Heterogeneous Returns to Schooling for Refugee and Other Adult Immigrants in U.S.

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Abstract: Schooling is a human capital skill that influences both the migration decisions of immigrants (especially for non-refugees), and the rate at which immigrants assimilate in the host country. Returns to schooling could be correlated with difficult-to-observe factors such as self-selection, and legal status, and these unobservables can affect the economic assimilation of immigrants into the host country differently. The objective of this paper is to investigate the returns to schooling for refugees and other immigrants. Refugees- a subset of immigrants- have different characteristics and face different constraints than other immigrants, and this could affect the evolution of their schooling returns in the destination country.

Estimates show that non-refugees receive a much larger crude wage return for schooling at both arrival, and over time. Although educated refugees presumably have greater ability to take advantage of refugees' greater flexibility in seeking more suitable employment matches during the adjustment period, they do not see higher return growth than non-refugees do. The two groups' returns grow over time, but refugees do not catch up with non-refugees. This suggests that schooling is more strongly correlated with unobserved skills among non-refugees, so it appears that selection into both migration and return-migration are more important factors than the advantage in terms of job search.

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1 Introduction

The theory of economic assimilation describes the phenomenon that human capital is a key factor in the assimilation process of immigrants, because of its strong impact on both employment and wages. The research that studies the effect of schooling on immigrants' wages shows that schooling is important for their economic assimilation in the U.S. However, when the return to foreign education is compared to the education acquired in the U.S., immigrants receive lower rates of return to education than natives do (Chiswick (1978). While investigating the importance of home country education on earnings of refugees in the U.S., Siraj (2007) finds that Eastern European refugees were likely to earn between 4.7 and 6.5 percent more per hour for average year of schooling than other refugee groups.

Most of this work, however, has not explored whether the earnings returns to schooling could differ between refugees and non-refugees. This distinction is important because the refugees' selection process into migration is different, and they also enjoy different rights than other immigrants after they come to the host country.

In investigating the effect of language fluency on hourly wages of refugees and other immigrants, Shaeye (2016) finds that refugees receive smaller premium than non-refugees do both at arrival and over time. Finding similar pattern for schooling returns would confirm that there must be some permanent unobservable difference between refugees and non-refugees that is correlated with human capital skills within the groups, possibly caused by differences in the processes by which the groups were originally selected into immigration. The results could have implications for the effectiveness of the refugee resettlement polices that are currently in place. For example, considering an immigration policy that implements post-arrival education programs targeted at refugees might be helpful.

Using the 2000 U.S. Census and subsequent cycles of the American Community Survey (ACS) data, in conjunction with data from U.S. immigrant agencies, I construct synthetic cohorts of immigrants to compute the share of immigrants from a particular country who were refugees in each year. Given the variation in the refugee share, we can estimate the returns to schooling among refugees in specifications that also include country-of-origin fixed effects

Results show that refugees receive a lower return for schooling at arrival. Refugees' return, however, sees growth over time as the more capable individuals among the refugees acquire more education, but the gap in the returns does not completely disappear. The fact that the gap lasts over the long run suggests that the groups are fundamentally different. So, differences in selection mechanisms, and better matches are determinants of the initial difference in returns, as well as its evolution.

The rest of the paper is organized as follows. Section 2 discusses background and some related literature. Section 3 then presents a conceptual model, and section four describes the data and methodology. Section 5 presents and discusses the empirical results, and the last section concludes.

2 Background and Literature Review

In general schooling is considered an important factor and a key determinant of individual earnings in the labor market for immigrants, whether it was acquired in the immigrant's home country or even in the host country. Most studies on the return to schooling for immigrants-which focuses on how it compares to that of native born- find that immigrants experience much lower return to the same levels of education than do natives, and that where the immigrant's education is acquired matters. For example, based on the 1970 Census, Chiswick's (1978) finds the partial effect of a year of schooling on earnings for the native born was 7.2 percent, and that it was 5.7 percent for immigrants. This is usually due to the limited transferability of the education acquired abroad. However, immigrants from developed countries receive higher returns to human capital acquired in the host countries after their arrival compared to migrants from less developed countries. This could be either because home and host country are more similar in terms of cultural, institutional, and technological aspects of their economies so that skills are easily transferable, or because more developed countries of origin simply have higher quality education systems.

In the refugee context, Siraj (2007), who investigates the importance of home country education on earnings of Eastern European refugees in the U.S., finds that the return of a year of schooling on their hourly wages is 6 percent.

Although previous work on immigrant and native earnings has allowed the return to schooling to differ for immigrants and natives, it does not distinguish between returns of schooling for refugees and other immigrants. To my knowledge, there are no other studies that investigate schooling return differences between refugees and non-refugees.

Refugees and asylee immigrants are individuals who leave their home country for fear of persecution. Refugees are different from asylees in that their asylum status is determined while outside of the U.S. Asylees, on the other hand, travel by their own means to the United States and then apply for refugee status upon entering the country. Unlike refugees and asylees who are leave their home countries for political reasons, most non-refugee immigrants do come to the United States mainly for economic reasons. So, refugees are expected to be more motivated by the push factor of persecution in the sending country and less motivated by economic gains in the host country.

After immigration, refugees are able to shop for jobs thanks to the legal rights they enjoy, but that is not the case for non-refugees. The visas that non-refugees qualify for are usually valid for a single employer, so it takes a while for them to adjust those visas to permanent residence ones, whereas refugees do not have such restrictions even at arrival. But this changes after about six years of non-refugees' arrival, and they eventually obtain similar rights for better job mobility, such as when they get a green card or citizenship, and at that point both groups have similar opportunities to job-shop. So, if this is an important factor for immigrants' labor market outcomes, then refugees would have a larger advantage during this period especially among those whose education can easily be transferrable.

Shaeye (2016) who investigates the difference in English fluency premium between refugees and non-refugees find that non-refugees initially earn a larger premium for English fluency, and although the refugees' premium grows over time, it does not catch up with the premium of non-refugees. In a similar fashion, I investigate in this paper the potential differential returns to schooling between refugees and non-refugees. Both fluency and schooling constitute human capital investments, and schooling is one of the important determinants of the migration decision for immigrants a well as an indicator for economic assimilation, especially for non-refugees. Like fluency, education could be correlated with unobservable skills of the immigrants that could

bias the return to schooling for different groups of immigrants. It could represent a statistical signal to employers, and could even reflect an omitted variable bias.

In other words, the measured return to schooling might differ between refugees and other immigrants both at arrival and over time and could reflect different sources of bias. Such biases mostly likely account for the variation in estimated schooling return across different groups of immigrants over time, since this difference may not be related to the initial difference in true productivity of schooling. For example, non-refugees are more likely to have invested in education that are easily transferable to the host country to ensure maximum returns to their education, whereas refugees do not have such education (Chiswick 1979). Non-Refugees are also more likely to have arrived with jobs that are a close match to their qualifications. Most non-refugees, however, face some legal barriers when they wish to change jobs, but from the moment they arrive in the U.S. refugees enjoy much greater legal rights in the labor market, similar to those of green card holders.

3 Empirical Model and Theoretical Considerations

In this section, I adopt a similar theory of the one outlined in Shaeye (2016) which discusses the hypotheses for the dynamics observed for the English fluency premium: In this model, the schooling returns differs between refugees and non-refugees upon immigration for reasons such as skill transferability, and self-selection. First, refugees might be not successful as economic immigrants to transfer their schooling because they are less likely to come with jobs in the first place (Akresh 2008), and they are asked to take lower paying jobs below their previous occupational status in their country of origin (Potocky-Tripodi 2003). For example, refugees with relatively higher transferable schooling might not be able to find jobs that match their skills. Second, it is also likely that there is a difference in the bias component of the crude schooling return, which reflects the correlation between schooling and the unobserved skills for the two groups. Since refugees' decisions to migrate were not primarily motivated by economic reasons, those with higher levels of unobserved skills have not necessarily moved to a new country where those skills can best be accommodated. On the other hand, non-refugees may have a wider range of options in choosing a destination than do refugees, and thus are more likely to move to a country where they expect their human capital skills to be highly rewarding.

Let us formalize the relationship between wages and schooling as follows:

$$\omega_{ijt} = \alpha_t + \beta X_{ijt} + \delta S_{it} + U_{ijt}, \qquad (1)$$

Where ω is the log wage, S is a measure for schooling, X is other relevant covariates, i stands for individuals, j stands for jobs and t represents time. The residual term can be further decomposed as

$$U_{ijt} = a_i + b_{ij} + e_{ijt} \qquad (2)$$

Here, a_i is the ability of the individual, which is relevant to employers but is unobserved by the econometrician; b_{ij} is a measure of the quality of the specific match between worker i and job j (which is also unobservable to the econometrician), and e_{ijt} is the residual term, which is assumed to be uncorrelated with both a and b. I am interested in the difference between the true δ and its estimated value δ^{hat} because it reflects unobserved factors that may help immigrants earn higher wages with the same level of schooling. Under this model, the estimated crude schooling return δ^{hat} converges to the sum of three components: (a) the true causal effect of schooling (δ), and biases associated with the correlations between schooling and (b) ability and (c) job match quality:

$$\delta^{hat} \rightarrow \delta + Cov\ (S, a_i)/Var(S) + Cov\ (S, b_i)/Var(S) \qquad \textbf{(3)}$$

The covariance between schooling and ability (Cov (S, a_i)) could possibly represent an actual return to schooling if the employer uses schooling as a signal about a_i, but otherwise if the employer observes a_i directly this component does not represent a causal effect of schooling on wages. It probably does differ between the groups because of economic immigrants' self-selection into migration. For example, those who do not have educational skills that are easily transferable in the U.S. but do have high ability are probably better off either staying in their homeland or else moving to somewhere else. That might not be an option for refugees, who are more likely to be less selected than non-refugees are.

The covariance between schooling and the job match parameter (Cov (S, b)) could probably represent a return to schooling insofar as those skills help one search for a job that is a better match, but the job match quality could vary for other reasons. It can also differ between the groups for two reasons. First, some economic immigrants only migrate after having a job offer, and that is presumably more common among those with easily transferrable schooling. Second,

over time refugees may have a better opportunity to increase b due to having more legal rights to shop for jobs.

Empirical estimates of equation (1) could be interpreted most cleanly if we posit that the true return to schooling is the same across all immigrants. This does not mean that the realized returns are actually identical, just that they would have been identical if different types of immigrants who have the same levels of education would have been selected via the same processes and if they had been equally well-matched to jobs. However, even if that were not the case, the identification strategy would still be appropriate as long as the difference between the true returns of refugees and other immigrants were constant during their years in the U.S. Such a situation could arise, for example, if the refugees had systematically acquired less human capital than economic immigrants who have the same number of years of schooling.

Let us next look at the evolution of the crude schooling return δ over time

$$\frac{\widehat{\partial \delta}}{\partial t} \quad \rightarrow \quad \frac{\partial \delta}{\partial t} + \frac{\partial}{\partial t} \frac{\text{Cov}(S,a)}{\text{Var}(S)} + \frac{\partial}{\partial t} \frac{\text{Cov}(S,b)}{\text{Var}(S)} \tag{4}$$

$\frac{\partial \delta}{\partial t}$ is probably similar for groups, and should converge to zero in the long run. The suggested hypotheses are characterized by $\frac{\partial}{\partial t} \frac{\text{Cov}(S,a)}{\text{Var}(S)}$ and $\frac{\partial}{\partial t} \frac{\text{Cov}(S,b)}{\text{Var}(S)}$.

1) $\frac{\partial}{\partial t} \frac{\text{Cov}(S,b)}{\text{Var}(S)}$

This trend is presumably much larger factor for refugees at first because they have greater legal right to move between jobs (and they may also be more poorly matched to begin with, even conditional on schooling). However, a similar trend should eventually appear for economic migrants too as they acquire the permanent rights to search (e.g., via a green card).

2) $\frac{\partial}{\partial t} \frac{\text{Cov}(S,a)}{\text{Var}(S)}$

It is possible that this trend is likely to be higher for the refugees ($\frac{\partial}{\partial t} \frac{\text{Cov}(S,a)}{\text{Var}(S)} > 0$), at least over the first few years after arrival, if the higher ability refugees are able to transfer their skills faster

by complementing with U.S. schooling (Duleep and Regets 1999, Cortes 2004). This seems likely due to both their greater ability and their stronger incentive (assuming these skills are complementary to ability in the labor market). However, this trend could also be higher for non-refugees later in the assimilation process due to return-migration if those who go back to their homelands are both less educated and less successful, especially that very few refugees become return-migrants (Cortes 2004).

Figure 1 Insert Here

4 Data

We perform this analysis using pooled individual level data of immigrants on the 2000 U.S. Census of Population, and American Community Survey (ACS) that spans the years 2001 to 2015. The analysis follows year-of-arrival immigrant cohorts who came to the U.S. between 1993 and 2015. I restrict the analysis on male immigrants who are above 18 and below 66 years of age, immigrated after the age of 17, are in the labor force, work for wages or salary income, are non-farmer workers, and are living outside group quarters.

After running an initial regression that contains all regions of the world for robustness test, I exclude from the remaining analysis immigrants who come from regions that send a lot of undocumented immigrants (particularly Mexico and Central America, as well immigrants from broad geographic regions that send very few refugees to the U.S., including Northern Europe, Australia, and East Asia). In other words, I restrict the sample to only immigrants from regions where most of the refugee come from (namely Eastern Europe, Southeast Asia, Middle East, South America, the Caribbean, and Africa)- called hereafter refugee-sending regions. This restriction actually makes surprisingly little difference in practice, but I impose it anyhow because it seems to create the most comparable control group for the refuges. However, at one point later on I will briefly reincorporate the immigrants from Central America and Mexico in order to assess the value of having legal status on the growth of the schooling return. This change will be made clear at the time.

The legal definition of an immigrant is "a person lawfully admitted for permanent residence in the United States." (INS Annual Report: Legal Immigration, 2000). Throughout this paper, however, I use the Census definition of immigrants as individuals who were born outside of U.S.

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with no citizenship at birth, which includes both refugees and non-refugees. Non-refugees include those on student, work, or other temporary visas; persons living in the country without authorization; legal immigrants; and naturalized citizens.

The U.S. Census and the subsequent cycles of the American Community Survey data allows me to construct a synthetic cohort since they have large number of observations that we can follow immigrants for a long time.

4.1 Assignment of Refugee Status

Large data sets like the Census report individuals' birthplaces and citizenship, so it is possible to identify immigrants, but they do not report the circumstances under which the individuals immigrated. So, a panel data on wages and schooling for individuals who are clearly identified as refugees, or non-refugees would apparently be ideal, but unfortunately no such data is available.

Thus, most of the literature assigns refugee status based on immigrants' countries of origin (e.g. Borjas, 2002). This strategy treats all immigrants from same country the same way, even if majority of those arrived in some years were not refugees. So, I replicate the process outlined in Shaeye (2016) to impute refugee status based on estimated probabilities that a given immigrant is a refugee. These probabilities are based on an immigrant's country of origin, and year of entry in the U.S. to identify refugees.

The method I use for attributing a refugee status is based on two characteristics: individuals' country of birth and their year of arrival in the U.S. It involves determining how many people are likely to have migrated to the U.S. as refugees from some country in some year. This is estimated as the ratio of the actual number of refugees admitted to the U.S. from a given country in a given year to the total number of people (whether on immigrant or non-immigrant visas) admitted from a that country in that year, as reported in the government's official administrative immigration records). I have explored an alternative identification strategy in which the denominator of the ratio is computed from the Census sample instead and the results are similar. Details of this strategy can be found in Shaeye (2016). After weighting the sample with both cohort size, and the sample weights, the number of male immigrants in the full sample who are expected to be refugees is 84, 381 (approximately 6% of the full sample), and it is 1,396,662 for non-refugees.

4.2 Summary and Data Characteristics

Table 1 shows descriptive statistics for some of the variables used in the analysis. For the purposes of describing the data, I report these summary statistics for two key subsamples: a high-refugee cohort sample, and a non-refugee cohort sample. I define entry cohorts as having a high percentage of refugees if at least 60% of that cohort are refugees (some might not be actually refugees), and a non-refugee cohort is defined as an entry cohort that includes no refugees whatsoever. Nearly all cohorts that include refugees have either very few of them (less than 10 percent or so) or a very high share of refugees, so these summary statistics are not very sensitive to how we set the threshold for inclusion into the high-refugee cohorts.

Insert Table 1 about Here

I then present some other demographic and human capital characteristics by immigrant status for immigrants who come from the refugee-sending regions. We divide the timeline of immigrant assimilation into four different phases based on data and institutional differences. Refugees enjoy more legal rights than other immigrants during the initial "adjustment" period (the first years after immigration), and this might potentially give them more opportunities to job-shop. During the transition period (7-12 years after arrival), however, non-refugees acquire rights similar to the ones that refugees had before. During an "integration" period (13-20 years after arrival)- which is the assimilation period- there shouldn't be any difference between the groups in terms of legal status, or human capital investment, and this would allow them to have similar paths for economic assimilation.

When we look at the labor market outcomes of the groups, non-refugees have higher employment rate in general, as well as higher earnings. Consistent with the expectations, non-refugees have higher employment rates than refugees at first, but refugee employment rates seems to catch up with one of non-refugees during the adjustment period. The two rates grow similarly afterwards, but refugees do not close the gap. In terms of earnings, non-refugees have higher annual and hourly earnings than refugees do, and this continues throughout the period of study.

Figures[1] 2, 3, and 4 show level of fluency for those who are educated, level of education in general, and school attendance by years since arrival in the U.S. Although the level of education grows in parallel for all immigrants over time, non-refugees have higher education levels than refugees, and they maintain that through the period of study. But Figure 3 shows that although non-refugees who are fluent in English are more likely to have associate degree or higher than refugees, refugees see growth in acquiring schooling, and they almost close the gap especially during the integration period.

The correlation between fluency and education is similar for both groups both at arrival and during adjustment period. However, the correlation between English and education then grows for refugees during the transition and integration period.

<div align="center">Figures 2 and 3 Insert Here</div>

As reported in figure 2, non-refugees are more likely to attend school than refugees during the adjustment period. The attendance goes down for both groups during the transition period, especially more for non-refugees., and is quite similar for both of them after that.

<div align="center">Figure 4 Insert Here</div>

Refugees are more likely than non-refugees to become naturalized citizens[2] within six years of arrival, and that advantage persists throughout the period of study. Educated non-refugees are more likely than non-educated non-refugees to become naturalized citizens, which could suggest that those who are unsuccessful among the non-refugees would more likely return-migrate.

5 Empirical Specification and Results

5.1 Empirical Model

The econometric model examines the relationship between schooling and wages of male refugees using the human capital earnings function. I use pooled country fixed effects (FE) regressions to estimate the relationship between schooling and wages for four different periods:

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[1] The analysis is for those who come from refugee-sending regions (Eastern Europe, Southeast Asia and Middle East, South America, and the Caribbean), are between ages 18 and 65, have been in the U.S. between 0 and 20 years, were surveyed between 2000 and 2015 and came to the U.S. after the age of 17.

[2] See Shaeye (2016) for pattern of citizenship for both groups over time.

arrival (0-1 years), adjustment (2-6 years), transition (7-12) and integration (13-20 years). The individual's log wage (Log ω) is the dependent variable, schooling S is the main explanatory variable, and its return is allowed to vary with the percentage R of immigrants in an entry cohort who are refugees. To avoid distinguishing between years of schooling within the high school dropout population, I code all dropouts as having 11 years of education. The return to education that I measure is thus the return to the last year of high school and beyond.[3]

The estimated wage equation is as follows:

$$Log\ \omega_{itpc} = \alpha_t + \alpha_c + \alpha_p + \gamma_p R_{cy} + \beta_p S_{itpc} + \delta_p S_{itpc} R_{cy} + \theta X_{itpc} + \varepsilon_{itpc}\ (2)$$

Subscript i stands for individuals, t stands for the year in which earnings were reported, c stands for the country of origin, and y stands for year of immigration (because the refugee share varies by entry cohorts even within home-countries). Entry cohorts are thus defined by c and y. The final index, p, represents the four phases of the assimilation process: arrival (0-1 years after arrival), adjustment (2-6 years), transition (7-12 years), and integration (13+ years).

Vector X is a set of covariates including a measure of linguistic distance (as a proxy for enclave effects) and dummies for four age groups, English fluency, marital status, race, citizenship, age at arrival, state of residence, weeks worked last year, usual hours worked per week. Note that because I control for weeks and usual hours worked, the dependent variable in effect becomes the individual's log hourly wage; the only reason this cannot be computed directly is that weeks-worked are often reported in intervals. ε_{itpc} represents the error term.

To identify the schooling return, I use a difference-in-difference technique. β is the crude schooling return for a cohort with no refugees (R=0), and ($\beta + \delta$) is the analogous return for an all-refugee cohort (R=1). In other words, I am measuring the crude returns to schooling for refugees and non-refugees by estimating how the crude return to schooling varies across cohorts with different concentrations of refugees, then extrapolating to a hypothetical cohort with R=1 or R=0. In many cases, this is only a mild extrapolation, since most cohorts with R>0 have R approaching 1 anyhow. The tested hypothesis is that refugees have lower return to schooling

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[3] Specifically, I define continuous variable for schooling as follows: 1st-11th grade 11; high school graduate 12; some college 13; associate degree 14; bachelor degree 16; masters' degree 18; professional degree 20; doctorate degree 22 years.

upon arrival, but that their return grows over time, especially as compared to that of non-refugees. More interestingly, we want to know when the convergence occurs if any, and what that signifies about barriers to assimilation.

When estimating the return to immigrants' schooling, it is important to note that where schooling is acquired matters. Many immigrants complete their schooling in their countries of origin. Many others, however, immigrate at young ages and obtain virtually all their human capital after immigration. Another portion possesses a combination of both foreign and domestic education.

Unfortunately, the Census does not ask respondents where the schooling of the immigrants was acquired, so we divide the immigrants into two groups. The first group consists of immigrants who arrived in U.S. before turning age 17 and who therefore have obtained some, or all of their compulsory schooling in the U.S. The second group consists of immigrants who arrived in U.S. after the age of 16 and who therefore had the opportunity to complete their compulsory education before migrating to U.S. With this division of the data, we can compare the returns to schooling between immigrants who were integrated into the U.S. school system at an early age and immigrants who acquired most of their schooling in their home country. So, to test our hypothesis, I restrict the sample to only those who were more likely acquired their education in the country of origin (i.e. those who arrived after the age of compulsory education). As predicted, the empirical results for those who immigrated before they were ten years old, and thus received most of their education in the U.S. reveal that their schooling returns[4] are very similar regardless of their immigration status. So, in this paper, I restrict the analysis to only those who arrived after the compulsory school age.

5.2 Empirical Results

5.2.1 Initial Returns to Schooling

I first estimate the initial schooling return for both refugee and non-refugee adults at the arrival period and report the results in the first two lines of Table 2. After controlling for other forms of human capital and socioeconomic characteristics, I find that upon arrival non-refugee immigrants

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[4] Refugees receive 0.092 versus 0.093 for non-refugees, and the difference is statistically insignificant.

earn higher schooling returns on their hourly[5] wages than immigrants who arrived as refugees (0.03 versus 0.06) for an average year of schooling. This is in line with the findings of Shaeye (2015, 2016) for the English fluency premium, where refugees earn lower premium for fluency than economic immigrants at arrival.

<div align="center">Table 2 Insert Here</div>

5.2.2 Dynamics of the Return to Schooling

I next examine how the return to schooling evolves over time. As the third and fourth columns of the first section in Table 2 show, results indicate that the schooling return grows during both the transition and integration periods for both groups, and the difference in the schooling returns is never eliminated, and the initial difference persists over time.

Differences in educational systems could still be an issue even if we consider only those who received their education outside of the U.S. (Akresh, 2007). Some of the non-refugee immigrants come from countries that have similar educational systems to the one of the U.S. Bratsberg and Terrell (2002) found important differences in the return to education by country of origin among US immigrants when studying the impact of source country schooling. But since the specification includes country fixed effects, it controls for differences in education systems.

The dynamics of the return and its growth for both groups are robust even when I control for immigrants' occupations. The estimated schooling return, which is reported in Table 2, falls if I control for occupation. However, those changes do not affect the pattern of the returns for the two groups. This is not surprising because the schooling return is most likely be mediated through occupation, and there could be a strong, positive relationship between earnings and the occupational schooling requirements. A similar pattern also emerges when I restrict the sample to only those who are fluent in English (see Table 2).

The magnitude of the schooling return is sensitive to definition of schooling (see Table 3) - as it should since there is a large difference between the schooling of the two groups - and it increases

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[5] The estimates do not change substantially if we instead measure weekly wages using the "weeks worked last year" variable, even though this procedure most likely introduces additional measurement error. It is not clear whether workers' hourly wages or their weekly wages (using the "weeks worked last year" variable) are measured more accurately, but fortunately the estimates are substantially similar regardless of which measure is used

as we use more restrictive definition. But the difference between the two groups persist across all different levels of education levels (i.e. less than high school, college grads, bachelor degree or higher), and the pattern stays similar. However, the difference is greater for those with bachelors' degree or higher. This makes sense because those who have higher levels of education among refugees, but end up with jobs they are overqualified for will face the highest penalty.

Table 3 Insert Here

One possible concern (Borjas 1985) is that there may be separate effects of the number of years since arrival (the assimilation effect that we are interested in) and the year of arrival itself (a cohort effect that may represent variation in the level of skills with which immigrants arrive). To address this concern, I have estimated a variation on the model that includes interactions between the number of years since immigration variable and country of origin dummies.[6] For each country, the estimated effects at zero years since immigration serves as a control for initial skills. When I do this, the estimated crude schooling returns for both refugee and non-refugee immigrants remain very similar to what they were previously. So, it appears the results are not driven by such cohort effects.

Table 4 reports separate estimates for several broad geographic regions of the world. Most results are similar to those from the full sample, suggesting that the results are not driven by the fact that it is much more common for refugees to come from some regions than others.

Table 4 Insert Here

5.3 Discussion of Results

The different hypotheses we have discussed above predict different dynamics in the groups' schooling returns, but it is not clear which one is more dominant. For example, selection on both who migrates and on who invests in easily transferrable skills predicts that non-refugees would receive higher returns to schooling shortly after arriving in the host country. But refugees' returns should grow if the more capable among them invest in new human capital skills, or

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[6] Note that the country-specific growth rates are linear trends, so they are not collinear with the phases of immigration dummies that we are interested in.

complement their pre-immigration schooling with U.S. country specific skills, especially if prior education is correlated with unobserved ability.

Furthermore, if selection on who can job-shop is important, then refugees' schooling returns should grow during the first few years after arrival. But that will not continue for a long time, especially after non-refugees acquire similar rights to the ones refugees have. Finally, selection on who decides to return to their home country predicts that non-refugees would see higher growth in schooling returns if the non-successful among them, who are more likely not to possess easily transferrable skills, go back to their countries of origin.

Results show that non-refugees receive higher schooling returns upon arrival, and that is in part because they have more easily transferrable education (as suggested by their pre-immigration higher schooling). It is also because they are more likely to have a job ready for me when they arrive. Results also confirm that refugees experience higher premium growth over time. Figure 11 suggests that fluent refugees are more likely to have higher schooling than those who are not fluent during transition and integration periods, which could have contributed to the return growth of refugees.

Consistent with the literature, we also find that refugees arrive with less schooling than non-refugees, and this doesn't change over time, and that is probably due the initial difference in human capital skills to begin with.

<div align="center">Figure 9 Insert Here</div>

The job-shopping hypothesis would predict that refugees would have an edge moving to new jobs because they have more legal rights than non-refugees who face legal constraints when they first arrive in the country. But the results show that the return for refugees do not substantially grow during the adjustment period except for those who are fluent in English. This is surprising since refugees are able to take advantage of the legal rights they have. It could be due to the State Department policy, which encourages refugees to take the first job they can find even if they are overqualified for it. So, it looks that it takes more for refugees to secure jobs although they have the legal status to search for one.

It may be premature to conclude that job-shopping is an irrelevant advantage for refugees. For example, wage convergence between refugees and non-refugees may appear to be misleadingly

slow if many of the non-refugees in the sample actually do have some form of legal status that also helps them to upgrade (or at least not downgrade) their jobs during their time in the U.S. However, even if many immigrants in our main sample may have visas that do not show up in the data, we can be confident that relatively few Mexicans and Central Americans would, since a high percentage of them (often estimated to be a majority) do not have legal authorization to be in the U.S. at all. It is thus instructive that our estimates indicate a different pattern when we compare refugees' returns to education to those of Mexicans and Central Americans, who have been otherwise excluded from our analysis.

When we compare their schooling return to the refugees', we find that those from Mexico and Central America do have higher initial returns, but their schooling returns do not grow over time. The crude returns to schooling for this group range between 6.5 to 7.5 percent per year of schooling in all four of the phases of assimilation, whereas the returns for refugees grow substantially over time. This difference is consistent with the idea that legal access to the labor market allows refugees to move gradually into jobs better suited for their skills.

One other potential remaining bias is related to differences in incentives for return migration. The return migration hypothesis would predict that those among non-refugee immigrants who are not able to transfer their skills easily into the labor market, or are not able to secure legal rights, would go back to their home countries. This is not a practical option for refugees, since most would fear persecution (Cortes 2004). Such dynamics would, if anything, bias us toward the conclusion the non-refugees' wages (and likely their returns to schooling) grow faster over time, especially after the transition period.

6 Summary

This paper analyses the return to schooling for refugee and other immigrant adults in the U.S. by using individual level data from the 2000 U.S. Census of Population and several waves of the American Community Survey (ACS). I find that non-refugees initially earn a larger return to schooling, most likely because they are more strongly self-selected into migration on the basis of easily transferable skills such as schooling and because they are more likely to come with jobs that are close match to their qualifications. Although refugees have more legal rights than non-refugees and they could invest more human capital skills especially among those who are

capable, their return does not catch up with that of non-refugees, who even become more selected as the less successful among them return-migrate to their home country.

These findings confirm that non-refugees are not only selected on observable characteristics (as documented in the literature) but on unobservables as well, and that the initial selection on unobservables will matter for their differential returns to schooling at arrival and over time. In other words, many adult refugees might not be well-suited for the U.S. labor market for some permanent but unobservable reasons, whereas this is less likely for non-refugees because they would likely not move to a country for which they are poorly-suited.

An extension for future research is exploring whether the differential return to human capital skills such as schooling, and fluency across the two groups can explain the wage-gap between refugees and non-refugees documented in the literature. One idea is to use an Oaxaca decomposition to measure how much of the overall wage gap between refugees and non-refugees can be explained by differences in their human capital and other observable skills and by the returns to those skills. Depending on results, we may find that refugees would benefit from greater investments in human capital, or perhaps there are other unobservable skills that are important for non-refugees.

References

Akresh, Ilana Redstone. "Occupational trajectories of legal US immigrants: Downgrading and recovery." Population and Development Review 34.3 (2008): 435-456.

Akresh, Ilana Redstone. "US immigrants' labor market adjustment: Additional human capital investment and earnings growth." Demography 44.4 (2007): 865-881.

Borjas, George J. "Welfare reform and immigrant participation in welfare programs." International Migration Review 36.4 (2002): 1093-1123.

Borjas, George J. "Assimilation, changes in cohort quality, and the earnings of immigrants." Journal of Labor Economics 3.4 (1985): 463-489.

Bratsberg, Bernt, and Dek Terrell. "School quality and returns to education of U.S. immigrants." Economic Inquiry 40.2 (2002): 177-198.

Chiswick, Barry R. "The economic progress of immigrants: some apparently universal patterns." (1979). In Fellner William, ed., *Contemporary Economic Problems*. (Washington, D.C.: American Enterprise Institute): 357–99.

Chiswick, Barry R. "The effect of Americanization on the earnings of foreign-born men." Journal of Political Economy 86.5 (1978): 897-921.

Chiswick, Barry R. "Are immigrants favorably self-selected?" The American Economic Review 89.2 (1999): 181-185.

Department of Homeland Security (DHS), *Immigration Statistics Data, 1991-2015*. Available at *https://www.dhs.gov/immigration-data-statistics*.

Department of State (DS), *Immigrant Visa Statistics, 1991-2015*.Available at *www.travel.state.gov*.

Duleep, Harriet Orcutt, and Mark C. Regets. "Immigrants and human-capital investment." The American Economic Review 89.2 (1999): 186-191.

Potocky-Tripodi, Miriam. "Refugee economic adaptation: Theory, evidence, and implications for policy and practice." Journal of Social Service Research 30.1 (2003): 63-91.

Shaeye, Abdihafit H. "Dynamics of the Crude English Fluency Premium for Refugees and Other Immigrants in the United States." Working Paper, University of Wisconsin - Milwaukee (2016).

Shaeye, Abdihafit H. "The Unexpectedly Small Wage Premium for English Fluency among Recent U.S. Refugees." Working Paper, University of Wisconsin - Milwaukee (2015).

Siraj, Tabassum. "The effect of refugees' Homeland Education on their Earnings in the United States." Dissertation, Georgetown University (2007).

Steven Ruggles, Katie Genadek, Ronald Goeken, Josiah Grover, and Matthew Sobek. Integrated Public Use Microdata Series: Version 6.0 [Machine-readable database]. Minneapolis: University of Minnesota, 2015.

	High-Refugee Cohorts (N= 55,821)				No-Refugee Cohorts (N= 232,279)			
	Associate Degree or Higher (N= 15,289)		Less than Associate Degree (N= 40,532)		Associate Degree or Higher (N= 105,283)		Less than Associate Degree (N= 126,996)	
Variables	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**	**Mean**	**Std Dev.**
Log Hourly wage (conditional on employment)	5.04	0.75	4.65	0.65	5.25	0.82	4.72	0.70
Employment	0.94	0.24	0.91	0.28	0.95	0.21	0.92	0.27
Fluency	0.75	0.43	0.40	0.47	0.90	0.30	0.70	0.46
School Attendance	0.12	0.33	0.07	0.26	0.15	0.36	0.12	0.33
Age	43.0	10.0	0.41	0.11	40	10.0	38.7	11.4
Citizenship	0.52	0.50	0.38	0.48	0.36	0.48	0.28	0.45

Table 2: Regressions on Log Hourly Wages

Years Since Migration	0-1	2-6	7-12	13-20
		Whole Sample		
Schooling- Non-Refugees (β_p)	0.06*** (0.01)	0.07*** (0.01)	0.09*** (0.01)	0.11*** (0.01)
Schooling- Refugees $(\beta_p + \delta_p)$	0.03*** (0.01)	0.03*** (0.01)	0.06*** (0.01)	0.09*** (0.01)
Difference (δ_p)	-0.03*** (0.01)	-0.04*** (0.01)	-0.03*** (0.01)	-0.02 (0.01)
		Restricting Sample to Fluent Immigrants		
Schooling- Non-Refugees (β_p)	0.08*** (0.01)	0.08*** (0.01)	0.09*** (0.01)	0.11*** (0.01)
Schooling- Refugees $(\beta_p + \delta_p)$	0.03*** (0 .01)	0.04*** (0.01)	0.07*** (0.01)	0.10*** (0.01)
Difference (δ_p)	-0.05*** (0.01)	-0.04*** (0.01)	-0.02*** (0.01)	-0.01 (0.01)
		Controlling for Occupation		
Schooling- Non-Refugees (β_p)	0.04*** (0.01)	0.04*** (0.01)	0.05*** (0.01)	0.07*** (0.01)
Schooling- Refugees $(\beta_p + \delta_p)$	-0.01 (0.02)	0.01** (0.01)	0.03*** (0.01)	0.05*** (0.01)
Difference (δ_p)	-0.04*** (0.01)	-0.03*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)
		Restricting the Sample to Those Who Arrived before Age Ten		
Schooling- Non-Refugees (β_p)		0.093*** (0.01)		
Schooling- Refugees $(\beta_p + \delta_p)$		0.092*** (0.02)		
Difference (δ_p)		-0.001 (0.009)		

Notes: Non-refugees" and "Refugees" represent regression estimates of the return to schooling when there are no refugees in the entry cohort (so the probability is 0 that a given observation from that cohort is a refugee), and the return to schooling for a hypothetical entry cohort that contains only refugees (so that the probability is 1 that a given observation from that cohort is a refugee). Regression controls include age, English fluency, race, Hispanic status, whether attending school, native wage measure, network measure, and state. All regressions include country-of-origin fixed effects. To correct for possible heteroscedasticity, I cluster the standard errors on country level. ***, **, ** indicate significance at 1 percent, 5 percent, and 10 percent levels.

Table 3: Regressions on Log Hourly Wages

Years Since Migration	0-1	2-6	7-12	13-20
High School Graduate Versus Drop-outs				
Schooling- Non-Refugees (β_p)	0.02 (0.04)	0.07** (0.01)	0.10*** (0.01)	0.13** (0.01)
Schooling- Refugees ($\beta_p + \delta_p$)	0.01 (0.04)	0.03** (0.01)	0.07*** (0.01)	0.05** (0.02)
Difference (δ_p)	-0.01 (0.04)	-0.04** (0.02)	-0.03** (0.01)	-0.08** (0.03)
Bachelor's Degree Versus Associate Degree				
Schooling- Non-Refugees (β_p)	0.21*** (0.03)	0.18*** (0.02)	0.20*** (0.01)	0.24*** (0.02)
Schooling- Refugees ($\beta_p + \delta_p$)	0.22*** (0.07)	0.10*** (0.03)	0.15*** (0.04)	0.19*** (0.03)
Difference (δ_p)	-0.01 (0.08)	-0.08*** (0.04)	-0.05 (0.05)	-0.05 (0.04)
Additional Degrees Versus Bachelor's Degree				
Schooling- Non-Refugees (β_p)	0.19*** (0.03)	0.22*** (0.01)	0.32*** (0.02)	0.38*** (0.02)
Schooling- Refugees ($\beta_p + \delta_p$)	0.04 (0.08)	0.11*** (0.07)	0.20*** (0.06)	0.29*** (0.05)
Difference (δ_p)	-0.15* (0.08)	-0.11 (0.07)	-0.12* (0.06)	-0.09* (0.05)

Notes: Non-refugees" and "Refugees" represent regression estimates of the return to schooling when there are no refugees in the entry cohort (so the probability is 0 that a given observation from that cohort is a refugee) and the return to schooling for a hypothetical entry cohort that contains only refugees (so that the probability is 1 that a given observation from that cohort is a refugee).

In this specification, I use four different categories; less than high school, high school graduates; those who has completed four-year college degree, and those with at least a bachelor's degree.

Regression controls include age, English fluency, race, Hispanic status, whether attending school, native wage measure, network measure, and state. All regressions include country-of-origin fixed effects. To correct for possible heteroscedasticity, I cluster the standard errors on country level.

***, **, ** indicate significance at 1 percent, 5 percent, and 10 percent levels.

Table 4: Regressions on Log Hourly Wages				
Years Since Migration	0-1	2-6	7-12	13-20
Eastern Europe				
Schooling- Non-Refugees (β_p)	0.05*** (0.01)	0.06*** (0.01)	0.07*** (0.01)	0.09*** (0.01)
Schooling- Refugees ($\beta_p + \delta_p$)	0.05*** (0.02)	0.04*** (0.01)	0.06*** (0.01)	0.09*** (0.01)
Difference (δ_p)	-0.01 (0.02)	-0.02* (0.01)	-0.01 (0.01)	-0.003 (0.006)
South America and Caribbean				
Schooling- Non-Refugees (β_p)	0.07*** (0.01)	0.07*** (0.01)	0.08*** (0.01)	0.10*** (0.01)
Schooling- Refugees ($\beta_p + \delta_p$)	0.01*** (0.002)	0.02*** (0.001)	0.04*** (0.01)	0.05*** (0.01)
Difference (δ_p)	-0.06*** (0.01)	-0.05*** (0.01)	-0.04*** (0.01)	-0.05** (0.01)
Asia				
Schooling- Non-Refugees (β_p)	0.07*** (0.01)	0.08*** (0.01)	0.10*** (0.01)	0.13*** (0.01)
Schooling- Refugees ($\beta_p + \delta_p$)	0.05*** (0.01)	0.05*** (0.01)	0.08*** (0.01)	0.10*** (0.01)
Difference (δ_p)	-0.02 (0.01)	-0.03*** (0.01)	-0.03*** (0.01)	-0.03*** (0.01)
Africa				
Schooling- Non-Refugees (β_p)	0.07*** (0.01)	0.07*** (0.01)	0.09*** (0.02)	0.10*** (0.01)
Schooling- Refugees ($\beta_p + \delta_p$)	0.03 (0.02)	0.03* (0.01)	0.07*** (0.01)	0.11*** (0.02)
Difference (δ_p)	-0.04 (0.03)	-0.04*** (0.01)	-0.01* (0.007)	0.01** (0.02)

Notes: Non-refugees" and "Refugees" represent regression estimates of the return to schooling when there are no refugees in the entry cohort (so the probability is 0 that a given observation from that cohort is a refugee) and the return to schooling for a hypothetical entry cohort that contains only refugees (so that the probability is 1 that a given observation from that cohort is a refugee). Regression controls include age, English fluency, race, Hispanic status, whether attending school, native wage measure, network measure, and state. All regressions include country-of-origin fixed effects. To correct for possible heteroscedasticity, I cluster the standard errors on country level. ***, **, ** indicate significance at 1 percent, 5 percent, and 10 percent levels.

Period	Arrival	Adjustment	Transition	Integration
Years	0-1	2-6	7-11	13-20
Key institutional features	• Non-refugees self-select into migration and schooling • Highly-educated non-refugees have the most ability to take advantage	• Refugees can legally job-shop; expected to be more useful for those with higher education • Non-refugees cannot do so easily	• Non-refugees get more legal rights • Job-shopping advantage expires • More refugees become highly educated, esp. those w/ more unobservable skills	• Unsuccessful non-refugees can return-migrate, but refugees will not
Implications for schooling returns	Relatively large initial return for non-refugees, but smaller for refugees	Expect return for refugees to grow faster than non-refugees' (if job-shopping is important)	Expect returns to grow for both groups, but for different reasons	Expect return to grow faster among non-refugees

FIGURE 1. HYPOTHESES ON DYNAMICS OF SCHOOLING RETURNS FOR REFUGEES & NON-REFUGEES

FIGURE 2. EDUCATION PROFILES FOR THE POOLED SAMPLE
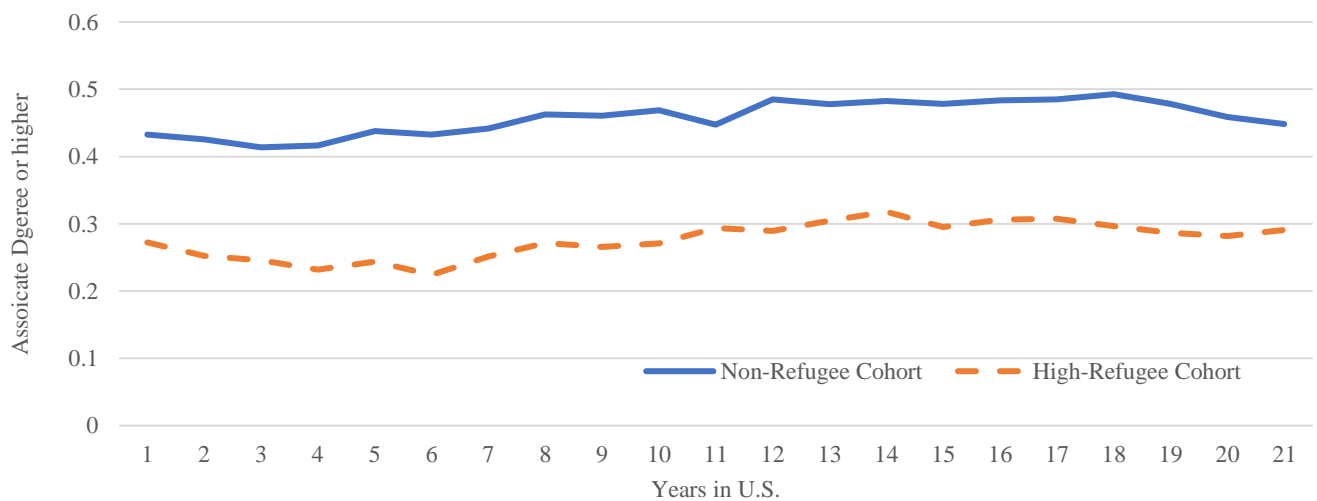
FIGURE 3. FLUENCY PROFILES OF THOSE WHO ARE EDUCATED FOR THE POOLED SAMPLE
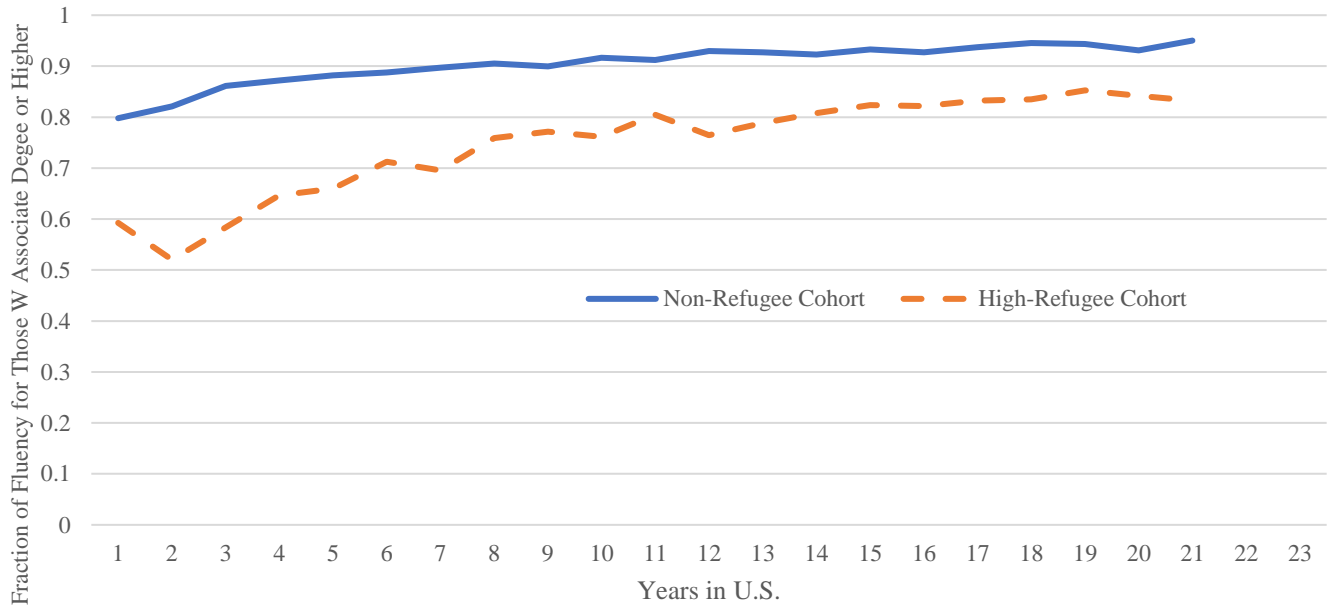

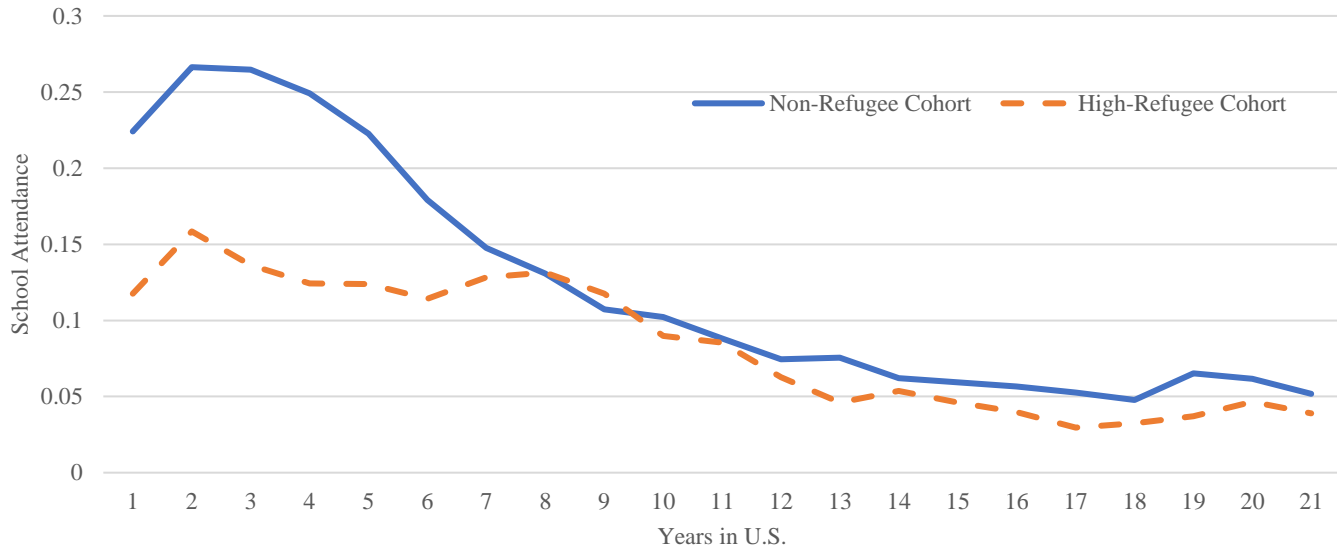FIGURE 4. SCHOOL ATTENDANCE PROFILES FOR THE POOLED SAMPLE

FIGURE 5. MAIN SAMPLE (EASTERN EUROPE, SOUTHEAST ASIA AND MIDDLE EAST, SOUTH AMERICA AND THE CARRIBEAN, AND AFRICA)
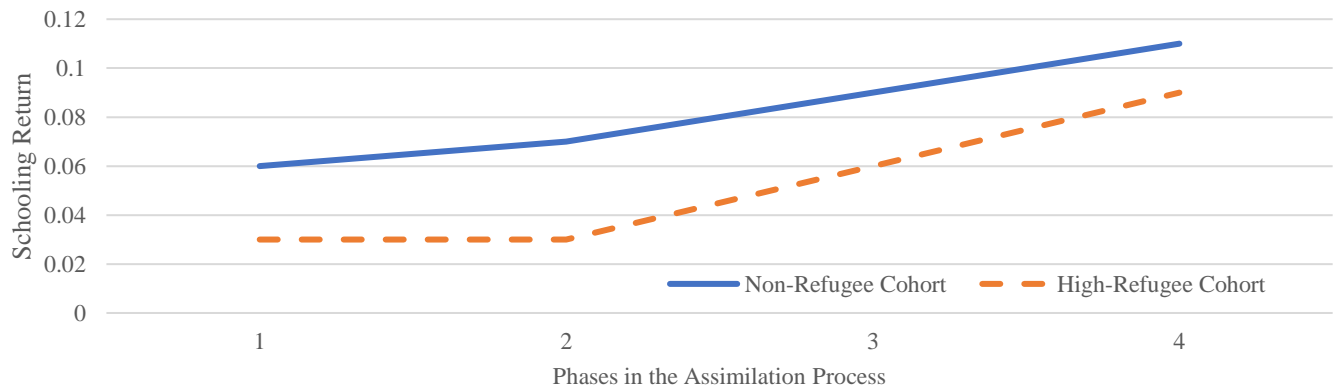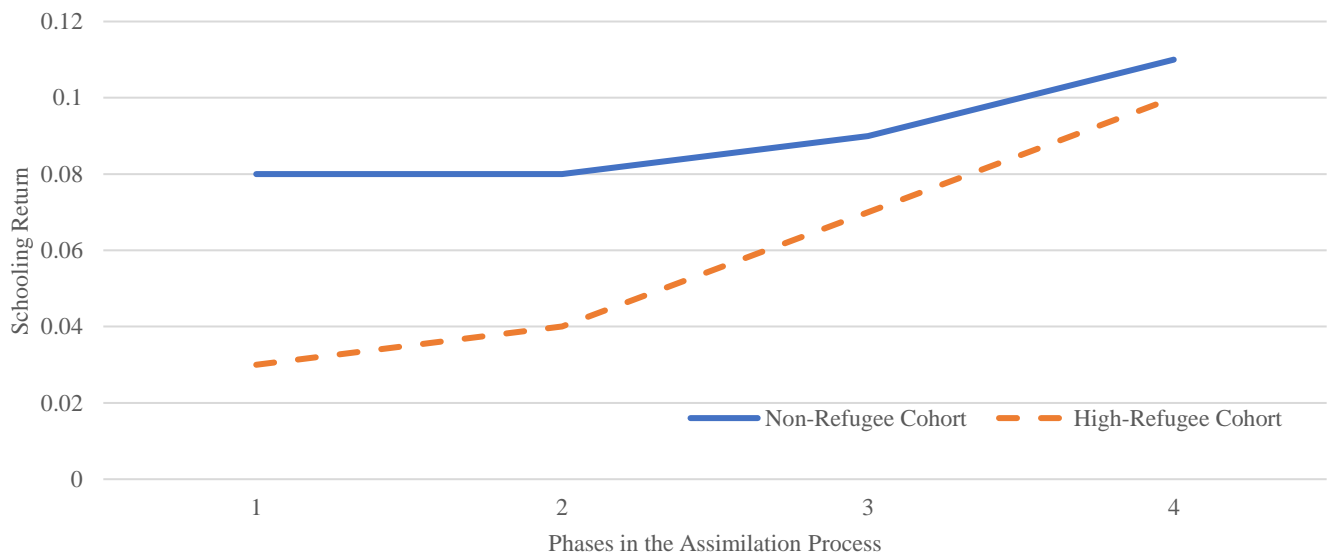

FIGURE 6. FLUENT IMMIGRANTS

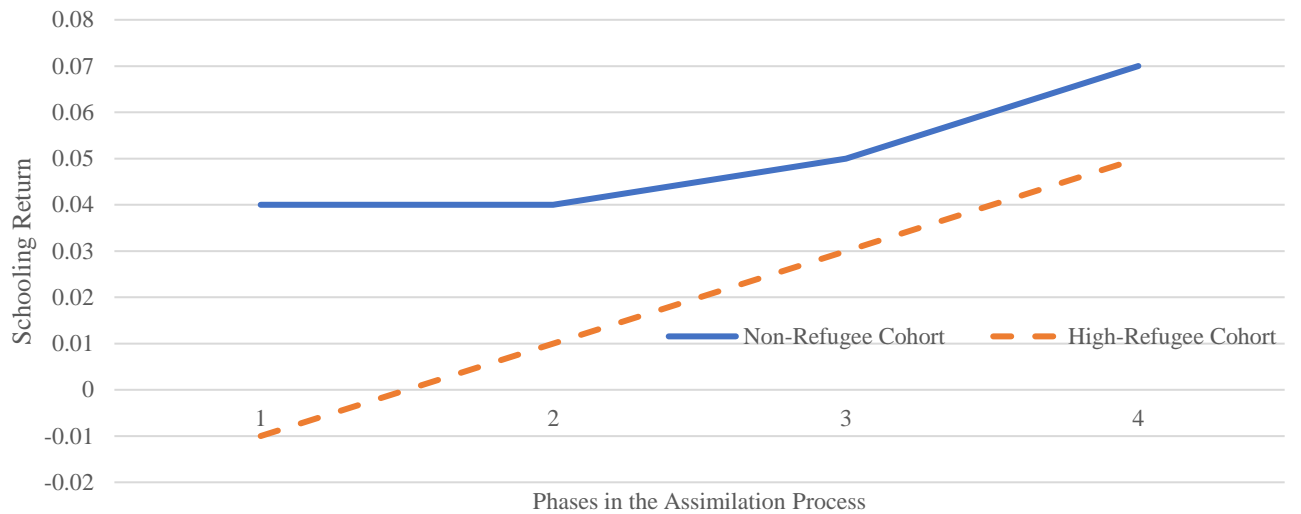FIGURE 7. CONTROLLING FOR OCCUPATION

FIGURE 8. DIFFERENCE IN SCHOOLING RETURNS BETWEEN THE TWO GROUPS STRATIFIED BY REGIONS OF THE WORLD AND YEARS SINCE ARRIVAL
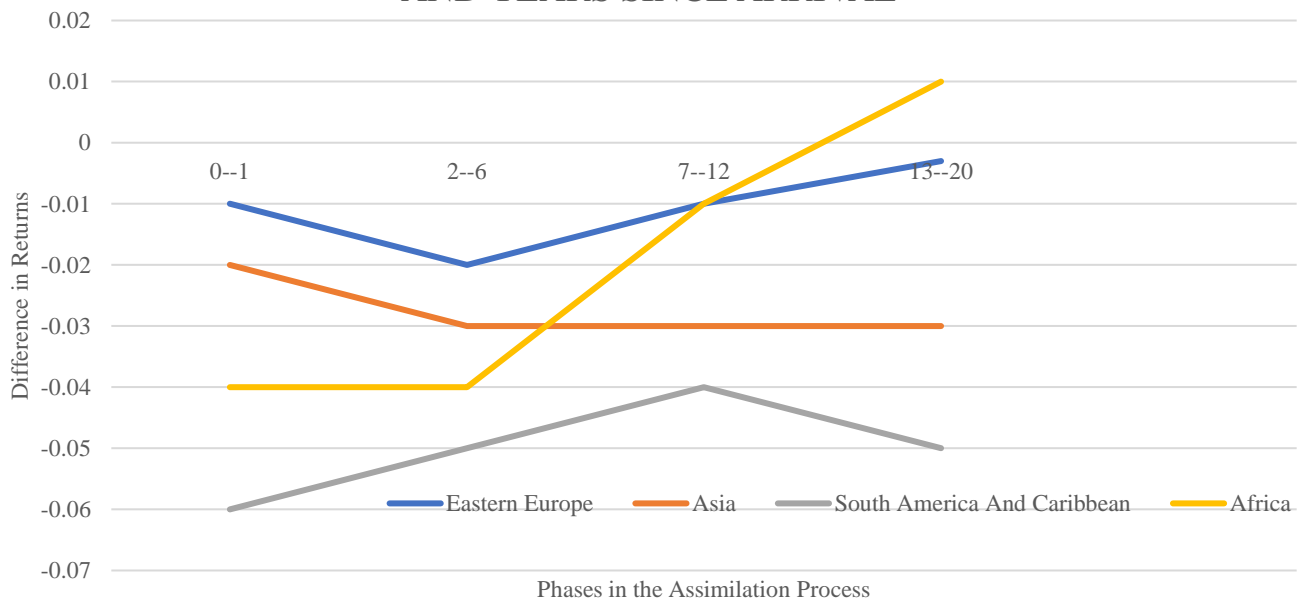
FIGURE 9. EDUCATION PROFILES OF FLUENT IMMIGRANTS AMONG THE HIGH - REFUGEE COHORT SAMPLE