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What Explains the Increase in Immigrants' Educational Attainment in the United States?

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Abstract

The educational distribution of U.S. immigrants shifted significantly to the right in recent decades as the share without a high school diploma fell and the share with a bachelor's degrees rose. This improvement coincided with a shift in immigrants' origins toward Asia and rising global education levels. This study examines how much of the change in immigrants' educational distribution over 2000-2019 is due to changes in their distribution across origin countries versus rising attainment among immigrants within origin countries. We demonstrate that within-country changes account for most of the observed increase in the educational distribution. In contrast, changes in where immigrants originated played a minimal role. Finally, we show that economic conditions in origin countries can explain little of this rise, whereas demographic trends and the skill composition of U.S. temporary worker visas are significantly related to changes in immigrants' educational distribution.

JEL classification

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1 Introduction

In the United States, immigrants have long been over-represented at the bottom of the education distribution. As far back as 1940, immigrants were almost 50% more likely than U.S. natives to have at most an 8th-grade education, and five times as likely to have no formal schooling at all.[1] In 2000, immigrants were more than twice as likely as U.S. natives to not have a high school diploma or equivalent. As education levels rose among U.S. natives during much of the 20th century, the failure of immigrants' educational attainment to keep pace was often cited as contributing to their relatively low average earnings and slow earnings assimilation (see, e.g., Borjas, 1995; Betts and Lofstrom, 2000; Hall and Farkas, 2008). However, relative trends in educational attainment show a different pattern during the first two decades of the 21st century, as gains slowed among U.S. natives and sped up among immigrants.[2]

This study examines what underlies the improvement in the education distribution among immigrants in the United States over the period 2000 to 2019, a topic that has received little attention from researchers. Those two decades witnessed a shift in where new immigrants came from, with Asia outpacing Latin America as a source region. Most notably, the share of immigrants from Mexico – a country whose immigrants tend to have relatively low education levels – fell, while the shares from India and China – countries whose immigrants typically have completed college and often have advanced degrees – rose (Hirschman, 2014). In addition, education levels rose in most origin countries during that period, and younger immigrants with more education effectively replaced older immigrants with less education who returned home or died. Using data from the U.S. Census Bureau, we investigate the relative contributions of such changes by first decomposing the change in the immigrant education distribution across 124 origin countries into within-country and between-country

[1] Stylized facts based on 1940 U.S. Census and 2020 5-year American Community Survey data available from IPUMS (Ruggles et al., 2025) for adults age 25 and older. The 1940 Census was the first to ask about education.

[2] Consistent with this pattern, time-use diaries show that immigrants spend more time than U.S. natives on education (Coniglio et al., 2022).

components.

We then further decompose the within-country changes in immigrants' education levels between 2000 and 2019 into three components: entry, exit and upgrading, and aging in. The first component incorporates immigrants who entered the United States since 2000. Since education levels have been rising in many source countries, the entry of new immigrants, who tend to be relatively young, likely contributed to gains in immigrants' average education levels for most countries. The exit and upgrading component includes adult immigrants who were present in the U.S. in 2000 but had left the country or died by 2019, as well as those who acquired more education over the two decades. Since return migration and deaths are likely to be concentrated among older immigrants, who typically have relatively low levels of education, exits are likely to boost the average education level among remaining immigrants. Upgrading necessarily increases education levels. Lastly, as its name suggests, the aging-in component incorporates immigrants who aged into our sample, which includes only adults ages 25 and older in order to focus on completed education. Aging-in immigrants were already present in the U.S. in 2000 but were too young to be included in the sample at the time. They are also likely to boost average education levels since they often arrived in the United States as children, giving them access to U.S. educational institutions for most or all of their childhoods and returns to education similar to those of U.S. natives (Bacolod and Rangel, 2017).

As all three components are likely to lead to increases in immigrants' education levels for most countries, we are particularly interested in cross-country differences in them. To that end, we present results from cross-country regressions that examine potential contributors to the observed within-country changes in immigrants' education distribution and the magnitudes of the three components of the within-country decomposition. We examine how economic and demographic characteristics in origin countries and among immigrants already present in the United States are related to changes in immigrants' education distribution and the contributions of entry, exit and upgrading, and aging in to those changes. Although

these regressions do not identify causal relationships, they nonetheless give insight into how changes within origin countries and in the immigrant stock may affect immigrants' education levels. We also examine relationships between several measures of immigrant inflows that U.S. immigration policy can directly impact, namely, the share of temporary worker visas in relatively skilled categories and the distribution of permanent resident visas across major classes of immigrants, and changes in immigrants' education levels.

Immigrants' education levels are important for several reasons. First, the amount and type of education immigrants have affects their economic and social integration into the destination, which in turn has implications for intergenerational progress or lack thereof (see, e.g., in the U.S. case, Portes and Rumbaut, 2001; Perreira et al., 2006; Thomas, 2009; Borjas, 2015; Waters and Pineau, 2015; Potochnick and Hall, 2021; Villarreal and Tamborini, 2023). Whether immigrants and their descendants are successful may, in turn, affect public perceptions of immigrants and support for or opposition to changes to immigration policy (Arora, 2020; Burgoon, 2014; Citrin et al., 1997). Our study contributes to those literatures in addition to adding to economic and demographic research that compares immigrants' education levels with those of natives, across origin countries, and over time (e.g., Cohen et al., 1997; Feliciano, 2005; Polgreen and Simpson, 2006; Waters and Pineau, 2015; Hanson et al., 2017). Our research on how and why immigrants' education levels have risen in recent decades thus has implications for how well immigrants are likely to integrate into the United States and for intergenerational progress among their descendants.

Moreover, migration affects the education distribution in both the origin and the destination, and thus can affect people who do not move (Dustmann and Glitz, 2011). Our study has implications for the question of whether the characteristics of immigrants differ from those who remain behind, or whether immigrants are positively or negatively selected from the origin. Feliciano (2005) shows that U.S. immigrants are more educated relative to individuals who do not migrate, implying positive selection and raising potential concerns about "brain drain" for origin countries. Brain drain may affect the incentive for origin countries

to provide education, which would in turn have implications for their economic development (Djajić et al., 2019). However, return migration may reduce brain drain or even result in "brain gain" (Dustmann et al., 2011). We offer some evidence of the role of exit in the observed higher educational attainment among immigrants in the U.S. Our results suggest that return migration or death (exit) significantly contributes to the increase. This could indicate that older, lower-educated immigrants are more likely to return to their countries of origin. Despite being less educated than those who remain, they still bring human capital acquired in the U.S. and may positively impact the origin country.

2 Changes in Immigrants' Education Levels, 2000-2019

We begin by examining how the education distribution of immigrants in the United States changed between 2000 and 2019. We use IPUMS data from the 2000 Census and the 2019 American Community Survey (ACS) (Ruggles et al., 2025). These surveys offer the largest publicly available nationally representative samples of U.S. residents. Both surveys ask about individual characteristics, including U.S. citizenship, country of birth, and the highest degree or level of school completed. We limit our samples to individuals ages 25 and older in order to largely capture completed education. Including younger immigrants would likely bias our results towards showing larger gains in education since immigrant youth aged and acquired more education and immigrant inflows generally slowed during the period we examine (Norlander and Sorensen, 2018). We classify as an immigrant everyone who is either a naturalized U.S. citizen or a noncitizen; the surveys do not ask about visa type or unauthorized status but are generally believed to include unauthorized immigrants.[3]

Our final sample includes adult immigrants from 124 countries that are identified in both

[3]That said, the surveys almost surely undercount unauthorized immigrants, who may be unwilling to answer U.S. government surveys. The Census-created person weights, which we use throughout, help adjust for this undercount. For discussion, see, for example, Hook and Bachmeier (2013); Tamborini et al. (2025). We examine 2019 as our endpoint since the Census Bureau had difficulties with data collection for the 2020 ACS, particularly among immigrants, because of the pandemic and the Trump administration's anti-immigrant rhetoric, among other reasons (Ross et al., 2021; Warren, 2022).

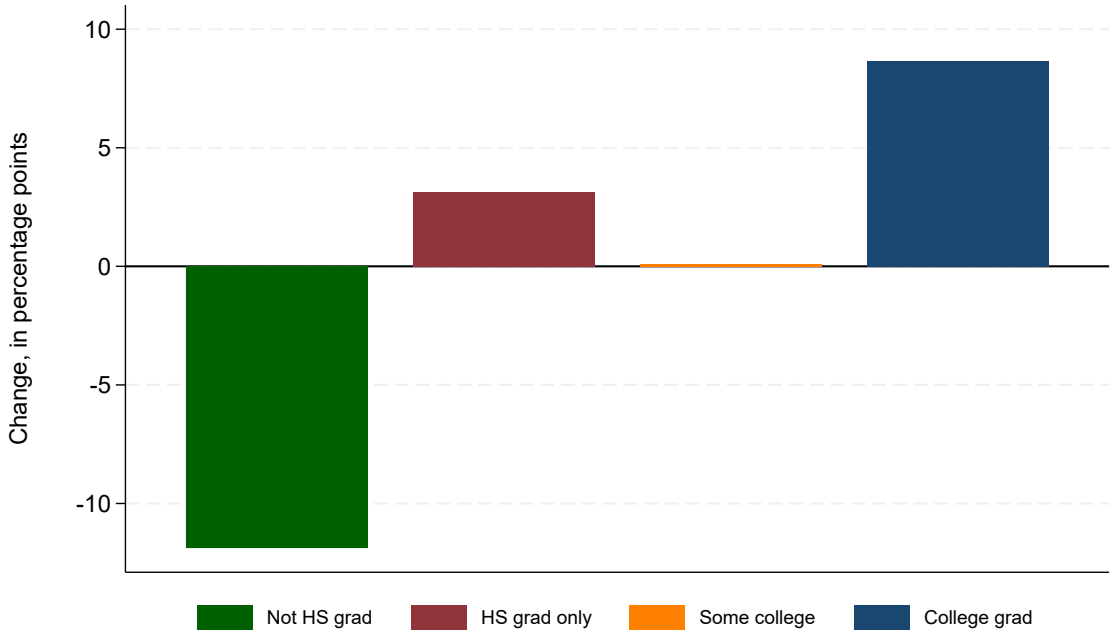


Figure 1: Change in immigrants' education distribution, 2000-2019

Note: The figure shows the change in the share of immigrants ages 25 and older in each of four categories by highest level of education attained: not high school graduate, high school graduate, some college, bachelor's degree or higher.

the 2000 Census and the 2019 ACS. Those 124 countries account for about 99 percent of all adult immigrants living in the United States in both years. Most of the countries that are not identified in one or both surveys are in Africa or are small island nations. The data are repeated cross-sections, not a panel, since individuals cannot be linked across the surveys in the public use data.

Figure 1 shows the change in the share of adult immigrants in four major education categories. These four categories are mutually exclusive and encompass all adult immigrants. The share of immigrants in the lowest category – not completed high school or the equivalent – fell by almost 12 percentage points, while the shares in all three higher categories rose at least slightly. The increase was largest among the highest category – college graduates – which rose by about 9 percentage points.

As noted earlier, changes in where new immigrants are from, or between-country compositional shifts, may have contributed to the rightward shift in immigrants' education distri-

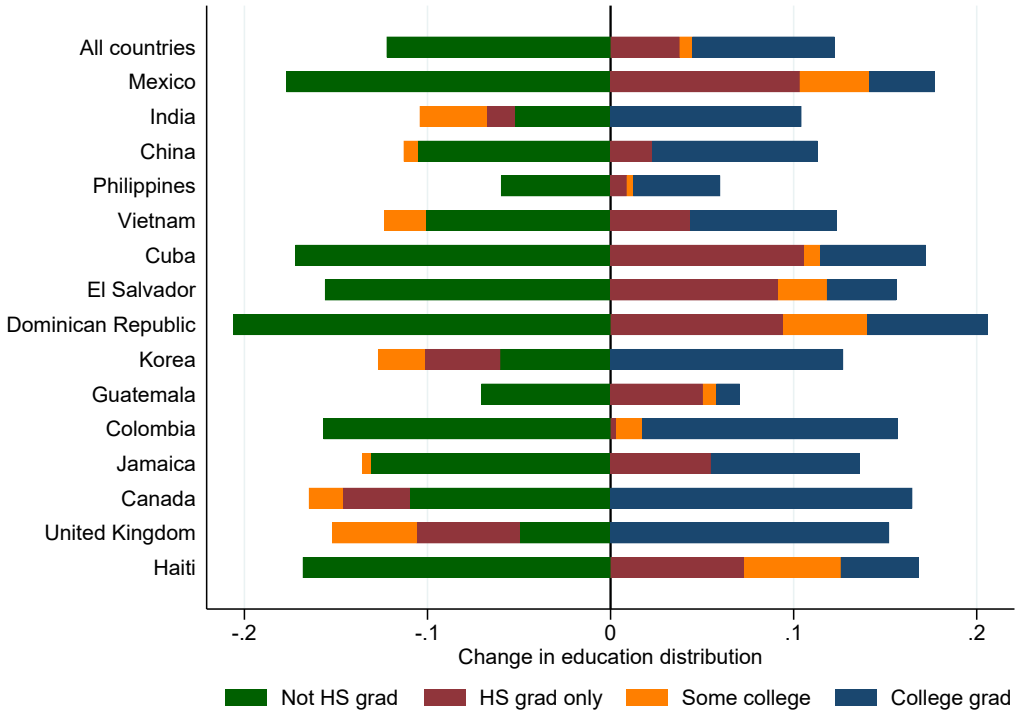


Figure 2: Change in immigrants' education distribution, 2000-2019, for top 15 immigrant-origin countries

Note: The figure shows the change in the share of immigrants ages 25 and older in each of four categories by highest level of education attained: not high school graduate, high school graduate, some college, and bachelor's degree or higher.

bution. In particular, immigration from much of Latin America eased over the two decades we examine, led by a decrease in the number of immigrants from Mexico (Norlander and Sorensen, 2018). As a result, the share of all adult U.S. immigrants who are from Mexico was a percentage point lower in 2019 than in 2000. Meanwhile, the share of immigrants from Asia grew. Most notably, the shares from China and India rose by 1.3 and 2.7 percentage points, respectively.[4] In 2000, Mexico had the highest share of immigrants who had not completed high school (70%), while India had one of the highest shares of immigrants who had completed college (69%), so that shift alone portends an increase in the overall education distribution.

The data also suggest that within-country changes in immigrants' education levels con-

[4]Stylized facts based on immigrants ages 25 and older in the 2000 Census and the 2019 ACS.

tributed to the rise in immigrants' educational attainment. Figure 2 shows the change in the distribution of immigrants across the four education categories within each of the top 15 origin countries. Those countries together account for two-thirds of the adult immigrant stock in both 2000 and 2019. In all 15 countries, the share of immigrants who have not completed high school fell, and the share who are college graduates rose. The direction of change in the middle two categories varies across countries, but points to rightward shifts of immigrants' education distribution for all of the top 15 countries.

Nonetheless, there is considerable cross-country variation in how much immigrants' education distribution shifted and where in the distribution the shifts occurred. The Dominican Republic and Mexico experienced among the largest changes, and the Philippines and Guatemala experienced some of the smallest changes, as indicated by the length of the bars in Figure 2. For origin countries whose immigrant stock in 2000 had relatively low levels of education – mostly countries in Latin America or the Caribbean – there were increases in the share of immigrants who have completed high school or some college in addition to an increase in the share of immigrants who are college graduates. For origin countries whose immigrant stock in 2000 had relatively high levels of education – India, Korea, Canada, and the UK, for example – there were decreases in the share of immigrants who have completed high school or some college in addition to a decrease in the share of immigrants who have not completed high school.

Although Figure 2 indicates rightward shifts in the immigrant education distribution for the major source countries, this was not the case for all countries. The share of immigrants who have not completed high school rose for a handful of countries, mostly notably Myanmar, with a 17.5 percentage point increase over the two decades. Morocco, Somalia, Tanzania, Cameroon, and Nepal also experienced increases in the lowest education category, albeit much smaller ones. (Appendix Figure A.1 shows the changes for all 124 countries in the sample.) In short, there is considerable cross-country variation in how immigrants' education levels changed between 2000 and 2019.

2.1 Decomposition into Within- versus Between-Country Changes

To more formally investigate the relative importance of changes in immigrants' education levels within countries versus shifts in where immigrants are from, we decompose the change in the share of immigrants in each of the four education categories. The change in the share of immigrants in each education category is simply

$$\Delta \text{Ed} = \sum_{\text{c}} \text{s}_{\text{c}}^{2019} \, \text{Ed}_{\text{c}}^{2019} \; - \; \sum_{\text{c}} \text{s}_{\text{c}}^{2000} \, \text{Ed}_{\text{c}}^{2000}, \tag{1}$$

where c indexes origin countries, s_c is the share of all immigrants living in the United States who are from country c, and Ed_c is the share of immigrants from country c in a given education category in 2000 or 2019. We calculate ΔEd for each of our four education categories; those values are shown in Figure 1. We then decompose ΔEd for each education category into the portion due to within-country changes, the portion due to between-country shifts in where immigrants are from, and a residual component:

$$\Delta \text{Ed} = \underbrace{\sum_{\text{c}} \text{s}_{\text{c}}^{2000} \left(\text{Ed}_{\text{c}}^{2019} - \text{Ed}_{\text{c}}^{2000}\right)}_{\text{Within-country change}} + \underbrace{\sum_{\text{c}} \left(\text{s}_{\text{c}}^{2019} - \text{s}_{\text{c}}^{2000}\right) \text{Ed}_{\text{c}}^{2000}}_{\text{Between-country shift}} + \underbrace{\sum_{\text{c}} \left(\text{s}_{\text{c}}^{2019} - \text{s}_{\text{c}}^{2000}\right) \left(\text{Ed}_{\text{c}}^{2019} - \text{Ed}_{\text{c}}^{2000}\right)}_{\text{Residual (interaction)}}. \tag{2}$$

As shown in equation 2, the within-country portion is the weighted sum of the change in the share of immigrants in a given education category within each country, where the weights are the share of all immigrants in the United States in 2000 from that country. The between-country portion is the weighted sum of the change in the share of all immigrants from each country, where the weights now are the country-specific share of immigrants in that education category in 2019. The residual component is the interaction between the changes in countries' immigrant shares and their education distributions. Our decomposition is a variant of the well-known Oaxaca-Blinder decomposition (Oaxaca, 1973; Blinder, 1973) and has been widely used to decompose changes into within-group changes versus between-group

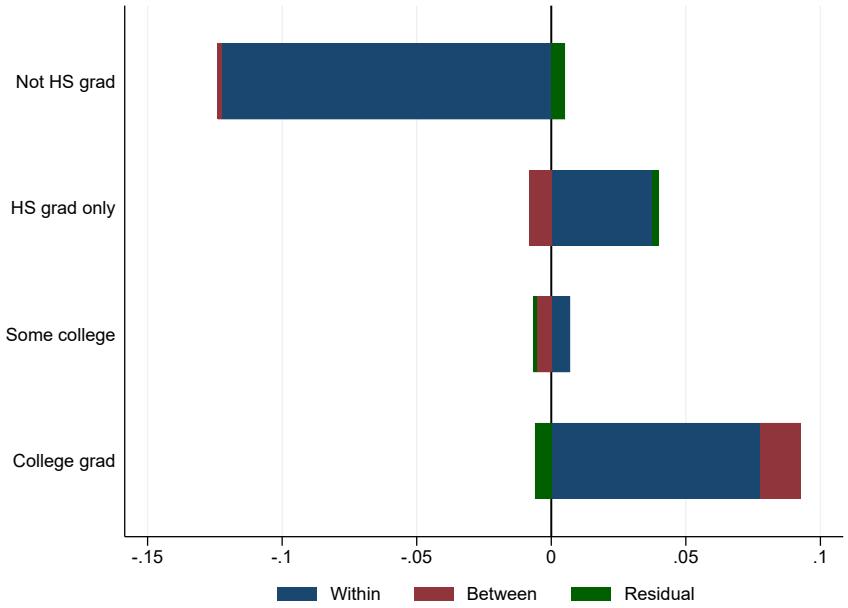


Figure 3: Decomposition of changes in education distribution into within- and between-country changes, by education level

Note: The figure shows the decomposition of the change in the share of immigrants in each education category into within-country, between-country, and residual components for 124 countries.

composition changes in a variety of contexts (see, e.g., Borjas, 1985; Hook et al., 2004; Han and Hermansen, 2024).

Within-country changes underlie most of the observed changes in the education distribution. As Figure 3 shows, virtually all of the 12 percentage point decrease in the share of immigrants who have not completed high school is due to within-country decreases in the share of immigrants who have not completed high school. Most of the increase in the share of immigrants who are high school graduates is due to within-country changes, and so is all of the small increase in the share of immigrants who have some college education. Interestingly, shifts in where immigrants are from – the between-country component – pulled down the increase in the shares of immigrants who are high school graduates or have some college education. Both within- and between-country changes contributed to the increase in the share of immigrants who are college graduates, but within-country changes account for most of the increase. In other words, most of the improvement in immigrants' education

levels was not due to getting more immigrants from highly educated countries and fewer from less educated countries, but rather due to immigrants from most countries being more highly educated than they were two decades ago.

3 Decomposition of Within-Country Changes

Since within-country changes underlie most of the observed changes in the immigrant education distribution, the rest of our analysis focuses on within-country changes. We first decompose the within-country changes for each of the education categories into three components. The first component is entry, or immigrants present in the United States in 2019 who entered after 2000. The second component is exit and upgrading, or immigrants present in the United States in 2000 but who left the country, died, or increased their education level by 2019. Since we cannot observe people who are no longer present, stayers – immigrants present in the country in both 2000 and 2019 – are a (inverse) proxy for exits. We cannot directly observe educational upgrading since we use repeated cross-sections instead of panel data, but we implicitly capture upgrading together with exits since we observe immigrants' education levels in 2000 and stayers' education levels in 2019. The final component is aging in, or immigrants present in the country in 2000 but not yet old enough to be included in our adult sample.

Equation 3 presents the within-country decomposition, where Ed_c is the country-specific share of immigrants in a given education category:

$$\Delta \mathrm{Ed_c} = \underbrace{\frac{\mathrm{P_c^{new}}}{\mathrm{P_c^{2019}}}(\mathrm{Ed_c^{new}} - \mathrm{Ed}_c^{2000})}_{\text{Entry}} + \underbrace{\frac{\mathrm{P_c^{stay}}}{\mathrm{P_c^{2019}}}(\mathrm{Ed_c^{stay}} - \mathrm{Ed}_c^{2000})}_{\text{Exit + Upgrading (Combined)}} + \underbrace{\frac{\mathrm{P_c^{age-in}}}{\mathrm{P_c^{2019}}}(\mathrm{Ed_c^{age-in}} - \mathrm{Ed}_c^{2000})}_{\text{Aging in}}. \quad (3)$$

Each portion of the decomposition measures the difference between the share of that group (entrants, exiters and upgraders as (inverse) proxied by stayers, and immigrants who aged

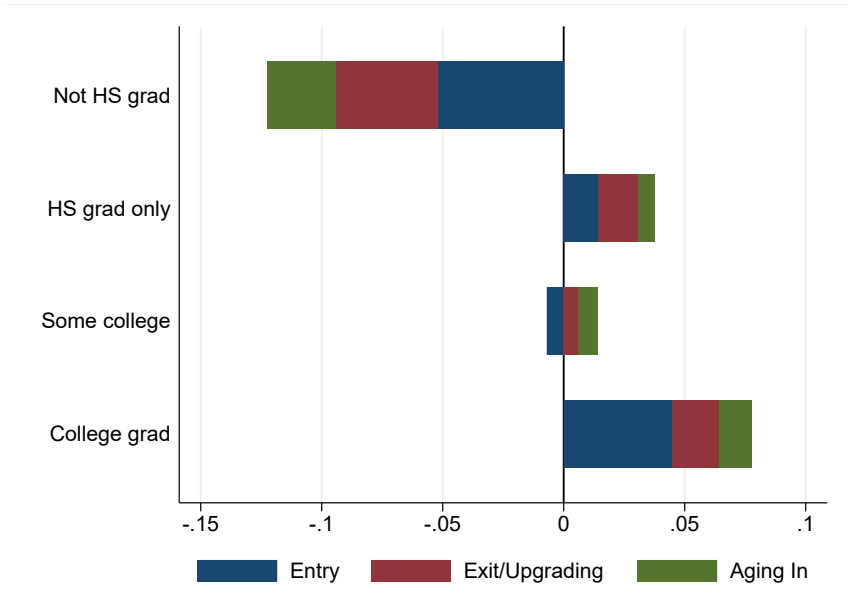


Figure 4: Decomposition of within-country changes in education distribution into entry, exit and upgrading, and aging in, by education level, 2000-2019

Note: The figure shows the average decomposition of the within-country change in the share of immigrants in each education category into entry, exit and upgrading, and aging in components for the 124 countries in the sample.

in) with a given education level in 2019 and the share of immigrants with that education level in 2000, weighted by that group as a share of all immigrants from that country in 2019. We calculate ΔEd_c for each of the 124 countries in our sample as well as for the 124 countries as a whole. As discussed earlier, we expect all three components to typically contribute to the rightward shift of immigrants' education distribution.

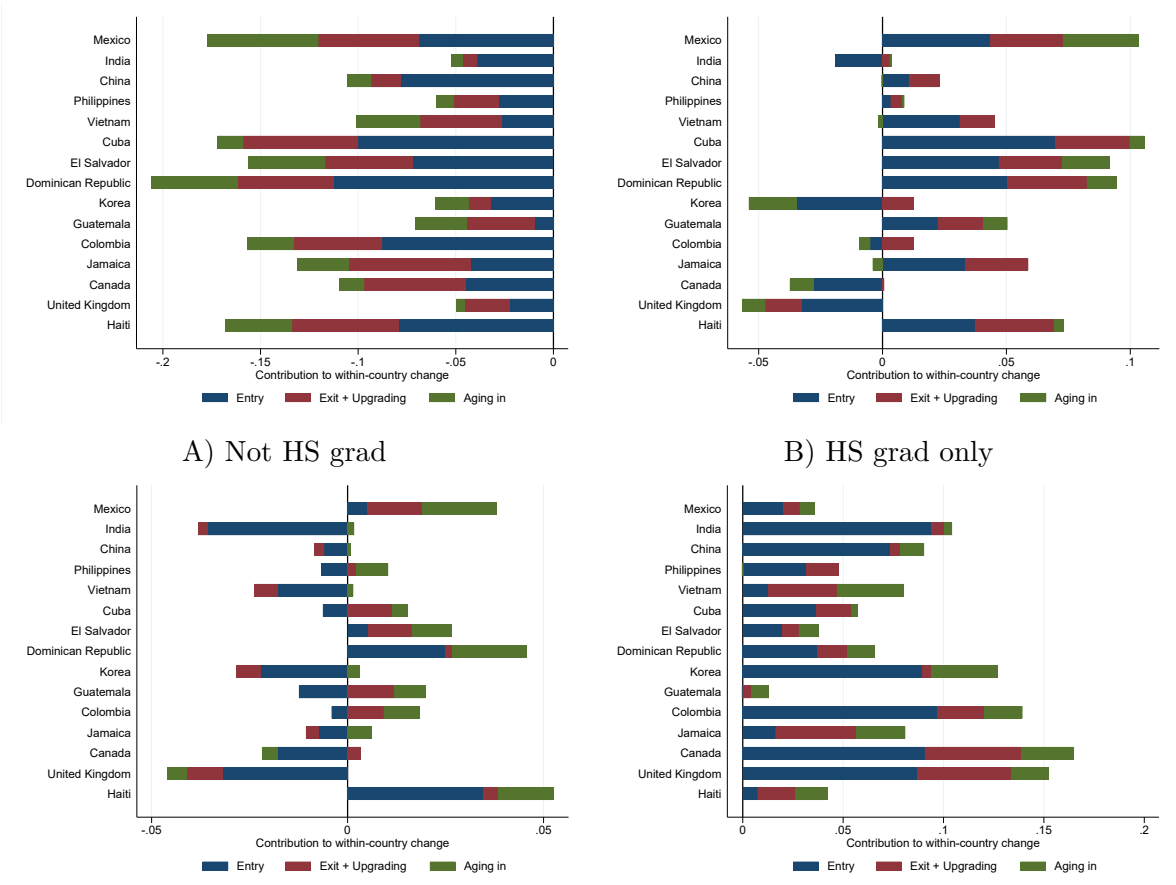
Figure 4 shows this is the case for our sample of 124 countries as a whole. The figure shows the cross-country average of the within-country decompositions for the four education categories. Entry, exit and upgrading, and aging in all contribute to the within-country drop in the share of immigrants who have not completed high school and to the within-country increases in the shares of immigrants who have completed high school or college. The only mixed results are for the share of immigrants who have some college education, where entry reduces the share while exit/upgrading and aging-in increase it.

There is again considerable variation across countries in the contributors to the observed changes in the education distribution. Figure 5 shows the within-country decompositions

for the four education categories for the top 15 immigrant-origin countries. (These are the results of applying equation 3 to the within-country changes in the education distribution shown in Figure 2.)

Entrants appear to play a sizable role in the observed changes for many countries and education categories, but there are a few exceptions. Entrants appear to play virtually no role in the small increase in the share of immigrants from Guatemala who are college graduates, and only a small role in the corresponding change for Haiti. For highly-educated countries – India, Korea, Canada, and the UK – it is not surprising that entrants contributed to the drop in the share of immigrants from there who had only completed high school or some college. Perhaps more surprisingly, entrants from some low- and middle-income countries pushed down education levels in the middle of the distribution. For example, immigrants from Colombia reduced the increase in the share of immigrants from there who had only completed high school or some college. Entrants from Cuba and Guatemala also reduced the increase in the share of immigrants from there who had some college, while entrants from Vietnam and Jamaica contributed to the drop in the share of immigrants from there who had some college.

Exits and education upgrading together pushed the education distribution among immigrants from most major origin countries to the right. This is not surprising since older immigrants, who are the most likely to no longer be in the United States in 2019, typically have relatively low levels of education. The extent to which exit and upgrading pushed the education distribution to the right varies across countries. It appears to play a relatively large role for Mexico and a relatively small role for India and the Philippines. Immigrants who aged into the sample also generally pushed the education distribution to the right, with that again meaning a drop in the share of immigrants who have only completed high school or some college for highly educated countries. Interestingly, aging-in effects are particularly small for immigrants from India and China, perhaps due to there being relatively few young immigrants from there in the sample in 2000 still present in the U.S. in 2019 or due to similar



A) Not HS grad

B) HS grad only

C) Some college

D) College grad

Figure 5: Decomposition of within-country changes in education distribution into entry, exit and upgrading, and aging in, by education level, for top 15 immigrant-origin countries, 2000-2019

Note: The figure shows the decomposition of the within-country change in the share of immigrants ages 25 and older in each education category into entry, exit and upgrading, and aging in components for the top 15 immigrant-origin countries.

levels of education among parents and immigrant children.

The most interesting cases in Figure 5 may be the ones where the three components of the decomposition are not all in the same direction for a given country and education category. For example, entrants and aging-in immigrants contributed to the drop in the share of Korean and Colombian immigrants who have only completed high school, while exits and upgrading partially offset them.

3.1 Net Difference Index

In order to analyze the potential roles of economic and demographic variables as well as immigration policy in the observed changes in immigrants' education distribution, we turn to the net difference index (NDI) (Lieberson, 1976, 1980; Feliciano, 2005). The NDI can be used to compare distributions of categorical variables across two groups or, in our case, across two points in time. It is a summary statistic that gives the share of individuals who would need to move across education categories in one distribution to make it the same as the other distribution. If all individuals would need to move to a higher education category, the NDI equals 1; if all individuals would need to move to a lower education category, the NDI equals -1. The value of the NDI does not reflect how many categories individuals would need to move up or down – a shift from not high school graduate to high school graduate, some college, or college graduate all count as the same in the NDI. Although it misses the size of shifts, the NDI nonetheless offers a useful summary statistic of shifts in the education distribution.

Formally, the aggregate within-country NDI across the 124 countries in our sample is calculated as

$$\text{NDI} = \sum_{\text{c}} \text{s}_{\text{c}}^{2000} \left(\sum_{\text{e}=1}^{4} \text{p}_{\text{e,c}}^{2019} \times \text{CumulShare}_{\text{e,c}}^{2000} \; - \; \sum_{\text{e}=1}^{4} \text{p}_{\text{e,c}}^{2000} \times \text{CumulShare}_{\text{e,c}}^{2019} \right), \qquad (4)$$

where e indexes education levels, s_c^{2000} is the share of all immigrants who are from country

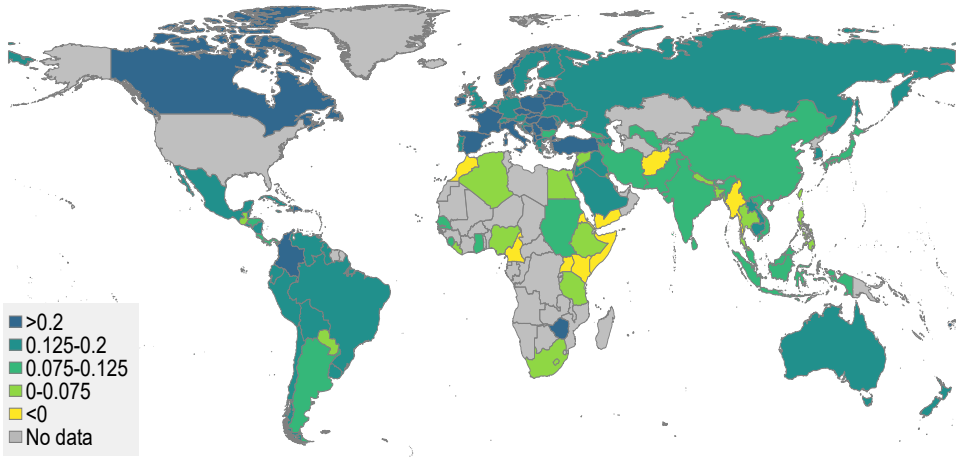


Figure 6: Map of within-country NDI of change in immigrants' education distribution, 2000-2019, by origin country

c in 2000, $p_{e,c}$ is the share of the immigrant population from c with education level e, and $CumulShare_{e,c}$ is the cumulative share of the immigrant population from c below education level e in 2000 or 2019. We also calculate an NDI for each of the 124 countries using equation 4 without the weighted sum across countries.

For the 124 countries in our sample, the average NDI is 0.153, indicating that an average of 15% of immigrants from a given country were in a higher education category in 2019 than in 2000. There is considerable variation in the NDI across countries, as shown in Figure 6. The NDI is negative for Afghanistan, Myanmar, Yemen, and several countries in Africa, indicating a leftward shift in their immigrant education distribution. The largest positive NDIs tend to be for European countries, although Canada, Colombia, and Zimbabwe are notable exceptions. Several small island nations also have relatively high NDIs: the Bahamas, Cape Verde, Fiji, Tonga, and St. Vincent and the Grenadines are all in the highest category shown in Figure 6.

We also decompose the within-country NDI into entry, exit and upgrading, and aging in components by using component-specific immigrants from that country in 2019 (i.e., entrants, stayers, or aging-in immigrants) to calculate $p_{e,c}^{2019}$ and $CumulShare_{e,c}^{2019}$ in equation 4. When weighted using the same weights as in equation 3, i.e., component-specific immigrants as a

share of all immigrants from that country in 2019, the three components sum to the country's NDI. Across the 124 countries in our sample, the average NDI due to entry is 0.072, which accounts for 47% of the total NDI; exit and upgrading, 0.047 (30.5% of the total NDI); and aging in, 0.035 (22.5% of the total NDI). Immigrants who arrived between 2000 and 2019 are thus the largest contributor to the increase in immigrants' education levels, but exits and upgrading and aging in also played a role, on average.

There is considerable variation in the NDI decomposition components across countries. Figure 7 shows the within-country NDI decomposition for the top 15 origin countries. (Appendix Figures A.2-A.4 show the within-country NDI decomposition for all 124 countries in the sample.) The three components contribute fairly similarly to the within-country NDI for some countries, such as Mexico, El Salvador, and Haiti. For some other countries, one or two components clearly dominate. For example, entry is the major contributor to India's and China's within-country NDIs. Exit and upgrading plays a more important role for Cuba, Jamaica, and Canada than for other countries. Aging in plays little role for India and the Philippines, while entry made almost no contribution to Guatemala's within-country NDI.

4 Potential Determinants of Within-Country Changes in Immigrants' Education Distribution

We now turn to how economic and demographic variables are related to within-country changes in immigrants' education levels, as measured by the NDI and its three decomposition components. As noted above, we do not identify causal relationships – some of the variables we examine might be affected by immigrants' education levels. Nonetheless, the analysis may shed light on how economic and demographic conditions in origin countries, the immigrant stock already present in a country, and immigration policies can lead to changes in immigrants' education levels.

We estimate basic cross-country regressions of the form

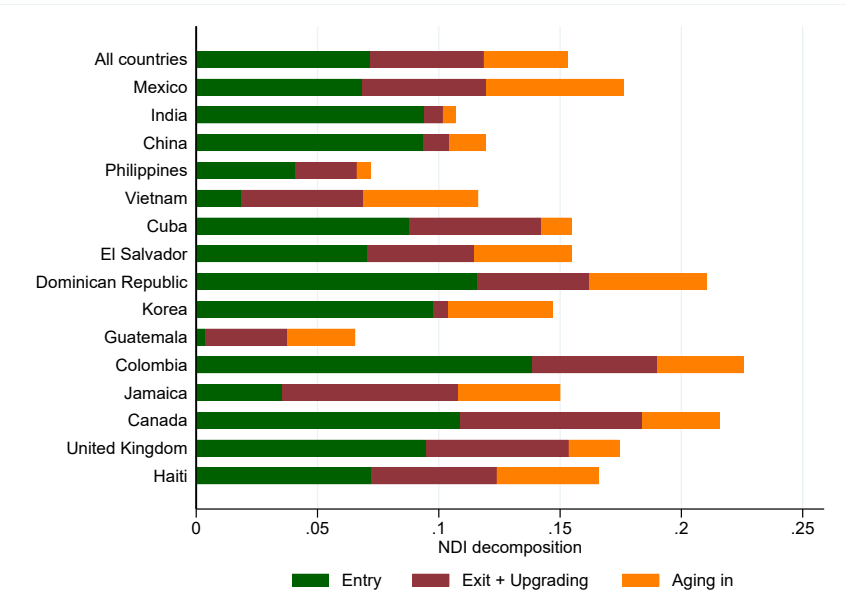


Figure 7: Decomposition of within-country NDI for top 15 immigrant-origin countries into entry, exit and upgrading, and aging in, 2000-2019

$$\text{NDI}_c = \Delta\text{Origin conditions}_c + \text{Age structure}_c + \text{Immigrants in US}_c + \text{Distance from US}_c + \epsilon_c, \tag{5}$$

where the dependent variable is the within-country NDI or one of the three decomposition components. We include several measures of how economic and demographic conditions in origin countries changed over 2000-2019: the growth rate of real GDP per capita (PPP), the change in the Gini index, the change in average years of education among people ages 15 and older, the number of major natural disasters, and the number of major armed conflicts. (Data sources and details are in the Appendix.) These variables capture push factors and other changes in the origin that may affect immigrants' education levels in the United States. For example, an increase in income inequality, as measured by an increase in the Gini index, may lead to a smaller increase in immigrants' education levels or even a decrease if it results in greater out-migration by less-educated people as their relative incomes fall, and also perhaps in greater return migration by more-educated immigrants in the United States.

In other words, we expect the change in the Gini index to be negatively related to the NDI. Meanwhile, a larger increase in education levels in the origin should result in a larger increase in immigrants' education levels, particularly among entrants, or the change in origin education levels should be positively related to the NDI.

We include several variables related to age structures. For the origin, we include the share of the population that is age 5-14 in 2000. A youth bulge typically leads to more out-migration when that cohort enters the labor market and pushes down wages and employment rates (Hanson and McIntosh, 2016). If those youth out-migrate and have more education than previous immigrants, they will shift immigrants' education distribution to the right. We also include two measures of age structure among U.S. immigrants in 2000: the share who are under age 25 and the share who are over age 65. The former will age into the sample by 2019 if they remain in the United States, while the latter are particularly likely to die or return migrate by 2019. A higher share in either age group should be positively related to the NDI, assuming that young immigrants have above-average education levels and elderly immigrants have below-average education levels.

In addition to the initial age structure of immigrants in the United States, we include the initial size of the immigrant network. We measure network size as the ratio of immigrants in the United States to the origin population in 2000. A larger network in the United States may make it easier for less-educated people to migrate by helping pay migration costs, sponsoring family members to migrate, sharing information about employment opportunities, offering housing, and so on (Munshi, 2020). The other variables related to immigrants in the United States capture policy-related immigrant inflows that may affect immigrants' education levels. Specifically, we include the share of temporary work visas that are issued in relative "skilled" categories and the distribution of permanent (lawful permanent resident, or LPR) visas across major categories, both over fiscal years 2000-2019. We expect that higher shares of temporary or permanent visas in skilled or employment-based categories should lead to an increase in immigrants' education levels, or increase the NDI.

Lastly, we include the distance between the origin country and the United States as a proxy for bilateral migration costs, both financial and psychic. Higher migration costs may result in more highly educated immigrant inflows. However, if migration costs are falling over time, resulting in migration flows becoming less educated, distance may be negatively related to the NDI. We also interact distance with the change in mean years of education in the origin and network size to capture how the relationship between those variables and immigrants' education levels varies with migration costs.

Since many of these variables are collinear, we report results from simple bivariate regressions in addition to full multivariate regressions. We estimate equation 5 using ordinary least squares. Observations are weighted by the size of the immigrant population from that country in 2000. We report robust standard errors.

4.1 Overall NDI

Changes in economic conditions in origin countries are generally not related to the change in immigrants' education levels, as measured by the NDI. As the first row in Table 1 shows, the growth rate of real GDP per capita in the origin and the NDI are negatively related when examining the bivariate relationship, but that result is not robust to controlling for other variables. The change in the Gini index in the origin does not appear to affect immigrants' education levels. Countries with larger increases in education levels also had larger increases in immigrants' education levels, but the relationship fades as the distance from the United States increases, as indicated by the negative interaction term in column 3. Natural disasters appear to be an important push factor for less-educated immigrants: the number of major natural disasters is negatively related to the NDI, suggesting that natural disasters lead to a smaller increase or even a decrease in immigrants' education levels.

The age structure of immigrants already present in the United States appears to play a large role in changes in their education levels over the next two decades, whereas the age structure in the origin appears to have little impact. In the bivariate regression, a youth

Table 1: Relationships between economic and demographic characteristics and the change in immigrants' education distribution (overall NDI), 2000-2019

	Bivariate	Multivariate		
	(1)	(2)	(3)	(4)
Growth rate of origin GDP per capita (PPP), 2000-19	-0.020***	0.002	-0.002	0.002
	(0.007)	(0.008)	(0.008)	(0.008)
Change in Gini index in origin, 2000-19	0.023	0.070	0.097	0.070
	(0.082)	(0.055)	(0.060)	(0.056)
Change in mean years of education in origin, 2000-15	-0.009	0.001	0.263**	0.001
	(0.012)	(0.008)	(0.104)	(0.008)
Number of natural disasters in origin, 2000-19	-0.011***	-0.006**	-0.006**	-0.006**
	(0.004)	(0.003)	(0.003)	(0.003)
Number of armed conflicts in origin, 2000-19	-0.060	-0.004	-0.004	-0.001
	(0.062)	(0.035)	(0.036)	(0.036)
Share of population age 5-14 in origin, 2000	-0.336**	-0.079	-0.061	-0.083
	(0.141)	(0.191)	(0.186)	(0.187)
Share of immigrant population <age 25, 2000	0.013	0.239***	0.229***	0.234***
	(0.100)	(0.090)	(0.080)	(0.089)
Share of immigrant population age 65+, 2000	0.158*	0.322***	0.310***	0.319***
	(0.081)	(0.098)	(0.092)	(0.098)
Size of immigrant network in U.S., 2000	0.223*	0.075	0.134	-1.478
	(0.114)	(0.101)	(0.111)	(2.878)
Share of temporary work visas skilled, 2000-19	-0.027*	0.067***	0.063**	0.058**
	(0.015)	(0.024)	(0.024)	(0.029)
Share of LPRs to immediate relatives, 2000-19	0.118**	0.068	0.058	0.068
	(0.047)	(0.057)	(0.063)	(0.058)
Share of LPRs to other family categories, 2000-19	-0.056	0.031	0.023	0.029
	(0.060)	(0.068)	(0.067)	(0.069)
Share of LPRs employment-based, 2000-19	-0.014	-0.045	-0.053	-0.044
	(0.047)	(0.069)	(0.066)	(0.070)
Share of LPRs to refugees, 2000-19	-0.031	-0.014	-0.008	-0.009
	(0.032)	(0.056)	(0.060)	(0.061)
Distance from origin to U.S.	-0.035***	-0.045***	0.002	-0.049***
	(0.007)	(0.012)	(0.022)	(0.012)
Change in origin mean years education × Distance	–	–	-0.030**	–
			(0.012)	
Size of immigrant network in U.S. × Distance	–	–	–	0.186
				(0.349)
N	124	124	124	124
R-squared		0.565	0.586	0.566

Note: The dependent variable is the net difference index (NDI), a measure of the change in immigrants' education distribution over 2000-2019, within 124 countries. In column 1, each estimate is from a separate bivariate regression, each with 124 observations (we do not report R-squared for those regressions). All regressions include a constant. Distance is in natural logs, and the number of armed conflicts is divided by 100. Observations are weighted by the immigrant population in 2000. Robust standard errors in parentheses.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

bulge in the origin and the NDI are negatively related, but the relationship is not robust to controlling for other variables. Countries with a higher share of U.S. immigrants under age 25 or over age 65 in 2000 have larger increases in education levels over 2000-2019. In the bivariate regression, network size and the NDI are positively related, but the relationship is not robust to controlling for other variables, including an interaction with distance between the origin country and the United States (column 4).

The share of temporary work visas that are issued in skilled categories appears to affect the change in immigrants' education levels. Although the visas are, in theory, temporary, many immigrants who enter on skilled temporary work visas ultimately stay in the United States for decades or even the rest of their lives if they adjust to a permanent resident visa. In the bivariate regression, the share of skilled temporary work vsas and the NDI are negatively related, but the relationship is positive when controlling for other variables. None of the variables measuring the distribution of permanent resident visas across categories are significantly related to the overall change in immigrants' education levels. Lastly, distance is negatively related to the change in immigrants' education levels.

4.2 NDI due to entry

The NDI due to entry captures how much immigrants' education levels, as proxied by the NDI, changed because of immigrants who entered the United States since 2000. Table 2 shows the regression results. Most of the results are similar to the overall NDI results, such as the positive relationship between the change in average years of education in the origin and the NDI that fades as distance increases and the strong positive relationship between the share of skilled temporary work visas and the NDI. The null relationship between the distribution of permanent resident visas and the NDI carries over, which suggests that the division of visas across major classes of admission may have little impact on immigrants' education levels.

However, some results differ notably. Surprisingly, natural disasters in the origin are not

Table 2: Relationships between economic and demographic characteristics and the change in immigrants' education distribution (NDI) due to entry, 2000-2019

	Bivariate	Multivariate		
	(1)	(2)	(3)	(4)
Growth rate of origin GDP per capita (PPP), 2000-19	-0.002	0.007	0.003	0.006
	(0.007)	(0.006)	(0.006)	(0.006)
Change in Gini index in origin, 2000-19	0.066**	0.025	0.057	0.024
	(0.032)	(0.038)	(0.046)	(0.037)
Change in mean years of education in origin, 2000-15	0.000	-0.002	0.308***	-0.002
	(0.009)	(0.007)	(0.102)	(0.007)
Number of natural disasters in origin, 2000-19	-0.005**	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)
Number of armed conflicts in origin, 2000-19	-0.023	0.038	0.038	0.034
	(0.030)	(0.027)	(0.028)	(0.027)
Share of population age 5-14 in origin, 2000	-0.339***	-0.174	-0.153	-0.166
	(0.055)	(0.144)	(0.128)	(0.141)
Share of immigrant population <age 25, 2000	-0.082**	0.119	0.108	0.126*
	(0.034)	(0.073)	(0.066)	(0.075)
Share of immigrant population age 65+, 2000	0.140***	0.086	0.073	0.092
	(0.026)	(0.082)	(0.072)	(0.082)
Size of immigrant network in U.S., 2000	-0.118**	-0.066	0.004	2.727*
	(0.055)	(0.073)	(0.079)	(1.525)
Share of temporary work visas skilled, 2000-19	0.018*	0.056**	0.051**	0.072***
	(0.011)	(0.023)	(0.021)	(0.024)
Share of LPRs to immediate relatives, 2000-19	0.009	0.032	0.020	0.033
	(0.027)	(0.043)	(0.053)	(0.040)
Share of LPRs to other family categories, 2000-19	-0.107**	0.007	-0.002	0.009
	(0.042)	(0.067)	(0.059)	(0.067)
Share of LPRs employment-based, 2000-19	0.092***	0.055	0.046	0.052
	(0.021)	(0.057)	(0.055)	(0.057)
Share of LPRs to refugees, 2000-19	-0.004	0.000	0.008	-0.010
	(0.021)	(0.044)	(0.054)	(0.043)
Distance from origin to U.S.	-0.005	-0.037***	0.018	-0.030**
	(0.007)	(0.013)	(0.023)	(0.014)
Change in origin mean years education × Distance	–	–	-0.035***	–
			(0.011)	
Size of immigrant network in U.S. × Distance	–	–	–	-0.335*
				(0.181)
N	124	124	124	124
R-squared	–	0.442	0.504	0.451

Note: The dependent variable is the portion of the net difference index (NDI), a measure of the change in immigrants' education distribution over 2000-2019, due to immigrants who entered the U.S. since 2000. In column 1, each estimate is from a separate bivariate regression, each with 124 observations (we do not report R-squared for those regressions). All regressions include a constant. Distance is in natural logs, and the number of armed conflicts is divided by 100. Observations are weighted by the immigrant population in 2000. Robust standard errors in parentheses.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

significantly related to the NDI due to entry when controlling for other variables despite being negatively related to the overall NDI. The age structure of immigrants in the United States in 2000 is generally not related to the NDI due to entry when controlling for other variables, whereas it is strongly related to the overall NDI. This difference is not surprising since, of course, entries after 2000 did not affect the age structure in 2000. Table 2 shows a large positive relationship between network size and the NDI due to entry that fades with distance (column 4), whereas the relationship with the overall NDI is not significantly different from zero.

Taking Table 2 as a whole, push factors in the origin do not appear to play a large role in changes in immigrants' education levels due to entry. Immigration policies or other conditions that increase the share of skilled temporary work visas do appear to play an important role.

4.3 NDI due to exit and upgrading

The age and number of co-national immigrants in the U.S. appear to play an important role in the change in immigrants' education levels due to exit and upgrading. Table 3 shows the regression results for the NDI component due to exit and upgrading. The results show a strong positive relationship between the share of immigrants in 2000 who are elderly and the change in immigrants' education levels. This is not surprising since elderly immigrants are the most likely to no longer be in the sample in 2019, and they typically have lower education levels than younger immigrants. Network size is generally positively related to the change in immigrants' education levels due to exit and upgrading. This result could mean that more highly educated immigrants are more likely than less-educated immigrants to stay in the United States if there are more co-nationals – network size may be more important to highly educated immigrants.

Economic and demographic conditions in the origin are generally not related to the change in immigrants' education levels due to exit and upgrading. Those null results suggest

Table 3: Relationships between economic and demographic characteristics and the change in immigrants' education distribution (NDI) due to exit and upgrading, 2000-2019

	Bivariate	Multivariate		
	(1)	(2)	(3)	(4)
Growth rate of origin GDP per capita (PPP), 2000-19	-0.011***	-0.005	-0.005	-0.004
	(0.003)	(0.004)	(0.004)	(0.004)
Change in Gini index in origin, 2000-19	-0.069*	0.015	0.010	0.016
	(0.037)	(0.025)	(0.024)	(0.027)
Change in mean years of education in origin, 2000-15	-0.006	0.002	-0.044	0.002
	(0.006)	(0.003)	(0.043)	(0.003)
Number of natural disasters in origin, 2000-19	-0.003*	-0.002	-0.002	-0.003*
	(0.001)	(0.001)	(0.001)	(0.001)
Number of armed conflicts in origin, 2000-19	-0.041*	-0.011	-0.011	-0.007
	(0.024)	(0.016)	(0.015)	(0.017)
Share of population age 5-14 in origin, 2000	-0.109	0.124	0.121	0.118
	(0.074)	(0.110)	(0.109)	(0.100)
Share of immigrant population <age 25, 2000	-0.060	0.028	0.030	0.022
	(0.050)	(0.048)	(0.049)	(0.047)
Share of immigrant population age 65+, 2000	0.117***	0.237***	0.239***	0.231***
	(0.036)	(0.057)	(0.057)	(0.055)
Size of immigrant network in U.S., 2000	0.132***	0.111**	0.100**	-2.347
	(0.048)	(0.044)	(0.043)	(1.438)
Share of temporary work visas skilled, 2000-19	-0.009	0.014	0.015	0.001
	(0.007)	(0.009)	(0.009)	(0.012)
Share of LPRs to immediate relatives, 2000-19	0.056**	0.027	0.029	0.026
	(0.028)	(0.024)	(0.025)	(0.023)
Share of LPRs to other family categories, 2000-19	-0.024	-0.010	-0.009	-0.012
	(0.025)	(0.027)	(0.025)	(0.028)
Share of LPRs employment-based, 2000-19	-0.039	-0.075***	-0.073***	-0.072***
	(0.026)	(0.026)	(0.027)	(0.027)
Share of LPRs to refugees, 2000-19	0.000	-0.016	-0.017	-0.007
	(0.011)	(0.022)	(0.022)	(0.022)
Distance from origin to U.S.	-0.013***	-0.003	-0.011	-0.009*
	(0.005)	(0.005)	(0.009)	(0.005)
Change in origin mean years education × Distance	–	–	0.005	–
			(0.005)	
Size of immigrant network in U.S. × Distance	–	–	–	0.295*
				(0.176)
N	124	124	124	124
R-squared	–	0.657	0.660	0.672

Note: The dependent variable is the portion of the net difference index (NDI), a measure of the change in immigrants' education distribution over 2000-2019, due to continuers (immigrants who were present in the U.S. in 2000 and 2019) as a proxy for exit/upgrading. In column 1, each estimate is from a separate bivariate regression, each with 124 observations (we do not report R-squared for those regressions). All regressions include a constant. Distance is in natural logs, and the number of armed conflicts is divided by 100. Observations are weighted by the immigrant population in 2000. Robust standard errors in parentheses.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

that changes in home country conditions may play little differential role in return migration across the education distribution. However, natural disasters in the origin do appear to be negatively related to the change in immigrants' education levels due to exit and upgrading, suggesting less-educated immigrants may be less likely to return migrate if their home country had a major natural disaster.

Table 3 reports a strong negative relationship between the share of permanent resident visas awarded in employment-based categories and the change in immigrants' education levels due to exit and upgrading. That result may be surprising since employment-based permanent resident visas are mostly limited to highly skilled immigrants and their accompanying dependents, who are likely to have relatively high levels of education. One potential explanation is that larger inflows of employment-based immigrants may have pushed some highly educated earlier immigrants to return home. The negative relationship also may signal an intergenerational downgrading of immigrants' education levels as a country's share of employment-based visas increases – earlier immigrants may have been particularly positively selected on education and are now exiting or return migrating.

4.4 NDI due to aging in

A larger share of young immigrants in 2000 increases immigrants' education levels as those immigrants age into the sample, as Table 4 shows. Perhaps more surprisingly, some origin country conditions also appear to influence immigrants' education levels via the aging-in component of the NDI decomposition. The change in the Gini index in the origin is positively related to the NDI due to aging in, suggesting that an increase in home country inequality may cause families or relatively young immigrants to be less likely to return migrate. The results in Table 4 indicate negative relationships between natural disasters and armed conflicts and the change in immigrants' education levels due to aging in. It may be the case that less-educated young immigrants or families are disproportionately less likely to return migrate after natural disasters or armed conflicts. Although the bivariate regression

results suggest that networks and the visa-related variables are related to the NDI aging-in component, none of those relationships are significant when controlling for other variables.

Table 4: Relationships between economic and demographic characteristics and the change in immigrants' education distribution (NDI) due to aging in, 2000-2019

	Bivariate	Multivariate		
	(1)	(2)	(3)	(4)
Growth rate of origin GDP per capita (PPP), 2000-19	-0.007	0.000	0.000	0.001
	(0.005)	(0.003)	(0.003)	(0.003)
Change in Gini index in origin, 2000-19	0.026	0.030*	0.029	0.031*
	(0.049)	(0.017)	(0.018)	(0.017)
Change in mean years of education in origin, 2000-15	-0.003	0.001	-0.001	0.001
	(0.005)	(0.002)	(0.039)	(0.002)
Number of natural disasters in origin, 2000-19	-0.003	-0.002**	-0.002**	-0.002**
	(0.002)	(0.001)	(0.001)	(0.001)
Number of armed conflicts in origin, 2000-19	0.000	-0.031**	-0.031**	-0.028**
	(0.000)	(0.012)	(0.012)	(0.011)
Share of population age 5-14 in origin, 2000	0.112	-0.030	-0.030	-0.035
	(0.069)	(0.062)	(0.062)	(0.055)
Share of immigrant population <age 25, 2000	0.155***	0.091***	0.091***	0.086***
	(0.029)	(0.033)	(0.033)	(0.031)
Share of immigrant population age 65+, 2000	-0.099***	-0.001	-0.001	-0.005
	(0.034)	(0.029)	(0.029)	(0.029)
Size of immigrant network in U.S., 2000	0.208***	0.030	0.030	-1.858
	(0.074)	(0.040)	(0.042)	(1.143)
Share of temporary work visas skilled, 2000-19	-0.036***	-0.004	-0.004	-0.014
	(0.005)	(0.007)	(0.007)	(0.009)
Share of LPRs to immediate relatives, 2000-19	0.053**	0.009	0.009	0.008
	(0.027)	(0.021)	(0.022)	(0.018)
Share of LPRs to other family categories, 2000-19	0.075***	0.034	0.035	0.033
	(0.025)	(0.022)	(0.022)	(0.021)
Share of LPRs employment-based, 2000-19	-0.067**	-0.026	-0.025	-0.023
	(0.026)	(0.025)	(0.025)	(0.024)
Share of LPRs to refugees, 2000-19	-0.026*	0.002	0.002	0.008
	(0.015)	(0.021)	(0.021)	(0.020)
Distance from origin to U.S.	-0.017***	-0.005	-0.005	-0.009**
	(0.005)	(0.004)	(0.008)	(0.004)
Change in origin mean years education × Distance	–	–	0.000	–
			(0.004)	
Size of immigrant network in U.S. × Distance	–	–	–	0.227
				(0.140)
N	124	124	124	124
R-squared	–	0.713	0.713	0.728

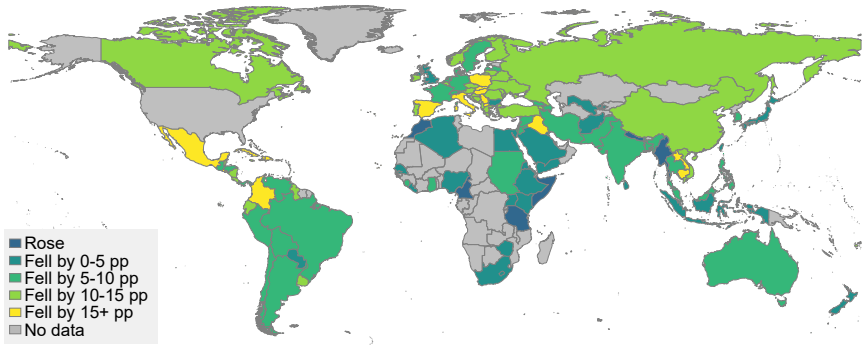
Note: The dependent variable is the portion of the net difference index (NDI), a measure of the change in immigrants' education distribution over 2000-2019, due to immigrants who were present in the U.S. in 2000 but not yet age 25. In column 1, each estimate is from a separate bivariate regression, each with 124 observations (we do not report R-squared for those regressions). All regressions include a constant. Distance is in natural logs, and the number of armed conflicts is divided by 100. Observations are weighted by the immigrant population in 2000. Robust standard errors in parentheses.
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.

5 Conclusion

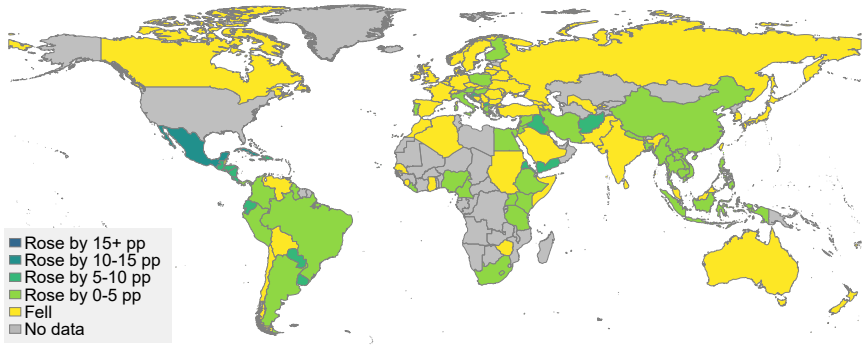
This study shows that the increase in educational attainment of immigrants in the U.S. over the last two decades was not driven by changes in where immigrants were from, but rather by rising levels of education among immigrants from most origin countries. We decompose this increase and document that it is largely driven by new immigrants or by immigrants who continued their education after they entered the U.S. Return migration appears to play a relatively smaller role. Economic conditions in origin countries do not explain the rise in immigrants' education. On the other hand, demographics both in the origin and among the foreign-born population already present in the U.S. and the availability of temporary visas for skilled workers appear to matter. These findings highlight the role of immigration policy in shaping the foreign-born population's composition and refute the notion that the increase in educational attainment of immigrants in the U.S. was due to a higher share coming from China and India. Areas for future research include identifying whether there have been changes in immigrant selection, namely, whether the education distribution in origin countries shifted to the right, explaining why new arrivals became more educated, or whether migrants have become more positively selected within origin-country education distributions.

Appendix

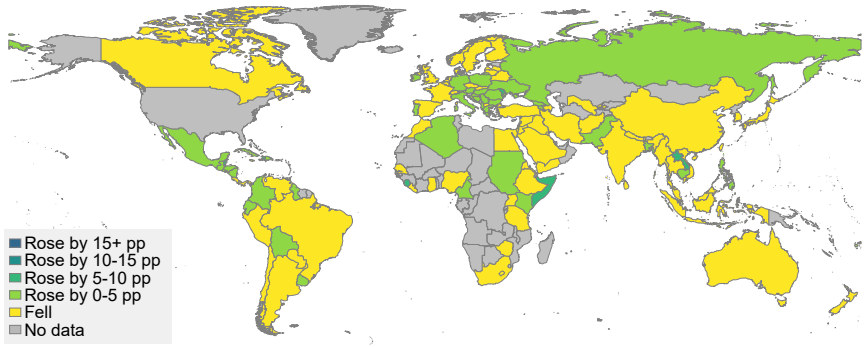
Appendix tables and figures



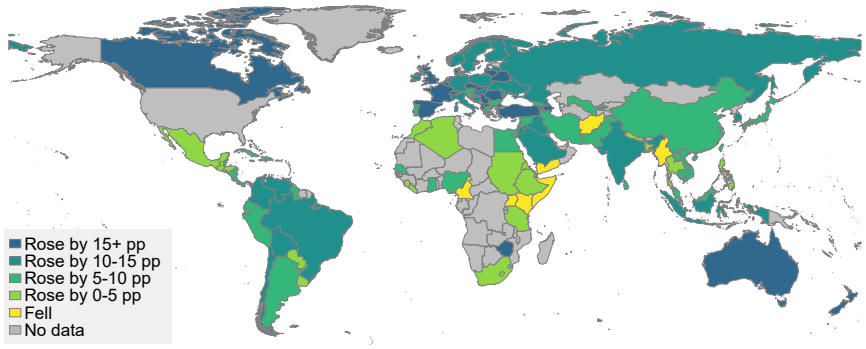
A) Not HS grad



B) HS grad



C) Some college



D) College grads

Figure A.1: Change in immigrants' education distribution, 2000-2019

Note: The figures show the change in the share of immigrants ages 25 and older with the indicated highest level of education attained.

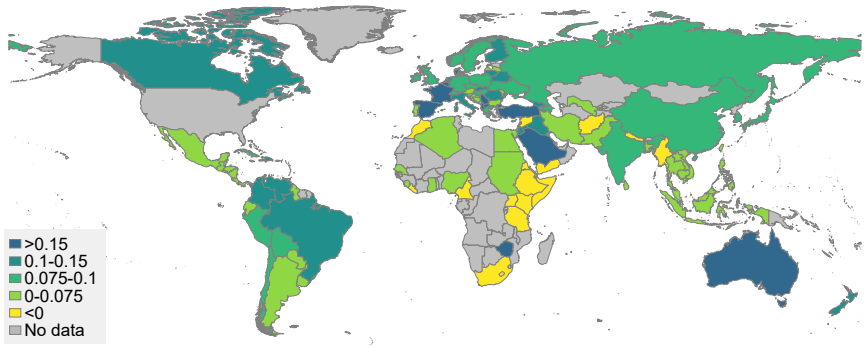


Figure A.2: Map of within-country NDI of change in immigrants' education distribution due to entry, 2000-2019, by origin country

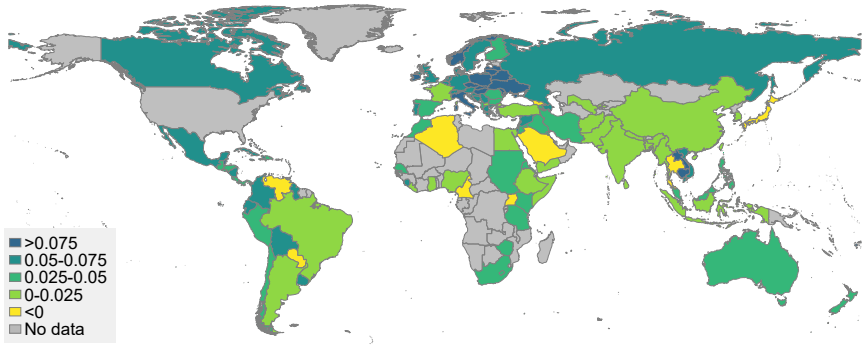


Figure A.3: Map of within-country NDI of change in immigrants' education distribution due to exits and upgrading, 2000-2019, by origin country

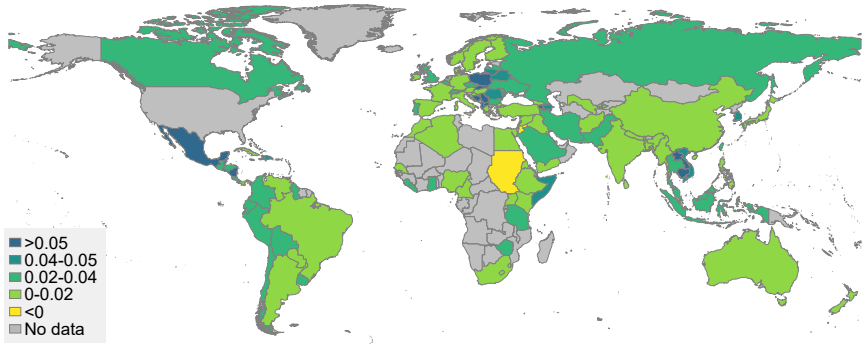


Figure A.4: Map of within-country NDI of change in immigrants' education distribution due to aging-in, 2000-2019, by origin country

Data sources and details

Any missing values are imputed at sample means

- Education distribution in the U.S. in 2000 and 2019 and age structure of immigrant population in the U.S. in 2000 from IPUMS, constructed using the person weights (Ruggles et al., 2025)
- Growth rate of real GDP per capita (PPP) in origin, 2000-2019, from World Bank, https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.KD
- Change in Gini index in origin, 2000-2019, from World Inequality Database, https://wid.world/data/
- Change in mean years of education in origin, 2000-2015, constructed using the Barro & Lee data, https://barrolee.github.io/BarroLeeDataSet/BLv3.html
- Number of major natural disasters (earthquake, hurricane, flood, volcano, drought that affected at least 10% of the population or resulted in the death of at least 0.01% of the population) in origin, 2000-2019, from EMDAT, https://public.emdat.be/
- Number of major (resulted in at least 1000 fatalities) armed conflicts in origin, 2000-2019, from Uppsala Conflict Data Program, https://ucdp.uu.se/downloads/
- Share of population age 5-14 in origin in 2000 from World Bank, https://databank.worldbank.org/source/population-estimates-and-projections#
- Size of immigrant network in U.S. in 2000 using immigrant population in U.S. from IPUMS and origin population from World Bank
- Share of temporary work visas skilled is E1, F1, H1B, H1B1, L1, and TN categories as a share of those categories plus H2A and H2B visas issued using visa issuances, 2000-2019, from U.S. State Department, https://travel.state.gov/content/dam/visas/Statistics/Non-Immigrant-Statistics/NIVDetailTables/FYs97-24_NIVDetailTable.xlsx
- Shares of lawful permanent resident (LPR) visas, 2000-2019, in various categories calculated using data from DHS Yearbook of Immigration Statistics, https://ohss.dhs.gov/topics/immigration/yearbook. Refugees includes refugees and asylees. "Other" is the omitted category, which includes diversity visas, parolees, children born abroad to noncitizen residents, victims of crimes, etc.
- Distance between origin and U.S. population centers from CEPII, https://www.cepii.fr/distance/dist_cepii.dta

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