Educational Self-Selection Among U.S. Immigrants and Returning Migrants

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Abstract

This paper empirically examines the educational selectivity of United States immigrants and of those that return to their source country from a historical perspective. Data from the 1970 to 2000 U.S. census, the 2010 American Community Survey, and the Barro and Lee (2010) International Data on Education Attainment are employed. Ten countries are selected for the study based on their historical and contemporaneous importance on U.S. migration. To determine the type of selection of incoming immigrants, the schooling distribution of recently arrived immigrants is compared to that of same-aged individuals at the source country. The selectivity of returning migrants is estimated using repeated cross-section data to examine changes through time in the distribution of schooling of synthetic immigrant entry cohorts. The synthetic cohorts are defined by age, country of birth, and first year of arrival to the United States. The results generally indicate positive selection on educational attainment of recently-arrived immigrants, being China, India, and Philippines the most prominent examples. Mexico, the highest contributor of contemporaneous immigrant population, does not show evidence of positive or negative selection, but their immigrants' selectivity has worsened through time. Historically, the educational selectivity of returning migrants accentuated the positive selection of those migrants that stay in the United States for a longer term in most countries' cases. However, this positive selection of the immigrant population that stays in the U.S. has recently declined and in some country's cases even disappeared. Yet, no evidence of negative selection of immigrants that stay in the U.S. is found.

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1 Introduction

International migration is a topic of great interest in multiple fields, like demography, politics, law, sociology, and economics. During the last decades, the number of international migrants has risen to a great extent. On 2010, it is estimated that roughly 214 million people migrated, being the United States the main destination. The most recent figures indicate that the U.S. comprises more than 40 million foreign-born inhabitants, which account for more than 12% of its population (Koser and Laczko 2010).

This paper empirically analyses from a historical perspective the selectivity that immigrants and returning migrants exhibit in terms of schooling. The United States is considered to be the host country and a group of ten sending countries are selected based on their historical contribution towards migration to the U.S. The purpose is to describe, on a country-by-country basis, the selectivity of incoming migrants with respect to their home country's schooling distribution. Then, synthetic cohorts of immigrants with similar characteristics are followed through census years to assess the kind of selectivity that results from returning migration.

From a microeconomic point of view, migration has been studied as a rational choice made by maximizing agents. The literature began by identifying migrants as a group of individuals that share some characteristics, like being more ambitious, highly motivated, and hard-working (Carliner 1980; Chiswick 1978). Some years later, in one of the most influential theoretical papers written on the topic, Borjas (1987, 1991) developed an application of Roy's model (Roy 1951) to explain how migrants self-select from the source countrys income distribution. According to that model, immigrants arriving from a country that has a higher (lower) level of inequality[1] than the host country, would negatively (positively) select from the source country's income distribution.

In a later paper, Borjas and Bratsberg (1996) extended the Borjas (1987, 1991) model to account for migrants returning to their country of origin. They concluded that returning migration accentuates the kind of selection that resulted from immigration. This conclu-

[1]The higher (lower) level of inequality is used as an indicator of higher (lower) returns to skills.

sion is relevant from a political point of view for countries such as the U.S., which has seen a recent wave of immigration from countries with higher levels of inequality in the last decades (mainly Mexico and Central American countries). According to these models, the immigrants arriving to the U.S. from these developing countries would be drawn from the bottom of the educational distribution of their home population. Moreover, the immigrants that decide to return to their home countries would be drawn from the top of the skills distribution of the immigrant population. This would leave in the U.S. a group of permanent migrants even more negatively selected in terms of skills (see Borjas and Bratsberg (1996), pp. 167, Figure 2, for a clear illustration of this idea).

Some later work contested the previous results. Chiquiar and Hanson (2005) developed an extension of the Borjas (1991) model. They showed that if the costs of migration declines with education, then the patterns of selection might be affected. More recently, Dustmann et al. (2011) developed a model that distinguishes between two types of skills. These skills have a different price in the source and host countries and can be developed differently through experience in either country. The idea is to capture that some countries are learning centers, and that the experience gained in those countries is valuable in the host country. They concluded that immigration and return migration patterns need not to be either positively or negatively selected.

Regarding the empirical literature, there is work both consistent and inconsistent with the Borjas (1987, 1991) selection models. Recently, Fernández-Huertas Moraga (2011) and Ambrosini and Peri (2012) found evidence of Mexican immigrants' negative selection in support of this result. Chiquiar and Hanson (2005) argued that Mexican migrants are selected from the middle and upper section of Mexicans' wage densities. Other papers that tested the selection models include: Akee (2007), Borjas and Friedberg (2009), Feliciano (2005), Hanson (2007), Ibarraran and Lubotsky (2007), Kaestner and Malamud (2010), and Orrenius and Zavodny (2005).

Nevertheless, little empirical work has been done concerning returning migration. Borjas (1989) infers that return migration could be estimated by sample attrition using a

longitudinal data set. Employing a sample of foreign-born scientists and engineers he finds that there is evidence that supports positive selection of returning migrants (i.e. the least successful leave the country). Jasso and Rosenzweig (1988) assume that migrants who do not naturalize are more likely to return to their countries, and show that the more skilled do not naturalize. Coulon and Piracha (2005) find that returning migrants to Albania are negatively selected from the country's earnings distribution. More recently, Ambrosini and Peri (2012) find positive selection of Mexican returning migrants, both in terms of observable and unobservable characteristics using a longitudinal Mexican dataset.

The data used in this paper comes from the 1970-2010 Integrated Public Use Microdata Samples (IPUMS) of the 1970 to 2000 U.S. Census, as well as the 2010 American Community Survey (ACS) (Ruggles et al. 2010). The ten source countries considered include: Canada, Central America,[2] China, Dominican Republic, Germany, India, Italy, Mexico, Philippines, and the United Kingdom. These countries were selected for their historical and contemporaneous importance as migrant populations in the U.S. Also, it was essential to include countries that had both higher and lower levels of inequality (and returns to education) to contrast the results with the predictions of selection models in the literature.

The methodology used to identify the type of selection is very simple. To assess immigrant selection, the source country's educational distribution[3] is compared to that of immigrants recently arrived to the U.S. of same-aged groups. Immigrants just-arrived are identified at each U.S. census as those that report "first entering to stay in the U.S." within the last 5 years. Then, to estimate the return migration selection, synthetic cohorts are formed using the country of birth, age and "year of first entry to stay in the U.S." questions. It is assumed that changes in the education distribution of a given cohort through time are mostly explained by return migration. Given that the Census and ACS are cross-section datasets, the key assumption is that each given cohort is comparable through time. Finally, recent return migration trends are analyzed in terms of gender and age of migrants.

[2]Includes Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

[3]The source country education distribution data is obtained from the Barro and Lee (2010) longitudinal dataset of educational attainment by age groups.

The analysis provides evidence of positive selection of immigrants. Interestingly, the positive selectivity of migrants has increased through time. This result is partly due to source countries' schooling improvements, but in some cases the increase in positive selectivity exceeds the source countries' progress. China, India, and Philippines are the most prominent examples of positive immigrant selection with respect to the non-migrant population's schooling distribution. Contrastingly, Mexico and Central America's positive selection from 1970 and 1980 has declined and in the case of Mexico, there is no evidence of positive selection in recent migration cohorts. No evidence of negative selection of immigrants was found for any country analyzed.

With respect to return migration, the historical analysis shows that most of the countries' early migration cohorts (i.e. those arrived 1965-1970 and 1975-1980) exhibited positive selection of immigrants staying in the United States. However, this trend has declined for later migration cohorts and, in some cases, the positive selectivity has even disappeared. Still, almost no evidence of negative selectivity of immigrants staying in the United States was found. Only a few specific subsamples of older immigrants showed some evidence of negative selectivity in terms of schooling.

The remainder of the paper is organized as follows: *Section 2* revises the theoretical framework that will guide the discussion; *Section 3* gives a brief background on U.S. migration and explains how the countries for the present analysis were chosen; *Section 4* describes the data used; *Section 5* presents the immigrants and returning migration empirical selection results; finally, *Section 6* concludes.

2 Theoretical framework

The following model is based on the Borjas and Bratsberg (1996) theoretical framework and draws some of the components used by Chiquiar and Hanson (2005) in their extension of the Borjas (1991) model.

The main equations of the model indicate: (1) the income level that a person would receive in the source country, (2) the income level that he would receive in the host country

if all the individuals from the source country were to migrate to the host country, and (3) the income level that he would receive as a temporary migrant if all the individuals were to temporary migrate (i.e. migrating and then returning to the source country).

$$\log w_{0i} = \mu_0 + \theta_0 s_i \tag{1}$$

$$\log w_{1i} = \mu_1 + \theta_1 s_i \tag{2}$$

$$\log w_{2i} = \lambda_i(\mu_1 + \theta_1 s_i) + (1 - \lambda_i)(\mu_0 + \theta_0 s_i + \kappa(s_i)) \tag{3}$$

where, the sub-indexes refer to the country of reference, being "0" the sub-index for the country of origin, "1" the sub-index for the host country, and "2" the sub-index that indicates temporary migration; w_{ji} refers to wages in country j of individual i; μ_j is the base wage; θ_j represents the returns to schooling; and s_i denotes the level of schooling of individual i. Finally, the function $\kappa(s_i)$ represents the gains that an individual with schooling s_i has on its income once he returns to his home country after migrating for λ_i proportion of time.[4]

Borjas and Bratsberg (1996) assume that the gains from migration for returning migrants on their home-country wages, $\kappa(s_i)$, are constant. There is evidence from the literature that sustains that experience gained during a migration spell might have superior returns to those gained in the host country.[5] For example, Reinhold and Thom (2009) find that Mexicans who gained experience in the U.S. increased earnings more than twice compared to experience gained in Mexico. Similarly, for Irish migrants, Barrett and O'Connell (2001) find a wage premium for migration upon returning that is higher for people with post-graduate degrees.

Finally, the model includes two types of cost of migration: (i) the cost of immigration to the U.S., $\psi_M(s_i)$; and (ii) the cost of returning migration, $\psi_R(s_i)$.

[4]For the time being, the form of the $\kappa(\cdot)$ function is not restricted. A more general version of the model would have the time spent abroad (λ_i) as an input of the gain function: $\kappa(s_i, \lambda_i)$.

[5]Some recent papers that provide evidence of this include: Barrett and Goggin (2010), Barrett and O'Connell (2001), Co et al. (2000), and Iara (2006).

In this model, an individual will choose his residence status by choosing the maximum level among three possible choices: never migrate, migrate permanently, and migrate temporally. For this model, the alternative of several temporary migrations is left out. The optimization decision can be represented by the following maximization problem:

$$Income_i = \max(\ln w_0, \ln w_1 - \psi_M(s_i), \ln w_2 - \psi_M(s_i) - \psi_R(s_i)) \tag{4}$$

So far, an important assumption in the model is the linearity of the returns to schooling in the log income equations for non-migrants, permanent, and temporary migrants (equations [1] to [3]). Therefore, what determines the type of selection with respect to schooling is the functional form for gains from migration, $\kappa(s_i)$, and costs of migration $\psi_M(s_i)$ and $\psi_R(s_i)$, the schooling returns' parameters (θ_j) and the base wages (μ_j).

To illustrate the use of the model assume, as in Borjas and Bratsberg (1996), that the gains and costs of migration components are fixed ($\psi_M(s_i) = \psi_1$, $\psi_R(s_i) = \psi_2$, $\kappa(s_i) = \bar{\kappa}$). This implies that all the alternatives in the maximization problem represented in equation 4 are linear with respect to schooling. Also, assume that immigrants arrive from a country with lower returns to schooling than those of the host country, then $\theta_0 > \theta_1$. For temporary migration to be an optimal decision, it has to be the case that the gains from migration dominate the costs of migrating and re-migrating.[6] *Figure 2* illustrates the maximization decision under the assumption that temporary migration is an optimal enterprise for some individuals. It shows how negative selection of immigrants results and how the alternative of returning migration accentuates the self-selection outcome. If returning migration was not considered, individuals below $s*$ would migrate and those above $s*$ would stay in their home country. After adding the return migration option, the individuals below s_1 decide to permanently migrate, those between s_1 and s_2 migrate temporally, and those above s_2 stay in their home country. As a result, permanent immigrants are an even more negatively selected group than without return migration (i.e. it can be easily shown formally that $s_1 < s*$).

Using this general model, it is possible to show that a different structure of the gains

[6]This condition is formalized in Borjas and Bratsberg (1996), pp. 167, equation (6)

from migration and costs functions could yield different patterns of self-selection.[7] For instance, let $\kappa' \leq 0$ and $\kappa'' \geq 0$, that is, let the individuals with less schooling benefit more from their experience gained during their migration spell. Also, let $\psi'_M < 0$, $\psi'_R < 0$, $\psi''_M > 0$, and $\psi''_R > 0$, that is, let the costs be a decreasing and convex function of schooling. In this case, the negative selection outcome could be overturned. To illustrate this argument in a simplified way, let the migrations cost functions be:

$$\psi_M(s_i) = \exp(\alpha_M - \phi_M s_i) \tag{5}$$

$$\psi_R(s_i) = \exp(\alpha_R - \phi_R s_i) \tag{6}$$

Furthermore, let the gains from migration be positive and constant for those individuals with schooling below $\hat{s}$, and zero for those above. Then, the gains function would be:

$$\kappa(s_i) = \bar{\kappa} \cdot 1\{s_i < \hat{s}\}, \bar{\kappa} > 0 \tag{7}$$

Therefore, if the gains from migration on the home income are high enough to compensate the costs of returning migration, it might be the case that for a group of individuals with low schooling and for whom permanent migration was originally their dominating option, now would be inclined toward temporary migration. This scenario is illustrated in *Figure 3*. All individuals below s_1 would not migrate either permanently or temporally because they face very high costs of migrating. Those between s_1 and $\hat{s}$ would find it optimal to migrate temporally. This group benefits from the gains that migration yields on their home wages. Those with schooling between $\hat{s}$ and s_2 would have a tendency towards permanent migration. This group no longer receives high enough gains from migration (i.e. none in this simplified case) to overcome the costs they have to pay for returning home. Finally, the group above s_2 remains at home. In this example, the observed self-selection pattern would depend on the support of the schooling distribution for the population in the source country.

[7] For instance, Chiquiar and Hanson (2005) show that if $\psi_M(\cdot)$ is a positive but decreasing function of s, under certain conditions, the negative selection of migrants might not result as Borjas (1987, 1991) predicts.

By no means is this a general result. As described above, it is relevant to note that the self-selection pattern depends entirely on the relation that costs and gains of migration have with the skills of the individuals. This relation might even be distinct between different kinds of source and host countries. For instance, the immigrants in the U.S. might get different gains from temporary migration if they arrived from Canada or Central America.

It is also important to mention that the model leaves out features that have been mentioned in the literature as having direct influence in the costs and gains from migration. For example, migration networks might have a direct implication in the costs of migration, and uncertainty over the outcome of migration might affect gains.

3 Selected countries for the analysis

The United States is, by far, the country that hosts most migrants in the world. The latest figures indicate that more than 40 million immigrants inhabit in the U.S. (Koser and Laczko 2010). Since the end of World War II, the trend of legal immigrants admitted in the U.S. has been increasing. Recently, in 2010, 1.04 million legal immigrants were admitted (Department of Homeland Security 2012). In addition to this, illegal immigration contributes to this numbers in a significant way as well. The latest numbers estimate the illegal population around 11.2 million migrants (Passel and Cohn 2010).

In this paper, ten different countries were chosen to analyze the selection patterns in terms of schooling that their immigrant and returning migrant populations exhibit: Canada, Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama), China, Dominican Republic, Germany, India, Italy, Mexico, Philippines, and the United Kingdom (see *Figure 1*).

The following conditions were used to guide the selection of the countries for the study:

a) Countries with important immigrant presence in the U.S. From a practical perspective, it is relevant to know the characteristics of the population that contribute

the most in absolute numbers to migration. From a methodological perspective, getting sufficient observations in the samples favors statistical validity. *Table 1* shows the top ten ranked countries in terms of number of migrants in the U.S. from 1970 to 2010. The countries that were top ranked in that list at some point were selected.

b) Countries with both higher and lower levels of inequality (or human capital returns) than the U.S. Given the theoretical framework specified in *Section 2*, this information would predict if $\theta_0 \gtrless \theta_1$. If the costs and gains functions are assumed to be fixed, then this information should be sufficient to predict the patterns of self-selection in terms of schooling. *Graph 1* shows the difference of the GINI coefficient between the U.S. and the selected countries whenever possible (United Nations 2008).[8] Additionally, *Graph 2* shows the difference in the returns to schooling between the U.S. and the selected group of countries, whenever the data was available.[9]

c) Geography. A natural choice was to select the two U.S. bordering countries: Canada and Mexico. In addition to being both bordering countries, they have the opposite relation with respect to the U.S. in terms of inequality. Hence, it would be interesting to compare their immigrants patterns of selection in terms of schooling. Central American countries and the Dominican Republic are the next group of countries in terms of proximity. Additionally, their levels of inequality might make a comparable case to Mexican migration. The Central American countries share borders, similar levels of inequality and schooling distribution within each other.

[8]The dataset used for this comparison is the WIID2b from the United Nations. This dataset collects information from national surveys. In particular, the income definitions used to construct the GINI coefficients are usually different among countries. The WIID2b database pays special attention to this problem to favor comparability among countries. For more information see: `http://www.wider.unu.edu/research/Database/en_GB/database`

[9]The data for returns to schooling comes from Psacharopoulos and Patrinos (2002)

4 Data and empirical strategy

The data used in this paper comes from two main sources:

Barro and Lee (2010). The educational attainment from the source countries comes from the Barro and Lee (2010) panel dataset (B&L hereafter). This is a longitudinal dataset on educational attainment that covers 146 countries from 1950 to 2010. The information is provided every 5 years and each country's population is disaggregated by gender and in 5-year age intervals. All the countries chosen for the analysis have available information. Educational attainment is classified in seven categories: (i) no schooling; (ii) primary incomplete; (iii) primary complete; (iv) secondary incomplete; (v) secondary incomplete; (vi) tertiary incomplete; and (vii) tertiary complete.

The B&L dataset was constructed with the specific purpose of cross-country comparisons and has been constantly been updated and improved. See Barro and Lee (2010) for further details.

Integrated Public Use Microdata Samples (IPUMS). The U.S. 1970-2000 U.S. Decennial census 5% samples (except for 1970, where the 1% Form 1 State sample was used), and the 2010 American Community Survey (ACS) are used in the analysis. The analysis presented here will use individual information about school attainment, immigrants' country of birth, first year of entry to stay in the U.S., citizenship status, and labor market indicators. The analysis is restricted to individuals not living in group quarters, that report being in the labor force, with positive individual income during the previous year, inhabiting in the continental U.S. territory.[10]

Identification of immigrant selection. At each census, a group of recently arrived immigrants are identified as those individuals born in a foreign country that report first entering to stay in the U.S. in any of the five years previous to that census (e.g. in the case

[10]Those individuals with total personal income above the 99th percentile are excluded to avoid outliers and those living in Hawaii or Alaska are also excluded since migration trends might be different to those locations.

of the 1970 census, a recent arrived immigrant would have entered the U.S. between 1965 and 1970 for the first time).[11] It is assumed that individuals report their first entrance to the United States with the purpose of inhabiting there and not for temporary stays (like vacation or family visits).

Immigrant selection is analyzed in terms of schooling. Recently arrived immigrants are compared to the same-aged population from their source country at each census: 1970, 1980, 1990, and 2000 on a country-by-country basis. The source country schooling distribution comes from the B&L dataset. To match the schooling attainment categories available form the B&L dataset, a standardized variable of school attainment is generated using the categories available at the census datasets. *Table A.2* in the Appendix details how the standardized educational variable was formed using the schooling categories available at the different census years.

Identification of return migrant selection. Recently arrived migrants are followed though the different census years by using synthetic cohorts. The cohorts are defined based on the country of birth, age, and "first year of entry to stay in the U.S." Each cohort is followed through three census years. Ages are restricted to recently arrived migrants over 30 to avoid individuals that migrate to the U.S. and acquire additional education while in the U.S. Also, ages are restricted below 65 at the last cohort follow-up. The following table gives a clear illustration of how the cohorts are formed:[12]

Cohort definitions

	Year of Entry	Ages				
Cohort	to the U.S.	1970	1980	1990	2000	2010
1	1965-1970	30-45	40-55	50-65		
2	1975-1980		30-45	40-55	50-65	
3	1985-1990			30-45	40-55	50-65
4	1995-2000				30-45	40-55

[11] The 1970, 1980, and 1990 censuses asked when the person first came to stay in the U.S.; the 2000 census and the ACS asked when the person first came to live in the United States.

[12] *Table 1* in the *Appendix* indicates the number of observations for each cohort by census (or ACS) year and country of origin.

To identify the selection in terms of schooling of return migrants, the distribution of the educational attainment is compared for a given cohort through the different census years. The data is not longitudinal so the results should be interpreted as how does the schooling distribution changes for groups of people with similar baseline characteristics observed at different points in time. Differences in the distribution are assumed to be mainly the result of migrants returning to their country of origin. Therefore, if a given cohort's schooling distribution reflects a more (less) educated group 20 or 10 years after the initial migration, it is assumed that the migrants from that group that left were less (more) educated.

One concern from the analysis is that migrants might poorly report the "first year of entry to the U.S." question. More educated individuals might be more likely to have previously visited the U.S. if they are from a foreign country. As a result, they might be undercounted as recently arrived immigrants (1970, 1980 and 1990 census), but not in a follow-up where the text of the "first year of entry" question changed to explicitly include "first entry to live in the U.S." (after the 2000 census and the ACS). This might bias the analysis towards positive selection. Only the analysis of cohort 4 would not be affected by this potential bias.

Recent returning migration trends. A more detailed analysis of recent return migration trends is done with post-2000 data. *Table A.2* in the *Appendix* indicates how a more detailed schooling variable is formed using the 2000 census and 2010 ACS schooling categories. Given that the cohort follow-up only considers a 10-year window, the age restriction for the recently arrived migrants is modified to individuals aged 25-54 in 2000. This analysis will also consider differences in returning migration trends for males and for younger (individuals aged 25-39 in 2000) versus older immigrants (individuals aged 40-59 in 2000). The younger versus older cohort analysis will give some insight of to what extent the differences in schooling distributions through time might be related to deceased individuals rather than returning migrants.

Limitations. Other confounding explanations include that differences might also arise from migrants moving to other destinations (different form their country of origin). Also, it is still possible that some adults acquire some type of education after their initial mi-

gration. Finally, the age restriction leaves out individuals that might migrate to the U.S. to acquire tertiary education (undergraduate or graduate level schooling). This restriction will diminish the positive selection of immigrants to the U.S. for some countries in the analysis. The investigation provided here only reflects immigration decisions of individuals that had completed their schooling in a country excluding the U.S.

5 Results

The results presented in this section attempt to shed some light on three subjects: (i) the historical selection patterns observed in terms of schooling for just-arrived immigrants in the U.S. compared to their same-aged home country population; (ii) the historical selection patterns observed in terms of schooling for permanent migrants in the U.S. with respect to migrants that left; and (iii) the recent selection patterns in terms of schooling of returning migration immigrants distinguishing for gender and age. Given the information about inequality and returns to education (*Graphs 1* and *2*), it is also possible to evaluate to what extent are the predictions from the theoretical literature met. In addition, the evidence provided will give detailed information to analyze if there are any patterns or trends for each of the ten countries under study.

5.1 Selection of immigrants

To determine the pattern of selection of immigrants with respect to their home country's population, the cumulative distribution function (hereafter CDF) of recently arrived immigrants' schooling is compared to that of their same-aged home-country population. *Graphs 3a* to *3j* illustrate this comparison in a country-by-country basis for each of the cohorts previously defined. The bold line on each graph shows the schooling CDF of the source country's population with ages 30 to 44, obtained from the B&L dataset. The dashed line shows the schooling CDF of the "just arrived" immigrant population. Finally, the gray line shows the schooling CDF of the latest follow-up available for each cohort. The latter line will be used to assess the return migrants' selectivity. For example, in the first panel of *Graph 3a (Cohort 1)*, the bold line shows the 1970's schooling CDF of the Canadian

population 30-44 years old; the dashed line shows the 1970's schooling CDF of Canadian immigrants who arrived to the U.S. between 1965 and 1970 and were between 30 to 44 years old; and the gray line shows the 1990's schooling CDF of Canadian immigrants that arrived to the U.S. between 1965 and 1970 and were between 50 and 64 years old.

Whenever the home-country CDF first-order dominates the just arrived immigrants CDF, there would be evidence of negative selection. The first-order dominance would indicate that for any category of schooling, there would be a higher proportion of home country's population than just-arrived migrants with more or equal schooling. In the opposite case, whenever the just-arrived migrants CDF first-order dominates, there would be evidence for positive selection.

Graphs 3a to *3j* provide overwhelming evidence of positive selection in terms of schooling in almost every cohort-country case. China, India, and Philippines exhibit the largest differences between the source country and the recent immigrants' CDFs, being all cases of positive selection. For example, *Graph 3f* shows that most of India's population attain levels of school achievement below complete secondary level. Nevertheless, over 80% of the migrants that arrive to the U.S. show the highest level of schooling (tertiary complete).

The positive selectivity of just arrived immigrants is evident even for countries with higher levels of inequality and returns to schooling than the U.S. (like Central America and Dominican Republic). The only cases where there is no first order domination of the immigrants CDF are Italy (cohort 1) and Mexico (cohorts 2 to 4). However, none of these cases shows evidence of negative selectivity either. The case of Mexico is of particular relevance, given that nowadays it is the main contributor of foreign-born population in the U.S. For the most recent immigration wave analyzed, 40% of the recent arrived Mexican migrants in 2000 had levels of schooling below or equal to primary complete (*Graph 3h*). The only case that is close to this proportion is Central America (39%), however, the Central America's source country schooling lags significantly below the Mexican.

Finally, the positive selectivity of just arrived immigrants has increased through time,

mainly because of the increase in the level of schooling at each source country. Still, in some cases the increase in positive selection of recently arrived immigrants has exceeded the increase in their countries' level of schooling. For example, Canada, China, and Italy's positive selectivity increased through time, whereas Central America, Mexico, and Philippines decreased.

This evidence of positive selection is not particular for the age range used. Very similar results are obtained if the age range is expanded or reduced. It could be argued that the home-population distribution includes soon-to-be immigrants and returned migrants. However, for the argument of soon-to-be immigrants to overturn the result, it would have to be the case that immigrants with low levels of schooling make their migration decision rather late. Even if this was the case, a large number of individuals would be needed to overturn the result for most of the countries analyzed.

5.2 Selection of returning migrants

To determine the selection patterns that result from returning migration, the synthetic cohorts are followed through time. As described above, the gray solid lines on *Graphs 3a* to *3j* represent the CDF for the population that remains in the U.S. 20 to 25 years after their initial immigration. To examine the return migration selection patterns, this CDF will be compared within each cohort to the CDF of the immigrants when they were recently-arrived (the dashed line). Following the idea in Borjas (1989) that outmigration behavior can be inferred from sample attrition in a longitudinal data set of foreign-born scientists and engineers, it is assumed here that the main determinant of the difference between these CDFs is the population attrition originated by returning migrants.

If the CDF of the just-arrived immigrants (dashed line) first-order dominates the CDF of the immigrants that remain after several years (gray solid line), there would be evidence of negative selection of the immigrant population that stays in the U.S. On the contrary, if the CDF of the immigrants that remain first-order dominates, there would be evidence in favor of positive selection.

Most cases illustrated in *Graphs 3a* to *3j*, suggest that positive selection in terms of schooling dominate in earlier cohorts (Cohorts 1 and 2). Still, the positive selection magnitudes are not closely as sizeable as the immigrants' arrival selection. This positive selectivity usually disappears or at least is greatly reduced in recent cohorts (particularly Cohort 4). Yet, there is very limited evidence of negative selection of staying migrants. The evidence presented, paired with the levels of inequality and returns to education, is not consistent with the theoretical framework the prediction of the model with constant costs and gains from migration.

Table 2 also provides interesting insight from the descriptive statistics. In particular, it is notable that through time the proportion of males tends to decrease in all the countries' cases. This suggests that female migration tends to be more permanent than males. The individuals most successful to gain naturalization ten years after their initial arrival to the U.S. are from China, India, and Philippines, which on average achieve U.S. citizenship in 58%, 56%, and 70% of the cases ten years after the initial immigration, respectively. On contrast, the geographically closest countries, Mexico, Central America, and Canada have the lowest level of naturalization ten years after the initial migration, with 20%, 25%, and 27% proportions on average, respectively. This might reflect that those are also the countries more prone to temporary or circulatory migration.

In terms of labor market outcomes, the immigrants with higher levels of unemployment are those from Dominican Republic and Central America. Unemployment levels peaked in the recent era. Finally, to give some insight of the relative position of immigrants in terms of earnings, the percentile of total individual pre-tax income the previous year to the data collection is calculated with respect to the full U.S. population. The median is reported for each country-cohort-year group. Immigrants from India stand out since they begin with high levels of relative income and increase their relative position through time for all cohorts. Immigrants from Canada, U.K., and Germany also begin relatively high in terms of income, but do not improve their position through time. Immigrants from Philippines begin on average below the median, but also greatly increase their relative position through time. On contrast, immigrants from Central America, Mexico, and Dominican Republic

begin relatively low and do not greatly improve their position through time.

It is important to mention that the staying population of migrants is not necessarily the same as the group of permanent migrants. In strict terms, the evidence provided here refers to selectivity of long-term migrants while still active on their employment status. There is evidence in the literature that argues that later in life there is a peak of returning migration after retirement (Duleep 1994; Steiner and Velling 1994).

5.3 Recent selection patterns

Finally, an analysis of recent migration trends uses data from the 2000 census and the 2010 ACS to investigate if there are any patterns of recent return migration selection in terms of schooling. *Graphs 4a* to *4j* present the results from this analysis. These graphs illustrate the difference between the 2010 ACS and 2000 census histograms of a more detailed schooling attainment variable. The four panels presented in each graph vary by the population included in the analysis: (i) the first panel includes the whole sample, which is composed of individuals aged 25 to 54 in 2000 (35 to 64 in 2010) that report arriving to the U.S. between 1995 and 2000; (ii) the second panel includes only the male individuals form the first subsample; (iii) the third panel includes the younger individuals form the first subsample, aged 25 to 39 in 2000; and (iv) the fourth panel includes the older individuals from the first subsample, aged 40 to 54 in 2000.

A positive (negative) selection of immigrants that stay in the U.S. would result for a given subsample if there is a positive (negative) mass in the differences at higher levels of schooling and a negative (positive) mass at lower levels. In the case of positive selection, the positive mass at higher levels of schooling would mean that a higher proportion of the subsample had advanced school attainment in 2010 than in 2000.

Consistent with the analysis from the previous section, most of the country cases exhibit low differences between the 2010 and 2000 schooling distributions. Mexico, Central America, and Dominican Republic show similar selection patterns with positive selection

of long-term migrants. This is mainly drawn from *High School* graduates being present in larger proportions in 2010, while *High School dropouts* and individuals with *no schooling* are present in lower proportions. In the case of the Dominican Republic, this trend results from the young individuals' pattern of selection. For Mexico and Central America, this pattern is consistently observed int he younger and older groups. India and Philippines also exhibit positive selection. In the case of India, it means that immigrants with *graduate level* studies stay in higher proportions while immigrants with *bachelor degree* studies leave. This result is driven from younger immigrants selectivity. Meanwhile, for Philippines the positive selection means immigrants with *bachelor* level studies and above, staying in higher proportions, while immigrants with *high school* level studies and below are present in smaller proportions in the follow-up.

Negative selection of long-term migrants is only observed for a few subsmaples. For example, older cohorts of immigrants form China, Germany, Italy, and U.K. see people with *bachelor* and *graduate level* studies in lower proportions in 2010 (only *graduate level* studies for Germany), while *high school graduates* and below tend to be present in larger proportions.

6 Conclusions

Ten countries were chosen based on their historical and present importance on U.S. migration. The empirical results shown on this paper suggest that there is overwhelming evidence in favor of positive selection of immigrants in terms of schooling, regardless of the source country's level of inequality and returns to schooling compared to the U.S. This positive selectivity has remained through time for most countries and in some cases it has even increased. In contrast, the analysis of return migration suggests that positive selectivity of staying migrants has decreased through time. The cohorts of migrants that arrived before 1980 exhibited positive selection of staying migrants in most of the countries analyzed. However, this positive selection is greatly reduced in later cohorts of migrants that arrived after 1995.

The case of Mexican migration to the U.S. has been the most thoroughly analyzed in

the literature given the proportion of immigrants that these population represents. The evidence presented suggests that Mexican migration was positively selected during the 1970's and 1980's, but through time the positive selectivity disappeared. No evidence of negative selectivity was found though. With respect to return migration, the recent cohort suggests a slightly positive selection of migrants staying in the U.S. for a longer period.

Given that immigrants and returning migrants are not a random sample of a country's population, it is relevant to understand and track their patterns of selectivity. This is relevant from an economic and policy perspective, both for the source and receiving country. This has led to a growing literature that attempts to understand how the migration decision is taken and what components influence it.

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Table 1: Top source countries of immigration to the United States

Rank	1970	Pop (,000)	%	1980	Pop (,000)	%
1	**Italy**	1,009	10.5%	**Mexico**	2,199	15.6%
2	**Germany**	833	8.7%	**Germany**	849	6.0%
3	**Canada**	812	8.4%	**Canada**	843	6.0%
4	**Mexico**	760	7.9%	**Italy**	832	5.9%
5	**U.K.**	686	7.1%	**U.K.**	669	4.8%
6	Poland	548	5.7%	Cuba	608	4.3%
7	U.S.S.R.	463	4.8%	**Philippines**	501	3.6%
8	Cuba	439	4.6%	Poland	418	3.0%
9	Ireland	251	2.6%	U.S.S.R.	406	2.9%
10	Austria	214	2.2%	Korea	290	2.1%
Rank	1990	Pop (,000)	%	2000	Pop (,000)	%
1	**Mexico**	4,298	21.7%	**Mexico**	9,177	29.5%
2	**Philippines**	913	4.6%	**Philippines**	1,369	4.4%
3	**Canada**	745	3.8%	**India**	1,023	3.3%
4	Cuba	737	3.7%	**China**	989	3.2%
5	**Germany**	712	3.6%	Vietnam	988	3.2%
6	**U.K.**	640	3.2%	Cuba	873	2.8%
7	**Italy**	581	2.9%	Korea	864	2.8%
8	Korea	568	2.9%	**Canada**	821	2.6%
9	Vietnam	543	2.7%	**El Salvador**	817	2.6%
10	**China**	530	2.7%	**Germany**	707	2.3%
Rank	2010	Pop (,000)	%			
1	**Mexico**	11,711	29.3%			
2	**India**	1,780	4.5%			
3	**Philippines**	1,778	4.4%			
4	**China**	1,608	4.0%			
5	Vietnam	1,241	3.1%			
6	**El Salvador**	1,214	3.0%			
7	Cuba	1,105	2.8%			
8	Korea	1,100	2.8%			
9	**Dom. Rep.**	879	2.2%			
10	**Guatemala**	831	2.1%			

Source: U.S. 1970, 1980, 1990, and 2000 Census and 2010 American Community Survey

Table 2: Descriptive statistics for each country by year and cohort

Cohort	Year	Country									
		CAM	CAN	CHI	D.R.	ENG	GER	IND	ITA	MEX	PHI
		a. Proportion of male immigrants									
1	1970	0.49	0.77	0.72	0.52	0.78	0.69	0.82	0.65	0.68	0.56
1	1980	0.38	0.58	0.59	0.52	0.61	0.43	0.79	0.66	0.63	0.47
1	1990	0.45	0.55	0.56	0.61	0.55	0.39	0.74	0.67	0.62	0.44
2	1980	0.53	0.65	0.6	0.58	0.71	0.66	0.68	0.73	0.74	0.46
2	1990	0.51	0.51	0.58	0.6	0.6	0.36	0.65	0.65	0.67	0.43
2	2000	0.47	0.5	0.56	0.6	0.61	0.39	0.62	0.59	0.63	0.42
3	1990	0.59	0.62	0.54	0.54	0.7	0.61	0.69	0.71	0.74	0.42
3	2000	0.52	0.56	0.55	0.55	0.65	0.45	0.66	0.63	0.64	0.4
3	2010	0.53	0.4	0.54	0.55	0.51	0.41	0.62	0.71	0.65	0.36
4	2000	0.65	0.63	0.57	0.5	0.73	0.62	0.74	0.66	0.71	0.43
4	2010	0.57	0.57	0.54	0.49	0.68	0.48	0.66	0.7	0.63	0.41
		b. Proportion of naturalized immigrants									
1	1970	0.15	0.06	0.15	0.28	0	0.12	0.06	0.1	0.24	0.07
1	1980	0.36	0.27	0.65	0.26	0.39	0.44	0.56	0.51	0.21	0.75
1	1990	0.52	0.34	0.83	0.47	0.47	0.54	0.73	0.62	0.29	0.89
2	1980	0.08	0.05	0.06	0.14	0.01	0.1	0.07	0.12	0.12	0.09
2	1990	0.27	0.18	0.72	0.24	0.19	0.34	0.56	0.39	0.24	0.78
2	2000	0.56	0.44	0.86	0.48	0.42	0.47	0.81	0.58	0.36	0.9
3	1990	0.06	0.09	0.06	0.12	0.06	0.12	0.05	0.13	0.11	0.11
3	2000	0.21	0.3	0.54	0.35	0.29	0.43	0.54	0.47	0.23	0.66
3	2010	0.37	0.45	0.84	0.6	0.6	0.42	0.84	0.61	0.34	0.85
4	2000	0.06	0.1	0.05	0.08	0.12	0.27	0.04	0.14	0.07	0.12
4	2010	0.18	0.33	0.42	0.4	0.35	0.29	0.57	0.35	0.14	0.64

Source: U.S. 1970, 1980, 1990, and 2000 Census and 2010 American Community Survey

Table 2: Descriptive statistics for each country by year and cohort (cont.)

Cohort	Year	Country									
		CAM	CAN	CHI	D.R.	ENG	GER	IND	ITA	MEX	PHI
c. Percentage of immigrants unemployed											
1	1970	2.8	2.1	4.3	13.0	2.8	1.7	2.3	4.5	6.2	0.7
1	1980	5.1	2.8	3.4	7.5	2.1	3.4	2.6	8.4	8.4	2.4
1	1990	4.2	3.7	3.5	9.0	3.6	2.2	3.8	7.6	11.5	3.2
2	1980	5.8	2.6	2.4	7.0	2.5	5.0	4.7	7.0	8.2	2.9
2	1990	6.4	1.9	2.6	10.5	0.9	3.1	2.0	3.0	9.9	3.1
2	2000	5.7	2.5	3.5	12.5	2.7	1.0	2.5	3.6	8.2	3.5
3	1990	7.1	3.1	4.5	11.0	3.0	2.8	5.5	5.1	8.0	2.9
3	2000	6.2	1.5	3.0	10.0	2.0	1.9	2.3	1.8	7.3	2.8
3	2010	10.9	6.5	9.1	11.0	1.1	13.9	4.5	7.8	9.3	6.0
4	2000	6.0	1.6	3.3	9.7	1.5	1.3	2.4	2.7	5.9	3.1
4	2010	8.2	3.1	3.0	9.3	1.9	4.3	3.6	5.3	7.3	4.6
d. Median percentile of the total personal income[a]											
1	1970	37.1	77.4	36.4	34.3	86.8	70.9	60.75	46.35	30.3	38.1
1	1980	39.4	71.9	45	36.1	77.55	61.6	90	55.3	38.3	66.2
1	1990	47.5	72.9	47.5	42.25	76.8	60.1	90.9	63.8	34	72.3
2	1980	28.1	75.2	34.3	26.3	73.7	68.7	55.3	54.3	31.2	45
2	1990	34	72.9	49.3	34	72.9	60.1	75.7	59.9	30.4	61.3
2	2000	32.3	73.6	40.7	29.8	76.3	59.9	75.7	55.5	28.7	59.9
3	1990	23.6	72.9	27	29.4	72.9	64	46.6	62	22.1	42.5
3	2000	29.8	70.5	52	30	79.1	59.9	62.8	66.1	28.3	55.5
3	2010	31	70.5	50.1	34.7	64.8	60	66.1	76.9	31	60.2
4	2000	24.3	77.8	45.9	25.4	80.5	68.4	73.6	61.6	22.6	41
4	2010	30.3	78.2	64.5	31	83.9	66.1	80.9	77.4	27.9	54.2

Source: U.S. 1970, 1980, 1990, and 2000 Census and 2010 American Community Survey

[a] Median percentile income is calculated with respect to the full U.S. employed population over 15 years old

Figure 1: Selected countries for the analysis

Central America includes: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama

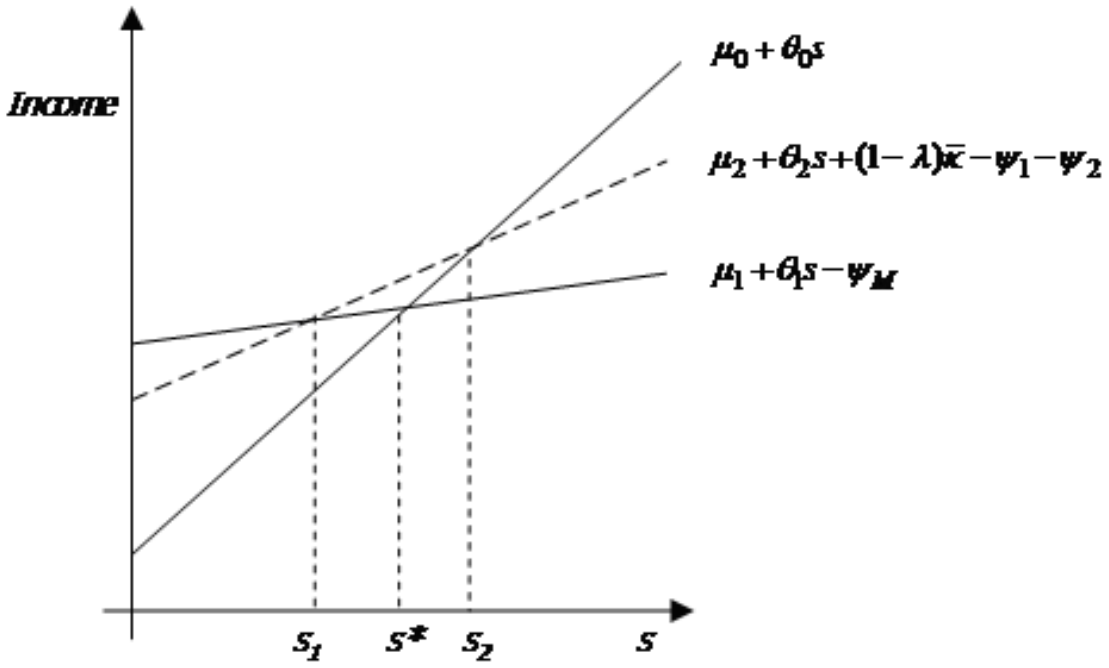


Figure 2: Negative selection with temporary migration

This figure assumes that $\theta_0 > \theta_1$, $\mu_1 > \mu_0$, $\psi_M(s_i) = \psi_1$, $\psi_R(s_i) = \psi_2$, $\kappa(s_i) = \bar{\kappa}$.

In the temporary migration option (dotted line), $\mu_2 = \lambda\mu_1 + (1-\lambda)\mu_0$, and $\theta_2 = \lambda\theta_1 + (1-\lambda)\theta_0$.

The optimal choice for individuals with $s_i < s_1$ is to migrate permanently, for individuals with $s_1 < s_i < s_2$ to migrate temporally, and for individuals with $s_i > s_2$ is to remain in the source country.

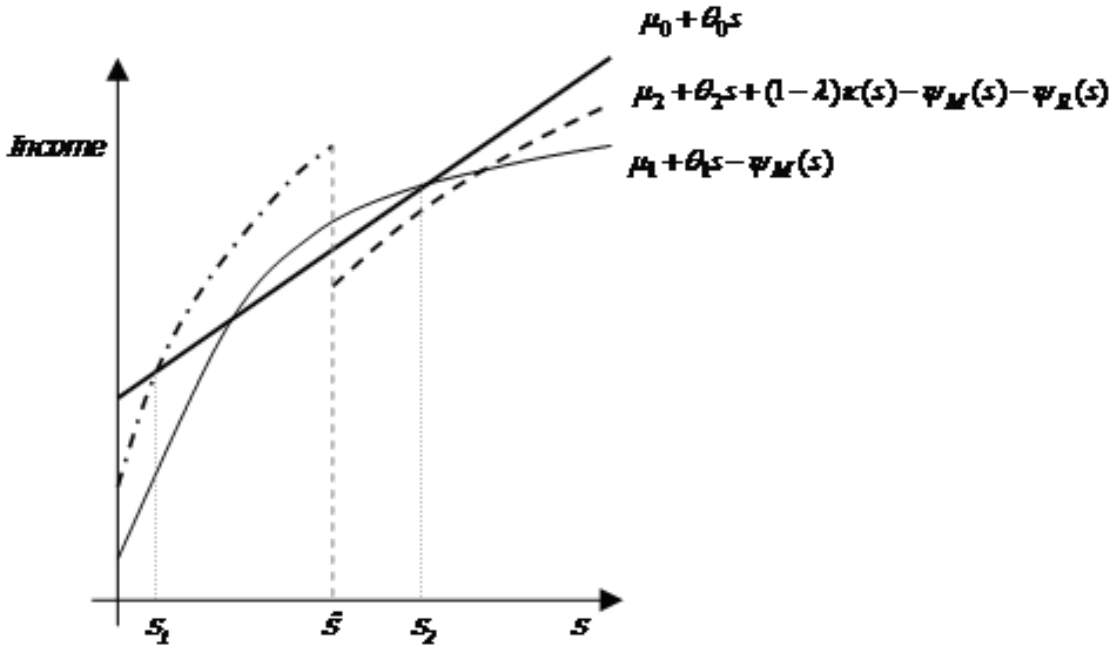
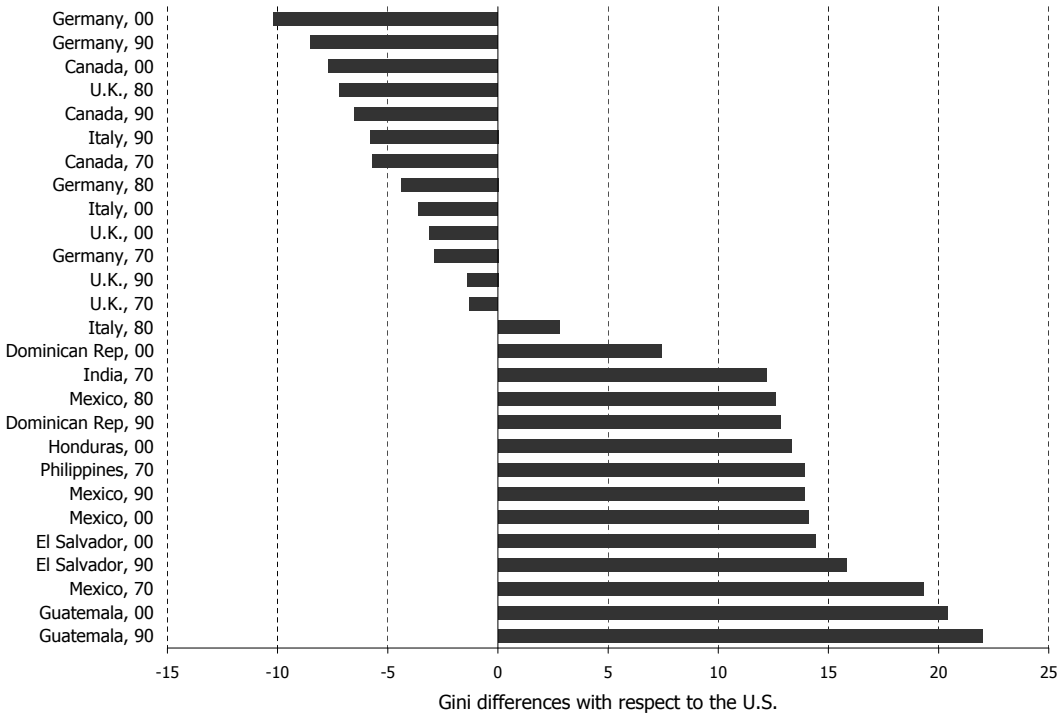


Figure 3: Mixed migration selection with temporary migration

This figure assumes that $\theta_0 > \theta_1$ and $\mu_0 > \mu_1$.

In the temporary migration option (dotted line), $\mu_2 = \lambda\mu_1 + (1-\lambda)\mu_0$, and $\theta_2 = \lambda\theta_1 + (1-\lambda)\theta_0$

The optimal choice for individuals with $s_i < s_1$ is not to migrate, for individuals with $s_1 < s_i < \hat{s}$ to migrate temporally, for individuals with $\hat{s} < s_i < s_2$ to migrate permanently, and for individuals with $s_i > s_2$ is to remain in the source country

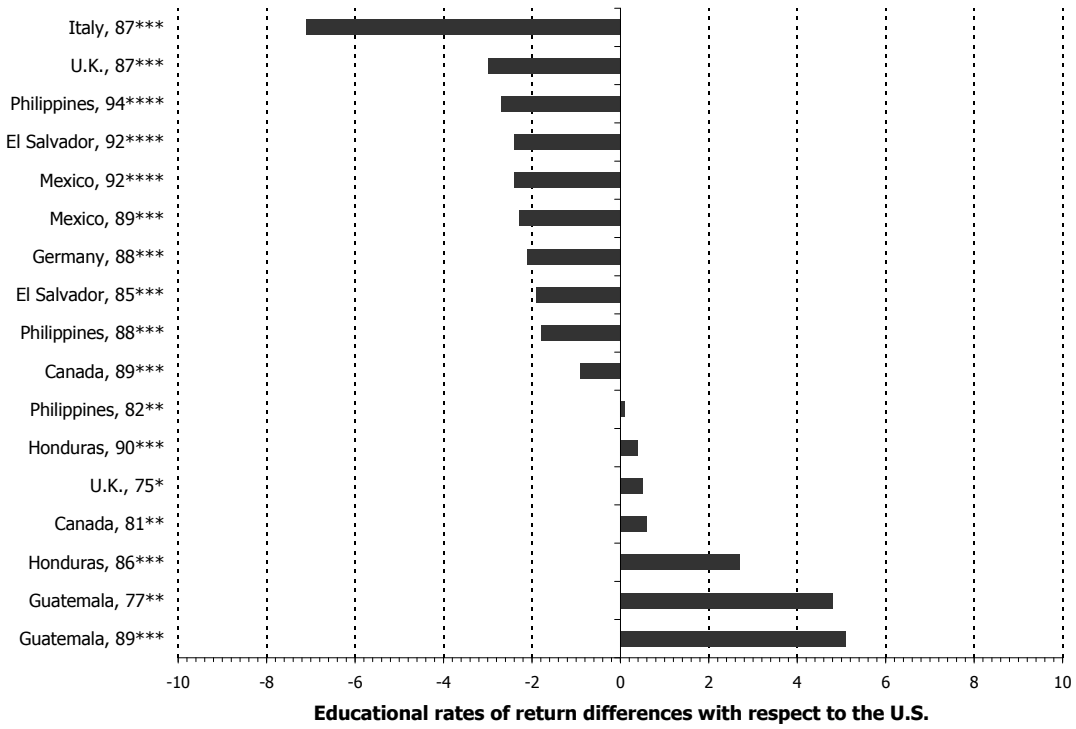


Graph 1: GINI index differences of source countries with respect to the United States

GINI index is measured between 0 and 100.

A positive (negative) value indicates that the source country is more (less) unequal than the United States. According to the theoretical framework described in *Section 2*, this should help predict the type of selectivity of immigrants and returning migrants.

Source of GINI indexes: UNU-WIDER dataset (United Nations 2008).

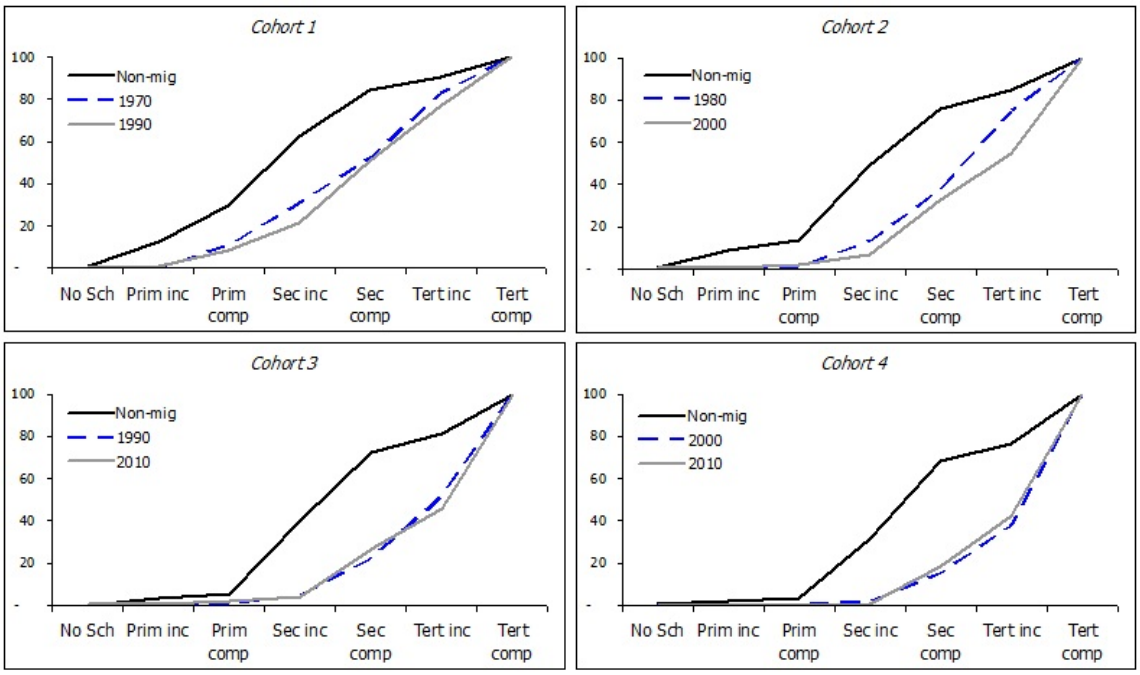


Graph 2: Educational rates of return differences of source countries with respect to the United States

Differences are in percentage points.

A positive (negative) value indicates that the source country has higher (lower) rates of return to years of schooling than the United States.

Source of rates of return to schooling: Psacharopoulos and Patrinos (2002).



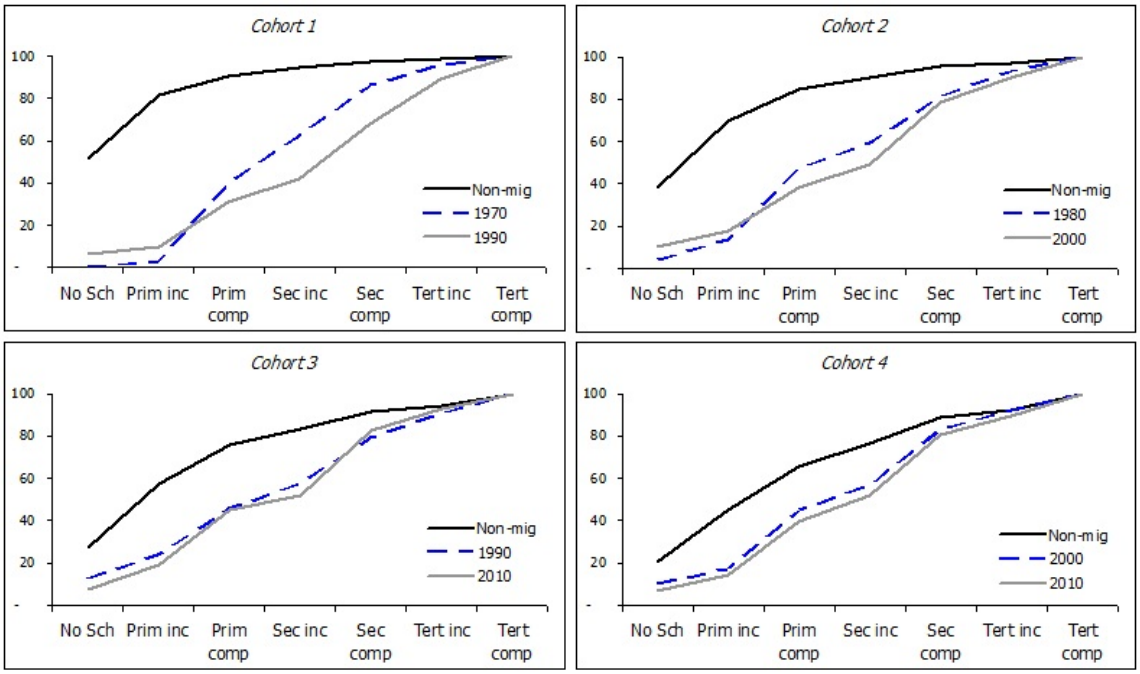
Graph 3a: Immigrant and return migration. CANADA

Cohort 1: Immigrants arrived 1965-1970.

Cohort 2: Immigrants arrived 1975-1980.

Cohort 3: Immigrants arrived 1985-1990.

Cohort 4: Immigrants arrived 1995-2000.



Graph 3b: Immigrant and return migration. CENTRAL AMERICA

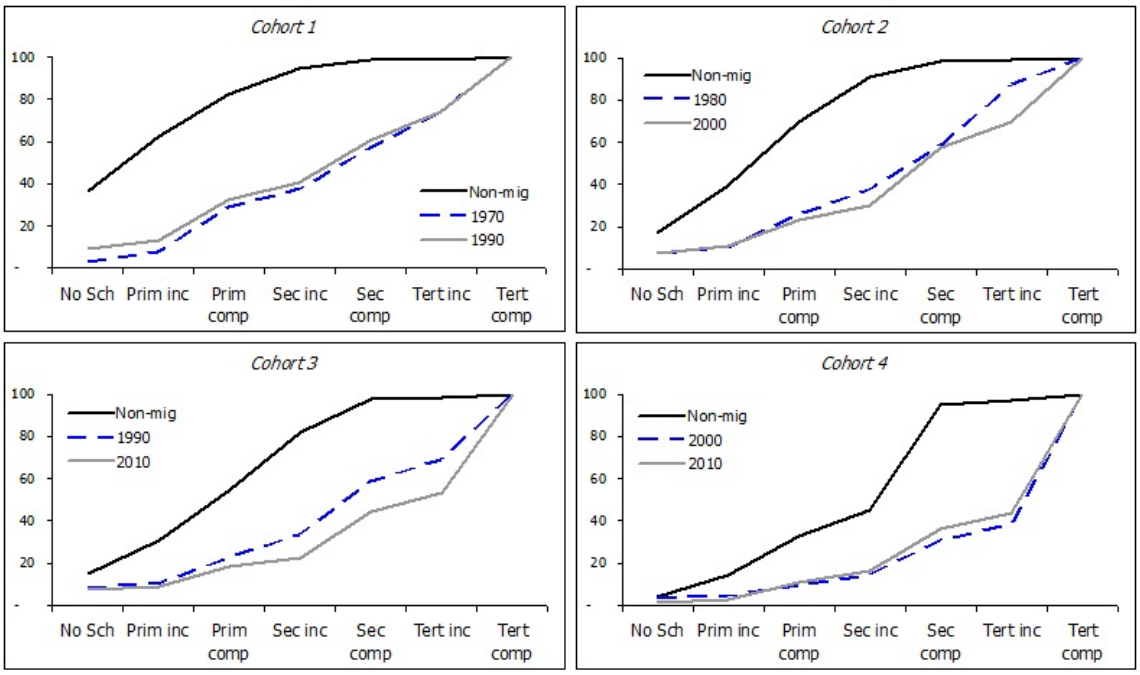
Central America includes: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

Cohort 1: Immigrants arrived 1965-1970.

Cohort 2: Immigrants arrived 1975-1980.

Cohort 3: Immigrants arrived 1985-1990.

Cohort 4: Immigrants arrived 1995-2000.



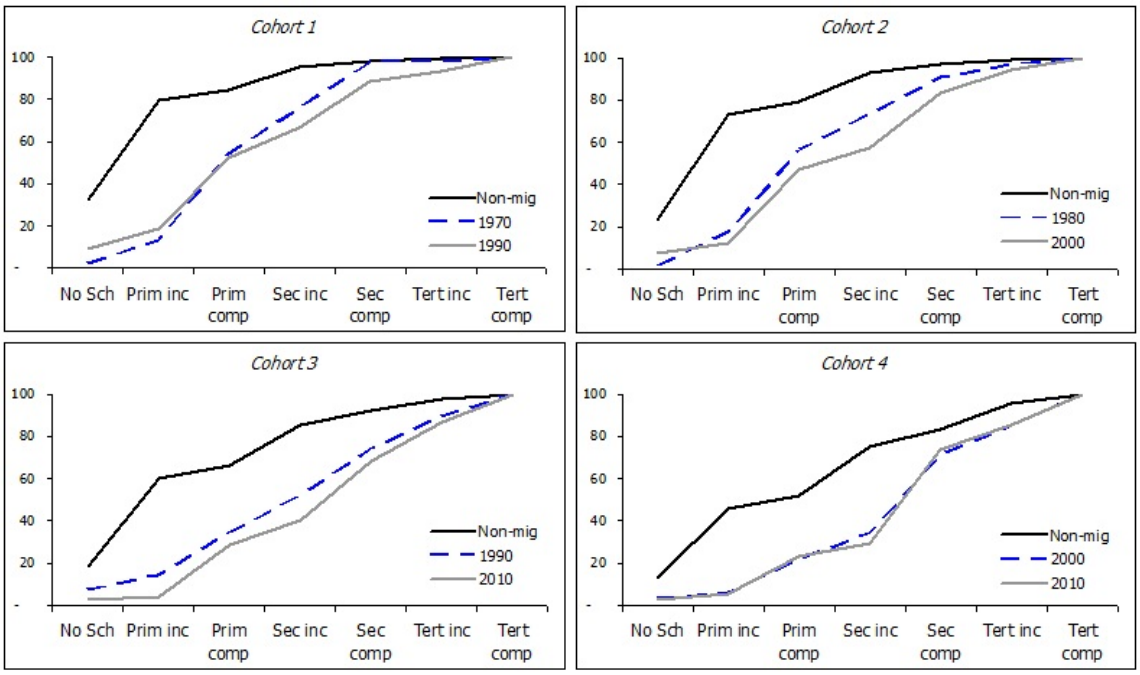
Graph 3c: Immigrant and return migration. CHINA

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



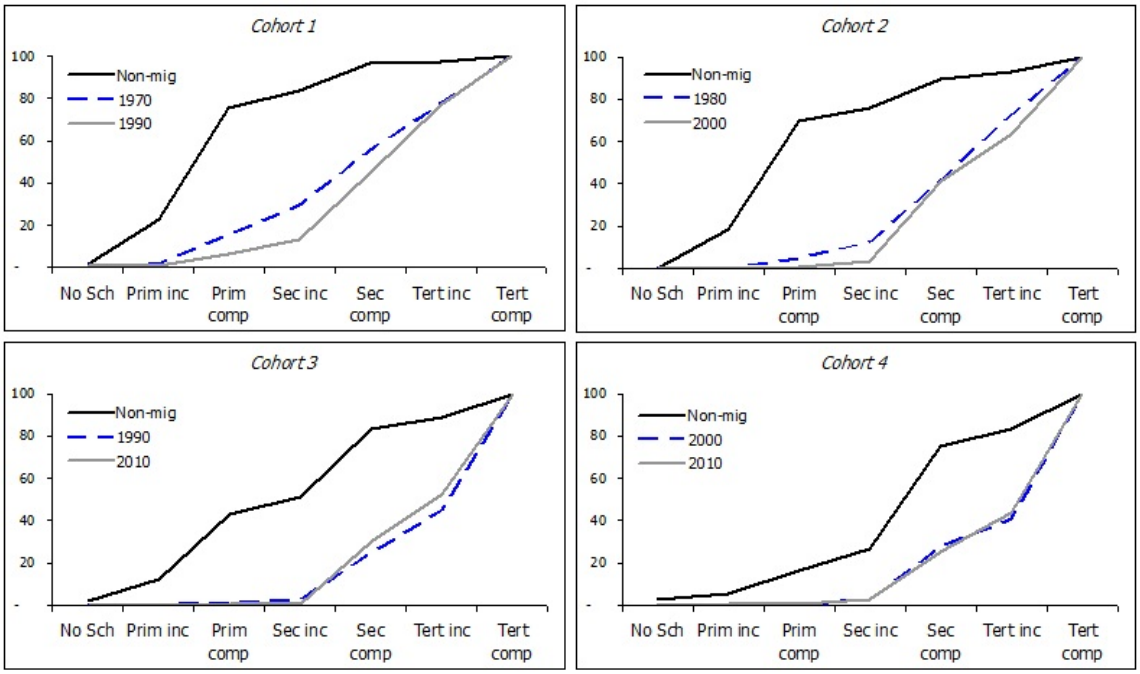
Graph 3d: Immigrant and return migration. DOMINICAN REPUBLIC

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



Graph 3e: Immigrant and return migration. GERMANY

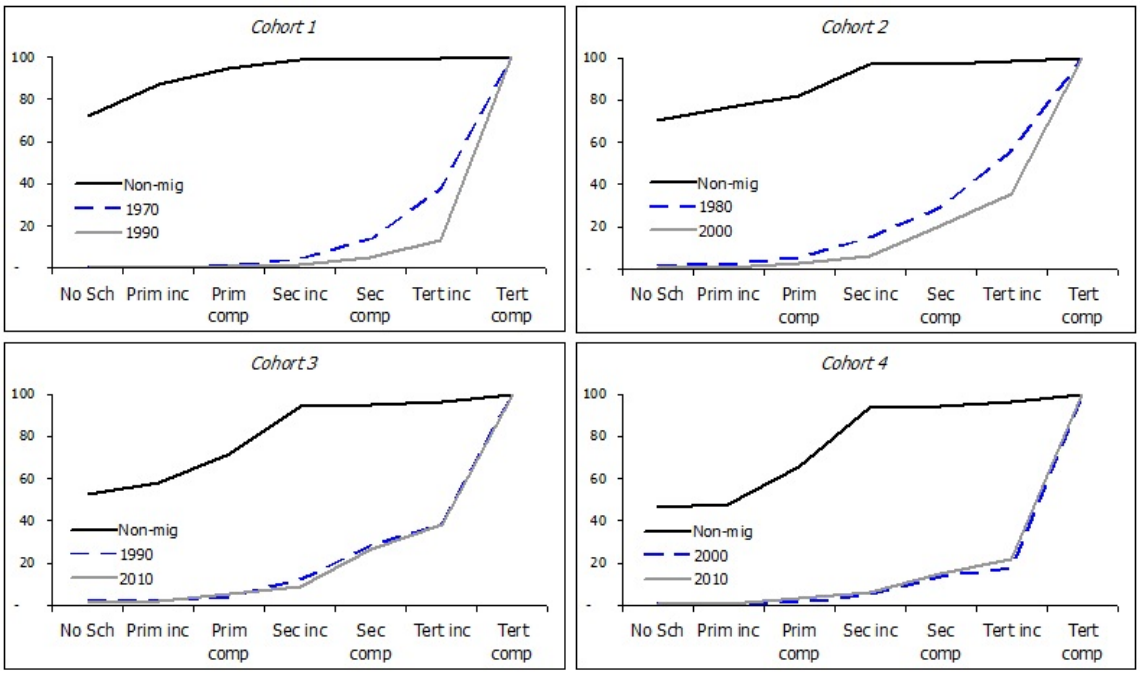
Includes Eastern and Western Germany previous to 1990.

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



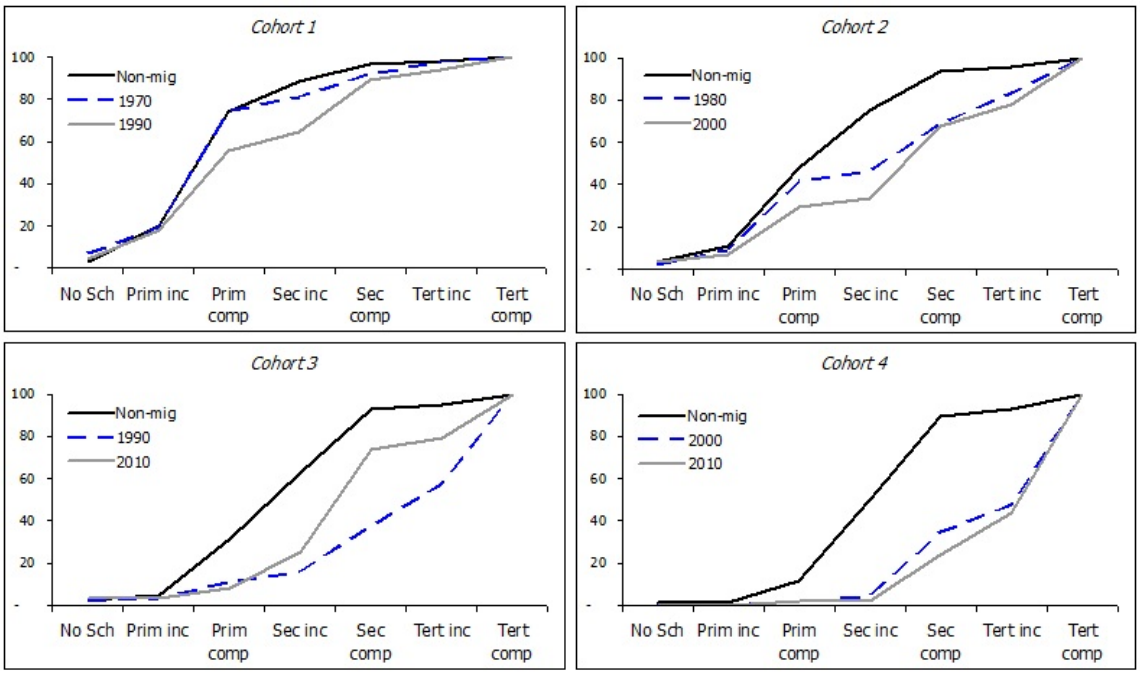
Graph 3f: Immigrant and return migration. INDIA

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



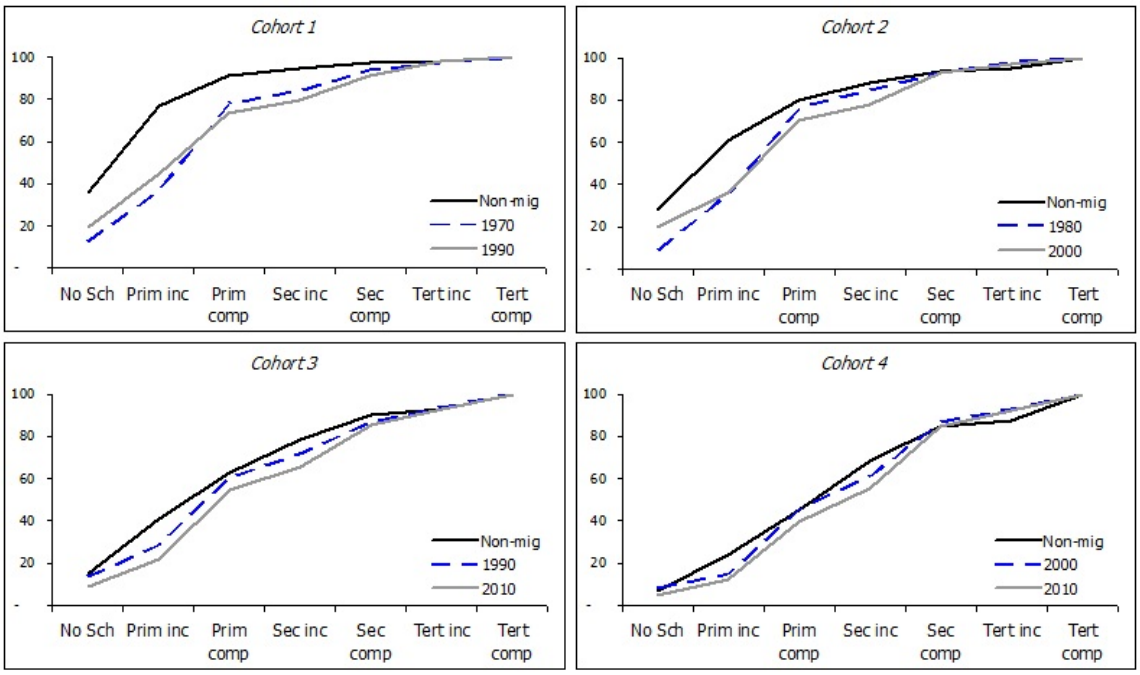
Graph 3g: Immigrant and return migration. ITALY

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



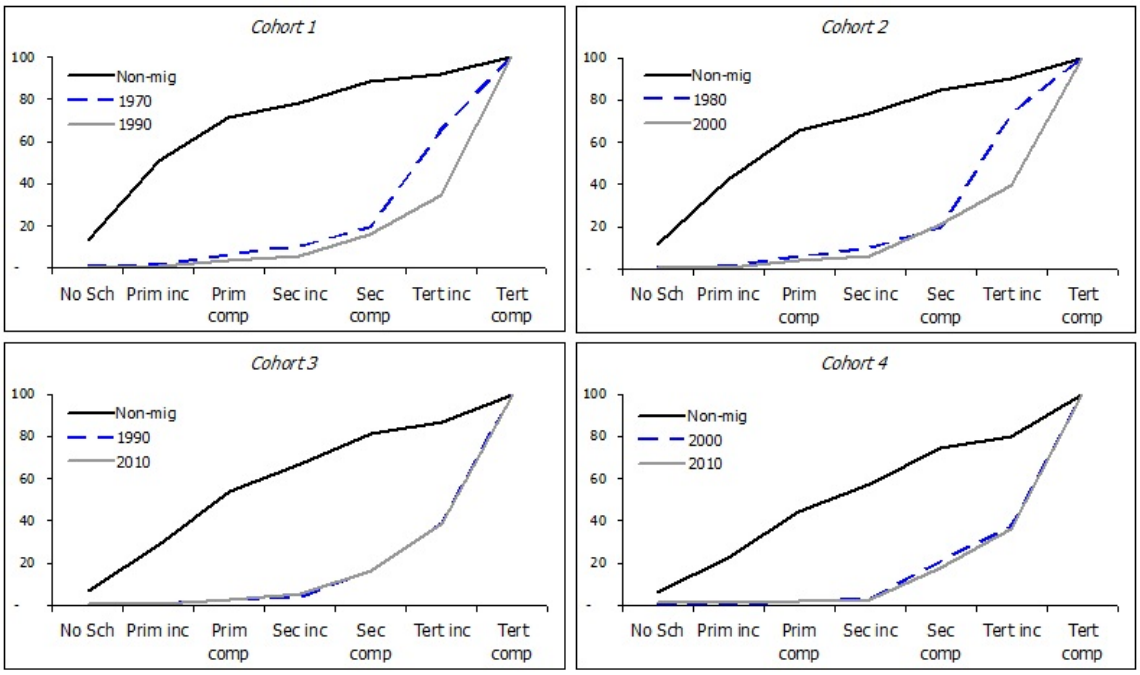
Graph 3h: Immigrant and return migration. MEXICO

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



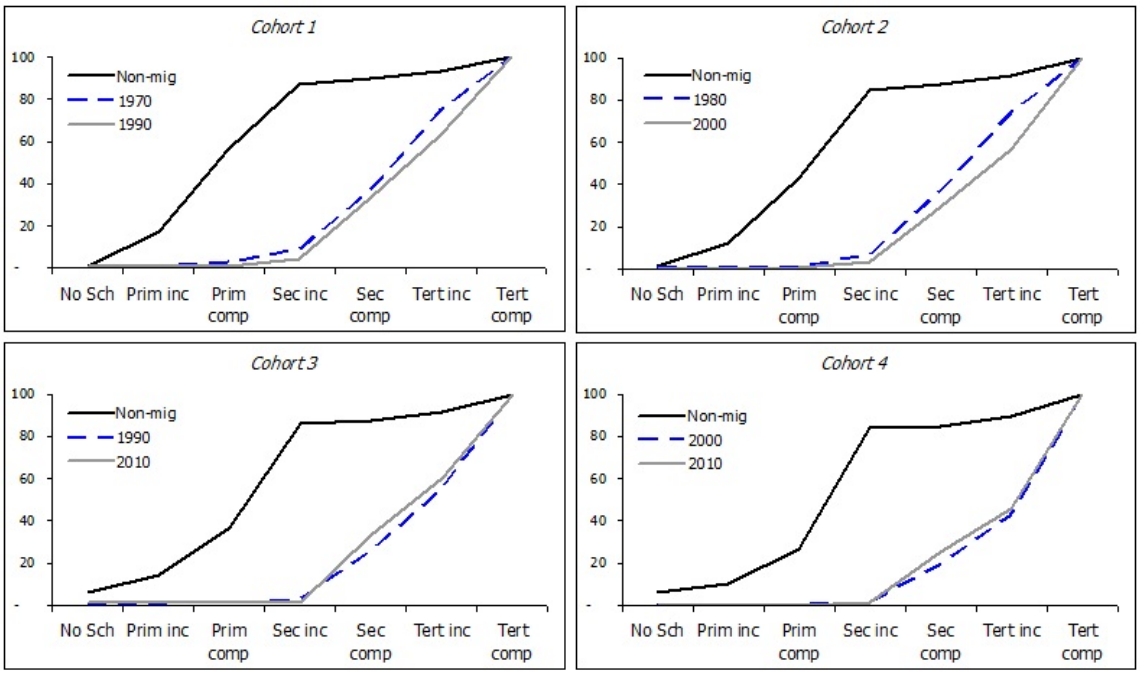
Graph 3i: Immigrant and return migration. PHILIPPINES

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



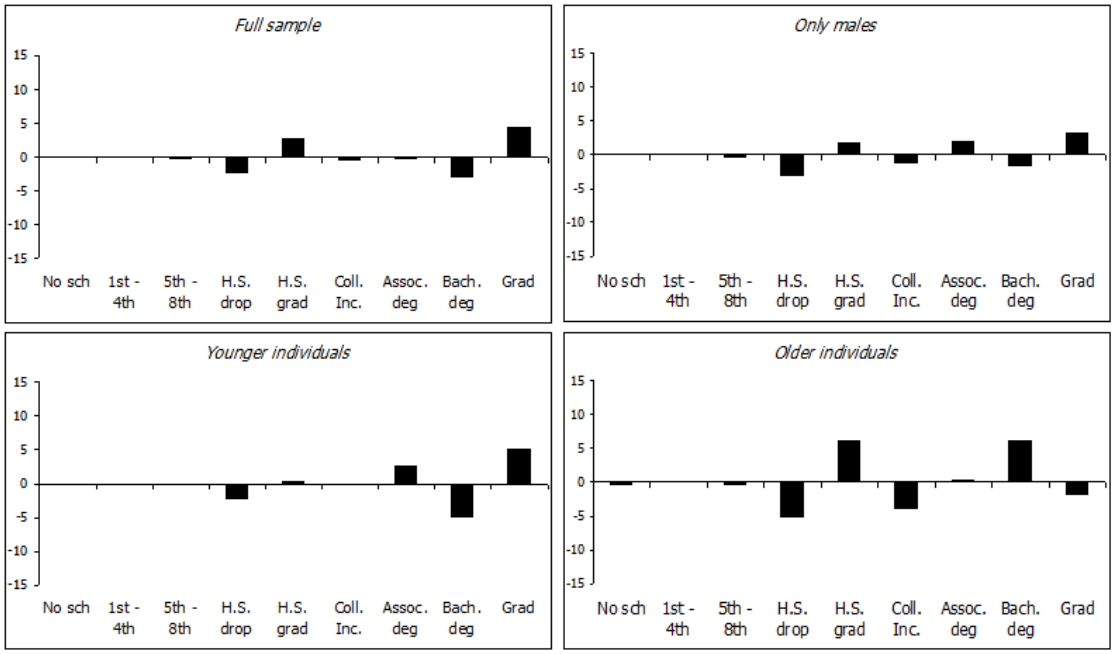
Graph 3j: Immigrant and return migration. UNITED KINGDOM

Cohort 1: Immigrants arrived 1965-1970

Cohort 2: Immigrants arrived 1975-1980

Cohort 3: Immigrants arrived 1985-1990

Cohort 4: Immigrants arrived 1995-2000



Graph 4a: Returners educational selectivity by gender and age groups. CANADA

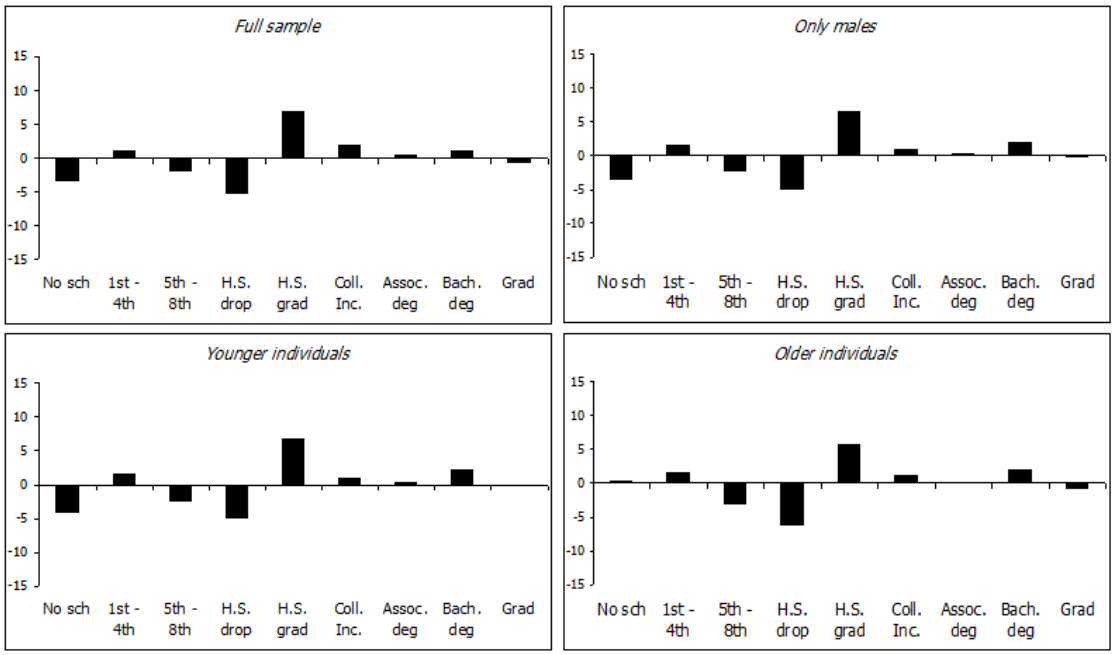
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4b: Returners educational selectivity by gender and age groups. CENTRAL AMERICA

The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

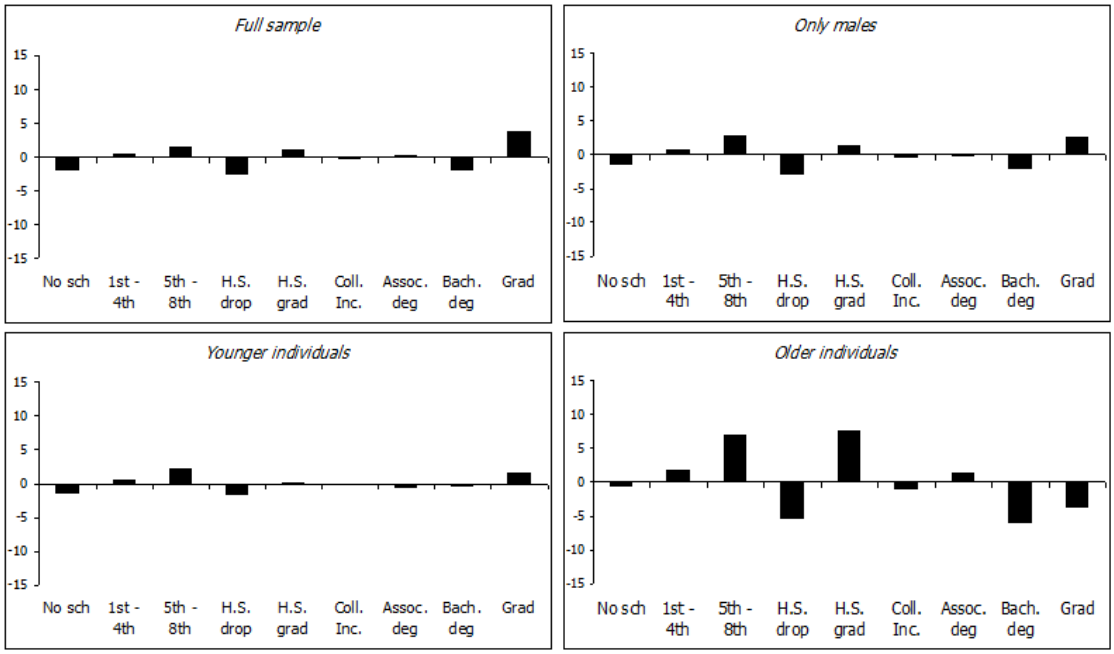
Central America includes: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4c: Returners educational selectivity by gender and age groups. CHINA

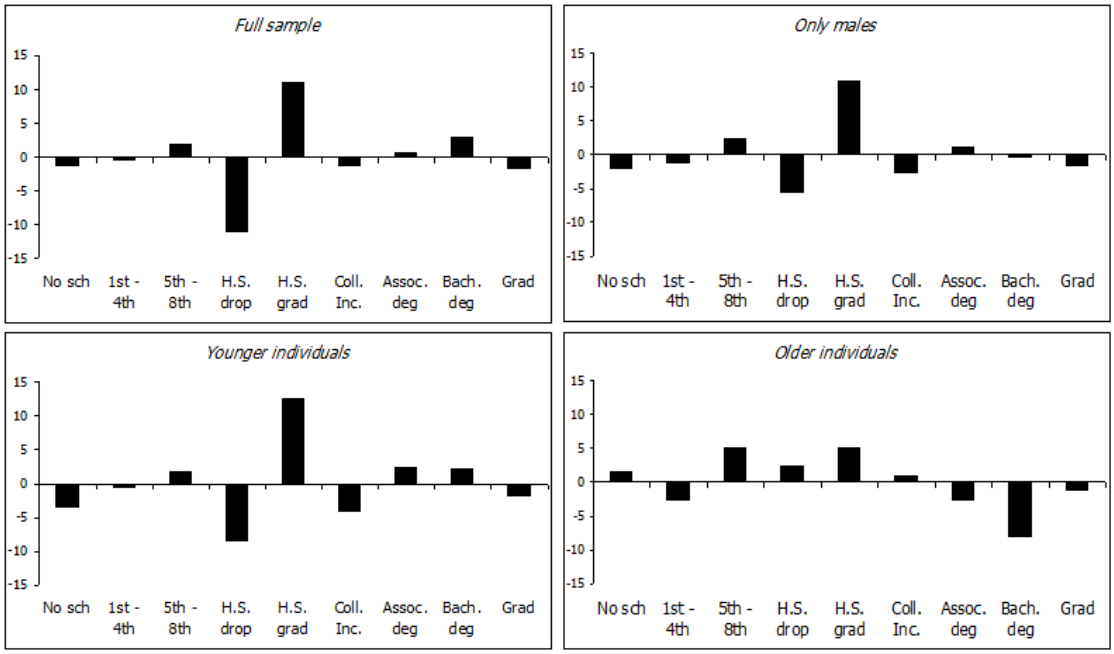
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4d: Returners educational selectivity by gender and age groups. DOMINICAN REPULIC

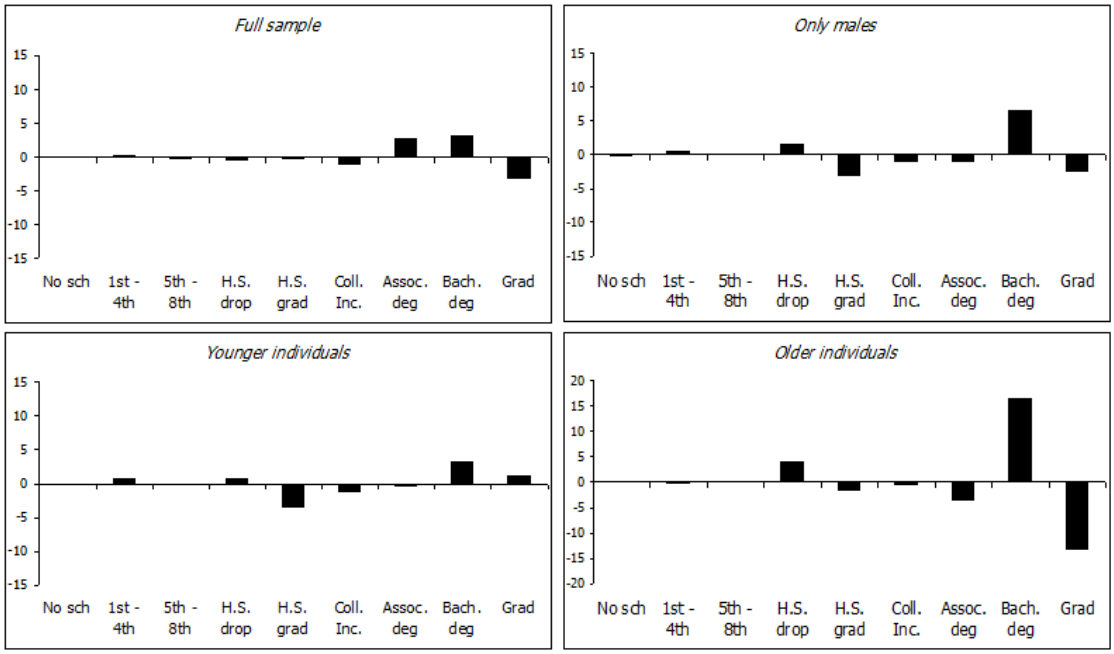
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4e: Returners educational selectivity by gender and age groups. GERMANY

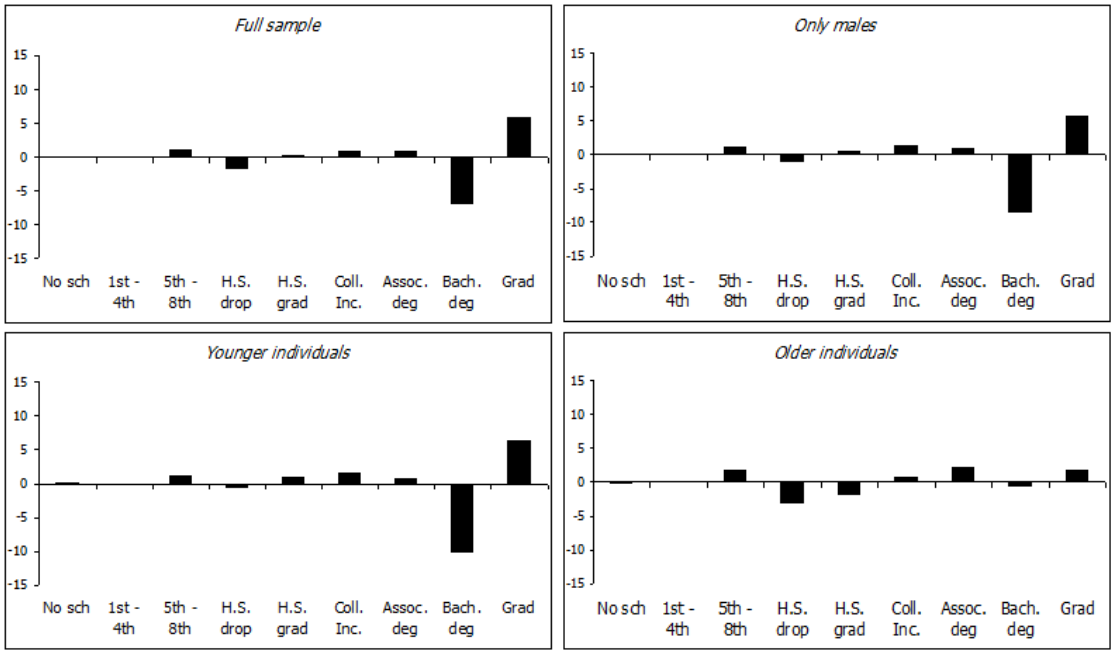
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4f: Returners educational selectivity by gender and age groups. INDIA

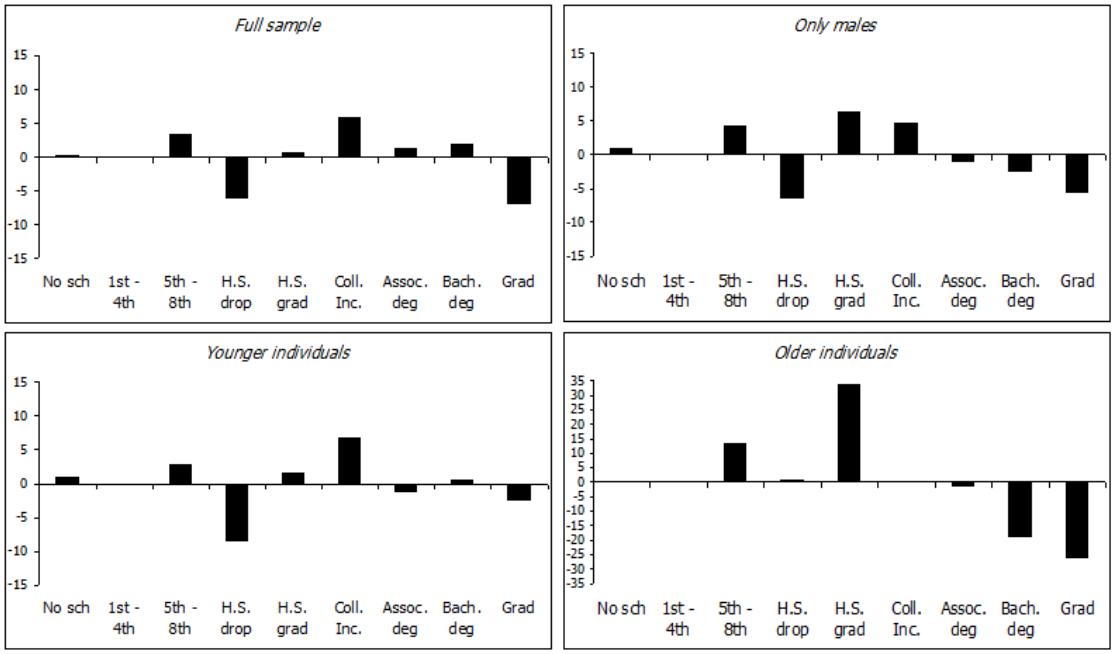
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4g: Returners educational selectivity by gender and age groups. ITALY

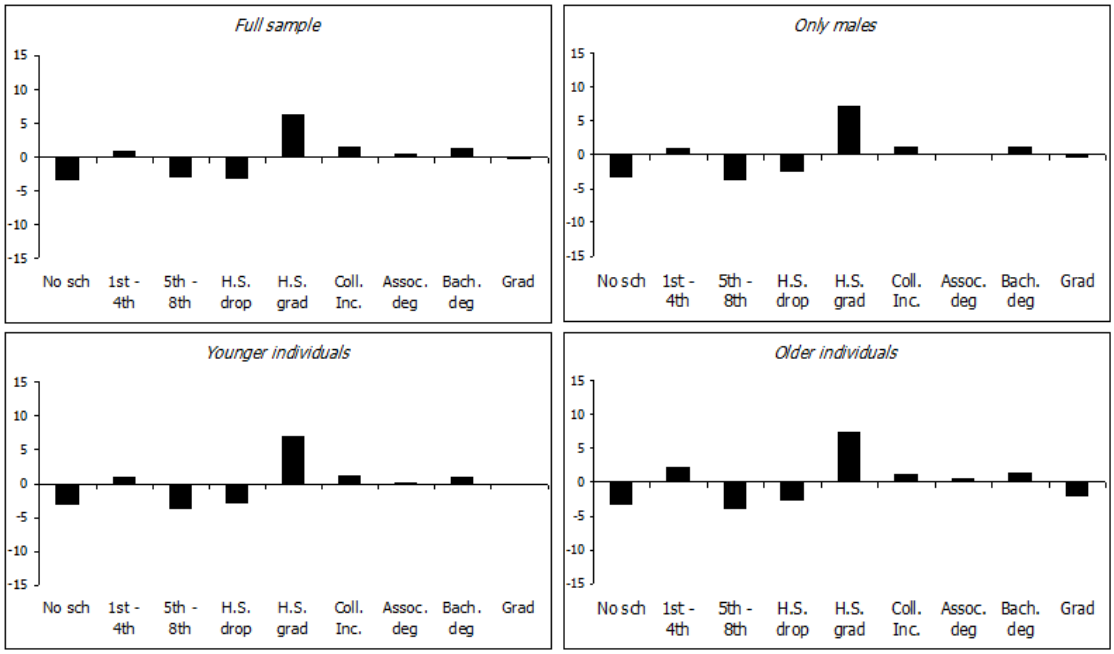
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4h: Returners educational selectivity by gender and age groups. MEXICO

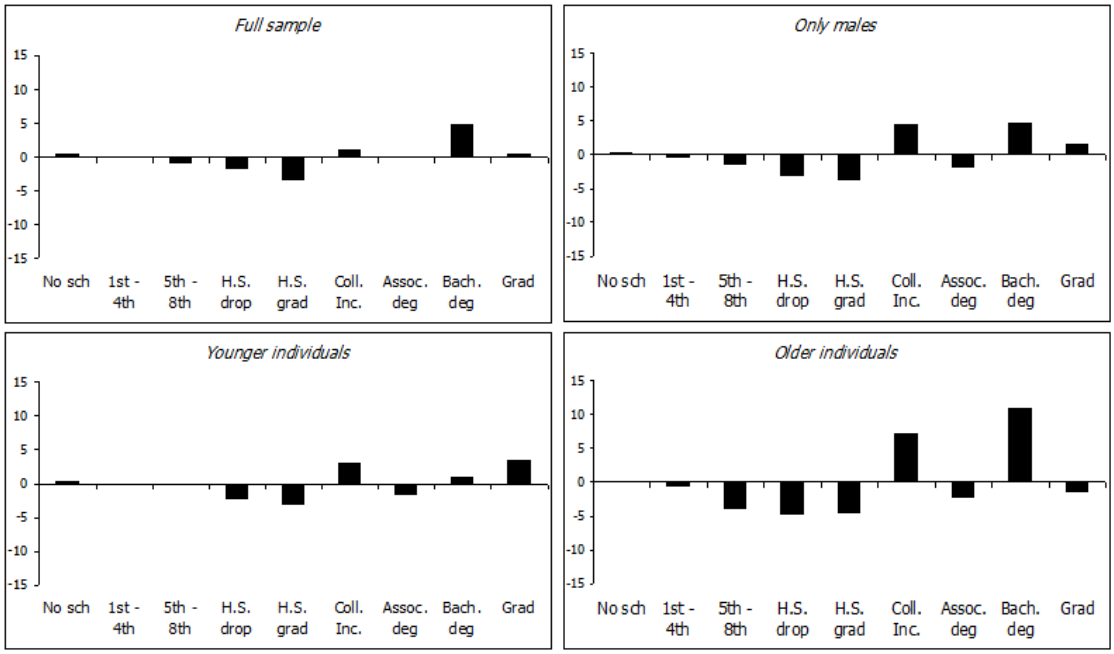
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4i: Returners educational selectivity by gender and age groups. PHILIPPINES

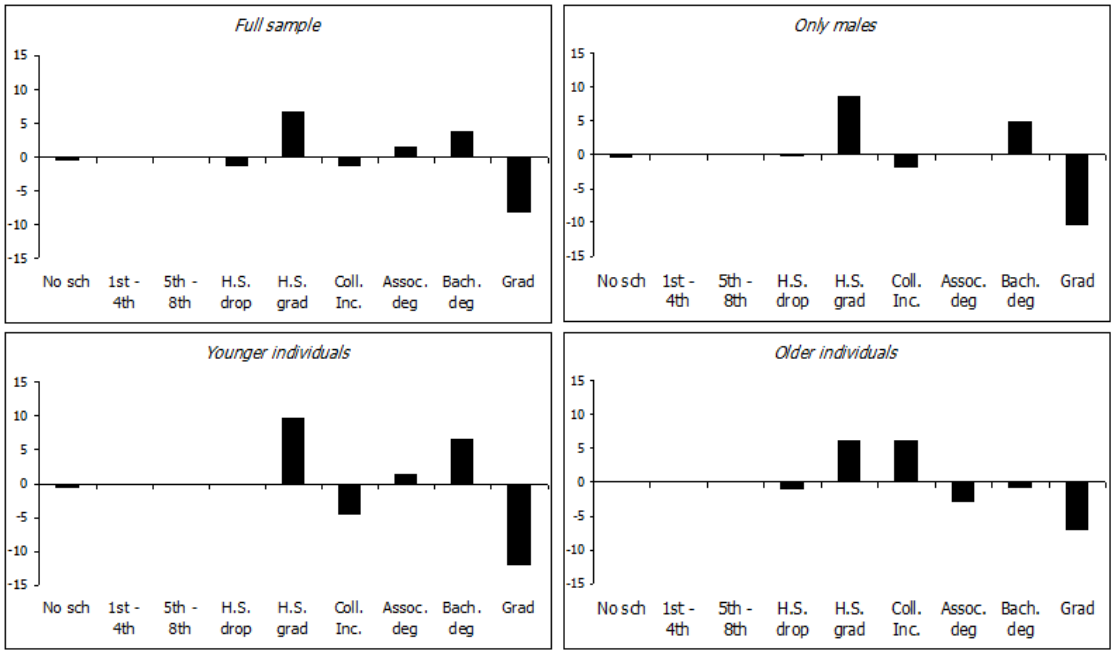
The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.



Graph 4j: Returners educational selectivity by gender and age groups. UNITED KINGDOM

The bars represent the difference between the 2010 and 2000 histograms at each schooling group. A positive (negative) value means that a higher (lower) proportion of the individuals had that level of schooling in 2010 than in 2000.

Full sample: Immigrants arrived 1995-2000, aged 25-54 in 2000.

Only males: Male immigrants arrived 1995-2000, aged 25-54 in 2000.

Younger individuals: Immigrants arrived 1995-2000, aged 25-39 in 2000.

Older individuals: Immigrants arrived 1995-2000, aged 40-54 in 2000.

Table A. 1: Number of observations for each country by year and cohort

		Country									
Cohort	Year	CAM	CAN	CHI	D.R.	ENG	GER	IND	ITA	MEX	PHI
1	1970	73	152	95	47	149	117	88	183	216	135
1	1980	447	559	596	344	502	454	345	895	1,558	844
1	1990	346	444	463	198	397	436	288	635	1,229	797
2	1980	767	556	698	340	610	328	1,009	284	3,508	1,352
2	1990	943	444	762	239	436	254	948	233	3,605	1,604
2	2000	1,089	446	805	272	473	293	1,024	215	3,824	1,530
3	1990	2,650	695	1,111	552	591	417	1,183	176	5,430	2,306
3	2000	3,312	763	2,481	943	536	453	1,678	183	7,797	3,132
3	2010	666	142	531	191	81	73	419	32	1,683	753
4	2000	2,496	1,605	2,071	748	768	1,181	2,693	269	11,882	1,661
4	2010	706	337	948	237	125	176	907	65	2,930	626

Source: U.S. 1970, 1980, 1990, and 2000 Census and 2010 American Community Survey

Table A. 2: Education variables standardization

IPUMS code	IPUMS Definition	Availability 1970	1980	1990	2000	2010	Barro and Lee standardization	Sch_var standardization
0	N/A or no schooling				X		·	·
1	N/A	X	X	X		X	·	·
2	No schooling	X	X	X	X	X	No school	No school
10	Nursery to 4th		X				Prim. inc.	Grade 1-4
11	Nursery - preschool	X		X	X	X	Prim. inc.	Grade 1-4
12	Kinder	X		X	X	X	Prim. inc.	Grade 1-4
13	Grade 1st-4th			X			Prim. inc.	Grade 1-4
14	Grade 1	X			X	X	Prim. inc.	Grade 1-4
15	Grade 2	X			X	X	Prim. inc.	Grade 1-4
16	Grade 3	X			X	X	Prim. inc.	Grade 1-4
17	Grade 4	X			X	X	Prim. inc.	Grade 1-4
20	Grade 5th-8th			X			Prim. comp.	Grade 5-8
21	Grade 5th-6th		X				Prim. comp.	Grade 5-8
22	Grade 5	X			X	X	Prim. comp.	Grade 5-8
23	Grade 6	X			X	X	Prim. comp.	Grade 5-8
24	Grade 7th-8th		X				Prim. comp.	Grade 5-8
25	Grade 7	X			X	X	Prim. comp.	Grade 5-8
26	Grade 8	X			X	X	Prim. comp.	Grade 5-8
30	Grade 9	X	X	X	X	X	Sec. inc	H.S. inc.

Continued on next page

Table A. 2 – continued

IPUMS code	IPUMS Definition	Availability					Barro and Lee standardization	Sch_var standardization
		1970	1980	1990	2000	2010		
40	Grade 10	X	X	X	X	X	Sec. inc	H.S. inc.
50	Grade 11	X	X	X	X	X	Sec. inc	H.S. inc.
60	Grade 12				X	X	Sec. comp.	
61	Grade 12- no diploma	X	X	X			Sec. comp.	H.S. inc.
62	HS degree or GED		X	X			Sec. comp.	H.S. grad.
63	HS degree	X					Sec. comp.	H.S. grad.
64	GED	X					Sec. comp.	H.S. grad.
65	Some college: ¡1 yr	X	X		X	X	Sec. comp.	H.S. grad.
70	College: 1+ yrs				X	X	Tert. inc.	
71	College: 1+yrs no degree	X	X	X			Tert. inc.	Some coll.
80	College: 2 yrs				X	X	Tert. inc.	
81	Associate deg: no spec	X	X				Tert. inc.	Assoc. deg.
82	Associate deg: occup			X			Tert. inc.	Assoc. deg.
83	Associate deg: academic			X			Tert. inc.	Assoc. deg.
90	College: 3 yrs				X	X	Tert. inc.	
100	College: 4 yrs				X	X	Tert. inc.	
101	Bachelor deg	X	X	X			Tert. comp.	Bach. deg.
110	College: 5+ yrs				X	X	Tert. comp.	
111	College: 6 yrs				X	X	Tert. comp.	
112	College: 7 yrs				X		Tert. comp.	

Continued on next page

Table A. 2 – continued

IPUMS code	IPUMS Definition	Availability					Barro and Lee standardization	Sch_var standardization
		1970	1980	1990	2000	2010		
113	College: 8+ yrs				X		Tert. comp.	
114	Masters deg	X	X	X			Tert. comp.	Grad. deg.
115	Professional deg	X	X	X			Tert. comp.	Grad. deg.
116	Doctoral deg	X	X	X			Tert. comp.	Grad. deg.