0.0155)	-0.0686*** (0.0110)	-0.0567*** (0.0135)
Female*Non-Citizen	0.0212 (0.0236)	-0.00554 (0.0277)	0.0525** (0.0187)	0.0612** (0.0230)
Exp Controls	X	X	X	X
Program FE		X		X
Employer FE			X	X
N	9,500	5,700	9,500	5,700
R-sq	0.089	0.208	0.496	0.482

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Exp controls include experience and experience squared. Observation count and R-sq reflect the regressions by sex and race results. URM includes AIAN/Hispanic/NHPI, Black, Two or more races, and race non-response.

Appendix A: Selected Questions from the 2019 Survey of Earned Doctorates (SED)

The SED collects the timing of doctoral degree receipt through question A1 which allows the recipient to provide the month and year when the doctorate was granted or is expected to be granted. Granting institution is collected as the write-in response to question A2.

The field of study is collected in question A3 which provides a pre-set list of 334 fine fields using the Comprehensive Instructional Program (CIP) categories with identification codes and a write-in for when these categories do not capture the field of study.²⁹ The item response rates for these questions in 2019 were: year of doctorate (100%), doctoral institution (100%), dissertation field (91.4%).³⁰ The SED publishes data by eight broad fields (for example “Life Sciences” and “Social Sciences”) and by 35 major fields of study (for example, “Economics”).³¹ “Economics” is published as part of “Social Sciences,” and is comprised of Natural Resources/Environmental Economics (665), Economics (667), and Econometrics (668).³²

We expand upon the SED definition of “Economics” to include two fine study codes from Life Sciences: Agricultural Economics (000) and Natural Resources/Environmental Economics (003) as these seemed similar enough to the other fine categories to merit inclusion.³³ Figure A1 shows the breakdown of these codes for our microdata sample period 2001-2017. As is clear from the figure, the fine field “Economics” (667) dominates accounting for 86% of our expanded definition of Economics; the second largest fine field is Agricultural Economics (000) which accounts for about 10% on average of our expanded definition of Economics.

The SED collects information on sex through a single question with two check box responses for male or female (Figure A2, question C1). The 2019 item response rate for the sex question was 100%. The SED publishes information about “Economics” by sex for all recipients as part of its tables.

The SED collects citizenship status through a two-part question (Figure A2, question C7) which enables them to distinguish between U.S. citizens from birth, U.S. citizens who were naturalized, non-U.S. citizens with a permanent U.S. resident visa, and non-U.S. citizens with a temporary U.S. Visa. The 2019 item response rate for the type of citizenship question was 96.3%. The SED publication tables provide detailed demographic information for U.S. citizens and those with a permanent U.S. resident visa, they do not provide as much detailed demographic information for non-U.S. citizens with a temporary visa.

The SED collects information on ethnicity through the question “Are you Hispanic or Latino?” (Figure A2, question C10). Respondents can check only one of five responses that

²⁹ These categories appear on pp. 16-17 of the 2017 SED instrument, available online at: [Survey of Earned Doctorates | NCSES | NSF](#)

³⁰ See Table A-4 of Technical Notes NCSES 2020.

³¹ The eight broad fields are: life sciences, psychology and social sciences, physical sciences and earth sciences, mathematics and computer sciences, engineering, education, humanities and arts, and other fields.

³² See Table A-6 of Technical Notes NCSES 2020.

³³ The fine study categories Natural Resources/Environmental Economics (003, 665) were introduced in 2012. We do not include the two other fine study categories with “Economics” in their titles: Business/ Managerial Economics (915) from Business Management/Administration and Home Economics (964) now called Family/Consumer Science/Human Science from Fields Not Elsewhere Classified.

cover no and yes with four details (Mexican/Chicano, Puerto Rican, Cuban, or Other Hispanic or Latino). The 2019 response rate for the Hispanic question was 94.6%. Finally, the SED collects information on race through the question “What is your racial background?” (Figure A2, question C11). Respondents can check one or more of the following five responses given in this order: American Indian or Alaska Native (AIAN); Native Hawaiian or Other Pacific Islander (NHPI); Asian; Black or African American; and White. The 2019 item response rate for race was 93.2%.

While race and ethnicity are collected as two separate questions, the SED collapses these two concepts into a single dimension in its publications. As they note in their Glossary of their reports, “Doctorate recipients who report Hispanic or Latino heritage, regardless of racial designation, are counted as Hispanic or Latino... Respondents who indicate they are not Hispanic or Latino and indicate a single race are reported in their respective racial groups...” (p. 26, NCSES 2020). We follow this convention in our microdata analyses.

In addition, the NHPI category is subsumed into the category “Other Race or Race not Reported.” Thus, for example Table 22 (see Figure A3) reports the following categories as mutually exclusive and exhaustive categories: Hispanic or Latino; American Indian or Alaska Native; Asian; Black or African American; White; More than One Race; Other Race or Race Not Reported; Ethnicity not Reported.

This hierarchical treatment of citizenship, ethnicity, and race is demonstrated in the format of SED publications. For example, Figure A3 replicates Table 22 from the 2019 SED publication. The example is for All Fields, but the same holds true for Economics. The first category shows All Recipients and then Temporary Visa Holders. The next set of cells is under the overall header of “U.S. Citizens and Permanent Residents” which starts with the “Total” and then splits out “Hispanic or Latino”. The next set of cells are under the overall subheader of “Not Hispanic or Latino” and provides information on “American Indian or Alaskan Native,” “Asian,” “Black or African American,” “White,” “More than one Race,” and “Other Race or Race not Reported” (which also includes NHPI).

Figure A1: Fine Fields in the Expanded Definition of Economics 2001-2017

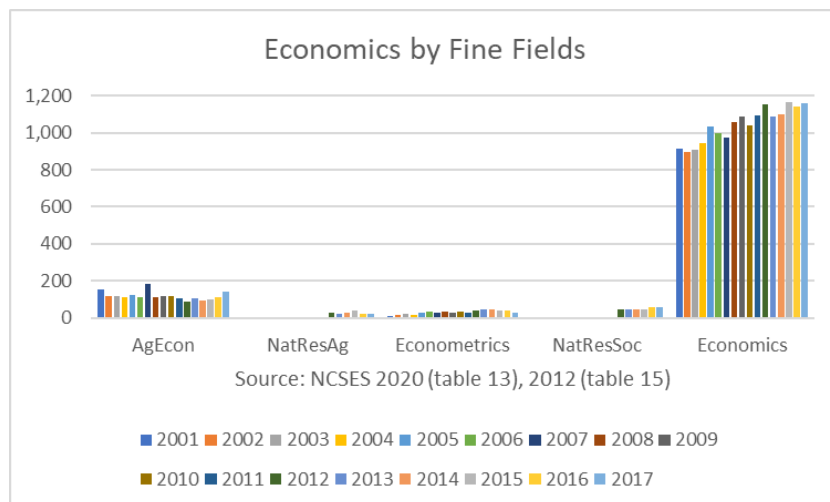


Figure A2: SED Questions Concerning Sex, Citizenship, Ethnicity, and Race

C1. Are you male or female?

1 Male 2 Female

C7. What is your citizenship status?
Mark (X) one

U.S. CITIZEN

1 Since birth → GO TO C9

2 Naturalized → GO TO C9

NON-U.S. CITIZEN

3 With a Permanent U.S. Resident Visa ("Green Card") → GO TO C8

4 With a Temporary U.S. Visa → GO TO C8

C10. Are you Hispanic or Latino?
Mark (X) one

1 No, I am not Hispanic or Latino

2 Yes, I am Mexican or Chicano

3 Yes, I am Puerto Rican

4 Yes, I am Cuban

5 Yes, I am Other Hispanic or Latino - Specify

C11. What is your racial background?
Mark (X) one or more

1 American Indian or Alaska Native

Specify tribal affiliation(s):

2 Native Hawaiian or Other Pacific Islander

3 Asian

4 Black or African American

5 White

Figure A3: SED Table for Citizenship, Ethnicity, and Race

Table 22
Doctorate recipients, by subfield of study, citizenship status, ethnicity, and race:
2019
(Number)

Field of study	All doctorate recipients ¹	Temporary visa holders	U.S. citizens and permanent residents								Ethnicity not reported
			Total	Hispanic or Latino	Not Hispanic or Latino					Other race or race not reported	
					American Indian or Alaska Native	Asian	Black or African American	White	More than one race		
All fields	55,703	18,351	35,274	2,848	120	3,421	2,512	24,248	1,121	381	623

Source: Screenshot of Table 22, National Center for Science and Engineering Statistics (NCSES), National Science Foundation (2020), Doctorate Recipients from U.S. Universities: 2019, NSF-21-308.

Appendix B: Other Measurement Details

Comparing Economics to All Fields using Published SED Data

We compare PhD economists to all PhD recipients using SED published data for sample period 2001-2017 for sex, citizenship, and race/ethnicity. Since we are using SED published data, the definition of Economics is the narrower definition. To give a rough sense of magnitudes, there are about a thousand Economics PhDs granted each year (with a generally upward time trend starting at about 900 in 2001 and ending at about 1,200 in 2017). All Fields PhDs rises from about 41,000 in 2001 to about 55,000 in 2017. Figure B1, panel A shows that the share of female (red) is lower in Economics as compared to All Fields. The share of female PhD recipients in All Fields is close to one-half over our entire sample; rising from 44% in 2001 to 47% in 2017; the share of female Economics PhD recipients is 28% in 2001 and generally rises over time ending with 34% in 2017.³⁴

Figure B1, panel B shows the shares of PhD recipients by U.S. citizens and permanent residents (black), Temporary Visa (grey), and status unknown (red).³⁵ The prevalence of U.S. citizens and permanent residents is much lower in Economics than for All Fields (less than one-half as compared to about two-thirds). In every year in our sample, there are more Economics PhD recipients on a temporary visa than U.S. citizens and permanent residents. The share of U.S. citizens and permanent residents fell from 71% in 2001 to 66% in 2017 for All Fields; for Economists, the share varies over time but starts at 43% in 2002 ends at 44% in 2017.

Finally, we present the comparison over Race and Ethnicity in Figure B1, panel C.³⁶ Both All Fields and Economics are dominated by PhD recipients who are White. The share of All Fields who are White falls from 75% in 2010 to 70% in 2017; the share for Economics falls from 74% in 2010 to 63% in 2017. The share of Hispanics is relatively similar across the two groups (6-7% for All Fields and 5-7% for Economics). The share for Asian recipients is larger in Economics than for All Fields (9% for most years for All Fields and 12-16% for Economics), but the reverse is true for the share of Black recipients (about 6-7% for All Fields and 3-4% for Economics).

Match Rates by Demographic Groups and Details on Program Rankings

We also include here Table B1, which shows the match rates across demographic groups. The share of observations with no PIK is highest amongst those with a temporary visa at the time of their PhD receipt. This is also the group most likely to have no earnings observed in the U.S. post-PhD. Thus, our analysis sample is selected on temporary visa holders that stay in the U.S. to work after they complete their PhDs.

Table B2 shows our analysis sample by gender, race, and PhD program rank. As noted in the paper, these demographics are largely useful for interpreting the impact of PhD program

³⁴ Lundberg and Stearns (2019) compare economics to other disciplines for gender representation in academia at top 50 departments. While social sciences in general have more female representation as professors (over all ranks) as compared to the physical sciences, economics is an outlier and is closer to the physical sciences and math and engineering.

³⁵ 2001 data are not available by major field so the Economics figure starts in 2002.

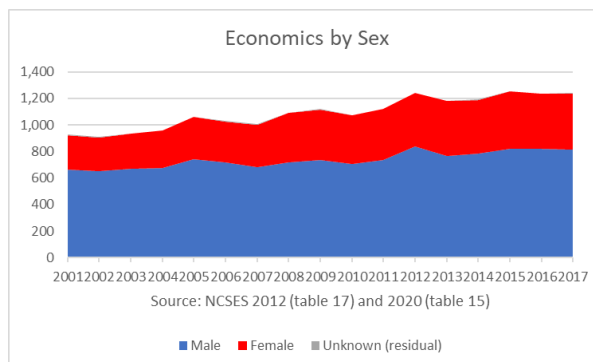
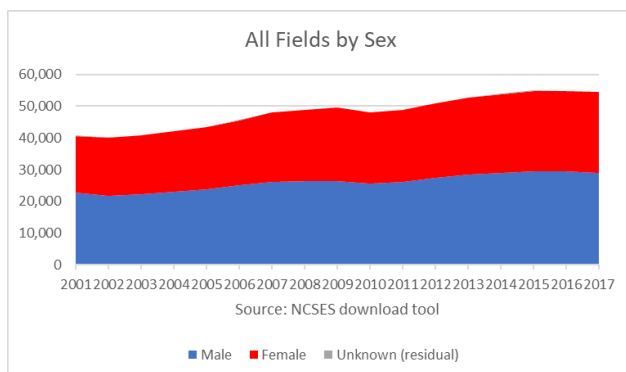
³⁶ Race and ethnicity counts for the Economics are published starting in 2010.

controls on our wage regressions. Graduates of top programs in our sample skew male, and programs in the 6-20 range are marginally less diverse.

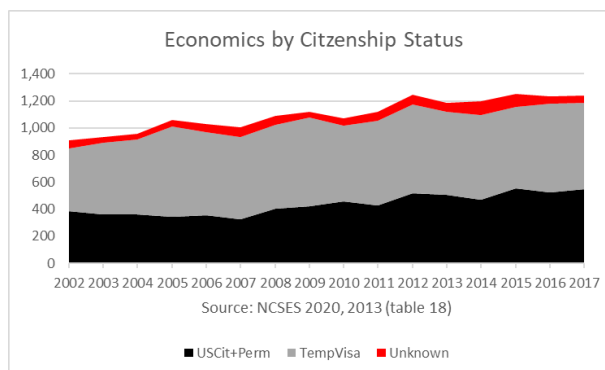
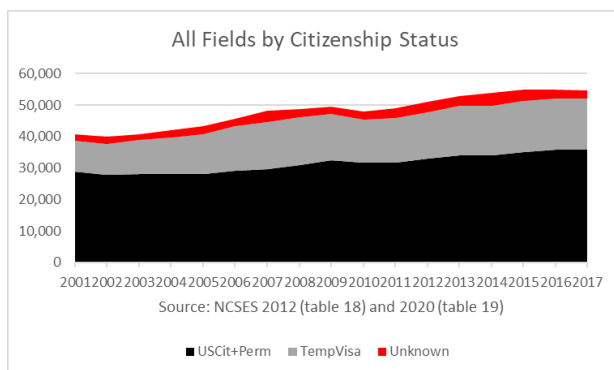
Finally, Table B3 shows the ranking from Research Papers in Economics (RePEc) used to create our Top 5 and Top 20 program categories for the descriptive distributions and tables.

Figure B1: Comparing Demographics of Doctoral Recipients All Fields and Economics

Panel A: By Sex



Panel B: By Citizenship Status



Panel C: By Race/Ethnicity (U.S. Citizens and Permanent Residents)

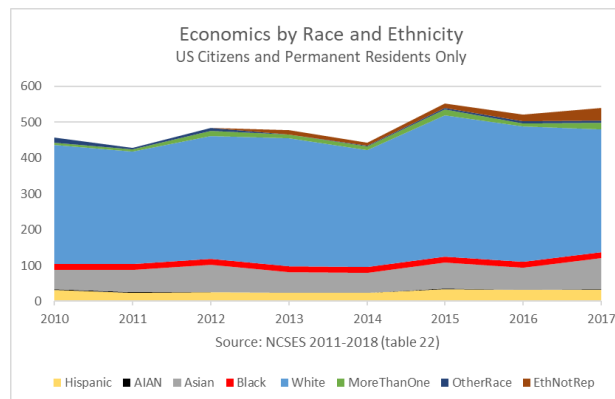
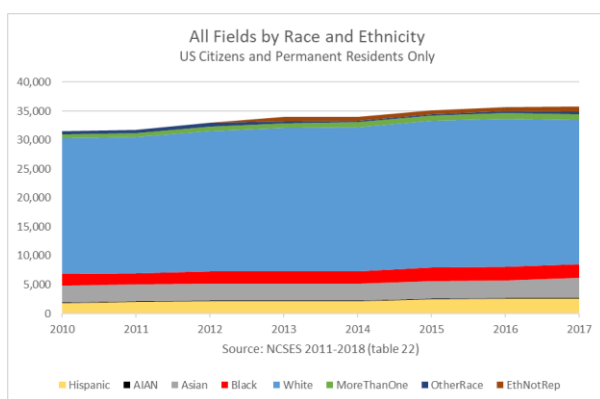


Table B1: Match Rates Across Demographics

Category	Number	Percentage of Demographic Group in Category						
		Sex	Race/Ethnicity					
		Female	Temporary Resident	AIAN, Hispanic, NHPI	Asian	Black	White	Two or More and Not Reported
All	20,500	33.17	60.98	2.20	5.37	1.46	29.27	1.46
No PIK	4,700	31.58	84.21	*	3.68	*	7.89	*
No Earnings	6,300	29.25	84.27	1.10	3.22	0.63	9.93	0.85
Our Sample	12,500	34.62	44.60	2.88	6.71	2.08	42.06	1.67

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Shares are rounded using Census rounding rules.

Table B2: Demographics of our Sample of PhD Economists

Demographic Group	Share			All
	Program Rank Top 5	Research Rank Top 6-20	Other	
Sex				
Female	25	31.25	36.9	34.62
	(0.12)	(0.09)	(0.05)	(0.04)
Race/Ethnicity				
Temporary Resident	43.75	50	44.05	44.60
	(0.12)	(0.10)	(0.05)	(0.04)
AIAN, Hispanic, NHPI	3.75	2.5	2.98	2.88
	(0.05)	(0.03)	(0.02)	(0.02)
Asian	9.38	8.33	5.95	6.71
	(0.07)	(0.06)	(0.03)	(0.02)
Black	1.25	0.83	2.38	2.08
	(0.03)	(0.02)	(0.02)	(0.01)
White	40.63	37.5	44.05	42.06
	(0.12)	(0.10)	(0.05)	(0.04)
Two or More /Not Reported	2.5	2.08	1.19	1.67
	(0.04)	(0.03)	(0.01)	(0.01)

Source: Authors calculations from matched SED/LEHD microdata. *Notes:* Shares are rounded using Census rounding rules. Standard errors in parentheses.

Table B3: RePEc ranks used to classify Top 5 and Top 20 programs

RePEc Rank	Name	Category	IPEDS
1	Harvard	Top 5	166027
2	MIT	Top 5	166683
3	UC Berkeley	Top 5	110635
4	University of Chicago	Top 5	144050
5	Princeton	Top 5	186131
6	Stanford	Top 20	243744
7	Columbia	Top 20	190150
8	Boston University	Top 20	164988
9	Brown University	Top 20	217156
10	New York University	Top 20	193900
11	Yale University	Top 20	130794
12	University of Pennsylvania	Top 20	215062
13	Dartmouth	Top 20	182670
14	UC San Diego	Top 20	110680
15	Northwestern University	Top 20	147767
16	University of Michigan	Top 20	170976
17	University of Southern California	Top 20	123961
18	UC Los Angeles	Top 20	110662
19	Columbia GSB	Top 20	190150
20	UC Davis	Top 20	110644

Source: Research Papers in Economics (RePEc) “Top 25% US Economics Departments”
<https://ideas.repec.org/top/top.usecondept.html>. Accessed 6/30/2021