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Socioeconomic Diversity of Economics PhDs

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22-4 Socioeconomic Diversity of Economics PhDs

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ABSTRACT

It is well documented that women and racial and ethnic minorities are underrepresented in the economics profession, relative to both the general population and many other academic disciplines. Less is known about the socioeconomic diversity of the profession. In this paper, we use data from the National Science Foundation's Survey of Earned Doctorates to examine the socioeconomic background of US economics PhD recipients as compared with US PhD recipients in other disciplines, proxying for socioeconomic background using PhD recipients' parents' educational attainment. We find that economics PhD recipients are substantially more likely to have highly educated parents, and less likely to have parents without a college degree, than PhD recipients in other disciplines. This is true both for US-born and non-US-born PhD recipients, but the gap between economics and other disciplines is starker for those born in the United States. The gap in socioeconomic diversity between economics and other PhD disciplines has increased over the last two decades.

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1. INTRODUCTION

It is well documented that women and racial and ethnic minorities are underrepresented in the US economics profession, relative both to the general population and to many other academic disciplines (see, for example, Bayer and Rouse 2016; Bayer and Wilcox 2019; Lundberg and Stearns 2019; Wessel, Sheiner, and Ng 2019; Lundberg 2020; Bayer, Hoover, and Washington 2020; Ginther and Kahn 2021). However, less is known about the socioeconomic backgrounds of those in the economics profession, largely because such data are scarcer than data on gender and race/ethnicity.¹

In this paper, we use data from the National Science Foundation's Survey of Earned Doctorates (SED), an annual census of all individuals who receive a research doctorate from an accredited US institution in a given academic year, to examine the socioeconomic background of economics PhD recipients in the United States and compare it with that of PhD recipients in other disciplines. To proxy for socioeconomic background, we use the highest education level attained by a parent or guardian of the PhD recipient, segmenting into three categories:² at least one parent with a graduate degree, at least one parent with a BA (but no parent with a graduate degree), and no parent with a BA (PhD recipients in this category are also referred to as "first-generation college graduates," following Pascarella et al. 2004). Parental education is one of the three most commonly used indicators of socioeconomic background in academic research, alongside parental incomes and occupations (see, for example, Duncan, Featherman, and Duncan 1972; Hauser 1994). We analyze separately US-born and foreign-born PhD recipients, as inferences about socioeconomic background from parental education status can vary substantially by country of origin.

PhD recipients in general, across disciplines, come from substantially more socioeconomically advantaged backgrounds than the population of college graduates (e.g., Mullen, Goyette, and Soares 2003). Similarly, the population of college graduates is more socioeconomically advantaged than the US population as a whole.

Our analysis of the SED data shows that economics is even more unrepresentative by socioeconomic background than the average PhD field. Among US-born PhD recipients over 2010-18, 65 percent of economics PhD recipients had at least one parent with a graduate degree, compared with 50 percent across all PhD fields (and 29 percent for the population of US-born BA recipients over the same period). At the other end of the spectrum, only 14 percent of US-born economics PhD recipients in 2010-18 were first-generation college graduates, compared with 26 percent across all PhD fields (and 44 percent among all US-born BA recipients). This makes economics the least socioeconomically diverse of any major field for US-born PhD recipients. And its socioeconomic diversity appears to have worsened over time: while economics has consistently been less socioeconomically diverse than both the other social

1 Relative scarcity of data on socioeconomic background is not unique to economics: efforts to track diversity rarely explicitly consider socioeconomic background, whether in academia (Kniffin 2007, Oldfield 2007, Lee 2015) or other elite professions (Laurison and Friedman, forthcoming).

2 Throughout the paper, we refer to parents or guardians collectively as "parents" for simplicity.

sciences and the biological and physical sciences, since 2000 it has also diverged from mathematics and computer science, the other two least socioeconomically diverse large PhD fields.

The lack of socioeconomic diversity in economics is striking compared with other PhD fields and even more striking compared with the general population. We use census data on educational attainment by age to estimate the share of the similar-aged US population with no parents with a BA (66 percent), at least one parent with a BA (21 percent), or at least one parent with a graduate degree (13 percent). US-born economics PhD recipients are roughly five times more likely than the similar-aged general US population to have a parent with a graduate degree, and five times less likely to have no parent with a college degree.

We next analyze the socioeconomic background of foreign-born PhD recipients. Economics is one of the most internationally diverse PhD fields, with almost 70 percent of PhD recipients born outside the United States (compared with an average of around half in other PhD disciplines). While parental education is a more complicated measure of socioeconomic background when comparing across countries, we still see that among foreign-born PhDs, economics is one of the least socioeconomically diverse PhD disciplines: 30 percent have no parent with a BA, the smallest share among large PhD disciplines, and 39 percent have at least one parent with a graduate degree, one of the highest shares. This means that, even though economics has a larger share of foreign-born students than most other fields, and even though foreign-born students are more likely to come from backgrounds with less parental education than US-born students, economics is still one of the least socioeconomically diverse disciplines overall.

Why is economics more unrepresentative by socioeconomic background than other PhD disciplines? Any hypotheses must seek to explain both why economics has an unusually low share of people who are first-generation college graduates and why it has an unusually high share of people from the most advantaged backgrounds (proxied here as those with at least one parent with a graduate degree). We document four stylized facts that can help inform possible explanations.

First, students in the majors that feed into economics PhDs (economics, mathematics, and other social sciences) tend to be less socioeconomically diverse than students across the full pool of BA majors. For example, data from the Baccalaureate and Beyond survey³ indicate that for US-born undergraduate students graduating with a BA from a US institution in 2016, 22 percent of economics graduates had no parent with a BA or higher, compared with 34 percent across math and social science graduates, and 42 percent across all fields.

Second, US-born economics PhD recipients got their BA from institutions that are on average less socioeconomically diverse than the BA institutions from which the average PhD comes. For example, 54 percent of US-born economics PhD recipients (2010-18) had a BA from a private university, compared with

3 The Baccalaureate and Beyond Longitudinal Study of the the National Center for Education Statistics is a nationally representative longitudinal study of students who completed the requirements for a bachelor's degree in a given academic year.

41 percent across all disciplines. 16 percent of US-born economics PhD recipients had a BA from an “Ivy Plus” school—defined as the Ivy League plus MIT, Stanford, Chicago, and Duke—compared with 7 percent across all disciplines.

Third, among US-born PhD recipients, across fields, the share with no parent with a college degree is strongly correlated with the shares who are female and who are an underrepresented racial or ethnic minority (URM).⁴ This suggests that some of the same factors that limit access to economics PhDs for these individuals in the United States may similarly limit access for those from less advantaged socioeconomic backgrounds.

Diversity of race and ethnicity has an important intersection with diversity of socioeconomic background. Among US-born PhDs, URM economists are much more likely to be from less advantaged socioeconomic backgrounds, and economics PhDs from less advantaged socioeconomic backgrounds are disproportionately likely to be URM. Economists with both characteristics are likely to face intersecting professional barriers.

Nonetheless, it is important to emphasize that racial/ethnic diversity and socioeconomic diversity are to a large degree distinct issues and require distinct analysis. In each major racial and ethnic group, among US-born students, economics is less socioeconomically diverse than other large PhD disciplines. In addition, the majority of first-generation-college-graduate PhDs are not URM, and the majority of URM PhDs are not first-generation college graduates.

Fourth, although we show that BA major, BA institution, PhD institution, and the racial, ethnic, and gender composition of the student body can explain some of the difference in socioeconomic diversity between economics and other PhD fields, there is still a substantial unexplained differential after controlling for these factors in regression analysis. This suggests that other factors specific to economics at the graduate level may also play a role.

There is reason to believe that the economics professoriate may be even less socioeconomically diverse than the population of economics PhDs: A recent survey of eight disciplines (not including economics) showed that the tenure-track professoriate within these eight disciplines is on average substantially less socioeconomically diverse than the population of PhD recipients (Morgan et al. 2021). Noting that the economics professoriate is drawn predominantly from a small number of elite PhD-granting institutions—for example, 50 percent of tenure-track faculty at the top 96 PhD-granting economics departments are graduates of the 15 top-ranked economics PhD programs (Jones and Sloan 2020)⁵—we can use data on the socioeconomic background of graduates from elite economics PhD programs to infer the possible socioeconomic background of the tenure-track economics professoriate in the US. Indeed, these 15 top-ranked programs are much less socioeconomically diverse than the average even among economics PhD programs. Among US-born graduates of these 15 economics PhD programs over 2010–18, 78 percent had at least one parent with a graduate degree, and only 6 percent were first-generation college graduates.

4 We follow the NSF (2021) in defining an underrepresented racial or ethnic minority as anyone who reports their ethnicity as Hispanic, and/or who reports their race as Black or African American, American Indian or Alaska Native, or Native Hawaiian or other Pacific Islander.

5 The top 15 and top 96 are drawn from the 2017 rankings generated by *US News and World Report* (Jones and Sloan 2020).

Overall, we find that economics PhDs are significantly less socioeconomically diverse than PhDs in other similar fields. Alongside the important focus on gender, race, and ethnicity, increasing both the representation and inclusion of individuals from less advantaged socioeconomic backgrounds should be a central part of the discussion on how to diversify the economics profession.

2. DATA

Our analysis is based on the 2019 Doctorate Recipient File (DRF), a restricted-use dataset of the National Science Foundation (NSF).⁶ The DRF is a cumulative listing of US-earned-doctorate recipients dating back to 1920, updated yearly with SED data.⁷ The SED, conducted annually since 1957, collects information on each doctoral recipient's educational history, demographic characteristics, and postgraduation plans. Results are used to assess characteristics of the doctoral population and trends in US doctoral education and degrees. The survey is administered with the help of institutional coordinators at each doctorate-granting institution, through a mix of web, mail, and computer-assisted telephone interviews⁸; the response rate has been above 90 percent every year since 1980 (NCSES 2020).⁹

We discuss the possibility for bias in our results, arising from differential nonresponse patterns, in section 3. We focus primarily on PhD recipients in 2010–18, a period for which we have data on 478,796 PhD recipients from US institutions, of which 10,063 were in economics.

Our primary variable of interest is the highest level of education attained by the respondent's parents or guardians. Parental education is one of the three most commonly used indicators of socioeconomic background in academic research, alongside measures of family income and parental occupation (Duncan, Featherman, and Duncan 1972; Hauser 1994).¹⁰ Each of these components

6 The survey is sponsored by the NSF's National Center for Science and Engineering Statistics (NCSES), National Institutes of Health, US Department of Education, and National Endowment for the Humanities.

7 The NSF defines research doctorates as follows: "Research doctorates require the completion of a dissertation or equivalent project, are oriented toward preparing students to make original intellectual contributions in a field of study, and are not primarily intended for the practice of a profession" (NCSES 2020, NSF 21-308). Recipients of professional doctoral degrees (e.g., MD, DDS, DVM, JD, DPharm, DMin, and PsyD) are not included.

8 When doctoral students apply for graduation, institutional coordinators at their universities give students the link to the survey registration website. In 2019, 96 percent of SED completions were via the web. Paper questionnaires are also mailed to institutional coordinators and distributed at some institutions. Nonrespondents are contacted with both follow-up emails with links to the web survey and a mailed paper questionnaire, and finally through computer-assisted telephone interviews (NCSES 2020). Because survey responses are self-administered, there is some scope for measurement error.

9 The NCSES does not report nonresponse rates before 1980. Response rates have trended down somewhat over time, from 96 percent in 1980 to 92 percent in 2018. Data on field, institution, and gender are recorded for nonrespondents by their PhD-granting institution. The NCSES reports that nonresponses are concentrated in certain institutions: in 2019 less than 10 percent of PhD-granting institutions accounted for 70 percent of all nonrespondents (NCSES 2020).

10 Socioeconomic background is, in itself, a somewhat amorphous concept: in general terms, it refers to "an individual's or a family's ranking on a hierarchy according to access to or control over some combination of valued commodities such as wealth, power, and social status" (Sirin 2005, p. 418).

captures a different avenue whereby advantages may be transmitted from parents to children (Sirin 2005). Our data enable us to observe only parental education, not family income or parental occupation.

We consider parental education an effective proxy for socioeconomic background. First, it is a strong predictor of family income in the United States, and family income is associated with students' greater access to the resources and opportunities that may enable them to succeed at school, at college, and outside of education (e.g., internships or professional experience) (Sirin 2005). In addition, even conditional on family income, a greater degree of parental educational attainment can provide students with a better understanding and awareness of the opportunities available to them in higher education, and the strategies needed to access and succeed in these opportunities.

A large literature studies the impact of socioeconomic status as measured by parental education on academic achievement, including students' progression to and success in graduate school (see, e.g., Ethington and Smart 1986; Mullen, Goyette, and Soares 2003; Walpole 2003; Morgan et al. 2021).¹¹ These studies illustrate mechanisms by which socioeconomic status can impact students' likelihood of getting a PhD; these mechanisms include differential academic opportunities and success pre-PhD, differential awareness of the possibility or desirability of doing a PhD, and differential support for and resources to pursue a PhD.

In the SED, respondents are asked two closed-ended questions about the highest educational attainment of each of their parents or guardians (we refer to these collectively as "parents" for simplicity),¹² selecting one of the following options: (1) less than high school/secondary school graduate, (2) high school/secondary school graduate, (3) some college, (4) associate's degree, (5) bachelor's degree, (6) master's degree, (7) professional degree, (8) research doctoral degree, or (9) not applicable/unknown. We use these data to construct

11 Ethington and Smart (1986) find that socioeconomic background has no direct influence on the likelihood of graduate study when conditioning on undergraduate education and experiences, but has an indirect influence since it affects choice of as well as academic and social integration in the undergraduate institution. Mullen et al. (2003) study the likelihood that students enter graduate study by socioeconomic background. They find that 76 percent of students whose parents had a high school education or less did not pursue graduate education after they received their bachelor's degree, compared with 62 percent of those whose parents had some graduate education. Parental education matters less for some types of graduate programs: about 18 percent of those whose parents have a high school degree or less enter a master's program compared with 22 percent of those from the most highly educated families. However, Mullen et al. find that students with highly educated parents are more than three times more likely to enroll in professional and doctoral programs than are those whose parents have a high school degree or less. Walpole (2003) shows that students from low-socioeconomic-status (SES) families are less likely to attend graduate school, and that college GPA is a stronger predictor of graduate school attendance for low-SES students than for high-SES students. First-generation PhD students are on average more likely to drop out before completing their degree compared with those who have more educated parents (CACREP 2009). Morgan et al. (2021) find that faculty across eight disciplines (not including economics) are substantially more likely to have highly educated parents and to come from higher-income zip codes than the overall population, and are on average 25 times more likely to have a parent with a PhD than the general population.

12 Until 2018 respondents were asked about the highest educational attainment of their father/male guardian and mother/female guardian (appendix figure A1); since then they have instead been asked to report the highest level of education for up to two parents or guardians of either sex. Data on the share of responses missing parental education are in appendix tables A1-A3 and appendix figure A2.

a new variable illustrating the highest level of education attained by any parent or guardian of the respondent. For most of our analysis, we group the results into three categories: those with at least one parent with a graduate degree (a master's, professional, or research doctoral degree), those with at least one parent with a bachelor's degree (BA) but no parent with a graduate degree, and those for whom no parent has a bachelor's degree (this group includes those with a parent who has an associate's degree or some college, is a high school graduate, or has less than a complete high school education). In some parts of our analysis, we also separately break out those whose parents have a PhD (a research doctoral degree).

We compare the parental education of economics PhD recipients to that of PhD recipients in the NSF's 14 "major field" categories: agriculture, biological/biomedical sciences, health sciences, engineering, computer and information sciences, mathematics, physical sciences, psychology, social sciences excluding economics, humanities, education, business management/administration, communication, and other or unknown.¹³ (Note that the NSF's original "social sciences" category includes economics—we break economics out separately for our analysis).

We segment our analysis according to whether US PhD recipients were born in or outside the United States. A large share are non-US-born, and this is particularly true in economics: of the 478,796 US PhD recipients in 2010–18, 46 percent across all fields and 69 percent in economics were born outside the United States (appendix figure A3).¹⁴ We segment our analysis in this way because the interpretation of parental education as an indicator of socioeconomic background can differ across countries and contexts, and because the path to a US PhD for non-US-born individuals is likely quite different than for US-born individuals, in ways that differ across disciplines and countries of origin. Since the mix of origin countries and continents also differs across PhD disciplines (appendix figure A4), we further break out our analysis of the socioeconomic background of foreign-born PhDs by continent of birth.

For US-born PhDs, we also compare socioeconomic background, race, and gender with the similar-aged US population.¹⁵ Summary statistics for all our variables of interest are shown for all US PhD recipients over 2010–18 in appendix table A1, for US-born only in appendix table A2, and for non-US-born in appendix table A3.

¹³ Appendix table A4 shows the number of PhD recipients by decade for each of these fields; appendix table A5 does the same for US-born PhD recipients only.

¹⁴ Data on country of birth are missing for 29,486 respondents; these are excluded when we analyze US-born and non-US-born separately. Because we do not have data on the location of respondents' childhood or preuniversity education, note that some foreign-born individuals in our data may have spent their childhood in the United States.

¹⁵ Analyses of racial and ethnic diversity in US PhD programs often focus only on US-born or US citizens and permanent residents (e.g., Bayer, Hoover, and Washington 2020), since the racial and ethnic makeup of different countries varies as well as the degree to which different racial and ethnic groups are underrepresented.

3. MAIN ANALYSIS: PARENTAL EDUCATION

Economics is more unrepresentative by socioeconomic background than the average PhD field. Among all (US- and foreign-born) PhD recipients 2010–2018 for whom we have data on parental education, 24.4 percent of economics PhD recipients had no parent with a BA or higher, compared with an average of 30.8 percent across PhD fields. Conversely, 47.7 percent of economics PhD recipients had at least one parent with a graduate degree, compared with an average of 43.1 percent across PhD fields. Figure 1, panel A, shows that, compared with the 14 large PhD fields, economics has the lowest share of PhD recipients with no parent with a BA or higher, and the second-highest share of PhD recipients with a parent with a graduate degree (after the humanities).

We can also disaggregate PhD fields into finer categories. The NSF defines 341 categories (areas of study) of PhD fields. Because some of these are extremely narrow, and possibly differentially so across fields, we focus on major fields. Nonetheless, among the 112 reasonably large PhD fields—those with more than 1,000 graduates over 2010–18—economics remains one of the least socioeconomically diverse, ranking 17th lowest in terms of the share with no parent with a college degree, and 27th highest in terms of the share with at least one parent with a graduate degree.

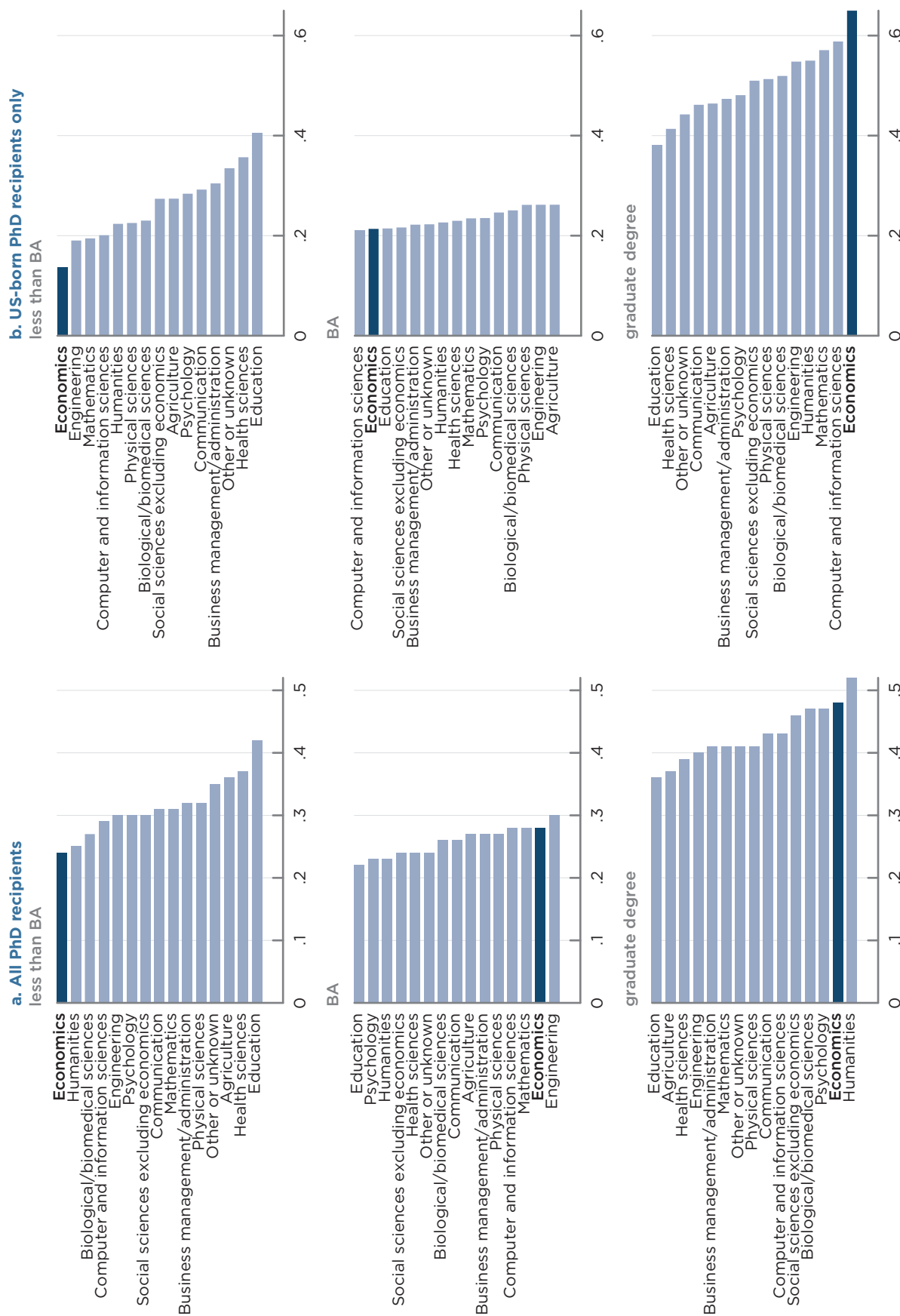
US-born PhD recipients

Economics is even more unrepresentative by socioeconomic background when looking only at US-born PhD recipients. Among US-born economics PhD recipients, 13.7 percent had no parent with a BA or higher, compared with an average of 26.4 percent across PhD fields. This is a substantially smaller share than in any other major PhD field, as illustrated in figure 1, panel B. And 65.0 percent of US-born economics PhD recipients had at least one parent with a graduate degree, compared with an average of 49.9 percent across PhD fields—a significantly larger share than in any other major PhD field.¹⁶

Comparing economics to narrow PhD fields, its unrepresentativeness is even more stark. Of the 137 narrow PhD fields for which there were more than 500 US-born PhD recipients over 2010–18, economics has the highest share of US-born PhD recipients with at least one parent with a graduate degree, and the lowest share with no parent with a BA or higher (making it slightly less socioeconomically diverse than, for example, art history or classics, as shown in appendix table A6).

16 To what extent could differential nonresponse rates bias these results? Among US-born economics PhD recipients over 2010–18, 6 percent were missing data on parental education. The average across all fields over the same period was also 6 percent. In the subjects that are arguably the closest to economics—mathematics, and social sciences excluding economics—the share missing was 5 percent. Unless there was vastly differential nonresponse bias across parental education by field—such that most missing responses in economics were from people with parents with little formal education, and most missing responses in mathematics and other social sciences were from people with parents with a lot of formal education—differential nonresponse patterns cannot affect our substantive conclusions. Appendix figure A5 shows the same pattern when filtering for US citizens/permanent residents, rather than US-born.

Figure 1

Highest level of parental education of US PhD recipients in different fields, 2010-18 (share)

Note: "Less than a BA" includes those without a high school diploma, those with high school but no college, and those with some college or an associate's degree; graduate degree includes master's degrees, PhD, and professional degrees.

Source: Data from Survey of Earned Doctorates.

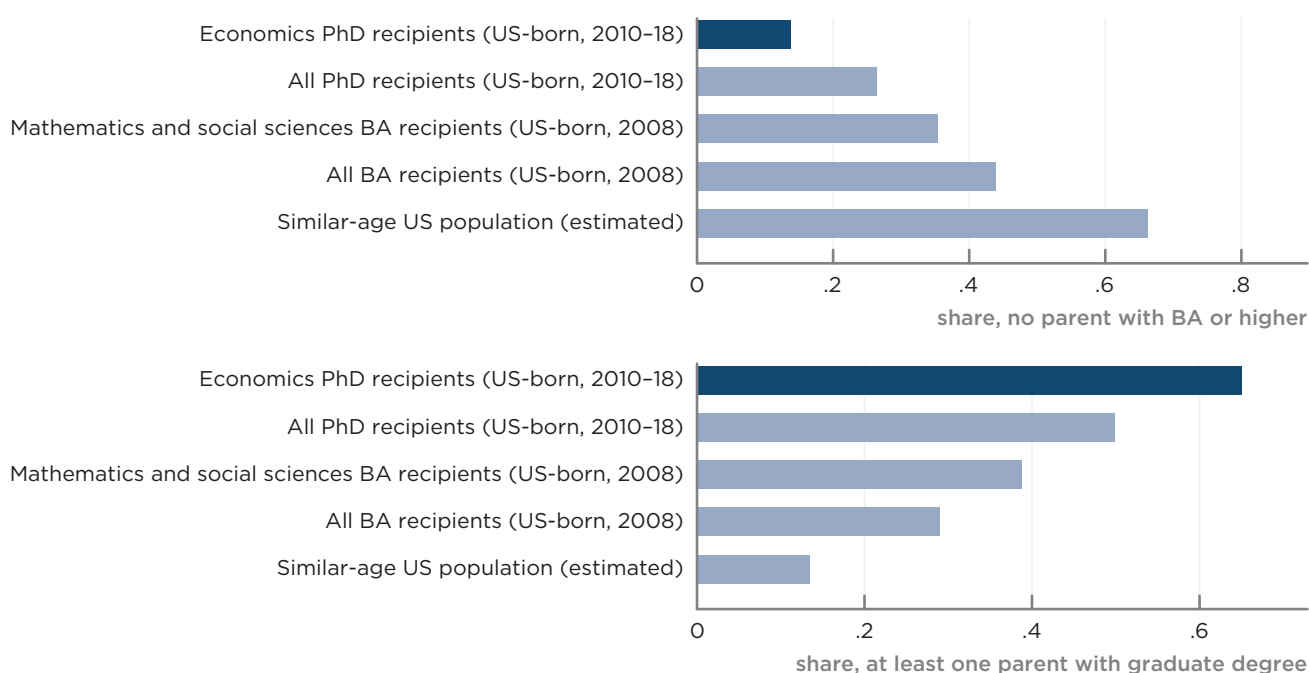
Beyond the comparison of socioeconomic background of economics and other PhD recipients, we look at how socioeconomically diverse US-born economics PhDs are relative to both the population of US BA recipients and the general US population. We obtain data on the parental education of US BA recipients from the NCES Baccalaureate and Beyond survey, focusing on US-born students who received their BA in 2008 (and therefore are roughly comparable to the group who received their PhD in 2010–18). We proxy for the parental education of the similar-aged US population with the educational attainment of the US population aged 50–74 as of 2019.¹⁷

We show the results of these comparisons in figure 2: we compare the share of economics PhD recipients with no parent with a BA or higher (13.7 percent) to the average among PhD fields (26.4 percent), the average among US-born math and social science BA recipients (35.3 percent), the average among US-born BA recipients of any major (43.8 percent), and the average for the similar-aged US population (which we estimate to be around 66 percent). We also compare the share of US-born economics PhD recipients with a parent with a graduate degree (65 percent) to the average among PhD fields (49.9 percent), the average among US-born math and social science BA recipients (38.7 percent), the average among US-born BA recipients of any major (29 percent), and the average among the similar-aged US population (13.4 percent). Overall, this calculation suggests that recent US-born economics PhDs are nearly five times more likely than an average similar-aged American to have a parent with a graduate degree, and only one fifth as likely to be from a family where no parent has a college degree.

Has economics always been less socioeconomically diverse than other PhD fields? Figure 3 plots parental education shares for US-born economics PhD recipients over 1970–2018 alongside seven other major arts and sciences fields (which may be considered more comparable to economics than more practically oriented PhD fields such as agriculture): mathematics, computer science, physical sciences, biological sciences, social sciences excluding economics, humanities, and psychology. In all fields, the share with a parent with a graduate degree increases over time and the share with no parent with a BA decreases over time. This is to be expected: the share of individuals earning either a bachelor's and/or graduate degrees rises substantially among the entire US population during this period. According to US Census Bureau data, in 1970 92.5 percent of the population aged 55 and over (roughly the age of parents of PhD recipients in our sample) did not have a four-year college education, compared with 67 percent by 2020. The decrease in the share of PhD recipients with no parent with a college degree was faster in all other fields: ranging from a decrease of 31 percentage points in the social sciences excluding economics to 38 percentage points in the physical and biological sciences (figure 3, panel B).

17 We choose 50- to 74-year-olds in 2019 to reflect people who were of roughly the right age to have been the parents of people who might have received their PhD in 2010–18 (noting that the median age of PhD receipt is 31.6; appendix table A1). To use the educational attainment of the 50- to 74-year-old population as a proxy for the educational attainment of people who were around 30 at some point in 2010–18, we assume that fertility does not differ substantially by education group. We obtained data on educational attainment for the 50- to 74-year-old population from the Census Bureau's data on "Educational Attainment in the United States: 2019," table 1-1.

Figure 2

Parental education of US-born economics PhD recipients compared to other groups

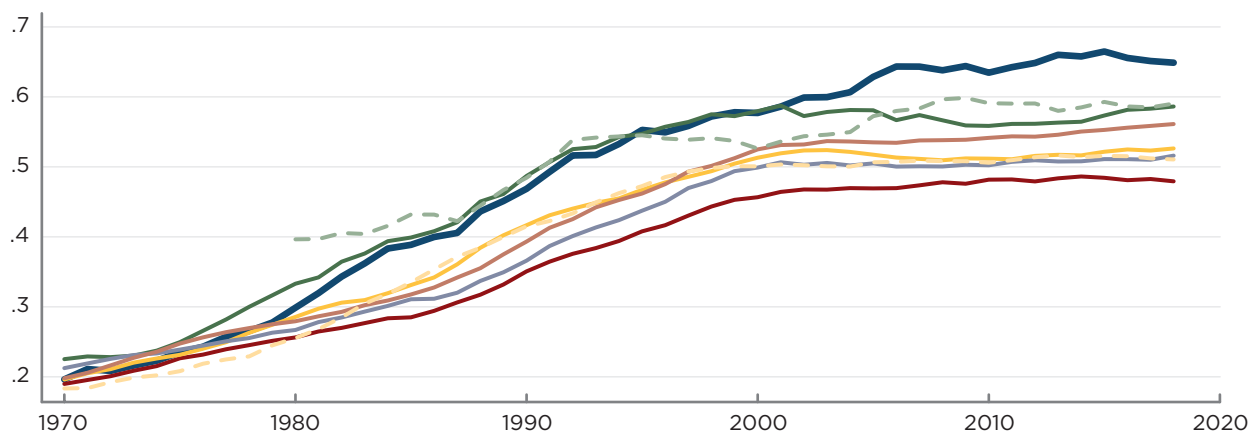
Sources and notes: Graduate degree is any degree after a BA, including PhD, master's degrees, and professional degrees. No BA or higher includes those without a high school diploma, those with high school but no college, and those with some college or an associate's degree. Data for PhD recipients are from the Survey of Earned Doctorates. Data for BA recipients are from the NCES Baccalaureate and Beyond survey of 19,000 students who completed their bachelor's degree in 2007–08 and include all individuals whose country of birth was the United States. The estimate for the similar-age US population is constructed as the share of US residents aged 50–74 with a graduate degree or without a BA, from the US Census Bureau's data on population by age and education in 2019. The group of 50- to 74-year-olds in 2019 is considered the cohort most likely to be comparable to the parents of people who received their doctorate in 2010–18 (noting that the median age of PhD receipt is around 32).

Comparing across fields, economics stands out as having become relatively less socioeconomically diverse over time. The share of US-born economics PhDs with no parent with a BA fell by 45 percentage points from 1970 to 2018, a substantially larger decline than in other disciplines or in the US population overall. While economics was one of the least socioeconomically diverse fields throughout this 50-year period (on par with mathematics and computer science¹⁸), it became a particular outlier in the past 15–20 years relative to comparable quantitative PhD disciplines: since 2000 economics has become more socioeconomically unrepresentative among US-born PhDs even relative to mathematics and computer science.

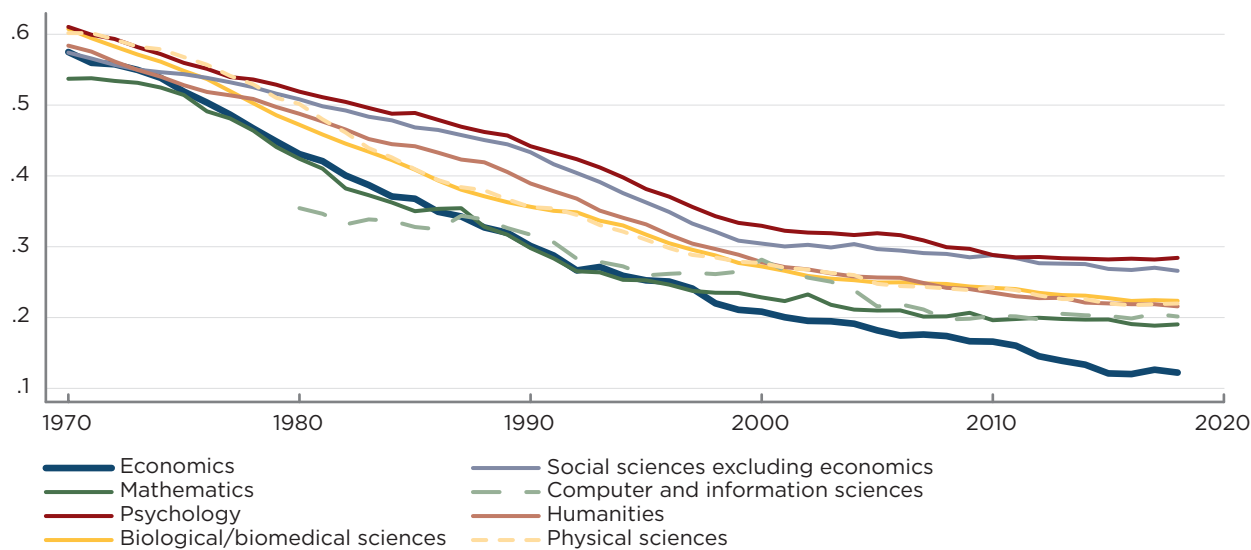
¹⁸ Computer science was a very new and small field in the 1970s, so we present data only from 1980 onward.

Figure 3
Highest level of parental education of US-born PhD recipients, selected fields, 1970–2018 (5-year moving average)

a. Share with at least one parent with a graduate degree



b. Share with no parent with a BA or higher



Note: Figures for computer science start in 1980 because of small sample sizes before then.

Source: Data from Survey of Earned Doctorates.

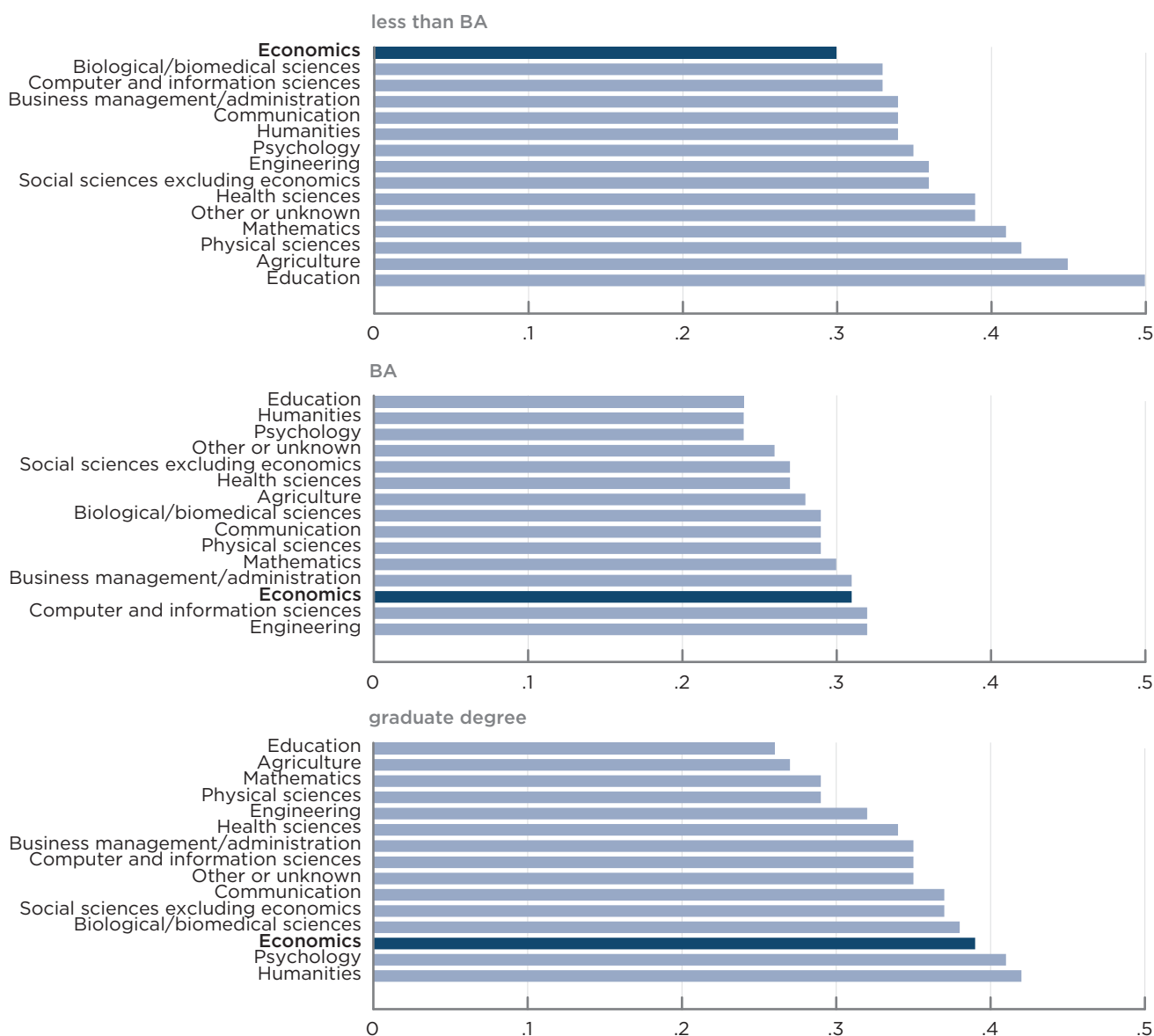
Foreign-born PhD recipients

Foreign-born PhD recipients are in general more likely than US-born PhD recipients to have no parent with a BA and less likely to have a parent with a graduate degree. Because economics has such a high share of foreign-born PhD recipients, this might be expected to push economics to be *more* socioeconomically diverse than other fields. But as figure 4 illustrates, even among foreign-born PhDs, economics has the lowest share of any major field of PhD recipients with no parent with a BA, and the third highest share with a parent with a graduate degree (after psychology and

the humanities).¹⁹ Disaggregating to narrower PhD fields, of the 88 fields for which there were more than 500 foreign-born PhD recipients over 2010–18, economics has the 12th lowest share of people with no parent with a BA or higher and the 26th highest share of people with at least one parent with a graduate degree.

Figure 4

Highest level of parental education of foreign-born US PhD recipients, 2010–18 (share)



Note: "Less than BA" includes those without a high school diploma, those with high school but no college, and those with some college or an associate's degree; graduate degree includes master's degrees, PhD, and professional degrees.

Source: Data from Survey of Earned Doctorates.

19 Among foreign-born PhD recipients, nonresponse is higher than among US-born PhD recipients: there was no information on parental education for 8 percent of foreign-born economics PhD recipients in the SED data over 2010–18, compared with 6 percent of US-born economics PhD recipients.

Interpreting this statistic is somewhat more difficult for foreign-born than US-born PhD recipients, because (i) a given level of education in one country may indicate a very different socioeconomic status—whether because different countries have different educational mixes among their population or because they require graduate education to different degrees for high-income, high-status professions (such as law or medicine)—and (ii) different PhD fields have different international student mixes. Foreign-born economics PhD recipients may be less likely to have no parent with a BA simply because they are more likely to come from countries with a smaller share of the overall population without a BA, for example. To understand the degree to which this is at play, in appendix figure A6 we show parental education of PhD recipients by continent of birth and PhD field. These illustrate that economics PhD recipients from Europe and the Americas (excluding the United States) are on average more socioeconomically advantaged than other PhD students from these regions—but this is not the case for economics PhD students from Asia or Africa.

How has the parental education mix of foreign-born PhD recipients changed over time? Figure 5 shows the trends in socioeconomic background for various disciplines from 1970 through 2018. In the 1970s and 1980s, the share of foreign-born PhD recipients in economics who had no parent with a BA was if anything slightly higher than in many other PhD fields, and the share with a parent with a graduate degree was lower than in many other PhD fields. However, by the 2010s economics was the lowest-ranked in terms of the share with no parent with a BA and among the top in terms of the share with a parent with a graduate degree.

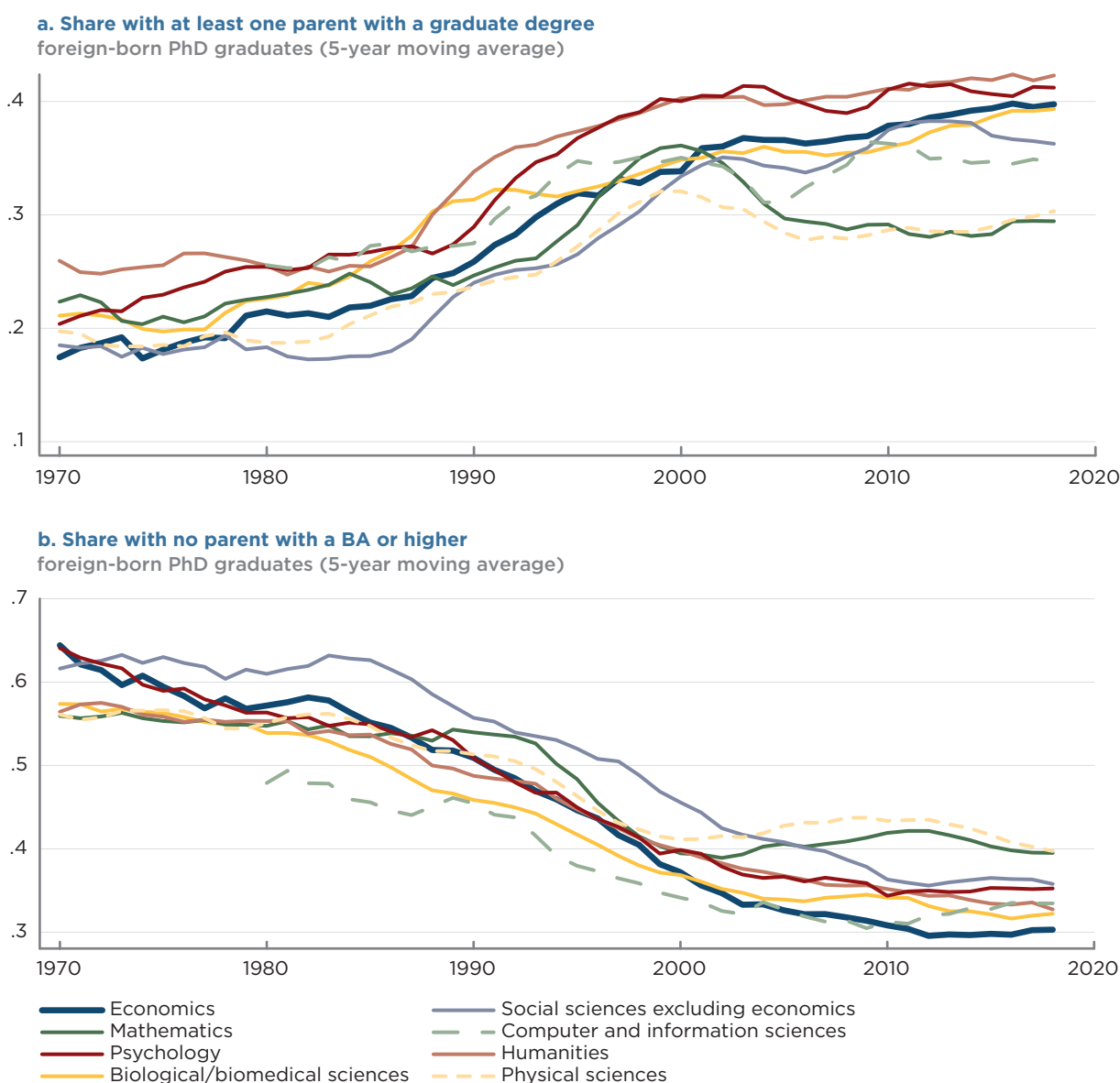
Breaking this analysis down by continent of birth, the rise in the average parental educational attainment of economics PhDs relative to other PhD disciplines is driven by a rapid rise in the average parental educational attainment of economics PhDs born in Europe and the Americas (excluding the United States), relative to PhD students born in these continents in other disciplines (figures available on request).

Parents with a PhD vs. parents with non-PhD graduate degrees

To explore further the possible mechanism for economics' status as an outlier among other disciplines, we disaggregate the share with at least one parent with a graduate degree into two groups: those with at least one parent with a PhD, and those with at least one parent with a graduate degree but no parent with a PhD. The children of PhD holders may be more likely to get a PhD because of preferences acquired through childhood, greater awareness of the possibilities or advantages of getting a PhD, or greater knowledge of and resources or support for the route to a PhD. On the other hand, the children of those with a different graduate degree (e.g., JD, MD, MBA) may be more likely than average to get a PhD because of advantages conferred by socioeconomic background rather than because of PhD-specific resources, knowledge, or preferences accessed through family.²⁰

20 Similarly, studies have shown that—even conditional on general measures of socioeconomic background or resources—children are likely to follow in their parents' occupational footsteps (Jonsson et al. 2009; Dal Bó, Dal Bó, and Snyder 2009).

Figure 5
Highest level of parental education of foreign-born PhD recipients, selected fields, 1970–2018



Note: Figures for computer science start in 1980 because of small sample sizes before then.

Source: Data from Survey of Earned Doctorates.

Disaggregating across PhD vs. other graduate degree-holding parents, we see that 19.6 percent of US-born economics PhD recipients in 2010–18 had at least one parent with a PhD, and 45.3 percent had at least one parent with a different graduate degree (but no parent with a PhD). These compare with 11.7 percent and 38.1 percent respectively for the total population of US-born PhD recipients over the same period. As illustrated in figure 6, panel A, the inheritance of academic qualifications for US-born PhDs seems particularly strong for the more quantitative PhD disciplines—the fields with the highest share of

PhD recipients with at least one parent with a PhD are economics, computer science, and mathematics. On the other hand, the share of US-born economics PhD recipients with a parent with a non-PhD graduate degree is 5 percentage points higher than in either computer science or mathematics (whose shares are 40.2 percent and 40.8 percent respectively). Of foreign-born PhDs, economics is among the top three disciplines in terms of both the share with a non-PhD graduate degree and the share with a PhD.

This evidence suggests that some of economics' lack of socioeconomic diversity may reflect a particularly large effect of having a parent with a PhD in economics and other quantitative disciplines. But it illustrates clearly that this is not the only important factor in explaining economics' lack of socioeconomic diversity: economics' large share of PhD recipients with parents with non-PhD graduate degrees also suggests a strong effect of socioeconomic background on the likelihood of getting an economics PhD as compared with a PhD in other disciplines.

4. SOCIOECONOMIC, GENDER, AND RACIAL AND ETHNIC DIVERSITY

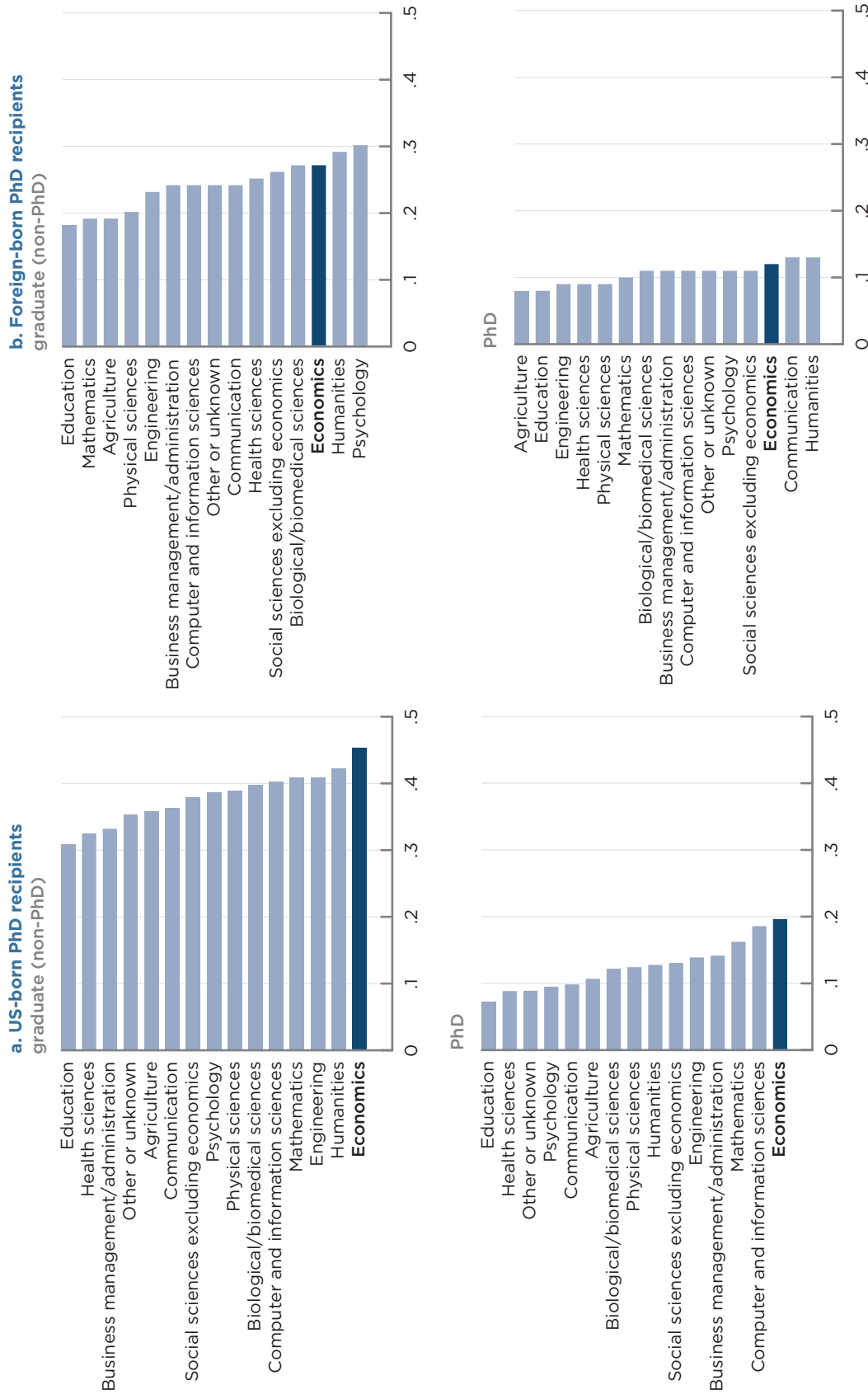
It is well documented that there is less gender and racial and ethnic diversity in economics relative to most other PhD fields. In fact, economics' relative progress in increasing representation by race, ethnicity, and gender has slowed since the mid-1990s or early 2000s (see, e.g., Bayer and Rouse 2016, Lundberg and Stearns 2019; appendix figures A7-A10). On the other hand, in terms of international diversity economics has a larger share of non-US students than almost any other large PhD field. How does socioeconomic diversity relate to other types of diversity? We examine this separately for US-born and non-US-born PhD recipients over 2010–18.

US-born PhD recipients

For each major PhD field, we calculate the share of US-born PhD recipients who are female and the share who are of an underrepresented racial or ethnic minority (URM). We define URM as anyone who reports their ethnicity as Hispanic, and/or who reports their race as Black or African American, American Indian or Alaska Native, or Native Hawaiian or other Pacific Islander (following NSF 2021).²¹

21 The two major racial groups *not* included in this category are White non-Hispanic and Asian non-Hispanic, as well as those who report two or more races. Asian non-Hispanic is not considered an underrepresented minority since, while Asian Americans are a racial minority in the US population overall, students who self-report their race as Asian are not underrepresented in economics relative to the US population averages, at either the graduate or undergraduate level (see, e.g., Bayer and Wilcox 2019). It is important to note that (i) the level of aggregation of our data does not allow us to capture disparities in access and inclusion within the Asian-American population, and (ii) even if a group is not underrepresented, its members may be treated inequitably or may not be fully included because of their racial or ethnic identity. In the AEA Climate Survey (Allgood et al. 2019) 24 percent of Asian economists report being discriminated against or treated unfairly in the profession based on their race (the comparable figures were 47 percent for Black economists, 16 percent for Latinx economists, and 4 percent for White economists).

Figure 6
Share with parent with PhD versus non-PhD graduate degree, 2010–18



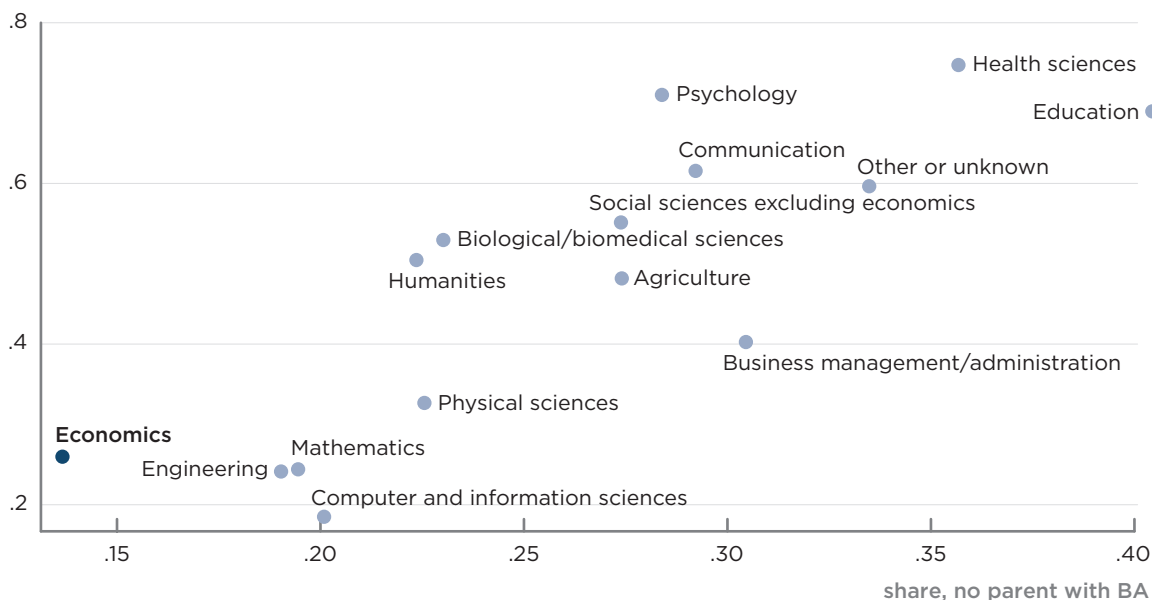
Note: "Graduate (non-PhD)" denotes master's or professional graduate degree.
Source: Data from Survey of Earned Doctorates.

Figure 7

Socioeconomic, gender, and racial/ethnic diversity among US-born PhD recipients, 2010–18

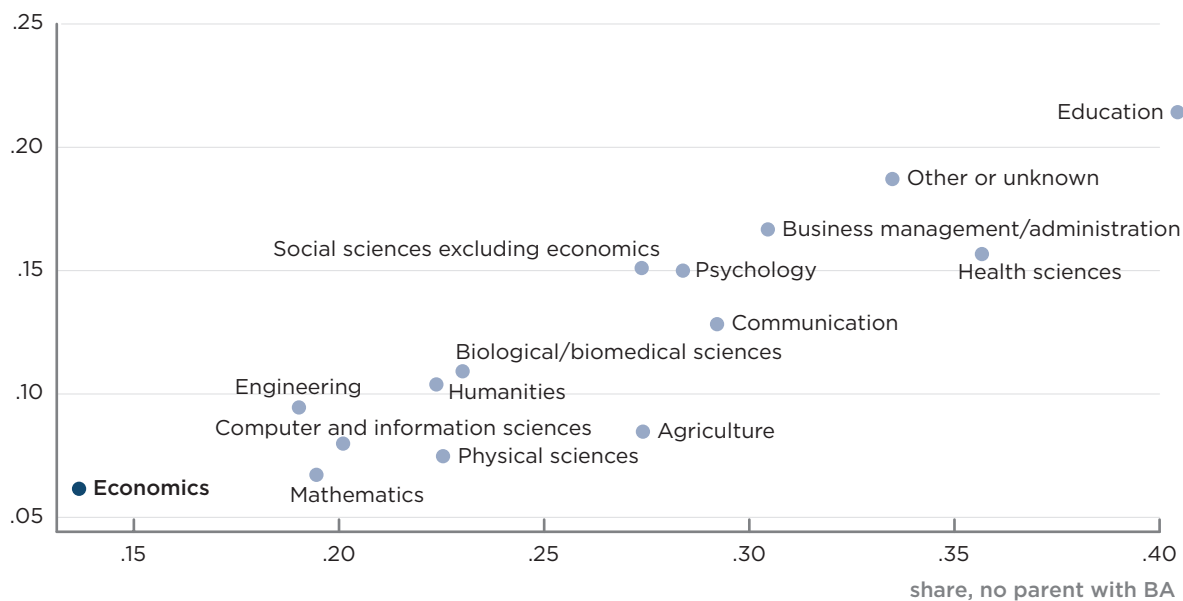
a. Share with no parent with BA or higher, and share female

share female



b. Share with no parent with BA or higher, and share URM

share URM



URM = underrepresented racial or ethnic minority

Source: Data from Survey of Earned Doctorates.

There is a strong correlation across PhD fields in the shares of first-generation college graduates, underrepresented racial or ethnic minorities, and women (figure 7). The PhD fields with the lowest shares of women and of underrepresented racial and ethnic minorities are also, on average, the fields with the lowest share of first-generation college graduates, and economics is at or near the bottom on all these metrics.

The slowdown in progress on diversity among US-born economics PhD recipients seems to coincide somewhat across all these areas: the share of women has stagnated since the mid-1990s (appendix figure A7), the share of underrepresented minority PhD recipients has barely increased since around 2000 (appendix figure A9), and the divergence of economics from mathematics and computer science in the socioeconomic background of PhD recipients appears to have begun around 2000.

It is important to emphasize that economics' lack of socioeconomic diversity is a separate axis that is not fully explained by (and does not fully explain) the field's lack of racial and ethnic diversity. As figure 8 illustrates, economics PhD graduates across different racial and ethnic groups are predominantly from families with high levels of formal education relative to other PhD disciplines.²² Indeed, more than half of Hispanic and Black non-Hispanic economics PhD recipients have at least one parent with a graduate degree. At the same time, while URM economics PhD recipients are disproportionately likely to have parents with less formal education, 82 percent of all US-born first-generation economics PhD recipients were White non-Hispanic. Thus, although there is an important intersection between race/ethnicity and socioeconomic background, the majority of first-generation-college-graduate PhD recipients in economics are not underrepresented racial or ethnic minorities, and the majority of URM PhD recipients in economics are not first-generation college graduates.

An intersectional understanding of barriers to opportunity might suggest that URM students who are also first-generation college students face greater barriers than either non-URM first-generation students or URM students who had a parent who attended college.²³ The data are consistent with this: URM first-generation college students are even more underrepresented among economics PhDs than either URM or first-generation college students as a whole.

Taking once again the US population aged 50–74 in 2019 to represent the population with roughly the same age as the parents of US PhD recipients in 2010–18, we evaluate the degree of socioeconomic diversity in the economics PhD population by race relative to the similar-aged general population (using Census Bureau data on educational attainment by age and race or ethnicity).²⁴ For example, among the Black US population aged 50–74 in 2019, 9 percent had a graduate degree, while among Black US-born PhD recipients in 2010–18, 54 percent had a parent with a graduate degree: this suggests that US-born Black economics PhD graduates are roughly 6 times more likely to have a parent with a graduate degree than the Black US population of a similar age. For White non-Hispanic and Asian economics PhDs the ratio is 4 times, and for Hispanic economics PhDs it is 9 times (appendix table A7).²⁵

22 This is also true when looking separately at men and women (appendix figures A11 and A12). The analysis in the next section (table 2) illustrates that even when controlling for race/ethnicity and gender, economics PhD graduates are substantially less socioeconomically diverse than the average PhD graduate.

23 And the effect of socioeconomic background in academic settings may play out differently along gender lines and for different racial or ethnic minority groups, as discussed by Strayhorn (2010).

24 Available at: <https://www.census.gov/topics/education/educational-attainment.html>.

25 Population data are from Census Bureau educational attainment by age and race (2019), table 1. To be consistent with the Census Bureau data, the racial categories we use here are slightly different from those in the analysis reported in figure 8. Here, we calculate parental education shares for four groups: White non-Hispanic, Asian alone (any ethnicity), Black alone (any ethnicity), and Hispanic (all races). Note that these categories are not mutually exclusive: the same individual could appear in both Black alone and Hispanic. Since the Census Bureau does not provide breakdowns for educational attainment by age and race for people of more than one race or for Native Americans, we exclude these categories in this table.

Figure 8

Highest level of parental education by field and race/ethnicity, for US-born PhD recipients, 2010-18

a. Share with at least one parent with a graduate degree

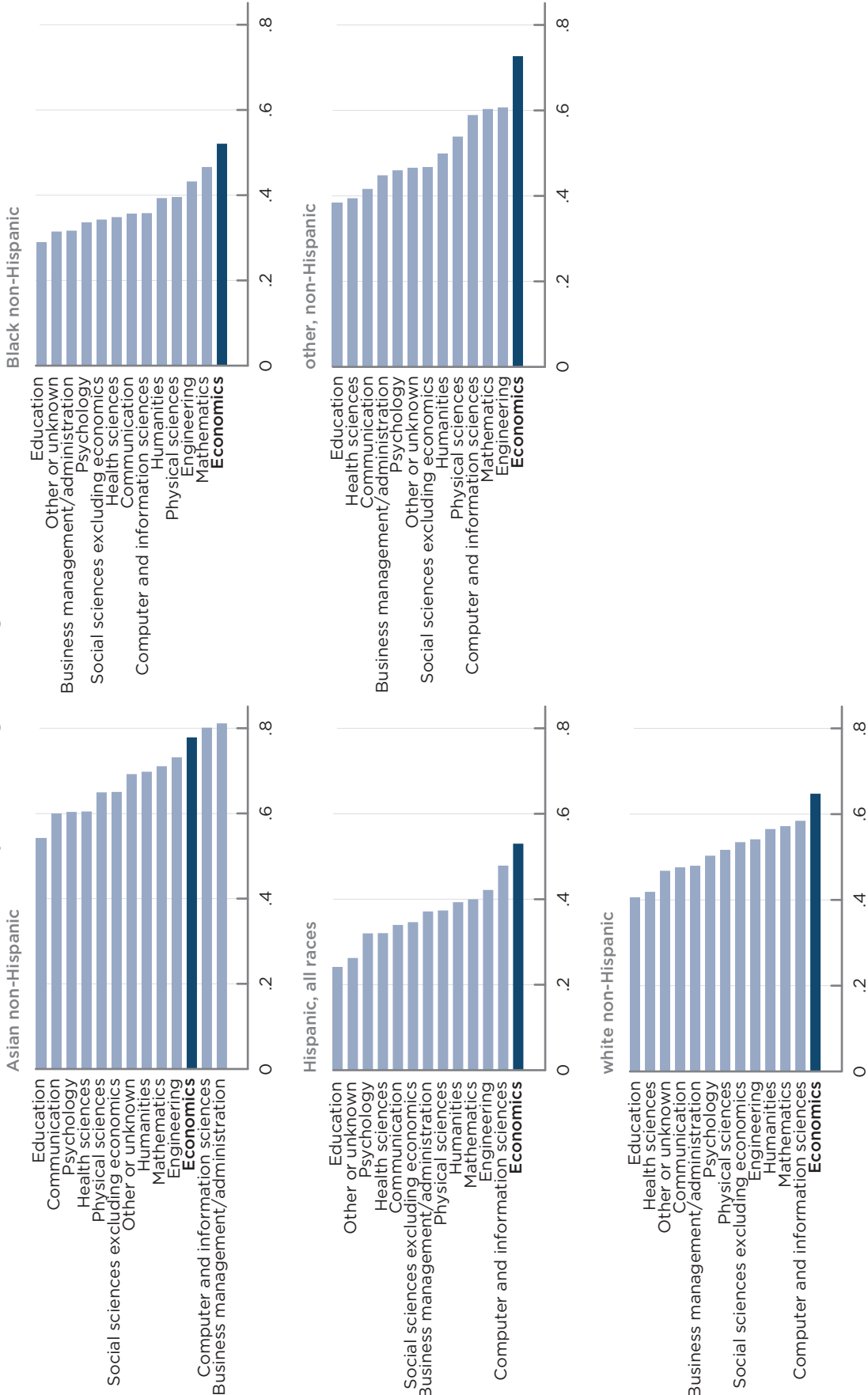
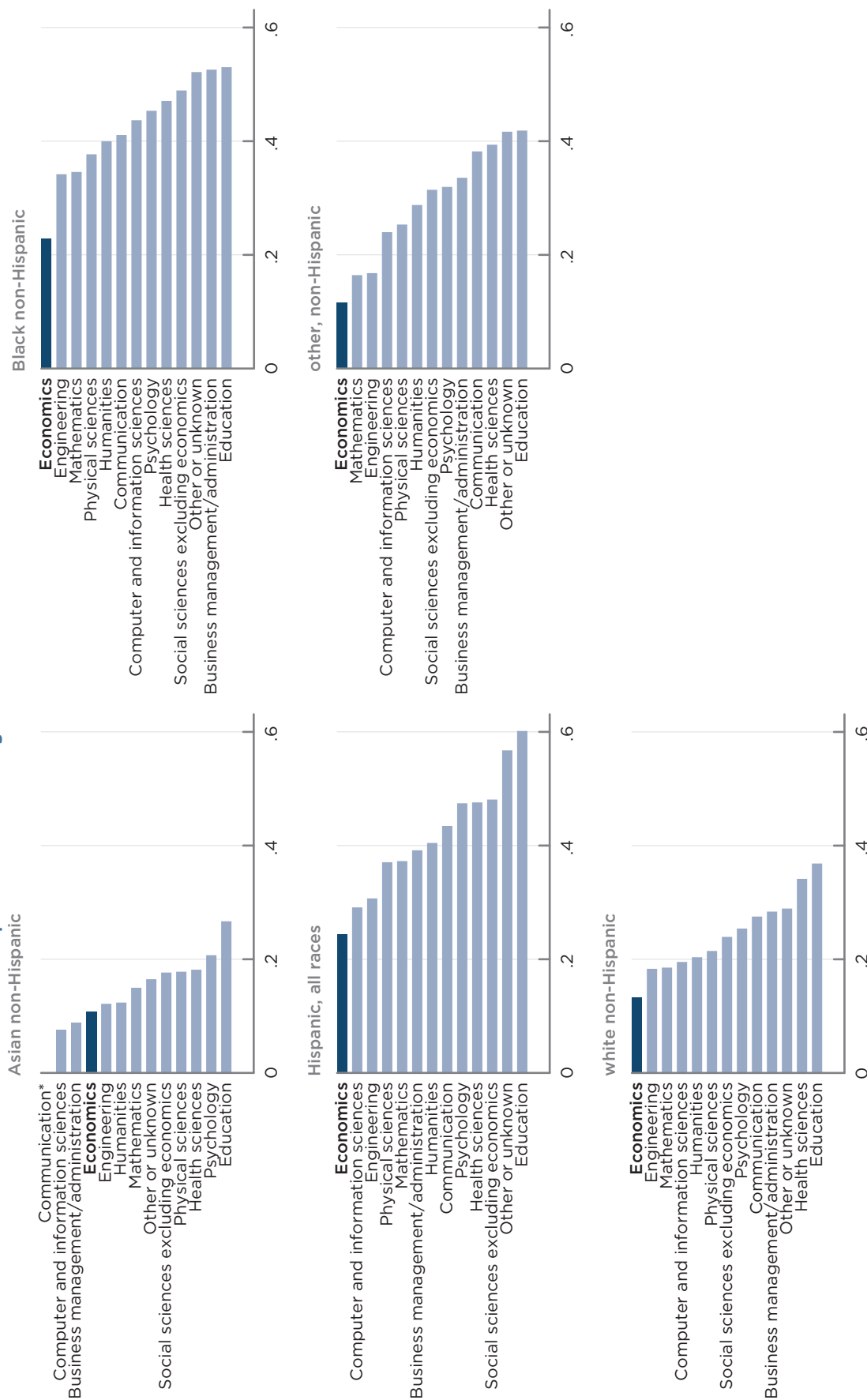


Figure 8 (continued)
Highest level of parental education by field and race/ethnicity, for US-born PhD recipients, 2010-18

b. Share with no parent with a BA or higher



*No data are reported for the share with no parent with a BA or higher for Asian non-Hispanic PhD recipients in communication because the sample size was too small to allow export from the secure server containing the SED data.

Note: "Other, non-Hispanic" includes the following racial categories: American Indian and Alaska Native, Native Hawaiian or other Pacific Islander, and those who report two or more races or do not report race. For these groups, there are too few observations in some fields to allow for nonidentifying disaggregation by parental education. We assign those who do not report ethnicity to non-Hispanic categories.

The relative underrepresentation of individuals from less advantaged socioeconomic backgrounds in economics has implications for understanding gender diversity. To show this, in figure 9, panel A we compare US-born economics PhDs by gender and level of parental education to our estimates of these shares for the similar-aged US population.²⁶ This exercise illustrates that even though women are underrepresented on average in economics PhDs—accounting for only around a quarter of US-born economics PhDs—women with parents with at least one graduate degree are *overrepresented* among economics PhDs relative to the general population: They make up 17 percent of all US-born economics PhD recipients in 2010-18, but only 7 percent of the similar-aged US population.²⁷ In contrast, even though men on average are overrepresented in economics PhDs relative to the generation population, men with no parent with a BA are underrepresented: they make up 11 percent of all US-born economics PhDs in our cohort, but 33 percent of the similar-aged population. Thus, the gender problem in economics is one of gender *and* socioeconomic background, not just gender.

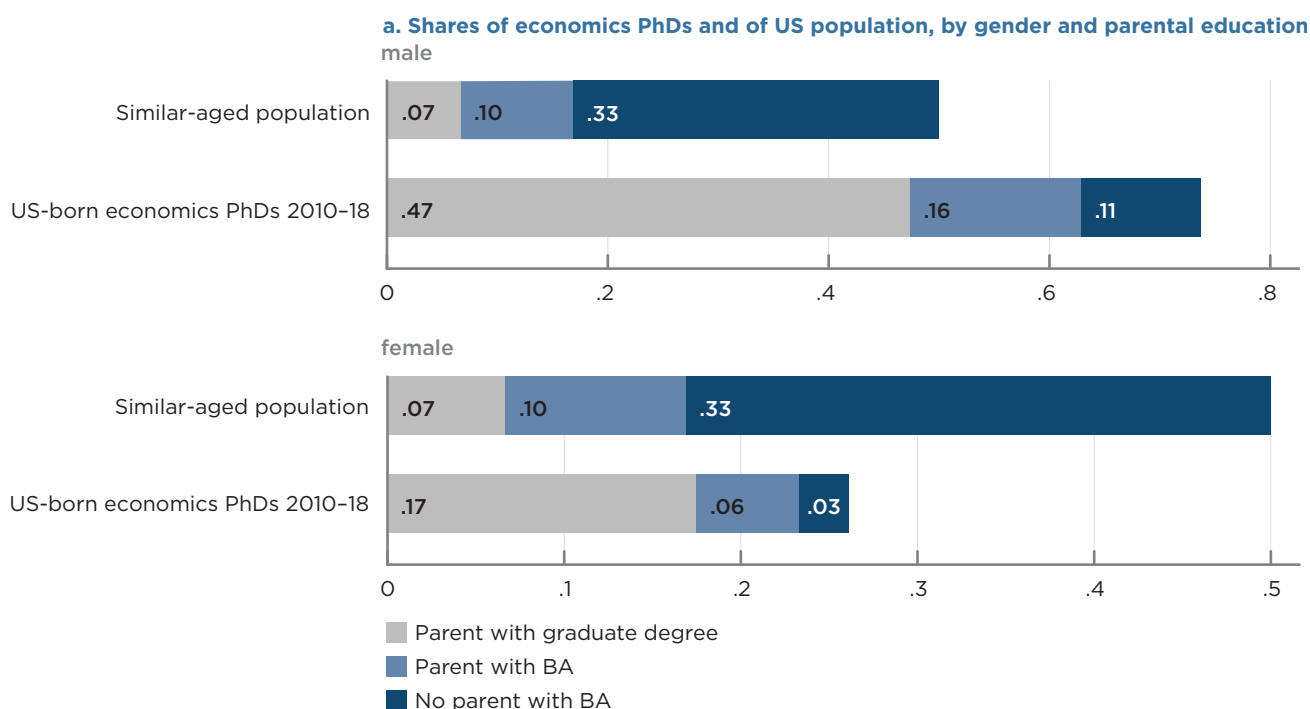
In a similar analysis, we look at economics PhDs and the similar-aged US population by both race/ethnicity and parental education. Figure 9, panel B illustrates that, although White non-Hispanic and Asian Americans are overrepresented on average among economics PhDs relative to the general population, those with no parent with a BA are underrepresented: 11 percent of US-born economics PhDs were White non-Hispanics with no parent with a BA, compared with 44 percent of the similar-aged population, and 1 percent were Asian and had no parent with a BA, compared with 3 percent of the similar-aged population. In addition, while Hispanic Americans are extremely underrepresented on average in economics, 2 percent of US-born economics PhDs were Hispanic and had a parent with a graduate degree, relative to 1 percent of the similar-aged population. For Black Americans, notably, there is underrepresentation of all socioeconomic groups relative to the general population, especially for those with no parent with a BA: they account for a scant 0.4 percent of economics PhD recipients but 9 percent of the similar-aged population.

26 We estimate the shares of the overall population very roughly: for example, we estimate that the share of the similar-aged US population made up of men with parents with less than a BA is half of the share of the total US population aged 50-74 who had no BA in 2019 (and similarly for the other education categories and gender, or education category and race/ethnicity). We halve the share since it is reasonable to assume that about half of the children of 50- to 74-year-olds are men and about half are women. As explained, the 50- to 74-year-old age range proxies for the parents of those who received their PhD in 2010-18.

27 To see this in the figure, note that if the colored bar for US-born economics PhD recipients is larger than the same-colored bar for the similar-aged population, this shows that the group is over-represented amongst economics PhDs relative to the similar-aged US population, and vice versa.

Figure 9

Representativeness of US-born economics PhD recipients, 2010–18, relative to similar-aged US population

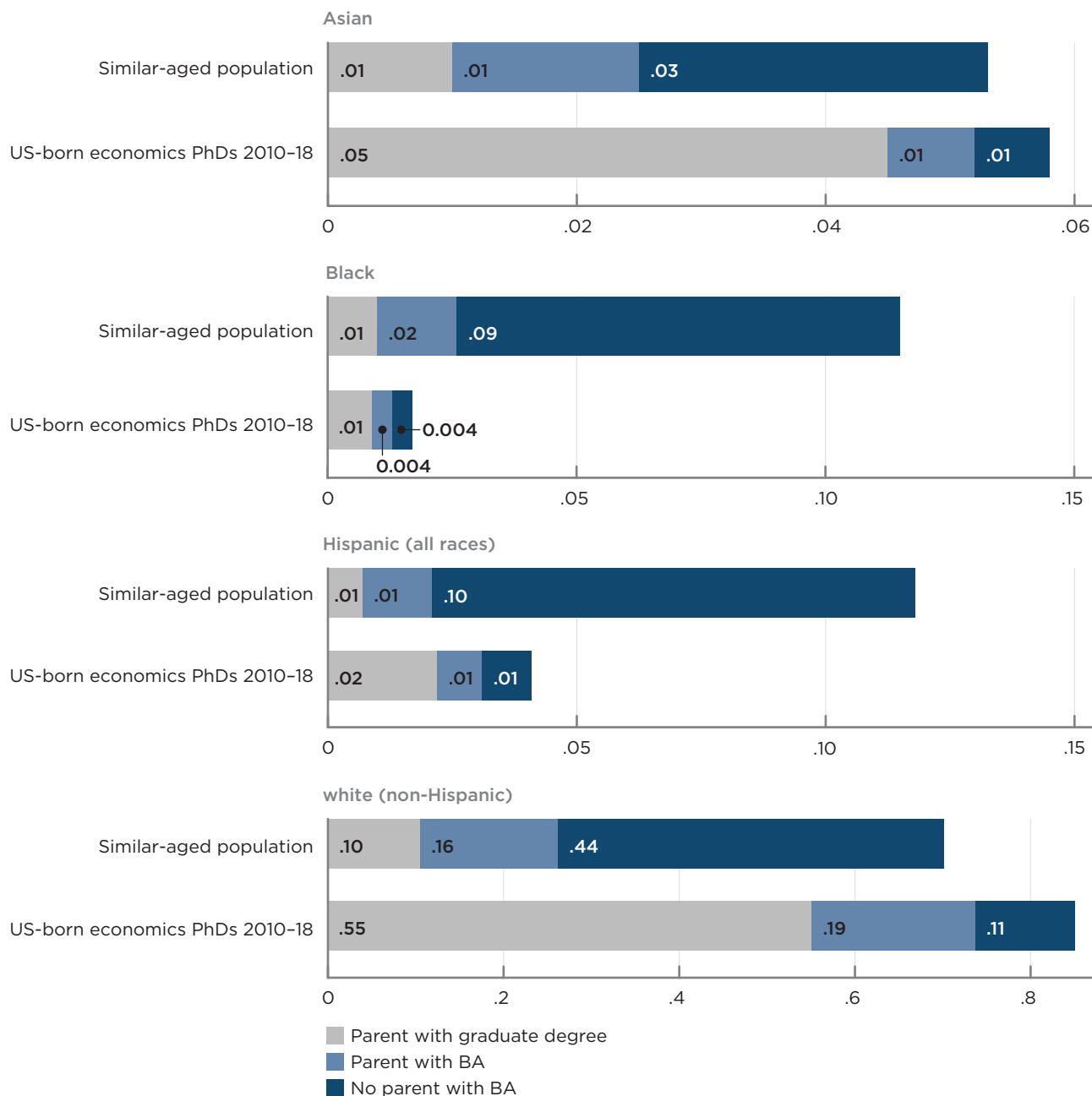


Note: Panel A shows the share of all US-born economics PhD recipients (2010–18) who have a specific gender and parental education level, as compared to the share of the similar-aged US population with that same gender and parental education level. For example, grey bars under “Male” in Panel A illustrate that 47 percent of all US-born Economics PhDs over 2010–18 were men who were from a family where at least one parent had a graduate degree, while only 7 percent of the similar-aged US population were men who were from a family where at least one parent had a graduate degree. Panel B shows the share of all US-born economics PhD recipients (2010–18) who have a specific race/ethnicity and parental education level, as compared with the share of the similar-aged US population with that same race/ethnicity and parental education level. For example, the grey bars under “White (Non-Hispanic)” in Panel B illustrate that 55 percent of all US-born Economics PhDs over 2010–18 were Non-Hispanic Whites from a family where at least one parent had a graduate degree, while only 10 percent of the similar-aged US population were Non-Hispanic Whites who were from a family where at least one parent had a graduate degree. Data on PhD recipients is drawn from all recipients of PhDs from US institutions who received their PhDs in 2010–2018 inclusive, who completed the Survey of Earned Doctorates, and who reported both their PhD field and the education level of at least one parent or guardian. Data on similar-aged population is estimated from the gender by education or race/ethnicity by education shares of the US population aged 50–74 in 2019 (roughly the age to be PhD graduates’ parents in 2010–18). Note that race and ethnicity categories are from the Census Bureau and are not mutually exclusive.

Figure 9 (continued)

Representativeness of US-born economics PhD recipients, 2010–18, relative to similar-aged US population

b. Shares of economics PhDs and of US population, by race/ethnicity and parental education

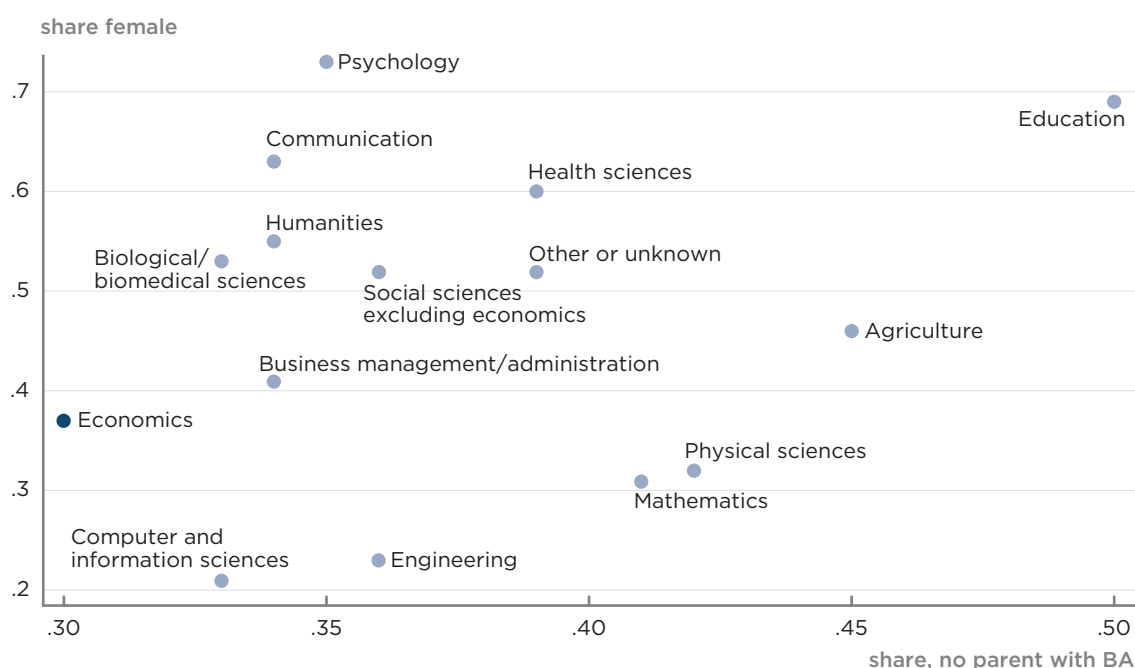


Sources and notes: Data on PhD recipients are from the Survey of Earned Doctorates. Data on similar-aged population are estimated from the gender by education or race/ethnicity by education shares of the US population aged 50–74 in 2019. Race and ethnicity categories are from the Census Bureau and are not mutually exclusive.

Foreign-born PhD recipients

What is the situation for foreign-born PhD recipients? As discussed above, we do not break down the race and ethnicity of foreign-born PhD recipients, since the definition of an under-represented racial and ethnic minority differs across countries of origin. We can, however, compare socioeconomic and gender diversity among foreign-born PhD recipients. Figure 10 shows the share of foreign-born PhD recipients (2010–18) who were female and the share who were first-generation college graduates (no parent with a BA or higher). There is no detectable correlation across PhD fields. This is largely driven by a lack of correlation between gender and socioeconomic background for PhD recipients born in Asia, who are the majority of foreign-born PhD recipients in the United States. It is also of note that foreign-born economics PhD recipients are substantially more gender diverse than US-born economics PhD recipients.²⁸

Figure 10
Share with no parent with BA or higher, and share female (foreign-born PhD recipients), 2010–18



Source: Data from Survey of Earned Doctorates.

5. THE ROLE OF COLLEGE, COLLEGE MAJOR, AND PHD INSTITUTION

Why is economics less socioeconomically diverse than other PhD disciplines? One way to shed light on this question is to understand the degree to which the socioeconomic diversity of PhD recipients is mediated through PhD institution, BA institution, and college major.

²⁸ We cannot perform an analogous exercise to that in figure 9 for foreign-born PhD recipients, because it is much more complex to obtain information on parental education for the general population of each of the countries of birth—as well as being unclear as to what combination of countries the denominator should be (only the countries from which PhD recipients are drawn, in proportion to their population in PhD programs, or the whole world?).

Table 1

Association of economics PhD and parental education level (US-born only), 2010–18

Specification: Linear probability model						
<i>Panel A</i>						
Dependent variable: Indicator, taking value 1 if at least one parent has a graduate degree						
	(1)	(2)	(3)	(4)	(5)	(6)
Economics	0.153*** (0.014)	0.135*** (0.013)	0.093*** (0.013)	0.065*** (0.011)	0.054*** (0.010)	0.050*** (0.010)
<i>Panel B</i>						
Dependent variable: Indicator, taking value 1 if no parent has a BA or higher						
	(1)	(2)	(3)	(4)	(5)	(6)
Economics	-0.129*** (0.009)	-0.109*** (0.009)	-0.082*** (0.009)	-0.062*** (0.009)	-0.053*** (0.008)	-0.048*** (0.008)
Observations	243,374	243,374	241,007	240,168	240,168	240,168
<i>Controls</i>						
Year	Y	Y	Y	Y	Y	Y
Demographics		Y				Y
BA field			Y (fine)	Y (coarse)	Y (coarse)	Y (coarse)
BA institution				Y	Y	Y
PhD institution					Y	Y

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Robust standard errors in parentheses, clustered by PhD institution. Panel A presents the regression coefficients on a dummy variable taking the value 1 if the PhD field is economics, where the dependent variable of interest is an indicator variable taking the value 1 if at least one parent has a graduate degree. Panel B presents the regression coefficients on a dummy variable taking the value 1 if the PhD field is economics, where the dependent variable of interest is an indicator variable taking the value 1 if no parent has a BA or higher. Control variables are listed in the bottom rows of the table: every specification includes year fixed effects; columns (2) and (6) include controls for race/ethnicity and gender; columns (3)–(6) include fixed effects for BA field (“fine” denotes 343 BA fields, “coarse” denotes 15 BA field categories); columns (4)–(6) include fixed effects for BA institution; and columns (5) and (6) include fixed effects for PhD institution. Data are from the Survey of Earned Doctorates.

Table 1 presents results of individual-level regressions analyzing the relationship between highest parental educational attainment and whether a PhD recipient’s field is economics, with different combinations of controls and fixed effects, across all US-born PhD recipients over 2010–18. The focus on US-born PhD recipients enables us to add information on the BA institution (most US-born PhD recipients attended a US institution for their undergraduate education, whereas most foreign-born PhD recipients did not). The dependent variable is an indicator taking the value 1 if the PhD recipient’s parents’ highest level of education was a graduate degree (panel A) or less than a BA (panel B). The independent variable of interest is an indicator taking the value 1 if the

PhD recipient's field was economics, and 0 if the field was not economics. The coefficient in column (1) illustrates the raw differential between economics PhD recipients and PhD recipients in other fields: economics PhD recipients are 15 percentage points more likely than the average US-born PhD recipient to have a parent with a graduate degree and 13 percentage points less likely to have no parent with a BA or higher.

Race, ethnicity, and gender: Column (2) adds controls for race/ethnicity and gender. The differential between economics and the average is reduced by around 2 percentage points in each case, reflecting the facts that (i) economics is less racially and ethnically diverse than the average among PhDs, and (ii) US-born URM PhD recipients are less likely to have parents with high levels of formal education. Nonetheless, the majority of the disparity between economics and other PhD disciplines remains: economics' lack of racial and ethnic diversity can only explain only a small share of its relative lack of socioeconomic diversity.

BA field of study: Column (3) removes the controls for race, ethnicity, and gender, and adds fixed effects for the field of the PhD recipients' BA, with a fine-grained categorization of majors into 343 fields. The magnitude of the coefficient on economics is reduced substantially relative to the baseline in column (1), by 6 percentage points in panel A and nearly 5 percentage points in panel B. This suggests that around one third of the raw percentage point differential in parental education between economics PhDs and the average PhD (15 percentage points for Panel A, 13 percentage points for panel B) is because the undergraduate majors that feed into an economics PhD are less socioeconomically diverse than the average pool of majors that feed into PhDs in other subjects.

This observation is borne out by analysis of data on parental education by BA major. The majority of US-born economics PhD recipients in our cohort have a BA in economics (64 percent); the next-largest BA fields are mathematics (12 percent), business and management (6 percent), and other social sciences (5 percent; for detail see appendix figure A13). Estimates from the Baccalaureate and Beyond study indicate that BA graduates in the majors that feed into an economics PhD are from more socioeconomically advantaged backgrounds than the average BA graduate²⁹: in 2016, 21 percent of US-born economics BA graduates had no parent with a BA or higher, and 41 percent had at least one parent with a graduate degree; these figures were 34 percent and 35 percent respectively for math and social sciences BA graduates, and 29 percent and 42 percent respectively for the average BA graduate.

BA institution: Column (4) adds fixed effects for the BA institution attended by the PhD recipient, based on SED data for those who received a BA from a US institution—the vast majority of US-born PhD recipients. In column (4) we also replace the fine-grained BA field fixed effect with a coarser categorical variable

29 Similarly, Bleemer and Mehta (forthcoming) report that economics majors at the University of California, Santa Cruz (2008–12) came from zip codes with mean income 8 percent higher than the average freshman. Hammock, Routon, and Walker (2016) found that economics majors (at 463 US colleges, 1994–99) were more likely than average to come from more educated and more affluent homes. More broadly, high-SES college students are more likely to study arts and science fields as opposed to vocational fields, and this also affects likelihood of graduate study (Goyette and Mullen 2006).

indicating the broad field of the BA.³⁰ The coefficient sizes are further reduced, by around 3 percentage points in panel A and 2 percentage points in panel B, illustrating that some of the lack of socioeconomic diversity among economics PhD recipients reflects the student population in the undergraduate institutions from which economics PhDs are drawn. Our analysis in the next section shows that economics draws its US-born PhD students disproportionately from private undergraduate institutions (and from Ivy Plus institutions) relative to other PhD disciplines.³¹ There may also be an intersection between the effects of major and BA institution: economics is a particularly popular major at more selective US universities, which tend to have more socioeconomically advantaged student bodies (Bleemer and Mehta, forthcoming).³²

PhD institution: Column (5) adds fixed effects for the PhD institution attended by the doctoral recipient. The coefficient is reduced a little further relative to column (4), by around 1 percentage point in both panels, suggesting that some of the lack of socioeconomic diversity among economics PhDs reflects a broader lack of diversity of the graduate student population in the institutions that grant economics PhDs. This might reflect both (i) a smaller number of institutions granting PhDs in economics than in some other disciplines (appendix table A2) and (ii) a tendency for PhDs at higher-ranked institutions to come from more socioeconomically advantaged backgrounds.

Column (6) reintroduces controls for race, ethnicity, and gender. While coefficient estimates here are reduced incrementally, large and statistically significant coefficients remain.

This analysis of the regressions in table 1 shows that the lack of socioeconomic diversity of the pool from which economics PhDs are drawn—in terms of both undergraduate major and undergraduate institution—is an important contributing factor to the lack of socioeconomic diversity among US economics PhDs.

Table 1 also shows the significant influence of other factors. Specifically, the estimates in column (6) suggest that even controlling for race, ethnicity, gender, BA field, BA institution, and PhD institution, economics PhD recipients are around 5 percentage points more likely to have a parent with a graduate degree as compared with the average US-born PhD recipient, and 5 percentage points less likely to have no parent with a BA or higher.

All PhD recipients (US- and foreign-born): In table 2 we rerun the regressions in table 1, for all PhD recipients, including country of birth fixed effects to allow for differences in average socioeconomic background across PhD recipients from different countries. The pattern observed is very similar: about two thirds of the initial difference in socioeconomic diversity between economics and the

30 We use the same 15 “major field” categories as for the PhD field analysis, breaking out economics separately from the other social sciences. We control for major field rather than narrow field to reduce the number of fixed effects to be estimated in our final specification.

31 The role of elite private liberal arts colleges may also be important: they generate very high numbers of eventual economics PhDs relative to the size of their BA population (Stock and Siegfried 2015).

32 The US Department of Education College Scorecard data show that economics is the most popular major at many Ivy League schools (<https://collegescorecard.ed.gov/>), but is less likely to be the most popular major at big public schools. Overall, economics was the 16th most common major among college graduates (using 2019 American Community Survey data for 25-29 year olds). Thanks to Zach Bleemer for this observation.

average US PhD can be “explained” by race, gender, BA field, BA institution, and PhD institution, with a 3 to 4 percentage point differential in parental education shares remaining “unexplained.”

Table 2

Association of economics PhD and parental education level (US- and foreign-born), 2010–18

Specification: Linear probability model						
<i>Panel A</i>						
Dependent variable: Indicator, taking value 1 if at least one parent has a graduate degree						
	(1)	(2)	(3)	(4)	(5)	(6)
Economics	0.081*** (0.007)	0.077*** (0.007)	0.050*** (0.008)	0.045*** (0.007)	0.031*** (0.006)	0.030*** (0.006)
<i>Panel B</i>						
Dependent variable: Indicator, taking value 1 if no parent has a BA or higher						
	(1)	(2)	(3)	(4)	(5)	(6)
Economics	−0.088*** (0.006)	−0.083*** (0.006)	−0.055*** (0.007)	−0.053*** (0.007)	−0.039*** (0.006)	−0.038*** (0.006)
Observations	419,783	419,779	410,871	408,087	408,087	408,084
<i>Controls</i>						
Year	Y	Y	Y	Y	Y	Y
Birth country	Y	Y	Y	Y	Y	Y
Demographics		Y				Y
BA field			Y (fine)	Y (coarse)	Y (coarse)	Y (coarse)
BA institution				Y	Y	Y
PhD institution					Y	Y

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Note: Robust standard errors in parentheses, clustered by PhD institution. Panel A presents the regression coefficients on a dummy variable taking the value 1 if the PhD field is economics, where the dependent variable of interest is an indicator variable taking the value 1 if at least one parent has a graduate degree. Panel B presents the regression coefficients on a dummy variable taking the value 1 if the PhD field is economics, where the dependent variable of interest is an indicator variable taking the value 1 if no parent has a BA or higher. Control variables are listed in the bottom rows of the table: every specification includes year fixed effects, columns (2) and (6) include controls for race/ethnicity and gender; columns (3)–(6) include fixed effects for BA field (“fine” denotes 343 BA fields, “coarse” denotes 15 BA field categories); columns (4)–(6) include fixed effects for BA institution; and columns (5) and (6) include fixed effects for PhD institution. For BA institution fixed effect, foreign BA and PhD institutions are grouped together in one code, since we do not have data on foreign institutions; only US institutions are given individual codes. Data are from the Survey of Earned Doctorates.

BA institution type

Our regression analysis shows that the pool of BA institutions from which economics draws PhD candidates is less socioeconomically diverse than the pool from which the average PhD is drawn. We dig deeper into this using SED data on BA institutions for those who received their BA in the United States.³³

First, we calculate the share of US-born PhD recipients who attended a private vs. public institution for their BA. On average, attending a private college is a strong predictor of being from a more advantaged socioeconomic group (see, e.g., Chetty et al. 2017). We also calculate the share who attended an Ivy Plus institution for their BA, following Chetty et al (2017) in categorizing the “Ivy Plus” as the eight Ivy League schools plus Stanford, MIT, Chicago, and Duke.³⁴ Raj Chetty and colleagues (2017) show that of 12 “tiers” of US higher education institutions, the Ivy Plus institutions draw disproportionately from the upper end of household income distribution, with 14.5 percent of parents of Ivy Plus undergraduates in the top 1 percent of the US income distribution, more than half in the top 10 percent, and 82 percent in the top 40 percent.³⁵

Across all US-born PhD recipients over 2010–18, 58.5 percent had a BA from a public institution and 6.7 percent from one of the 12 Ivy Plus institutions. In economics, 46.2 percent of US-born PhD recipients had a BA from a public institution and 15.7 percent from one of the 12 Ivy Plus institutions. Among US-born PhD recipients in major fields, economics has the lowest share of US-born PhD recipients with a BA from a public institution (figure 11, panel A), and by far the largest share with a BA from an Ivy Plus institution (figure 11, panel B).³⁶ As with parental education, the trend for economics was relatively similar to mathematics and computer science in the 1980s and 1990s, but a gap opened up around 2000 (appendix figures A15 and A16). Most foreign-born PhD recipients did not receive their BA in the United States, so we are unable to perform a similar analysis for this group. However, of those who did receive their BA in the United States, they were more likely to have done so at private colleges as compared with foreign-born PhD recipients in other disciplines (appendix figure A17).

33 Among US-born PhD recipients in 2010–18, 97 percent received their BA from a US institution.

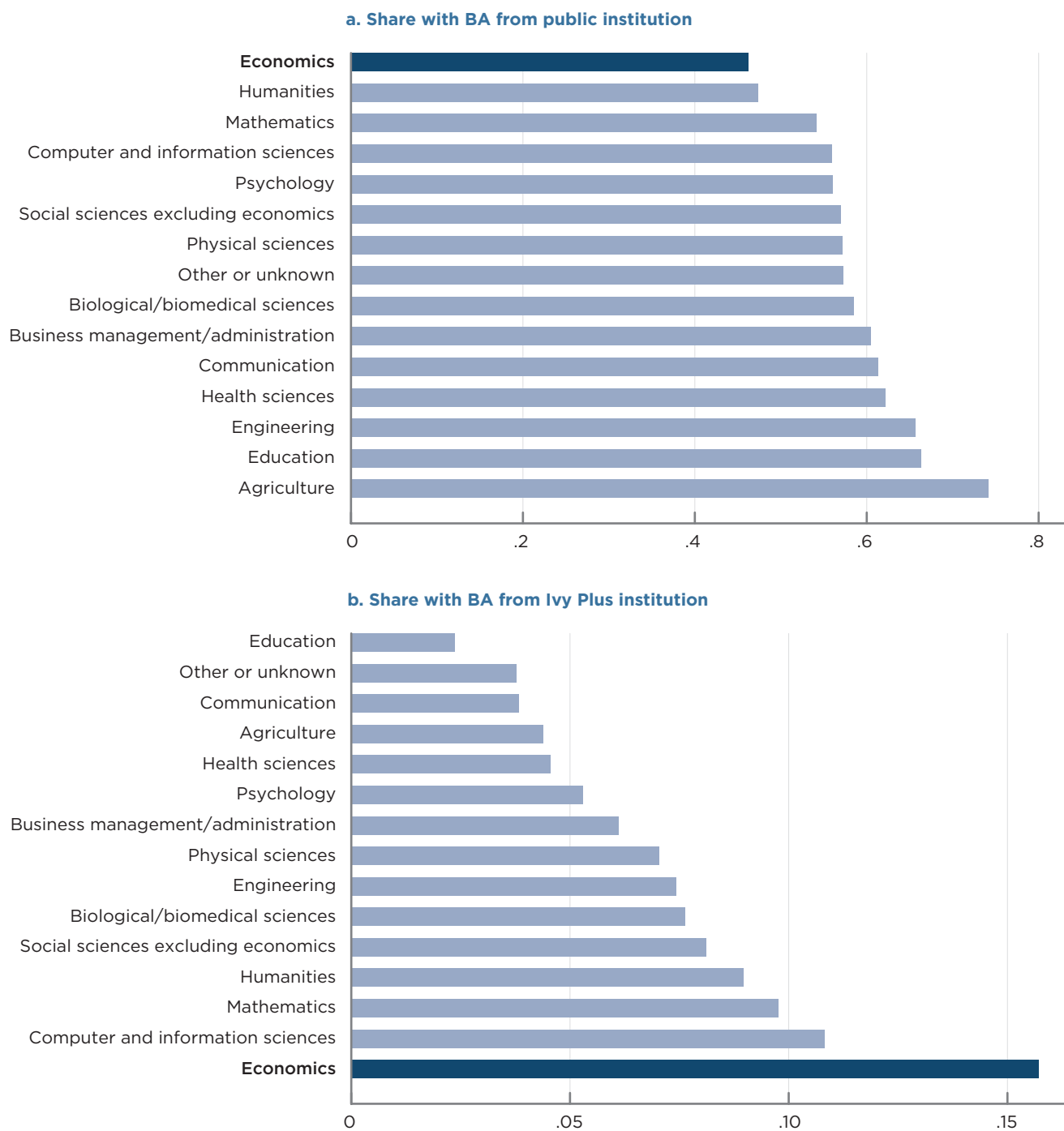
34 The Ivy Plus universities include the eight Ivy League schools—Brown, Columbia, Cornell, Dartmouth, Harvard, Princeton, the University of Pennsylvania, and Yale—and Duke, Chicago, MIT, and Stanford. While we follow the definition in Chetty et al (2017), note that other universities may also be considered Ivy Plus, such as Caltech, Johns Hopkins, and Northwestern.

35 This compares to 2.5 percent of parents of undergraduates at highly selective public colleges who are in the top 1 percent of the US income distribution, or 71 percent who are in the top 40 percent of the US income distribution (these statistics cover the 26 public colleges defined by Barron’s as “highly selective”). The data cover the population of undergraduate students born in 1980–82. For details, see Chetty et al. (2017). Appendix figure A14 also shows that economics PhD recipients with a BA from an Ivy Plus institution have substantially higher average levels of parental education than those with BAs from non-Ivy Plus institutions.

36 While we categorize only by public vs. private institution here, we note that the public BA institutions most represented among economics PhDs are typically highly selective (e.g., UC Berkeley, U Wisconsin–Madison, U Michigan) (Siegfried and Stock 2007), and likely have a relatively socioeconomically advantaged population as compared with public college students as a whole.

Figure 11

BA institution type, for all US-born PhD recipients, 2010–18, who received a BA in the United States, by PhD field



Note: Ivy Plus institutions are defined here as Brown, Columbia, Cornell, Dartmouth, Harvard, Princeton, the University of Pennsylvania, and Yale as well as Duke, Chicago, MIT, and Stanford.

Source: Data from Survey of Earned Doctorates.

6. TOP 15 US ECONOMICS PHD PROGRAMS

Our data enables us only to examine the socioeconomic background of economics PhDs recipients. It would also be of interest to understand the socioeconomic background of the various professions which economics PhDs join, including the economics professoriate. Evidence from a recent large-scale survey shows that tenure-track faculty (in eight disciplines not including economics) are substantially more likely to have highly educated parents and to come from higher-income zip codes than the population of PhDs in those disciplines (Morgan et al 2021). If economics follows the pattern of these other disciplines, this study would suggest that the economics professoriate is even less socioeconomically diverse than the population of economics PhDs.

We can throw some light on this by analyzing the socioeconomic background of PhD recipients from the subset of PhD institutions from which the economics professoriate is predominantly drawn: Jones and Sloan (2020) show that half of tenure-track economics professors got their PhDs at the 15 “top-ranked” economics PhD-granting departments according to *US News and World Report* (2017).³⁷ In figure 12, we present a breakdown of indicators of socioeconomic background for economics PhD recipients from these “top 15” programs (breaking them into those ranked 1-6 and those ranked 7-15), as compared with the programs ranked 16+.

In the top six programs, 79 percent of US-born economics PhDs in 2010-18 have at least one parent with a graduate degree, while only 5 percent have no parent with a BA or higher.³⁸ Of the programs ranked 7-15, the shares are comparable: 77 percent have at least one parent with a graduate degree, and 7 percent have no parent with a BA or higher. US-born PhD recipients from programs ranked 16 and below are substantially more socioeconomically diverse than at the top-ranked programs: 59 percent have at least one parent with a graduate degree, and 17 percent had no parent with a BA or higher. Strikingly, however, students at economics PhD programs ranked 16 and below are still less socioeconomically diverse than US-born PhD recipients in any other major discipline (across all ranks of schools).³⁹

A comparison of undergraduate institution type illustrates a similar pattern. In the top six economics PhD programs, 77 percent received their BA from a private institution, and 46 percent received their BA from an Ivy Plus institution; in programs ranked 7-15, 70 percent received their BA from a private institution and 27 percent from an Ivy Plus institution; and in programs ranked 16 and below,

37 Specifically, Jones and Sloan (2020) report that over half of tenure-track faculty at the top 96 PhD-granting economics departments received their PhD from universities ranked in the top 15 by *US News and World Report* (2017) (and 14 percent received their PhD from MIT or Harvard). According to this ranking, the top six US economics PhD programs are at Harvard, MIT, UC Berkeley, Yale, Stanford, and Princeton; those ranked 7-15 are at U Chicago, Northwestern, Columbia, U Penn, NYU, UCLA, UCSD, U Michigan-Ann Arbor, and U Wisconsin-Madison. Rankings are subjective and different rankings put different institutions in the top 10 or 20.

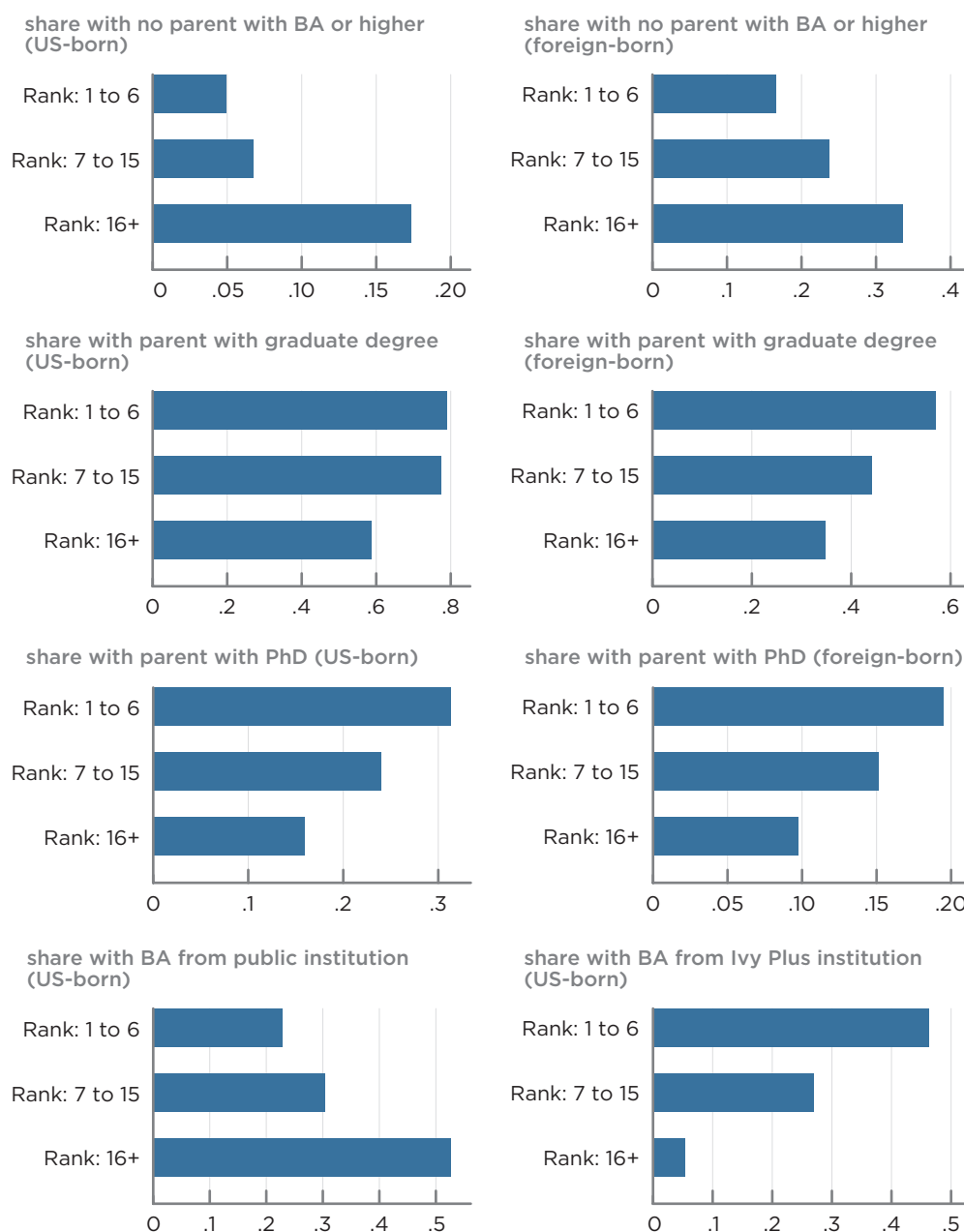
38 Similarly, in their study of mental health outcomes among economics PhD students, Bolotnyy, Basilico, and Barreira (forthcoming) document that 59 percent of the economics PhD students at the eight elite programs in their study (Columbia, Harvard, U Michigan, MIT, Princeton, UC Berkeley, UC San Diego, and Yale) had a father with a graduate degree and 49 percent had a mother with a graduate degree.

39 This can be seen by comparing the shares in the 16+ ranking category to the shares by field shown in figure 1B.

47 percent received their BA from a private institution and 5 percent from an Ivy Plus institution.⁴⁰

Figure 12

Indicators of socioeconomic background of economics PhD graduates, 2010–18, from differently ranked groups of PhD institutions



Note: US economics PhD programs rankings according to *US News and World Report* (2017).

40 The disproportionate representation of a small number of elite schools among PhD recipients also exists among economics faculty. Todd Jones and Arielle Sloan (2020) study the BA institutions of tenure-track faculty at ranked US economics departments and find that 20 percent of the roughly half of economics faculty who got their BA in the United States did so at an Ivy League school.

While the levels of socioeconomic diversity are higher among foreign-born PhDs across the board, there is still a strong gradient across institution rank: 17 percent in the top six PhD programs had no parent with a BA or higher, compared with 34 percent in the programs ranked 16 and below, and 57 percent in the top six PhD programs had a parent with a graduate degree, compared with 35 percent in the programs ranked 16 and below.

7. DISCUSSION

We have presented descriptive evidence that recipients of a US PhD in economics are from a narrower—and more privileged—range of socioeconomic backgrounds than US PhDs from other disciplines. We could speculate as to why this is the case, but we do not have the answers: our hope is that this evidence will prompt further investigation to explain why:

- economics is one of the least socioeconomically diverse PhD disciplines among both US- and foreign-born PhD students, but particularly starkly so among the US-born; and
- the lack of socioeconomic diversity manifests itself at both the bottom and top of the socioeconomic spectrum, with unusually low representation of people whose parents did not have a college degree, and unusually high representation of people who have at least one parent with either a non-PhD graduate degree or a PhD.

When considering why economics draws students disproportionately from socioeconomically advantaged backgrounds, there are three useful patterns to distinguish:

- 1 The population of PhDs in all subjects is substantially more socioeconomically advantaged than the population of BA recipients (who in turn are more socioeconomically advantaged than the population as a whole).
- 2 US-born students in a subset of quantitative PhD disciplines—economics, mathematics, and computer science—are more socioeconomically advantaged than average across PhD disciplines.
- 3 US-born economics PhD recipients have since 2000 been even more socioeconomically advantaged than those in mathematics and computer science.

Research on the reasons for the lack of socioeconomic diversity amongst the PhD population as a whole is well-established (see, e.g., Walpole 2003).

We therefore focus here on the other two observations and document several facts that may be helpful in sorting through competing hypotheses as to why economics in particular is less socioeconomically diverse than other PhD disciplines.

One important area appears to be *factors at the undergraduate level*, in particular college major and BA institution. College students in the majors that feed into economics PhDs—economics, mathematics, and other social science subjects—tend to be less socioeconomically diverse than average. This appears to be true for both US- and non-US-born PhDs, but more so for the US-born. And

the institutions from which US-born economics PhDs received their BA have less socioeconomically diverse populations than those of the average PhD. US-born economics PhDs are more likely than those in any other field to have a BA from a private undergraduate institution in general, and much more likely to have a BA from an Ivy Plus institution in particular. Bearing these facts in mind, it seems clear that socioeconomic diversity at the BA level needs further exploration, in two dimensions: (i) At a given BA institution, to what extent is economics less socioeconomically diverse than other majors, and why is this? (ii) To what extent is economics more likely to be offered, or more likely to be a large and popular major (relative to other BA majors), at institutions with more socioeconomically advantaged student populations?

Even when controlling for both BA major and BA institution, however, there remains an *unexplained differential* between the socioeconomic diversity of economics PhDs relative to the average among PhDs. This suggests that other factors may lead undergraduates who have the preparation, skills, and/or interest to get a PhD in economics not to do so (e.g., they do not apply for a PhD, or they fail to get into a PhD program, or they enter but do not complete the program). What might these factors be?

One possibility is the *complexity of the path to a PhD in economics*. Undergraduate students from socioeconomically advantaged backgrounds are more aware of and interested in the option of doing a PhD post-college, and/or are likely to be more aware of the requirements to get accepted into a PhD program; in contrast, prospective students from lower socioeconomic-status backgrounds are less likely to have informational resources about options in college or options for graduate school (see e.g. Walpole 2003, Mullen et al 2003, Gardner and Holley 2011, Posselt and Black 2012, Brown et al 2016). If the path to a successful economics PhD application, or to successful PhD completion, is more obscure or more inaccessible than in other disciplines, this might contribute to economics' relative overrepresentation of people from households with high levels of formal education and underrepresentation of first-generation college students. Students from less advantaged socioeconomic backgrounds may be less aware of what's involved in studying economics⁴¹ and/or unaware of the academic requirements for a successful PhD application (specific advanced math classes, independent research experience) until too late in their undergraduate

41 Jeitschko (2019) finds evidence that few undergraduates understand what obtaining a PhD in economics entails, and that this information asymmetry is more pronounced for women, URM, and first-generation students. Consistent with this, two recent field experiments suggest that informational messages to freshmen about the economics major can substantially increase uptake of economics courses and majors by first-generation college students (Pugatch and Schroeder 2021, Bayer et al. 2019). Dynan and Rouse (1997) and Avilova and Goldin (2018) find that, before taking an economics class, women undergraduates are less likely to indicate interest in economics.

career.^{42,43} In addition, if the path to the PhD in economics is more obscure or complex than for other fields, less high-profile colleges—with a more socioeconomically diverse student population—may not have adequate resources to prepare their students for this path (for example, opportunities to offer research assistantships). Finally, the prevalence of GPA cutoffs for economics majors (common at large public universities) disproportionately decreases lower-SES students' access to the economics major as a result of poorer academic preparation and opportunity before college (Bleemer and Mehta 2021).⁴⁴

A second possibility is *disparate access to professional relationships*, which can affect the likelihood of PhD program entry and success. If the path to an economics PhD relies more heavily on access to specific relationships or networks as compared with other PhD disciplines, this may explain some of the field's socioeconomic disparities. Socioeconomic background can influence the likelihood of forming effective mentoring relationships in a number of ways:

- Access to opportunities often relies on students initiating relationships with faculty (going to office hours, or asking for opportunities outright), but students with limited family experience of higher education are often unaware that this is an option or expectation, or may be less comfortable in interactions with faculty (Smith, Mao, and Deshpande 2016; Jack 2016; Yee 2016).⁴⁵
- Implicit or explicit bias toward students from advantaged socioeconomic backgrounds may affect the likelihood of low-SES students' formation of effective mentoring relationships.⁴⁶

42 For example, a successful economics PhD application requires specific math classes or even a math major (Jones et al. 2020). As Bayer et al. (2020, p. 198) note, following Sharpe (2017): "it is not intuitive to undergraduates that an economics major is not sufficient preparation for a doctoral economics program." Students from less socioeconomically advantaged backgrounds may be less aware of these somewhat unintuitive requirements until late in their undergraduate degree.

43 A further possibility is that the path to a PhD in economics may be longer than for other disciplines. This does not appear to be the case from the data on US-born PhD recipients over 2010-18: the median number of years between BA and PhD completion in economics is higher than math but lower than other social sciences or computer science, and there is little evident difference between economics PhD students with different socioeconomic backgrounds (appendix figure A18). But the data may not be recent enough to capture the rise of predoctoral research assistantships (as illustrated in, for example, Bryan 2019). Survey evidence on recent US predocs finds that the large majority have a parent with a graduate degree and very few are first-generation college graduates (Huang, Liang, and Russel n.d.).

44 Further, Thompson (2021) finds that first year grades in STEM subjects account for a substantial portion of the difference between first-generation and continuing-generation students in the likelihood of majoring in STEM fields.

45 Jack (2016, p.1) draws a distinction at elite universities between the "privileged poor" (low-income undergraduates who attended boarding, day, or preparatory high schools) who "enter college primed to engage professors and are proactive in doing so," and the "doubly disadvantaged" (low-income undergraduates who attended local high schools), who "are more resistant to engaging authority figures in college and tend to withdraw from them."

46 While socioeconomic background may often be less immediately detectable than race or gender, research suggests that US individuals are able to detect socioeconomic status from people's voices (Kraus, Park, and Tan 2017; Kraus et al. 2019) and facial cues (Bjornsdottir and Rule 2017) among other characteristics (e.g., dress, behavior, name), and that individuals with signals on their resume indicating socioeconomic advantage are more likely to receive callbacks in hiring for elite occupations (Rivera and Tilcsik 2016). In addition, there is evidence that faculty responses to undergraduate students are biased along other directions: Milkman, Akinola, and Chugh (2015) show that faculty are less likely to respond to requests for a meeting from undergraduates with female names or names signaling a non-White race; this bias may also extend to social class.

- Students from advantaged socioeconomic backgrounds may have more experience comporting themselves in ways that are considered professionally advantageous or impressive, which may make potential mentors more likely to offer opportunities or provide strongly positive recommendation letters.⁴⁷
- There is evidence that effective mentoring relationships are more likely to form along demographic lines (e.g., Blake-Beard, Murrell, and Thomas 2006), making the existing demographic makeup of the profession somewhat self-perpetuating without intentional corrective action.

A third possibility is *financial circumstances and incentives*. Students from less advantaged socioeconomic backgrounds are less likely to choose to pursue a career in academia in part because it offers less financial stability, particularly in its early years (compared with private sector jobs that students with good BA qualifications can access) (see, e.g., Millett 2003, Hoffer et al. 2003, Walpole 2003). This can explain some of the drop-off in socioeconomic diversity between the populations of BA and PhD recipients across disciplines, but alone cannot explain the difference in socioeconomic diversity between economics and other disciplines. However, if the opportunity cost of a PhD relative to a career in the private sector—for students who might be interested in and qualified for both—is greater in economics than in other disciplines, this might explain economics’ relative underrepresentation of first-generation college students.⁴⁸

A final factor that may influence the socioeconomic diversity of the economics discipline at both the undergraduate and graduate levels is the *orientation, culture, and practice of economics* as a discipline. Is there something about the nature of the economics discipline that dissuades people from less socioeconomically advantaged backgrounds from wanting to study it? We offer the following observations:

- Aspects of the culture of economics academia may be unwelcoming for women and racial and ethnic minorities (Daly 2018; Allgood et al. 2019; Wu 2020; Bayer, Hoover, and Washington 2020), and this may also apply to members of other underrepresented groups, including those of less advantaged socioeconomic backgrounds.
- The content in introductory economics courses may be a poor representation of the full range of subjects economists study. This may dissuade students from less advantaged socioeconomic backgrounds who see unrealistic or

47 Friedman and Laurison (2020, p.31) observe, in research in elite UK occupations, that firms seek job candidates with “a polished appearance, strong debating skills, and a confident manner, traits [that]...can be closely traced back to advantaged social backgrounds.”

48 On the other hand, data suggest that the career prospects after an economics PhD are better than for most other similar PhD disciplines in terms of both expected salary and expected job security (Freeman 1999; Fourcade, Ollion, and Algan 2015; Bleemer and Mehta, forthcoming). This might push in the opposite direction—if, as noted above, students were aware of the benefits of an economics degree.

limited portrayals of topics that are of particular importance to them or in which they have more first-hand experience.⁴⁹

- To the extent that economics academics tend to hold more conservative views about economic redistribution and social welfare than academics in other social sciences, this may dissuade people from less advantaged socioeconomic backgrounds.⁵⁰
- The language commonly used in economics—and the values implicit in this language, whether intentionally or unintentionally—may be off-putting to students from less advantaged socioeconomic backgrounds. Such terms include “unskilled,” “low type,” “low skill,” or “low ability,” commonly used to refer to people with little formal education.
- To the extent that people tend to be excluded from and feel alienated in groups where they are highly underrepresented, the unrepresentativeness of the economics profession itself could create a climate that continues to exclude and dissuade people from less advantaged socioeconomic backgrounds.⁵¹

Considering these explanations, one informative stylized fact is the correlation across different types of diversity: among US-born PhDs, the *share of first-generation college graduates is strongly correlated with both the URM share and the female share across PhD fields*. This is consistent with the hypothesis that some of the same factors that limit access to economics PhDs in the United States for racial and ethnic minorities or for women also limit access to economics PhDs for those from less advantaged socioeconomic backgrounds.

It is interesting to note that the fields that are particularly nondiverse in terms of gender, race, and socioeconomic background among US-born students—economics, mathematics, and computer science—are also those that have a larger share of PhDs who are not US born (appendix figure A19). This is consistent with the hypothesis that PhD recruitment from a larger international pool of students may increase competition among domestic students, which

49 Bayer et al. (2020) studied a large new introductory undergraduate economics course that attracted a more diverse student pool and identified three factors in its success: a personal connection to the students’ experiences, real-world exposure, and social relevance. Owen and Hagstrom (2021) studied a comprehensive curricular reform in an introductory economics course aimed at communicating the breadth of topics economists study, and found that the reform increased the number of economics majors who were first-generation college students, women, or URM (although it did not increase their shares, as it also increased the number of nonminority students majoring in economics).

50 Gross and Simmons’ (2007) survey of American professors found that economics professors are substantially more likely to be conservative than the average university professor. For example, half of economists endorsed the proposition that “the government should do more to help needy Americans, even if it means going deeper into debt,” as compared with 90 percent of sociologists (Gross 2013, quoted in Fourcade et al. 2015). Hammock, Routon, and Walker (2016) show that matriculating economics majors are substantially more likely than other undergraduate students to disagree that wealthy people should pay more taxes, and Bartlett, Ferber, and Green (2009) found that undergraduates with a conservative political orientation are more likely to major in economics than in other fields.

51 A literature survey found that undergraduate students from less advantaged socioeconomic backgrounds are less socially integrated into their institutions and feel a weaker sense of belonging (Rubin 2012).

may have the unintended consequence of reducing access for students with less competitive profiles—who may, because of lack of access, information, and/or opportunities, be disproportionately from underrepresented groups.

8. CONCLUDING REMARKS: WHY DOES IT MATTER?

This paper has documented a lack of socioeconomic diversity among economics PhD recipients compared with the general US population, the population of US BA recipients in social sciences and mathematics, and other PhD disciplines.

There are several reasons why economics' lack of socioeconomic diversity should be a cause for concern. First, a lack of socioeconomic diversity is inefficient. An economics profession that does not draw from the entire population is less likely to recruit and retain individuals with the talent and interest to be an economist.

Second, to the extent that a lack of socioeconomic diversity results from barriers to access, it reflects an injustice to individuals who would like to study or practice economics but are denied that opportunity.

Third, a lack of socioeconomic diversity can affect the quality, breadth, and depth of the intellectual contributions of the profession. Individuals' socioeconomic background can affect their knowledge of economic issues, their choice of questions to investigate, and their values.⁵² While this may be an issue in any discipline, it seems particularly problematic in the social science of economics—a field concerned with income distribution, inequality, unemployment, access to education, the welfare system, poverty, and myriad other issues that disproportionately affect people who are not at the higher end of the income or education distribution. Note that the underrepresentation in economics programs of individuals whose parents do not have a college education reflects underrepresentation of not only students from low-income backgrounds but also those from middle-class backgrounds: the population of students whose parents do not have a college degree spans those raised in poverty to those raised in well-off middle-class households (headed for example by non-college-educated businesspeople, tradespeople, or health professionals, to name a few occupations). Accordingly, the lived experiences—and associated insights—that are missing from economics likely span this entire range.

This is particularly true of the economics professoriate: PhDs from the top 15 US economics PhD programs make up 50 percent of the tenure-track economics professoriate (Jones and Sloan 2020). Since 2010, 78 percent of US-born economics PhDs in these programs have been from households where at least one parent has a graduate degree, and only 6 percent were first-generation college graduates. And a larger share did their undergraduate degree at one of the 12 Ivy Plus institutions than at any public institution (36 percent, compared with 27 percent). Given this discrepancy, how well can the research or policy advice produced by the economics profession reflect the lived experience of the large majority of the population? What important questions and answers are missing?

52 May, McGarvey, and Whaples (2014) illustrate this for gender, finding large differences in views on economic outcomes and policies between male and female AEA members.

Finally, it is important to note that we focus here on only one snapshot in the academic career: graduation from a PhD program. But the influence of socioeconomic background may not stop there. A recent survey of over 7,000 professors at US PhD-granting institutions across eight disciplines in STEM, social sciences, and the humanities (not including economics) finds that even among those with PhDs, parental education is correlated with progression to both tenure-track faculty positions and faculty positions at elite departments (Morgan et al. 2021),⁵³ and our evidence suggests this pattern may also hold among economists.⁵⁴ Moreover, even conditional on a given job, academics from less well-off or less formally educated backgrounds report barriers to full inclusion in the profession.⁵⁵ In addition to focusing on the makeup of those who enter the economics field in graduate school, it is important to ensure a level playing field once they attain their graduate degree.

Economics' poor performance in gender and racial diversity has attracted attention over recent years, and efforts have been directed to making much-needed progress. With our documentation and analysis of the lack of socioeconomic diversity in economics, we hope to spur similar, complementary efforts, toward documenting diversity of socioeconomic background in the economics profession, analyzing the causes of economics' unrepresentativeness, and developing solutions.

53 Morgan et al. (2021) find that (i) tenure-track faculty are twice as likely as other PhD recipients to have a parent with a PhD, and 25 percent less likely to have no parent with a college degree, and (ii) faculty at elite departments are 1.5 times as likely to have a parent with a PhD, compared with faculty at the least prestigious departments. Similarly, Wanelik et al. (2020) find that early-career scientists in ecology and evolutionary biology from a lower socioeconomic background were more likely to report being in teaching and research positions, as opposed to research-only positions. More broadly, Laurison and Friedman (forthcoming) find a pay gap for people of working-class origin in high-status professional and managerial occupations even when controlling for demographics, education, occupation, firm size, and work experience. Calarco (2020) shows that success in graduate school (which can affect post-PhD trajectories) depends on mastery of the "hidden curriculum" of professional practices and norms—which may be less familiar to people without access to mentorship and support networks in higher education.

54 Indeed, a "leaky pipeline" even after PhD graduation exists in the economics profession for women and for underrepresented racial and ethnic minorities (Bayer and Rouse 2016, Buckles 2019, Lundberg and Stearns 2019).

55 In interviews, academics from first-generation, working-class, or low-SES family origins report weaker professional networks, additional financial and family responsibilities outside of work, difficulties adapting to norms of behavior, speech, or dress, and feeling like "cultural outsiders" and that they "don't belong" in academia (in the United States in Lee 2015, in Canada in Waterfield, Beagan, and Mohamed 2019).

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APPENDIX A

ADDITIONAL FIGURES AND TABLES

This appendix contains supplementary figures and tables, primarily drawn from Survey of Earned Doctorates data.

Figure A1

Parental education question in Survey of Earned Doctorates

C4. What is the highest educational attainment of your parents or guardians?

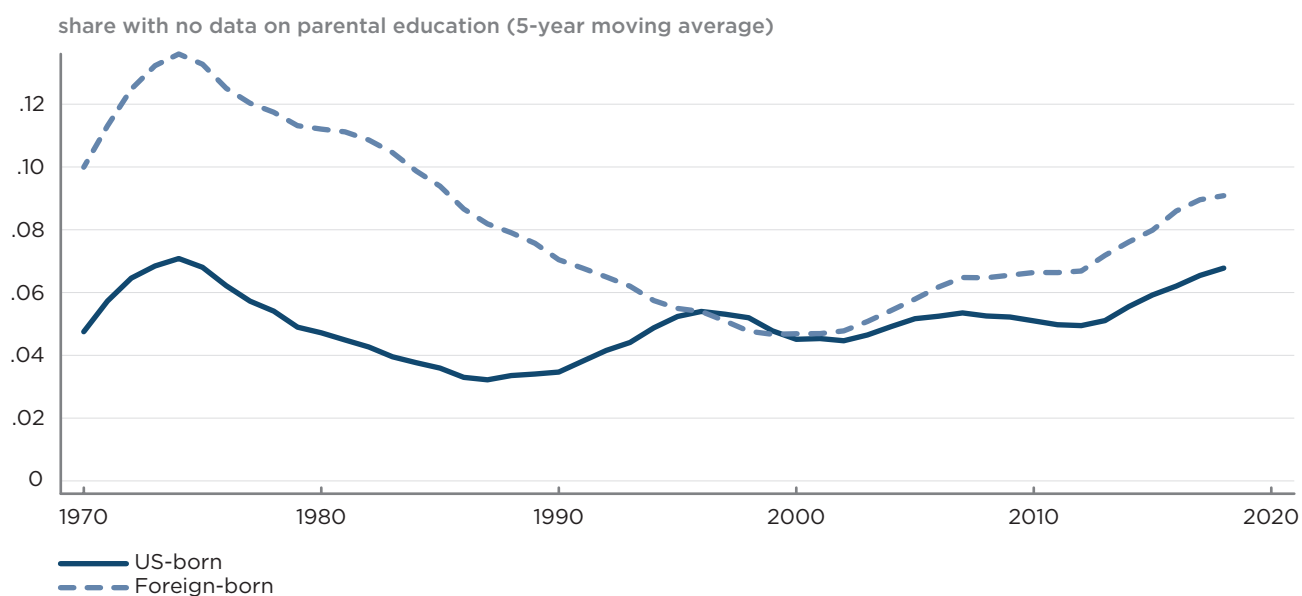
Mark (X) one for each parent or guardian

	a MOTHER/ FEMALE GUARDIAN	b FATHER/ MALE GUARDIAN
Less than high school/secondary school graduate . 1	☐	☐
High school/secondary school graduate 2	☐	☐
Some college 3	☐	☐
Associate's degree 4	☐	☐
Bachelor's degree 5	☐	☐
Master's degree 6 (e.g., MA, MS, MBA, MSW, etc.)	☐	☐
Professional degree 7 (e.g., MD, DDS, DVM, JD, PsyD, DDiv, etc.)	☐	☐
Research doctoral degree 8 (e.g., PhD)	☐	☐
Not applicable/Unknown 9	☐	☐

Note: Since 2018, respondents have been asked to report the highest level of education for up to two parents or guardians of either sex.

Figure A2

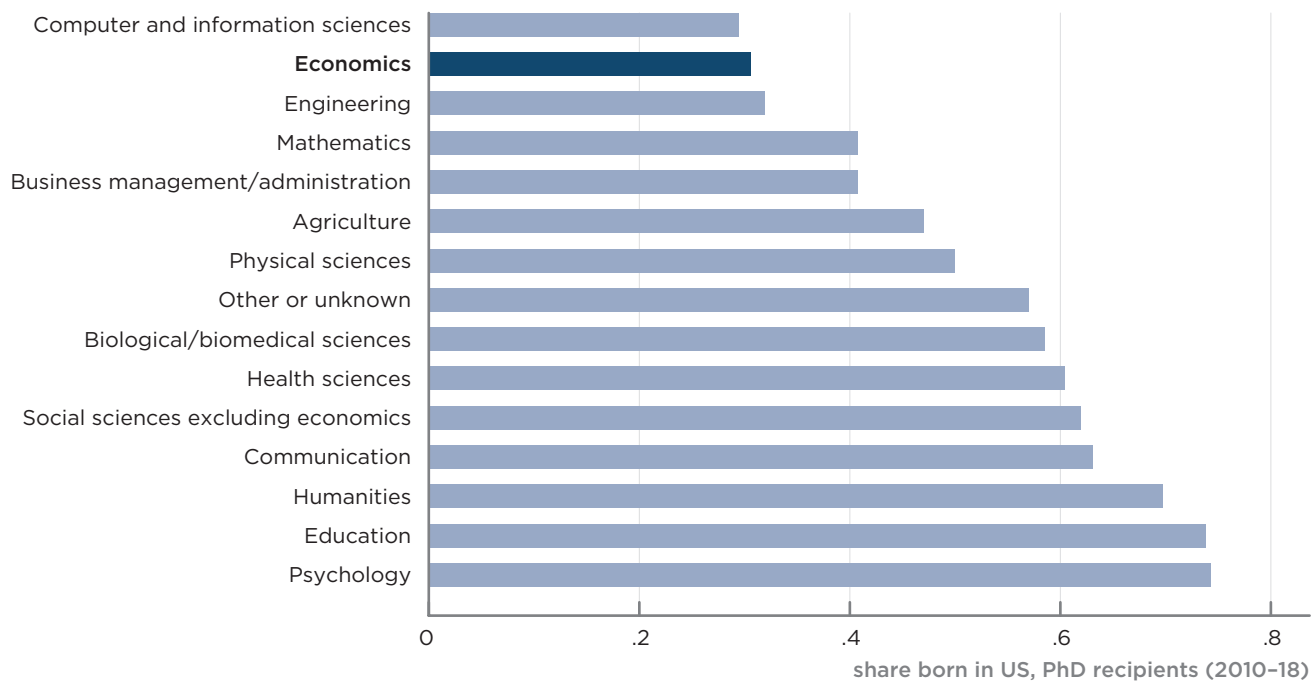
Share of PhD graduates missing data on parental education, 1970–2018 (5-year centered moving average)



Source: Data from Survey of Earned Doctorates.

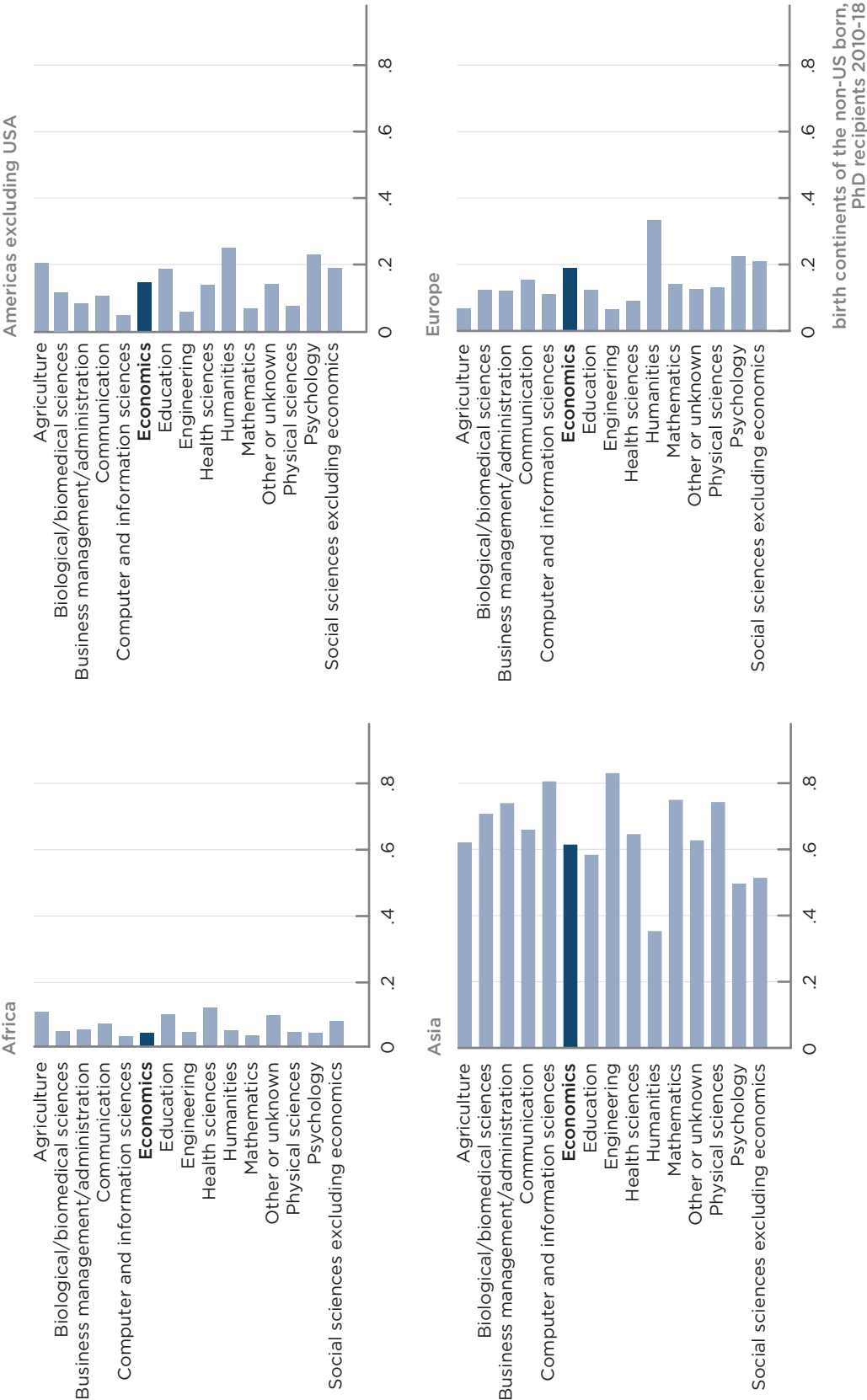
Figure A3

Share of PhD recipients born in the United States, by PhD field, 2010–18



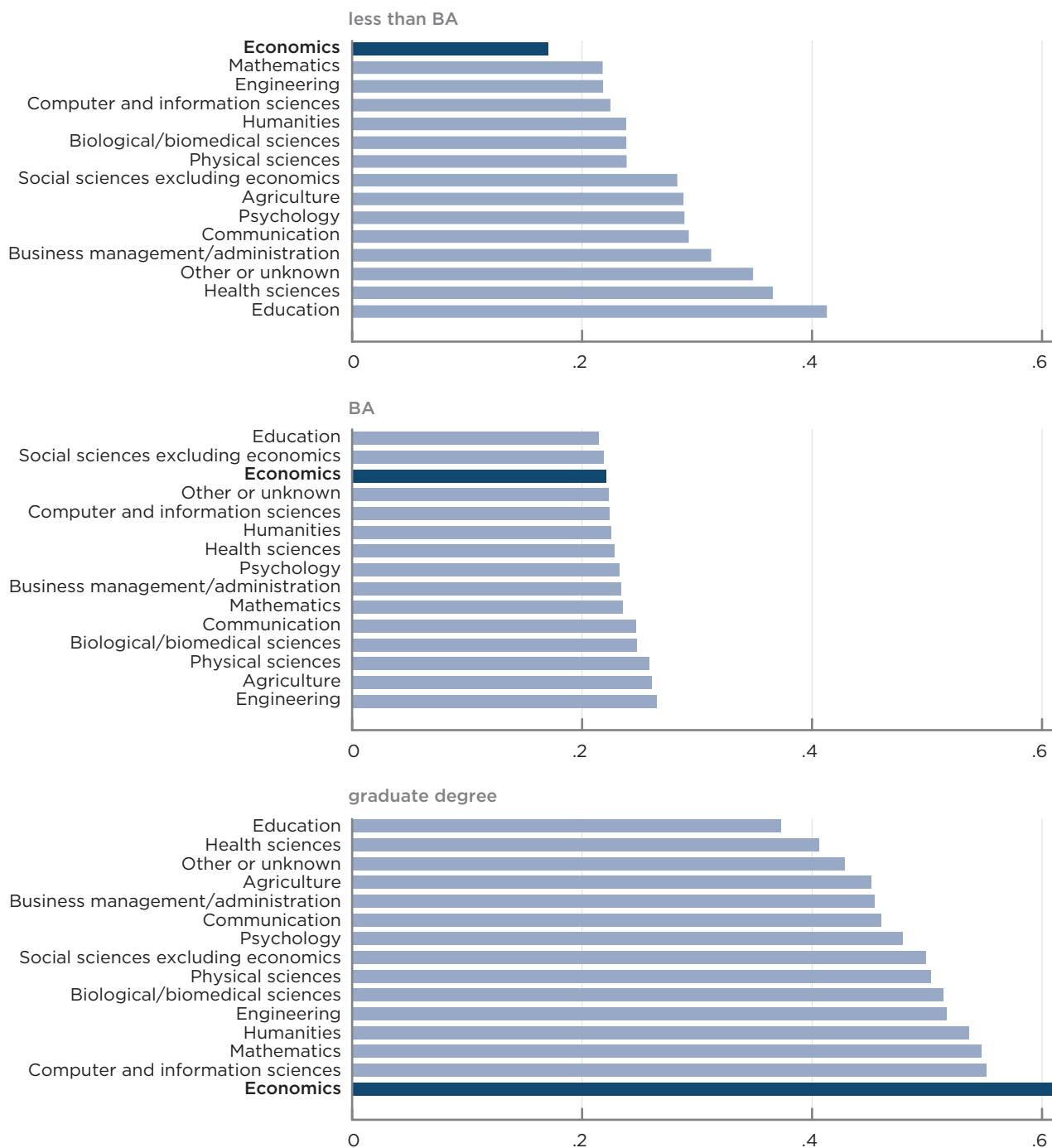
Source: Data from Survey of Earned Doctorates.

Figure A4
Continent of birth, by PhD field, foreign-born US PhD recipients, 2010-18 (share)



Note: Oceania is not included because of its small share: It represents between 0.2 and 1.3 percent of foreign-born PhDs, depending on the field.
Source: Data from Survey of Earned Doctorates.

Figure A5

Highest level of parental education, by field, US citizen or permanent resident PhD recipients, 2010–18 (share)


Source: Data from Survey of Earned Doctorates.

Figure A6
Parental education by continent of birth and PhD field, PhD recipients, 2010–18

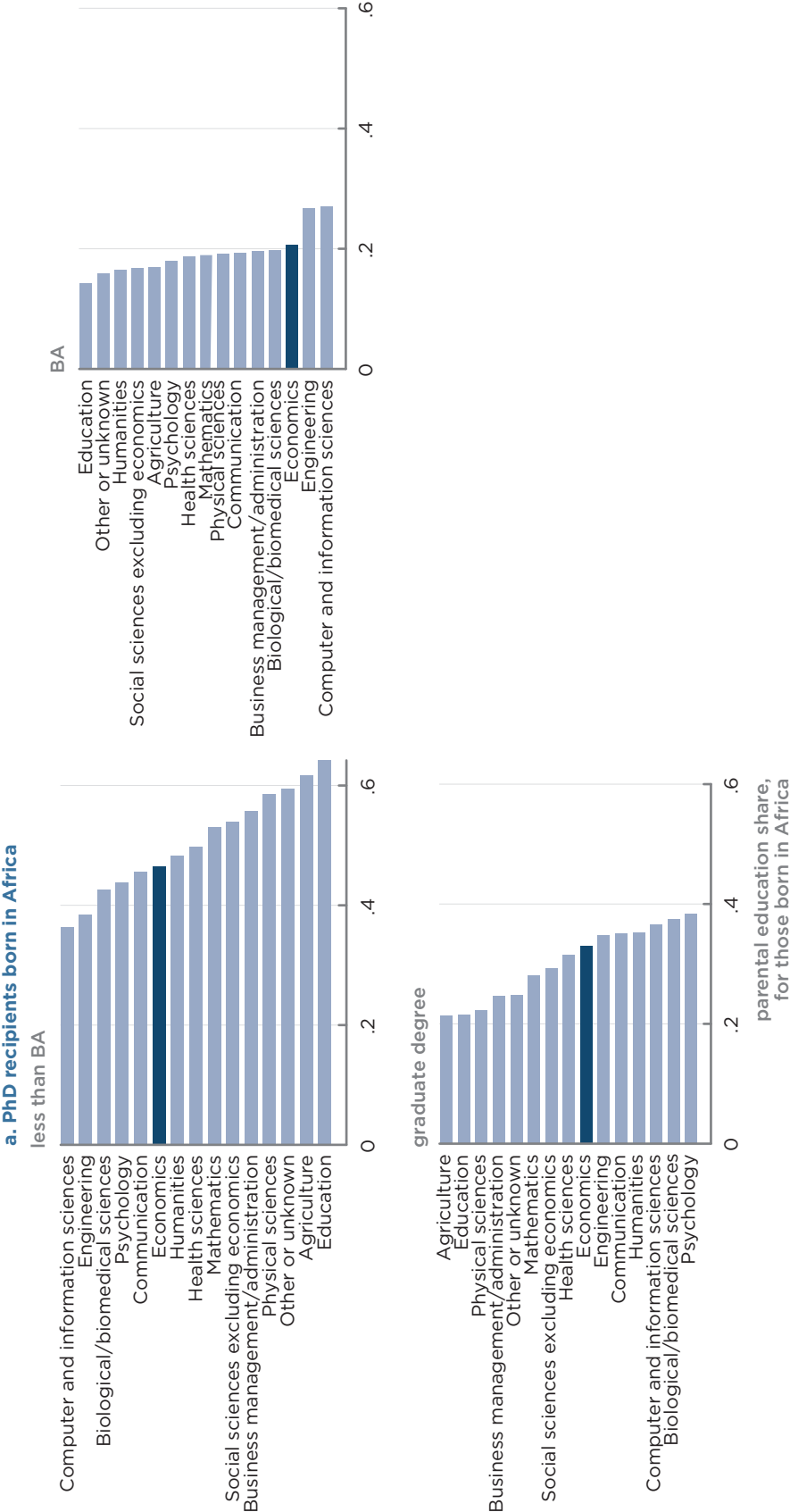


Figure A6 (continued)

Parental education by continent of birth and PhD field, PhD recipients, 2010–18

b. PhD recipients born in the Americas (excluding the United States)

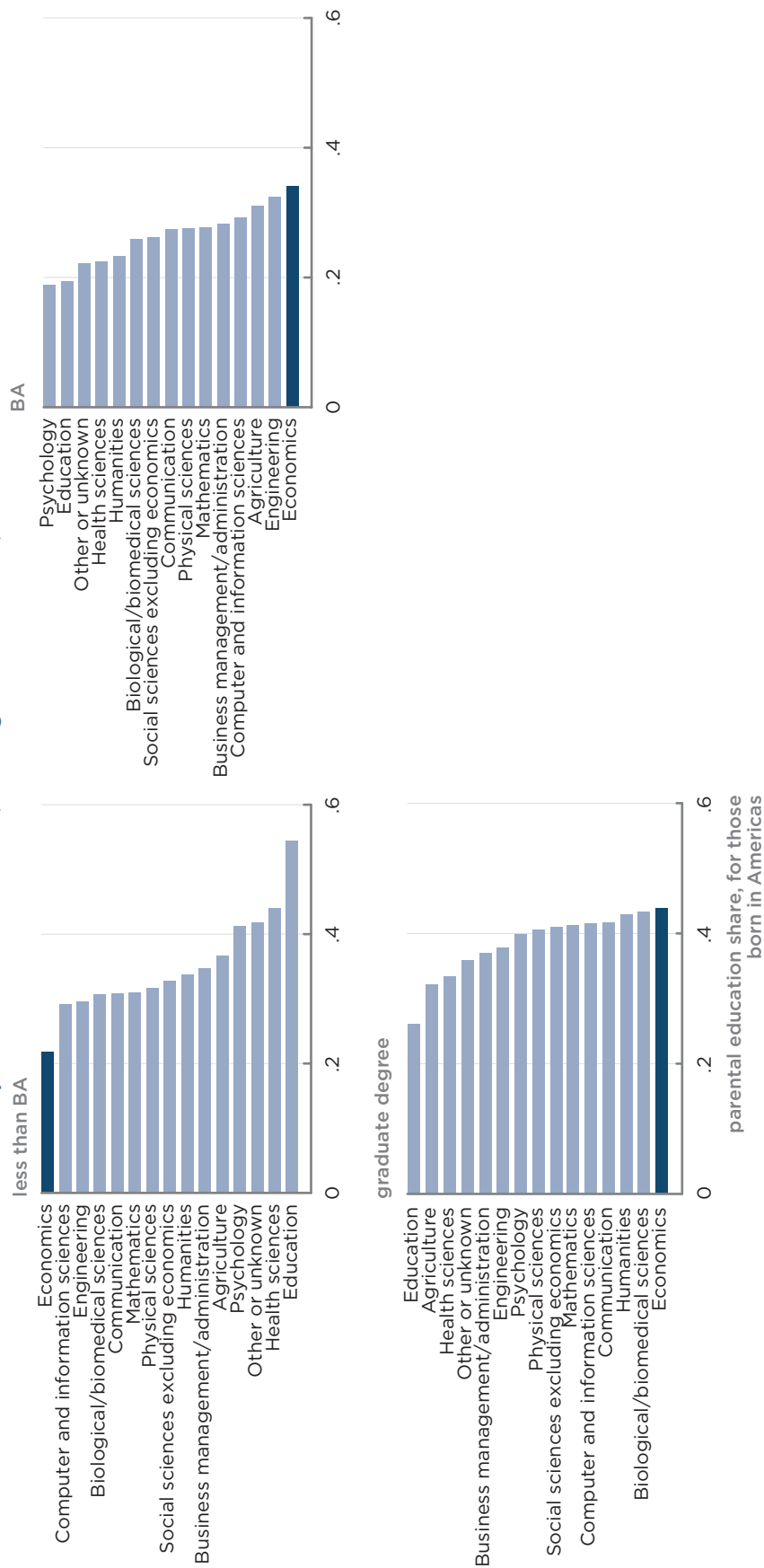


Figure A6 (continued)
Parental education by continent of birth and PhD field, PhD recipients, 2010–18

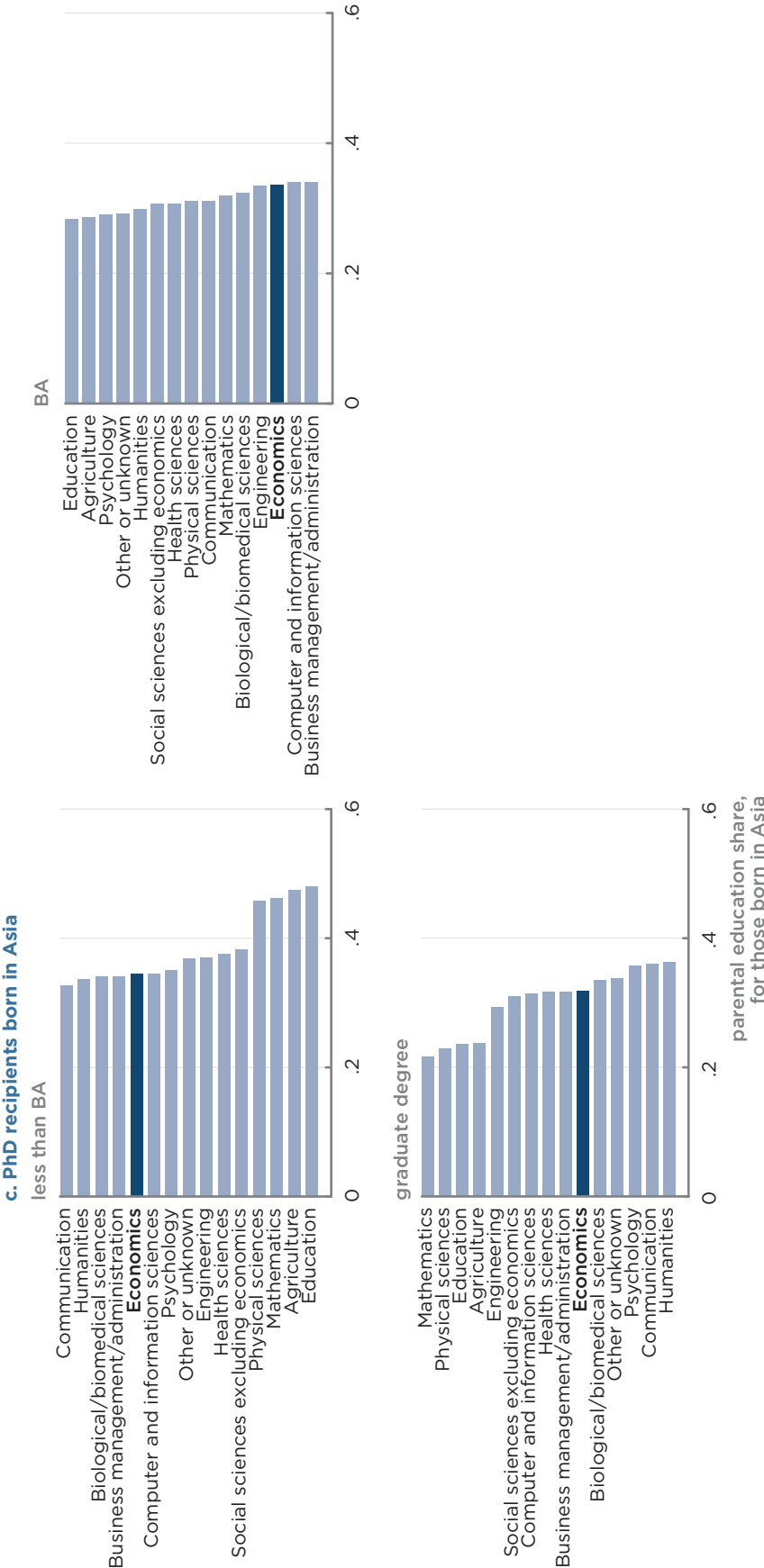
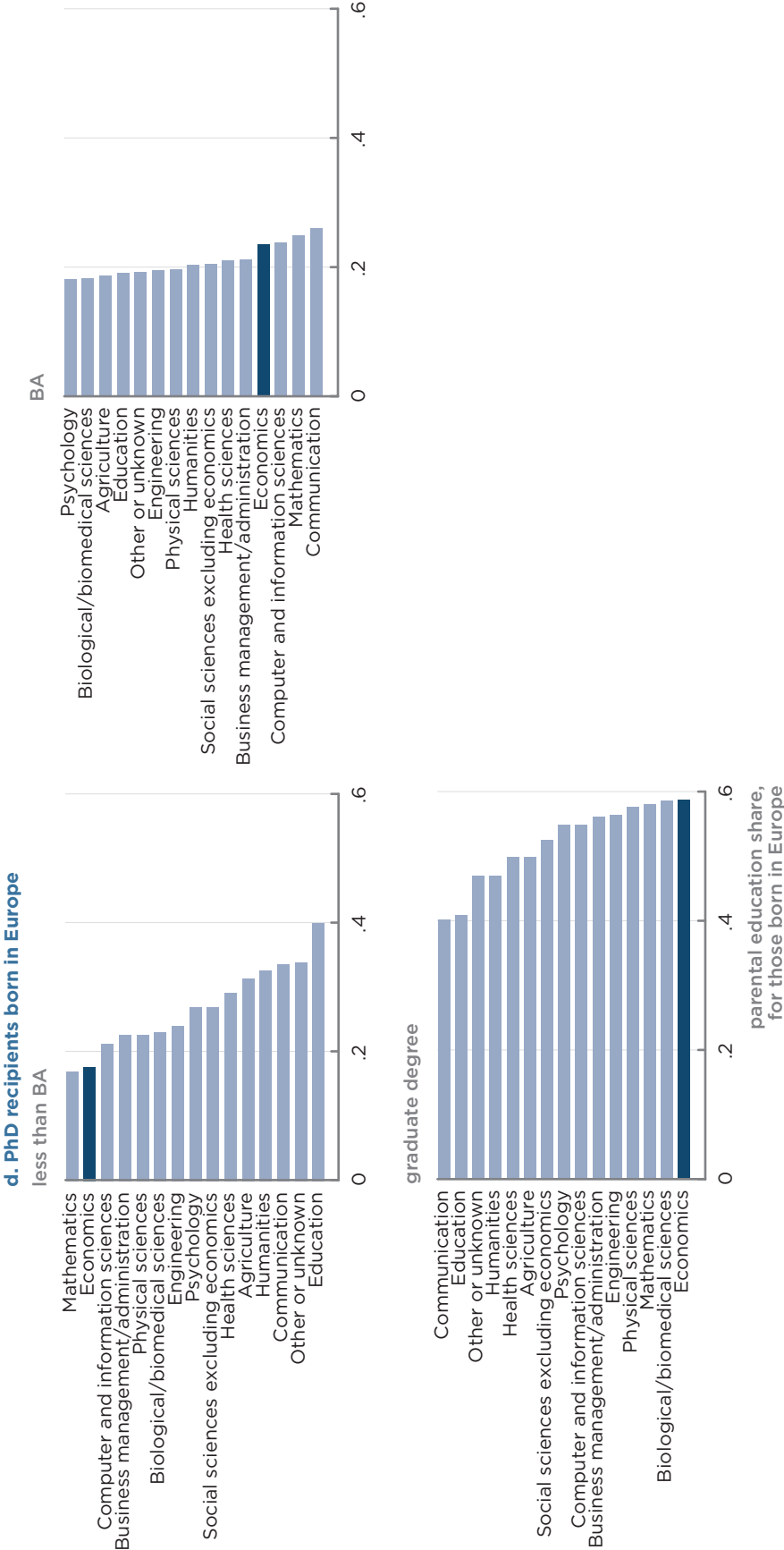
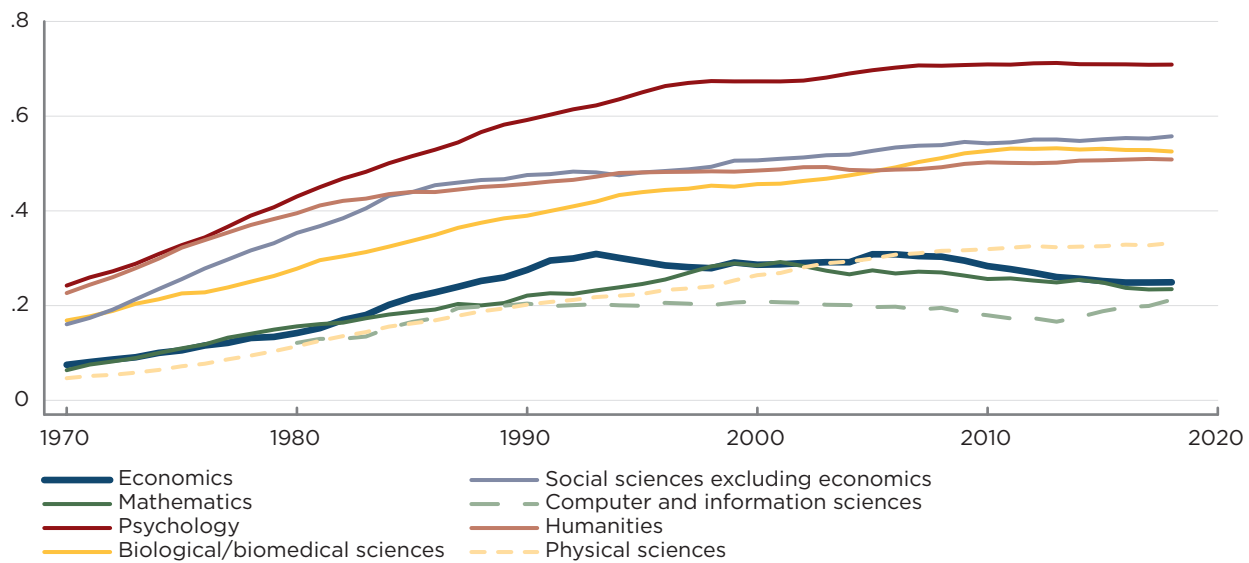


Figure A6 (continued)
Parental education by continent of birth and PhD field, PhD recipients, 2010–18



Note: “Americas” excludes those born in the United States, Oceania is omitted because of small sample sizes.
Source: Data from Survey of Earned Doctorates.

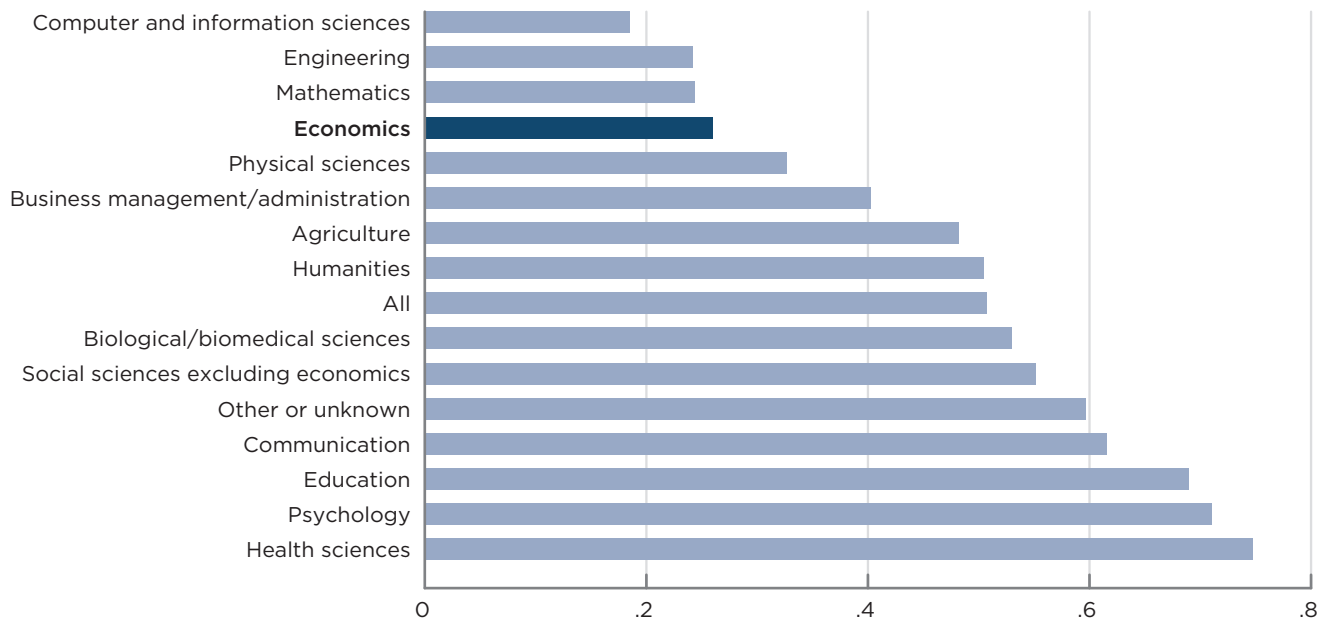
Figure A7

Female share, US-born PhD graduates, by field, 1970–2018 (five-year centered moving average)

Notes: Computer/information sciences data start in 1980 because of small sample sizes before then.

Source: Data from Survey of Earned Doctorates.

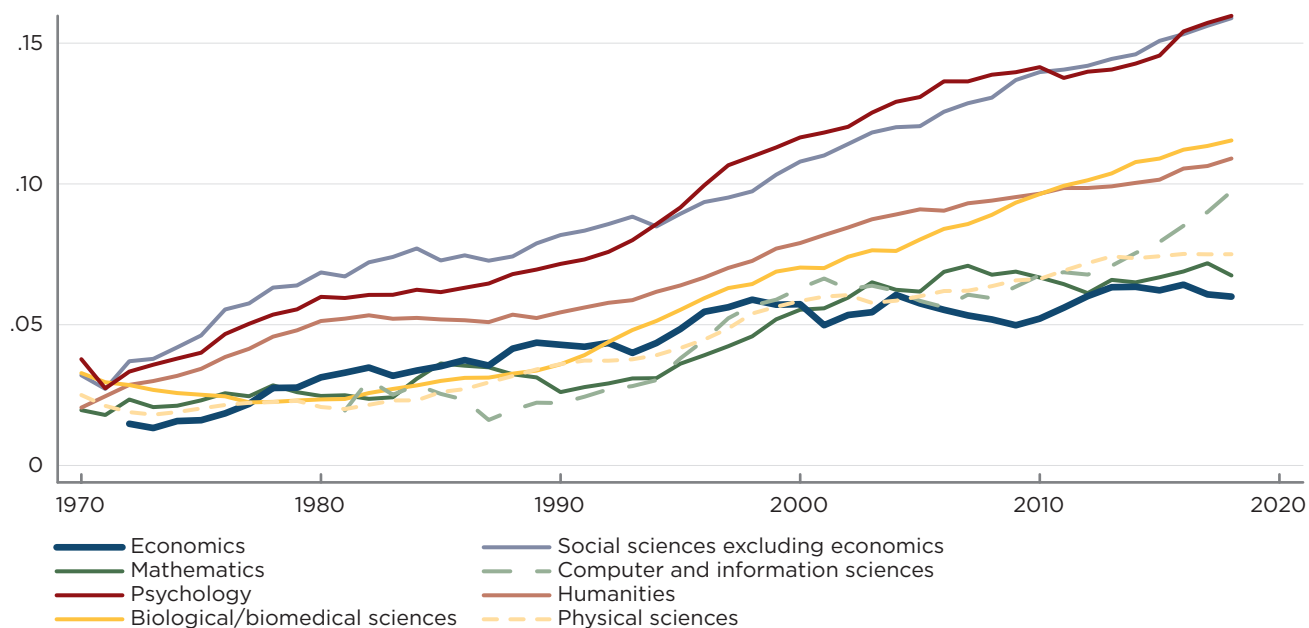
Figure A8

Female share, US-born PhD graduates, by field, 2010–18

Source: Data from Survey of Earned Doctorates.

Figure A9

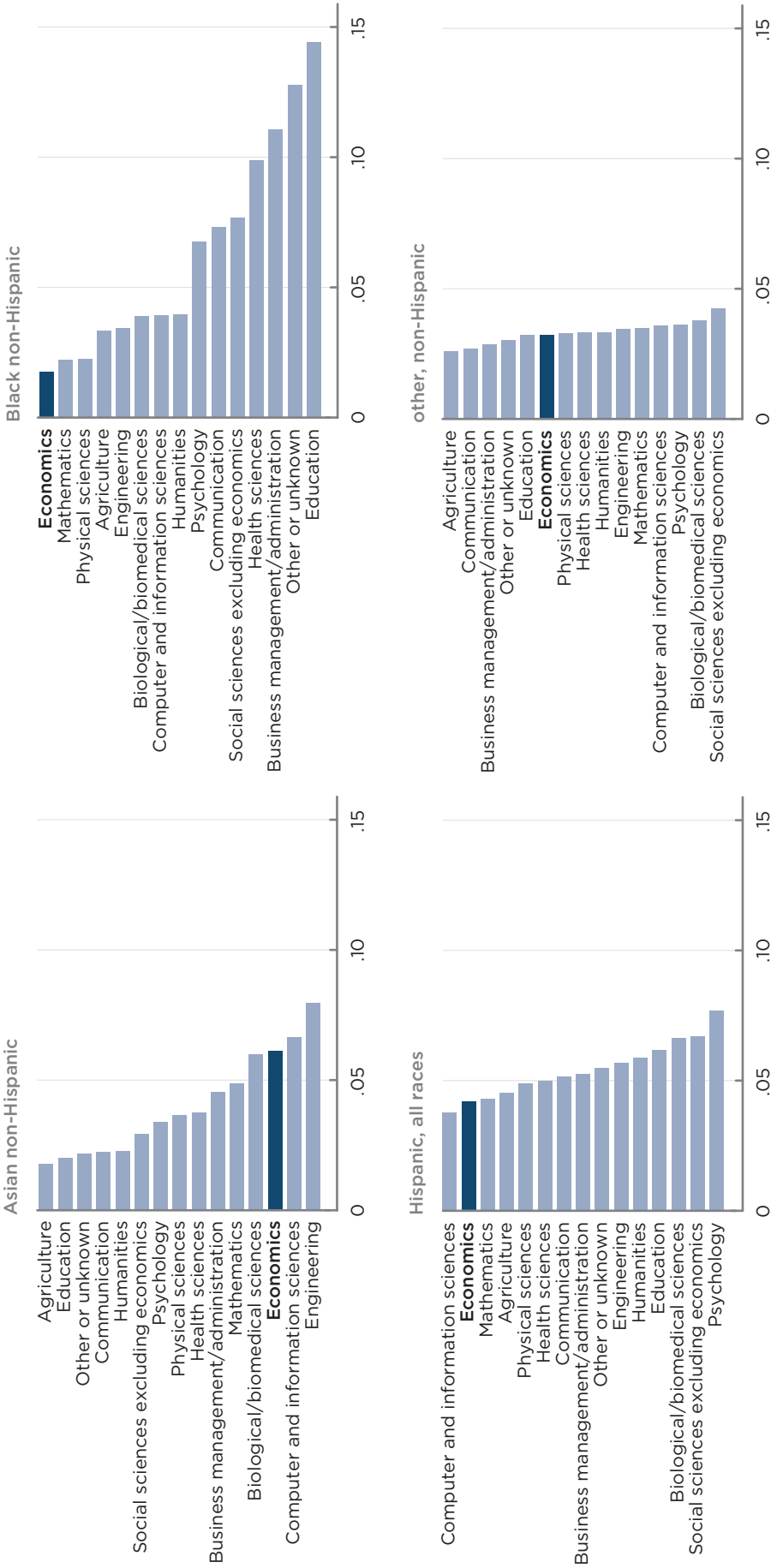
Share underrepresented minority, US-born PhD graduates, by field, 1970–2018 (5-year centered moving average)



Note: "Underrepresented minority" comprises US-born PhD recipients who reported their race or ethnicity as American Indian or Alaskan Native, Black or African American, Puerto Rican, Mexican or Chicano, Cuban, or Other Hispanic. This categorization does not correspond exactly to the categorizations used in our analysis because the race and ethnicity option changed in the SED in 2001. Computer/information sciences data start in 1980 because of small sample sizes before then.

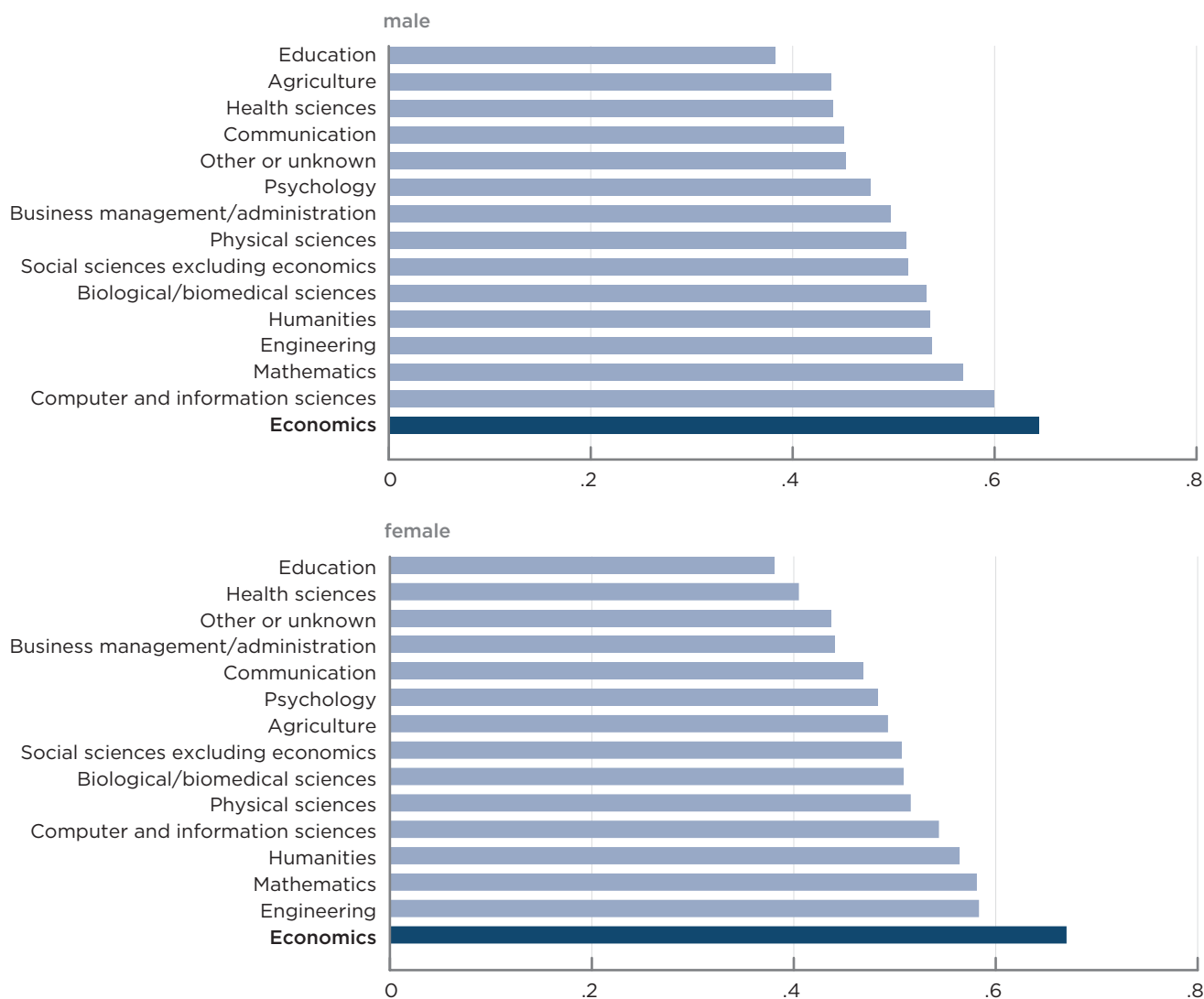
Source: Data from Survey of Earned Doctorates.

Figure A10
Race/ethnicity share (excluding white non-Hispanic), US-born PhD graduates, by field, 2010-18



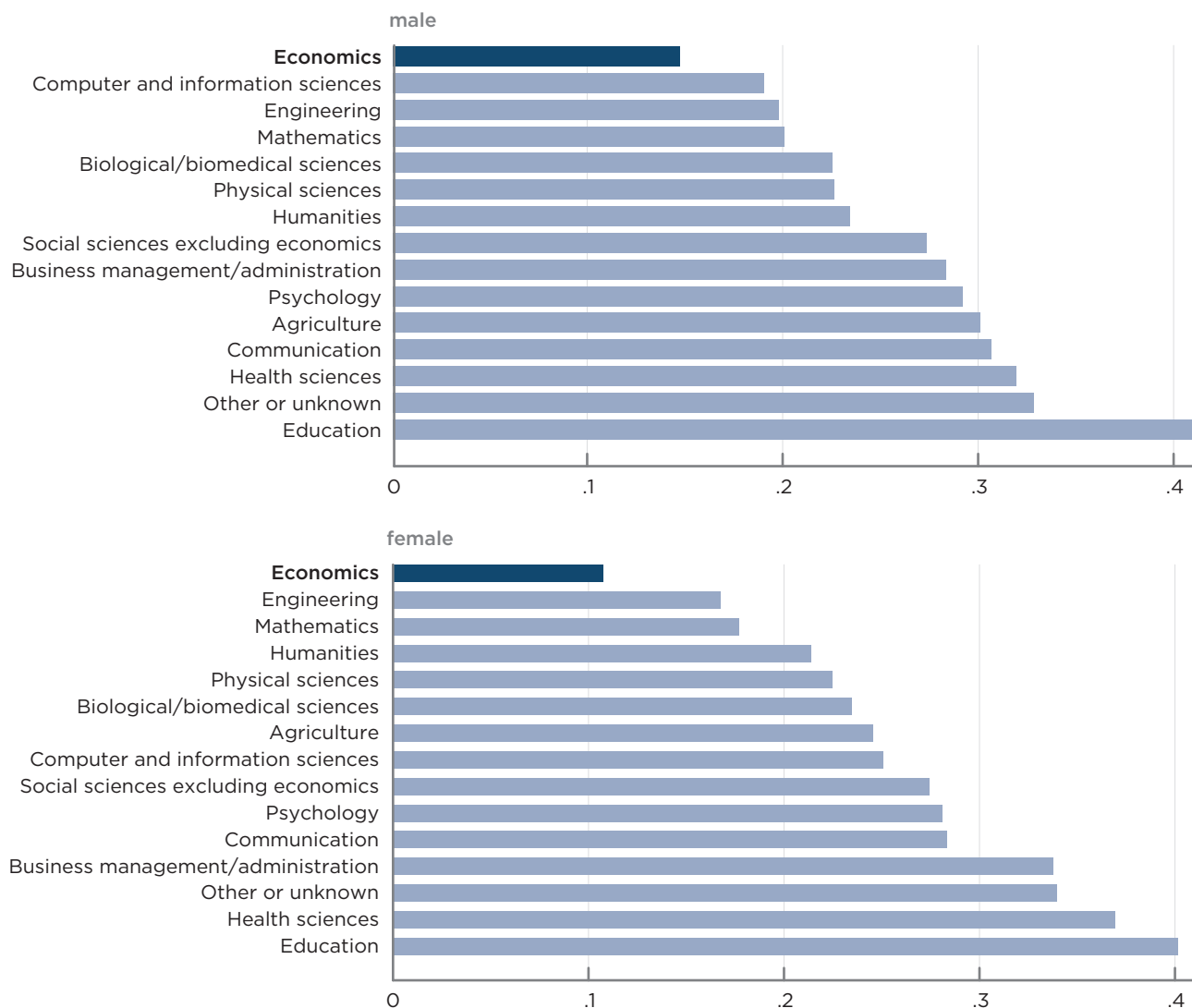
Source: Data from Survey of Earned Doctorates.

Figure A11

Share with at least one parent with a graduate degree, by gender and field

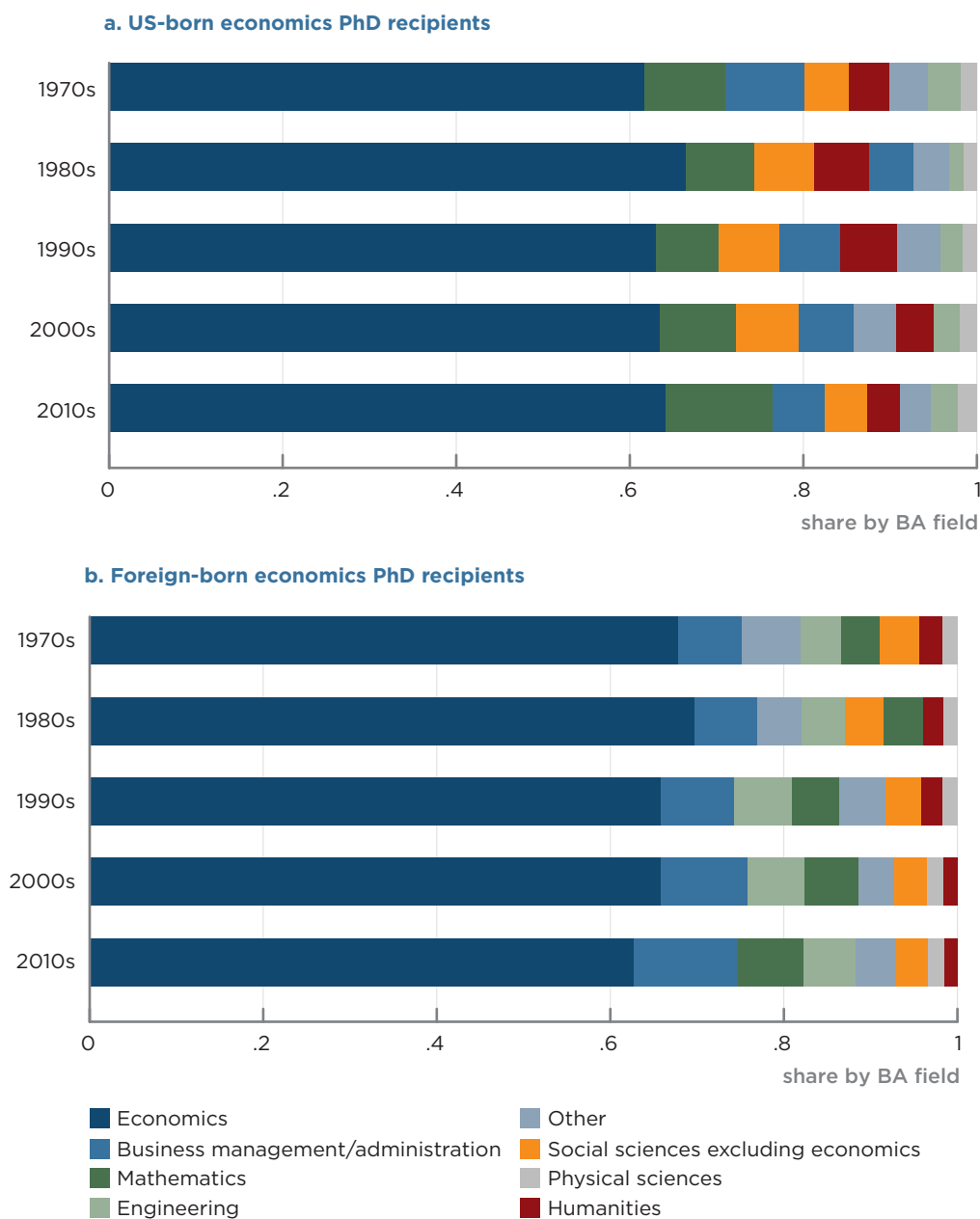
Source: Data from Survey of Earned Doctorates.

Figure A12

Share with no parent with BA or higher, by gender and field

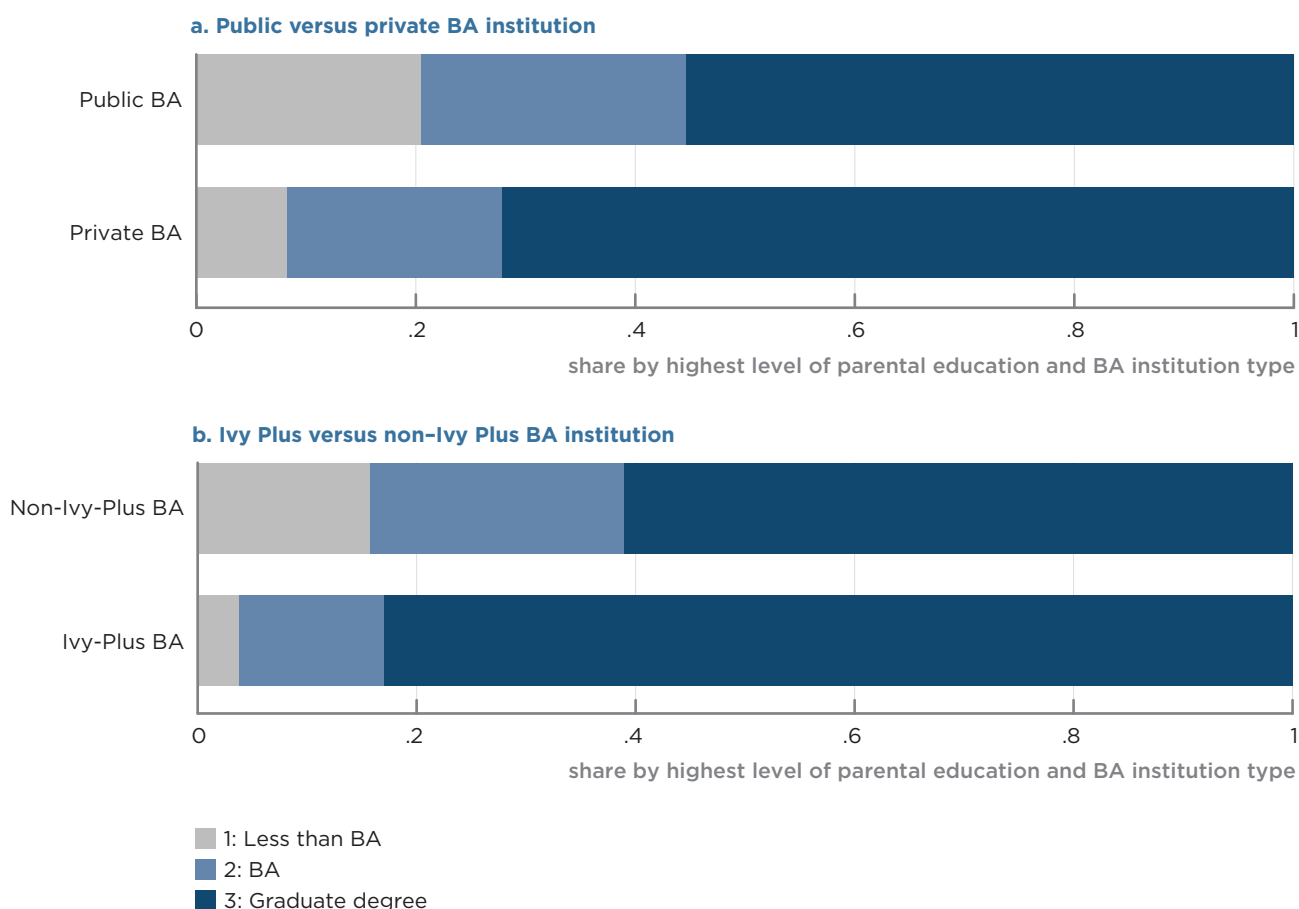
Source: Data from Survey of Earned Doctorates.

Figure A13
BA major of economics PhD recipients, 1970–2018



Source: Data from Survey of Earned Doctorates.

Figure A14

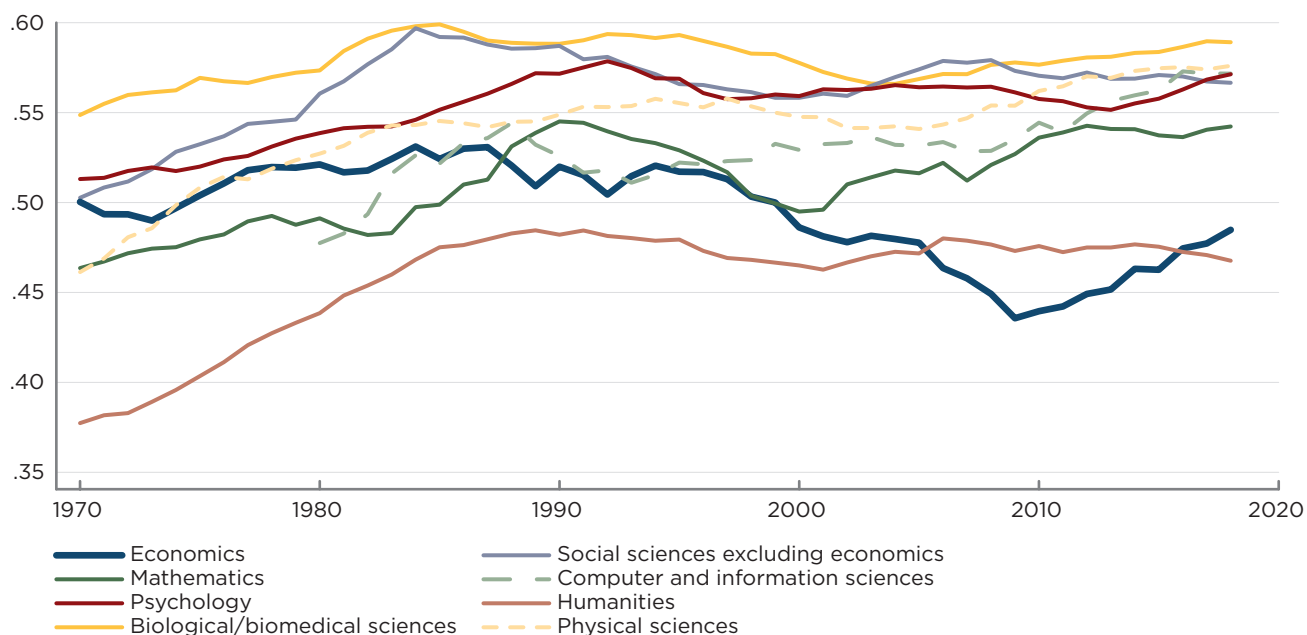
BA institution type and parental education, US-born PhD economics graduates, 2010-18

Note: Ivy Plus institutions are the eight Ivy League schools—Brown, Columbia, Cornell, Dartmouth, Harvard, Princeton, the University of Pennsylvania, and Yale—and Duke, Chicago, MIT, and Stanford. Panel A shows the parental education breakdown of the economics PhDs who got their BA from a private institution versus did not get their BA from a private institution. Panel B shows the parental education breakdown of the economics PhDs who got their BA from an Ivy Plus institution versus did not get their BA from an Ivy Plus institution (but got it from some other US institution, private or public). For example, the bottom right darkest blue bar indicates that, of all the US-born Economics PhDs who got their BA from an Ivy Plus institution, over 80% had at least one parent with a graduate degree.

Source: Data from Survey of Earned Doctorates.

Figure A15

**Share with BA from public institution, US-born PhD graduates, 1970–2018
(5-year centered moving average)**

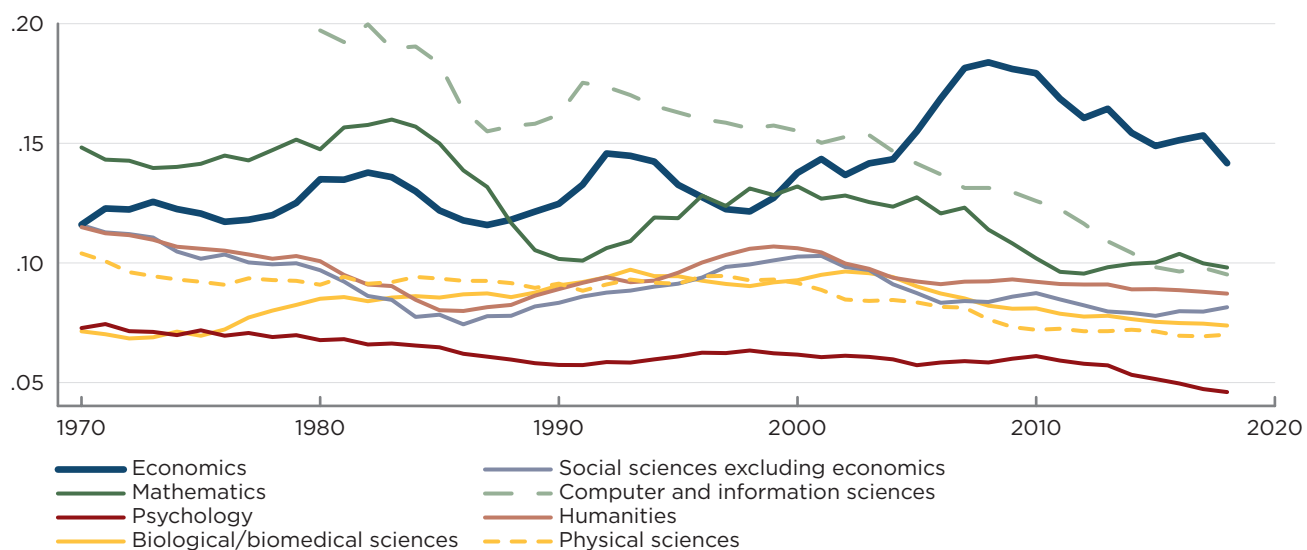


Note: Computer/information sciences data start in 1980 because of small sample sizes before then.

Source: Data from Survey of Earned Doctorates.

Figure A16

**Share with BA from Ivy Plus institution, US-born PhD graduates, 1970–2018
(5-year centered moving average)**



Note: Ivy Plus institutions are the eight Ivy League schools—Brown, Columbia, Cornell, Dartmouth, Harvard, Princeton, the University of Pennsylvania, and Yale—and Duke, Chicago, MIT, and Stanford. Computer/information sciences data start in 1980 because of small sample sizes before then.

Source: Data from Survey of Earned Doctorates.

Figure A17
BA institution type by continent of birth and PhD field, foreign-born PhD recipients, 2010-18

a. Share who attended a US BA institution

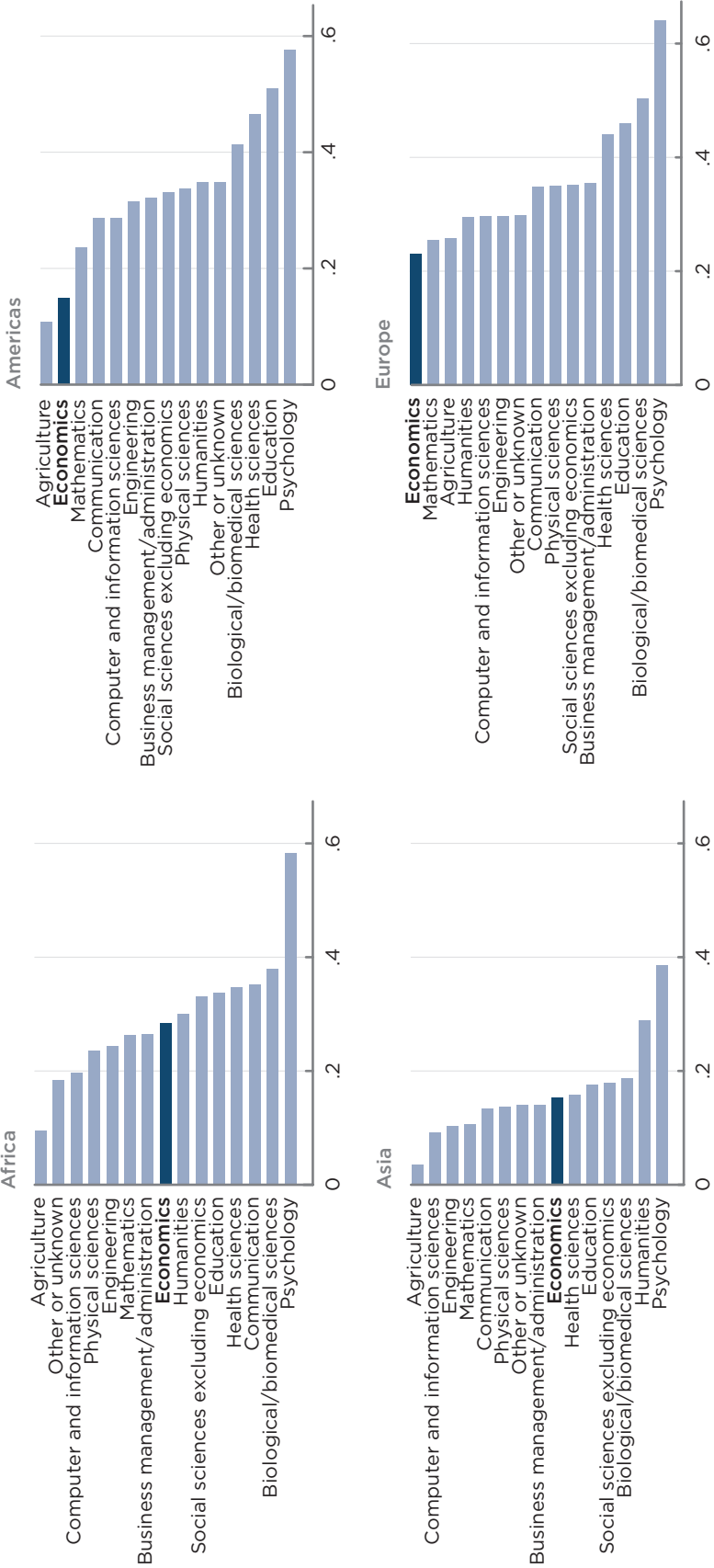
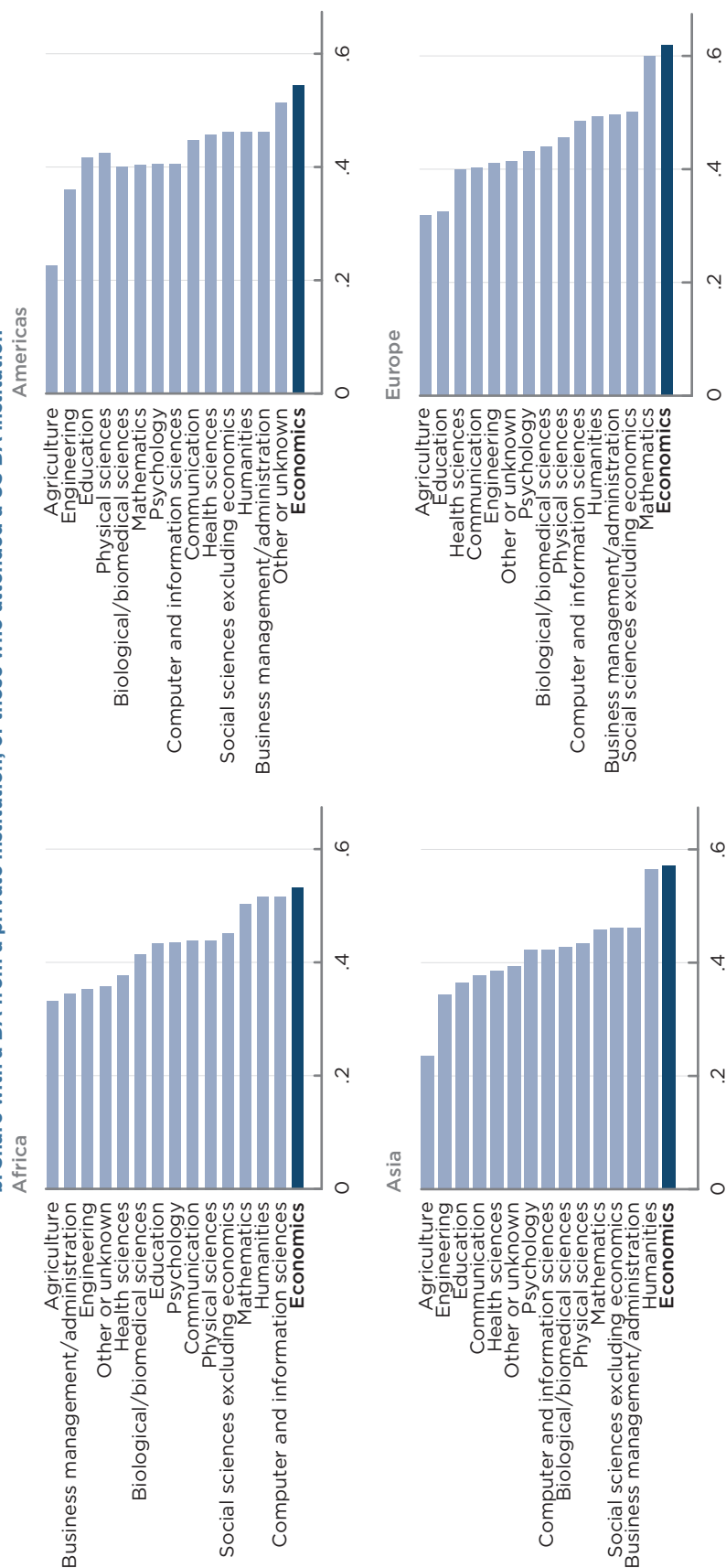


Figure A17 (continued)

BA institution type by continent of birth and PhD field, foreign-born PhD recipients, 2010–18

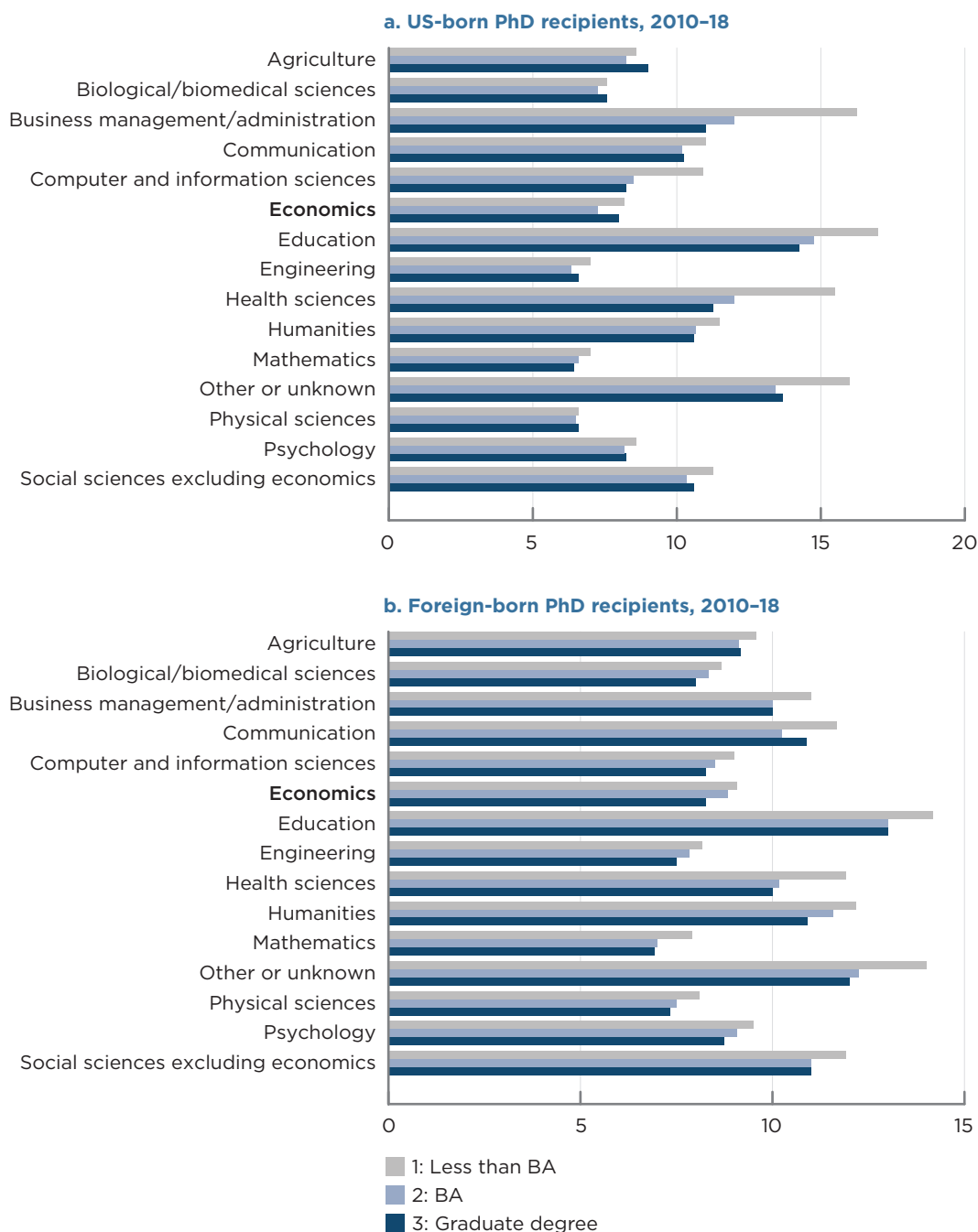
b. Share with a BA from a private institution, of those who attended a US BA institution



Note: "Americas" excludes those born in the United States. Oceania is omitted because of small sample sizes.

Source: Data from Survey of Earned Doctorates.

Figure A18

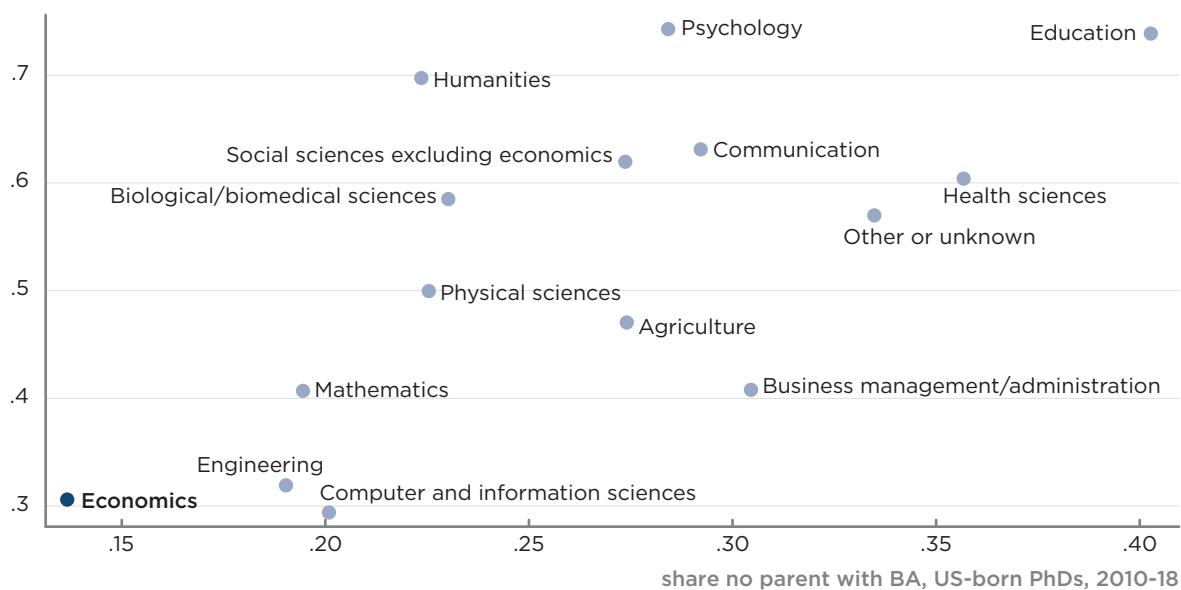
Median years from BA to PhD, by field and highest level of parental education

Source: Data from Survey of Earned Doctorates.

Figure A19

Share of PhD recipients 2010–18 who are US-born, and share of US-born PhDs who have no parent with a BA or higher, by PhD field

share US-born, all PhDs, 2010–18



Source: Data from Survey of Earned Doctorates.

Table A1

Summary statistics on all PhD recipients in the United States, 2010–18, by field

PhD field	Number of PhD recipients	Number of PhD-granting institutions	HHI across institutions	Median age at PhD	Median years BA to PhD	Median years grad school entry to PhD	Female share	Share with no parent with BA or higher	Share with parent with graduate degree	Share with parent with PhD	Share missing parental education
Agriculture	11,904	224	189	31.8	7.6	5.0	47%	36%	37%	9%	11%
Biological/ biomedical sciences	77,918	328	80	30.3	6.6	5.7	53%	27%	47%	12%	9%
Business management/ administration	13,376	255	100	34.2	8.8	5.0	41%	32%	41%	13%	17%
Communication	5,734	166	158	33.7	8.3	5.5	62%	31%	43%	11%	14%
Computer/ information sciences	18,111	241	101	31.3	7.6	5.8	21%	29%	43%	13%	13%
Economics	10,063	165	119	31.1	7.0	5.7	34%	24%	48%	14%	13%
Education	44,176	320	79	38.3	11.8	5.9	69%	42%	36%	7%	13%
Engineering	83,056	267	118	30.0	6.7	5.3	23%	30%	40%	11%	12%
Health sciences	21,057	297	123	34.7	9.2	5.3	69%	37%	39%	9%	13%
Humanities	48,009	278	100	34.1	9.3	6.9	52%	25%	52%	13%	12%
Mathematics	16,283	227	93	29.3	6.3	5.3	29%	31%	41%	13%	12%
Physical sciences	52,770	283	87	29.5	6.3	5.7	32%	32%	41%	11%	11%
Psychology	33,853	316	74	31.3	6.9	5.9	71%	30%	47%	10%	18%
Social sciences excluding economics	33,644	302	90	34.1	9.0	6.7	54%	30%	46%	13%	11%
Other or unknown	8,842	261	91	37.0	11.2	6.3	56%	35%	41%	10%	18%
All	478,796	8088	69	31.6	7.5	5.7	46%	31%	43%	11%	12%

Note: “Number of PhD-granting institutions” is the number of unique institutions that granted at least one PhD in the field in question over 2010–18. “HHI across institutions” is a measure of the concentration of PhD graduates across institutions, and is calculated as the sum of the squared shares of PhD graduates in each field accounted for by each institution (out of a maximum possible of 10,000); an HHI of 200 is equivalent to approximately 50 equal-sized PhD-granting institutions. Parental education shares are calculated as a proportion of those for whom we have information on parental education; the final column shows what share of all PhD recipients in the data *did not* provide information on parental education.

Source: Data from Survey of Earned Doctorates.

Table A2
Summary statistics on US-born PhD recipients, 2010–18, by field

PhD field	Number of US-born PhD recipients	Number of PhD-granting institutions	HHI across institutions	Median age at PhD	Median years BA to PhD	Median years grad school entry to PhD	Female share	URM share
Agriculture	5,600	199	180	31.3	8.6	7.0	48%	8%
Biological/ biomedical sciences	45,592	317	88	30.0	7.6	6.3	53%	11%
Business management/ administration	5,456	230	129	36.0	12.4	9.3	40%	17%
Communication	3,618	145	152	33.6	10.3	8.0	62%	13%
Computer/ information sciences	5,325	224	120	31.5	8.7	7.3	18%	8%
Economics	3,080	148	154	30.3	7.9	6.0	26%	6%
Education	32,622	304	76	38.8	15.3	12.3	69%	21%
Engineering	26,507	251	134	29.2	6.6	5.9	24%	9%
Health sciences	12,717	268	120	35.5	12.5	9.7	75%	16%
Humanities	33,475	271	95	33.7	10.9	9.0	50%	10%
Mathematics	6,630	213	101	29.1	6.6	6.0	24%	7%
Physical sciences	26,364	270	103	29.0	6.6	6.0	33%	7%
Psychology	25,147	306	72	31.0	8.3	6.8	71%	15%
Social sciences excluding economics	20,852	285	91	33.8	10.9	8.7	55%	15%
Other or unknown	5,040	245	98	37.7	14.2	11.7	60%	19%
All	258,025	451	68	31.7	9.0	7.3	51%	13%

Table A2 (continued)
Summary statistics on US-born PhD recipients, 2010–18, by field

PhD field	Share with no parent with BA or higher	Share with parent with graduate degree	Share with parent with PhD	Share with BA from public institution	Share with BA from Ivy Plus institution	Share with BA from known US institution	Share missing race/ethnicity	Share missing parental education
Agriculture	27%	46%	11%	74%	4%	98%	1%	6%
Biological/ biomedical sciences	23%	52%	12%	58%	8%	98%	1%	4%
Business management/ administration	30%	47%	14%	60%	6%	96%	2%	9%
Communication	29%	46%	10%	61%	4%	97%	1%	7%
Computer/ information sciences	20%	59%	19%	56%	11%	96%	2%	6%
Economics	14%	65%	20%	46%	16%	97%	2%	6%
Education	40%	38%	7%	66%	2%	98%	1%	6%
Engineering	19%	55%	14%	66%	7%	97%	2%	6%
Health sciences	36%	41%	9%	62%	5%	96%	1%	6%
Humanities	22%	55%	13%	47%	9%	98%	2%	5%
Mathematics	19%	57%	16%	54%	10%	97%	2%	5%
Physical sciences	23%	51%	12%	57%	7%	98%	1%	5%
Psychology	28%	48%	10%	56%	5%	97%	1%	9%
Social sciences excluding economics	27%	51%	13%	57%	8%	97%	2%	5%
Other or unknown	33%	44%	9%	57%	4%	96%	1%	8%
All	26%	50%	12%	59%	7%	97%	1%	6%

Note: “Number of PhD-granting institutions” is the number of unique institutions that granted at least one PhD to a US-born recipient in 2010–18. “HHI across institutions” is a measure of the concentration of PhD graduates across institutions, and is calculated as the sum of the squared shares of US-born PhD graduates in each field accounted for by each institution. “URM share” is the share who are underrepresented racial and ethnic minorities, as a proportion of those for whom we have data on race/ethnicity. URM is defined as anyone who reported their ethnicity as Hispanic, or who reported their race as Black or African-American, American Indian or Alaska Native, or Native Hawaiian or other Pacific Islander. Parental education shares are calculated as a proportion of those for whom we have information on parental education; the final column shows what share of all PhD recipients in the data *did not* provide information on parental education. “Ivy Plus” institutions are defined as the eight Ivy League schools plus Stanford, MIT, Chicago, and Duke, following Chetty et al. (2017).
Source: Data from Survey of Earned Doctorates.

Table A3

Summary statistics on foreign-born PhD recipients, 2010–18, by field

PhD field	Number of foreign-born PhD recipients	Number of PhD-granting institutions	HHI across institutions	Median age at PhD	Median years to PhD	Median years grad school entry to PhD	Female share	Share with no parent with BA or higher	Share with parent with graduate degree	Share with parent with PhD	Share missing parental education
Agriculture	5,717	190	224	32.2	8.0	5.0	46%	45%	27%	8%	8%
Biological/ biomedical sciences	28,586	311	78	30.9	7.2	5.7	53%	33%	38%	11%	6%
Business management/ administration	6,799	219	102	33.3	8.6	5.0	41%	34%	35%	11%	10%
Communication	1,687	125	191	33.8	8.7	5.7	63%	34%	37%	13%	6%
Computer/ information sciences	11,658	223	102	31.3	7.7	5.7	21%	33%	35%	11%	8%
Economics	6,322	156	119	31.3	7.7	5.7	37%	30%	39%	12%	8%
Education	8,636	270	111	36.9	10.6	5.7	69%	50%	26%	8%	9%
Engineering	51,889	250	114	30.4	7.0	5.2	23%	36%	32%	9%	8%
Health sciences	6,954	254	142	33.7	8.6	5.2	60%	39%	34%	9%	9%
Humanities	11,401	245	136	35.0	9.9	6.8	55%	34%	42%	13%	7%
Mathematics	8,756	212	102	29.6	6.7	5.2	31%	41%	29%	10%	9%
Physical sciences	23,673	260	81	30.1	6.9	5.7	32%	42%	29%	9%	8%
Psychology	5,414	283	82	32.4	7.7	5.9	73%	35%	41%	11%	9%
Social sciences excluding economics	10,925	255	100	34.6	9.7	6.3	52%	36%	37%	11%	7%
Other or unknown	2,868	212	117	36.2	10.4	5.9	52%	39%	35%	11%	11%
All	191,285	441	78	31.4	7.7	5.6	40%	37%	34%	10%	8%

Note: “Number of PhD-granting institutions” is the number of unique institutions that granted at least one PhD to a non-US-born recipient over 2010–18. “HHI across institutions” is a measure of the concentration of PhD graduates across institutions, and is calculated as the sum of the squared shares of non-US-born PhD graduates in each field accounted for by each institution. Parental education shares are calculated as a proportion of those for whom we have information on parental education; the final column shows what share of all PhD recipients in the data do *not* provide information on parental education.

Source: Data from Survey of Earned Doctorates.

Table A4
Number of PhD recipients by field and decade, 1970–2018

PhD field	1970s	1980s	1990s	2000s	2010–18
Agriculture	10,651	12,321	12,551	11,888	11,904
Biological/ biomedical sciences	35,907	39,069	53,179	66,316	77,918
Business/management	7,337	8,555	12,183	12,513	13,376
Communication	2,317	2,691	3,584	4,927	5,734
Computer/information sciences	466	3,810	8,843	12,431	18,111
Economics	8,371	8,030	9,196	9,836	10,063
Education	72,191	68,108	66,213	64,158	44,176
Engineering	30,333	33,593	57,128	65,203	83,056
Health sciences	5,077	7,567	12,886	18,506	21,057
Humanities	45,847	34,006	46,747	51,542	48,009
Mathematics	10,793	7,432	11,026	12,275	16,283
Physical sciences	37,623	35,817	44,865	44,693	52,770
Psychology	26,932	31,912	34,900	33,619	33,853
Social sciences excluding economics	24,747	20,932	25,201	29,007	33,644
Other or unknown	5,867	8,241	8,643	8,646	8,842

Source: Data from Survey of Earned Doctorates.

Table A5
Number of US-born PhD recipients by field and decade

PhD field	1970s	1980s	1990s	2000s	2010-18
Agriculture	6,511	7,079	5,642	5,435	5,600
Biological sciences	28,904	30,332	32,395	38,344	45,592
Business/management	5,547	5,225	7,084	5,556	5,456
Communication	2,027	2,089	2,574	3,097	3,618
Computer/information sciences	324	2,012	3,713	3,902	5,325
Economics	5,571	4,148	3,529	2,787	3,080
Education	64,851	56,581	54,766	49,683	32,622
Engineering	16,766	12,637	20,342	19,062	26,507
Health sciences	3,895	5,562	8,622	11,481	12,717
Humanities	38,279	26,504	34,766	35,908	33,475
Mathematics	7,864	3,716	4,582	4,644	6,630
Physical sciences	27,986	23,379	23,873	21,291	26,364
Psychology	24,202	27,363	29,153	26,058	25,147
Social sciences excluding economics	19,098	13,989	15,900	18,075	20,852
Other or unknown	4,348	6,125	6,020	5,143	5,040

Source: Data from Survey of Earned Doctorates.

Table A6

Ten least socioeconomically diverse narrow PhD fields among US-born PhD recipients, 2010-18 (only listing fields with at least 500 US-born PhD recipients), 2010-18

a. Ten fields with the lowest shares with no parent with a BA or higher		
PhD field	Number of US-born PhD recipients	Share, no parent with a BA or higher
Economics	2,907	13.7%
Bioengineering and biomedical engineering	4,607	13.8%
Astronomy	627	14.2%
Musicology/ethnomusicology	868	14.4%
Art history/criticism/conservation	1,587	14.6%
Classics	618	14.7%
Biophysics	798	15.0%
Particle (elementary) physics	1,071	15.5%
Physics, other	523	16.3%
Statistics	904	16.7%
b. Ten fields with the highest shares with at least one parent with a graduate degree		
PhD field	Number of US-born PhD recipients	Share, at least one parent with graduate degree
Economics	2,907	65.0%
Art history/criticism/conservation	1,587	64.8%
Classics	618	62.9%
Musicology/ethnomusicology	868	62.1%
Astronomy	627	61.7%
Computer science	3,699	61.7%
European history	1,326	61.4%
Comparative literature	818	61.2%
Bioinformatics	595	60.8%
Bioengineering and biomedical engineering	4,607	60.7%

Note: Data for economics PhD recipients from Survey of Earned Doctorates. PhD field categories provided by the NSF. Tables list only fields that had at least 500 US-born PhD recipients over 2010-18.

Table A7

Parental education by race and ethnicity, four major groups, for US-born economics PhD recipients 2010–18 and US population aged 50–74 in 2019

White non-Hispanic	Asian alone	Black alone	Hispanic, all races
<i>Economics PhD recipients: share with at least one parent with graduate degree</i>			
65%	77%	54%	53%
<i>US population aged 50–74, 2019: share with graduate degree</i>			
15%	19%	9%	6%
<i>Economics PhD recipients: share with no parent with BA or higher</i>			
13%	11%	25%	24%
<i>US population aged 50–74, 2019: share with no BA</i>			
63%	52%	77%	82%
<i>Unrepresentativeness ratio: at least one parent with graduate degree</i>			
4.3	4.1	6.0	8.8
<i>Unrepresentativeness ratio: no parent with BA or higher</i>			
0.2	0.2	0.3	0.3

Note: Data for economics PhD recipients, from the Survey of Earned Doctorates, show the share *within* each racial or ethnic group by parental education (e.g., 65% of White non-Hispanic economics PhD recipients had at least one parent with a graduate degree). Data for US population, from US Census Bureau estimates of educational attainment by age and race, show the share *within* each racial or ethnic group by education (e.g., 15% of the White Non-Hispanic population aged 50–74 had a graduate degree in 2019). The unrepresentativeness ratio is calculated as the economics PhD recipient share with a particular highest education level of parent, divided by the US population aged 50–74 share with the same education level.



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