NBER WORKING PAPER SERIES

IMMIGRANT ENTREPRENEURSHIP: NEW ESTIMATES AND A RESEARCH AGENDA

Saheel A. Chodavadia
Sari Pekkala Kerr
William R. Kerr
Louis J. Maiden

Working Paper 32400
http://www.nber.org/papers/w32400

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
May 2024

William Kerr is the corresponding author. This paper is a draft chapter for an upcoming volume Migration and Innovation: A Research Agenda. We thank the volume editors, Francesco Lissoni and Andrea Morrison, and seminar participants for comments. We thank Stuart Anderson and George Hu for helpful data assistance. We gratefully acknowledge funding support by Ewing Marion Kauffman Foundation and Harvard Business School. 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 Numbers 1182, 1731, and 2766. (Request 5948, 8512, CBDRB-FY23-P1731-R10666, CBDRB-FY24-P1731-R11027, CBDRB-FY23-P2766-R10877, and CBDRB-FY23-P2766-R10856). This research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by the following 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.

Immigrant Entrepreneurship: New Estimates and a Research Agenda
Saheel A. Chodavadia, Sari Pekkala Kerr, William R. Kerr, and Louis J. Maiden
NBER Working Paper No. 32400
May 2024
JEL No. F22,F6,J15,J61,L26,M13,O15,O3,R23

ABSTRACT

Immigrants contribute disproportionately to entrepreneurship in many countries, accounting for a quarter of new employer businesses in the US. We review recent research on the measurement of immigrant entrepreneurship, the traits of immigrant founders, their economic impact, and policy levers. We provide updated statistics on the share of US entrepreneurs who are immigrants. We utilize the Annual Business Survey to quantify the greater rates of patenting and innovation in immigrant-founded firms. This higher propensity towards innovation is only partly explained by differences in education levels and fields of study. We conclude with avenues for future research.

Saheel A. Chodavadia
University of Michigan
Department of Economics
Gerald R. Ford School of Public Policy
735 S. State Street
Ann Arbor, MI 48109
saheel@umich.edu

William R. Kerr
Harvard Business School
Rock Center 212
Soldiers Field
Boston, MA 02163
and NBER
wkerr@hbs.edu

Sari Pekkala Kerr
Wellesley College
106 Central Street
Wellesley, MA 02481
skerr3@wellesley.edu

Louis J. Maiden
Harvard Business School
Greenhill House
204-A Soldiers Field
Boston, MA 02163
lmaiden@hbs.edu

1. Introduction

Immigrants play outsized roles in entrepreneurship in many countries, accounting for about a quarter of new employer businesses in the United States (Kerr and Kerr, 2017, 2020b; Azoulay et al., 2022). Immigrants are over-represented as founders of innovative firms and in the high-tech industry. In 2022, the four most valuable private, venture-backed US companies (SpaceX, Stripe, Instacart, Databricks) had immigrant founders, along with three of the ten most valuable public companies globally (Alphabet, Nvidia, Tesla) (Crunchbase, 2022). Consequently, an understanding of the characteristics of immigrant entrepreneurship is important for discussions of levers to grow economies and create jobs (Haltiwanger et al., 2013).

Section 2 reviews the nascent literature on immigrant entrepreneurship. We mostly focus on work since 2017 and group papers into four themes:

- Measurement of immigrant entrepreneurship
- Characteristics of immigrant entrepreneurs for innovation
- Economic consequences of immigrant entrepreneurship
- Policies regarding immigrant entrepreneurship

Contributing to the first theme on measurement, Section 3 provides updated statistics on the share of US entrepreneurs who are immigrants through 2020. Section 4 utilizes the 2017-2019 Annual Business Surveys (ABS) to document the greater rates of patenting and innovation in immigrant-founded firms. Using approaches developed by Hunt (2011) and Brown et al. (2020), we show that this higher propensity towards innovation is only partly explained by differences in education levels and fields of study. The last section concludes with avenues for future research.

2. Literature

This section reviews four research frontiers related to immigrant entrepreneurship. Space constraints require us to be parsimonious, and we mostly focus on papers since 2017. Schuetze and Antecol (2005), Fairlie and Lofstrom (2014), Kerr and Kerr (2017), and Lofstrom and Wang (2022) review earlier studies.

Measurement of immigrant entrepreneurship

While perhaps surprising to someone new to the literature, most of the early work on immigrant entrepreneurship has been devoted to its measurement. Traditional datasets struggle to accurately capture entrepreneurship, much less whether founders of firms are immigrants. Strong comparative statements over countries, akin to what is now feasible for the migration of inventors (Lissoni and Miguelez, 2024), remain elusive.

The earliest papers establish that immigrants engage in self-employment at higher rates than natives (Borjas, 1986). Fairlie and Lofstrom (2014) describe this first wave of work that employs household surveys like the Current Population Survey (CPS), recently extended by Lofstrom and Wang (2021). We measure in the 2020 American Community Survey (ACS) 5% sample that 21.5% of all self-employed individuals in the United States are immigrants during 2016-2020, up from 14.0% in 2000. Similarly, Fairlie et al. (2017) measure in the Kauffman Entrepreneurial Survey and CPS that 29.5% of new entrepreneurs in 2016 were immigrants, up from 13.3% in 1996. In a recent update (Fairlie, 2024), the immigrant share of new business formation in 2023 was 30.9%. While household surveys provide important initial evidence, there is substantial heterogeneity in entrepreneurship, spanning from necessity-based self-employment to radical high-growth entrepreneurship (Schoar, 2010; Fairlie and Fossen, 2019). Self-employment may disproportionately reflect sole proprietorships, and household surveys do not reveal the growth dynamics of businesses.

Accordingly, recent efforts study immigrant entrepreneurship in firm and linked employer-employee databases. An example of a firm-based survey is the Survey of Business Owners (SBO), which records owners of the firm and their immigrant status. Isolating young, newly created firms that have employees, Kerr and Kerr (2020b) measure that 21.7% of firms are founded exclusively by immigrants in the 2012 SBO, with an additional 4.3% of firms combining immigrant and native founders. There is significant variation across the country, exceeding 40% in states like California and New York. In the 2010 Scientists and Engineers Statistical Data System (SESTAT), Blume-Kohout (2016b) measures that 26.6% of owners of high-growth startups are immigrants. These types of metrics broaden from self-employment, but they are measured less frequently and again do not speak to growth dynamics.

One method that can approximate entrepreneurship in large-scale employer-employee databases is to isolate the top initial earners of the firm, akin to a founding team. Kerr and Kerr (2017) apply this technique to the Longitudinal Employer-Household Dynamics (LEHD) database, estimating that 24% of top initial earners are immigrants in a sample of states during 1995-2008. Expressed as a rate, 2% of immigrants start a business over a three-year period, one-third higher than the native rate of 1.5%. While an approximation, this approach allows for observation of how the immigrant share is increasing over time and the subsequent growth dynamics of companies.[1] Section 3 will replicate this LEHD approach through 2020 and provide additional firm surveys to update the SBO.

In a high-profile recent publication, Azoulay et al. (2022) continue this research and calculate the high rate of immigrant entrepreneurship in multiple Census Bureau datasets and among extra high-growth firms (i.e., venture capital backed and Fortune 500 companies like those mentioned in the introduction). We will discuss their employment creation results

[1] Choi et. al (2021) discuss efforts to replicate the method and the comparisons of the founding team to Schedule K-1 data on business owners. Those efforts found the method to be reasonably accurate.

later. While there is no perfect estimate, it is remarkable how well the various approaches converge to a common estimate that about a quarter of US entrepreneurs are immigrants.

Adjacent research measures the share of inventors who are immigrants, most of whom work in established firms. While this study focuses on entrepreneurship, these estimates are useful to note given our later work on the patenting by immigrant entrepreneurs. Bernstein et al. (2022) analyze USPTO data from 1990-2016 and find that immigrants comprise 16% of all US inventors and 23% of total innovation output, suggesting an outsized impact. With a notable shift in levels, Akcigit and Goldschlag (2023) estimate with Census Bureau data that the immigrant share of inventors rose from 24% in 2000 to 35% in 2016. They too find the impact of patents by immigrants to be higher than natives.

Unfortunately, as noted earlier, it is not easy to build comparative estimates globally. Lofstrom and Wang (2022) review older studies from Europe that contain immigrant shares among self-employed. Using 2011 Census data, Clark et al. (2017) provide tabulations suggestive of immigrants accounting for about 18% and 20% of male and female self-employed in England and Wales, respectively. These are modestly larger than the comparable immigrant shares of population. In a more recent example, Fornaro (2018) estimates that rates of entrepreneurship by immigrants and natives in Finland are about the same during the 2010s. Using employer-employee data, Marshalian (2023) finds that immigrants contribute disproportionately to Canadian entrepreneurship in both urban and rural settings. Green et al. (2024) measure that 41% of immigrants to Canada own a firm within ten years of arrival. While this rate is higher than natives, the authors note much of it is unincorporated self-employment. Turning towards more high-growth settings, Nathan (2015) documents an over-representation of ethnic inventors for the United Kingdom compared to ethnic shares in the working population. The 2023 Beauhurst Report estimates

that immigrants contributed to the founding of 39.1% of UK high-growth firms during 2013-2022, which received 60.4% of UK equity funding.

Characteristics of immigrant entrepreneurs for innovation

New data allow researchers to characterize traits of immigrant entrepreneurs and their companies. Hunt (2011) provides important background with the 2003 National Survey of College Graduates. She first establishes that immigrants to the United States are more likely to hold a granted patent (1.1%), commercialize a patent (0.7%), publish a scientific paper (3.2%), and start a business (0.18%) compared to natives. Hunt then shows that controlling for educational attainment and field of study fully accounts for the first three outcomes, indicating that the patenting and publication prowess of immigrants can be mostly attributed to their training. Interestingly, educational preparation does not explain the higher rate of entrepreneurship among immigrants in her study. In a subsequent piece that explores variation among college degree holders within science and engineering, Blume-Kohout (2016b) finds that educational attainment does predict the higher immigrant propensity to found new firms compared to natives.

While these studies consider individual-level data, Brown et al. (2020) and Lee et al. (2023) document that immigrant-founded firms also show more innovativeness than native-founded firms. These two studies utilize a breadth of data spanning the 2014 Annual Survey of Entrepreneurs (ASE), administrative datasets at Census Bureau, and self-employment filings. Across the studies, immigrant-founded businesses are more likely to create new technologies, engage in R&D (basic and applied), and patent more. They comprehensively show this link carries through when controlling for founder demographics, motivations, financing, and similar. Similarly, Ostrovsky and Picot (2021) show that immigrant-owned firms in Canada have higher rates of innovation than native-owned companies. In Section 4,

we build upon this research strand by applying the Hunt (2011) technique in the context of the 2017-2019 Annual Business Survey (ABS), a successor to the ASE.

Personal career histories and selection of who migrates explain some of the immigrant propensity towards entrepreneurship. Using the New Immigrant Survey, Akee et al. (2013) show that immigrants entering entrepreneurship before migration in their home country are disproportionately likely to enter entrepreneurship in their new host country. Brieger and Gielnik (2021) find that female immigrants are significantly less entrepreneurial and innovative than male immigrants. Conti and Guzman (2023) find that Israeli startups that migrate to the United States receive more funding and have higher acquisition values than Israeli startups that do not migrate. Interestingly, the authors do not find evidence that being in the United States further increased the startup's patenting, suggesting selection effects were more significant than location benefits.

Cultural mismatch has been connected to immigrant entrepreneurship in both sending and receiving countries. Blume-Kohout (2016b) shows that selection of migrants is important—among adult arrivals to the United States, immigrants are more likely to engage in entrepreneurship if coming from a sending country where entrepreneurship is not well supported, likely evidence of a cultural mismatch of their home country to their desired occupation. Looking instead at receiving countries, Kahn et al. (2017) find that immigrants are more likely to be entrepreneurs than natives when cultural differences are high, especially in entrepreneurship for science and high-tech industries. Doran and Yoon (2020) find a similar effect historically.

Independent of specific cultures or skills, group-level choices matter. Kerr and Mandorff (2023) model the industry/occupational specialization by nationality for immigrant entrepreneurship. Smaller, more isolated immigrant groups are particularly likely to enter entrepreneurship in the same industry/occupation, such as Vietnamese nail care salons and

Gujari Indian motels in the United States (Kalnins and Chung, 2006). The authors model how this can arise from a complementarity of self-employment clustering to the immigrants' non-work group activities. In a case example, Kerr and Kerr (2020a) measure that immigrants working in a premier entrepreneurship co-working center in Boston and St. Louis are substantially more likely to give and receive business advice, promoting innovative networks and collaboration in the entrepreneurial ecosystem.

Finally, a long-standing strand of the literature considers the link of immigrant entrepreneurship to ethnic enclaves (Wilson and Portes, 1981; Borjas, 1986; Fairlie and Woodruff, 2007). Examining Polish immigration to Great Britain, Marinoni (2023) estimates that immigration increases entrepreneurship outside of ethnic enclaves. Given that immigrant entrepreneurs outside enclaves tend to achieve worse growth outcomes, she concludes that the Polish immigrants turn to entrepreneurship when excluded from the labor market. Andersson et al. (2021) show that the link of enclaves to higher entrepreneurship in Sweden is due to more co-ethnic peers who are business owners.

Economic Consequences of Immigrant Entrepreneurship

A significant amount of research over the last decade explores the economic consequences of immigration inflows and cross-border links created and maintained by migrants (Clemens, 2011). Related to this review, studies from around the world tend to find that influxes of skilled immigrants increase innovation at the regional and firm levels.[2] Likewise, a consistent finding is that immigrants aid their new home country through

[2] For example, positive effects are found in Crown et al. (2020) for Australia; Ferrucci (2020) for France; Beerli et al. (2021) for Switzerland; and Hunt and Gauthier-Loiselle (2010), Kerr and Lincoln (2010) and Brinatti et al. (2023) for the US. By contrast, Bratti and Conti (2018) measure weak links for Italy, and Doran et al. (2022) are skeptical of the impact of the H-1B program. Anelli et al. (2023) consider the reverse, how emigration can lead to depressed entrepreneurship in a sending region.

knowledge transfer.[3] The effects appear to have long-run consequences.[4] Yet, while informative, very little of this research connects beneficial outcomes directly to immigrant entrepreneurship, and many of the beneficial outcomes (e.g., increased patenting) accrue at least partly through larger firms. Given that 25% or thereabouts of US entrepreneurs are immigrant, this is an acute research need.

The creation of jobs is one area of recent inquiry. Examining 2005-2010, Azoulay et al. (2022) measure that immigrants are 80% more likely to start companies than natives. Reflecting the link of new firm birth to labor demand, they further calculate that immigrants have a 49% higher ratio of jobs created per capita than natives. Kerr and Kerr (2017) attribute the faster employment growth of immigrant-founded firms to an up-or-out effect similar to Haltiwanger et al. (2013). In a study of immigration and firm dynamics in the US, Mahajan (2024) confirms the disproportionate job creation role of immigrant entrepreneurs, while also noting that the impact of immigrant labor availability for inducing new establishment entry by large US companies is even more sizable in economic magnitude. Dimmock et al. (2021) similarly consider immigrant availability as an aid to start-up growth. As reviewed by Lofstrom and Wang (2022), studies regarding immigrant entrepreneurship and associated job creation across the business cycle are mixed.[5]

A series of papers show that immigrant hiring tends to pull from an ethnically similar pool. Hammarstedt and Miao (2020) show that self-employed immigrants in Sweden, especially non-European, are more likely to hire other immigrants than native self-employed.

---

[3] For example, Hornung (2014), Bahar and Rapoport (2018), Bahar et al. (2020), Bernstein et al. (2022), and Miguelez and Morrison (2023).

[4] For example, Sequira et al. (2020), Docquier et al. (2020), Burchardi et al. (2020), and Akcigit et al. (2017). Reviews linked to diversity and innovation are taken up in this volume by Cooke et al. (2024) and Marino et al. (2024).

[5] For example, Clark and Drinkwater (2010), Andersson et al. (2013), Constant and Zimmerman (2014), Catron (2017), and Miao (2020). Lofstrom and Wang (2022) also review the mixed results with respect to the performance of immigrant- vs. native-founded firms.

This builds upon the same-ethnic workplace hiring documented in Aslund et al. (2014), Andersson et al. (2014), and Ansala et al. (2021). Kerr and Kerr (2021) find that immigrant entrepreneurs in the United States employ an average of 20% or more of their workers being from the same country, with a range across ethnicities from <2% to >40%. Co-ethnic hiring grows with the size of the local ethnic workforce, greater linguistic distance to English, lower cultural/genetic similarity to US natives, and harsher policy environments towards immigrants. Linking to studies of ethnic enclaves, these patterns matter for local economies. Dagnelie et al. (2019) find that immigrant entrepreneurs are an important ingredient, and perhaps the most important one, for successful refugee settlement in a location.

Beyond job counts, we unfortunately lack good estimates on the total economic impact of high-skilled immigrant entrepreneurs, despite their prominent visibility and effect for industry transformation. Saxenian (2002), with many followers, documents that immigrants play a disproportionate role in tech clusters like Silicon Valley, and she points to the global entrepreneurial networks across cities like San Francisco, Beijing, and Bangalore that result from immigrant entrepreneurs. Recent work continues to confirm these observations. Shi et al. (2023) measure that 1.4% of venture-capital backed firms migrate globally, mostly to the United States, and ethnic networks are prominent in venture investing (Hegde and Tumlinson, 2014; Bengtsson and Hsu, 2015). Kerr and Kerr (2020b) suggest that most of the immigrant effect in large tech clusters is due to the sheer number of entrepreneurs assembled, versus special agglomeration advantages among them. In terms of global networks, Balachandran and Hernandez (2021) show how US venture capitalists who work with Indian entrepreneurs in America are more likely to invest into the home regions within India of those entrepreneurs, often even forgoing a local co-investor.[6]

[6] See the review of Gaule (2024) in this volume.

Policies regarding immigrant entrepreneurship

Immigration policy governs the potential impacts of immigrant entrepreneurship on the receiving country. As reviewed by Lofstrom and Wang (2022), studies across countries differ in terms of which type of entry channel/visa is most associated with immigrant entrepreneurship (e.g., Constant and Zimmermann, 2005; Hunt, 2011; Kone et al., 2021). Findings from research tend to be specific to each country and setting.

The United States lacks a coordinated policy regarding immigrant entrepreneurship[7], and studies frequently isolate segments. Among high-growth and venture-backed startups, Amornsiripanitch et al. (2023) find the most common route for immigrant entrepreneurs entering the United States is through higher education, with this share increasing with time. Nonetheless, these entrepreneurial aspirations of students are frequently disappointed. Roach et al. (2020) quantify that foreign-born PhD students (especially from China and India) express more interest in becoming a founder or startup employee than their native counterparts before graduation, but they are less likely to end up in such a position after school completion. The authors find that restrictive visa policies create this wedge between immigrants' desire to engage in entrepreneurship and them doing so. Agarwal et al. (2021) similarly study how work authorization impacts career choices of skilled immigrants.[8]

---

[7] Blume-Kohout (2016a) and Kerr and Kerr (2022) provide comprehensive reviews of US immigration policy and note its limits toward immigrant entrepreneurship. Immigrants typically have two options when pursuing de novo entrepreneurship. They can engage in business planning as a foreign-born student on the F-1 Visa, launch the business on the OPT period, and subsequently transition to an employment-based visa such as the O-1 or a self-petitioned green card via the EB-1A or EB-2 National Interest Waiver (NIW). A second route is to obtain an employment-based visa such as the H-1B and subsequently transition to a self-petitioned green card. Other policies like E2 cover existing business owners/investors. Congress frequently debates "start-up visas" but none has passed, despite predictions of significant benefits to the economy (Stangler and Konczal, 2013). Kerr and Kerr (2022) identify more than 25 countries, including Canada, Australia, and the United Kingdom, that have visas targeting immigrant entrepreneurs. Chatterji et al. (2014) describe local U.S. policies.

[8] Ganguli and MacGarvie (2024) review migration linked to schooling in this volume.

Turning to migration to the United States more broadly, studies demonstrate how the strictness of general immigration policies and their enforcement influence the rate of self-employment among immigrants (e.g., Wang, 2019; Amuedo-Dorantes et al., 2021). This is especially true for those lacking work authorization. Studies of the legalization of undocumented US immigrants include Kossoudji and Cobb-Clark (2002) and Fairlie and Woodruff (2010).

Outside of the United States, Clark et al. (2017) find a points-based approach to immigrant selection boosted immigrant self-employment rates in the United Kingdom. Along with Ulceluse and Kahanec (2017), they also note how transitional policies that favor self-employed migrants during European Union enlargement increased immigrant entrepreneurship in receiving countries. For Canada, Glennon and Lee (2023) consider the Canadian Start-Up Visa program and competition for immigrant entrepreneurs with the United States. The policy reform boosted founder migration to Canada, disproportionately drawing Asian founders (who are well represented in Canada). Green et al. (2024) conclude, however, that Canada's system in total has yielded disproportionately lower-growth forms of immigrant entrepreneurship and self-employment, with limited job creation.

Within Latin America, Bahar et al. (2023) study a 2018 policy in Colombia that granted resident visas to nearly 500,000 undocumented Venezuelan migrants, finding that significant entrepreneurship growth follows. Start-Up Chile, a government-sponsored start-up accelerator program bringing in foreign entrepreneurs to Chile through a temporary one-year visa, has reached more than 1,000 start-ups and 5,000 entrepreneurs (Start-Up Chile, 2023). Gonzalez-Uribe and Leatherbee (2017) quantify that the program, when coupled with entrepreneurial schooling, is linked to significantly improved venture performance.

3. Data and New Measurements

Our empirical work utilizes the Annual Business Survey (ABS) and the Longitudinal Employer-Household Dynamics (LEHD) database. The ABS combines survey responses from business owners with administrative records. It is conducted annually for about 300,000 employer businesses and for 850,000 employer businesses every five years. It began in 2017, replacing the Survey of Business Owners (SBO) and the Annual Survey of Entrepreneurs (ASE). We define immigrants as persons born outside the United States and entrepreneurs as owners of young firms (in business for five years or fewer).

The LEHD is built from quarterly worker-level unemployment insurance (UI) filings by employers and identifies the employees of each private-sector firm in the United States. It is longitudinally linked at both the firm and employee levels. As in previous works, we define immigrants as persons born outside of the United States. Following Kerr and Kerr (2017), we isolate individuals meeting three criteria: (a) in an entering single-unit firm, (b) present in the LEHD in the first year that the new firm entered, and (c) among the top three initial earners in the firm. Calculations restrict entrepreneurs to persons whose firm was founded in the prior three years. Individuals who satisfy these conditions are best thought of as the top initial team of the firm, as we do not have ownership status in the LEHD. While the methodology is the same, the LEHD sample of states differs from Kerr and Kerr (2017) due to our current project being granted access to a different set of states than the original work.

Figure 1a reports estimates of the share of immigrant entrepreneurship over time using the SBO, ASE, and ABS. The data sources, despite their differences, are consistent in their trend. Across the SBO, ASE, and ABS, there is an upward trend over time in share of immigrant entrepreneurship, with the share being 18.7% in 2007 and 24.2% in 2019. Appendix Table 1 provides additional descriptive tabulations on founders.

Figure 1b compares the 2019 ABS estimate to alternatives from the same period, some of them for specific type of entrepreneurship. From the American Community Survey, we calculate immigrant shares of self-employed individuals during 2016-2020. We also model the immigrant shares among top earners for the 25 states in our LEHD sample. Using data in Fairlie (2024), we calculate the CPS rate based upon new business formation for 2021-2023. Finally, we draw three estimates from the literature of high-growth ventures. Amornsiripanitch et al. (2023) estimate the immigrant share of founders of new ventures supported by venture capital during 2015-2019. NFAP (2022, 2023) estimate the immigrant share of founders of unicorn ventures (valuations greater than $1 billion) and prominent artificial intelligence startups.[9]

In Figure 2a, we plot the full series of the LEHD data for the 25 states that we can follow from 2003 onwards. The immigrant share of top initial earners grows from 22.5% to 28.9% in 2020.[10] In Figure 2b, we isolate 11 states with a longer range of data that support estimates from 1995 onwards. The appendix provides extensions on Figures 2a and 2b, including the heterogeneity across regions.

We can use a decomposition exercise to explore how the immigrant entrepreneurship share for the 25 states included in this study increased from 2003 to 2020:

$$\Delta IE^{03\to 20} = \underbrace{\sum s_i^{03} \Delta IE_i^{03\to 20}}_{within} + \underbrace{\sum \left(IE_i^{03} - IE^{03}\right) \Delta s_i^{03\to 20}}_{between} + \underbrace{\sum \Delta s_i^{03\to 20} \Delta IE_i^{03\to 20}}_{cross}$$

[9] We thank the authors of the prior studies for providing us with modified calculations from their original studies to enable easier comparisons in this chart. NFAP conducted the research through interviews and gathering information on the 43 U.S. companies on Forbes AI 50, a list of the top startup companies "developing the most promising business applications of artificial intelligence—companies with compelling visions and the resources and technical wherewithal to achieve them."

[10] The 25 states in our LEHD sample appear reasonably representative of the country in 2020, albeit on a slightly slower growth trajectory. Examining the immigrant share of self-employed in IPUMS, our 25 states grow from 14.5% in 2000 to 21.1% in 2016-2020. The national growth is 14.0% to 21.5%.

In this equation, *IE* is the immigrant entrepreneur rate for the whole sample and for state i when indexed. The variable s_i measures the share of economic activity in each state, summing to 100% over our sample. The first term, called the "within" effect, measures how much of the total increase in immigrant entrepreneurship can be credited to deepening levels of immigrant entrepreneurship within states, holding fixed the initial shares of states. The "between" term measures the degree to which rising immigrant entrepreneurship follows from states that had deeper starting levels of immigrant entrepreneurship in 2003 growing faster from 2003 to 2020. The final term, called the "cross" effect, measures whether states that grew faster than average also showed more rapid growth in their immigrant entrepreneur shares. This decomposition is an identity, such that these terms always sum to the total change. In the LEHD, we find most of the growth (65.9%) in immigrant entrepreneurship comes through the "within" component. By contrast, the "between" term accounts for 35.5%, and the "cross" term is negligible at -1.4%. In other words, most of the growth of US immigrant entrepreneurship has come through a widespread strengthening of immigrant entrepreneurship across all states rather than a particular boom within a small number of them.

4. Empirical Analysis of Startup Innovation

Hunt (2011) finds that education level and field of study fully explain the immigrant advantage in patenting, but not the immigrant advantage in entrepreneurship. We extend this work to quantify the relationship between immigrant entrepreneurship and innovation and whether educational training explains the observed relationships. Unlike samples built upon college graduates' data, our sample considers all education levels. Brown et al. (2020)

and Lee et al. (2023) are important precursors for this work with their comprehensive studies of innovation in immigrant-founded firms using the ASE.

We use the 2017-2019 ABS data and empirically describe immigrants' relative advantage on various innovation outcomes with the regression format (for an individual owner i):

(1) $Outcome_i = \alpha + \beta Immigrant_i + \gamma Control_i + \varepsilon_i$.

Immigrant is an indicator variable for each owner, and we estimate models with and without control variables. The column headers of Table 1 provide the outcome variable under study. In the first column, we observe that immigrant founders are 7.4-9.2% more likely to have a STEM field of study compared to native founders. After this initial column, we include whether one has a STEM education into Panel B as an additional control variable.

Columns 2-5 report outcomes from the 2017 ABS. Columns 2 and 3 show that a firm is more likely to have a patent and more patents per employee if the owner is an immigrant. This result is quite robust to controlling for education and other traits of the owner and firm in Panel B. Conditional on controls, immigrant owners are more likely to bring new innovations to market or report being creative in their work in Columns 4 and 5. These results are tenuous, however, as they depend upon the controls and, even then, show only modest statistical precision.

The remaining columns use outcomes from the 2019 ABS. Immigrant founders report that they face fewer barriers for innovating than native founders do. Firms founded by immigrants are 3.4-4.5% more likely to produce new technologies and less likely to use other existing technologies. Education and other controls again have limited impact.

These findings suggest that, even beyond education and field of study, immigrant entrepreneurs tend to be more strongly linked to innovation. This ABS analysis confirms the

major themes that Brown et al. (2020) and Lee et al. (2023) derived with the ASE, although we only analyze a portion of the outcomes they consider.

5. Future Research

There is much more to learn about immigrant entrepreneurship. To begin, we still have a remarkably poor understanding of why immigrants are so entrepreneurial. The answer does not lie with simple demographic traits or educational training, and there are both "push" and "pull" factors at play. Kerr and Kerr (2020a) provide a longer depiction of theories, grouped into the four categories of Entrepreneurial Personality, Opportunity-Based Migration, Weaker Labor Market Prospects, and Co-Ethnic Social Bonds. Additional work to test these theories individually and comparatively in different contexts, especially those beyond the United States, is valuable. This work can analyze immigrants' proclivity towards entrepreneurship, the traits of their firms, and their economic impact.

Another line of research should continue to close the micro<>macro gap. Macro studies emphasize themes like knowledge transfer, technology diffusion, and externalities promoted by immigrants, but they rarely parse the role of immigrant entrepreneurs vs. immigrants more generally. Mahajan (2024) is an exception with his portrait of the macro business dynamics linked to immigration while also measuring the direct role of immigrant entrepreneurs. Prato (2023) is a similar example on the immigrant inventor side. Continued data development—such as the new links feasible between the USPTO patent dataset and the employee records in the LEHD (plus other Census Bureau data)—bodes well for future research on these micro<>macro connections. These empirics can, in turn, enable stronger quantitative models.

Another important topic is the link of immigrant entrepreneurship to broader economic and political outcomes. With many economies confronting aging workforces and the potential for shrinking populations, policy makers and their populaces will continue to debate the optimal rate of immigration. The innovativeness of immigrant entrepreneurs, especially in the high-tech sector, suggest links to economic growth, labor adjustment, and agglomeration effects in tech clusters. These empirical connections are under-explored. Similarly, it would be important to learn how the outcomes associated with immigrant entrepreneurship (e.g., when a great success occurs) impact public attitudes towards immigrants, shape policies/subsidies, and influence education decisions of youth. Such studies will be influential in future decision making and legislation regarding immigrant entrepreneurship.

Even before the pandemic, observers speculated on how growing digital connections would shape immigrant entrepreneurship—would global tech clusters lose or gain value? Research can explore how connectivity influences the location choices of entrepreneurs, and the degree to which immigrant entrepreneurs build businesses that span multiple countries (i.e., businesses that are global from the start). As geopolitics evolve, including the potential economic decoupling of China from the United States, the impact for immigrant entrepreneurship will be closely followed.

There is a pressing need for more empirical studies of immigrant entrepreneurship outside of the United States. As our literature review stressed, the work on this topic regarding Europe and beyond is limited. Classical migration theory stresses that the skill composition of migrants varies across migration corridors, and the legal and business communities of destination countries vary significantly. While one should always be cautious about applying findings related to immigration in out-of-sample contexts, that warning may be particularly apt for work on immigrant entrepreneurship (e.g., Green et al., 2024).

Finally, for the United States, a large upcoming question is the entrepreneurial behavior of second-generation immigrants. As the current wave of immigration to the United States began in the 1970s, most of the story till this point has been about first-generation immigrants. The coming decades will have many first- and second-generation immigrants considering business starts, among other economic options. The choices of the families of immigrant entrepreneurs with respect to career preparation and trajectories of children, the transfer of businesses across generations, and similar topics will be important to study.

REFERENCES

Agarwal, Rajshree, Martin Ganco and Joseph Raffiee. 2021. "Immigrant Entrepreneurship: The Effect of Early Career Immigration Constraints on New Venture Formation." *Organization Science*, 33 (4), 1372-1395.

Akcigit, Ufuk, and Nathan Goldschlag. 2023. "Measuring the Characteristics and Employment Dynamics of U.S. Inventors." *NBER Working Paper 31086.*

Akcigit, Ufuk, John Grigsby and Tom Nicholas. 2017. "Immigration and the Rise of American Ingenuity." *American Economic Review*, 107 (5): 327-331.

Akee, Randall, David Jaeger and Konstantinos Tatsiramos. 2013. "The Persistence of Self-Employment Across Borders: New Evidence on Legal Immigrants to the United States." *Economics Bulletin*, 33 (1): 126-137.

Amornsiripanitch, Natee, Paul Gompers, George Hu and Kaushik Vasudevan. 2023. "Getting Schooled: The Role of Universities in Attracting Immigrant Entrepreneurs." *Research Policy (forthcoming).*

Amuedo-Dorantes, Catalina, Magnus Lofstrom and Chunbei Wang. 2021. "Immigration Policy and the Rise of Self-Employment among Mexican Immigrants." *Industrial and Labor Relations Review,* 75 (5): 1189-1214.

Andersson, Fredrik, Monica García-Pérez, John Haltiwanger, Kristin McCue and Seth Sanders. 2014. "Workplace Concentration of Immigrants." *Demography*, 51 (6): 2281-2306.

Andersson Lina, Mats Hammarstedt, Shakir Hussain and Ghazi Shukur. 2013. "Ethnic Origin, Local Labour Markets and Self-Employment in Sweden: A Multilevel Approach." *Annals of Regional Science*, 50 (3): 885-910.

Andersson, Martin, Johan P. Larsson and Özge Öner. 2021. "Ethnic Enclaves and Self-Employment among Middle Eastern Immigrants in Sweden: Ethnic Capital or Enclave Size?" *Regional Studies*, 55 (4): 590-604.

Anelli, Massimo, Gaetano Basso, Giuseppe Ippedico and Giovanni Peri. 2023. "Emigration and Entrepreneurial Drain." *American Economic Journal: Applied Economics*, 15 (2): 218-252.

Ansala, Laura, Olof Åslund, and Matti Sarvimäki. 2021. "Immigration History, Entry Jobs, and the Labor Market Integration of Immigrants." *Journal of Economic Geography*, 22 (3): 581-604.

Åslund, Olof, Lena Hensvik, and Oskar NordströmSkans. 2014. "Seeking Similarity: How Immigrants and Natives Manage in the Labor Market." *Journal of Labor Economics*, 32 (3): 405-441.

Azoulay, Pierre, Benjamin F. Jones, J. Daniel Kim and Javier Miranda. 2022. "Immigration and Entrepreneurship in the United States." *American Economic Review: Insights*, 4 (1): 71-88.

Bahar, Dany, and Hillel Rapoport. 2018. "Migration, Knowledge Diffusion and the Comparative Advantage of Nations." *The Economic Journal*, 128 (612): F273-F305.

Bahar, Dany, Bo Cowgill and Jorge Guzman. 2023. "Legalizing Entrepreneurship." *Social Science Research Network 4155358.*

Bahar, Dany, Prithwiraj Choudhury and Hillel Rapoport. 2020. "Migrant Inventors and the Technological Advantage of Nations." *Research Policy*, 49 (9): 103947.

Balachandran, Sarath, and Exequiel Hernandez. 2021. "Mi Casa Es Tu Casa: Immigrant Entrepreneurs as Pathways to Foreign Venture Capital Investments." *Strategic Management Journal*, 42 (11): 2047-2083.

Beauhurst. 2023. *Gender and Diversity in UK Tech Sector*. Report.

Beerli, Andreas, Jan Ruffner, Michael Siegenthaler and Giovanni Peri. 2021. "The Abolition of Immigration Restrictions and the Performance of Firms and Workers: Evidence from Switzerland." *American Economic Review*, 111 (3): 976-1012.

Bengtsson, Ola, and David Hsu. 2015. "Ethnic Matching in the U.S. Venture Capital Market." *Journal of Business Venturing*, 30 (2): 338-354.

Bernstein, Shai, Rebecca Diamond, Abhisit Jiranaphawiboon, Timothy McQuade and Beatriz Pousada. 2022. "The Contribution of High-Skilled Immigrants to Innovation in the United States." *NBER Working Paper 30797*.

Blume-Kohout, Margaret E. 2016a. "Imported Entrepreneurs: Foreign-Born Scientists and Engineers in U.S. STEM Fields Entrepreneurship." U.S. Small Business Administration Report.

Blume-Kohout, Margaret E. 2016b. "Why Are Some Foreign-Born Workers More Entrepreneurial Than Others?" *The Journal of Technology Transfer*, 41: 1327-1353.

Borjas, George. 1986. "The Self-Employment Experience of Immigrants." *Journal of Human Resources*, 21: 487-506.

Bratti, Massimiliano, and Chiara Conti. 2018. "The Effect of Immigration on Innovation in Italy." *Regional Studies*, 52 (7): 934-947.

Brieger, Steven A., and Michael M. Gielnik. 2021. "Understanding the Gender Gap in Immigrant Entrepreneurship: A Multi-Country Study of Immigrants' Embeddedness in Economic, Social, and Institutional Contexts." *Small Business Economics*, 56: 1007-1031.

Brinatti, Agostina, Mingyu Chen, Parag Mahajan, Nicolas Morales and Kevin Shih. 2023. "The Impact of Immigration on Firms and Workers: Insights from the H-1B Lottery." *Social Science Research Network 4431106*.

Brown, J. David, John S. Earle, Mee Jung Kim and Kyung Min Lee. 2020. "Immigrant Entrepreneurs and Innovation in the US High-Tech Sector." In *The Roles of Immigrants and Foreign Students in US Science, Innovation, and Entrepreneurship*, edited by Ina Ganguli, Shulamit Kahn, and Megan MacGarvie, 149-172. Chicago, IL: University of Chicago Press.

Burchardi, Konrad B., Thomas Chaney, Tarek Alexander Hassan, Lisa Tarquinio and Stephen J. Terry. 2020. "Immigration, Innovation, and Growth." *NBER Working Paper 27075*.

Catron, Peter. 2017. "Prosperity-Pull or Recession-Push?: Mexican Immigrant Self-Employment Across the Business Cycle." *SSRN Working Paper*.

Chatterji, Aaron, Edward Glaeser and William R. Kerr. 2014. "Clusters of Entrepreneurship and Innovation." *Innovation Policy and the Economy*, 14 (1): 129-166.

Choi, Joonkyu, Nathan Goldschlag, John Haltiwanger, and Daniel J. Kim. 2021.Early Joiners and Startup Performance. *NBER Working Paper 28417.*

Clark, Ken, and Stephen Drinkwater. 2010. "Patterns of Ethnic Self-employment in Time and Space: Evidence from British Census Microdata." *Small Business Economics*, 34 (3): 323-338.

Clark, Ken, Stephen Drinkwater, and Catherine Robinson. 2017. "Self-employment amongst Migrant Groups: New Evidence from England and Wales." *Small Business Economics*, 48 (4): 1047-1069.

Clemens, Michael A. 2011. "Economics and Emigration: Trillion-Dollar Bills on the Sidewalk?" *Journal of Economic Perspectives*, 25 (3): 83-106.

Constant, Amelie, and Klaus Zimmermann. 2005. "Legal Status at Entry, Economic Performance, and Self-employment Proclivity: A Bi-national Study of Immigrants." *CEPR Discussion Paper 5696.*

Constant, Amelie, and Klaus Zimmermann. 2014. "Self-employment Against Employment or Unemployment: Markov Transitions Across the Business Cycle." *Eurasian Business Review,* 4 (1): 51-87.

Conti, Annamaria, and Jorge A. Guzman. 2023. "What Is the US Comparative Advantage in Entrepreneurship? Evidence from Israeli Migration to the United States." *The Review of Economics and Statistics*, 105 (3): 528-554.

Cooke, Abigail, Tom Kemeny, Max Nathan, and Ceren Ozgen. 2024. "Immigrant Diversity and Innovation in Cities and Regions." *Forthcoming Chapter in Volume.*

Crown, Daniel, Alessandra Faggian and Jonathan Corcoran. 2020. "Foreign-Born Graduates and Innovation: Evidence from an Australian Skilled Visa Program." *Research Policy*, 49 (9): 103945.

Crunchbase. 2022. The 4 Most Valuable US Unicorns Have Immigrant CEOs. So Do 4 Of The 7 Top Public Companies. *Crunchbase*, Link.

Dagnelie, Olivier, Anna Maria Mayda and Jean-François Maystadt. 2019. "The Labor Market Integration of Refugees in the United States: Do Entrepreneurs in the Network Help?" *European Economic Review*, 111: 257-272.

Dimmock, Stephen G., Jiekun Huang and Scott J. Weisbenner. 2021. "Give Me Your Tired, Your Poor, Your High-Skilled Labor: H-1B Lottery Outcomes and Entrepreneurial Success." *Management Science*, 68 (9): 6950-6970.

Docquier, Frederic, Ricardo Turati, Jerome Valette and Chrysovalantis Vasilakis. 2020. "Birthplace Diversity and Economic Growth: Evidence from the US States in the Post-World War II Period." *Journal of Economic Geography*, 20 (2): 321-354.

Doran, Kirk, and Chungeun Yoon. 2020. "Immigration and Invention: Does Language Matter?" In *The Roles of Immigrants and Foreign Students in US Science, Innovation, and Entrepreneurship*, edited by Ina Ganguli, Shulamit Kahn, and Megan MacGarvie, 123-146. Chicago, IL: University of Chicago Press.

Doran, Kirk, Alexander Gelber and Adam Isen. 2022. "The Effects of High-Skilled Immigration Policy on Firms: Evidence from Visa Lotteries." *Journal of Political Economy*, 130 (10): 2501-2533.

Fairlie, Robert W. 2024. "Indicators of Entrepreneurial Activity: 2023". *SSRN Working Paper*.

Fairlie, Robert W., and Frank Fossen. 2019. "Defining Opportunity versus Necessity Entrepreneurship: Two Components of Business Creation." *NBER Working Paper 26377*.

Fairlie, Robert W., and Magnus Lofstrom. 2014. "Immigration and Entrepreneurship." In *Handbook on the Economics of International Migration*, edited by B. R. Chiswick and P. W. Miller. Amsterdam: Elsevier.

Fairlie, Robert W., Arnobio Morelix and Inara Tareque. 2017. *2017 Kauffman Index of Startup Activity*. Kansas City, MO: Ewing Marion Kauffman Foundation.

Fairlie, Robert W., and Christopher Woodruff. 2007. "Mexican Entrepreneurship: A Comparison of Self-Employment in Mexico and the United States." In *Mexican Immigration to the United States*, edited by G. Borjas. Chicago, IL: University of Chicago Press.

Fairlie, Robert W., and Christopher Woodruff. 2010. "Mexican American Entrepreneurship." *The B.E. Journal of Economic Analysis & Policy*, 10 (1): 1-44.

Ferruci, Edoardo. 2020. "Migration, Innovation and Technological Diversion: German Patenting After the Collapse of the Soviet Union." *Research Policy*, 49 (9): 104057.

Fornaro, Paolo. 2018. "Immigrant Entrepreneurship in Finland." *ETLA Report 83*.

Ganguli, Ina, and Megan MacGarvie. 2024. "International Students' Migration: Immigration Policy and Implications for Innovation." *Forthcoming Chapter in Volume.*

Gaulé, Patrick. 2024. "Return Migration and Diffusion: Case Studies and Micro-Econometric Evidence." *Forthcoming Chapter in Volume.*

Glennon, Britta, and Saerom Lee. 2023. "The Effect of Immigration Policy on Founding Location Choice: Evidence from Canada's Start-up Visa Program." *NBER Working Paper 31634.*

Gonazales-Uribe, Juanita, and Michael Leatherbee. 2017. "The Effects of Business Accelerators on Venture Performance: Evidence from Start-Up Chile." *The Review of Financial Studies*, 31 (4): 1566-1603.

Green, David, Huju Liu, Yuri Ostrovsky, and Garnett Picot. 2024. **"**Are Immigrants Particularly Entrepreneurial? Policy Lessons from a Selective Immigration System." *Working Paper*.

Haltiwanger, John, Ron Jarmin and Javier Miranda. 2013. "Who Creates Jobs? Small vs. Large vs. Young." *Review of Economics and Statistics*, 95 (2): 347-361.

Hammarstedt, Mats, and Chizheng Miao. 2020. "Self-Employed Immigrants and Their Employees: Evidence from Swedish Employer-Employee Data." *Review of Economics of the Household*, 18 (1): 35-68.

Hegde, Deepak, and Justin Tumlinson. 2014. "Does Social Proximity Enhance Business Partnerships? Theory and Evidence from Ethnicity's Role in U.S. Venture Capital." *Management Science*, 60 (9): 2355–2380.

Hornung, Erik. 2014. "Immigration and the Diffusion of Technology: The Huguenot Diaspora in Prussia." *American Economic Review*, 104 (1): 84-122.

Hunt, Jennifer. 2011. "Which Immigrants Are Most Innovative and Entrepreneurial? Distinctions by Entry Visa." *Journal of Labor Economics*, 29 (3): 417-457.

Hunt, Jennifer, and Marjolaine Gauthier-Loiselle. 2010. "How Much Does Immigration Boost Innovation?" *American Economic Journal: Macroeconomics*, 2 (2): 31-56.

Kahn, Shulamit, Giulia La Mattina and Megan J. MacGarvie. 2017. "'Misfits', 'Stars', and Immigrant Entrepreneurship." *Small Business Economics*, 49: 533-557.

Kalnins, Arturs, and Wilbur Chung. 2006. "Social Capital, Geography, and Survival: Gujarati Immigrant Entrepreneurs in the U.S. Lodging Industry." *Management Science*, 52 (2): 233-247.

Kerr, Sari Pekkala, and William R. Kerr. 2017. "Immigrant Entrepreneurship." In *Measuring Entrepreneurial Businesses: Current Knowledge and Challenges*, edited by John Haltiwanger, Erik Hurst, Javier Miranda, and Antoinette Schoar, 187–249. Chicago, IL: University of Chicago Press.

Kerr, Sari Pekkala, and William R. Kerr. 2020a. "Immigrant Networking and Collaboration: Survey Evidence from CIC." In *The Roles of Immigrants and Foreign Students in US Science, Innovation, and Entrepreneurship*, edited by Ina Ganguli, Shulamit Kahn, and Megan MacGarvie, 173-206. Chicago, IL: University of Chicago Press.

Kerr, Sari Pekkala, and William R. Kerr. 2020b. "Immigrant Entrepreneurship in America: Evidence from the Survey of Business Owners 2007 & 2012." *Research Policy*, 49 (3): 103918.

Kerr, Sari Pekkala, and William R. Kerr. 2021. "Whose Job Is It Anyway? Coethnic Hiring in New US Ventures." *Journal of Human Capital*, 15 (1): 86-127.

Kerr, Sari Pekkala, and William R. Kerr. 2022. "Immigration Policy Levers for US Innovation and Startups." In *Innovation and Public Policy*, edited by Austin Goolsbee and Benjamin Jones, 85-115. Chicago, IL: University of Chicago Press.

Kerr, William R., and William F. Lincoln. 2010. "The Supply Side of Innovation: H-1B Visa Reforms and U.S. Ethnic Invention." *Journal of Labor Economics*, 28 (3): 473-507.

Kerr, William R., and Martin Mandorff. 2023. "Social Networks, Ethnicity, and Entrepreneurship." *Journal of Human Resources*, 58 (1): 183-220.

Kone, Zovanga L., Isabel Ruiz, and Carlos Vargas-Silva. 2021. "Self-employment and Reason for Migration: Are Those Who Migrate for Asylum Different from Other Migrants?" *Small Business Economics*, 56 (3): 947-962.

Kossoudji, Sherrie A., and Deborah A. Cobb-Clark. 2002. "Coming out of the Shadows: Learning about Legal Status and Wages from the Legalized Population." *Journal of Labor Economics*, 20 (3), 598-628.

Lee, Kyung Min, Mee Jung Kim, J. David Brown, John S. Earle and Zhen Liu. 2023. "Are Immigrants More Innovative? Evidence from Entrepreneurs." *Presented At the NBER Conference on Immigrants and the U.S. Economy (March 2023).*

Lissoni, Francesco, and Ernest Miguelez. 2024. "Migration and Innovation." *Journal of Economic Perspectives*, 38 (1): 27-54.

Lofstrom, Magnus, and Chunbei Wang. 2021. "Self-Employment and Labor Market Assimilation of Immigrants 1980–2016." *Working Paper.*

Lofstrom, Magnus, and Chunbei Wang. 2022. "Immigrant Entrepreneurs." In *Handbook of Labor, Human Resources and Population Economics*, edited by Klaus F. Zimmermann, 1-32. Switzerland: Springer Nature.

Mahajan, Parag. 2024. "Immigration and Business Dynamics: Evidence from U.S. Firms." *Journal of the European Economic Association (forthcoming).*

Marinoni, Astrid. 2023. "Immigration and Entrepreneurship: the Role of Enclaves." *Management Science*, 69 (12): 7266-7284.

Marino, Marianna, PierPaolo Parrotta, and Francesco Lissoni. 2024. "Firm and Team Country-of-origin Diversity and Innovation." *Forthcoming Chapter in Volume.*

Marshalian, Michelle. 2023. "The Rural-Urban Divide and Entrepreneurial Diversity in Canada." *Working Paper.*

Miao, Chizheng. 2020. "Immigrant Self-employment and Local Unemployment in Sweden." *The Manchester School*, 88 (3): 464-488.

Miguelez, Ernest, and Andrea Morrison. 2023. "Migrant Inventors as Agents of Technological Change." *The Journal of Technology Transfer*, 48: 669-692.

Nathan, Max. 2015. "Same Difference? Minority Ethnic Inventors, Diversity and Innovation in the UK." *Journal of Economic Geography*, 15 (1): 129-168.

National Foundation for American Policy. 2022. *Immigrant Entrepreneurs and U.S. Billion-Dollar Companies.* Policy Brief.

National Foundation for American Policy. 2023. *AI and Immigrants.* Policy Brief.

Ostrovsky, Yuri, and Garnett Picot. 2021. "Innovation in Immigrant-owned Firms." *Small Business Economics*, 57: 1857-1874.

Prato, Marta. 2023. "The Global Race for Talent: Brain Drain, Knowledge Transfer, and Economic Growth." *Working Paper.*

Roach, Michael, Henry Sauermann and John Skrentny. 2020. "Are Foreign STEM PhDs More Entrepreneurial? Entrepreneurial Characteristics, Preferences, and Employment Outcomes of Native and Foreign Science and Engineering PhD Students." In *The Roles of Immigrants and Foreign Students in US Science, Innovation, and Entrepreneurship*, edited by Ina Ganguli, Shulamit Kahn, and Megan MacGarvie, 207-228. Chicago, IL: University of Chicago Press.

Saxenian, AnnaLee. 2002. "Silicon Valley's New Immigrant High-Growth Entrepreneurs." *Economic Development Quarterly*, 16: 20-31.

Schoar, Antoinette. 2010. "The Divide between Subsistence and Transformational Entrepreneurship." *Innovation Policy and the Economy*, 10 (1): 57-81.

Schuetze, Herbert, and Heather Antecol. 2005. "Immigration, Entrepreneurship, and the Venture Start-up Process." In *International Handbook Series on Entrepreneurship Volume 2*, edited by Zoltan Acs and David Audretsch, 107-120. Kluwer Academic.

Sequira, Sandra, Nathan Nunn and Nancy Qian. 2019. "Immigrants and the Making of America." *The Review of Economic Studies*, 87 (1): 382-419.

Shi, Yuan, Olav Sorenson and David Waguespack. 2023. "The New Argonauts: The International Migration of Venture-Backed Companies." Working Paper.

Stangler, Dane, and Jared Konczal. 2013. "Give Me Your Entrepreneurs, Your Innovators: Estimating Employment Impact of a Startup Visa." *Ewing Marion Kauffman Foundation*, SSRN 2226454.

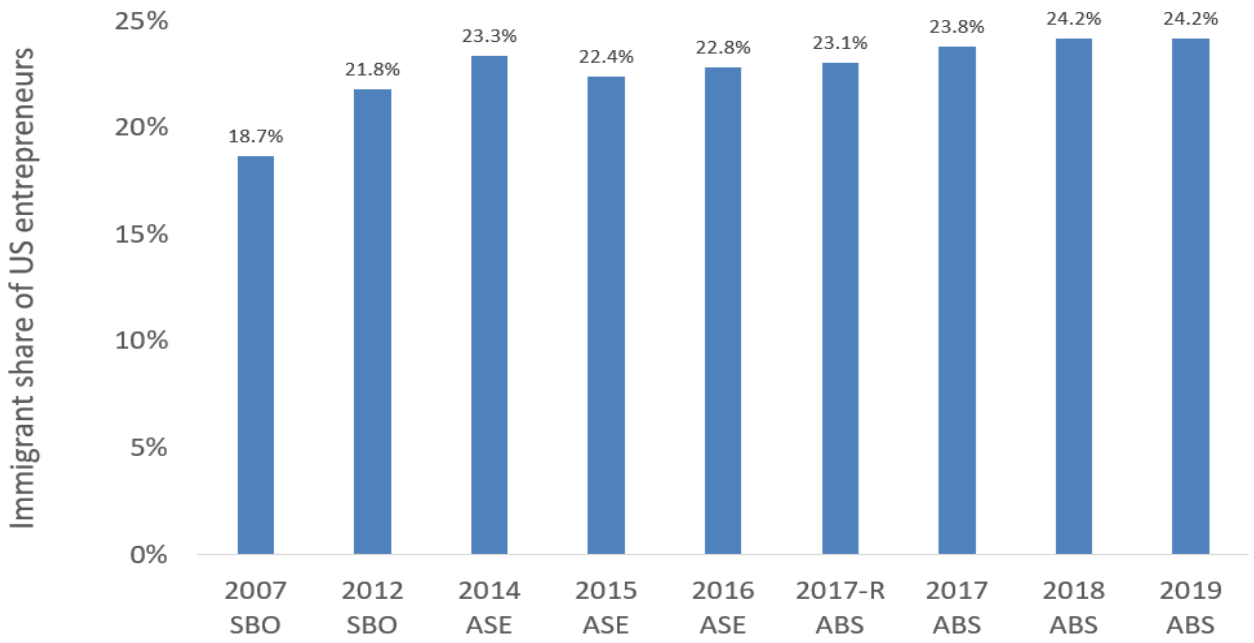
Start-Up Chile. 2023. Statistics Page. *Start-Up Chile*, Link

Ulceluse, Magdalena M., and Martin Kahanec. 2017. "Self-employment Effects of Restrictive Immigration Policies: The Case of Transitional Arrangements in the EU." *Central European Labour Studies Institute Discussion Paper 47.*

Wang, Chunbei. 2019. "Tightened Immigration Policies and the Self-Employment Dynamics of Mexican Immigrants." *Journal of Policy Analysis and Management*, 38 (4): 944-977.

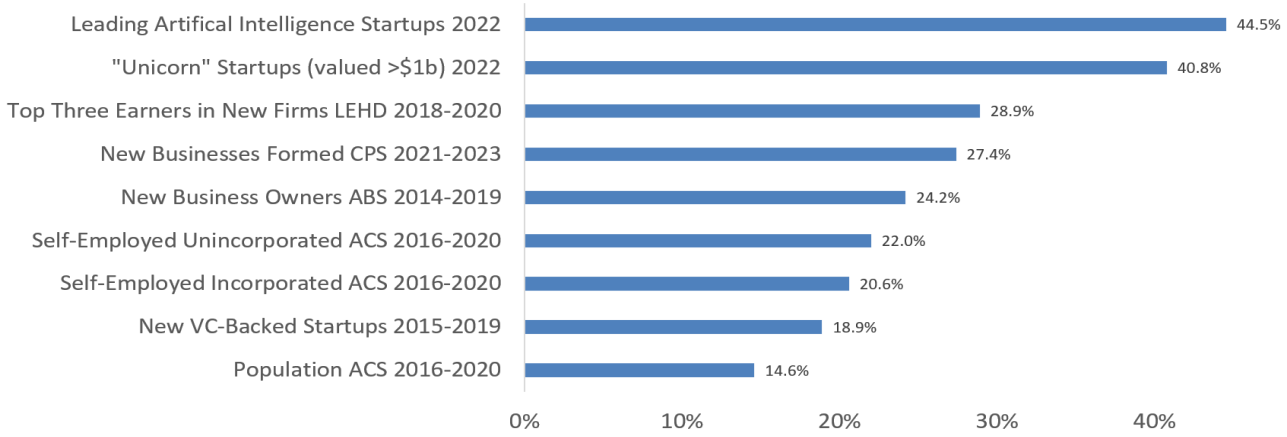
Wilson, Kenneth, and Alejandro Portes. 1981. "Immigrant Enclaves: An Analysis of the Labor Market Experiences of Cubans in Miami." *American Journal of Sociology*, 86: 295-319.

Figure 1a: Immigrant share of US entrepreneurship in SBO-ASE-ABS



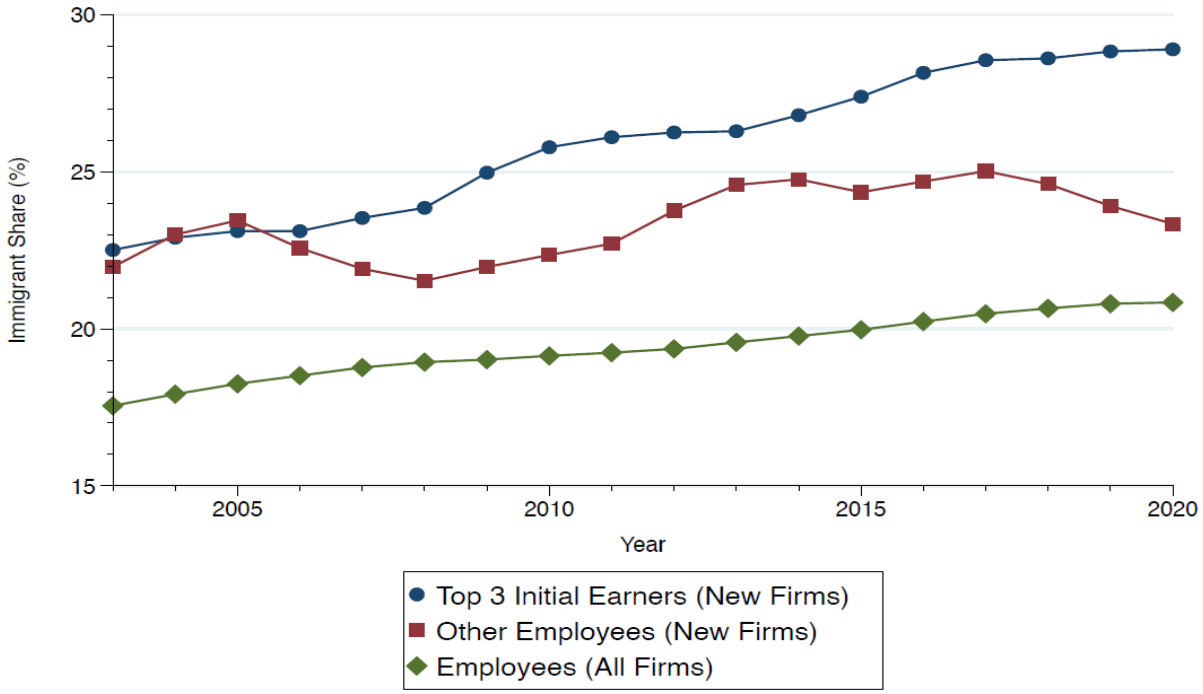
Notes: Figure combines statistics from the Survey of Business Owners, Annual Survey of Entrepreneurs, and Annual Business Survey. The SBO, ASE, and 2017-R ABS statistics require owners to have founded the firm (vs. other means of acquiring a business like purchase or inheritance). The remaining ABS values do not have this requirement as the 2018 and 2019 ABS waves dropped the question. Disclosure conducted under FSRDC Project Numbers 1182 and 1731. Request number 5948, 8512, CBDRB-FY23-P1731-R10666 and R11027.

Figure 1b: Immigrant share of US entrepreneurship by types



Notes: Figure combines statistics from types of startup activity. The 2016-2020 American Community Survey is used to calculate population and self-employment shares. Fairlie (2024) documents the Current Population Survey data on new businesses formed. Amornsiripanitch et al. (2023) provide the immigrant share among founders of new startups receiving venture capital investment during 2015-2019. Immigrant founder shares for unicorn and leading AI startup shares are taken from Anderson and NFAP (2022, 2023). In both cases, we thank the authors of the prior studies for providing us modified calculations to enable easier comparisons in this chart. The ABS and LEHD figures are disclosed under FSRDC Project Numbers 1731 and 2766, CBDRB-FY23-P1731-R10666, R11027 and CBDRB-FY23-P2766-R10877, R10856.

Figure 2a: Immigrant shares in full LEHD sample



Notes: Figure provides trends related to immigrant entrepreneurship in 25 states in our LEHD sample. See Columns 6-8 of Appendix Table 2a. Disclosure conducted under FSRDC Project Numbers 2766, CBDRB-FY23-P2766-R10877, R10856.

Figure 2b: Immigrant shares in long LEHD sample

Notes: Figure provides trends related to immigrant entrepreneurship in 11 states in our LEHD sample with an extended time horizon. See Columns 6-8 of Appendix Table 2b. Disclosure conducted under FSRDC Project Numbers 2766, CBDRB-FY23-P2766-R10877, R10856.

Table 1: Estimations of firm innovativeness for immigrant vs. native business owners in new entrants

	(0,1) Owner was a STEM major	(0,1) Firm has any patent	Number of patents per employee	(0,1) Firm is said to be creative	(0,1) Firm brought new innovation to market	Number of innovation barriers faced by firm (max = 11)	(0,1) Firm produced new technology	(0,1) Firm used other technology
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				A. Immigrant differential without controls				
(0,1) Immigrant owner	0.0741	0.0085	0.0201	-0.0138	0.0022	-1.210	0.0336	-0.0581
	(15.64)	(4.26)	(2.51)	(-3.35)	(0.51)	(-23.86)	(6.98)	(-8.45)
				B. Immigrant differential with controls				
(0,1) Immigrant owner	0.0922	0.0122	0.0260	0.0074	0.0076	-1.126	0.0452	-0.0276
	(22.05)	(6.02)	(2.73)	(1.82)	(1.71)	(-21.63)	(9.59)	(-3.91)
Immigrant mean	0.255	0.035	0.046	0.159	0.179	7.534	0.144	0.385
Native mean	0.181	0.026	0.026	0.173	0.177	8.744	0.110	0.443
beta[Panel A] / Native mean	41%	32%	78%	-8%	1%	-14%	31%	-13%
beta[Panel B] / Native mean	51%	47%	101%	4%	4%	-13%	41%	-6%
Observations	46,000	46,000	46,000	46,000	46,000	28,000	28,000	28,000

Notes: Table reports traits of newly entered firms (first year in business of 2014-2019) and their owners using micro-data from the Annual Business Survey. Columns 1-5 use questions contained in the 2017 ABS; Columns 6-8 use questions contained in the 2019 ABS. Each observation is separate owner-firm pair. Panel A only models an indicator variable for an immigrant owner, measuring the difference between the sample means. Panel B includes controls for year, industry, gender, age, number of owners of firm, education level, and STEM major. The last control of STEM major is excluded in Column 1. Observation counts are rounded per Census Bureau disclosure requirements. Parentheses report t-statistics with robust standard errors. Disclosure conducted under FSRDC Project Number 1731. CBDRB-FY23-P1731-R10666, R11027.

Appendix Table 1: Descriptive statistics for SBO-ASE-ABS

	2007 SBO	2012 SBO	2014 ASE	2015 ASE	2016 ASE	2017-R ABS	2017 ABS	2018 ABS	2019 ABS
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Number of firms	114,000	50,000	31,000	9,400	9,000	108,000	129,000	40,500	38,500
Number of owners / founders	177,000	74,500	45,000	13,000	12,500	155,000	202,000	62,000	59,000
% Family Owned	30.9%	25.1%	24.3%	22.8%	24.5%	26.0%	26.8%	25.6%	24.8%
% Owners Female	31.4%	31.8%	31.6%	32.0%	32.0%	32.1%	32.6%	32.5%	33.5%
% Owners Immigrant	18.7%	21.8%	23.3%	22.4%	22.8%	23.1%	23.8%	24.2%	24.2%
% Owners College Educated	52.2%	56.5%	55.0%	55.7%	54.4%	55.1%	54.2%	54.3%	55.7%
% Owners HS / Some College	44.6%	40.8%	41.7%	41.0%	41.9%	41.9%	42.6%	42.6%	41.1%
% Owners Less than HS	3.2%	2.9%	3.3%	3.3%	3.7%	3.0%	3.2%	3.1%	3.2%
% Owners Aged < 25	1.3%	1.1%	0.8%	1.3%	1.3%	0.7%	0.8%	0.8%	0.8%
% Owners Aged 25-35	17.0%	16.0%	15.0%	18.6%	18.8%	12.3%	12.6%	12.9%	12.4%
% Owners Aged 35-55	62.4%	60.0%	59.3%	58.1%	58.6%	57.9%	57.3%	57.8%	58.0%
% Owners Aged > 55	19.3%	23.0%	24.9%	22.0%	21.4%	29.1%	29.3%	28.5%	28.9%
% Owners White	87.4%	82.3%	81.9%	81.9%	80.9%	85.4%	84.2%	84.0%	83.8%
% Owners Black	2.2%	2.9%	2.6%	2.8%	3.2%	2.5%	2.3%	2.4%	2.5%
% Owners Hispanic	6.9%	7.5%	8.5%	8.7%	9.5%	7.9%	7.5%	8.2%	8.7%
% Owners Asian	8.6%	13.1%	13.7%	13.4%	13.6%	11.7%	13.2%	13.2%	13.3%
% Owners Other Race	1.8%	3.0%	3.0%	3.5%	3.8%	0.3%	0.3%	0.3%	0.3%
% Owners with Previous Firms	51.4%	51.3%	47.2%	52.1%	n/a	43.9%	43.3%	72.1%	52.2%

Notes: See Figure 1 and Table 1. Table combines statistics from the Survey of Business Owners, Annual Survey of Entrepreneurs, and Annual Business Survey. The SBO, ASE, and 2017-R ABS statistics require owners to have founded the firm (vs. other means of acquiring a business like purchase or inheritance). The remaining ABS values in Columns 7-9 do not have this requirement as the 2018 and 2019 ABS waves dropped the question. Questioning regarding previous business ownership changed in 2018. Disclosure conducted under FSRDC Project Numbers 1182 and 1731. Request number 5948, 8512, CBDRB-FY23-P1731-R10666, R11027. Due to differences in education coding across disclosures, we adjusted all classifications to include only BA and higher as a college degree, while Associate degree is considered not a college degree. Where needed, adjustment was done using the 2007 SBO PUMS ratio for the Associate degree.

Appendix Table 2a: Immigrant entrepreneurship in the full sample of 25 states

Year	Share of new firms with at least one immigrant entrepreneur	Equal weight given to each firm			Equal weight given to each individual		
		Immigrant share of top three initial earners in new firms	Immigrant share of other employees in new firms	Immigrant share of employees for all firms	Immigrant share of top three initial earners in new firms	Immigrant share of other employees in new firms	Immigrant share of employees for all firms
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
2003	0.268	0.233	0.211	0.181	0.225	0.220	0.176
2004	0.272	0.237	0.218	0.185	0.229	0.230	0.179
2005	0.273	0.237	0.219	0.189	0.231	0.235	0.183
2006	0.273	0.236	0.214	0.193	0.231	0.226	0.185
2007	0.277	0.240	0.217	0.197	0.235	0.219	0.188
2008	0.280	0.243	0.218	0.201	0.239	0.215	0.189
2009	0.292	0.256	0.226	0.205	0.250	0.220	0.190
2010	0.301	0.264	0.230	0.208	0.258	0.224	0.191
2011	0.305	0.266	0.232	0.209	0.261	0.227	0.192
2012	0.305	0.266	0.234	0.211	0.263	0.238	0.194
2013	0.304	0.265	0.236	0.214	0.263	0.246	0.196
2014	0.310	0.271	0.237	0.216	0.268	0.248	0.198
2015	0.316	0.278	0.241	0.219	0.274	0.244	0.200
2016	0.323	0.286	0.248	0.222	0.282	0.247	0.202
2017	0.327	0.291	0.252	0.225	0.286	0.250	0.205
2018	0.327	0.291	0.251	0.227	0.286	0.246	0.207
2019	0.330	0.295	0.252	0.230	0.288	0.239	0.208
2020	0.330	0.296	0.255	0.232	0.289	0.233	0.208
Mean	0.301	0.264	0.233	0.209	0.259	0.234	0.194
Ratio 2020/2003	1.23	1.27	1.21	1.28	1.28	1.06	1.19

Notes: Table provides trends related to immigrant entrepreneurship in 25 states present in the LEHD: AZ, CA, CO, CT, DE, KS, MA, MD, ME, MO, MT, ND, NM, NV, OH, OK, PA, SC, SD, TN, UT, VA, WA, WI, and WY. New firms are included for their first three years in a rolling sample (i.e., the share for 2006 is measured over firms launched in 2004-2006). Entrepreneurial teams are proxied as top three initial earners in the new firm. Other employees are those working in the nascent firm who are not a top three initial earner. FSRDC Project Number 2766. CBDRB-FY23-P2766-R10877, R10856.

Appendix Table 2b: Immigrant entrepreneurship in the long sample of 11 states

Year	Share of new firms with at least one immigrant entrepreneur	Equal weight given to each firm			Equal weight given to each individual		
		Immigrant share of top three initial earners in new firms	Immigrant share of other employees in new firms	Immigrant share of employees for all firms	Immigrant share of top three initial earners in new firms	Immigrant share of other employees in new firms	Immigrant share of employees for all firms
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1995	0.240	0.206	0.200	0.170	0.199	0.207	0.167
1996	0.250	0.214	0.207	0.176	0.208	0.213	0.173
1997	0.258	0.222	0.215	0.182	0.215	0.218	0.180
1998	0.258	0.223	0.224	0.189	0.216	0.221	0.188
1999	0.265	0.228	0.222	0.195	0.222	0.220	0.193
2000	0.272	0.234	0.223	0.200	0.229	0.225	0.200
2001	0.283	0.246	0.237	0.207	0.241	0.240	0.207
2002	0.298	0.260	0.249	0.214	0.255	0.256	0.211
2003	0.315	0.277	0.256	0.223	0.270	0.271	0.215
2004	0.318	0.280	0.261	0.227	0.273	0.279	0.218
2005	0.318	0.279	0.258	0.231	0.274	0.280	0.221
2006	0.316	0.277	0.253	0.235	0.273	0.272	0.223
2007	0.319	0.279	0.255	0.239	0.276	0.264	0.226
2008	0.321	0.281	0.255	0.243	0.278	0.258	0.227
2009	0.334	0.294	0.262	0.247	0.289	0.258	0.227
2010	0.342	0.303	0.265	0.249	0.298	0.261	0.228
2011	0.347	0.305	0.268	0.249	0.301	0.267	0.229
2012	0.346	0.303	0.270	0.251	0.301	0.283	0.229
2013	0.345	0.300	0.272	0.253	0.300	0.292	0.231
2014	0.350	0.307	0.273	0.255	0.306	0.291	0.233
2015	0.357	0.315	0.277	0.257	0.312	0.281	0.234
2016	0.362	0.323	0.284	0.258	0.320	0.285	0.236
2017	0.367	0.329	0.288	0.262	0.324	0.290	0.238
2018	0.364	0.327	0.285	0.264	0.323	0.285	0.239
2019	0.368	0.331	0.287	0.266	0.325	0.277	0.239
2020	0.368	0.332	0.290	0.268	0.326	0.269	0.240
Mean	0.318	0.280	0.255	0.231	0.275	0.260	0.217
Ratio 2020/1995	1.53	1.62	1.45	1.57	1.64	1.30	1.43

Notes: See Appendix Table 2a. Table provides trends for 11 states with extended data: AZ, CA, CO, KS, MD, MO, MT, PA, WA, WI, and WY.

Appendix Table 3: Regional variation in immigrant entrepreneurship

Year	Total average for 25 states (Column 6, App. Table 2a)	California, Nevada, Washington	Connecticut, Maine, Massachusetts	Delaware, Maryland, South Carolina, Tennessee, Virginia	Arizona, Colorado, New Mexico, Utah	Ohio, Pennsylvania, Wisconsin	Kansas, Missouri, Oklahoma	Montana, North Dakota, South Dakota, Wyoming
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2003	0.268	0.385	0.194	0.177	0.132	0.098	0.069	0.037
2004	0.272	0.387	0.206	0.188	0.134	0.102	0.071	0.041
2005	0.273	0.385	0.213	0.195	0.137	0.105	0.075	0.040
2006	0.273	0.382	0.223	0.202	0.141	0.109	0.076	0.042
2007	0.277	0.385	0.233	0.206	0.147	0.114	0.079	0.042
2008	0.280	0.388	0.246	0.213	0.152	0.121	0.081	0.043
2009	0.292	0.398	0.260	0.224	0.158	0.129	0.088	0.043
2010	0.301	0.405	0.272	0.231	0.161	0.135	0.093	0.048
2011	0.305	0.406	0.280	0.234	0.162	0.139	0.097	0.053
2012	0.305	0.403	0.291	0.239	0.160	0.145	0.098	0.055
2013	0.304	0.400	0.296	0.241	0.159	0.151	0.105	0.056
2014	0.310	0.406	0.300	0.238	0.158	0.152	0.109	0.059
2015	0.316	0.414	0.308	0.233	0.162	0.151	0.108	0.061
2016	0.323	0.423	0.315	0.232	0.162	0.155	0.109	0.065
2017	0.327	0.427	0.324	0.229	0.164	0.161	0.114	0.068
2018	0.327	0.425	0.332	0.230	0.166	0.162	0.114	0.068
2019	0.330	0.423	0.336	0.230	0.168	0.164	0.112	0.070
2020	0.330	0.420	0.328	0.234	0.172	0.166	0.117	0.073
Mean	0.301	0.403	0.275	0.221	0.155	0.137	0.095	0.054
Ratio 2020/2003	1.23	1.09	1.70	1.33	1.30	1.69	1.70	1.96

Notes: See Appendix Table 2a. LEHD disclosure requires each sample contain at least three states. Samples are ordered by their mean 2003-2020 value.