

NBER WORKING PAPER SERIES

POSITIONED AT EXTREMES:
FUTURE JOB PLACEMENTS OF IMMIGRANT STUDENTS AT U.S. COLLEGES

Francis M. Dillon
Sari Pekkala Kerr
William R. Kerr
Andrew J. Wang

Working Paper 34440
<http://www.nber.org/papers/w34440>

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
November 2025

We thank Francisco Diaz Bretrones, Chris Brewster, Stacey Fitzsimmons, Aida Hajro, Milda Zilinskaite and seminar participants for helpful comments. We thank the Ewing Marion Kauffman Foundation for financial support. The research in this paper was conducted while the authors were Special Sworn Status researchers of the U.S. Census Bureau. Any views expressed are those of the authors and not those of the U.S. Census Bureau. The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data used to produce this product. This research was performed at a Federal Statistical Research Data Center under FSRDC Project Number 2766 (CBDRB-FY24-P2766-R11782; FY25-P2766-R12183). This research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by National Science Foundation Grants SES-9978093, SES-0339191 and ITR-0427889; National Institute on Aging Grant AG018854; and grants from the Alfred P. Sloan Foundation. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

NBER working papers are circulated for discussion and comment purposes. They have not been peer-reviewed or been subject to the review by the NBER Board of Directors that accompanies official NBER publications.

© 2025 by Francis M. Dillon, Sari Pekkala Kerr, William R. Kerr, and Andrew J. Wang. All rights reserved. Short sections of text, not to exceed two paragraphs, may be quoted without explicit permission provided that full credit, including © notice, is given to the source.

Positioned at Extremes: Future Job Placements of Immigrant Students at U.S. Colleges
Francis M. Dillon, Sari Pekkala Kerr, William R. Kerr, and Andrew J. Wang
NBER Working Paper No. 34440
November 2025
JEL No. F22, F23, F66, I23, J61, L26, M13, M16

ABSTRACT

Immigrant students who attend U.S. colleges are disproportionately employed in either large firms—especially multinationals—or small firms and self-employment. Using linked Census and longitudinal employment data, we trace the jobs taken by college students in 2000 during the 2001-20 period and evaluate four mechanisms shaping sector and firm size placement: geographic clustering, degree specialization, firm capabilities/visas, and ethnic self-employment specialization. Degree fields predict large firm and MNE placement, while ethnic specialization explains small firm sorting. Immigrant students who remain in the U.S. earn more than their native peers, suggesting the segmentation reflects productive sorting rather than blocked opportunity.

Francis M. Dillon
University of Pennsylvania
The Wharton School
dillon98@wharton.upenn.edu

Sari Pekkala Kerr
Wellesley College
skerr3@wellesley.edu

William R. Kerr
Harvard University
Harvard Business School
and NBER
wkerr@hbs.edu

Andrew J. Wang
Stanford University
Stanford Digital Economy Lab
andrewjwang@stanford.org

1. Introduction

Theories of labor market segmentation emphasize that immigrants are not randomly distributed across jobs but instead are systematically sorted—often into “niches” shaped by employer demand, institutional constraints, and ethnic networks (Piore 1979; Portes and Zhou 1993; Waldinger 1996). While most of this foundational literature focuses on low-wage settings, similar stratification occurs among well-paid positions. Highly educated immigrants often experience structured pathways that reflect differences in skills, networks, visa access, and institutional supports (e.g., most H-1B visas are used for IT work within large firms). Despite this awareness, we know relatively little about the forces that shape job placements of immigrant college students.

This paper investigates how immigrant students who attend U.S. colleges transition into the labor market and their subsequent employers. These individuals occupy a unique position: they hold domestic credentials, are often fluent in English, and have been exposed to American culture. At the same time, they may require work visas, favor certain academic fields, and attend schools in bigger cities. Their job placements, and how they differ from native students, offer a lens into the contemporary intersection of education, immigration, and segmented opportunity.

Moreover, the school-to-work pathway is essential to U.S. immigration (Bound et al. 2020, 2021; Chen and Yang 2024). For many international students, especially from low-income countries, attending a U.S. college is a first step to the labor market (Kato and Sparber 2013; Shih 2016). And the number of international students is significant, representing in 2018 more than 5% of U.S. undergraduate degrees, 18% of master’s degrees, and 13% of doctorate degrees (Bound et

al. 2021). Counts of international students more than doubled from 408,000 in 1990-91 to 1,057,000 in 2022-23 (Open Doors 2023).¹

To study how immigrant students place into jobs, we build a unique database that links U.S. college students in the 2000 Decennial Census to their subsequent employment from 2001 to 2020 as captured by the Longitudinal Employer Household Dynamics and the Integrated Longitudinal Business Database. We measure the jobs that immigrant and native students take in terms of firm size, sector, and multinational enterprise (MNE) status.

These data reveal a striking and consistent pattern: immigrant college students take jobs that are disproportionately positioned at the extremes of the firm size distribution. They are more likely than native peers to work in large firms (particularly MNEs) and small firms (including self-employment), being underrepresented in mid-sized firms. This U-shaped pattern is most pronounced among non-citizen immigrants who arrived close to college age.

These placements at the extremes are not random but instead reflect individual specialization and institutional opportunities. To explain them, we draw on an interdisciplinary literature that links immigrant sorting to four key mechanisms:

- **Geographic clustering**, which captures how immigrant students’ greater proximity to urban labor markets and global cities—where large firms and MNEs cluster—shapes job opportunities after graduation.
- **Degree specialization**, particularly in STEM and quantitative fields, which aligns immigrant students with sectors and firms where these skills are required.

¹ Online Appendix A provides an overview of U.S. student visa policy. We use the term “immigrant students” to encompass undergraduate students who are not natural-born citizens. We use “international students” when specifically discussing data regarding student visas. There is a close, but not exact, correspondence of international students to non-citizen students. We do not analyze immigrants studying for advanced degrees nor those arriving with foreign degrees.

- **Firm capabilities**, especially the ability and willingness to sponsor work visas like the H-1B, which varies significantly across firms by size, sector, and HR infrastructure.
- **Ethnic self-employment specialization**, reflecting immigrant group histories of entrepreneurship, co-ethnic job hiring, and community-based labor markets, which facilitates small firm employment and self-employment.

Our conceptual framework treats these mechanisms as potentially complementary. Using variation across places of birth, we develop hypotheses to test the explanatory power of the mechanisms for the sectors and firm sizes of the future jobs of immigrant students compared to native peers. The literature also allows us to make predictions about whether the mechanisms operate differently in large versus small firms, and within versus outside of MNEs.

Degree specialization is the strongest factor for explaining differences in job placement, especially among jobs at large firms and MNEs. Geographic clustering is the second strongest mechanism. Ethnic self-employment specialization is the leading factor shaping the jobs taken at small and new firms by immigrant students. Firm capabilities/visa access, while conceptually important, shows modest explanatory power across groups. These results underscore that work segmentation is not the consequence of a single dynamic, but instead blends human capital, social embeddedness, and institutional structure.

We finally examine the long-run earnings of students. Immigrant students who remain in the U.S. labor force earn more than their native peers in paid jobs and in self-employment. These earnings premiums, while not directly motivated by the literature, suggest that workplace segmentation of students is likely benign and may reflect productive sorting. Rather than a signal of marginalization, segmentation in this college-educated setting more likely reflects skill

advantages and efficient employer-employee matching, particularly for those with technical degrees or entrepreneurial backgrounds.

These findings speak to several contemporary issues. In immigration policy, they highlight the importance of observable features like geography and degrees for explaining the economic consequences of rising immigrant student levels, given how the U.S. system empowers schools and firms to select individuals for visas (Kerr 2019). In higher education, they reinforce the need to understand international students as future workers, and to enable and track their career outcomes beyond graduation. For scholars of migration and inequality, we provide new evidence on the assimilation of immigrant college students into the U.S. workforce and the segmentation that arises due to their individual attributes and structural features.

2. Immigrant College Students and Job Placements

Immigrants represent a disproportionate share of U.S. workers with the lowest and highest educations. Parsing by education is useful as assimilation differs by credentials (Chiswick 1978; Chiswick, Lee and Miller 2005). Even more, efforts to understand immigrant experiences and model the implications of policy changes that directly impact immigrant students (e.g., adjustments in United States' openness to international students or changes in its Optional Practical Training policy) require empirical analyses specific to college-educated workers.

Mostly due to data limitations, few academic studies link information about the schooling of college-educated immigrants to future workplace outcomes (Hou and Lu 2017; Holbrow and Nagayoshi 2018; Rho and Sanders 2021). Yet, immigrant students are unevenly distributed across schools and degree fields. Moreover, employers differ in their institutional capacity to hire immigrant students. These features predict that immigrant students and native peers will take up systematically different jobs after school, resulting in a nuanced assimilation of educated immigrants beyond the simple attainment of college degrees. Our analysis builds on migration theory traditions that emphasize structural and network factors in shaping migrant labor market outcomes (Massey et al. 1993).

Such patterns echo classic depictions of labor market “niches” shaped by employer demand, institutional constraints, and community networks in low-wage settings (Piore 1979; Portes and Zhou 1993; Waldinger 1996; Hagan et al. 2015; Kerr and Mandorff 2024). Our work builds upon the prior literature in exploring how institutional features, skill specialization, and similar mechanisms structure job placements of immigrants, but we also move to the relatively unexplored domain of student-to-work transitions (Light and Bonacich 1988; Nee and Sanders 2001; Ruhs and Anderson 2010). We build on recent reformulations of assimilation theory that emphasize

heterogeneous outcomes and structural barriers (Waters and Jiménez 2005). This richer portrait helps bridge academic fields examining the global movement of talent (de Haas 2021; Hajro et al. 2021, 2023).

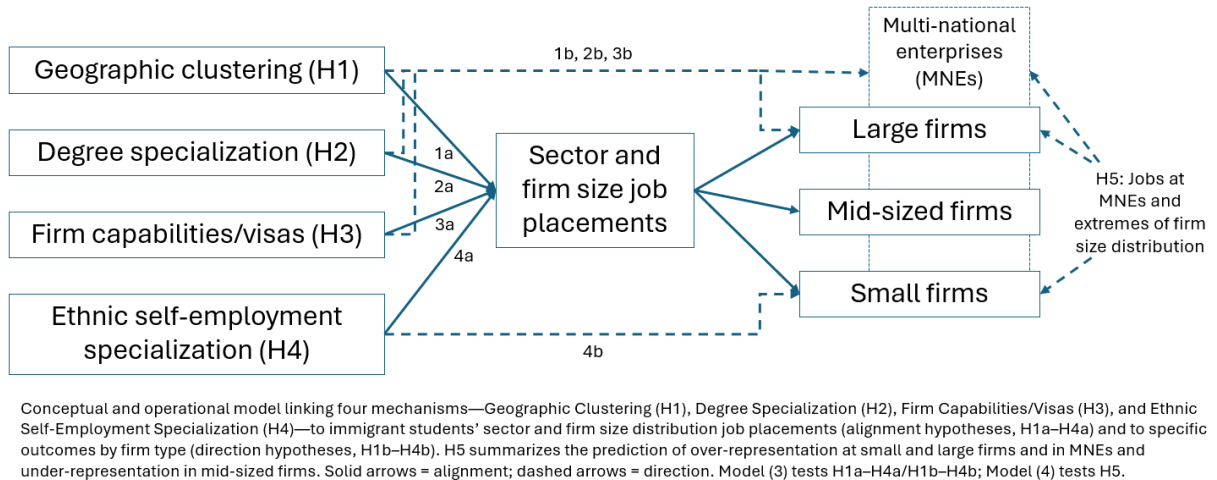
Multi-national enterprises (MNEs) are defined as those owning and controlling activities in multiple countries (Buckley and Casson 1976). MNEs are widely discussed in the immigration literature, and the recent wave of refugee migration in Europe highlights their role as important employers (Lee, Johnson and Szkudlarek 2025). In many cases, MNEs are quite dependent on immigrant workers and have operations shaped by them (Hernandez 2014; Bahar et al. 2024a,b), even if offshoring remains a viable strategy in the face of immigration restrictions (Mehra and Kim 2023; Glennon 2024; Morales 2025). Migrating skilled employees who work in MNEs impact knowledge transfer and innovation within the firm (e.g., Bonache, Brewster and Suutari 2001; Foley and Kerr 2013; Choudhury 2016; Verfürth 2022; Vora, Fitzsimmons and Thomas 2025).

Research Question and Study Design

Our research focuses on whether immigrant students in U.S. colleges take jobs in different economic sectors and firm sizes compared to their native peers. An interdisciplinary literature yields four mechanisms that shape these placements, with some tension between them. Our framework models the mechanisms individually and synthesizes them into a testable hypothesis about overall job placements of immigrant college students into the firm size distribution. This approach integrates mid-level theory and quantitative testing for migration studies (Portes 1997; De Haas 2021) and has its foundations in the literature on segmented opportunity structures (Zhou 1997; Alba and Nee 2003; Waldinger and Lichter 2003).

Figure 1 summarizes our framework linking the four mechanisms — geographic clustering, degree specialization, firm capabilities/visas, and ethnic self-employment specialization — to immigrant students’ sector and firm size job placements. Solid arrows (H1a–H4a) represent “alignment” hypotheses that model the ability of the mechanisms to explain differences in how immigrant student groups place into jobs across sectors and firm sizes. In addition, “direction” hypotheses represented by dashed arrows (H1b–H4b) predict whether mechanisms matter more in small versus large firms or by MNE status. H5 summarizes the prediction that immigrant students are overrepresented at the extremes of firm size (and in MNEs) and underrepresented in the middle, relative to natives.

Figure 1. Conceptual model and hypotheses



Geographic Clustering and Job Placements

Immigrants typically cluster in some parts of their host country more densely compared to the underlying native population. This arises due to heterogeneous reasons, such as: immigrants living in areas closer to their home country, especially in a country as large as the United States; the stickiness of arrival locations, often called “gateway cities,” and past migrant networks;

immigrants favoring places that match their skillset and technologies (Obolensky, Tabellini and Taylor 2023); and larger cities often being more welcoming of immigrants (Winders 2006; Florida 2012).

Spatial clustering is also evident among immigrant college students, and many colleges actively pursue international students. For example, New York University was home to 24,000 international students in 2022-23, while Columbia had 19,000. To put these counts into perspective, only five other states had aggregate international enrollments equal to these two schools. A localized job search in Manhattan by New York City's students makes placement in larger firms or the finance sector more likely compared to students graduating from the University of Rochester, another school in the state of New York. Indeed, a quantitative study shows exogenous increases in foreign student enrollments at U.S. schools boost the future sizes of local workforces due to localized hiring (Beine, Peri and Raux 2023).

Scholars in international business and economic geography also document that MNEs disproportionately locate in bigger cities and areas with immigrant concentrations (Hernandez 2014; Shukla and Cantwell 2018; Benfratello, Castellani and D'Ambrosio 2024), suggesting a co-evolution of firm location and labor supply (Born 2019; Hernandez and Kulchina 2020; Bahar, Carlson, and Hernandez 2024; Belderbos et al. 2025). This alignment appears particularly strong for high-skilled migrants (Ozgen, Nijkamp and Poot 2014; Shachar 2006; Morales 2025) and links to digital trade (Cantwell and Shukla 2025).

Hypothesis 1a (Geographic Clustering Alignment): The geographic locations of immigrant students explain differences in future job placements across sectors and firm sizes.

Hypothesis 1b (Geographic Clustering Direction): Differences due to geographic clustering matter more for job placements among larger firms and MNEs than small firms.

Degree Specialization and Job Placements

Immigrant and native students favor different fields of study. Notably, immigrant students are more engaged in science and engineering, and less engaged in education and communications, compared to natives. These differences relate to the portability of math, science, and coding skills compared to language- and context-dependent skills like marketing; differences in the desirability or prestige of fields across ethnic groups; and other factors. There is also competition among students within U.S. schools: high rates of foreign student enrollments in STEM fields can reduce native student enrollments, especially for women (Orrenius and Zavodny 2015; Anelli, Shih, and Williams 2023).

Alongside this specialization in coursework, immigrants specialize by occupation in the workplace (Peri and Sparber 2009, 2011; Patel and Vella 2013). They are disproportionately in occupations that involve STEM work and patenting (Hunt and Gauthier-Loiselle 2010; Kerr and Lincoln 2010; Bernstein et al. 2022). While the patterns mirror each other, research linking student activities/visas to future workplace outcomes is rare (Hunt 2011). Consequently, as programs like the H-1B visa simultaneously draw workers educated domestically and abroad, the job pathway for students coming out of U.S. schools remains unclear.

Hiring based upon field of study can yield differences across economic sectors and firm size. Degree fields and their linked occupations are unevenly spread across firms, and activities

like R&D and patenting are disproportionately done by larger firms (Cohen and Klepper 1996; Akcigit and Kerr 2018), suggesting this factor may matter more among larger firms and MNEs.

Hypothesis 2a (Degree Specialization Alignment): The degree specializations of immigrant students explain differences in future job placements across sectors and firm sizes.

Hypothesis 2b (Degree Specialization Direction): Differences due to degree specialization matter more for job placements among larger firms and MNEs than small firms.

Firm Capabilities and Job Placements

Many immigrants require a work visa like the H-1B. Prospects for getting U.S. visas shape student enrollments (Kato and Sparber 2013; Shih 2016), and immigrant-dependent employers are sensitive to U.S. policy (Hunt 2011; Kerr, Kerr and Lincoln 2015; Bahar, Glennon and Choudhury 2020; Brinatti et al. 2024). As the United States uses an employer-driven system for much of its work-oriented migration, the institutional capacity of firms to sponsor work visas shapes immigrant job placement.

These capabilities often depend upon the size of a firm. Larger companies can spread the fixed costs of HR functions over more employees, improving the return from engaging in visas. There is also randomness in who receives an H-1B visa, as demand vastly outstrips a fixed visa supply, resulting in a lottery. Larger companies that apply for visas for multiple students can better handle this randomness and similar features (Doran, Gelber and Isen 2022; Morales 2025). Beyond this size dimension, innovative firms working in technical fields may disproportionately pursue visas.

Hypothesis 3a (Firm Capabilities Alignment): The institutional capabilities of firms to sponsor visas explain differences in future job placements across sectors and firm sizes.

Hypothesis 3b (Firm Capabilities Direction): Differences due to firm capabilities matter more for job placements among larger firms and MNEs than small firms.

Ethnic Self-Employment and Job Placement

Ethnic self-employment is a cornerstone of migration scholarship. Immigrants enter self-employment and entrepreneurship disproportionately (Fairlie and Lofstrom 2013; Kerr and Kerr 2020; Azoulay et al. 2022; Chodavadia et al. 2024). Seminal work conceptualizes co-ethnic entrepreneurship as both a response to labor market exclusion and an autonomous strategy rooted in ethnic bonds/networks (Light 1972; Portes and Sensenbrenner 1993; Waldinger, Aldrich, and Ward 1990). Further studies describe how ethnic group-specific traditions, occupations, and capital endowments shape self-employment (Clark and Drinkwater 2000; Kloosterman and Rath 2001; Zhou 2004; Kerr and Mandorff 2024). Classic examples of ethnic specialization include Vietnamese nail care salons, Korean dry cleaners, and Gujarati Indian motels (Kalnins and Chung 2006).

Ethnic specialization extends to college-educated workers. Immigrant-founded ventures cluster within high-tech sectors (Saxenian et al. 2002; Brown et al. 2020), and an extensive literature documents the strength of immigrant networks for finding jobs. U.S. schooling links to immigrant entrepreneurship (Amornsiripanitch et al. 2023). Moreover, even highly educated immigrants may face credential devaluation or visa limitations that restrict entry into mainstream firms (Wadhwa et al. 2009; Oreopoulos 2011; Marinoni 2023), thereby increasing reliance on

ethnic networks and entrepreneurship. Self-employment also reflects deliberate choices to build transnational businesses (Saxenian 2006).

Hypothesis 4a (Ethnic Specialization Alignment): How immigrant ethnic groups specialize for entrepreneurship explains differences in future job placements across sectors and firm sizes.

Hypothesis 4b (Ethnic Specialization Direction): Differences due to ethnic specialization matter more for job placements among small firms than larger firms.

Immigrant Student and Job Placement into Extremes of Firm Size Distribution

The four mechanisms predict immigrant students sort into jobs unevenly across sectors and firm sizes. Isolating firm size, they jointly predict placement of immigrant college students into the extremes of U.S. firm sizes compared to native peers. They also predict a greater likelihood of working in a MNE.

Hypothesis 5 (Firm Size Distribution Extremes): Immigrant students are more likely than their native peers to take jobs in small or large firms, being disproportionately under-represented in the middle. Immigrants are also more likely to work in MNEs.

Career Earnings of Immigrant Students

The four mechanisms do not yield predictions regarding career earnings. International students display high academic strength (Chen, Howell, and Smith 2023), and the self-selection of students who stay for work suggests a floor to observed earnings (Borjas 1987; Borjas and Bratsberg 1996; Lubotsky 2007). Larger firms generally pay better wages (Brown and Medoff

1989). Yet, the selection margin may be weak for students from poorer countries, and studies debate whether H-1B workers, for example, are underpaid compared to native peers (Doran, Gelber and Isen 2022). In the case of degree competition, the crowding-out is neutral with respect to earnings (Orrenius and Zavodny 2015; Anelli, Shih and Williams 2023).

This ambiguity prevents a clear hypothesis about relative future earnings of immigrant versus native students. We nonetheless analyze career earnings as they provide important context for interpreting findings. The literature on labor market segmentation often emphasizes blocked opportunities and weaker jobs for immigrants. Segmentation among college-educated workers may be benign or even beneficial.

3. Data

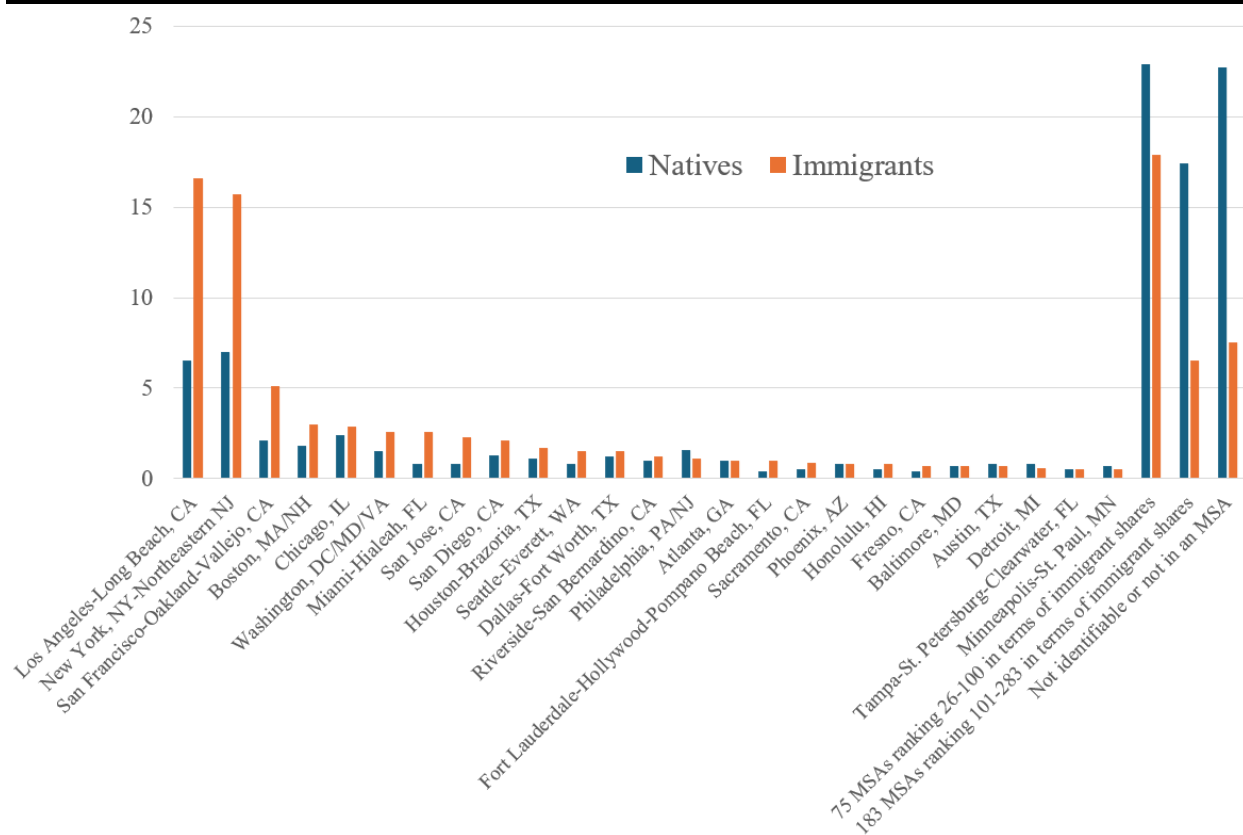
We combine the 2000 Decennial Census (Census), the 2001-20 Longitudinal Employer Household Dynamics files (LEHD), and the 2001-20 Integrated Longitudinal Business Database (ILBD). The Census identifies college students in 2000, and the LEHD and ILBD measure their future paid and self-employment work, respectively.

The long-form Census surveys one in six of the population in 2000, and we restrict to individuals aged 19-25 who are attending college as undergraduates. We group students into four categories: native citizens, immigrant citizens, non-citizen immigrants who arrive in the United States before the age of 17, and non-citizen immigrants who arrive at age 17 or older. Many in this last group are migrating for college itself. We separate citizen versus non-citizen immigrants given citizens have greater U.S. attachment and full work authorization.

The 2000 Integrated Public Use Microdata Series (IPUMS) files provide descriptive statistics comparable to our internal sample. Among immigrant college students, 36.7% arrived in the United States by age 10 and 62.2% by age 16. The most common age at arrival is 18. Among native students, 58.3% are women and 23.2% live in a dorm. Immigrant shares on these dimensions are modestly lower at 54.1% and 12.9%, respectively. Immigrants who arrived at 17 and older are the most likely among immigrant students to live in dormitories.

Figure 2 describes the spatial distribution of students in the IPUMS files, showing the top 25 locations of immigrant students. Immigrant students are twice as likely as natives to be in Los Angeles, New York City, and San Francisco and are much less likely to be studying outside of a metro area (e.g., a rural college).

Figure 2: Geographic locations of undergraduate students at U.S. colleges and universities, 2000

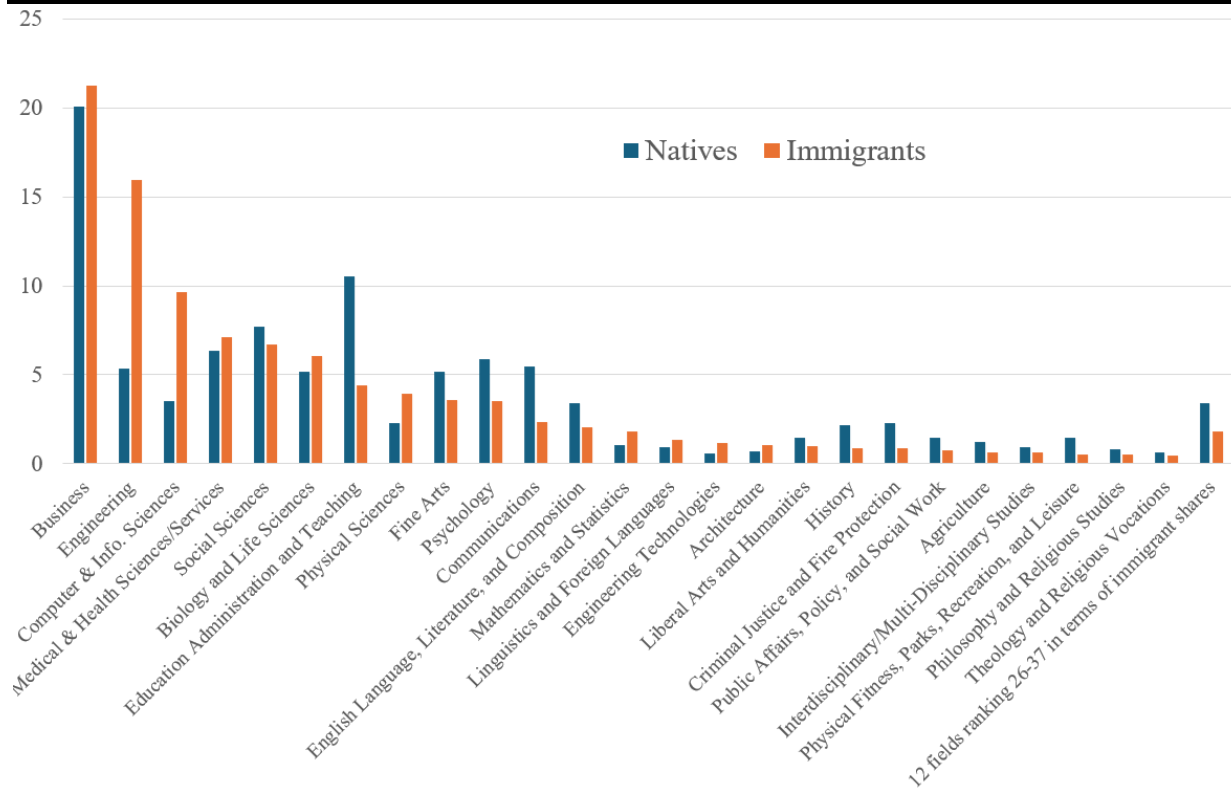


Notes: Figure developed with the 2000 Decennial Census. Individuals in the sample are 19-25 years old, attending college as undergraduates, and show limited work activity (i.e., work for 20 hours or fewer and make \$20,000 or less). The top 25 locations of study for immigrants are shown in descending order of their share of immigrant students. Contemporaneous native student shares are also provided.

While the 2000 Census did not collect information on degree fields, the American Community Survey (ACS) begins doing so in 2010. We use the ACS to approximate fields of study for students in 2000. Specifically, we measure from the 2010-19 ACS the degree fields of college-educated immigrants by place of birth who arrived in the United States before 2000 and would have been aged 19-25 in 2000. This is not a perfect representation of the 2000 student population as, for example, it does not include students in 2000 who left the United States before 2010. Nevertheless, the metric captures major differences across places of birth.

Figure 3 shows the top 25 fields of study for immigrants, along with comparable native shares. Immigrant students disproportionately study engineering and computer sciences, while being underrepresented in degree fields like education, fine arts, psychology, and communications.

Figure 3: Estimated degree specialization for undergraduate students at U.S. colleges and universities, 2000



Notes: Figure developed with the 2010-19 American Community Surveys. Individuals in the sample match our 2000 college student sample in terms of education, age, and year of arrival to the United States. The top 25 fields of study for immigrants are shown in descending order of their share of immigrant fields of study. Contemporaneous native student shares are also provided.

We next link students to their future jobs, focusing on students in 25 states where our project has detailed LEHD data for 2001-20. Our sample represents about half of the country, equally drawn from large and small states. We use 32 LEHD places of birth that specify individual countries with many immigrants to America (e.g., Mexico, Germany) with some regional blocks (e.g., Middle East and North Africa). Online Appendix B provides a full list of LEHD states and places of birth, additional details on data development, analyses of national employment rates, and extended descriptive statistics.

Table 1: Descriptive statistics on 2001-20 work patterns of college students in 2000

	Patterns among immigrant students				
	Natives	Immigrants	Citizen immigrants	Non-citizen	Non-citizen
				immigrants, arrival in U.S. by age 16	immigrants, arrival in U.S. at age 17+
	(1)	(2)	(3)	(4)	(5)
Observations	223,000	24,000	9,300	8,800	6,100
Share of sample	0.903	0.097	0.038	0.036	0.025
Share of quarters worked 2001-20 by firm size (sum to 100% in column):					
1-20 employees	0.150	0.182	0.176	0.182	0.191
21-100 empl.	0.140	0.136	0.131	0.135	0.146
101-1,000 empl.	0.226	0.197	0.194	0.200	0.194
1,001-10k empl.	0.221	0.196	0.198	0.198	0.189
10,000+ empl.	0.263	0.290	0.301	0.286	0.279
Share of quarters worked 2001-20 by sector (sum to 100% in column):					
Goods producers	0.103	0.115	0.107	0.114	0.129
Low-skill services	0.239	0.227	0.214	0.241	0.227
High-skill services	0.303	0.367	0.374	0.354	0.374
Health/education	0.319	0.242	0.262	0.241	0.214
Share of quarters worked 2001-20 by firm trait:					
Multi-nationals	0.189	0.240	0.240	0.235	0.249
High-tech	0.049	0.093	0.092	0.080	0.112
Average annualized earnings in LEHD when working (\$2000):					
2001-05	\$25,780	\$28,940	\$30,780	\$25,930	\$30,010
2006-10	\$36,330	\$41,670	\$44,350	\$38,360	\$42,280
2011-15	\$45,610	\$52,920	\$56,020	\$48,480	\$54,550
2016-20	\$55,620	\$65,270	\$68,860	\$59,500	\$67,900

Notes: Table describes career trajectories of students among 25 LEHD states included in this project. The sample includes individuals attending college aged 19-25 in the 2000 Decennial Census who work at least two quarters during 2001-20. Share values indicate share of employment worked in indicated type of firm, weighting individuals equally regardless of labor force attachment. Dollar values are expressed in real 2000 dollars. Average quarterly earnings for an individual are annualized and winsorized at 1%/99% values. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

Table 1 provides descriptive statistics. Column 1 considers native students, Column 2 considers immigrant students, and Columns 3-5 separate immigrants based upon citizenship status and age at arrival. The first row provides observation counts (rounded per Census Bureau disclosure rules), and the second row shows that immigrants are 9.7% of our sample. The next two blocks measure shares of quarters employed by firm size and broad economic sector. For each column and block, these shares sum to 100%. Additional tabulations consider MNE status and high-tech sectors. Descriptively, immigrants hold more jobs in firms of extreme sizes and MNEs. Immigrants are also less engaged in health/education firms but more employed in high-tech sectors. The final block provides average annualized LEHD earnings expressed in real 2000 dollars. Immigrant students who remain in the United States have higher average earnings than native peers.

4. Methods and Estimation Strategy

Analysis of Alignment Hypotheses

Hypotheses 1a, 2a, 3a, and 4a predict four mechanisms will explain the sectors and firm sizes where immigrants take jobs. To test these hypotheses, we analyze the 2006-10 job placements of immigrant students in 2000 from various places of birth compared to their native peers.

We organize our data into cells that are the full interaction of 18 sectors s , 5 firm size categories f , and 32 places of birth b . Sectors are organized around two-digit NAICS2 codes, dropping NAICS2 11 (Agriculture, Forestry, Fishing and Hunting) and 92 (Public Administration) that are not well covered by the LEHD. Firm size categories are 1-20, 21-100, 101-1,000, 1,001-10,000, and 10,000+ employees. Places of birth follow LEHD definitions.

Dependent Variable: $Job\%_{sfb}^{06-10}$ measures the share of jobs taken in 2006-10 in sector s and firm size f by immigrant students from place of birth b who attended college in 2000. That is, the sum over sector and size category shares of a given place of birth is 100%, or $\sum_{sf} Job\%_{sfb}^{06-10} = 1 \forall b$. Shares are measured in 2006-10 to provide time for students in 2000 to finish schooling and begin careers. Job placement is measured among our covered LEHD states, and individuals are given equal weight conditional on two quarters or more of work during 2006-10.

Independent Variables: Separate metrics test each hypothesis.

H1 Geographic Clustering: We measure the explanatory power of geographic clustering by calculating the expected $Job\%_{sfb}^{Geo}$ for a place of birth b based upon where those students attend school in 2000. Conceptually, our measure proxies what the sector and firm sizes of jobs will be if students take a job at random from the Core Based Statistical Area (CBSA) where they are studying. More precisely, if a student was studying in a CBSA, we take the sector-size distribution

of college-educated workers aged 27-33 in 2000 working in that same CBSA. If a student was not studying in a CBSA (e.g., residing in a small college town), we take the sector-size distribution of college-educated workers aged 27-33 in 2000 for their state of study excluding CBSA areas. This measure does not contain ethnic-specific features except spatial differences in where students attend college. Formally,

$$Job\%_{sfb}^{Geo} = \sum_c Student\%_{cb}^{2000} * Job\%_{sfc}^{2000} \quad (1)$$

where c indexes CBSAs and non-CBSA regions of states, $Student\%_{cb}^{2000}$ describes the spatial layout of students from place of birth b in 2000 (summing to 100% across c), and $Job\%_{sfc}^{2000}$ describes the sector-size job distribution of college-educated workers aged 27-33 in 2000 working in CBSA c (summing to 100% across sectors and sizes for each c).

H2 Degree Field Alignment. We measure the explanatory power of education fields by first calculating the typical job placement by sector and firm size for degree fields. We then weight these sector-size distributions by the extent to which students from a place of birth specialize in various fields of study. This approach parallels the geographic clustering predictor, except using fields of study rather than cities of study. This measure does not contain ethnic-specific features except differences in their college degree choices. Formally,

$$Job\%_{sfb}^{Degree} = \sum_d Student\%_{db}^{2000} * Job\%_{sfd}^{2010} \quad (2)$$

where d indexes fields of study captured by the ACS, $Student\%_{db}^{2000}$ describes the field of study distribution from place of birth b in 2000 as proxied by the later ACS files (summing to 100% across d), and $Job\%_{sfd}^{2010}$ describes the sector-size job distribution of college-educated workers with those degrees (summing to 100% across sectors and sizes for each d). The superscript 2010 denotes the later origin of these data.

H3 Firm Capabilities. We measure the institutional capabilities of firms to support immigrants by quantifying the rate at which firms of different sizes and sectors supported newly arrived immigrants who had already finished their educations when arriving. We specifically isolate in the 2000 Census the non-citizen immigrants who arrived during 1996-2000 aged 27-33 with a college education. Most of these immigrants need work visas, and the sample does not overlap with our focal college students. We quantify the explanatory power of firm capabilities, represented as $Job\%_{sfb}^{Visa}$, as the share in 2000 of these older immigrants by sector and firm size. This measure is not specific to places of birth, being the same for all immigrant groups.

H4 Ethnic Self-Employment Specialization. We measure this predictor $Job\%_{sfb}^{Entr}$ from the ILBD as the sector-size distribution of self-employed workers in 2000 for each place of birth b , including all ages and educations. Self-employment activity is only in the smallest size category, so the variation across places of birth is by sector. This is our most ethnic-specific metric.

Control Variables. We include a baseline control $Job\%_{sf}^{06-10,Natives}$ that measures the job placements in 2006-10 of native students in 2000. This metric partials out where native students are taking jobs, focusing independent variables on differences. We also include fixed effects for sector, size category, and place of birth.

Regression Model. We employ models of the form,

$$\begin{aligned}
 Job\%_{sfb}^{06-10} = & \gamma^{Geo} Job\%_{sfb}^{Geo} + \gamma^{Degree} Job\%_{sfb}^{Degree} + \gamma^{Visa} Job\%_{sfb}^{Visa} \\
 & + \gamma^{Entr} Job\%_{sfb}^{Entr} + \gamma^{Baseline} Job\%_{sf}^{06-10,Natives} \\
 & + \lambda_s + \lambda_f + \lambda_b + e_{sfb},
 \end{aligned} \tag{3}$$

where s indexes sectors, f indexes firm sizes, and b indexes places of birth. The γ coefficients measure the explanatory power of our mechanisms through variation over places of birth. All metrics sum to 100% for a place of birth, such that each γ coefficient can be interpreted as how

much a 1% higher predicted placement for an immigrant student group into a sector-size category links to a realized higher rate of job placement in 2006-10 in percentage point terms.

We weight observations by the triple interaction of the log total employment in the sector, the log total employment in the firm size category, and the log total employment of students from the place of birth. This approach emphasizes naturally larger cells. For example, it emphasizes services more than mining, larger firms more than mid-sized firms, and larger sending countries in 2000 more than smaller countries. By not using actual placements, we avoid over emphasizing potentially endogenous outcomes. Estimations report robust standard errors.

Analysis of Direction Hypotheses

Hypotheses 1b, 2b, 3b, and 4b predict where in the firm size distribution and MNE status each mechanism should play a stronger role. We test size predictions using split samples of model (3). The MNE prediction is tested by re-calculating the DV $Job\%_{sfb}^{06-10}$ with jobs by MNE status, which can fall into all sectors and sizes.

Analysis of Job Placements into the Extremes of the Firm Size Distribution

Hypothesis 5 predicts immigrant students will spend more time working at the extremes of the firm size distribution and in MNEs. We test this through individual-level analyses of the college students in 2000 and their subsequent careers.

Dependent Variable: $Quarters\%_i^{sz,01-20}$ measures the share of quarters worked over the 2001-20 period by student in three firm size categories (1-100, 101-10,000, and 10,001+ employees); these three shares sum to 100% for each person. An additional metric measures the share of quarters spent working in MNEs during 2010-20.

Independent Variables: Three indicator variables model the student being a citizen immigrant, non-citizen younger arrival, and non-citizen older arrival. The omitted category is native students.

Control Variables. Regressions include indicator variables X for an individual's gender, race, age, and CBSA in 2000.

Regression Model. We employ analyses of the form,

$$\begin{aligned}
 Quarters_{0i}^{sz,01-20} &= \gamma_1(0,1)Citizen\ Immigrant_i \\
 &+ \gamma_2(0,1)Noncitizen\ Immigrant\ Younger\ Arrival_i \\
 &+ \gamma_3(0,1)Noncitizen\ Immigrant\ Older\ Arrival_i + \beta X_i \\
 &+ \epsilon_i,
 \end{aligned} \tag{4}$$

where i indexes individuals.

We weight individuals by the number of quarters worked 2001-20. Regressions report robust standard errors.

5. Results

Analysis of Alignment and Direction Hypotheses

Table 2 considers each mechanism in isolation. All factors show explanatory power, with degree specialization being the most prominent for explaining group differences. In the bottom row, the baseline native job placement regressor also maintains good explanatory power. In the fifth estimation with just the fixed effects and the native job placement control, there is a 0.7 correlation of immigrant and native job placements. In the presence of our four mechanisms, and especially firm capabilities/visas, this control's role declines significantly.²

The first column of Table 3 shows our preferred estimation using model (3). We find support for H1a, H2a, H3a, and H4a—each mechanism explains differences in how immigrant college students in 2000 subsequently took jobs in sectors and firm sizes compared to peers. Degree specialization again has the strongest explanatory power across groups. A one-percentage-point increase in this metric links to a 0.54-percentage-point increase in realized job placement. This measure is followed by geographic clustering, which explains a 0.22-percentage-point differential in job placement. By contrast, firm capabilities/visas and ethnic self-employment specialization have less explanatory power for group differences.

² To test robustness of the degree specialization, a second metric uses the sector-size distribution of occupations in 2000 among college-educated workers aged 27-33 in 2000. The occupational alignment predictor has a 0.3152*** correlation with job placements conditional on the native job placement control and fixed effects.

Table 2: Single-factor analysis of job placements during 2006-10 of immigrant college students in 2000

	Dependent Variable: Share of immigrant students in 2000 by place of birth who are working during 2006-10 in sector x firm size cell				
	(1)	(2)	(3)	(4)	(5)
H1 Geographic clustering	0.4898*** (0.041)				
H2 Degree specialization		0.6919*** (0.045)			
H3 Firm capabilities/visas			0.2456*** (0.028)		
H4 Ethnic self-employment				0.0196*** (0.007)	
Native placement, 2006-10	0.5260*** (0.029)	0.5991*** (0.027)	0.2039*** (0.040)	0.6915*** (0.025)	0.7040*** (0.025)
Sector, firm size, and POB FE	Yes	Yes	Yes	Yes	Yes
Observation count	2,900	2,900	2,900	2,900	2,900

Notes: Regressions examine job placement predictors for immigrant students in isolation. The dependent variable is the share of immigrant students in 2000 by place of birth who are working during 2006-10 in sector x firm size cell. Regressions control for peer native student placements and include fixed effects for sector, firm size category, and place of birth. Regressions are weighted by a triple interaction of log workers in the ethnic group, the sector, and the firm size category. Regressions report robust standard errors. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

Column 2 uses an alternative weighting strategy that weights each cell by the realized number of immigrant college students taking jobs in that sector-size category from each place of birth. This approach provides similar outcomes.

Columns 3-4 of Table 3 split the sample by firm size to test the four direction hypotheses. Column 3 considers firms with more than 20 employees, dropping the ethnic self-employment metric since it is only non-zero among small firms. Degree specialization maintains a comparable role as in the full sample, while geographic clustering becomes more important. The role of firm capabilities/visas remains the same as Column 1.

Table 3: Multi-factor analysis of job placement during 2006-10 of immigrant college students in 2000

	Baseline analysis of job placements (1)	Alternative weights (2)	Job placement among larger companies with more than 20 employees (3)	Job placement among small companies with 20 or fewer employees (4)	Job placement among multi- national companies (5)	Job placement among non-multi- national companies (6)
Dependent Variable: Share of immigrant students in 2000 by place of birth who are working during 2006-10 in sector x firm size cell						
H1 Geographic clustering	0.2233*** (0.046)	0.2220*** (0.046)	0.4652*** (0.071)	-0.0571 (0.531)	0.2763*** (0.106)	0.2544*** (0.050)
H2 Degree specialization	0.5422*** (0.049)	0.6403*** (0.041)	0.5631*** (0.064)	0.1687 (1.155)	1.2730*** (0.115)	0.3377*** (0.054)
H3 Firm capabilities/visas	0.1195*** (0.029)	0.0680*** (0.025)	0.1306*** (0.037)		-0.0173 (0.067)	0.0898*** (0.032)
H4 Ethnic self-employment	0.0120* (0.006)	0.0289*** (0.006)		0.2061*** (0.048)	-0.0383*** (0.015)	0.0213*** (0.007)
Native placement, 2006-10	0.1722*** (0.040)	0.1432*** (0.035)	0.1442** (0.060)		-0.1156 (0.094)	0.2805*** (0.044)
Sector, firm size, and POB FE	Yes	Yes	Yes	Yes	Yes	Yes
Weighting	Base	Adjusted	Base	Base	Base	Base
Observation count	2,900	2,900	600	2,300	2,900	2,900

Notes: Column 1 provides the baseline multi-factor analysis. This regression and Columns 3-6 are weighted by a triple interaction of log employment in the ethnic group, the sector, and the firm size category. Column 2 weights observations using log count of immigrant students from place of birth who are working during 2006-10 in the sector and firm size cell. Columns 3 and 4 quantify factors explaining job placements among large and small firms, respectively. Columns 5 and 6 quantify factors explaining job placements within and outside of multi-nationals, respectively. Explanatory regressors in Columns 3-6 are kept the same as baseline analysis. Regressions report robust standard errors. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782. FY25-P2766-R12183.

Column 4 alternatively examines job placements among firms with 20 or fewer employees.

We exclude the firm capabilities regressor as, with one firm size bin, it is fully captured by sector fixed effects; we similarly drop the native baseline. Among small firms, job placements are almost

entirely linked to self-employment specialization exhibited by ethnic groups, with no role evident for geographic clustering nor degree specialization.

Columns 5 and 6 measure outcome variables using the MNE status of employers. For jobs within MNEs, degree fields are by far the strongest predictor of immigrant placement. Potential examples include accounting degrees linked to Deloitte and PWC or technical degrees to Apple and Siemens. Geographic clustering has a measured role. Firm capabilities/visas do not matter for these jobs, in large part because MNE firms tend to draw from similar sectors and size bins. For students who are not working in MNEs, the best predictors are contemporaneous native placements, reflective of the underlying distribution of activity, and degree fields and geographic clustering, in relatively equal contributions.

Among our direction hypotheses, we find good support for H1b and H2b about geographic clustering and degree specialization being important for placements among larger firms and multinationals. While there is some support for H3b regarding firm capabilities/visas mattering within larger firms, especially in Table 2, this mechanism explains little of group differences. Finally, we find support for H4b regarding the strength of ethnic self-employment specialization for job placement among small firms.

Analysis of Overall Job Placements in the Firm Size Distribution

Tables 4 reports the outcomes with model (4). Over the 20-year period, immigrant college students spend 2.4%-4.5% fewer quarters in mid-sized firms compared to natives. Immigrants also spend 3.4%-6.0% more quarters working in MNEs. These results confirm H5 and further show the shift towards work in small firms comes disproportionately through immigrants arriving at older ages. These patterns are robust to weighting individuals equally regardless of quarters worked, to

adjustments in sample inclusion criteria, and to conducting matched sample analyses that pair natives and immigrants attending school on observable traits.

Table 4: Share of quarters worked during 2001-20 by firm size and MNE status

	Dependent variable in regressions:			
	Share quarters worked in firms with 1-100 employees	Share quarters worked in firms with 101-10,000 employees	Share quarters worked in firms with 10,000+ employees	Share quarters worked in multi-national firms (2010-20)
	(1)	(2)	(3)	(4)
	Reference category is career trajectories of native students			
(0/1) Citizen immigrant	-0.0071 (0.004)	-0.0309*** (0.004)	0.0380*** (0.004)	0.0446*** (0.004)
(0/1) Non-citizen immigrant, arrival by age 16	0.0030 (0.004)	-0.0238*** (0.004)	0.0208*** (0.004)	0.0339*** (0.004)
(0/1) Non-citizen immigrant, arrival by age 17+	0.0263*** (0.005)	-0.0454*** (0.005)	0.0191*** (0.005)	0.0599*** (0.005)
Individual controls	Yes	Yes	Yes	Yes
Observation count	247,000	247,000	247,000	202,000
Mean of dependent variable	0.263	0.463	0.274	0.204

Notes: See Table 1. Individual controls include gender, race, age, and CBSA in 2000 dummies. Regressions weight individuals by quarters worked. Regressions report robust standard errors. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

Career Earnings of Immigrant Students

Table 5 provides similar estimates using model (4) of quarters worked and log average annual earnings in the LEHD. Columns 1 and 3 weight individuals equally regardless of labor force attachment; Columns 2 and 4 weight individuals by quarters worked. These estimations confirm the higher average earnings noted in Table 1. Citizen immigrants have an 11% earnings advantage over natives, while conditional differentials for non-citizen immigrants are smaller.

Table 5: Regressions of 2001-20 quarters worked and earnings of college students in 2000

	Quarters worked		Log average annual earnings	
	(1)	(2)	(3)	(4)
Reference category is career trajectories of native students				
(0/1) Citizen immigrant	0.2607 (0.252)	-0.2718 (0.202)	0.1149*** (0.006)	0.1083*** (0.005)
(0/1) Non-citizen immigrant, arrival by age 16	-0.9053*** (0.259)	-0.8784*** (0.212)	0.0032 (0.006)	-0.0121* (0.006)
(0/1) Non-citizen immigrant, arrival by age 17+	-5.124*** (0.305)	-3.584*** (0.264)	0.0228** (0.007)	0.0652*** (0.007)
Individual controls	Yes	Yes	Yes	Yes
Quarters worked weighting		Yes		Yes
Observation count	247,000	247,000	247,000	247,000
Mean of dependent variable	38.3	54.0	10.4	10.6

Notes: See Table 1. This table reports values that aggregate 2001-20 LEHD files. Individual controls include gender, race, age, and CBSA in 2000 dummies. Earnings are winsorized at 1%/99% values. Columns 1 and 3 weight individuals equally regardless of labor force attachment; Columns 2 and 4 weight individuals by quarters worked. Regressions report robust standard errors. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

While Table 5 focuses on paid employment, the Online Appendix reports how immigrant students have higher self-employment earnings than native peers. For example, among workers in 2016-20 who earn most of their income from self-employment, immigrants earn 16% more than natives.

7. Discussion

Immigrant students take up jobs positioned at extremes, being disproportionately present in large, multi-national firms and in self-employment/small firms. We show that immigrant students sort differently than natives across firm types, structured by variation within the immigrant population itself. Four multi-level mechanisms play a role, with degree specialization being the strongest predictor of variations across student groups, especially among large firms and MNEs. Ethnic self-employment specialization, by contrast, best explains job placement among small firms. Co-ethnic market niches remain salient even among U.S.-educated migrants, providing a networked route into employment.

Given the strong earnings achieved by immigrant students, these patterns likely represent productive sorting rather than blocked pathways. Theoretically, we extend segmented labor market accounts by showing that firm size and MNE status are axes—alongside occupation and wages—through which credentialed immigrants are sorted. Because large firms generally pay premia, earnings advantages can coexist with segmentation, refining the welfare implications of dual-market sorting.

Our analysis faces important limitations. While we segment by citizenship and age at arrival, our analysis groups together students who arrived under different legal pathways, including F-1 visas, family-based admissions, and undocumented statuses. These distinctions shape employment trajectories in ways we cannot observe. There are also variations in work authorization, and the time to green card eligibility varies across nationalities, impacting job choices (Gupta 2025). Our macro portrait complements studies of individual visa pathways, and the interactions of employer visa capacity with individual pathways underlies labor market dynamics.

Mechanisms beyond the four we identify may be important. Differences in the qualities and prestige of schools attended by immigrants and natives shape job placement and future access to alumni networks (Rivera 2015). Skilled immigrants often face challenges entering regulated professions like healthcare or law (Kriemer 2024). While we consider U.S. students, some of these classic barriers due to occupational regulations and employer discrimination may contribute to job sorting.

More deeply, our methodology focuses on mechanisms that can be quantified on an equal basis for all groups. This common structure facilitates analysis, but it abstracts from unique elements that shape how immigrant student groups place. For example, students from a culture that deeply values engineering may prioritize jobs at tech firms even if their degrees are in non-technical fields. Similarly, the social meaning of entrepreneurship, expectations around family business succession, and perceived barriers in white-collar workplaces vary across immigrant communities. These unmeasured features shape career ambitions and employer targeting beyond what we quantify. We map macro-patterns of segmentation, a step toward explaining why individuals make career choices.

Our analysis measures realized job placements, and we need to collect more insights about what immigrant students find desirable in MNEs, and vice versa. This paper connects migration and international business studies by theorizing MNEs as structured gateways for early-career immigrants. We treat MNE employment as a destination, though it may also serve as a transitional step in the U.S. labor market. Further work could measure the persistence of jobs and how their sequence impacts skill development (Arellano-Bover 2023).

There could also be an ethnic-specific MNE link, akin to self-employment. Samsung may disproportionately recruit U.S. students from South Korea to enable its international operations.

Its recruiting team may also better recognize talent among Korean students than other MNEs. A Korean student may, in turn, also value an employer headquartered in her country of origin. These channels may help explain why the future careers of immigrant students favor MNEs even more than large companies in general.

Research can further explore why ethnic self-employment specialization continues to matter for college students, ranging from using college to prepare for the work (e.g., business degrees, medicine) to an unfortunate lack of opportunities despite collegiate studies. The literature on first jobs is mixed on whether immigrant careers are enhanced or diminished by joining co-ethnic firms. These studies consider the full immigrant population, and we have much to learn about how early career choices of immigrant college students shape future trajectories. Such an inquiry would help identify the extent to which this study's findings vary systematically across immigrant groups (Fitzsimmons, Baggs and Brannen 2020).

Future work needs to evaluate if the patterns for immigrant students in 2000 hold with later cohorts. Our results are shaped by the economic conditions in the United States and the structure of the global economy when these students left school, both of which change. Moreover, the number of international students has swelled since 2000, and the composition of sending countries evolves. There is more pressure on the U.S. system for students to obtain visas, which could be further exacerbated if international enrollments further increase. These contextual features are important for the generalizability of our findings.

Finally, future work should analyze the professional networks among college students, both immigrants and natives, attending school together using platforms like the LEHD. Our work provides a start, but a strong dataset would isolate specific schools and majors. This research will characterize the education-to-work pathway for immigrants. Substantively, we integrate migration

theory, education-to-work transitions, and firm organization to show how and where U.S.-educated immigrants take up jobs, a template for studying skilled migration in other advanced economies. In labor markets with stronger visa-capable employer infrastructures and STEM-intensive demand, immigrant–native differences in firm size placements may widen, while richer co-ethnic self-employment environments amplify small-firm sorting.

REFERENCES

- Akcigit, U. and W. Kerr. (2018). “Growth Through Heterogeneous Innovations.” *Journal of Political Economy* 126(4): 1374–1443.
- Alba, R. and V. Nee. (2003). *Remaking the American Mainstream: Assimilation and Contemporary Immigration*. Cambridge, MA: Harvard University Press.
- Amornsiripanitch, N., P. Gompers, G. Hu and K. Vasudevan. (2023). “Getting Schooled: The Role of Universities in Attracting Immigrant Entrepreneurs.” *Research Policy*, forthcoming.
- Anelli, M., K. Shih and K. Williams. (2023). “Foreign Students in College and the Supply of STEM Graduates.” *Journal of Labor Economics* 41(2), 511-563.
- Arellano-Bover, J. (2023). “Career Consequences of Firm Heterogeneity for Young Workers: First Job and Firm Size.” *Journal of Labor Economics*, forthcoming.
- Azoulay, P., B. Jones, J.D. Kim and J. Miranda. (2022). “Immigration and Entrepreneurship in the United States.” *American Economic Review: Insights* 4(1), 71-88.
- Bahar, D., N. Carlson and E. Hernandez. (2024a). “Global Palette: The Impact of Immigrant Talent on Multinational Product Strategy.” Working Paper.
- Bahar, D., R. Choudhury, S. Signorelli and J. Sappenfield. (2024b). “Talent Flows and the Geography of Knowledge Production: Causal Evidence from Multinational Firms.” Working Paper.
- Bahar, D., B. Glennon and R. Choudhury. (2020). “An Executive Order Worth \$100 Billion: The Impact of an Immigration Ban's Announcement on Fortune 500 Firms’ Valuation.” NBER Working Paper 27997.
- Beine, M., G. Peri and M. Raux. (2023). “International College Students’ Impact on the US Skilled Labor Supply.” *Journal of Public Economics* 223, 104917.
- Belderbos, R., B. Leten, N.H. Nguyen and M. Vancauteran. (2025). “Multinational Firms and the Quest for Global Talent: Employing (Skilled) Foreign Workers at Home and Abroad.” *Journal of International Business Studies* 56: 151-173.
- Benfratello, L., D. Castellani and A. D'Ambrosio. (2024). “Migration and the Location of MNE Activities: Evidence from Italian Provinces.” *Journal of Regional Science* 64(2), 428-461.
- Bernstein, S., R. Diamond, A. Jiranaphawiboon, T. McQuade and B. Pousada. (2022). “The Contribution of High-Skilled Immigrants to Innovation in the United States.” NBER Working Paper 30797.
- Bonache, J., C. Brewster and V. Suutari. (2001). “Expatriation: A Developing Research Agenda.” *Thunderbird International Business Review* 43(1), 3-20.
- Borjas, G. (1987). “Self-Selection and the Earnings of Immigrants.” *American Economic Review* 77(4): 531–553.
- Borjas, G. and B. Bratsberg. (1996). “Who Leaves? The Outmigration of the Foreign-Born.” *Review of Economics and Statistics* 78(1): 165-176.

- Born, V. (2019). "Getting the Best of Us: Multinational Corporate Networks and the Diffusion of Skill-Selective Immigration Policies." University of Pennsylvania.
- Bound, J., B. Braga, G. Khanna and S. Turner. (2020). "A Passage to America: University Funding and International Students." *American Economic Journal: Economic Policy* 12(1), 97-126.
- Bound, J., B. Braga, G. Khanna and S. Turner. (2021). "The Globalization of Postsecondary Education: The Role of International Students in the US Higher Education System." *Journal of Economic Perspectives* 35(1), 163-184.
- Brinatti, A., M. Chen, P. Mahajan, N. Morales and K. Shih. (2024). "The Impact of Immigration on Firms and Workers: Insights from the H-1B Lottery." SSRN 4431106.
- Brown, J.D., J.S. Earle, M.J. Kim and K.-M. Lee. (2020). "Immigrant Entrepreneurs and Innovation in the US High-Tech Sector." In Ganguli, I., S. Kahn and M. MacGarvie (Eds.), *The Roles of Immigrants and Foreign Students in US Science, Innovation, and Entrepreneurship*, 149-171. Chicago, IL: University of Chicago Press.
- Brown, J.N. and J.L. Medoff. (1989). "The Employer Size–Wage Effect." *Journal of Political Economy* 97(5): 1027–1059.
- Buckley, P.J. and M.C. Casson. (1976). *The Future of the Multinational Enterprise*. Macmillan, London.
- Cantwell, J. and P. Shukla. (2025). "Migrants, Knowledge Connections, and Digital Trade in the Information Age." Working Paper.
- Chen, M., J. Howell and J. Smith. (2023). "Best and Brightest? The Impact of Student Visa Restrictiveness on Who Attends College in the US." *Labour Economics* 84, 102385.
- Chen, M. and Y. Yang. (2024). "The Impact of International Students on US Colleges: Higher Education as a Service Export." Working Paper.
- Chodavadia, S., S.P. Kerr, W. Kerr and L. Maiden. (2024). "Immigrant Entrepreneurship: New Estimates and a Research Agenda." NBER Working Paper 32400.
- Choudhury, P. (2016). "Return Migration and Geography of Innovation in MNEs: A Natural Experiment of Knowledge Production by Local Workers Reporting to Return Migrants." *Journal of Economic Geography* 16(3), 585-610.
- Chiswick, B.R. (1978). "The Effect of Americanization on the Earnings of Foreign-born Men." *Journal of Political Economy* 86(5), 897-921.
- Chiswick, B.R., Y.L. Lee and P.W. Miller. (2005). "A Longitudinal Analysis of Immigrant Occupational Mobility: A Test of the Immigrant Assimilation Hypothesis." *International Migration Review* 39(2), 332-353.
- Clark, K. and S. Drinkwater. (2000). "Pushed Out or Pulled In? Self-Employment Among Ethnic Minorities in England and Wales." *Labour Economics* 7(5): 603–628.
- Cohen, W. and S. Klepper. (1996). "A Reprise of Size and R&D." *The Economic Journal* 106(437): 925–951.
- de Haas, H. (2021). "A Theory of Migration: The Aspirations-Capabilities Framework." *Comparative Migration Studies* 9(8): <https://doi.org/10.1186/s40878-020-00210-4>.

- Doran, K., A. Gelber and A. Isen. (2022). “The Effects of High-Skilled Immigration Policy on Firms: Evidence from Visa Lotteries.” *Journal of Political Economy* 130(10), 2501-2533.
- Fairlie, R. and M. Lofstrom. (2013). “Immigration and Entrepreneurship.” In Chiswick, B. and P. Miller (Eds.), *Handbook of the Economics of International Migration*. Amsterdam: North Holland.
- Fitzsimmons, S.R., J. Baggs and M.Y. Brannen. (2020). “Intersectional Arithmetic: How Gender, Race and Mother Tongue Combine to Impact Immigrants' Work Outcomes.” *Journal of World Business* 55(1), 101-113.
- Florida, R. (2012). *The Rise of the Creative Class—Revisited: Revised and Expanded*. New York: Basic Books.
- Foley, C.F. and W. Kerr. (2013). “Ethnic Innovation and U.S. Multinational Firm Activity.” *Management Science* 59(7), 1529-1544.
- Glennon, B. (2024). “How Do Restrictions on High-Skilled Immigration Affect Offshoring? Evidence from the H-1B Program.” *Management Science* 70(2), 907-930.
- Gupta, A. (2025). “Labor Mobility, Entrepreneurship, and Firm Monopsony: Evidence from Immigration Wait-Lines.” Working Paper.
- Hagan, J., R. Hernandez-Leon and J.-L. Demonsant. (2015). *Skills of the “Unskilled”: Work and Mobility among Mexican Migrants*. Berkeley, CA: University of California Press.
- Hajro, A., D.V. Caprar, J. Zikic and G.K. Stahl. (2021). “Global Migrants: Understanding the Implications for International Business and Management.” *Journal of World Business* 56(2), 101-119.
- Hajro, A., M. Žilinskaitė, C.B. Gibson, P. Baldassari, W. Mayrhofer, C. Brewster and M.Y. Brannen. (2023). “2023: Movement of People across Borders: Transdisciplinary Research to Meet the Challenges in Migration, Business, and Society.” *Academy of Management Discoveries* 9(2), 125-131.
- Hernandez, E. (2014). “Finding a Home away from Home: Effects of Immigrants on Firms’ Foreign Location Choice and Performance.” *Administrative Science Quarterly* 59(1), 73-108.
- Hernandez, E. and E. Kulchina. (2020). “Immigrants and Foreign Firm Performance.” *Organization Science* 31(4), 797-820.
- Holbrow, H. and K. Nagayoshi. (2018). “Economic Integration of Skilled Migrants in Japan.” *International Migration Review* 52(2), 458-486.
- Hou, F. and Y. Lu. (2017). “International Students, Immigration and Earnings Growth: The Effect of a Pre-Immigration Host-Country University Education.” *IZA Journal of Development and Migration* 7(5), 1-24.
- Hunt, J. (2011). “Which Immigrants are Most Innovative and Entrepreneurial? Distinctions by Entry Visa.” *Journal of Labor Economics* 29(3), 417-457.
- Hunt, J. and M. Gauthier-Loiselle. (2010). “How Much Does Immigration Boost Innovation?” *American Economic Journal: Macroeconomics* 2(2), 31-56.

- Kalnins, A. and W. Chung. (2006). "Social Capital, Geography, and Survival: Gujarati Immigrant Entrepreneurs in the U.S. Lodging Industry." *Management Science* 52(2), 233-247.
- Kato, T. and C. Sparber. (2013). "Quotas and Quality: The Effect of H-1B Visa Restrictions on the Pool of Prospective Undergraduate Students from Abroad." *Review of Economics and Statistics* 95(1), 109-126.
- Kerr, S.P. and W. Kerr. (2020). "Immigrant Entrepreneurship in America: Evidence from the Survey of Business Owners 2007 & 2012." *Research Policy* 49(3): 103918.
- Kerr, S.P., W. Kerr and W. Lincoln. (2015). "Skilled Immigration and the Employment Structures of U.S. Firms." *Journal of Labor Economics* 33(S1): S147-S186.
- Kerr, W. (2019). *The Gift of Global Talent: How Migration Shapes Business, Economy & Society*. Stanford University Press, Palo Alto, CA.
- Kerr, W. and W.F. Lincoln. (2010). "The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention." *Journal of Labor Economics* 28(3), 473-508.
- Kerr, W. and M. Mandorff. (2024). "Social Networks, Ethnicity, and Entrepreneurship." *Journal of Human Resources* 58(1), 183-220.
- Kloosterman, R. and J. Rath. (2001). "Immigrant Entrepreneurs in Advanced Economies: Mixed Embeddedness Further Explored." *Journal of Ethnic and Migration Studies* 27(2): 189-201.
- Kriemer, L. (2024). *Highly Skilled Immigrants Face a Changing Landscape for Credential Recognition*. Migration Policy Institute.
- Lee, E.S., S. Johnson and B. Szkudlarek. (2025). "Multi-stakeholder Collaborations: How Multinational Enterprises Can Drive Refugee Employment." Working Paper.
- Light, I. (1972). *Ethnic Enterprise in America: Business and Welfare Among Chinese, Japanese, and Blacks*. Berkeley, CA: University of California Press.
- Light, I. and E. Bonacich. (1988). *Immigrant Entrepreneurs: Koreans in Los Angeles, 1965–1982*. Berkeley, CA: University of California Press.
- Lubotsky, D. (2007). "Chutes or Ladders? A Longitudinal Analysis of Immigrant Earnings." *Journal of Political Economy* 115(5), 820-867.
- Marinoni, A. (2023). "Immigration and Entrepreneurship: The Role of Enclaves." *Management Science* 69(12): 7266–7284.
- Massey, D., et al. (1993). "Theories of International Migration: A Review and Appraisal." *International Migration Review* 19(3): 431-466.
- Mehra, M. and D. Kim. (2023). "Skilled Immigration, Offshoring, and Trade." *Journal of Economic Dynamics and Control* 146.
- Morales, N. (2025). "High-Skill Migration, Multinational Companies and the Location of Economic Activity." *Review of Economics and Statistics* 107(4): 982–996.
- Nee, V. and M. Sanders. (2001). "Understanding the Diversity of Immigrant Incorporation: A Forms-of-Capital Model." *Ethnic and Racial Studies* 24(3): 386–411.

- Obolensky, M., M. Tabellini and C. Taylor. (2023). "Migration, Climate Similarity, and the Consequences of Climate Mismatch." Harvard Business School Working Paper 24-031.
- Open Doors. (2023). *Fast Facts*. Institute of International Education Report.
- Oreopoulos, P. (2011). "Why Do Skilled Immigrants Struggle in the Labor Market? A Field Experiment with Thirteen Thousand Resumes." *American Economic Journal: Economic Policy* 3(4), 148-171.
- Orrenius, P. and M. Zavodny. (2015). "Does Immigration Affect whether U.S. Natives Major in Science and Engineering?" *Journal of Labor Economics* 33 (S1), S79-S108.
- Özgen, C., P. Nijkamp and J. Poot. (2014). "The Impact of Cultural Diversity on Firm Innovation: Evidence from Dutch Micro-Level Data." *IZA Journal of Migration* 2(18).
- Patel, K. and F. Vella (2013). "Immigrant Networks and Their Implications for Occupational Choice and Wages." *Review of Economics and Statistics* 95(4), 1249-1277.
- Peri, G. and C. Sparber. (2009). "Task Specialization, Immigration, and Wages." *American Economic Journal: Applied Economics* 1(3): 135-169.
- Peri, G. and C. Sparber. (2011). "Highly-Educated Immigrants and Native Occupational Choice." *Industrial Relations* 50(3): 385-411.
- Piore, M. (1979). *Birds of Passage: Migrant Labor and Industrial Societies*. Cambridge, UK: Cambridge University Press.
- Portes, A. (1997). "Immigration Theory for a New Century: Some Problems and Opportunities." *International Migration Review* 31(4): 799-825.
- Portes, A. and J. Sensenbrenner. (1993). "Embeddedness and Immigration: Notes on the Social Determinants of Economic Action." *American Journal of Sociology* 98(6): 1320-1350.
- Portes, A. and M. Zhou. (1993). "The New Second Generation: Segmented Assimilation and Its Variants." *Annals of the American Academy of Political and Social Science* 530(1): 74-96.
- Rho, D. and S. Sanders. (2021). "Immigrant Earnings Assimilation in the United States: A Panel Analysis." *Journal of Labor Economics* 39(1), 37-78.
- Rivera, L. 2015. *Pedigree: How Elite Students Get Elite Jobs*. Princeton, NJ: Princeton University Press.
- Ruhs, M. and B. Anderson. (2010). *Who Needs Migrant Workers? Labour Shortages, Immigration, and Public Policy*. Oxford, UK: Oxford University Press.
- Saxenian, A.L. (2006). *The New Argonauts: Regional Advantage in a Global Economy*. Cambridge, MA: Harvard University Press.
- Saxenian, A.L., Y. Motoyama and X. Quan. (2002). *Local and Global Networks of Immigrant Professionals in Silicon Valley*. Public Policy Institute of California.
- Shachar, A. (2006). "The Race for Talent: Highly Skilled Migrants and Competitive Immigration Regimes." *New York University Law Review* 81(1): 148-206.
- Shih, K. (2016). "Labor Market Openness, H-1B Visa Policy, and the Scale of International Student Enrollment in the United States." *Economic Inquiry* 54(1), 121-138.

- Shukla, P. and J. Cantwell. (2018). "Migrants and Multinational Firms: The Role of Institutional Affinity and Connectedness in FDI." *Journal of World Business* 53(6), 835-849.
- Verfürth, P. (2022). "Highly Skilled (Re-) Migrants in Multinational Enterprises: Facilitators of Cross-Border Knowledge Transfers." *Global Networks* 22(3), 447-465.
- Vora, D., S. Fitzsimmons and D. Thomas. (2025). "Unlocking the Potential of Multicultural Migrants in Multinational Enterprises: Cultural Brokering Scale Development and Validation." Working Paper.
- Wadhwa, V., A.L. Saxenian, B. Rissing, and G. Gereffi. (2009). *America's Loss Is the World's Gain: America's New Immigrant Entrepreneurs, Part IV*. Durham, NC: Duke University.
- Waldinger, R. (1996). *Still the Promised City? African-Americans and New Immigrants in Postindustrial New York*. Cambridge, MA: Harvard University Press.
- Waldinger, R., H. Aldrich and R. Ward. (1990). *Ethnic Entrepreneurs: Immigrant Business in Industrial Societies*. Newbury Park, CA: Sage Publications.
- Waldinger, R. and M. Lichter. (2003). *How the Other Half Works: Immigration and the Social Organization of Labor*. Berkeley, CA: University of California Press.
- Waters, M. and T. Jiménez. (2005). "Assessing Immigrant Assimilation: New Empirical and Theoretical Challenges." *Annual Review of Sociology* 31: 105–125.
- Winders, J. (2006). "New Immigrant Destinations in Global Context." *International Migration Review* 40(4): 803-819.
- Zhou, M. (1997). "Segmented Assimilation: Issues, Controversies, and Recent Research on the New Second Generation." *International Migration Review* 31(4): 975–1008.
- Zhou, M. (2004). "Revisiting Ethnic Entrepreneurship: Convergencies, Controversies, and Conceptual Advancements." *International Migration Review* 38(3): 1040–1074.

POSITIONED AT EXTREMES: FUTURE JOB PLACEMENTS OF IMMIGRANT STUDENTS AT U.S. COLLEGES*

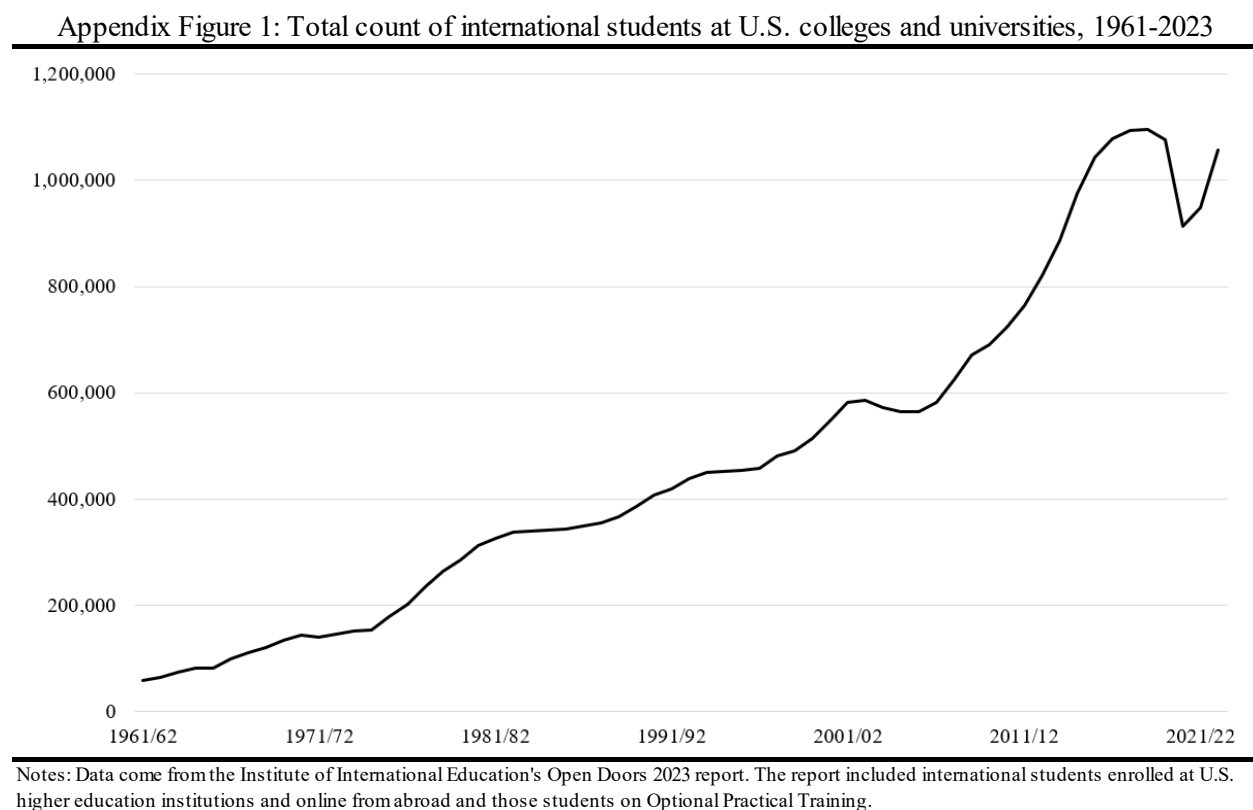
October 2025

Online Appendices

* The research in this paper was conducted while the authors were Special Sworn Status researchers of the U.S. Census Bureau. Any views expressed are those of the authors and not those of the U.S. Census Bureau. The Census Bureau has reviewed this data product to ensure appropriate access, use, and disclosure avoidance protection of the confidential source data used to produce this product. This research was performed at a Federal Statistical Research Data Center under FSRDC Project Number 2766 (CBDRB-FY24-P2766-R11782; FY25-P2766-R12183). This research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by National Science Foundation Grants SES-9978093, SES-0339191 and ITR-0427889; National Institute on Aging Grant AG018854; and grants from the Alfred P. Sloan Foundation.

Online Appendix A: Student Visa Policy in the United States

Studying in a U.S. college or university often provides a pathway to the U.S. labor market, and international students are keenly aware of the prospects of obtaining a student visa as well as the available post-study visa options when making the decision to attend a U.S. school. H-1B visa restrictions make studying in the United States an attractive option as it opens an entry to the IT labor market (Bound et al. 2015). Indeed, the overall number of international students has more than quadrupled since 1980, generating a large pool of revenue for universities educating those students (Shih 2017; Bound et al. 2021). This is especially important for the finances of state public universities, which have benefited from the higher fee payments made by (the increasing number of) international students, during a period of declining state support (Bound et al. 2020). Appendix Figure 1 plots the count of international students.

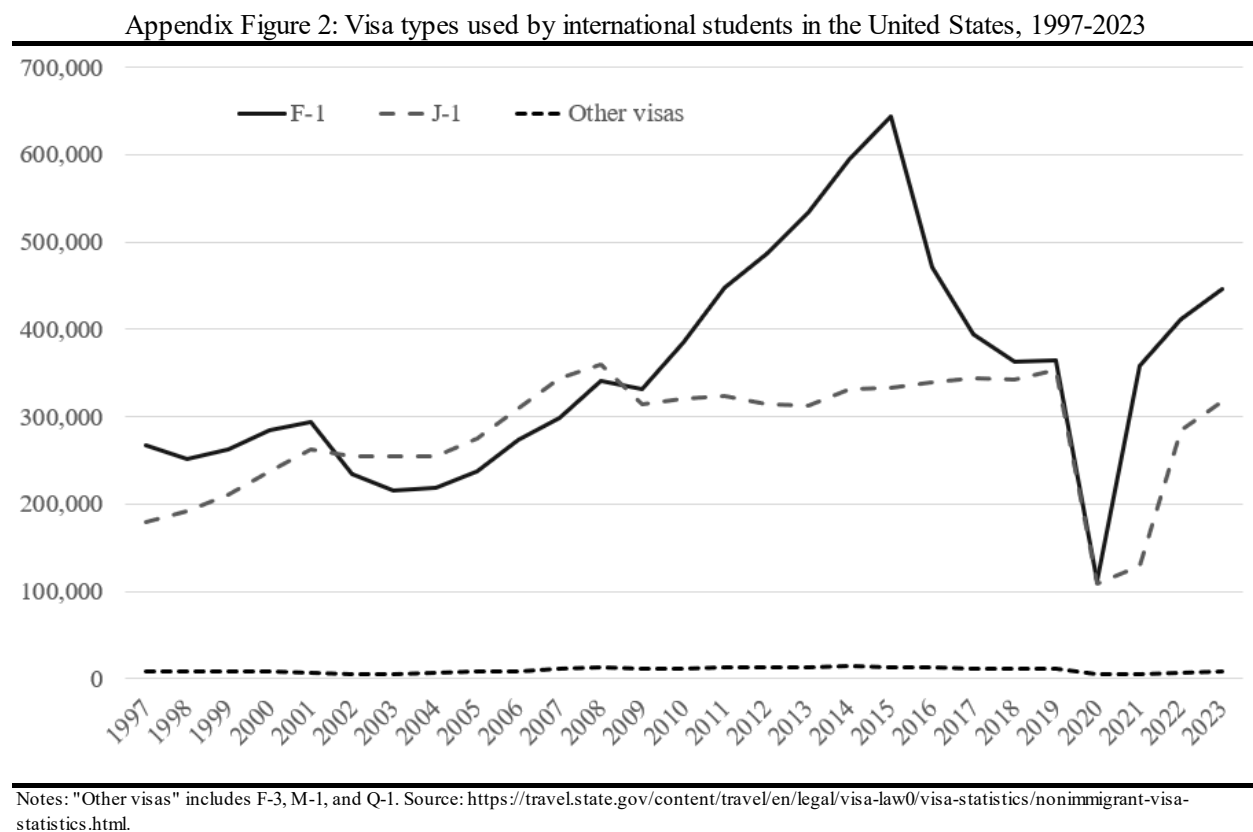


The main visa used by international students is the F-1. In 2023, the United States received 698,773 F-1 visa applications and granted a visa to 445,418 applicants (<https://travel.state.gov/content/travel/en/legal/visa-law0/visa-statistics/nonimmigrant-visa-statistics.html>). Unlike the skilled work visa (H-1B), the F-1 does not have an official cap, yet the rejection rate tends to vary between 15%-28% (Chen, Howell, and Smith 2023). J-1 visas are also used by international students for the purpose of participating in academic exchange programs (e.g., to complete a post-doc at a U.S. university). The number of J-1 visas is also not capped, although there are limitations on the length of the visa (maxing out at 36 months for STEM-related programs) and in some cases requirements that a student return to their home country for a specified period. Appendix Figure 2 shows the number of approved visas in the main visa categories utilized by international students. The COVID-19 pandemic caused a major drop in applications and approvals of all kinds of visas, but the F-1 visa counts have now returned to the pre-pandemic level, with the J-1 visas still lagging somewhat.

Unlike uncapped student and academic visitor visas, work visa options for international students graduating from U.S. universities have become more limited. Students with an F-1 visa are eligible for the Optional Practical Training (OPT) work authorization that allows them to remain working in the United States for 12 months upon completion of their degree (with a potential extension of 24 months for those whose degree is from a STEM field).

During the OPT period, many seek to obtain an H-1B visa for skilled employees in “specialty occupations.” The student’s employer will sponsor the H-1B visa, and the visa is (at least initially) tied to a specific job/employer. Given that H-1B visa applications are submitted in March-April of each year for employment that begins in October, students who have an active or approved H-1B petition are eligible for an H-1B Cap Gap Extension until the H-1B start date. Up

to 65,000 H-1B visas are issued to private sector employers, with universities, colleges, and non-profit or government research organizations not subject to this cap. An additional 20,000 visas are issued to applicants with an advanced degree from a U.S. university.



In some cases, the O-1 visa (Individuals with Extraordinary Ability or Achievement) can also be an option for the international students seeking to remain in the United States, yet the number of those visas granted is much smaller than the H-1B visa (e.g., 18,994 O-1 visas in 2023). In short, the post-study visa options are generally much more limited relative to the number of F-1 and J-1 visas granted.

Online Appendix B: Empirical Appendix

Data Preparation

The Census identifies students attending college in the year 2000, with several studies affirming accuracy for student populations (Bauman and Graf 2003; Day and Jamieson 2003; Ruggles et al. 2021). From the Census we collect information on the student's citizenship status, place of birth, age, and location while attending school. We only observe citizenship status in 2000 and hold that value fixed, understanding that some later become citizens. As the Census does not collect full- versus part-time engagement at school, we require limited contemporaneous work activity (i.e., max of 20 hours/week and \$20,000 income). Our results are robust to samples that include anyone attending college, regardless of hours worked, or requiring zero contemporaneous work (including summer jobs and part-time efforts).

The LEHD data collects earnings information from unemployment insurance records for 95% of workers in our 25 covered states. Our sample represents about half of the country, equally drawn from large and small states. Among the five largest states, we have access to records from California and Pennsylvania, but lack Florida, New York and Texas. Our LEHD states include Arizona, California, Colorado, Connecticut, Delaware, Kansas, Maine, Maryland, Massachusetts, Missouri, Montana, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, Pennsylvania, South Carolina, South Dakota, Tennessee, Utah, Virginia, Washington, Wisconsin, and Wyoming. Arizona data begins in Q1 2004, and Massachusetts data begins in Q1 2010.

Our work combines the LEHD's Job History File, Establishment Employer Characteristics File, National Firm Characteristics File, and Individual Characteristics File. We exclude records where individuals have fewer than two quarters of earnings, the average quarterly earnings are less than \$2,000, or there is no establishment that makes up at least half of a person's annual earnings.

These criteria remove individuals weakly connected to the labor market and allow identification of a person's primary place of work. The reported earnings measures include all jobs of workers, aggregating over multiple jobs for workers within a year, and are adjusted for inflation and reported in real 2000 dollars.

We align places of birth around LEHD definitions. The LEHD groups are the United States and its territories (except Puerto Rico), Mexico, the Philippines, Vietnam, India, Germany, Puerto Rico, El Salvador, United Kingdom, Canada, China, South Korea, Taiwan, Guatemala, Japan, Haiti, USSR Core, Jamaica, Colombia, Poland, Iran, Dominican Republic, Italy, and (excluding countries/areas listed above) the regions of Former Socialist Europe, Western Europe, Central Asia, South East Asia, Middle East and North Africa, the Caribbean, Central America, South America, Africa, and Oceania.

The LEHD links a worker to an establishment within the firm (Abowd et al. 2009). We identify a person's main place of work for a year to be where they earn the most. For Table 1 of the main text, we use four primary industry groups based upon 2017 NAICS codes: Goods (NAICS codes 21, 22, 23, 31, 32, 33), Low-Skill Service (44, 45, 48, 49, 71, 72, 81), High-Skill Service (51, 52, 53, 54, 55, 56), and Education and Health (61, 62). We additionally follow Shackelford and Jankowski (2016) to define high-tech firms as those engaged in three-digit NAICS codes 334, 517, 518, and 519 and four-digit NAICS codes 5112 and 5415. This high-tech measure is independent of the four main groups noted above.

We also link LEHD records to firm size and firm identification numbers as present in the Longitudinal Business Database. We then measure in three ways whether a firm has multi-national operations: 1) whether a firm has patents that indicate inventors outside of the United States during 2001-20; 2) whether the firm in Compustat data shows pre-tax foreign income during 2001-20;

and 3) whether the Business R&D Survey from 2008-20 indicates the firm to have overseas employees. We label the firm as an MNE in a year if any of these three conditions are met. Our MNE analysis focuses on the 2010-20 period when all three classification approaches are available.

With respect to 2010-19 ACS data, there is a 98% correlation between the fields of study we measure for the 2000 cohort of students and the fields of study pursued by current immigrant college students in 2010-19. This correlation suggests this field specialization is quite stable during the period of study and, at least for a medium-run timeframe, relatively fixed for immigrant groups.

Sample Inclusion

Table 1 in the main text describes our primary sample built off the covered states and matched 2000 student records. We next position the sample and its properties with some auxiliary data. The LEHD's National Employment Indicator file provides the annual employment status of workers between 2001-20 (but not information on type of employer). This file provides national coverage of most private and non-federal government employment, spanning all 50 states. We construct a series of indicator variables for future employment during five-year periods from 2001 to 2020 to understand the broad work history for each student. Additionally, the ILBD measures whether an individual is self-employed in a non-employer business from personal tax filings. We create a binary variable indicating if a person has any earnings in the ILBD each year and sum the total earnings across all jobs.

Appendix Table 1 provides nationwide descriptive statistics on the 2001-20 jobs of 418,000 college students in 2000. Similar immigrant student shares are evident in the Current Population Survey (Batalova and Fix 2023). We first measure the share of time spent self-employed. We calculate the number of years an individual is observed in self-employment divided by the total

number of years in which the individual is engaged in self-employment or wage work. Immigrants are more likely to be self-employed, and citizenship status appears important for immigrants entering entrepreneurship.

App. Table 1: National employment during 2001-20 of college students in 2000

	Patterns among immigrant students				
	Natives	Immigrants	Citizen immigrants	Non-citizen	Non-citizen
				immigrants, arrival in U.S. by age 16	immigrants, arrival in U.S. at age 17+
	(1)	(2)	(3)	(4)	(5)
Observations	418,000	47,500	16,000	16,500	14,500
Share of total	0.898	0.102	0.034	0.035	0.031
Share self-employed	0.103	0.113	0.121	0.122	0.095
Share present in LEHD national employment indicators file or in ILBD self-employment file:					
2001-05	0.970	0.883	0.947	0.926	0.765
2006-10	0.939	0.836	0.921	0.898	0.672
2011-15	0.895	0.789	0.884	0.855	0.612
2016-20	0.875	0.772	0.863	0.836	0.601

Notes: This table reports national employment rates for all young, full-time college students in the 2000 Decennial Census by combining the 2001-2020 LEHD national employment indicator file and ILBD self-employment files. Citizenship status is taken from the 2000 Census and held constant. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

We next report future employment for students using a combination of the LEHD indicators file and the ILBD self-employment records. For each five-year period, we measure the share of each student group working at least once in one or both databases. Unobserved individuals could be working outside of the United States, working for the federal government (not covered in the LEHD), out of the labor force, or deceased. Shares for all groups decline over time and follow intuitive patterns. The shares for non-citizen immigrant students who arrived as children

are comparable to those of citizen immigrants, whereas non-citizen immigrant students who arrived aged 17 or older show greater attrition.

The shares should not be interpreted as “stay rates” in the country, which are often measured at about 20% for international undergraduate students (e.g., Beine et al. 2023; O’Brien 2024). Our data frame requires individuals to have a Protected Identification Key (PIK) identifier, and international students who never work in the United States are much less likely to ever have a PIK. The PIKs are assigned by the Person Verification System that relies on the SSA Numident File, IRS data, and other federal records. Non-citizens have much lower PIK rates than U.S. natives (NORC 2011; Alexander and Genadek 2023), measured at 57% in one study (Bond et al. 2014). PIK rates are also lower among 18-to-24-year-olds, the age groups that form our student population (Rastogi and O’Hara 2012). Back-of-the-envelope calculations of these PIK rates with Appendix Table 1’s employment shares suggest our sample is a good representation of the foreign student population who remain in the United States for work.

Appendix Table 2 documents self-employment patterns with greater detail. For this analysis, we suspend our minimum thresholds for quarters worked and income rates within quarters because we lack comparable features in the self-employment filings. The tabulations show that the greater propensity for immigrants to engage in self-employment begins soon after college, with both immigrant and native propensities growing over time.

Appendix Table 2: Self-employment during 2001-20 of college students in 2000

	Share with any self- employment income	Share with majority of income coming from self- employment	Average annual self- employment earnings when self-employed	Average annual total earnings among those with majority of income in self-employment	Average annual total earnings among those with majority of income in wage earnings
	(1)	(2)	(3)	(4)	(5)
A. Natives					
2001-2005	0.059	0.032	\$8,884	\$29,610	\$18,110
2006-2010	0.099	0.059	\$14,670	\$35,350	\$31,170
2011-2015	0.126	0.079	\$20,430	\$40,300	\$39,690
2016-2020	0.145	0.092	\$25,730	\$44,340	\$49,470
B. Immigrants					
2001-2005	0.077	0.050	\$13,870	\$39,850	\$20,420
2006-2010	0.122	0.079	\$20,720	\$44,180	\$35,790
2011-2015	0.147	0.101	\$27,480	\$50,310	\$46,410
2016-2020	0.165	0.109	\$31,920	\$49,110	\$57,490

Notes: This table reports values that aggregate 2001-20 LEHD and ILBD files for individuals who were college students in the year 2000. Panel A considers natives, and Panel B considers immigrants. Column 1 provides the share with any self-employment activity, calculated as the share of years where an individual has self-employment earnings divided by the total years in period when the individual was engaged in salaried work or self-employed. Column 2 provides the share of the group with more ILBD self-employment earnings than wage earnings during the five-year period. Column 3 provides average annual self-employment earnings conditional on being self-employed. Dollar values are expressed in real 2000 dollars; earnings are winsorized at 1%/99% values. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782. Columns 4 and 5 provide total earnings, combining self-employment and wage earnings, by whether most of the individual's earnings during the five-year period come from self-employment or wage work. Dollar values are expressed in real 2000 dollars; earnings are winsorized at 99.5% values. Across a five-year period, self-employment losses are bottom-coded to be zero value. CBDRB-FY25-P2766-R12183.

Immigrants are frequently concentrated in the same workplaces (Hellerstein and Neumark 2008; Andersson Joona and Wadensjö 2009; Garcia-Perez 2011; Andersson et al. 2014; Åslund et al. 2014; Ansala et al. 2022) and often with co-ethnic employees (den Butter et al. 2007; Hammarstedt and Miao 2020; Kerr and Kerr 2021). Appendix Table 3 considers traits of co-workers in the establishments that employ these college students. Comparing the first two columns, immigrants are more likely to work with other immigrants than natives are. Column 3 measures future co-ethnic matching, especially among small firms, for the college students.

App. Table 3: Co-worker traits at establishments during 2001-20 of college students in 2000

	<u>Natives: Share of</u> co-workers who are immigrants by type of establishment	<u>Immigrants: Share of</u> co-workers who are immigrants by type of establishment	<u>Immigrants: Share of</u> co-workers who are from same country/region by type of establishment
	(1)	(2)	(3)
Overall	0.132	0.326	0.121
2-20 employees	0.128	0.447	0.217
21-100 empl.	0.131	0.358	0.130
101-1,000 empl.	0.127	0.316	0.100
1,001-10k empl.	0.133	0.281	0.079
10,000+ empl.	0.146	0.263	0.071
Goods producers	0.163	0.385	0.133
Low-skill services	0.131	0.363	0.156
High-skill services	0.141	0.303	0.095
Health/education	0.118	0.287	0.102
Multi-nationals	0.169	0.299	0.070
High-tech	0.193	0.364	0.085

Notes: This table describes co-worker traits during 2001-20 for college students in the 2000 Census. Values are unweighted averages of establishment traits experienced by individuals within firms of indicated type. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

Finally, Appendix Table 4 repeats Table 4 weighting individuals equally.

Appendix Table 4: Table 4 without weights

	Share quarters worked in firms with 1-100 employees	Share quarters worked in firms with 101-10,000 employees	Share quarters worked in firms with 10,000+ employees	Share quarters worked in multi-national firms (2010-20)
	(1)	(2)	(3)	(4)
	Reference category is career trajectories of native students			
(0/1) Citizen immigrant	0.0001 (0.004)	-0.0317*** (0.004)	0.0315*** (0.004)	0.0362*** (0.004)
(0/1) Non-citizen immigrant, arrival by age 16	0.0079 (0.004)	-0.0222*** (0.004)	0.0143*** (0.004)	0.0302*** (0.004)
(0/1) Non-citizen immigrant, arrival by age 17+	0.0423*** (0.005)	-0.0529*** (0.005)	0.0106* (0.005)	0.0468*** (0.005)
Individual controls	Yes	Yes	Yes	Yes
Observation count	247,000	247,000	247,000	202,000
Mean of dependent variable	0.292	0.442	0.266	0.194

Notes: See Table 4 of main text. Regressions weight individuals equally regardless of labor force attachment. Disclosure conducted under FSRDC Project Number 2766. CBDRB-FY24-P2766-R11782.

ADDITIONAL REFERENCES AND SOURCES

- Abowd, J.M., B.E. Stephens, L. Vilhuber, F. Andersson, K.L. McKinney, M. Roemer and S. Woodcock. (2009). “The LEHD Infrastructure Files and the Creation of the Quarterly Workforce Indicators.” In *Producer Dynamics: New Evidence from Micro Data*, edited by T. Dunne, J.B. Jensen, and M.J. Roberts, 149–230. Chicago, IL: University of Chicago Press.
- Alexander, T.J. and K.R. Genadek. (2023). “Using Administrative Records to Support the Linkage of Census Data: Protocol for Building a Longitudinal Infrastructure of U.S. Census Records.” ADEP Working Paper 2023-01, U.S. Census Bureau.
- Andersson, F., M. García-Pérez, J. Haltiwanger, K. McCue and S. Sanders. (2014). “Workplace Concentration of Immigrants.” *Demography* 51(6), 2281-2306.
- Andersson, F., S. Burgess and J. Lane. (2014). “Do as the Neighbors Do: The Impact of Social Networks on Immigrant Employment.” *Journal of Labor Research*.
- Andersson Joona, P. and E. Wadensjö. (2009). “Being Employed by a Co-national: A Cul-de-sac or a Short Cut to the Main Road of the Labour Market?” *Journal of International Migration and Integration* 13(1), 99-120.
- Ansala, L., O. Åslund and M. Sarvimäki. (2022). “Immigration History, Entry Jobs, and the Labor Market Integration of Immigrants.” *Journal of Economic Geography* 22(3), 581-604.
- Åslund, O., L. Hensvik and O. Nordström Skans. (2014). “Seeking Similarity: How Immigrants and Natives Manage in the Labor Market.” *Journal of Labor Economics* 32(3), 405-441.
- Batalova, J. and M. Fix. (2023). *Shared Gains: Immigrant-Origin Students in U.S. Colleges*. Migration Policy Institute Report.
- Bauman, K. and N. Graf. (2003). “Education Attainment: 2000.” Census Brief.
- Bound, J., M. Demirci, G. Khanna and S. Turner. (2015). “Finishing Degrees and Finding Jobs: US Higher Education and the Flow of Foreign IT Workers.” In Kerr, W., J. Lerner and S. Stern (eds.) *Innovation Policy and the Economy Volume 15*.
- Bond, B., D.J. Brown, A. Luque and A. O’Hara. (2014). “The Nature of the Bias When Studying Only Linkable Person Records: Evidence from the American Community Survey.” CARRA Working Paper Series Working Paper #2014-08, U.S. Census Bureau.
- Day, J.C. and A. Jamieson. (2003). “School Enrollment: 2000.” Census Brief.
- den Butter, F.A.G., E. Masurel and R.H.J. Mosch. (2007). “The Economics of Co-Ethnic Employment: Incentives, Welfare Effects and Policy Options.” In L-P. Dana (ed.) *Handbook of Research on Ethnic Minority Entrepreneurship*.
- Garcia-Perez, M. (2011). “Does it Matter Who I Work For and Who I Work With? The Impact of Owners and Coworkers Birthplace and Race on Hiring and Wages.” Working Paper.
- Hammarstedt, M. and C. Miao. (2020). “Self-Employed Immigrants and Their Employees: Evidence from Swedish Employer-Employee Data.” *Review of Economics of the Household* 18(1), 35-68.
- Hellerstein, J. and D. Neumark. (2008). “Workplace Segregation in the United States: Race, Ethnicity, and Skill.” *Review of Economics and Statistics* 90(3), 459-477.

- Kerr, S.P. and W. Kerr. (2021). “Whose Job Is It Anyway? Co-Ethnic Hiring in New U.S. Ventures.” *Journal of Human Capital* 51(1), 86-127.
- NORC. (2011). *Assessment of the U.S. Census Bureau’s Person Identification Validation System: Final Report*. NORC, University of Chicago.
- O’Brien, C. (2024). “Most International Graduates of American Universities Ultimately Leave the U.S.” <https://eig.org/immigrant-retention-estimates/>.
- Rastogi, S. and A. O’Hara. (2012). *2010 Census Match Study*. 2010 Census Planning Memo No. 247, U.S. Census Bureau.
- Ruggles, S. et al. (2021). IPUMS USA: Version 11.0. Minneapolis, MN: IPUMS. <https://doi.org/10.18128/D010.V11.0>.
- Shackelford B. and J. Jankowski. (2016). “Information and Communications Technology Industries Account for \$133 Billion of Business R&D Performance in the United States in 2013.” NSF Report.
- Shih, K. (2017). “Do International Students Crowd-Out or Cross-Subsidize Americans in Higher Education?” *Journal of Public Economics* 156, 170-184.