Getting Schooled:
The Role of Universities in Attracting Immigrant Entrepreneurs

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Immigrant founders of venture capital-backed companies have been critical to the entrepreneurial ecosystem. We document the channels through which immigrant founders find their way to the United States and how those channels have changed over time. Immigrants have been an important source of founders for venture capital-backed startups accounting for roughly 20% of all founders over the past 30 years. Immigrants coming to the United States for their education have been the primary source of founders with those coming after being educated abroad and then arriving for work decreasing in importance over time. The importance of undergraduate education as a channel for immigrant founders has increased over time. Immigrant founders coming for education are likely to start their companies in the state in which they were educated, especially states where they received their graduate education, leading to potentially large local economic benefits. The results of this paper have important policy implications for the supply of entrepreneurial talent and efforts to promote entrepreneurial ecosystems.

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1 Introduction

Immigrants play a vital role in innovation activities (Hunt and Gauthier-Loiselle, 2010; Bernstein, Diamond, McQuade, and Pousada, 2020) and entrepreneurship (Kerr and Kerr, 2016; Azoulay, Jones, Kim, and Miranda, 2020; Kerr and Kerr, 2020). Given the substantial contribution of immigrants in these areas, a set of natural questions arise: what are the pathways that high-skilled immigrants take to arrive in the United States and how has the importance of these pathways changed over time? What are important institutions that serve as gatekeepers for high-skilled immigrants and does it affect the types of immigrant founders that come to the United States? Do certain parts of the United States benefit disproportionately from high-skilled immigration, and if so, what are some factors that contribute to these benefits? The answers to these questions have important implications for designing immigration policy and regulation which have become increasingly acrimonious topics in public discourse. They also have important implications for firms and universities which recruit talent from abroad and the communities which hope to promote vibrant entrepreneurial ecosystems.

To answer these questions, we study venture capital (VC)-backed immigrant entrepreneurs. The VC ecosystem plays a crucial role in the macroeconomy (Gornall and Strebulaev, 2015; Gompers and Lerner, 2000), with VC-backed firms contributing disproportionately to the right tail of the firm size and innovation distributions in the US economy (Akcigit, Dinlersoz, Greenwood, and Penciakova, 2019). Venture-backed firms are also substantial job creators for the US economy; focusing on the contribution of immigrant founders of venture-backed firms illustrates the job *creating* role that immigrants play in the economy, helping address concerns that immigrants primarily take jobs away from natives (Azoulay, Jones, Kim, and Miranda, 2020). Finally, a variety of policy makers have endeavored to design policies that promote and foster high growth-potential entrepreneurship. Accordingly, understanding the contribution of immigrants to this important part of the economy is of interest in its own right. Additionally, as we discuss further, while entrepreneurs that start venture-backed firms may be a selected sample, the detailed dataset we assemble on immigrant entrepreneurs yields insights that are likely to generalizable to high-skilled immigrants in general.

To address the questions that we raise, we leverage a combination of unique datasets that allow us to identify immigrant entrepreneurs and to more closely study their backgrounds. Particularly, we combine a dataset from Infutor, which enables us to proxy for the immigration status of individuals in the United States, with VentureSource, a workhorse dataset for the study of VC ecosystem, which contains detailed information on the near universe of venture capital-backed startups in the United States. We supplement these data with hand-collected information on the education and fields of study and prior work experience for entrepreneurs in our sample. Combined, these data provide a detailed source of information that we take advantage of to understand the pathways that high-skilled immigrants take towards entrepreneurship.

We begin our empirical analysis by documenting several facts about immigrant entrepreneurs in our sample. We estimate that approximately 20% of the founders in our sample are immigrants, broadly in-line with estimates in other work of the immigrant share in other entrepreneurial and innovation activities. Consistent with overall immigration trends, we find that the proportion of East Asian and South Asian founders has increased substantially over our sample. We also find that immigrant founders are just as likely as native founders to start firms that have initial public offerings (IPOs) or are acquired at valuations greater than 100 million dollars, markers of success for VC-backed firms. Moreover, relative to natives, immigrants disproportionately tend to start Information Technology (IT) firms. On a relative basis, venture-backed firms founded by immigrants also tend to be founded in coastal states, most notably California, Massachusetts, and New York, as opposed to smaller states in the southern and middle parts of the country. Thus, even relative to their overall greater share of venture capital-backed companies, these coastal states have higher proportions of founders who are immigrants. This last fact indicates that the benefits associated with high-growth potential, immigrant-founded firms have been especially geographically concentrated in certain parts of the country.

Having established these broad facts about immigrant entrepreneurs and their firms, we move to leveraging our unique data on the educational and work history of immigrant entrepreneurs, to better understand immigrant pathways towards entrepreneurship. We categorize each of the immigrant entrepreneurs in our sample into one of three categories: those that came to the US first for college, those that came to the US first for post-graduate education, and those that came to the US after receiving their education elsewhere. This classification allows us to more closely explore how the different pathways of high-skilled immigration to the United States contribute to the pool of entrepreneurial talent. This classification reveals a striking fact; more than 75% immigrant entrepreneurs that we have education information for received some form of education in the United States. Of this 75%, more than half of the entrepreneurs received an undergraduate degree in the United States. The substantial portion of immigrant entrepreneurs educated in the US is one of our key novel findings and suggests the extent to which universities play an important role in importing global entrepreneurial talent to the United States.

More closely focusing on entrepreneurs across the different groups, we find that immigrant entrepreneurs that come to the US for college tend to have similar educational backgrounds to native entrepreneurs. In contrast, entrepreneurs who come to the US for graduate educations or for work tend to be substantially more likely to have studied a science, technology, engineering, and mathematics (STEM) discipline; consistent with this fact, these groups of entrepreneurs are also responsible for the disproportionate representation of immigrants among founders of IT firms in our sample. Interestingly, while the share of immigrant entrepreneurs has stayed relatively constant over our sample, we find that the relative share of US college-educated immigrant entrepreneurs has been rising, while the share of immigrant entrepreneurs that came to the US for graduate school and work has been falling.

Lastly, we study the location in which immigrant founders across the different groups start their companies in order to unpack some of the drivers behind which geographic areas tend to benefit from immigrant entrepreneurs. We find that more than 40% of founders in our sample found firms in the same state that they were educated. This fact is not simply driven by Berkeley- and Stanford-educated entrepreneurs founding companies in the Bay Area, and Harvard- and MIT-educated entrepreneurs founding companies in Massachusetts. Instead, it captures a more general phenomenon that applies to non-venture capital hubs as well. The evidence suggests the presence of top universities has likely been an important determinant of which areas have benefited most from the immigration of high-skilled immigrants that go on to start firms. More generally, this result provides additional evidence for the role that universities play in local agglomeration economies. Universities are known to contribute to local economies in a variety of ways, for example by training a skilled labor force, or by knowledge diffusion from innovation activities (e.g., Hausman, Forthcoming). Our results suggest that this agglomeration benefit extends to attracting skilled immigrants, some of whom end up starting high-growth potential firms.

From a policy perspective, our results emphasize the importance of immigrant entrepreneurs as founders of high-growth potential startups. While a substantial focus in the current public discourse revolves around work visas, such as the H-1B visa, our evidence suggests that student visas may deserve almost as much attention, given the role of universities in bringing foreign students in the right-tail of the distribution into the country. Policy proposals in the past few years have sought to place restrictions on student visas for foreigners. Given the substantial contribution of immigrant entrepreneurs educated in the United States, our results suggest that such policies likely carry significant costs for the country, by restricting the supply of talented potential entrepreneurs. Our results also suggest that there is a substantial lag between when immigrant entrepreneurs enter the country, and when they found their firms. Accordingly, the effects of policies that increase or decrease the flow of immigrants may have very persistent effects on immigrant entrepreneurship which only show up decades after the implementation of the policies.

Our work closely relates to the literature on immigrant entrepreneurship.[1] Kerr and Kerr (2016) merge the Longitudinal Employment-Household Dynamics (LEHD), Longitudinal Business Database

[1] See Fairlie and Lofstrom (2015) for a recent literature review.

(LBD), and venture data to document key facts about immigrant entrepreneurship. An important, unanswered question in this literature is how successful immigrant entrepreneurs come to the United States. We fill this gap in the literature by merging a detailed data set of founders' education and work history with the Dow Jones VentureSource and Infutor data sets. This merged dataset allows us to identify immigrant founders, summarize their educational background, and classify them into three groups, according to their path of immigration.[2] More importantly, we paint a detailed picture of how these foreign entrepreneurs immigrated to the United States and of the path that led them to high-growth entrepreneurship. The findings in this paper highlights the role that American universities play as a key source of foreign entrepreneurial talent for the county which has broad policy implications.

Our paper also adds to the strand of the immigrant entrepreneurship literature that is concerned with the disproportionate contribution that immigrant entrepreneurs make to innovation and technological advances in the United States (Kerr and Fu, 2008; Balasubramanian and Sivadasan, 2011; Akcigit and Kerr, 2010). In this paper, we document that immigrant founders are more likely to hold STEM degrees and start information technology companies, which suggests that immigrant entrepreneurship is a channel through which American universities contribute to the commercialization of innovation and technology in the United States. Additionally, our paper contributes to the strand of the immigrant entrepreneurship literature that studies the impact of immigrant entrepreneurship on local job growth and economic development (Kerr, 2010). We show that, for both native and immigrant founders, education location is an important determinant of startup location. In other words, founders are likely to start their companies in the state that they received their post-secondary education. This result suggests that establishing high quality universities to attract both talented native and foreign students may be a viable strategy to promote local high-growth firm creation.

[2] Other works in the literature use surveys to study immigrant founders' education background (Wadhwa et al., 2007; Wadhwa et al., 2010). However, these works survey only a few hundred VC-backed startup founders. The Dow Jones VentureSource data set allows us to study the near-universe of VC-backed companies that were started by native and immigrant entrepreneurs.

Lastly, our paper sheds light on the role of universities in bringing immigrants into the United States' entrepreneurial ecosystem. Our work thus contributes to a broader literature that focuses on immigration and education (Bound et al., 2011; Grogger and Hanson, 2015; Hanson and Slaughter, 2017; Kerr, 2020). A key takeaway message from our work is that the majority of VC-backed entrepreneurs are educated in the United States, with many educated at top US universities and choosing to start firms in close proximity to their place of education. The role of universities in bringing high-skilled immigrants to the United States complements the results of the literature, and suggests that student visas, and immigrations policies surrounding foreign students more broadly, are a critical area to focus on.

2 Data

We use two main data sources for our study. The first is the Infutor database, which contains address history and information for US residents. The Infutor database is especially useful for our study because it enables us to construct a reasonable proxy for the immigrant status of individuals in the database. The second main data source we use is Dow Jones VentureSource, which is one of the main databases used to study VC-backed firms. We supplement the data from these sources with hand-collected educational data for the founders in our sample. We discuss these datasets, and how we combine them to form the final dataset used in this paper, in more detail below.

2.1 Infutor Database

The Infutor database provides address history and information for more than 160 million US residents. The data is aggregated from many sources, including phone books, magazine subscriptions, and credit header files. For each individual, the database contains the individual's first and last name, and the exact address and date of residence for the individual's current and past residences. The dataset also contains demographic information for number of individuals in the sample, such as their years of birth, genders, and the first five digits of their social security numbers. Past studies that have used the Infutor dataset include Diamond et al. (2019) and Bernstein et al. (2018). As noted in these works, the Infutor data appears to be largely representative of the overall US population. The address history captured in the sample generally goes back to 1990, though there are some individuals with data entries back to the 1980s.

We broadly follow the approach outlined in Bernstein et al. (2018) to construct an immigrant variable for observations in the Infutor database. This approach exploits the fact that, from 1936 to 2011, social security numbers (SSNs) were assigned using a specific formula. The first three digits of the social security number (the "area number") reflect the geographic region that the social security number was assigned, the next two digits corresponded with a "group number," and the last four digits correspond with an individual-specific serial number. Moreover, group numbers were assigned sequentially within a geographic region over the given time period. That is, for a given area number, the same group number was used for all social security numbers, until all possible serial numbers (the last four digits), ranging from 0001 to 9999, were exhausted. Accordingly, any combination of the first five digits of the social security number was only assigned during a certain year(s); the mapping from first five digits to social security number assignment years is readily available.[3]

Using an individual's date of birth, and the year they obtained their social security number, we estimate the age at which individuals in the data received their social security numbers. We classify immigrants as having received their social security numbers after the age of 18, and non-immigrants as having their social security numbers before the age of 18. The conclusions that we draw in the paper are not sensitive to cutoff age we use to distinguish between immigrants and non-immigrants, though, naturally, the choice of cutoff age does slightly influence the total proportion of founders that we identify as immigrants.[4]

2.2 Dow Jones VentureSource

[3] We use data from the website www.ssn-verify.com in order to map from the first five digits of social security number to state and year, once again following Bernstein et al (2018).
[4] While Bernstein et al. (2018) use a cutoff age of 20, we use a cutoff age of 18 to better capture individuals that may have arrived in the United States for college.

The Dow Jones VentureSource dataset contains information on the near universe of venture capital fund investments in startups from around the world and is one of the two main datasets used in academic research on the venture capital industry.[5] The type of data that is reported can be categorized into several areas. The first area is investment data, which contains variables such as investment amount, investment date, venture capital firm name(s), and portfolio company name. This set of data allows researchers to see a given startup's funding history. The second area is startup data, which contains variables such as company start date, company industry, business description, and office location. The third area is personnel data, which contains information about individuals associated with each startup such as venture capital investors, founders, board members, and employees. For these individuals, the VentureSource data provides their first and last names, as well as information on their work experience, such as the names of their past employers, past job titles, and employment dates. We focus our analyses on startups that are based in the United States. Following other work in the literature, we focus on firms that receive VC-backing funding from 1990 to 2019 because, for both Infutor and VentureSource, data coverage is poor prior to 1990 (Gompers, Lerner, and Scharfstein, 2005; Gompers, Kovner, Lerner, and Scharfstein, 2010).

2.3 Hand-Collected Data

We augment the VentureSource data by hand-collecting founders' education and work experience information from LinkedIn, Bloomberg Businessweek, and company websites. We collect education data for 92% of the founders in our sample. For a founder with complete background information, we observe her undergraduate institution, undergraduate major, graduate institution(s), graduate degree(s), and year(s) of graduation. We aggregate colleges, professional schools, and graduate schools up to the institution-level. For example, Harvard College and Harvard Business School are coded as Harvard University. Using information on undergraduate and graduate majors, we classify degrees into three categories – STEM,

[5] The other is Thompson VentureXpert.

business, and other. We also collect information on the geographic location of universities using the Google Maps API.

2.4 Merging the Infutor and VentureSource Data

In order to infer the immigrant status of VC-backed founders, we merge the VentureSource and Infutor datasets together. We merge observations across the two datasets using an iterative procedure that matches observations using name, location, and age information. The Infutor dataset contains individuals' residential address information, while the VentureSource contains information on the city and state for firms, supplemented with our hand-collected data on the geographic locations in which founders received their educations.

We are able to uniquely match more than half of the founders VentureSource and Infutor datasets. There are also a number of founders in the VentureSource data with multiple matches in the Infutor data. In these instances, we classify founders as immigrants if more than 80% of potential matches in the Infutor data are immigrants, non-immigrants if less than 20% of potential are immigrants, and do not assign an immigrant classification otherwise. Our merged dataset includes 70% of founders in the VentureSource dataset. In the appendix, we discuss the procedure for merging the data together in more detail and provide a comparison between the merged and unmerged observations in our sample.

3 Summary Statistics

3.1 Founder and Startup Characteristics by Immigration Status

Table 1A presents summary statistics on founder characteristics by immigration status. Approximately 20% of the founders in our sample are immigrants. As we discuss in Appendix B, due to data limitations, this number may slightly understate the proportion of immigrant founders in our sample. Kerr and Kerr (2016) find that 28% of VC-backed startup founders are immigrants. Our results are broadly consistent with Kerr and Kerr (2016), though a notable difference is that while they define immigrant founders by country of birth, we define immigrants according to age at which the individual receives his or her social security number (SSN). Given this difference in definitions, we would expect to see a slight difference in the proportion of founders reported as entrepreneurs in the two samples, even if the true proportions are identical. While the majority of entrepreneurs identified as immigrants by the two definitions likely overlap, the definition using country of birth (used by Kerr and Kerr (2016) likely encompasses children who came to and were educated in elementary and/or high school in the US as immigrants. It is likely the decision to immigrate was not made by them, but by their parents. In contrast, the definition we use means that our sample consists almost entirely of immigrants that come to the US for college, graduate school, or work, and for whom immigration was their own decision.

Table 1A highlights a number of differences between native and immigrant founders in our sample. The first difference is that there tends to be a higher proportion of female founders in the immigrant sample. The second main difference is, not surprisingly, the immigrant sample seems to be more ethnically diverse. Following Kerr and Lincoln (2010), we use a named-based algorithm to assign founders to ethnic groups. Most significantly, the proportions of Indian and East Asian founders are much larger among immigrant founders than among native founders. The proportion of Indian founders in the immigrant sample is almost ten times larger than that of the native sample. Similarly, the proportion of East Asian founders is almost five times larger. This difference is not surprising given that over the sample period, the United States has seen a significant number of immigrants from India and China who came into this country for education and employment opportunities, particularly in high-tech sectors. The table also demonstrates a notable advantage to our approach of classifying immigrants using SSN information relative to using the name-based algorithm to proxy for immigration status, as others have done. A substantial proportion of founders that we classify as immigrants (38%) have names that are classified as *white*. These are founders that an ethnic-classification algorithm may not identify as immigrants. The high proportion of immigrant founders identified as white also suggests the potentially substantial contribution of immigrant entrepreneurs from Canada and Western European countries.

In line with the literature on immigrants' productivity, immigrant founders, on average, start more VC-backed companies than natives.[6] However, the average success rate, measured by IPO or IPO plus high-valued acquisition, of immigrant-founded startups is not higher than that of native-founded startups, which suggests that VC funds adequately screen deals and founders along the dimension of immigration status.[7] Finally, we find that average founding age, among both natives and immigrants is greater than 42 years old, which is in line with the results from the literature. Azoulay et al. (2020b) find that the average founders' age of the fastest-growing companies in the United States is 45 years old. The difference here is that immigrants tend to start high-growth companies at an older age compared to natives. The average founding age of immigrant founders is close to 48 years old.

In Table 1B we present industry breakdowns for startups founded by native and immigrant entrepreneurs. Immigrants are significantly more likely to start a company in the information technology (IT) sector than natives and significantly less likely to start companies in Business and Finance or the Consumer Services sectors. The proportion of immigrant founded companies that are in the IT sector (47.5%) is more than 30% higher than the proportion of native founded companies in IT (35.6%). The differences in Business and Finance (4.2% of immigrant founded companies vs. 22.0% of native founded companies) and Consumer Services (5.3% of immigrant founded companies vs. 18.0% of native founded companies) is equally striking.[8] The result is in line with the fact that immigrants tend to come to the United States to study in STEM fields and pursue STEM-related employment opportunities (Hanson and Slaughter, 2017).

Table 2 shows the top ten and bottom ten states by number and percentage of immigrant founder-startup pairs. To construct the top panel, we use data on each startup's headquarter office address and count

[6] Kerr and Kerr (2020) find that immigrants tend to start more companies than natives. Azoulay et al. (2020a) find that, at every point of the firm size distribution, immigrants start larger companies than natives. Bernstein et al., (2020) and Hung and Gauthier-Loiselle (2010) find that immigrant inventors produce more patents than native inventors.

[7] We consider M&A deals where the startup was valued at $100 million USD or more as high-valued acquisitions.

[8] Wadhwa et al. (2010) present proportions of technology and engineering-types among immigrant-founded companies.

the number of immigrant founder-startup pairs. The top three states with the greatest number of VC-backed startups in the sample, namely California, Massachusetts, New York, are also the top three states with the highest number of immigrant founder-startup pairs. In general, states that appear in the top ten list tend to be coastal states and are states that feature prominently in the venture capital ecosystem in the US. On the other hand, states that appear in the bottom ten list tend to be smaller states and states in the south and middle of the country.

The top panel of Table 2 presenting counts of found-startup pairs is highly influenced by the states' population size, economy size, and level of venture capital activity. The bottom panel of Table 2 controls for size by tabulating the top ten and bottom ten states with the highest fraction of start-ups that are founded by immigrants. Within the top ten, California, Massachusetts, and New York remain on the list and indicates that the largest venture capital hubs house the highest number and share of immigrant founders. Like results in the top panel, states with the lowest share of founders who are immigrants are in the south and middle of the country.[9] These results show that venture capital hubs on the coasts, especially California, Massachusetts, and New York, benefit the most from high-growth immigrant-founded companies.

3.2 Immigrant Founder Share Time Trends

Kerr and Kerr (2016) use annual data to show that the share of immigrant founders among VC-backed startups was approximately 25% in 1995, peaked at 32% during the dot-com bubble, and declined to 30% in 2005. We use a longer time series to build on their work. Figure 1 plots the share of immigrant founder-startup pairs by 5-year bin, from 1990 to 2019. From 1990 to 2004, the share of immigrant founder-startup pair increased from around 20% to the peak of around 25%. After this time period, the share dropped to around 17% and started to rise again, up to 2019.

[9] Results are similar if we instead use founders as the unit of observation.

At first glance, the trend may appear to suggest that H-1B Visa Reform Act of 2004 have played a role in reducing the share of immigrant founders in the subsequent period.[10] However, this is likely not to be the case, for the following reason. The average age for when immigrant founders got their social security number is close to 26 years old, which is a rough proxy for when these immigrants entered the United States. On the other hand, the average age at founding a VC-backed company is 49 years old, which indicates that the majority of founders, even in the latter part of the sample, likely immigrated to the United States before 2004. Therefore, it is unlikely that the H-1B Visa Reform Act of 2004 is the primary driver of the change in the immigrant founder share during our sample, though, as we discuss, we may expect its effects to show up in the coming years.

Figure 2 plots the share of each ethnic group among immigrant founders by 5-year bin, from 1990 to 2019. This plot shows that the ethnic composition of immigrant entrepreneurs has changed substantially over time. First, the share of white immigrant founders decreased from close to 50% to less than 40%. Likewise, the share of ethnically Jewish immigrant founders decreased from close to 20% to be slightly more than 10%. The groups that saw substantial expansion are ethnically Indian, East Asian, and Hispanic immigrant founders. The share of Indian immigrant founders increased from less than 20% to more than 30%. The share of East Asian immigrant founders rose from approximately 15% to about 25%. The share of Hispanic immigrant founders increased from less than 5% to around 10%. The rise of Indian and East Asian entrepreneurs is in line with results from previous work on trends in immigrant entrepreneurship (Wadhwa et al., 2007). It also mirrors the trend in college and graduate school where the share of students from India, China, and South Korea who came to the United States for higher education rose substantially over the broader sample (Bound et al., 2021). The increasing share of ethnically Hispanic immigrant entrepreneurs, however, is an interesting result that is distinct from these trends.

4 Three Paths of Immigration for Entrepreneurs

[10] The H-1B Visa Reform Act of 2004 reduced the annual H-1B visa cap from 195,000 to 65,000.

In this section we explore the channels by which immigrant founders come to the United States. Understanding these different pathways is crucial to providing recommendations on various policies and initiatives to promote entrepreneurial ecosystems. We divide entrepreneurs into three groups, based on their path of emigration to the United States to more closely examine the roles of institutions that bring immigrant entrepreneurs, and to analyze differences across immigrant entrepreneurs who arrive via different channels. We classify immigrant founders who came to the United States for their undergraduate education as Group 1. We label immigrant founders who came to the United States first for their postgraduate education as Group 2. Group 2 founders have no undergraduate degrees from an American university but hold at least one postgraduate degree from a university based in the United States. Finally, we classify immigrant founders who came to the United States first for work as Group 3. Group 3 immigrant founders hold no degree from a university based in the United States. We drop immigrant founders with missing education information from this set of analyses.

4.1 Founder and Startup Characteristics by Immigration Path

Table 3A presents summary statistics of founder and startup characteristics by immigration path. The first key observation is that the majority of immigrant founders came to the United States via the two education paths. Forty-two percent of the immigrant founder sample came to the United States for undergraduate studies, 37% came for postgraduate studies, and only 22% came for work. These statistics show that universities serve as a much larger channel for foreign entrepreneurial talent compared to companies, which implies that universities' admission policy, potentially, plays a much larger role in determining the quality of entrepreneurial talent in the United States than work visa policy.

Immigrant founders in Group 1, i.e., those that came to the US for their undergraduate education, are 12% female versus 9% female for Group 2 and Group 3 founders. The ethnic composition shows that the relatively high proportion of Indian founders come from Groups 2 (46% of Group 2 founders) and 3 (28% of Group 3 founders). East Asian immigrant founders, however, show higher representation among Group 1 (19%) and Group 2 (20%) than Group 3 (12%). These statistics are consistent with trends in ethnic composition of foreign undergraduate and graduate students in the United States (Bound et al., 2021). We also find that ethnically white immigrant founders primarily come through Group 1 (46%) and Group 3 (44%), i.e., they either first enter the US for undergraduate education or for work.

Using data on birth dates and the year in which the founder received his or her social security number, we are able to calculate each founder's age when he or she received his or her social security number. The average age at which the immigrant received their SSN increases monotonically as we move from Group 1 to Group 3 which gives us confidence in our assignment to groups. It should be noted that the large gap between average SSN age and average founding age across all three immigrant founder groups demonstrates (between 18 and 29 years) that any changes in H-1B policies are unlikely to have an immediate effect on the rate of immigrant entrepreneurship or the number of immigrant-founded companies. In fact, the impact would not be observed for almost two decades. Lastly, productivity, as measured by average number of companies started and their success rate, is similar across immigrant founder groups, which suggests that entrepreneurial talent is consistent across immigration paths.

A unique feature of our data set is the detailed founders' education information. Table 3B summarizes founders' education information across immigration status and path. With respect to college major, immigrant founders are more likely to major in STEM fields and less likely to major in business-related fields compared to native founders. The largest difference appears when we compare Groups 2 (71.6% STEM majors) and 3 (57.5% STEM majors) immigrant founders to native founders (47.9% STEM majors). We find that 71.6% of Group 2 immigrants had an undergraduate STEM degree compared to 47.9% of native founders. With respect to graduate degrees, immigrant founders are more likely to hold a graduate degree, when compared to native founders. This feature of the data is mainly driven by Group 2 immigrant founders who came to the United States for graduate studies. By definition, all of these immigrant founders will have a graduate degree. Inspecting the breakdown of graduate degree types, immigrant founders are more likely to hold technical degrees than native founders while Group 1 immigrant founders look nearly identical to native founders. Nearly 80% of Group 2 immigrant founders have a STEM masters or Ph.D. degree. Native, Group 1, and Group 2 founders are roughly equally likely to earn an MBA (20-25%), while MBAs are rare (8.6%) for Group 3 immigrant founders.

The bottom panel of Table 3B focuses on the likelihood that a founder had received at least one degree from a top school following the definition in Gompers et al., (2016).[11] The unconditional probability that an immigrant founder holds a top-school degree is 33% while the unconditional probability that a native founder holds a top-school degree is 35%. This difference is statistically significant, which suggests that, on average, immigrants are less likely to attend a top school. However, these averages mask substantial differences across groups and types of degrees. For top colleges, Group 1 immigrant founders are significantly more likely to hold a degree from a top college than are native founders (30.2% vs. 21.9%). For top graduate schools, Group 1 and Group 2 immigrant founders are significantly more likely to hold a degree from a top university (26.4% and 37.7%) than are native founders (22.8%). This conclusion is true for both MBA and non-MBA degrees. These findings show that, conditional on coming to the United States for education, immigrant founders are more likely to attend a top university, which is consistent with the idea that the population of US-educated immigrant founders is likely to be drawn from the right-hand tail of their home country's academic talent distribution.

These summaries of educational attainment across our various founder groups provides several important takeaways. First, Group 1 immigrant founders tend to have similar educational background to native founders, while Group 2 and Group 3 immigrant founders are quite different from native founders. Second, immigrant founders are more likely to hold advanced degrees, when compared to native founders. Finally, immigrant founders are more likely to major in STEM fields than are native founders. These features of educational background are reflected in the types of companies that they start. Table 3C presents the industry breakdowns for companies founded by natives and our various immigrant groups. There are

[11] We define top universities to include Ivy League schools, Amherst College, California Institute of Technology, Duke University, MIT, Northwestern University, Stanford University, University of California (Berkeley), University of Chicago, Williams College, Cambridge University, INSEAD, London School of Economics, London Business School, and Oxford University.

two key observations that mirror the educational background summary statistics. First, the industry distribution of companies started by native founders are remarkably similar to those of Group 1 immigrants. IT companies represent 35-38% of their startups, Business and Finance 22%, and Consumer Services 18%. This observation is consistent with the fact that native founders and Group 1 immigrant founders tend of have similar educational backgrounds. Second, Group 2 and Group 3 immigrant founders are much more likely to start companies in the IT sector (55.1% and 51.6%) than native founders (35.6%) and are less likely to found Business and Finance (16.0% and 17.0%) or Consumer Services (8.1% and 10.4%) than are native founders (22.0% and 18.0% respectively). This fact suggests that Group 2 and Group 3 immigrant founders who had much greater proportion of STEM education found more technologically-focused companies.

4.2 Important Institutions

In this section, we identify which institutions provide the channel by which talented immigrant founders come to the United States. For each immigrant founder group, Table 4 presents the top ten institutions that provided entry to the greatest number of immigrant founders. The first column lists the top ten universities that granted the greatest number of college degrees to Group 1 immigrant founders. The second column lists the top ten universities that granted the greatest number of graduate degrees to Group 2 immigrant founders.

The overlap of these two lists is quite striking. In fact, the top five universities are identical across the two lists. Second, this group of universities are also the same group of universities that educated the greatest number of founders in our sample. This result suggests that these universities, either culturally or through the surrounding entrepreneurial ecosystem produce both native and immigrant founders via both their undergraduate and graduate degree programs. Not surprisingly, these universities also have above-average shares of foreign students. U.S. News' university database contains information on each university's annual share of foreign undergraduate student from the 1996 to 2019. The average foreign student share among the universities listed in Table 4 is 9% while the average foreign student share among all American universities is 4%. In this group, the University of Michigan has the lowest average foreign student share of 5% while Carnegie Mellon University has the highest average foreign student share of 13%. This result suggests that these universities are among the most immigrant-friendly higher education institutions in the country.

We also compare the fraction of Group 1 founders educated at each of the top ten colleges to the fraction of students who are immigrants. The bottom panel of Table 4 shows that for all these universities, while the share of immigrants in the student population is high (9% on average), the average share of immigrants among founders who were educated at those universities is even higher (14%), which suggests that immigrant students at these colleges are more likely to become VC-backed startup founders than their native peers.

The last column in Table 4 lists the top ten companies that employed the greatest number of Group 3 immigrant founders before they started their companies. First, these companies are among those that employed the greatest number of founders, native and immigrant, in our sample. The list also represents two distinct types of spawning companies (Gompers, Lerner, and Scharfstein, 2005). First, seven of the top ten companies are venture capital-backed, highly successful IT companies. Gompers, Lerner, and Scharfstein (2005) show that these companies tend to spawn significant numbers of venture capital-backed entrepreneurs. Three of the seven companies are large, old computer companies. These companies played an important role in providing entrepreneurs for the early waves of venture capital-backed companies in the 1990s. In addition, many of these companies are among the top H-1B sponsors in the country (Kerr, 2020).

The evidence suggests that there are a specific of set of universities and companies that play an especially vital role in fostering the careers of immigrant entrepreneurs in America's VC-backed startup ecosystem. While not surprising, these are the same institutions that foster entrepreneurs generally.

4.3 Immigration Paths Time Trends

Figure 3 plots the breakdown of immigrant founder-startup pairs by immigration path over time, from 1990 to 2019. The proportion of Group 1 immigrant founders is stable in the early part of the sample and has increased in the past decade. On the other hand, the proportion of Group 2 and Group 3 immigrant founders peaked in the 5-year period between 2000 and 2004 and has since steadily declined. These dynamics show several facts. First, the decline in the share of immigrant founders shown in Figure 1 is primarily driven by the decline in immigrant founders from Group 2. Compared to Group 3, Group 2 immigrant founders make up a much larger proportion of the immigrant founder sample and the relative decline from Group 2's peak period is also larger. This change drives the overall decline in immigrant founder shares. Second, the proportion of Group 1 immigrant founder has been increasing throughout the sample period. The trends point to the growing importance of undergraduate education as a source of foreign entrepreneurial talent for the United States. The share of foreign students in US universities took a dramatic jump in the late 1970s and again in the 2010s (Israel and Batalova, 2021). These trends have begun to reverse as the change in new foreign student enrollment in US universities turned negative in 2016-2019. While it is unlikely to affect immigrant founders in the short-run, the long-term implications might be troubling.[12]

5 Education and Startup Location

Given the significant role that universities play in bringing immigrant entrepreneurs to the United States, in this section we explore whether the local areas benefit from the supply of entrepreneurs produced by their local universities. In particular, we assess if foreign university students who become founders show

[12] Given differences in the industries that immigrants in each of the groups start firms in, one alternative explanation is that changes in the industrial composition of firms funded by venture capitalists over time may account for the increasing share of Group 1 immigrants and decreasing share of Group 3 immigrants over time. Figure C.1 in the appendix suggests this is likely not to be the case. The figure plots industry composition-implied immigrant founder group share over time. Per-period industry implied founder group shares are calculated as the product of the full-sample industry-group shares (e.g., share of Group 1 founder-startup pairs in the IT industry) and the per-period industry shares (share of IT founder-startup pairs). The plot shows that industry-implied group shares are relatively constant over time.

a high propensity to start their companies near where they were educated. These local spillovers may be important to understand if various geographies seek to enhance their entrepreneurial ecosystems.

Table 5 presents the percentage of native founders, Group 1, and Group 2 immigrant founders who started their companies in the same state that they received their education. The top panel presents these percentages for the whole sample. For all groups, education state is an important determinant of business formation state. Specifically, 40% of native founders started their companies in the same state that they received their post-secondary education. This percentage is 41% for Group 1 immigrant founders and 35% for Group 2 immigrant founders. Second, founders are more likely to start their company in the same state in which they received their graduate degrees than in states that they received their college degrees. This pattern is to be expected if we believe that geographic mobility may decrease with age (e.g., due to increased costs associated with moving a family).

One potential driver of these facts comes from the geographic concentration of the venture capital ecosystem which is especially concentrated in three hub states: California, Massachusetts, and New York. These states are also home to top universities that produces top entrepreneurs. A natural question is whether the pattern we document simply comes, for example, from Stanford- and Berkeley-educated immigrant entrepreneurs founding startups in the Bay Area, and Harvard- and MIT-educated immigrant entrepreneurs founding startups in the Boston area. To address this question, Table 5 also breaks down the education state and firm founding state for founders into venture capital hub states (California, Massachusetts, and New York) and the rest of the country. The table presents the same statistics as before. 34% of founders in non-hub states are educated in the same state in which they start their company. This number is even higher in venture hubs, (35% for New York, 45% for California, and 59% for Massachusetts). The evidence suggests that the concentration of founders educated in the same state in which they start firms is common across all states, although this concentration is especially high in venture hubs.

The geographic "stickiness" documented in Table 5 is important for several reasons. As a general feature that holds true both for natives and immigrants, the evidence suggests that local talent may play a key role in giving rise to startups. Additionally, the presence of educational institutions plays a significant role in the presence of that local talent. Because immigrants, by definition, come from outside the local communities, the results suggest that there is a geographically localized economic benefit stemming from the presence of universities that can import top talent from abroad. There is likely to be a strong agglomeration effect in play, where firm creation benefits from the presence of local universities. Combined with the fact that startups are the main drivers of job creation (Gornall and Strebulaev, 2015; Gompers and Lerner, 2000), the evidence suggests that the presence of high-quality universities that attract talented native and foreign students may be a potent contributor to local job growth via the creation of high-growth firms started by locally educated talent (Haltiwanger et al., 2013). While our focus is on immigrants that start high-growth potential firms, this conclusion is likely to be more general; the same universities that produce immigrant entrepreneurs may also educate the talent required to propel these firms forward.

6 Determinants of Startup Success

In this section, we explore the relation between immigrant status, channel of immigration, and startup outcomes. Previous work suggests that there are certain observable founder characteristics that predict the success of venture capital backed firms. For example, previous experience working at a venture-backed startup, previous experience as a founder, and previous attendance of a top school are all correlated with likelihood of success (Gompers et al., 2010; Gompers et al., 2016). Given that there appear to be some differences between immigrant and native entrepreneurs, an important question is whether the same characteristics are correlated with success for both immigrant and native entrepreneurs.

Table 6 reports regression results for regressions where success is (an indicator variable for whether a firm had an IPO or was acquired for more than $100 million) regressed on founder characteristics including previous work experience at a venture-backed startup, previous founding experience, gender, and ethnicity. The first column of the table reports regression results where the sample consists of firms founded by natives and the second column of the table reports results where the sample consists of firms founded by immigrants. Point-estimates of coefficients are similar across the two regressions, indicating that similar founder characteristics are correlated with success for immigrants and natives. The strongest covariates with success are previous work experience at a startup, and attendance at a top school. Previous experience at a venture-backed startup corresponds with a 7-8% higher success probability. Attendance of a top school corresponds with a 3.6% higher success probability. The success probability for female founders is a little more than 2% lower than for male founders, and previous experience as a founder is also associated with lower success probabilities of 4-5%.[13] The last three columns of the table report regression results for the same regressions, where the samples consist of each of the three groups of immigrant entrepreneurs. The point-estimates of coefficients are generally similar across the regressions, though the estimates are noisier due to smaller sample sizes.

The coefficients reported in the tables are correlations, of course, and do not necessarily admit a causal interpretation. Rather, they likely capture correlations with other features of the venture capital ecosystem that may be important determinants of success, for example, social networks and connections. Importantly, however, there does not appear to be any substantial difference in these relationships for immigrants and natives, and the same covariates with success appear to be present for both immigrant and native founders. This result suggests that the screening process applied by venture capitalists is likely to be similar for both immigrants and natives.

7 Policy Implications and Conclusion

The evidence that we document in this paper adds to the policy debate about immigration. We find that immigrants contribute substantially to the US economy as founders of high-growth potential firms, consistent with other work that documents immigrant contributions to innovation and entrepreneurship. While others have recognized the role of immigrants in the startup ecosystem, little was understood about

[13] A subtlety here is that previous experience as a founder of a successful venture-backed firm is positively correlated with success, while previous experience as a founder of an unsuccessful venture-backed firm is strongly negatively correlated with success. Founders of the latter variety are more represented than founders of the former in our sample. See Gompers et al. (2010) for more discussion.

the channels by which they came to the United States and the local spillovers that result. Understanding the various channels and their economic consequences is vital to business, education, and immigration policy.

Moreover, our results highlight the dominant role that US higher educational system plays in bringing immigrants that start high-growth potential firms to the United States; the majority of immigrant entrepreneurs in our sample are US-educated. Moreover, immigrant entrepreneurs tend to disproportionately start firms in high-tech industries. This result is broadly similar to conclusions drawn in the literature regarding the broader talent pool of IT workers (Bound et al., 2015), which also finds that foreign graduate students who expect to be especially successful tend to stay in the United States (Grogger and Hanson, 2015). Relative to prior work which focuses on immigrants that come to the United States for graduate school education, our results highlight that immigrants who earned college degrees in the United States also make up a large fraction of immigrant entrepreneurs. That is, the US undergraduate system plays an important, and increasing, gatekeeping role in bringing high-skilled immigrants into the country.

These findings have important policy implications. Government policies that affect the flow of foreign students into the United States also likely affect the flow of entrepreneurial talent into the country. Proposals in recent years to restrict the flow of foreign students into the United States, or to restrict the ability of foreign students to stay in the country after earning degrees would also restrict an important source of innovative and entrepreneurial talent and ideas that contributed to the US economy. Similarly, our results highlight that university admissions decisions to admit high-skilled foreign students also carry important implications that carry over into the broader economy.

Immigrants are likely to found their startups in the state in which they were educated, particularly graduate education. While one cannot ignore broader elements of the ecosystem, it is clear that research universities have been significant importers of entrepreneurial talent. These geographic spillovers we document have their own broader policy implications. The beneficiaries of immigrant entrepreneurship in our sample have primarily been coastal states. One driver of this fact is the presence of top universities on the coast which tend to have a larger share of immigrants in their student population. A sizable proportion of immigrant founders tend to start firms in the same states that they received their education. These results suggest that a potential lever that can contribute to local economic growth is attracting high-skilled immigrants to local universities. However, given the long average lag between arrival in the US and starting a firm, it likely takes a sustained effort over an extended period of time in order to observe the benefits of such a policy. Policies targeted at attracting immigrant students are also likely not sufficient on their own. Broader policy changes to attract capital and other resources must be implemented in concert with them in order make a location attractive for immigrants to stay.

The US has been a substantial beneficiary of “the gift of global talent” over the past three decades using the terminology from Kerr (2020). Our results make clear that this point is especially true in the right-tail of the skill distribution where immigrants have contributed substantially, as founders of high-growth potential businesses. Our results highlight the dominant role that the US higher education system has played in facilitating high-skilled immigrants’ contribution the economy.

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Figure 1: Immigrant Founder Share Over Time

The figure plots the share of immigrant founders over time. Shares are calculated from all founder-startup pairs in each 5-year bin.

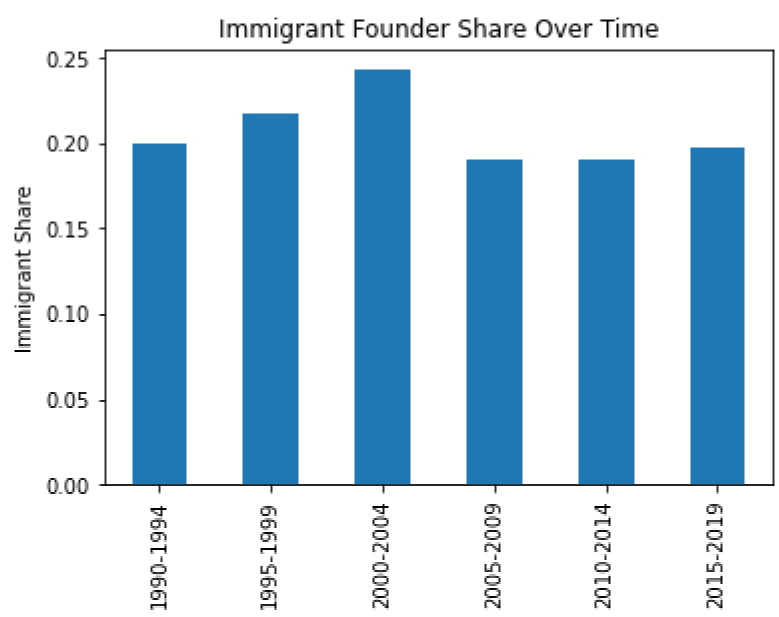

Figure 2: Immigrant Founder Share by Ethnicity Over Time

The figure plots immigrant founders' ethnicity breakdown over time. Shares are calculated from all founder-startup pairs in each 5-year bin.

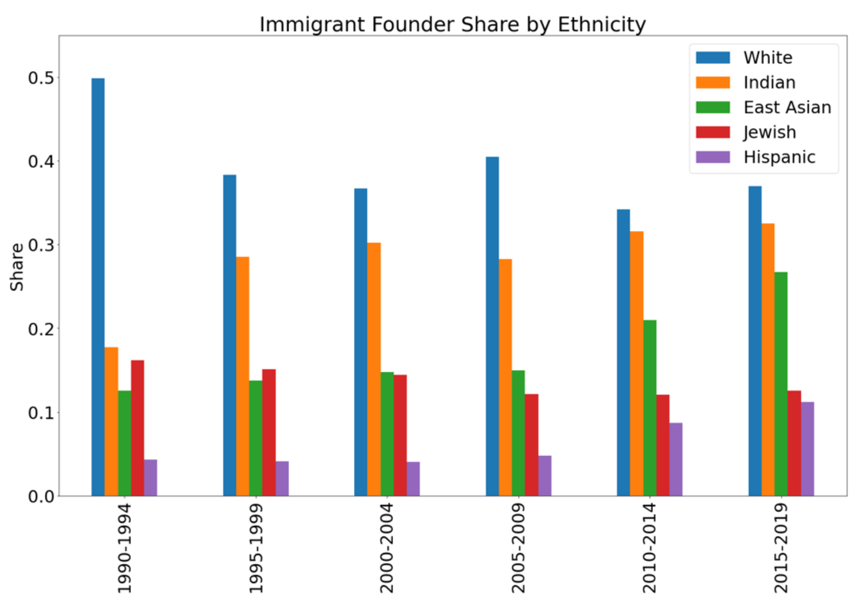

Figure 3: Immigrant Founder Share by Immigration Path

The figure plots immigrant founders' immigration path breakdown over time. Shares are calculated from all founder-startup pairs in each 5-year bin. Group 1 immigrant founders are those who came to the United States for undergraduate studies. Group 2 immigrant founders are those who came to the United States for graduate studies. Group 3 immigrant founders are those came to the United States for work. Number of immigrant founder-startup pairs in each immigrant group is scaled by the total founder-startup pairs in each 5-year bin.

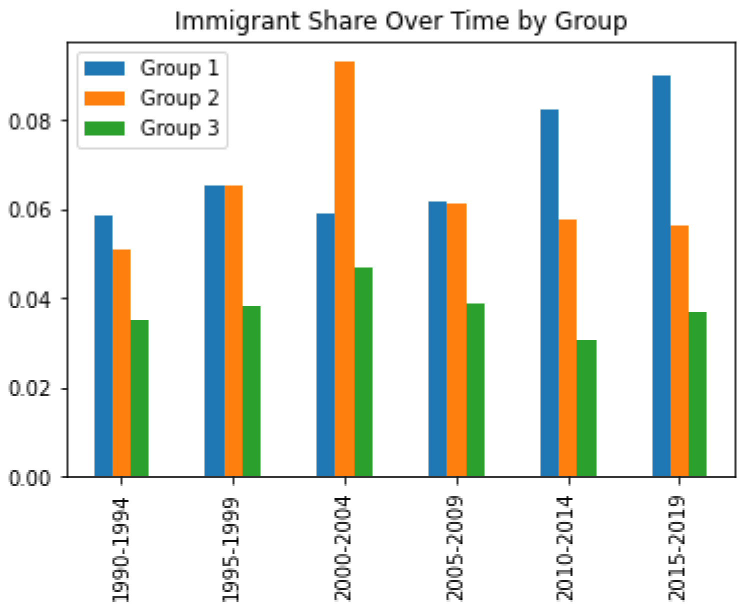

Table 1A: Founder Characteristics by Immigration Status

The table presents summary statistics for native and immigrant founders' characteristics. Each observation is a founder. Gender and ethnicity are assigned using name-based algorithms. IPO equals 1 if the startup had gone public by 2019 and zero otherwise. IPO Rate is the percentage of the founder's startups that had gone public. Success equals 1 if the startup had gone public or was acquired for more than $100 million USD by 2019 and zero otherwise. Success Rate is the percentage of the founder's startups that succeeded. Number of Firms counts the number of VC-backed ventures that each founder had started throughout the sample. Founding Age is the average of the founder's age at the time the startup was formed. Asterisks denote statistical significance level from t-tests on differences in sample means, * is for 10%, ** is for 5%, and *** is for 1% level.

	Natives		**Immigrants**		**Difference**	
	N	**Mean**	**N**	**Mean**	**Mean**	**t-Statistic**
Female	29,905	0.09	7,496	0.10	-0.011**	(-2.72)
Jewish	29,898	0.18	7,495	0.13	0.056***	(12.46)
East Asian	29,898	0.04	7,495	0.18	-0.140***	(-30.26)
Indian	29,898	0.03	7,495	0.29	-0.257***	(-48.09)
Hispanic	29,898	0.04	7,495	0.07	-0.029***	(-9.31)
White	29,898	0.75	7,495	0.38	0.367***	(59.77)
# of Firms	29,905	1.11	7,496	1.14	-0.035***	(-6.20)
Founding Age	22,336	42.13	6,380	47.78	-5.999***	(-30.99)
IPO	29,905	0.04	7,496	0.05	-0.004	(-1.53)
Success	29,905	0.27	7,496	0.27	-0.004	(-0.68)

Table 1B: Industry Breakdown by Immigration Status

The table compares number and proportion of startups in each industry across native and immigrant founders. Z-statistics from tests for differences across population proportions are presented in the final column.

	Natives		**Immigrants**		**Natives-Immigrants**	
	N	**%**	**N**	**%**	**Diff**	**Z-statistic**
Business and Finance	7,251	22.0%	1,507	17.9%	4.2%	3.61
Consumer Goods	1,107	3.4%	170	2.0%	1.3%	0.95
Consumer Services	5,913	18.0%	1,067	12.6%	5.3%	4.27
Energy	462	1.4%	108	1.3%	0.1%	0.10
Healthcare	5,744	17.5%	1,398	16.6%	0.9%	0.79
Industrials	688	2.1%	182	2.2%	-0.1%	-0.05
IT	11,722	35.6%	4,005	47.5%	-11.8%	-13.32
Unassigned	22	0.1%	3	0.0%	0.0%	0.02
Total	32,909	100.0%	8,440	100.0%	-	-

Table 2: Immigrant Founder Count and Share by State

The bottom panel presents the top and bottom ten states with the highest and lowest number of immigrant founder-startup pairs. The bottom panel presents the top and bottom ten states with the highest and lowest immigrant founder-startup pair shares. Shares are calculated as the proportion of immigrant founder-startup pairs divided by total founder-startup pairs.

Top 10 States by Count		Bottom 10 States by Count	
State	**Count**	**State**	**Count**
CA	4,679	HI	5
MA	743	LA	3
NY	685	VT	3
TX	302	MS	1
WA	230	MT	1
PA	201	ND	1
NJ	160	WV	1
FL	156	WY	1
IL	136	ID	0
VA	128	SD	0

Top 10 States by Share		Bottom 10 States by Share	
State	**Share**	**State**	**Share**
DE	28.8%	UT	8.3%
NJ	27.6%	VT	6.8%
CA	27.1%	WV	6.7%
FL	20.1%	RI	6.3%
MA	19.8%	MS	6.3%
NY	17.9%	KS	6.1%
MD	17.2%	LA	4.6%
AR	16.7%	MT	3.1%
PA	16.0%	ID	0.0%
CT	15.8%	SD	0.0%

Table 3A: Founder Characteristics by Immigration Path

The table presents summary statistics for immigrant founders' characteristics by immigration path. Each observation is a founder. Group 1 immigrant founders are those who came to the United States for undergraduate studies. Group 2 immigrant founders are those who came to the United States for graduate studies. Group 3 immigrant founders are those came to the United States for work. Gender and ethnicity are assigned using name-based algorithms. IPO Rate is the percentage of the founder's startups that had gone public. Success equals 1 if the startup had gone public or was acquired for more than $100 million USD by 2019 and zero otherwise. Success Rate is the percentage of the founder's startups that succeeded. Number of Firms counts the number of VC-backed ventures that each founder had started throughout the sample. Founding Age is the average of the founder's age at the time the startup was formed. SSN Age is the founder's age when he received his social security number.

	Group 1		**Group 2**		**Group 3**	
	N	**Mean**	**N**	**Mean**	**N**	**Mean**
Female	2,647	0.12	2,318	0.09	1,368	0.09
Jewish	2,647	0.15	2,318	0.10	1,368	0.13
East Asian	2,647	0.19	2,318	0.20	1,368	0.12
Indian	2,647	0.19	2,318	0.46	1,368	0.28
Hispanic	2,647	0.07	2,318	0.06	1,368	0.08
White	2,647	0.46	2,318	0.22	1,368	0.44
SSN Age	2,231	24.34	2,018	24.67	1,120	29.01
# of Firms	2,647	1.11	2,318	1.15	1,368	1.13
Founding Age	2,245	52.45	2,032	43.47	1,124	45.83
IPO Rate	2,647	0.03	2,318	0.04	1,368	0.05
Success Rate	2,647	0.25	2,318	0.29	1,368	0.28

Table 3B: Education Information by Immigration Status and Path

This table presents education information by immigration status and path. Each observation is a founder. Group 1 immigrant founders are those who came to the United States for undergraduate studies. Group 2 immigrant founders are those who came to the United States for graduate studies. Group 3 immigrant founders are those came to the United States for work. Definition for Top School follows Gompers et al. (2016).

	Native	**Group 1**	**Group 2**	**Group 3**
	%	**%**	**%**	**%**
College Major				
STEM	47.9%	52.1%	71.6%	57.5%
Business	22.6%	20.8%	4.6%	10.7%
Graduate Degree				
Any	54.0%	53.9%	100.0%	55.4%
MBA	19.9%	19.1%	24.8%	8.6%
Non-MBA	38.9%	40.3%	89.4%	48.8%
STEM Master's	17.0%	21.6%	45.9%	26.4%
Ph.D.	9.5%	8.8%	32.6%	12.7%
Top School				
Any Degree	35.3%	43.1%	37.8%	5.0%
College	21.9%	30.2%	0.6%	1.9%
Graduate	22.8%	26.4%	37.7%	3.7%
MBA	9.9%	10.8%	13.0%	0.9%
Non-MBA	14.4%	17.9%	26.2%	3.1%

Table 3C: Industry Breakdown by Immigration Path

The table presents startup industry proportions by immigration status and path. Each observation is a founder-startup pair. Group 1 immigrant founders are those who came to the United States for undergraduate studies. Group 2 immigrant founders are those who came to the United States for graduate studies. Group 3 immigrant founders are those came to the United States for work.

	Natives	**Group 1**	**Group 2**	**Group 3**
Business and Finance	22.0%	22.1%	16.0%	17.0%
Consumer Goods	3.4%	2.8%	1.2%	1.8%
Consumer Services	18.0%	18.2%	8.1%	10.4%
Energy	1.4%	1.1%	1.4%	0.7%
Healthcare	17.5%	14.7%	16.2%	16.5%
Industrials	2.1%	2.3%	2.1%	1.9%
IT	35.6%	38.9%	55.1%	51.6%
Unassigned	0.1%	0.0%	0.0%	0.1%

Table 4: Top Institutions by Immigration Paths

The top panel presents top ten institutions that produced the greatest number of immigrant entrepreneurs by immigration path. Column 1 lists the top ten universities that granted the greatest number of college degrees to Group 1 immigrant entrepreneurs. Column 2 lists the top ten universities that granted the greatest number of graduate degrees to Group 2 immigrant entrepreneurs. Column 3 lists the top ten companies that employed the greatest number of Group 3 immigrant entrepreneurs. The bottom panel presents, for top 10 colleges shown in column 1 of the top panel, number of native founders, number immigrant founders, share of immigrant founders, and US News foreign undergraduate student share.

College (Group 1)		Graduate School (Group 2)		Firms (Group 3)	
University	**Count**	**University**	**Count**	**Firm**	**Count**
Stanford U.	130	Stanford U.	213	Microsoft	34
UC Berkeley	120	UC Berkeley	130	Cisco Systems	30
MIT	120	MIT	107	Hewlett-Packard	23
Harvard U.	80	Harvard U.	102	Sun Microsystems	20
U. of Penn	68	U. of Penn	73	Bell Labs	19
Cornell U.	62	Carnegie Mellon U.	54	IBM	18
Columbia U.	44	Columbia U.	79	Oracle	18
Princeton U.	39	USC	57	Intel	15
U. of Michigan	37	Cornell U.	43	VMware	11
Yale U.	36	New York U.	43	Google	10

	Native Founders	Immigrant Founders	Immigrant Founder Share	Foreign Student Share
Stanford U.	788	130	0.14	0.07
UC Berkeley	637	120	0.16	0.07
MIT	636	120	0.16	0.09
Harvard U.	589	80	0.12	0.09
U. of Penn	475	68	0.13	0.10
Cornell U.	462	62	0.12	0.09
Columbia U.	221	44	0.17	0.11
Princeton U.	286	39	0.12	0.09
U. of Michigan	404	37	0.08	0.05
Yale U.	318	36	0.10	0.09

Table 5: Education and Startup Locations

The table presents the percentage of founders who started their companies in the same state that they received their education. The Education row calculates the percentage of founders who started a company in the same state that they received their undergraduate or graduate degree. The B-school row calculates the percentage of founders who started a company in the same state that they received their MBA degree. The G-School row calculates the percentage of founders who started a company in the same state that they received their non-MBA graduate degree. The College row calculates the percentage of founders who started a company in the same state that they received their college degree.

	Firm State Same as	**Natives**		**Group 1**		**Group 2**	
Sample	**State of**	**N**	**%**	**N**	**%**	**N**	**%**
All	Education	25,622	40%	2,647	41%	2,318	35%
	B-School	4,873	39%	487	38%	558	36%
	G-School	9,184	38%	1,022	38%	1,997	32%
	College	22,142	32%	2,647	31%	-	-
CA	Education	9,640	42%	1,301	45%	1,370	38%
	B-School	1,765	41%	223	35%	285	39%
	G-School	3,470	44%	545	45%	1,216	35%
	College	8,168	34%	1,301	33%	-	-
MA	Education	2,316	53%	206	59%	202	43%
	B-School	479	61%	52	58%	44	61%
	G-School	1,041	50%	103	45%	177	36%
	College	1,980	37%	206	43%	-	-
NY	Education	2,536	31%	322	35%	123	34%
	B-School	479	32%	61	41%	39	31%
	G-School	677	35%	74	31%	94	33%
	College	2,219	25%	322	28%	-	-
Other	Education	11,130	37%	818	34%	623	26%
	B-School	2,150	34%	151	33%	190	26%
	G-School	3,996	29%	300	25%	510	23%
	College	9,775	31%	818	27%	-	-

Table 6: Determinants of Startup Success

The table report regression results from a series of regressions where success (defined as firms with an initial public offering or acquired at a valuation greater than $100 million) is regressed onto a series of founder characteristics. The founder characteristics include whether the founder has previous experience working at a venture-capital backed startup (Prev XP), whether the founder previously founded a venture-backed firm (Prev Founding XP), whether the founder attended a top school (Top School), as well as gender and ethnicity indicators. The observations in the regression are founder-firm pairs. Each column in the table corresponds with regressions run using a different sample: native founders, immigrant founders, Group 1 immigrant founders (that have a US college degree), Group 2 immigrant founders (that do not have a US college degree but have a US post-graduate degree), and Group 3 immigrant founders (who do not have any US education). Standard errors are clustered at the firm level.

	(1)	(2)	(3)	(4)	(5)
	Natives	Immigrants	Group 1	Group 2	Group 3
Prev XP	0.0875***	0.0770***	0.112**	0.0799	0.138**
	(0.013)	(0.029)	(0.053)	(0.049)	(0.067)
Prev Founding XP	-0.0570***	-0.0446	-0.0837	-0.0765	-0.0894
	(- 0.016)	(- 0.034)	(- 0.060)	(- 0.055)	(- 0.076)
Female	-0.0246***	-0.0263*	0.00608	-0.0162	-0.0988***
	(- 0.008)	(- 0.015)	(0.025)	(- 0.030)	(- 0.035)
Jewish	0.0104*	-0.0234	-0.0284	-0.0434	0.0302
	(0.006)	(- 0.015)	(- 0.022)	(- 0.030)	(0.035)
East Asian	-0.0187*	-0.0265**	-0.00977	-0.00939	-0.0683**
	(- 0.011)	(- 0.013)	(- 0.021)	(- 0.024)	(- 0.031)
Indian	0.0114	0.0272**	-0.0012	0.0276	0.0450*
	(0.013)	(0.012)	(- 0.020)	(0.021)	(0.027)
Hispanic	-0.0145	-0.0232	-0.000462	-0.0223	-0.130***
	(- 0.011)	(- 0.017)	(- 0.027)	(- 0.035)	(- 0.033)
Top School	0.0368***	0.0355***	0.0397**	0.0385**	-0.0318
	(0.005)	(0.011)	(0.016)	(0.018)	(- 0.052)
Constant	0.265***	0.276***	0.240***	0.277***	0.298***
	(0.003)	(0.008)	(0.013)	(0.019)	(0.018)
Observations	32,894	8,433	2,929	2,668	1,540
R-squared	0.11	0.10	0.11	0.12	0.12
Industry FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y

Robust standard errors in parentheses

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

Appendix

A Venture Source-Infutor Merge Procedure

Here, we outline our procedure for merging the VentureSource dataset with the Infutor dataset, which enables us to identify founders as immigrants. Our enhanced VentureSource dataset includes zip code, state information, and year information for firms and founder's educational institutions. The Infutor dataset contains residential address history information (including zip code and state), as well as the years that an individual resided at a particular address. Our merge procedure identifies potential matches across the two datasets by using first and last name information, and filters potential matches by using location information.

Step 1: We first identify potential matches between the VentureSource and Infutor datasets. We consider a person in the Infutor dataset a potential match for an observation in the VentureSource dataset if they share the same last name, and they share the same first three letters of the first name.

Step 2: For all potential matches, we identify if the following criteria are satisfied across the two datasets:

A. First name (exact match)
B. Matching state of firm founding and state of residence
C. Matching state of firm founding and state of residence, where firm founding date is during time of residence
D. Zip code of firm founding within 25, 50, or 100 miles of residence (using the NBER Zip Code Distance Database)
E. Zip code of firm founding within 25, 50, or 100 miles of residence, matching founding date and residence dates
F. Matching state of education and state of residence
G. Matching state of education and state of residence at time of education
H. Zip code of education within 25, 50, or 100 miles of residence
I. Zip code of education within 25, 50, or 100 miles of residence at time of education
J. Undergraduate degree received between age of 18 and 25, graduate school degree received between age of 22 and 40, and business school degree received between age of 22 and 40, where age at graduation identified using hand-collected data on year of graduation, and date of birth information in Infutor

Step 3: We impose the following criteria, in the order listed, and filter potential matches such that they meet the listed criteria. At each point, we consider a match to be unique if imposing the listed criteria yields a one-to-one match.

1. Criteria B or D
2. Criterion D
3. Criteria C or E
4. Criterion E
5. Criteria (B or D) and (F or H)
6. Criteria (C or E) and (F or H)
7. Criteria (C or E) and (G or I)
8. Criteria E and I

Step 4: We run step 3 using all potential matches, then restricting the set of potential matches to having first names match exactly (Criterion A), then restricting the set of potential matches to having first names match exactly and ages match (Criterion J). This matching procedure yields a unique match for 57% of founders in the VentureSource dataset.

Step 5: For founders without unique matches that have potential matches, we calculate the proportion of potential matches who are immigrants that satisfy Criteria A (exact first name match) and E (residential zip code within 100 miles of firm founding at time of founding). If this proportion exceeds 80%, we consider the founder an immigrant, and if it is below 20%, we classify the founder as a native. Including this step, we have an immigrant variable for approximately 70% of observations in the VentureSource sample.

B Merged and Unmerged Observations

Our analysis in the paper focuses on founders in the VentureSource data for whom we are able to identify immigration status by merging into the Infutor data. Table B.1 displays statistics on various characteristics of founders in our final merged dataset, versus characteristics for founders that are not in the merged dataset. Founders in our merged dataset are more likely to be educated in the US (92% versus 73%), slightly more likely to start a successful firm that has an initial public offering or is acquired for a valuation of greater than $100 million (27% versus 22%), more likely to attend a top school (30% versus 25%), more likely to be white (67% versus 62%), and less likely to be East Asian, Indian, or Hispanic.

The characteristics of the merged versus unmerged data suggest that data limitations may lead us to slightly *underestimate* the contribution of immigrant founders to the VC ecosystem. For example, if we assume all non-US educated founders in the unmerged sample are immigrants, the proportion of immigrant founders in our data is around 22%, a couple of percentage points more than the figure reported in the main text.

Table B.1: Merged and Unmerged Observations

	Merged		**Unmerged**	
	N	**Mean**	**N**	**Mean**
US Educated	31,955	0.92	12,805	0.73
Success	37,380	0.27	15,893	0.22
IPO	37,380	0.05	15,893	0.03
Female	37,380	0.10	15,893	0.12
Top School	37,380	0.30	15,893	0.25
No Post Grad	37,380	0.51	15,893	0.58
Jewish	37,373	0.17	15,880	0.15
East Asian	37,373	0.07	15,880	0.11
Indian	37,373	0.08	15,880	0.14
Hispanic	37,373	0.04	15,880	0.11
White	37,373	0.67	15,880	0.62

C Industry Composition-Implied Immigrant Founder Shares

Figure C.1: Industry Composition-Implied Immigrant Founder Share by Immigration Path

The figure plots industry composition-implied immigrant founders' immigration path breakdown over time. Per-period industry-implied group shares are calculated as the product of the full-sample industry-group shares (e.g., share of Group 1 founders in the IT industry) and the per-period industry shares (e.g., share of IT founder-startup pairs). Group 1 immigrant founders are those who came to the United States for undergraduate studies. Group 2 immigrant founders are those who came to the United States for graduate studies. Group 3 immigrant founders are those came to the United States for work.