

Foreign vs. U.S. Graduate Degrees: The Impact on Earnings Assimilation and Return Migration for the Foreign Born

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Abstract

Using a novel panel data set of recent immigrants to the U.S., we identify return migration rates and earnings trajectories of two immigrant groups: those with foreign graduate degrees and those with a U.S. graduate degree. We focus on immigrants (of both genders) to the U.S. who arrive in the same entry cohort and from the same country of birth over the period 2005-2015. In Census-IRS administrative data, we find that downward earnings trajectories are predictive of return migration for immigrants with degrees acquired abroad. Meanwhile, immigrants with U.S.-acquired graduate degrees experience mainly upward earnings mobility.

Keyword: Post-Secondary Education, Immigration, Human Capital, Wage Growth, Panel Data.

JEL Classification: J31, F22, J61, J15

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1 Introduction

Many factors play a role in determining immigrant success, including language facility, size of networks, and unobserved abilities. Perhaps the characteristic that receives the most attention from researchers is the stock of human capital an immigrant possesses, both at the time of arrival and acquired in the destination country. In particular, the transferability of educational attainment and degrees across nations is an important area of empirical research. [Kaarsen \(2014\)](#) finds, using cross-country data, that one year of education in the U.S. is about the same as three years of education from a lower-income country. Other research has confirmed that degrees earned in the U.S. explain a large proportion of immigrant-native earnings differentials ([Akee and Yuksel, 2008](#); [Akresh, 2007](#); [Alexander et al., 2018](#); [Arbeit and Warren, 2013](#); [Bratsberg and Ragan Jr, 2002](#); [Kaushal, 2011](#)). Similar results have been found for other developed countries as well ([Fortin et al., 2016](#); [Friedberg, 2000, 2001](#); [Lehmer and Ludsteck, 2015](#); [Valbuena and Zhu, 2018](#); [Warman et al., 2015](#)). While these previous studies have often focused on level differences in the returns to education across immigrant and native-born populations, they have been unable to identify dynamic differences in earnings trajectories or their relationship to the return migration decision. A lack of nationally representative, long-term panel data has hampered the ability to trace the highly educated immigrant earnings growth and attrition from the U.S. labor force.

In this research, we create a novel panel data set which compares dynamic earnings outcomes for two groups of recent immigrant cohorts to the U.S. (2004–2007): those who enter to enroll in graduate school in the U.S. and those who have a graduate degree upon arrival.¹ We restrict our analysis to a relatively young cohort of individuals—ages 18–45 upon arrival; we allow for the possibility that individuals as young as age 18 may attend graduate school. We examine rates of return migration for each group and compare the groups’ earnings over time to a representative sample of the native-born population in the U.S. with the same set of human capital characteristics. The nature of our data allow us to identify the earnings trajectories of the recent immigrant arrival cohort over nearly a decade. This analysis allows us to test whether where one acquires human capital—in the U.S. or abroad—has an impact on earnings assimilation with comparable natives. We also show that the return migration decision is related to downward earnings trajectories for those with prior graduate degrees; on the other hand, return migrants who enrolled in graduate school in the U.S. differ in unobserved characteristics from long-term stayers and have the same upward earnings trajectories over time.

The novel data set used for this analysis combines confidential-use individual records from the U.S. Census Bureau’s American Community Survey (ACS) and Internal Revenue Service (IRS) records. The ACS provides characteristics of the population and allows us to identify current educational enrollment status, educational attainment, immigrant arrival dates and country of birth. The IRS data provide longitudinal observations on annual earnings over the period 2007–2015.² We focus on arrivals to the U.S. in 2005, 2006, or 2007 and link those individuals to their annual earnings from W-2 and 1099 data for the years 2007–2015. This administrative panel provides a unique look at the earnings of a newly arrived—and highly educated—immigrant cohort to the U.S. over a decade at annual intervals.

¹Those whom we categorize as enrolled may have existing graduate education, a fact that we take into account in our analysis.

²Due to the fact that we pool our observations over the 2005–2007 ACS arrival cohorts, we start our earnings and return migration analyses in 2007 onward.

We examine the results for men and women separately.

In our analysis, we investigate whether return migration rates differ for individuals who acquired their graduate degrees in the U.S. or arrived in the U.S. with those degrees. Our data allow us to observe whether an individual has a reported W-2 or 1099 for a given year. Thus when an individual does not appear in our data in subsequent years, we conclude that she may have return migrated, left the labor force, or became employed in the informal labor market. We make the assumption that consecutively missing observations in the longitudinal administrative records indicates return migration.³ We find that there is a slight difference in return migration rates for men—those with existing graduate degrees return at a slightly higher rate than those who attain a graduate degree in the U.S. For women we do not observe a difference in the return migration rates by these two categories.

We also find relatively quick earnings assimilation for male immigrants with graduate degrees, but female immigrants do not achieve earnings parity with their native-born counterparts over the period we examine. For the subgroup that return migrates, we observe downward earnings mobility in the period prior to their return migration. We found a similar result for a broader group of immigrants in previous research ([Akee and Jones, 2019](#)).

In contrast, we find strong evidence that immigrants who enroll in a graduate program in the U.S. eventually experience upward earnings mobility. This holds true for those who remain in the U.S. over the full duration of the panel as well as for those who return migrate in earlier years. Both male and female immigrants in this group experience upward mobility. These novel findings suggest that return migration motivations for those who are educated in the U.S. differ from those who arrive in the U.S. with existing graduate degrees. This negative labor market experience may, in turn, play an important role in return migration decisions.

One additional new finding is that there are level differences in initial (and longer-term) earnings among the long-term stayers and the return migrants depending upon whether they acquired graduate education in the U.S. or not. For those who arrive in the U.S. with completed graduate degrees and who are not enrolled, average initial earnings for the stayers and the return migrants are closer in value than are the initial earnings for the stayers and return migrants who received an education in the U.S. Specifically, for immigrants with existing graduate degrees the difference in initial earnings in 2007 for men is about 0.2 log points and less than 0.03 log points for women; for immigrants who acquire graduate degrees in the U.S. the average initial difference in earnings is 0.5 log points for men and 0.4 log points for women. This suggests that the U.S. labor market evaluates immigrants with existing foreign-attained graduate degrees as equivalent, at least initially. However, for individuals who attend graduate school in the U.S. we find that those who eventually return migrate have consistently lower earnings than their counterparts who remain in the U.S. To our knowledge this is the first time researchers have been able to observe the earnings trajectories of individual immigrant arrivals in the U.S. based on their graduate education and where it was acquired. It also allows us to disentangle potential motivations for return migration for this highly educated group.

³In earlier work we found that the return migration hypothesis is appropriate for individuals who are not observed in administrative records for consecutive years. For example, we find that only 4 percent of immigrants who are present in the IRS records for only a single year in 2005 are enumerated in the 2010 U.S. Census. This strongly implies that these individuals have return migrated. See [Akee and Jones \(2019\)](#).

2 Data Description

We use individual-level data from the American Community Survey (ACS) for the years 2005, 2006, and 2007. The ACS provides characteristics of the population sampled annually. We use the year of entry variable to identify new arrivals to the U.S.⁴ In our analysis we include individuals who report entry either in the year prior to the ACS or the current year.⁵ In practice this means that we include individuals within a two-year arrival range of the ACS (2004 and 2005 for the 2005 ACS; 2005 and 2006 for the 2006 ACS; 2006 and 2007 for the 2007 ACS); as a result we have an effective arrival range of 2004–2007 but we refer to this group as the ACS arrival cohorts for years 2005–2007.⁶

These immigrant cohorts are linked at the U.S. Census Bureau to their individual IRS data using a process whereby observations in each data set were given a unique, protected identification key, called a “PIK.” When a Social Security Number (SSN) is available in a data set, the identifier is assigned based on SSN. For records without an SSN, personally identifiable information such as name, address, and date of birth is used in probabilistic matching to assign PIKs. Personal information is then removed from each data set before they may be used for research purposes. Only those observations that received the unique person identifier are used in the analysis. The IRS W-2 data spans the years 2005–2015 and allow us to examine the earnings progression of the individuals we study over an 11-year period. It also allows us to identify individuals who start out in the labor force and leave it subsequently either as return migrants or because they work in the informal sector.

It is important to note that the record-linkage approach we use to link the data introduces some bias. Minorities and people with lower socioeconomic status are less likely to receive a record-linkage key compared to whites and people who have higher levels of socioeconomic status (Bond et al., 2014). Because we focus on incoming immigrants and use IRS return information, we are only able to link and follow those immigrants who enter the U.S. to work in the formal labor market. Any results we report will therefore only apply to immigrants working in the formal sector. We provide some details below on how much the linking procedure covers the new immigrant population in the ACS.

Once these individuals are linked, we identify whether the individuals are present annually in each of the years from 2007–2015. Our analysis is restricted to individuals ages 18–45 at the start of our panel in 2005–2007. We calculate the two outcome variables of interest: missing W-2 or 1099 filings in subsequent years (2007–2015) and relative earnings (as compared to natives). This novel data set provides a representative picture of the earnings progression of recent immigrants to the U.S. who either have or are earning a graduate degree upon arrival. We are able to track the earnings of these migrants over 2007–2015, excluding from the analysis the years 2005 and 2006 because—given the recent arrival and our pooling of the three ACS cohorts—it is likely that many people will not be full-time employed at entry (i.e., they are currently enrolled in graduate school or just arriving to the U.S.). In other words, the earnings and return migration analysis takes 2007 as the base year in our analyses. Finally, for

⁴Grieco et al. (2018) has shown that the single year ACS data provides more accurate reporting than multi-year ACS data for immigrant arrivals. Additionally, they find that there is an undercount the longer the recall period. Our analysis only requires an immigrant to recall arrival for the current or prior year.

⁵The question on the ACS asks: “When did this person come to live in the United States?” and as such may not necessarily be the first time that an individual came to the U.S.; it simply indicates the most recent date of arrival.

⁶While the ACS data provide a snap-shot perspective of the country on average, the sampled individuals are not the same on an annual basis and it is not possible to create a panel data set using the ACS alone.

comparison, we take a sample of native-born from the 2005 ACS in the same age range and education level as the group in question (either non-enrolled degree-holders or students). We take a 50 percent sample of that population for comparison in the return migration/labor force participation rate and earnings assimilation analyses.

We identify our enrolled individuals from the ACS question which asks about current school enrollment. The question reads, “At any time in the last 3 months, has this person attended school or college?” A person is then asked “What grade or level was this person attending?” One of the options is: “Graduate or professional school beyond a bachelors degree.” Our group with an existing graduate degree are defined using the ACS question regarding years of education.

Table 1 shows the rounded sample sizes for the panel data used in our analysis.⁷ The first row in Panel A shows that there are 4,200 individuals who fit the criteria of: male; ages 18–45; hold a graduate degree or are enrolled in a graduate program; and year of arrival to the U.S. is 2004 or 2005 for the 2005 ACS, 2005 or 2006 for the 2006 ACS, or 2006 or 2007 for the 2007 ACS. The next row shows that 3,200 of these individuals were assigned a PIK by the U.S. Census Bureau. The assignment of PIKs is in large part determined by whether the individual has a presence in administrative data and records.⁸ By definition, an undocumented immigrant is less likely to appear in administrative records than a documented immigrant or a citizen.⁹ As a result, our panel data for the most part identify documented immigrants to the U.S. who have valid visas or work permits. Our PIK assignment rate of 79 percent is thus higher than found in other work on the PIK rate of immigrants identified in the ACS (Bond et al., 2014); we attribute this to the selection of highly educated immigrants into U.S. administrative records. Additionally, the use of Individual Tax Identification Numbers (ITIN) to assign PIKS for individuals contained in the IRS data may have increased overall match rates as well. In the third row we show that the link to the IRS W-2 and/or 1099 data results in a total sample size of 2,600 observations. This rate is higher than the average labor force participation rates in the U.S. in general, which again is likely due to the relatively high education levels of this immigrant group.¹⁰ Panel B provides similar data for the immigrants who are women. We find that the match rates at all stages are lower for women than for the men.

As part of identifying our two immigrant groups and their native-born comparison, we separate groups into mutually exclusive categories: those enrolled in a U.S. graduate program and non-enrolled degree-holders. A concern with this definition is that the composition of degree-holders within the

⁷U.S. Census Bureau data dissemination requires rounding of count data as well as regression coefficients. Those rules have been employed throughout this paper and has been approved for use by the Census Bureau Disclosure Review Board.

⁸Bond et al. (2014) evaluated the assignment of PIK numbers to individuals from the ACS and found a similar assignment rate for the foreign-born population. Subsequent versions of PIK assignment (2010 ACS) accounted for Individual Taxpayer Identification Numbers (ITINs), which may be available in IRS data when an individual does not have a Social Security Number (Bhaskar et al., 2016). However, this is not possible for the assignment of PIKs to earlier data because ITINs are not available in earlier years. As a result, the individuals studied in this analysis are likely to be employed in the formal sector and have a strong participation in government programs in order to be identified in the Personal Identification Validation System, which assigns PIKs to individuals.

⁹In recent research Foster et al. (2018) found a higher match of foreign-born between the Census and IRS data. Their data differ slightly in that they are examining all immigrant arrival cohorts, not just the most recent ones as we are. They also use a wider variety of IRS data, including the 1040 tax returns; we do not use these data since we are primarily concerned with identifying individual immigrants’ earnings in isolation, which might not be discernible on jointly filed tax forms.

¹⁰In Appendix Tables A1 and A2 we show the comparison of several characteristics for the matched and unmatched observations for both matching steps.

enrolled group may differ between native-born and immigrant students. Appendix Table A3 provides the proportions of foreign-born and native-born graduate students, both men and women, with and without existing graduate degrees at the start of our panel. On average the foreign born tend to have an existing graduate degree by about four percentage points more than the native born (this holds for both genders and is a statistically significant difference in each case). For our enrolled group, we ran additional analyses that included an indicator for having an existing graduate degree. The results are qualitatively and quantitatively similar to the main results and are available upon request.

A second composition concern for our enrolled group is that native-born and immigrant students may differ on type of program. If native-born students are more or less likely to be enrolled in PhD programs than are immigrant students, the results we find may be driven more by type of degree attained than by a U.S.-acquired versus foreign degree. We assessed the Employer Identification Number (EIN) for all students enrolled at the start of the panel, under the assumption that, unlike master’s students, most PhD students would be at least partially employed by their university for the duration of their program. We defined students whose W-2s report the same EIN for at least 5 years as likely PhD students, and found that the composition of PhD students did not differ between native-born and foreign students. As in the case of existing graduate degrees, adding an indicator for “likely PhD student” did not alter our results.

Table 1: Table of Dataset Creation by Subsequent Merges for Immigrants in Age Range 18-45

| Panel A Men | Count | Percent of Row Above |
|--|-------|----------------------|
| Total Observations for Arrival Cohorts (2005-2007) | 4,200 | - |
| Not Missing PIK | 3,300 | 0.79 |
| Found in W-2s and/or 1099s | 2,600 | 0.79 |
| Panel B Women | Count | Percent of Row Above |
| Total Observations for Arrival Cohorts (2005-2007) | 3,600 | - |
| Not Missing PIK | 2,300 | 0.64 |
| Found in W-2s and/or 1099s | 1,500 | 0.65 |

Source: ACS 2005–2007 (top two rows) matched to IRS W-2s (2007–2007). Sample is all immigrants ages 18–45 who are recent arrivals and are either hold a graduate degree or are currently in graduate school (see text for definition).

3 Research Methodology

3.1 Estimating the Return Migration of New Immigrant Arrival Cohorts

For each year of data we count up the total number of individuals who have a reported W-2 or 1099 form from the original entry cohort count (2005–2007) of groups defined by immigrant versus native, enrolled versus existing degree, and men and women. These proportions will then be plotted in a figure (see Figure 1) for each group over 2005–2015. These graphs show the proportion present in the data for

each year for the recent immigrant arrival groups, with the assumption that absence from the W-2 or 1099 data is a sign of return migration. It is important to note that the data only allow us to observe whether an individual reports W-2s or 1099s in a given year; therefore, it is possible to observe “gaps” in reporting that capture those who drop out of the formal labor force and subsequently return. That being said, in previous research we show that individuals who do not report having a W-2 or 1099 for consecutive years have probably left the U.S. (see footnote 3).

For a comparison, we include a similar set of observations for the native-born population that either has a graduate degree or is in graduate school in 2005 and in the same age range. This comparison group allows us to examine whether there are similar reductions for the native-born in reporting of either (or both) W-2s or 1099s over the same period. Results are provided separately for men and women. We report changes in the initial rate of reporting of W-2s or 1099s from the initial 2007 value for the native-born; in practice, this means that we normalize the native-born rate of reporting W-2s or 1099s in 2005 to one and show deviations from that amount in subsequent years.

3.2 Estimating the Earnings Assimilation of New Immigrant Arrival Cohorts

Our primary analysis examines the earnings assimilation of highly educated immigrants to that of highly educated native-born individuals. We follow the same two categories of individuals over time: 1) newly arrived immigrants who already have a graduate degree (presumably acquired abroad); and 2) newly arrived immigrants who report being currently enrolled in graduate school in the U.S. regardless of previous degree status. We compare each immigrant group to their native-born counterparts, examining potential differences in earnings assimilation depending on where education was acquired.

The empirical equation is given below:

$$Y_i = \alpha + \beta \times Immigrant_i + \theta_i + \lambda_i + \gamma_i + \epsilon_i \quad (1)$$

for each year separately (2007–2015).

In our equation, Y is the log of earnings for an individual for a single year, where earnings is the sum of all W-2 and 1099 earnings reports. We include a state of residence fixed effect θ_i , a country of birth fixed effect λ_i , and an age fixed effect γ_i . The coefficient of interest is β , which indicates the difference in log earnings for an immigrant relative to a native-born individual. We disaggregate the immigrants into two further groups: immigrants who remain for all years in our analysis (2007–2015) and those who return migrate sometime prior to 2015. We then plot the coefficient β by year by group in the figures.

We identify those whom we classify as leavers or return migrants based on whether they have reported W-2 or 1099 forms for a particular year. Individuals are only coded as leavers when they are missing in our data for consecutive years until 2015. Table 2 shows how we code individuals based on whether they have missing W-2 or 1099 forms in our data for the pooled ACS arrival cohorts 2005–2007. Our methods allow individuals to have short unemployment spells and not be counted as leavers as long as they are observed to have a W-2 or 1099 again at some later time.¹¹ The bottom row of the table

¹¹As mentioned in footnote 3, there is outside evidence that individuals who are not present in the administrative data have probably left the U.S. entirely. We should also point out that it is not possible to state with

implies that individuals with data for 2007 and 2015 are coded as part of the panel (or continuously present) observations in our data.

Table 2: Identifying a Return Migrant in Our Data for All ACS Arrival Cohorts 2005–2007

| First W-2/1099 Observation | Final W-2/1099 Observation | Identified as Missing in Subsequent Years? |
|-------------------------------|-------------------------------|---|
| 2007 | 2007 | Yes |
| 2007 | 2008 | Yes |
| 2007 | 2009 | Yes |
| 2007 | 2010 | Yes |
| 2007 | 2011 | Yes |
| 2007 | 2012 | Yes |
| 2007 | 2013 | Yes |
| 2007 | 2014 | Yes |
| 2007 | 2015 | No |

certainty that individuals present in 2015 are present in the next year, because our data end in 2015.

4 Return Migration Immigrants Educated Domestically and Internationally

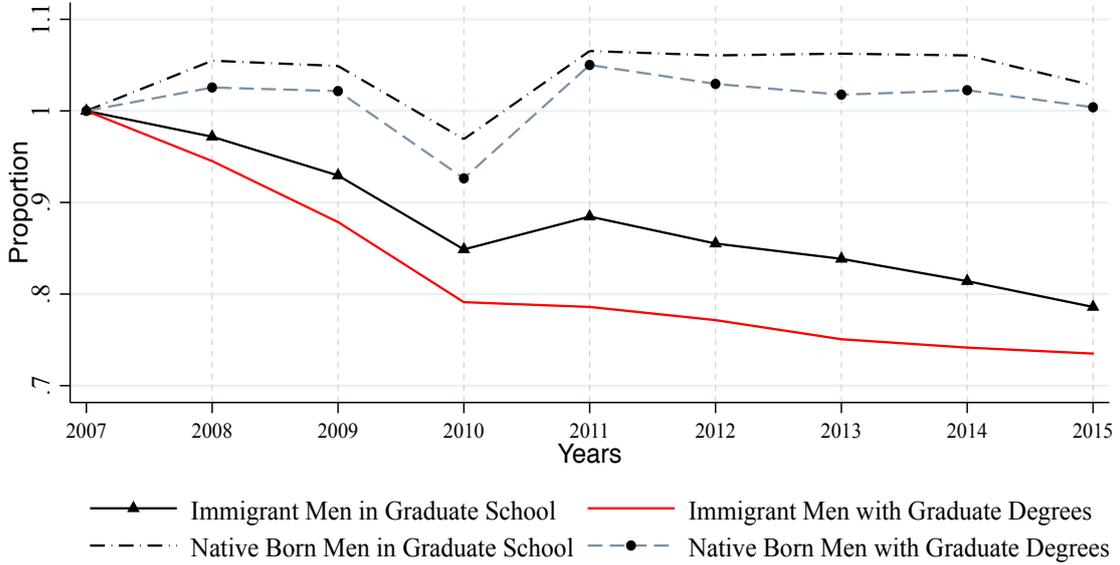
In Panel A of Figure 1 we provide the return migration of male immigrants who reported that they were enrolled in graduate school in the U.S. or that they already had a graduate degree when they entered in 2005, 2006, or 2007. Each line represents the count of the group who appears in W-2 or 1099 records, with an absence indicating return migration. For comparison, we also include analogous rates for native-born men in this age range who also report being enrolled in graduate school in the ACS cohorts for 2005–2007; in the case of the native-born, we interpret absence as a lack of labor force participation. Each group’s rate of presence is normalized to one for 2007. For simplicity, we do not show confidence intervals, but describe where differences are statistically significant at traditional levels. We show that over time there are fewer individuals reporting a W-2 or 1099 across our study period for immigrants compared to natives, a difference that is statistically significant for all years. Overall return migration rates are lower for individuals who received their graduate degrees in the U.S. compared to those who arrived in the U.S. with a graduate degree, although these trends are only statistically different between 2010 and 2014. The difference is about five percentage points. There is an almost continuous downward trend over the observed period, with a slight uptick in 2011 for the immigrants who went to graduate school in the U.S. This uptick is contemporaneous with an uptick in native-born labor-force participation.

For the native-born there is a dip in 2010, which is the year of the Great Recession with the highest unemployment rates. Subsequently, we observe an increase in the proportion (relative to the initial number of individuals reporting in 2007) of labor force participation as recovery occurs. Overall, the two native-born groups follow similar trends over time.

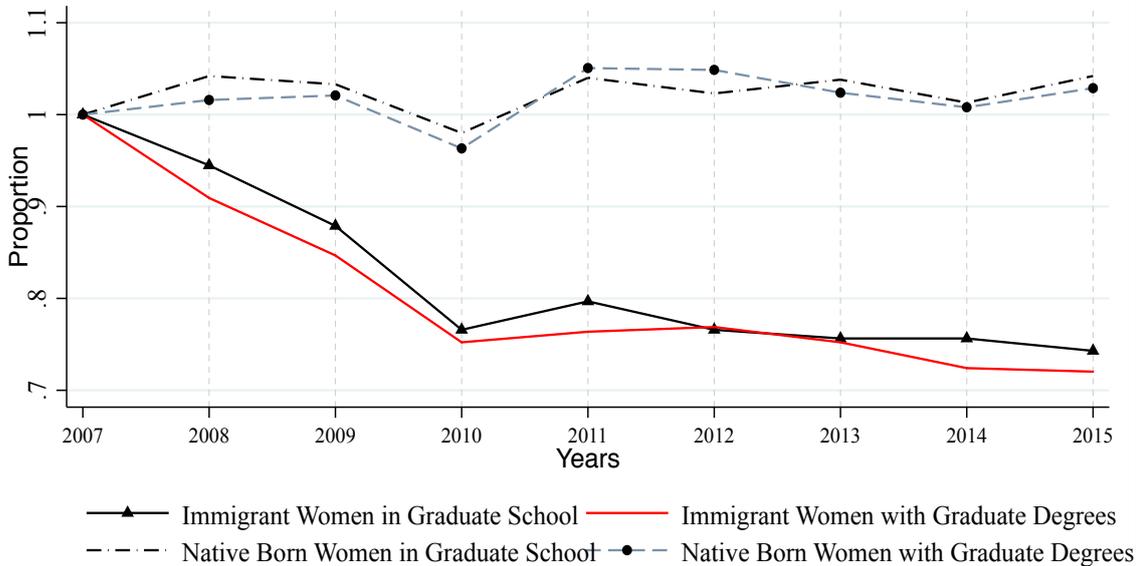
In Panel B we provide a similar analysis for women with the same group assignments. Unlike men, return migration rates for immigrant women do not look different (and are not statistically different) depending on whether the degree was acquired abroad or in the U.S. Labor force participation rates for native-born women also do not vary by group. We note that native-born women display the same increase in reporting of W-2s and 1099s in 2011 as men do.

Figure 1: Return Migration of Immigrants with Graduate Degree and for Those in Graduate School in Panel Data 2005–2007 Arrival Cohorts

Panel A: Men



Panel B: Women



Notes: Each point represents the proportion of each group that is present in the data for each year. We start our analysis in 2007 and take that as the complete immigrant arrival cohort. For the native-born, we take the proportion reporting a W-2 or 1099 in 2005 as the base amount and subsequent amounts are relative to that 2007 rate. Source: ACS 2005–2007 and IRS W-2s or 1099 data (2007–2015).

5 Earnings Experience for Immigrants

In this section, we show the earnings assimilation for immigrants over all years in our study by whether they were enrolled in graduate school on arrival or arrived with a graduate degree. In the figures that follow, we plot the estimated coefficients, based on Equation 1, for the immigrant indicator variable for the two subgroups of immigrants: those who end up leaving the data at some point in the 9-year panel (the return migrants) and those who remain for the entire period. The regressions are conducted for each year separately, and we plot the estimated coefficients for each of these two groups in the figures. We present the results by initial education level at the time of arrival (graduate degree or enrolled in graduate school) and by gender.

5.1 Earnings Experience for Immigrants Educated Domestically or Internationally

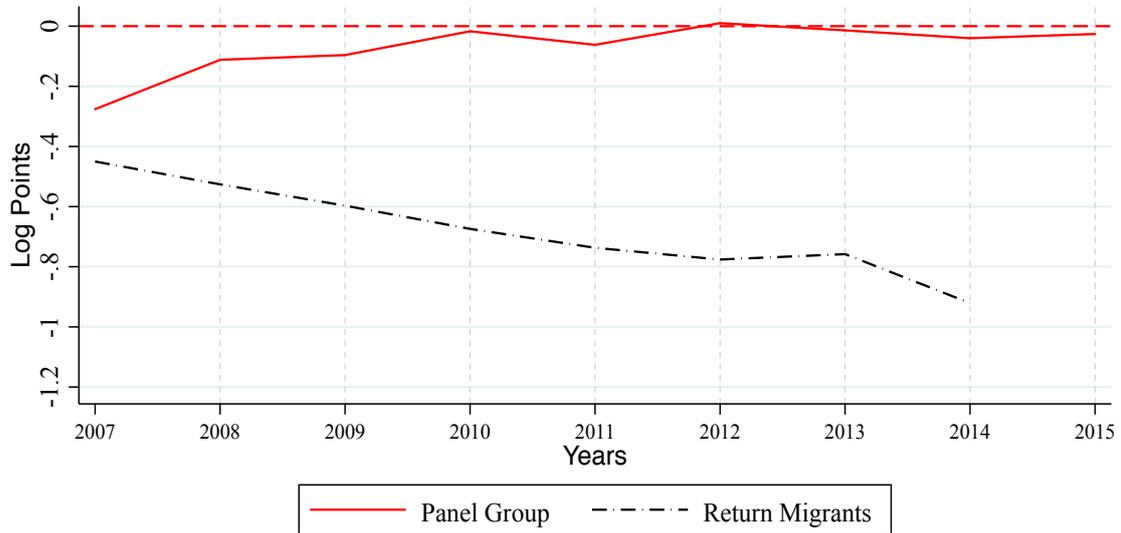
In Figure 2 Panel A, we show earnings assimilation for men who have a graduate degree acquired abroad over 2007–2015 and for women in Panel B. In the first panel, we plot a line for the panel data observations and for the return migrants. We first note that on average these two groups differ in initial earnings by approximately 0.2 log points, which is approximately \$6,700. The long-term immigrants have 0.25 log points lower earnings than comparable native-born men; it is about 0.45 log points lower for the group of return migrants. Over time we observe that there is a divergence in earnings mobility for the group that remains in the U.S. and for the group that eventually return migrates; by 2014 the vertical difference is almost 1.0 log points. We do not plot the confidence intervals in this graph but note that the estimated coefficients are statistically significant at the 5 percent level for all years for the return migrants and only for the year 2007 for the panel group. The full regression coefficients for all years are given in Appendix Table A4.

The men with graduate degrees that remain for all years in our data approach earnings parity with the native-born men after about five years in the U.S. However, after just the second full year in the U.S., the group that eventually return-migrates experiences downward earnings mobility. This decline continues for all subsequent years. We found a similar result for a less restrictive group of immigrants (all levels of educational attainment) in previous research (Akee and Jones, 2019). Our results indicate that migrants to the U.S. with graduate degrees who stay long term tend to quickly assimilate to the earnings of native-born men. Thus job loss and earnings decreases may be determinants of return migration for those drawn from this same initial arrival cohort and educational group.

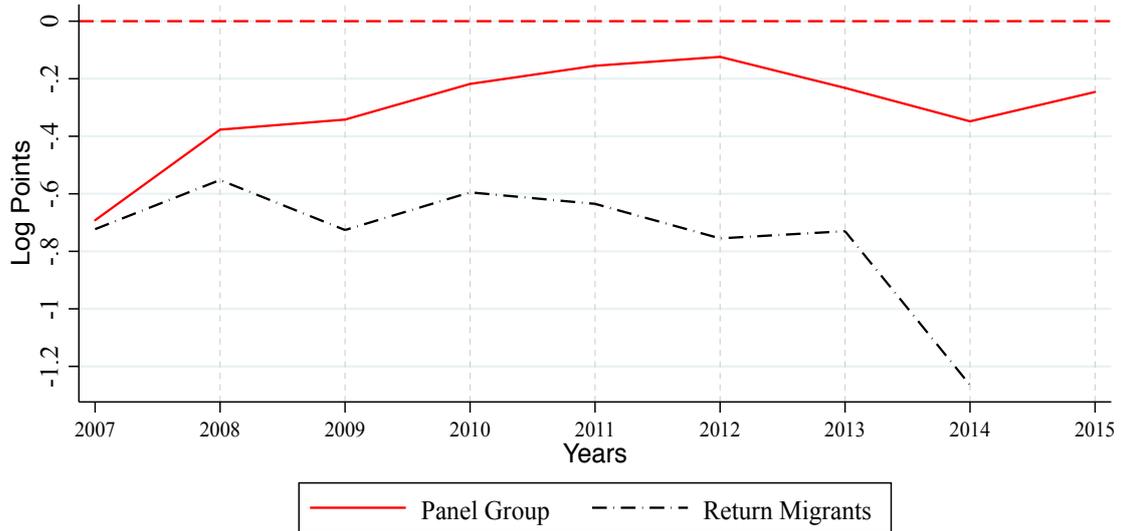
In Panel B we provide the same analysis for women. Initial earnings differ little between the panel group and return migrants in 2007, with the panel group having slightly higher initial earnings on average—approximately \$700. However, we observe the same strong upward mobility for the panel group as the number of years in the U.S. increases. Earnings for women in this group do not reach parity with their native-born counterparts, as was the case with men. While female return migrants exhibit downward earnings mobility, it is not as pronounced as it was for the men in the previous panel until 2014. The estimated coefficients for both groups of women (panel and return migrants) are statistically significant at the 5% level for all years; the full regression coefficients for all years are given in Appendix Table A5.

Figure 2: Log Immigrant-Native Earnings for Individuals with Prior Graduate Degrees in Panel Data, Ages 18–45 for 2005–2007 Arrival Cohorts

Panel A: Men



Panel B: Women



Notes: Each point represents the estimated coefficient on an immigrant indicator variable in a log wage regression conducted separately for each year for each of the two subgroups relative to the native-born population. We include additional control variables in the regression such as state of residence fixed effects, country of birth fixed effects, and age fixed effects. Source: ACS 2005–2007 and IRS W-2s or 1099 data (2007–2015).

5.2 Earnings Experience for Immigrants Educated Domestically

We now turn our attention to a different sub-group of recent immigrant arrivals—those who arrived in the U.S. specifically in order to attend graduate school. We restrict our analysis to only those individuals, immigrant or native-born, that were in graduate school in the years 2005–2007 and exclude all individuals who are not currently enrolled in graduate school in any of those years.

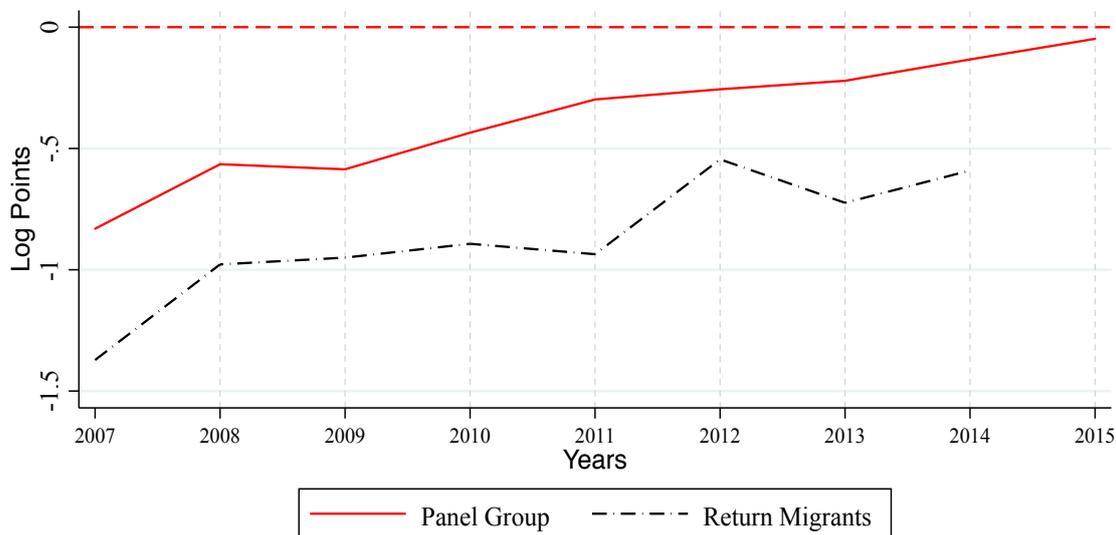
Our analysis is presented in Figure 3 which is based on Equation 1. In the first panel we present the earnings assimilation relative to native-born graduate students for male immigrants who were also initially enrolled. The first result of interest is that the initial earnings differ across the panel and return-migrant groups. This level difference in earnings is shown by the vertical distance in 2007 between these two groups. For example, there is almost a 0.5 log point difference in the earnings at the outset for the full panel compared to the return migrants; this difference is approximately \$14,000 and remains mostly constant over time. In Figure 2 we found that the panel group and the return migrants initially started out with similar average earnings, and there was a strong divergence over time; in this case, there is a relatively large difference in initial earnings between these two subgroups. Additionally, we do not find any evidence for a downward earnings trajectory for those immigrants who end up returning home. This suggests that individuals educated at the graduate level in the U.S. who return migrate may be motivated for other, non-earnings-related reasons. Overall, these results provide evidence of different motivations for return migration based on where one acquires human capital. Note that the estimated coefficients are always statistically significant at the 5 percent level for all groups and all years except for the year 2015 for the panel group. The full set of regressions is provided in Appendix Table A6.

Panel B provides the same analysis for women. We find qualitatively similar results as those found for the men. There are level differences in earnings across the panel group and the returnees, and these persist over the period examined; this difference is also approximately \$14,000. Beginning in 2011, however, we observe some downward earnings mobility for the return migrants. Again, all of the estimated coefficients in these figures are statistically significant at the 5 percent level, and the full set of regressions is provided in Appendix Table A7.

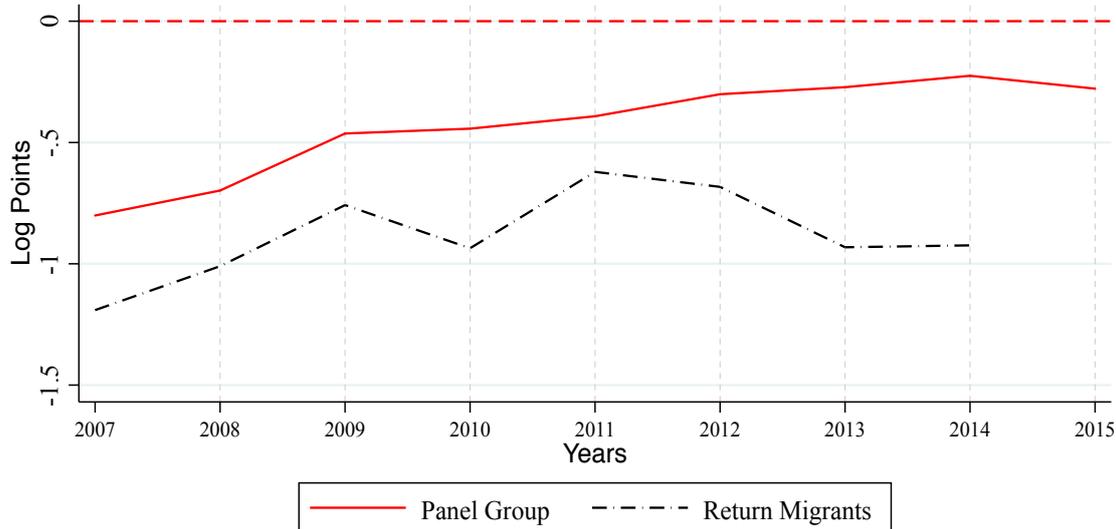
Evaluating all the findings tells an interesting story about whether a U.S. degree is valued higher than a foreign degree. While immigrants with an existing degree appear to have fairly homogeneous value to the U.S. labor market upon arrival, there is an early divergence where those who succeed in the labor market rapidly assimilate to native-born earnings, and those who do not thrive quickly leave. Meanwhile, immigrants who attain a U.S. degree experience earnings growth in every year in the U.S. labor market regardless of eventual return (with the exception of later years for returnee women). They also experience lower return rates than do those with a foreign degree. This indicates an overall higher value for U.S. degrees when differential return migration is accounted for, although immigrants with foreign degrees who survive reach parity faster than immigrants who attain a U.S. degree.

Figure 3: Log Immigrant-Native Earnings for Individuals in Graduate School in Panel Data, Ages 18–45 2005-2007 Arrival Cohorts

Panel A: Men



Panel B: Women



Notes: Each point represents the estimated coefficient on an immigrant indicator variable in a log wage regression conducted separately for each year for each of the two subgroups relative to the native-born population. We include additional control variables in the regression such as state of residence fixed effects, country of birth fixed effects, and age fixed effects. Source: ACS 2005–2007 and IRS W-2s or 1099 data (2007–2015).

6 Conclusion

Our analysis examines whether where one acquires graduate education affects earnings assimilation and return migration for a recent immigrant arrival cohort to the U.S. Our confidential-use, individual-level data provide a nationally representative overview of the earnings outcomes for immigrant arrivals relative to comparable native-born groups. We find that immigrant men with existing graduate degrees are fairly homogeneous in terms of earnings at the start of their time in the U.S., but that return migrants experience a steady downward trend in earnings over time. Immigrants who arrive in order to attend graduate school in the U.S. show a level difference in initial earnings that persists over all years between the full panel and the returnees, but both groups show steady upwards earnings growth. These results suggests there are unobserved characteristics that influence either employment or earnings success in the U.S. labor market and in turn affect these immigrants' long-run return-migration decisions.

We can suggest a few explanations for these patterns in earning trajectories. Immigrants with existing degrees may be rewarded differently in the U.S. depending on the quality and type of their existing degrees. For example, an immigrant arriving to the U.S. with an advanced computer science degree may find it easier to transition into a high-paying U.S. job than will an immigrant with an M.D. Our findings may also indicate that less tangible, non-cognitive skills may play a different role in the U.S. labor market than in the home country; this implies that the U.S. labor market may initially evaluate two immigrants' human capital as equivalent at the outset but reward these skills more for some immigrants than for others.

Meanwhile, the trajectory for those who enroll in school in the U.S. seems to point to heterogeneous characteristics that simultaneously predict type of enrollment and return decisions. The persistent level differences in earnings may indicate differences in areas of study, university funding levels that vary by program, and different returns to degree in the U.S. labor market. Our findings suggest that more work could be done on this topic with additional access to administrative records on program enrollment and degree type. Nevertheless, the findings indicate that a U.S. degree leads to earnings growth in the U.S. labor market regardless of eventual return. Combined with the evidence on immigrants with foreign degrees, the findings suggest that a U.S. degree has a higher return than a foreign degree when return migration is accounted for, but that immigrants with especially valuable foreign degrees and perhaps better non-cognitive skills can quickly achieve earnings parity with the highly educated native-born.

One important caveat is that our analysis period (2005–2015) spans the Great Recession. It would, of course, be instructive to observe return migration of this same group in a non-recession period, and this may be possible in the future as more data become available. In a previous paper ([Akee and Jones \(2019\)](#)), we examined the return migration of all immigrants (excluding immigrants who arrived for graduate school) ages 25–45 in all arrival cohorts from 2005–2014. In Appendix Figure [A3](#) we show the results for the return rates over all years. There appears to be a consistent return of new arrivals over time for that group; however, the return rate does diminish somewhat in the first few years after arrival after the Great Recession than compared to arrival cohorts prior to the Great Recession. Future research using additional years would shed more light on whether the observed results can be generalized to highly educated immigrant populations in non-recession eras.

These results provide some insight on the determinants of return migration and the earnings

assimilation of immigrants. While possessing a high level of educational attainment is useful upon entering (and perhaps in order to enter) the U.S., our research points to unobserved characteristics of foreign-degree holders—either pertaining to the degree or to other types of human capital—that leads to downward-trending earnings and eventual departure. Meanwhile, attaining a U.S. degree is always rewarded, but individuals educated at the graduate level in the U.S. who return migrate may be motivated for other, non-earnings-related reasons.

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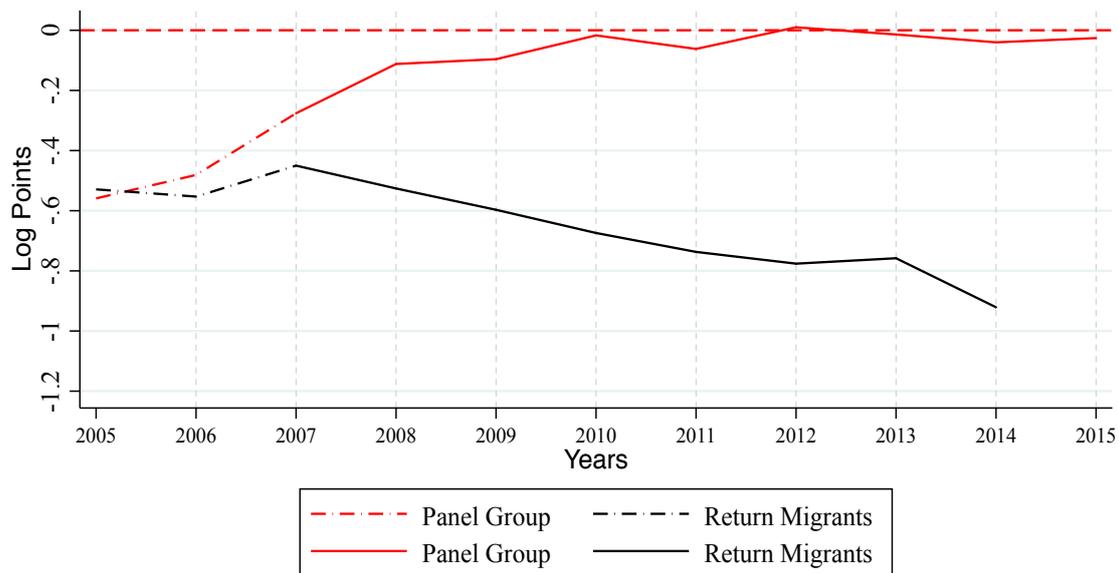
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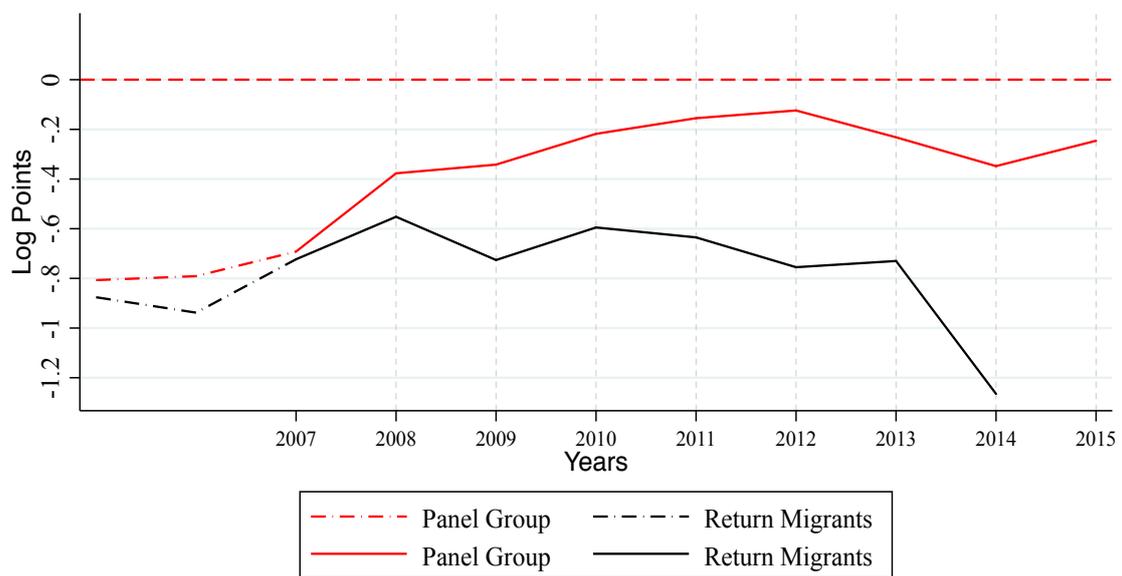
A Appendix Figures

Figure A1: Log Immigrant-Native Earnings for Individuals with Prior Graduate Degrees in Panel Data, Ages 18–45 for 2005–2007 Arrival Cohorts

Panel A: Men



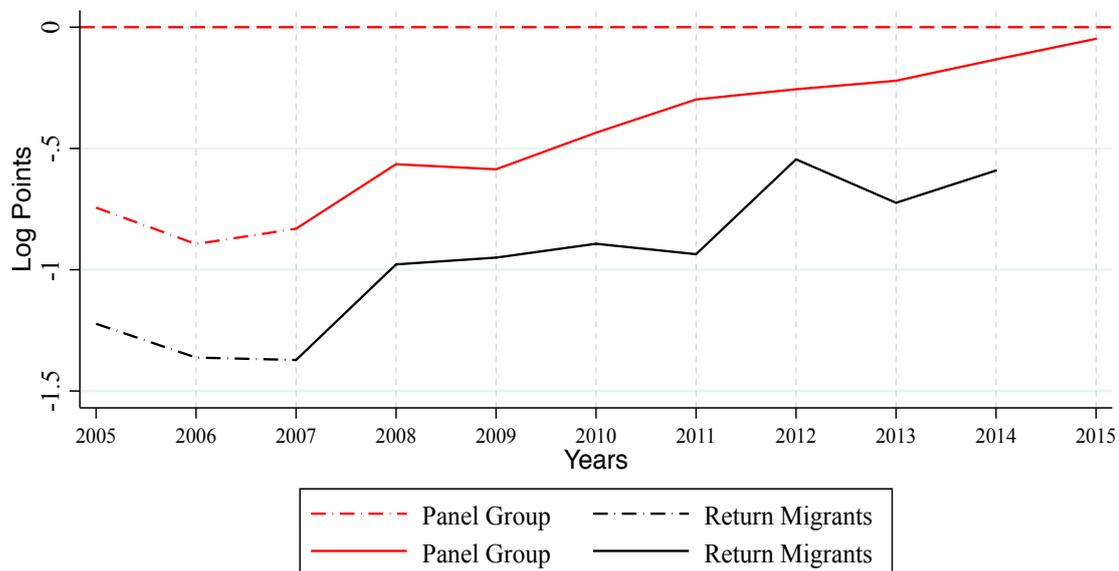
Panel B: Women



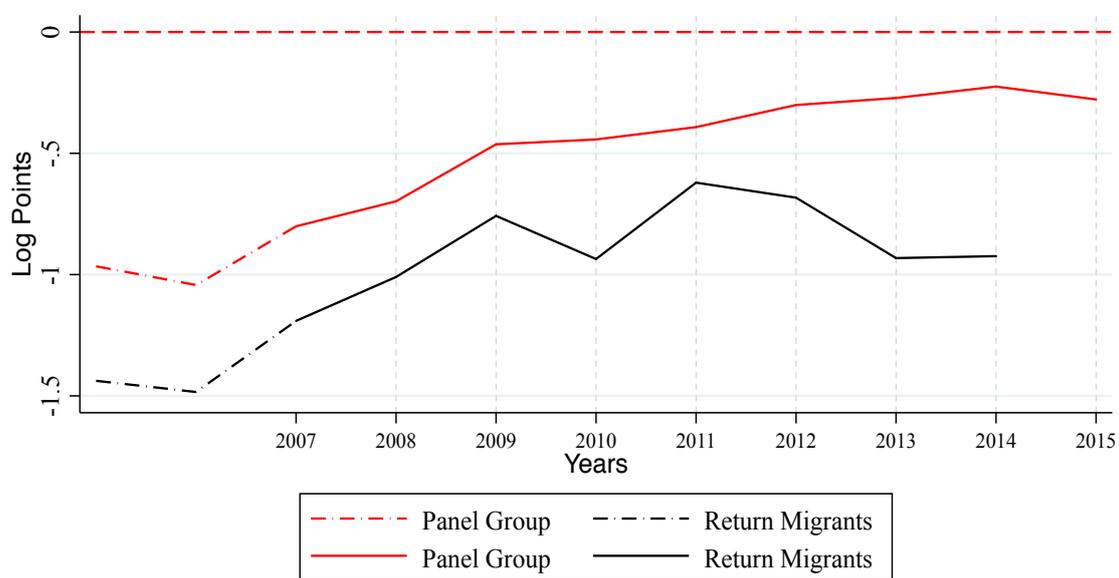
Notes: Each point represents the estimated coefficient on an immigrant indicator variable in a log wage regression conducted separately for each year for each of the two subgroups relative to the native-born population. We include additional control variables in the regression such as state of residence fixed effects, country of birth fixed effects, and age fixed effects. Source: ACS and IRS W-2s or 1099 data (2007-2015).

Figure A2: Log Immigrant-Native Earnings for Individuals in Graduate School in Panel Data, Ages 18–45 2005–2007 Arrival Cohorts

Panel A: Men



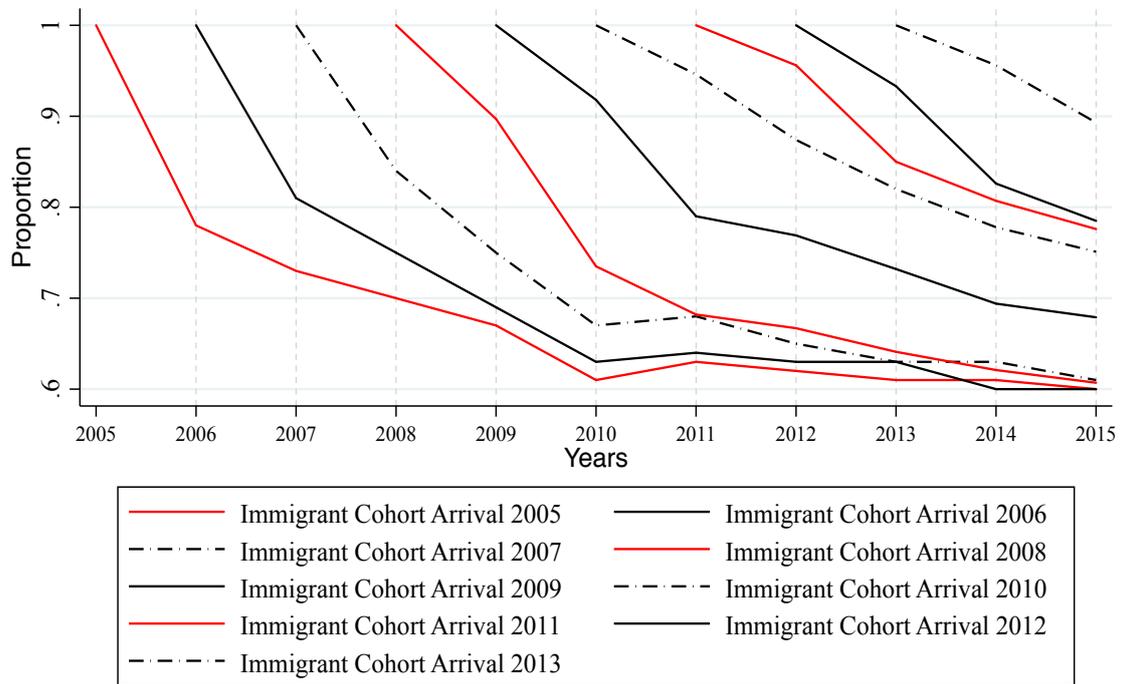
Panel B: Women



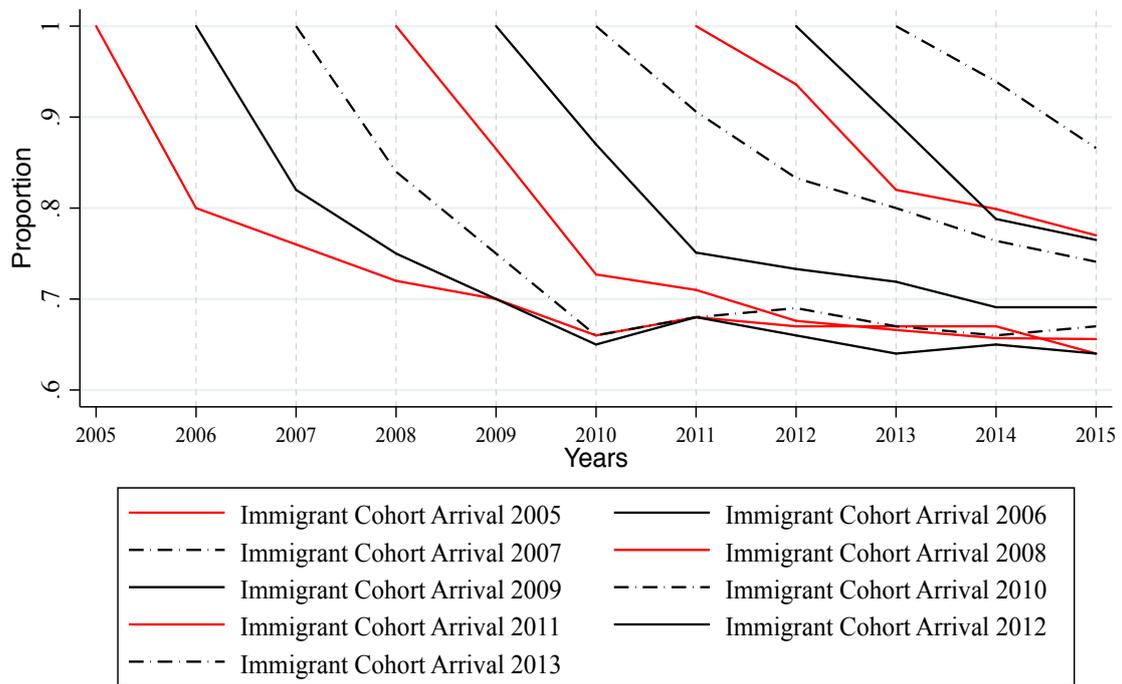
Notes: Each point represents the estimated coefficient on an immigrant indicator variable in a log wage regression conducted separately for each year for each of the two subgroups relative to the native-born population. We include additional control variables in the regression such as state of residence fixed effects, country of birth fixed effects, and age fixed effects. Source: ACS and IRS W-2s or 1099 data (2007–2015).

Figure A3: Return Migration of All Immigrants not in Graduate School in Panel Data 2005–2013
Arrival Cohorts

Panel A: Men



Panel b: Women



Note: Each point represents the proportion of each group that is present in the data for each year. We start our analysis in 2005 and take that as the complete immigrant arrival cohort. For the native-born, we take the proportion reporting a W-2 or 1099 in 2005 as the base amount and subsequent amounts are relative to that 2005 rate. Source: ACS 2005–2013 and IRS W-2s or 1099 data (2005–2015).

B Appendix Tables

Table A1: Table of Means for the Matched ACS to No Missing PIK Observations of New Arrivals

Panel A: Men

| | Matched | | Non-Matched | | T-Statistic |
|---------------------------------|---------|--------------------|-------------|--------------------|-------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | |
| Total Income | 42,350 | 56,600 | 25,420 | 40,600 | 10.11 |
| Wages or Salary Income | 40,500 | 55,100 | 21,820 | 38,400 | 11.68 |
| Self-Employment Income | 500 | 7,100 | 900 | 7,000 | -1.51 |
| Age | 31 | 6 | 31 | 6 | 2.59 |
| Male | 1 | 0 | 1 | 0 | NA |
| Married | 0.56 | 0.49 | 0.43 | 0.49 | 7.06 |
| Less than High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| High School Graduate | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| Some Post High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| College Degree | 0.21 | 0.40 | 0.34 | 0.47 | -7.58 |
| MA or PhD | 0.78 | 0.40 | 0.65 | 0.47 | 7.58 |
| Mexico | 0.02 | 0.16 | 0.07 | 0.25 | -5.69 |
| India | 0.23 | 0.42 | 0.14 | 0.34 | 6.67 |
| Philippines | 0.01 | 0.12 | 0.01 | 0.12 | 0.00 |
| China | 0.10 | 0.30 | 0.08 | 0.28 | 1.87 |
| Canada | 0.03 | 0.17 | 0.02 | 0.15 | 1.72 |
| Other | 0.59 | 0.49 | 0.65 | 0.47 | -3.36 |

Note: There are 3,300 observations in the matched data and 900 observations in the unmatched data. Characteristics are from the 2005 American Community Survey.

Panel B: Women

| | Matched | | Non-Matched | | T-Statistic |
|---------------------------------|---------|--------------------|-------------|--------------------|-------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | |
| Total Income | 20,130 | 35,130 | 10,320 | 28,430 | 9.11 |
| Wages or Salary Income | 18,860 | 34,790 | 8,920 | 27,850 | 9.38 |
| Self-Employment Income | 300 | 3,800 | 300 | 3,400 | 0.00 |
| Age | 30 | 6 | 30 | 6 | 2.05 |
| Male | 0 | 0 | 0 | 0 | NA |
| Married | 0.60 | 0.48 | 0.63 | 0.48 | -1.80 |
| Less than High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| High School Graduate | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| Some Post High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| College Degree | 0.20 | 0.40 | 0.22 | 0.42 | -1.40 |
| MA or PhD | 0.79 | 0.40 | 0.77 | 0.42 | 1.40 |
| Mexico | 0.02 | 0.16 | 0.05 | 0.23 | -4.17 |
| India | 0.18 | 0.38 | 0.23 | 0.42 | -3.55 |
| Philippines | 0.03 | 0.18 | 0.01 | 0.11 | 4.13 |
| China | 0.10 | 0.31 | 0.06 | 0.25 | 4.22 |
| Canada | 0.04 | 0.20 | 0.01 | 0.12 | 5.62 |
| Other | 0.59 | 0.49 | 0.60 | 0.48 | -0.60 |

Note: There are 2,300 observations in the matched data and 1,300 observations in the unmatched data. Characteristics are from the 2005 American Community Survey.

Table A2: Table of Means for the Matched to W-2 Data of New Arrivals

| Panel A: Men | Matched | | Non-Matched | | T-Statistic |
|---------------------------------|---------|--------------------|-------------|--------------------|-------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | |
| Total Income | 43,580 | 58,520 | 37,450 | 48,050 | 2.85 |
| Wages or Salary Income | 42,330 | 57,110 | 33,170 | 45,560 | 4.46 |
| Self-Employment Income | 300 | 4,500 | 1,430 | 13,000 | -2.26 |
| Age | 31 | 6 | 33 | 6 | -5.88 |
| Male | 1 | 0 | 1 | 0 | NA |
| Married | 0.54 | 0.49 | 0.61 | 0.48 | -3.41 |
| Less than High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| High School Graduate | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| Some Post High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| College Degree | 0.21 | 0.41 | 0.18 | 0.39 | 1.79 |
| MA or PhD | 0.78 | 0.41 | 0.81 | 0.39 | -1.79 |
| Mexico | 0.02 | 0.16 | 0.02 | 0.15 | 0.00 |
| India | 0.26 | 0.44 | 0.08 | 0.27 | 13.47 |
| Philippines | 0.01 | 0.11 | 0.01 | 0.12 | 0.00 |
| China | 0.10 | 0.31 | 0.08 | 0.27 | 1.68 |
| Canada | 0.03 | 0.17 | 0.01 | 0.13 | 3.37 |
| Other | 0.55 | 0.50 | 0.77 | 0.41 | -12.00 |

Note: There are 2,600 observations in the matched data and 700 observations in the unmatched data. Characteristics are from the 2005 American Community Survey.

Panel B: Women

| Panel B: Women | Matched | | Non-Matched | | T-Statistic |
|---------------------------------|---------|--------------------|-------------|--------------------|-------------|
| | Mean | Standard Deviation | Mean | Standard Deviation | |
| Total Income | 22,500 | 36,210 | 15,180 | 32,200 | 4.77 |
| Wages or Salary Income | 21,350 | 35,890 | 13,660 | 31,750 | 5.07 |
| Self-Employment Income | 200 | 3,270 | 500 | 4,620 | -1.55 |
| Age | 30 | 6 | 31 | 6 | -4.88 |
| Male | 0 | 0 | 0 | 0 | NA |
| Married | 0.56 | 0.49 | 0.69 | 0.46 | -6.05 |
| Less than High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| High School Graduate | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| Some Post High School Education | 0.00 | 0.00 | 0.00 | 0.00 | NA |
| College Degree | 0.22 | 0.41 | 0.15 | 0.36 | 4.06 |
| MA or PhD | 0.77 | 0.41 | 0.84 | 0.36 | -4.06 |
| Mexico | 0.02 | 0.15 | 0.03 | 0.18 | -1.28 |
| India | 0.19 | 0.39 | 0.15 | 0.36 | 2.36 |
| Philippines | 0.04 | 0.20 | 0.02 | 0.14 | 2.71 |
| China | 0.12 | 0.32 | 0.07 | 0.26 | 3.89 |
| Canada | 0.05 | 0.22 | 0.02 | 0.16 | 3.62 |
| Other | 0.55 | 0.49 | 0.67 | 0.46 | -5.58 |

Note: There are 1,500 observations in the matched data and 800 observations in the unmatched data. Characteristics are from the 2005 American Community Survey.

Table A3: Proportion with Graduate Degrees or Less for Those Enrolled in Graduate School

| | Males | | Females | |
|-----------------------------|--------------|-------------|--------------|-------------|
| | Foreign Born | Native Born | Foreign Born | Native Born |
| Less than Graduate Degree | 0.588 | 0.628 | 0.591 | 0.63 |
| Has Graduate Degree already | 0.411 | 0.371 | 0.408 | 0.369 |

Table A4: Table of Earnings Regressions for Men with Graduate Degrees

| Panel A: Panel Data Earnings Regression | | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| | Log Earnings in | | | | | | | | | | |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Immigrant | -0.559 (0.117) | -0.481 (0.100) | -0.276 (0.072) | -0.112 (0.089) | -0.096 (0.089) | -0.017 (0.077) | -0.062 (0.084) | 0.010 (0.090) | -0.014 (0.090) | -0.040 (0.070) | -0.026 (0.097) |
| Observations | 14,500 | 14,000 | 15,000 | 15,000 | 15,000 | 14,000 | 15,500 | 15,000 | 15,000 | 15,500 | 15,000 |
| R-squared | 0.086 | 0.073 | 0.058 | 0.049 | 0.034 | 0.030 | 0.028 | 0.026 | 0.024 | 0.019 | 0.020 |

| Panel B: Attriters Earnings Regression | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Log Earnings in | | | | | | | | | |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Immigrant | -0.529 (0.086) | -0.553 (0.097) | -0.450 (0.071) | -0.526 (0.056) | -0.597 (0.098) | -0.674 (0.141) | -0.737 (0.163) | -0.776 (0.163) | -0.758 (0.106) | -0.921 (0.261) |
| Observations | 14,500 | 14,000 | 14,500 | 15,000 | 15,000 | 13,000 | 15,000 | 14,500 | 14,500 | 14,500 |
| R-squared | 0.087 | 0.070 | 0.069 | 0.053 | 0.043 | 0.037 | 0.035 | 0.033 | 0.028 | 0.023 |

Includes state fixed effects, age fixed effects, country of birth controls, and a constant. Standard errors clustered at state of residence. Note that there are more observations in these regressions because the stock of individuals with graduate degrees is larger than those currently enrolled in graduate school. *** p<0.01, ** p<0.05, * p<0.1.

Table A5: Table of Earnings Regressions for Women with Graduate Degrees

| Panel A: Panel Data Earnings Regression | | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| | Log Earnings in | | | | | | | | | | |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Immigrant | -0.807 (0.092) | -0.791 (0.104) | -0.692 (0.074) | -0.377 (0.091) | -0.342 (0.076) | -0.218 (0.068) | -0.155 (0.080) | -0.124 (0.087) | -0.232 (0.097) | -0.348 (0.081) | -0.246 (0.103) |
| Observations | 16,000 | 16,000 | 16,000 | 16,500 | 16,500 | 15,500 | 17,000 | 17,000 | 16,500 | 16,500 | 17,000 |
| R-squared | 0.031 | 0.031 | 0.027 | 0.020 | 0.022 | 0.021 | 0.016 | 0.020 | 0.017 | 0.020 | 0.022 |

| Panel B: Attriters Earnings Regression | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| | Log Earnings in | | | | | | | | | |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Immigrant | -0.876 (0.084) | -0.938 (0.098) | -0.723 (0.105) | -0.552 (0.078) | -0.726 (0.132) | -0.595 (0.125) | -0.635 (0.149) | -0.755 (0.188) | -0.730 (0.201) | -1.265 (0.336) |
| Observations | 16,000 | 15,500 | 16,000 | 16,500 | 16,500 | 15,500 | 17,000 | 16,500 | 16,000 | 16,000 |
| R-squared | 0.034 | 0.036 | 0.031 | 0.023 | 0.029 | 0.027 | 0.018 | 0.023 | 0.019 | 0.023 |

Includes state fixed effects, age fixed effects, country of birth controls, and a constant. Standard errors clustered at state of residence. Note that there are more observations in these regressions because the stock of individuals with graduate degrees is larger than those currently enrolled in graduate school. *** p<0.01, ** p<0.05, * p<0.1

Table A6: Table of Earnings Regressions for Men in Graduate School

| Panel A: Panel Data Earnings Regression | | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| VARIABLES | Log Earnings in | | | | | | | | | | |
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
| Immigrant | -0.744 (0.089) | -0.894 (0.085) | -0.831 (0.068) | -0.565 (0.094) | -0.586 (0.093) | -0.435 (0.088) | -0.298 (0.075) | -0.256 (0.062) | -0.221 (0.082) | -0.133 (0.063) | -0.048 (0.065) |
| Observations | 4,200 | 4,200 | 4,400 | 4,600 | 4,600 | 4,300 | 4,700 | 4,700 | 4,700 | 4,700 | 4,600 |
| R-squared | 0.202 | 0.200 | 0.156 | 0.111 | 0.087 | 0.070 | 0.046 | 0.032 | 0.027 | 0.032 | 0.030 |

| Panel B: Attriters Earnings Regression | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| VARIABLES | Log Earnings in | | | | | | | | | |
| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
| Immigrant | -1.223 (0.122) | -1.362 (0.130) | -1.372 (0.131) | -0.978 (0.113) | -0.950 (0.081) | -0.893 (0.115) | -0.936 (0.176) | -0.545 (0.115) | -0.724 (0.140) | -0.591 (0.235) |
| Observations | 4,000 | 4,000 | 4,200 | 4,400 | 4,300 | 3,900 | 4,300 | 4,200 | 4,200 | 42,00 |
| R-squared | 0.183 | 0.179 | 0.167 | 0.114 | 0.091 | 0.087 | 0.057 | 0.041 | 0.037 | 0.042 |

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

Includes state fixed effects, age fixed effects, country of birth controls and a constant. Standard errors clustered at state of residence.

Table A7: Table of Earnings Regressions for Women in Graduate School

| Panel A: Panel Data Earnings Regression | | | | | | | | | | | |
|---|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | Log Earnings in | | 2012 | 2013 | 2014 | 2015 |
| | | | | | | 2010 | 2011 | | | | |
| Immigrant | -0.966 (0.147) | -1.043 (0.156) | -0.801 (0.105) | -0.698 (0.152) | -0.463 (0.085) | -0.443 (0.087) | -0.392 (0.089) | -0.301 (0.102) | -0.272 (0.099) | -0.225 (0.085) | -0.278 (0.073) |
| Observations | 6,000 | 5,800 | 6,000 | 6,200 | 6,200 | 5,900 | 6,200 | 6,100 | 6,200 | 6,100 | 63,00 |
| R-squared | 0.087 | 0.065 | 0.068 | 0.042 | 0.035 | 0.036 | 0.030 | 0.023 | 0.019 | 0.019 | 0.024 |

| Panel B: Attriters Earnings Regression | | | | | | | | | | |
|--|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| VARIABLES | 2005 | 2006 | 2007 | 2008 | 2009 | Log Earnings in | | 2012 | 2013 | 2014 |
| | | | | | | 2010 | 2011 | | | |
| Immigrant | -1.438 (0.117) | -1.484 (0.106) | -1.191 (0.162) | -1.010 (0.184) | -0.758 (0.099) | -0.936 (0.152) | -0.621 (0.159) | -0.683 (0.269) | -0.932 (0.265) | -0.924 (0.317) |
| Observations | 5,900 | 5,700 | 5,900 | 6,100 | 6,000 | 5,700 | 6,000 | 5,900 | 6,000 | 5,800 |
| R-squared | 0.111 | 0.080 | 0.093 | 0.057 | 0.053 | 0.043 | 0.030 | 0.031 | 0.032 | 0.024 |

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

Includes state fixed effects, age fixed effects, country of birth controls and a constant. Standard errors clustered at state of residence.