Essays in Economics of Immigration

by

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Dissertation submitted in partial fulfillment of the requirements for the degree of
Doctor of Philosophy in the Department of Economics
in the Graduate School of Duke University
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Abstract

This dissertation consists of two related essays on the economics of immigration.[1] The first chapter presents new evidence on whether the earnings of foreign-born workers grow faster than that of similarly educated natives. We compare cross-sectional and panel analyses of assimilation in the U.S. context. The panel data allow us to control for fixed unobserved heterogeneity in earnings. As others have found for earlier entry cohorts, we find that immigrants with less than a college education start at an earnings disadvantage but converge toward native earnings with time in the U.S. in the cross-section. Lower earning immigrants selectively leave on-the-books jobs. We also find substantial selection among low earnings natives who also tend to work less and leave the labor force earlier. Both groups display selection and the net result is that controlling for fixed unobserved heterogeneity has little effect on the relative earnings growth of low-skilled immigrants.

We find very different results for high-skilled workers. In the cross-sectional analysis, immigrants whose highest level of education is a bachelor's degree exhibit a decline in relative earnings with time in the U.S. However, for these immigrants, the inclusion of an individual fixed effect reveals faster earnings growth relative to natives. Among both immigrants and natives, lower earners selectively leave the

[1] Any opinions and conclusions expressed herein are those of the author and do not necessarily represent the views of the U.S. Census Bureau. All results have been reviewed to ensure that no confidential information is disclosed. This research uses data from the Census Bureau's Longitudinal Employer Household Dynamics Program, which was partially supported by the following NSF Grants SES-9978093, SES-0339191 and ITR-0427889; NIA Grant AG018854; and grants from the Alfred P. Sloan Foundation.

covered sector. However, because low earning immigrants who remain in the sample become more likely to work with time in the U.S., the net result is that the average earnings of immigrants diminish. These results indicate that controlling for individual heterogeneity is important in estimating the economic assimilation of immigrants.

The second chapter examines the role of the workplace in earnings assimilation. Using an earnings panel much like in the first chapter, we consider whether job characteristics such as firm size, industry, and firm specific tenure can account for earnings differences between native and foreign-born workers. We focus on workers with less than a college education and find that the job characteristics considered account for almost all of the faster earnings growth of high school dropouts and half of the faster earnings growth of high school graduate immigrants. Rising relative job tenure of immigrants is the most important factor.

To mom, dad, and Rachael: Thank you for all the love, prayers, and support.

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1

Earnings Assimilation of Foreign-Born Workers in the United States

1.1 Introduction

The inflow of new immigrants into the United States has been a hotly debated policy issue for many decades. There is a great deal of work investigating the earnings differences between immigrant and native-born workers.[1] Most of these studies use U.S. Decennial Census data which has the advantage of having large cross-sectional samples of immigrants with consistent measurement of both year of entry into the U.S. and earnings.[2] Some inference can be made by following immigrants across census years who migrated to the U.S. in a specific time period (e.g. 1975-1980). Analyses relying on synthetic cohorts are limited by return migration changing the composition of a synthetic cohort over time. Additionally, studies on wages or earnings of immigrants over time rely on calculating statistics on the working population. Less recognized and discussed, selective labor force participation over time of natives as well as immigrants who do not leave the U.S. can also bias cross-sectional estimates

[1] Borjas (1994) and LaLonde and Topel (1997) survey the economic literature on immigration.

[2] Chiswick (1978) and Borjas 1985) are seminal papers that use these data.

of earnings assimilation.

This paper seeks to address these selection concerns by exploiting a panel dataset. We present new evidence on the earnings growth of foreign-born workers compared to similar natives. More specifically, we examine immigrants who entered the U.S. in the late 1990s and compare their earnings to that of similarly educated natives. It is among the first papers to compare cross-sectional and panel analyses of assimilation in the U.S. context using the same data set. The panel data allow us to control for fixed unobserved heterogeneity in earnings. We address selection issues by education level, something theoretically and empirically important.

Consistent with studies of earlier entry cohorts, our cross-sectional results indicate that immigrants with less than a college education start at an earnings disadvantage but converge toward native earnings with time in the U.S. We find evidence of lower earning immigrants selectively leaving the sample. Low earning natives also work less and leave the labor force earlier. Both groups display selection and the net result is that controlling for fixed unobserved heterogeneity has little effect on the relative earnings growth of low-skilled immigrants.

We find very different results for college-educated workers. The cross-sectional analyses suggest that high-skilled immigrants who arrived in the U.S. early in their labor market careers start at an earnings advantage. The relative earnings of immigrants whose highest level of education is a bachelor's degree decline in the cross-section. However, the inclusion of an individual fixed effect reverses this decline. What accounts for the downward bias in estimates of assimilation for this education level? Low earners are more likely to work towards the end of the panel while high earners work throughout the sample period among college graduates. The entry of low earning immigrants tends to lower average earnings of college graduate immigrants over time in the cross-section. While selective attrition of immigrants among high school dropouts and high school graduates counter balances this, there is much

less selective attrition among college graduate immigrants. Highly educated immigrants leave the sample from both the bottom and top of the earnings distribution. For immigrants whose highest level of education is a bachelor's degree, the greater participation of low earners in later years outweighs the modest effect of low earners leaving the panel, resulting in a decline in the relative earnings of these immigrants in the cross-section. These results indicate that cross-sectional analyses of earnings assimilation may result in biased estimates not only due to selective attrition but also because of selective participation in the labor market.

The paper proceeds as follows. Section 1.2 discusses the literature on immigrant assimilation and the literature on wage dispersion more generally that help inform us on what to consider as drivers for assimilation with detailed employer-employee data. Section 1.3 describes the data and presents descriptive statistics on the sample. Section 1.4 discusses the empirical framework to measure earnings assimilation and Section 1.5 presents the results. Section 1.6 concludes.

1.2 Background

Many studies have established that immigrants earn less than native workers upon arrival but converge towards the native-born with time in the U.S. Most earlier studies use U.S. Decennial Census data which has the advantage of having large cross-sectional samples of immigrants with consistent measurement of year of entry into the U.S. and earnings. A second advantage is that, like most household surveys, the Census long-form samples include workers whether or not they are documented, the latter group estimated to be about 30% of the foreign-born population in 2006.[3] The typical approach is to define an entry cohort, for example immigrants entering between 1975 and 1980. The 1980 level of earnings is interpreted as the initial earnings in the U.S., the 1990 level of earnings is interpreted as the level of earnings

[3] Passel (2006)

after 10-15 years, and the 2000 earnings as the level of earnings after 20-25 years in the U.S. Most studies find that initial earnings of immigrants are lower than similar native-born workers but the earnings gap diminishes with time (Borjas 1985; LaLonde and Topel 1992; Borjas 1995).[4]

A recent exception to this finding is Borjas (2013) which finds that while earlier immigrant entry cohorts narrow the earnings gap by around 15 percentage points during the first two decades in the U.S., immigrants who entered the country after the 1980s have a negligible rate of wage convergence. Additionally, Chiswick and Miller (2011) find evidence of "negative assimilation" for immigrants to the U.S. from English Speaking Developed Countries (ESDC). Chiswick and Miller find that immigrants from ESDC countries start at an earnings advantage relative to natives which diminishes with time in the U.S. This finding supports their model of international migration among countries in which immigrants' skills are highly transferable. Immigration occurs when individuals experience a favorable wage draw in the potential destination relative to the wage available in the country of origin. A high wage offer that attracts immigrants need not persist indefinitely and a "regression to the mean" occurs without a deterioration of skills. Negative assimilation is found for ESDC immigrants in the same cross-sectional Census data in which relative earnings increases are found for immigrants born in other countries.

The synthetic cohort approach that is necessary with repeated cross-sections can be affected by both back-and-forth migration and permanent outmigration which change the composition of immigrants remaining to be measured at any census. For instance, rising relative earnings of immigrants could reflect lower earning immigrants leaving the U.S., potentially biasing upward immigrant earnings growth. Additionally, the labor force participation of natives as well as immigrants in the

[4] There has been almost no work that looks at these changes in earnings patterns by level of education.

synthetic cohort can also become selective over time. Using the 2000 Decennial Census, Duncan and Trejo (2012) shows that while overall male employment rates are similar for natives and immigrants, the immigrant-native employment differences vary greatly by education level. They find that although only 72.6% of native high school dropouts are employed, 84.9% of similarly educated immigrants are working. Additionally, immigrant employment may rise with years in the the U.S. Duncan and Trejo (2012) shows immigrants who have been in the US for six or more years are more likely to be employed than recent migrants. The employment of immigrants relative to natives can bias estimates of assimilation in cross-sectional studies. This bias depends both on changes in the relative employment rates of immigrants and natives as they age and on how selection out of the labor force takes place for each group. It is difficult to know a priori the sign of the bias because little is known about the relative rates of employment with age and whether the selection is the same or different for immigrants and natives.

While the availability of appropriate data has been limiting, a number of studies have used longitudinal samples. Using earnings data from the Social Security Administration, Lubotsky (2007) investigates the nature of selective outmigration. Unlike this paper, Lubotsky does not control for education and also does not estimate a fixed effects model but rather, compares estimates of earnings convergence between workers who remained in the U.S. long enough to be measured in the 1990/91 Survey of Income and Program Participation and the 1994 Current Population Survey to estimates from Decennial Census cross-sections. He finds that half the convergence in earnings remains in the panel data, suggesting that lower earning immigrants selectively leave the U.S.

Kim (2011) uses a sample of workers who are observed in two consecutive years from the Current Population Survey Merged Outgoing Rotation Group data and estimates both cross-sectional models and panel models that include individual fixed

effects. While the cross-sectional estimates are similar to those of previous studies, the longitudinal results suggest that immigrant earnings grow slower than that of similar natives. To our knowledge this is the only other paper that compares cross-section and panel analyses of assimilation in the U.S. context using the same data set. While Kim's estimates are based on annual variation in wages, our quarterly panel spans a fourteen year period and has a much larger sample size. Additionally, unlike the previous panel studies, we examine the relative earnings patterns of immigrants by education and find differences in assimilation across skill levels. Finally, we examine the estimates of the individual fixed effects and explore how unobserved worker characteristics relate to selective outmigration.

1.3 Longitudinal Employer-Household Dynamics Data and Descriptive Statistics

1.3.1 Longitudinal Employer-Household Dynamics Data

The data comes from the 2000 Decennial Census 1-in-6 long form which we link to earnings data from the Longitudinal Employer-Household Dynamics (LEHD) database. The LEHD contains quarterly earnings data from complete sets of unemployment insurance (UI) records for 47 states from the early nineties to 2008.[5] We limit our analysis to the 27 states with earnings records that are available starting in 1995 or earlier.[6] Because the data is from UI records, earnings information is not available for the self-employed and for those who work in the informal sector. We exclude earnings observations in agriculture and public administration since coverage is incomplete. While the LEHD contains basic demographic information such as sex, age, and place of birth for all workers as well as the year of application for a Social Security number (SSN), education information is not available and we must rely on

[5] Data from Connecticut, New Hampshire, Massachusetts, and Washington D.C. are not available.

[6] The states in our analysis include: AK, AZ, CA, CO, FL, GA, HI, ID, IL, IN, KS, LA, MD, MN, MO, MT, NC, NM, NY, OR, PA, RI, SD, TX, WA, WY, and WI.

the 2000 Decennial Census for this measure.

Our sample consists of individuals in the 2000 Decennial Census who lived in one of the 27 states considered in 1995 and who are linked to LEHD earnings records for at least 2 quarters. For natives, we use the Decennial Census question "Where did you live 5 years ago?" The answer to this question indicates the state of residence of the individual in 1995 which we use to exclude those who lived outside of the 27 states considered. Since most of the immigrants in our sample were not in the U.S. at the start of the panel, we use the state in which they applied for an SSN as their initial state of residence. The proportion of immigrants who are successfully linked is substantially lower than the proportion of natives. Undocumented immigrants are unlikely to be matched, as are those who have visas that do not authorize them to work, and those working in jobs not covered by UI. Andersson et al. (2010) find that a similar matched sample is reasonably representative of UI-covered employment. Starting from a sample drawn from LEHD earnings records in 2000, they find that the subset that also matches to 2000 Decennial data differs only modestly from the full sample (though their sample is limited to 31 metropolitan areas in 11 states and their immigrant sample is not restricted to individuals arriving between 1995 and 1999). We discuss how this affects the composition of our immigrant sample below.

For this analysis we consider male immigrants who entered the U.S. in 1995-1999 and a random sample of native-born men of the same age who can be linked to LEHD earnings data.[7] The sample is limited to individuals who are 25 years or older at the time of the 2000 Decennial Census and 65 years or younger at the end of our sample period. We only observe education in the Decennial Census and individuals younger than 25 are less likely to have completed their education.

The year of application for an SSN is taken as the year of immigration rather

[7] We take a 10% random sample of all native men who have less than a graduate degree and a 20% random sample of graduate degree holders. We only consider males since the labor force participation of women is more selective.

than the self-reported year of entry in the Decennial Census. The Decennial Census asks "When did this person come to live in the United States?" For those who have had multiple trips to the U.S., it is unclear how they would interpret this question.[8] Table 1.1 gives the mean of the absolute value of the difference between the self-reported year of arrival and the year of applying for an SSN for immigrants in our sample. The mean absolute difference for immigrants taken as a whole is 2.72 years. For more than half of all immigrants, the self-reported year of immigration corresponds to the year in which they applied for an SSN. The discrepancy between the self-reported arrival year and year of SSN application is primarily driven by Mexican immigrants. For about half of this group, the discrepancy is greater than 6.53 years.

The earnings panel begins in 1995 and earnings of an individual who moves across states are included if they work in a UI covered job in one of the 27 states considered. Quarterly earnings are the total earnings from all firms in which the individual works during that quarter.[9] We observe labor force status in the 2000 Decennial Census but not in the LEHD. Although the LEHD has accurate earnings information for those working in UI covered work, when an individual does not work, we only observe a lack of earnings and have no information on labor force status or place of residence. Despite this, we seek to explore how unobserved worker characteristics relate to the labor force participation of natives and immigrants and the outmigration of foreign-born workers.

Attrition in our context is the absence of earnings observations before the end

[8] Lubotsky (2007) matches administrative Social Security earnings records and the 1990/1991 Survey of Income and Program Participation (SIPP) and the 1994 March Supplement to the Current Population Survey (CPS). The SIPP and CPS ask "When did this person come to the United States to stay?" Lubotsky finds that fourteen percent of immigrants in the longitudinal data have earnings prior to the year of their reported arrival in the SIPP or CPS.

[9] Since we are not considering all states and do not know the start date of a particular job, we exclude the first quarter of earnings we observed for each individual since this is not likely to be a full quarter of earnings.

of the sample period. Though not solely the result of workers leaving the U.S., immigrant attrition from the covered sector may shed light on selectivity in outmigration, given the high number of immigrants who return to their countries of origin.[10] Additionally, to consider selective labor force participation, we examine selective participation in covered work for those who remain in the sample until the end of the panel period. As discussed above, there are differences in the labor force participation of natives and immigrants and evidence of increasing participation for immigrants with time in the U.S. Given the limited evidence available on how assimilation affects immigrant-native differences in employment, we believe these exercise provide valuable evidence on this topic, despite the fact that our data does not cover all kinds of jobs or all states.

As mentioned above, the earnings of a worker who moves across states are included in the panel if he works in one of the 27 states considered. Bartel (1989) finds that immigrants are more likely to move within the U.S. than similarly educated natives and those with higher education are more likely to move. If this is the case in our sample, we may be missing more immigrant earnings than native earnings due to higher interstate mobility of immigrants. However, we are likely capturing a majority of interstate moves as we are only missing moves to out-of-sample states. We seek to explore this further in future versions of this paper.[11] Another reason for missing earnings is self-employment. Immigrants are more likely to be self-employed than natives and in the cross-section their likelihood for self-employment increases with time in the U.S (Lofstrom 2002). Since we cannot distinguish between immigrants who have attrited from our panel because of outmigration and those who are

[10] Borjas and Bratsberg (1996) estimate that 18 to 22 percent of legal immigrants who arrived in the U.S. in 1970-1980 left the country by 1980.

[11] We also plan to exploit all 47 available states in year 2008 to investigate the degree to which those who attrit from our panel are working in the other states in year 2008. Although we cannot include the 20 additional states in our main analysis because earnings records are available starting after 1995, by 2008 all additional states have earnings available.

not observed because of self-employment, we must interpret our analysis of selective attrition with caution.

1.3.2 Descriptive Statistics

Table 1.2 displays the education distribution of natives and immigrants in our sample as well as the place of birth distribution of immigrants from the most represented countries of origin. Immigrants are much more likely than natives to be high school dropouts as well as graduate degree holders. Since immigrants in the LEHD are a subset of all U.S. immigrants, we compare the LEHD sample to Decennial Census data to assess how selection into UI covered jobs affects the sample of foreign-born workers.

Column 1 of Table 1.3 presents the place of birth distribution of immigrants in the LEHD full sample. The Public Use sample in Column 3 consists of immigrants who are the same age and live in the same state as those in the LEHD sample and self-reported that they arrived in the U.S. in 1995-1999. About one third of the Public Use sample consists of Mexican immigrants. While Mexico is the largest source country in the full sample, the proportion (17.46%) is much smaller than that found in the Decennial Census, which reflects the nature of our sample selection. As mentioned previously, the LEHD sample under-represents undocumented workers or those who have visas that do not authorize them to work. It also excludes those who work in sectors not covered by UI. The underrepresentation of Mexicans in our sample likely reflects the overrepresentation of Mexican immigrants in the undocumented immigrant population, in work not covered by UI, and in agricultural industries.[12] Any differences in characteristics associated with the different year-of-arrival measures will also disproportionately affect Mexicans, as documented in Table 1.1. In Columns 2 and 4 we see that excluding Mexican immigrants, the country-of-origin

[12] Passel (2006)

distributions of the two samples are fairly similar.

Table 1.4 presents average log quarterly earnings of workers in years 2000, 2004, and 2008. Natives are older than immigrants and have higher earnings in the raw data in 2000. The immigrant earnings gap is calculated by subtracting native log earnings from that of immigrants. High school graduate and graduate degree holding immigrants are at the greatest disadvantages in 2000 with earnings gaps of about -31 to -32% compared to their native counterparts. For all education groups, the raw earnings disadvantage diminishes with time in the U.S. High school dropout immigrants catchup to their native counterparts while foreign-born workers with a high school degree or more remain at a disadvantage in 2008. We note that these earnings disparities between natives and immigrants reflect a combination of differences in hours of work and wages. Because the data does not include a measure of hours worked, our analysis will only consider quarterly earnings rather than wage.

Next, Figure 1.1 displays the distribution of final year of observation. About 67-68% of high school graduate immigrants and natives can be observed working in the covered sector at the end of our sample period. High school dropout immigrants are also observed in 2008 at about the same rate. However, only 58% of high school dropout natives are observed at the end of the panel period. While the lowest skilled natives are less likely to be working in the covered sector than their immigrant counterparts, this is not the case for native-born college graduates. About 74% (70%) of natives whose highest level of education is a bachelor's (graduate) degree are seen working while only about 63% (61%) of similarly educated immigrants are observed. Selective attrition from our panel may bias cross-sectional estimates of earnings assimilation. Unfortunately, we do not have specific information on why earnings are not available in any given year. The individual may have left the country, be unemployed or self-employed, or be working in agriculture or a state that is not in our sample.

Nonrandom participation in the covered sector can also bias estimates of relative earnings growth. We present the distribution of the percentage of total time worked prior to attriting or reaching the end of the sample period in Figure 1.2.[13] For all education groups, with the exception of high school dropouts, natives are more likely than immigrants to be working for 80% or more of the quarters considered. Only 53% of high school dropout natives work for 80% or more of the time while 60% of their immigrant counterparts do so.

1.4 Earnings Assimilation Regressions

Before considering selection issues, we estimate earnings regressions in the spirit of those that are found in the immigrant earnings assimilation literature. We then augment these regressions with person fixed effects to control for selective outmigration and time invariant unobserved heterogeneity. Log quarterly earnings of worker i in quarter t are given by:

$$w_{it} = \alpha_0 + \alpha_1 Age_{it} + \beta_0(Imm_i * AgeMig_i) + \beta_1(Imm_i * YSM_{it}) + \gamma_t + \epsilon_{it} \quad (1.1)$$

The earnings of natives are decomposed by Age_{it}, a quartic in age, and γ_t, year-quarter fixed effects. Immigrant earnings are further decomposed by the effect of age at migration and the effect of years since migration to the United States. An indicator of immigrant status, Imm_i, is interacted with a vector, $AgeMig_i$, composed of indicators for whether an immigrant arrived at ages 20-25, 26-30, 31-35, 36-40, 41-45, or 46 and older.[14] Natives are the omitted group. The effect of time in the United States is captured by a quartic in years since migration, YSM_{it}. The coefficient β_0

[13] For natives, the total possible time worked excludes the first quarter of 1995. For immigrants it excludes the quarters during the year of migration.

[14] Most immigrant assimilation studies consider all immigrants who arrived in the U.S. at age 18 or older. Due to the age restrictions in the sample selection criteria all immigrants in our sample arrived at age 20 or older.

measures the initial immigrant-native earnings gap and β_1 captures changes in the gap with years since migration.

We estimate equation 1.1 using ordinary least squares separately for high school dropouts, high school graduates, those whose highest degree is a bachelor's, and those with graduate degrees. We also include an indicator for professional/Ph.D. degrees in the regression for the highest education group. Typically immigrant earnings assimilation equations such as equation 1.1 also include indicators for year of entry in the U.S. Coefficients on these indicators are taken as a measure of "cohort quality." We are only considering those who immigrated in 1995-1999 and do not include such indicators.

To the extent that attrition from the panel and participation in the covered sector in a given year is not random, cross-sectional estimates of earnings assimilation will be biased. We include a person fixed effect, η_i, to address selection concerns. Log quarterly earnings is then given by:

$$w_{it} = \alpha_1 Age_{it} + \beta_1(Imm_i * YSM_{it}) + \gamma_t + \eta_i + \epsilon_{it} \tag{1.2}$$

We compare estimates of β_1 in equations (1) and (2) to consider whether there is a bias in cross-sectional estimates of assimilation.

In addition to considering the net effect of the inclusion of an individual fixed effect, we directly examine the estimates of these fixed effects. We explore the nature of attrition and selective participation in covered work of both natives and immigrants to further understand the assimilation process.

1.5 Results

1.5.1 Assimilation

Table 1.5 reports regression results for the cross-sectional model. Since the coefficients on the year since migration terms are difficult to interpret in this context,

we present the relative earnings patterns of immigrants that are predicted by the regression results in Figure 1.3. High school dropout immigrants who arrived at ages 25 or younger start at a substantial earnings advantage. However, the initial relative earnings of immigrants decrease as the age at migration increases and later entrants are at large earnings disadvantages compared to similar native workers. The cross-sectional results indicate that most high school dropout immigrants start at an earnings disadvantage which diminishes substantially with time in the U.S. This is also the case for high school graduate immigrants whose relative earnings improve by about 24 percentage points in the first 10 years since migration.

We find dramatic initial earnings advantages of high-skilled foreign-born workers in the cross-section. Immigrants who entered the U.S. before the age of 25 whose highest level of education is a bachelor's (graduate) degree start with earnings advantages of about 29% (20%). As in the low-skilled samples, the initial relative earnings of immigrants decrease as the age at migration increases. Figure 1.3 shows that high-skilled immigrants do not experience a continual increase in relative earnings throughout the first 10 years in the U.S. In fact, about 2 years after migration, immigrants with just a bachelor's degree, experience slower earnings growth leading to an overall decrease in relative earnings of about 4 percentage points 10 years after migration. While immigrants with graduate degrees also do not experience substantial improvements in relative earnings beyond 2 years after migration, their relative earnings are about 12 percentage points higher than when they first arrived.

As discussed above, nonrandom attrition from the panel and selective participation in the covered sector can bias these estimates. We present estimates from the fixed effects model by education in Table 1.6. Figures 1.4 and 1.5 display the predicted relative earnings patterns of immigrants implied by both the cross-sectional analysis and the panel results. Controlling for individual unobserved heterogeneity does not substantially change the estimates of relative earnings growth of high

school dropout foreign-born workers. On the other hand, the inclusion of fixed effects slightly increases the relative earnings gains of high school graduate immigrants after a decade in the U.S.

The inclusion of a person fixed effect has a much more substantial effect in the analysis of high-skilled workers. For workers whose highest level of education is a bachelor's degree, the cross-sectional results suggest a decline in the relative earnings of immigrants two years after migration. However, including an individual fixed effect reveals improvements in relative earnings of about 11 percentage points after a decade in the U.S. suggesting that selection may bias estimates of assimilation for this education group. The estimates of relative earnings gains of graduate degree holding immigrants in the fixed effects model are also greater than that of the cross-sectional analysis with improvements of about 20 percentage points 10 years after migration. We explore the nature of the selection that creates differences in the cross-sectional and panel analyses.

1.5.2 Selection

Cross-sectional estimates of earnings assimilation will differ from estimates obtained from the fixed effect model to the extent that selection into the covered sector differs between immigrants and natives. Given that the assimilation estimates for low-skilled workers are not much changed by the inclusion of a fixed effect, we expect that any selective participation in the covered sector would be similar between natives and their immigrant counterparts. Figure 1.6 displays the mean fixed effect of all those working in a given quarter from 2000-2008 for high school dropouts and graduates. The average fixed effect of high school dropouts who are working increases across the sample period for both native and foreign-born workers. This is also the case to a lesser extent among workers with high school degrees.

The patterns for the college-educated differ more significantly between native

and foreign-born workers. Figure 1.7 shows that among those whose highest level of education is a bachelor's degree, the mean fixed effect of native workers increases slightly over time while the mean fixed effect of immigrant workers decreases across the sample period. These changes in the composition of workers underlie the decline in relative earnings of immigrants in the cross-sectional analysis. As previously discussed, controlling for individual fixed effects results in a reversal of the decline in relative earnings of these immigrants to an improvement in relative earnings. The relative earnings of immigrants with graduate degrees also improve with the inclusion of an individual fixed effect but to a lesser extent than that of those with only a bachelor's degree. Correspondingly, Figure 1.7 depicts similar but less dramatic changes in the composition of native and immigrant workers in the highest education group; the average fixed effect of natives improves while the mean decreases for immigrants.

What accounts for these changes in worker quality across the sample period? First we consider selective attrition, a much emphasized source of bias in cross-sectional estimates of assimilation. As discussed above, Lubotsky (2007) finds evidence that outmigration of low-skilled immigrants biases upwards cross-sectional estimates of earnings assimilation. In Figures 1.8 and 1.9, we examine the nature of selective attrition from our panel. These figures plot the mean fixed effect of all individuals remaining in the sample (seen working in that year or in a later year) across years 2000-2008. The monotonic increase in mean fixed effects across time for each group represented in Figure 1.8 indicates that low earners leave the panel. The negative selection out of the covered sector is most dramatic for native high school dropouts. The average fixed effect of those remaining until 2008 is nearly 25 percentage points higher than the average fixed effect of those in the sample until at least 2000. The average fixed effect of high school dropout natives who have not left the sample before 2000 is about the same as that of their immigrant counterparts. However, the

greater selection in attrition of lower earning natives results in a native mean fixed effect that is 10 percentage points higher than the mean for immigrants who remain in the panel through 2008. Although Figure 1.9 indicates that among high-skilled workers, lower earners are also more likely to attrit, attrition is much less selective for immigrants whose highest level of education is a bachelor's degree.

We consider selective attrition further in Figure 1.10 and 1.11 in which we divide individuals into quartiles of the fixed effect distributions of their education level and examine attrition by these quartiles and immigrant status. These figures plot the percent of individuals in the quartile that are remaining in the sample (seen working in that year or in a later year) across years 2000-2008. In Figure 1.10 we see that for all groups considered, workers in the lowest quartiles are most likely to attrit by 2008. With the exception of high school graduate immigrants in the highest quartile, there is a negative monotonic relationship between quartile and attrition. While this is the case for college-educated natives, Figure 1.11 shows that college-educated immigrants in the highest quartiles are just as likely or more likely to attrit than those in the 25th-49th percentiles and 50th-74th percentiles, suggesting that perhaps the highest earning college-educated immigrants may also be selectively leaving the U.S. Unfortunately, we do not observe whether an individual is still in the U.S. if we do not observe earnings.

Differences between immigrants and natives in the nature of selective attrition do not fully account for the patterns in worker quality in Figures 1.6 and 1.7. For instance, despite differences in the degree of selective attrition among high school dropout immigrants and their native counterparts, the changes in the quality of those working across the sample period are not dramatically different between the two groups, implying nonrandom participation in the covered sector among workers who remain in the panel. Additionally, Figure 1.9 indicates that among high-skilled workers, lower earners are also more likely to attrit. Interestingly, this is the case

for immigrants with a bachelor's degree although Figure 1.7 shows that the quality of those who are working among college-educated immigrants diminishes. Since this cannot be accounted for by attrition, selection into covered work, controlling for attrition, must be an important factor. Specifically, it must be the case that high earning immigrants become less likely to work with time, low earning immigrants become more likely to work across the sample period or a combination of both such that the overall worker quality diminishes despite the attrition of low earners.

We explore this by focusing on those who are seen working in 2008. These workers definitively are in the U.S. and working at the end of our sample period. Once again we consider quartiles of the fixed effect distributions by education. Table 1.7 presents the percentage of college-educated workers who worked for at least one quarter in a given year for years 2001-2008. The general pattern for both immigrants and natives is an increase in the percent of those working across the years considered. We find no evidence of high earning immigrants decreasing their participation in covered work towards the end of the sample period. The percent of those working in the early years increases as the quartile of the fixed effects distribution increases; higher earners are more likely to be working in the earlier years than low earners. This is the case for both native and foreign-born workers. However, lower fixed effect immigrants are much less likely to be working in the earlier years than natives in the same quartile. Among those whose highest level of education is a bachelor's degree, although an immigrant in the lowest quartile is just as likely to be working in 2001 as a native in the lowest quartile, about 93% (95%) of natives in the 25th-49th (50th-74th) percentile are working in 2001 but only about 87% (89%) of immigrants in that quartile do so. A similar pattern can be seen for workers with graduate degrees in Panel B. The increase in participation of low earning immigrants in the covered sector across the sample period dominates over the weaker impact of the attrition of low earners, resulting in the decrease in worker quality found in our analysis of

college-educated immigrants.

Table 1.8 also suggests an increase in participation of low earning workers across the sample period among workers with less than a college degree who remain in the panel until 2008. Despite that, as previously discussed, Figure 1.6 shows that worker quality improves across the sample period for low-skilled workers. The attrition of low earners plays a greater role than the increase in participation of low earners who remain in the panel. Interestingly, unlike what we observe for college-educated workers, lower fixed effect immigrants are more likely to be working in the earlier years than natives in the same quartile. For instance, about 70% (79%) of high school dropout (graduate) immigrants who are in the bottom quartile of the fixed effect distribution are working in 2000 while about 65% (72%) of their native counterparts are working that year.

1.6 Conclusion

This chapter is among the first instances of directly comparing cross-sectional and panel analyses of immigrant earnings assimilation in the U.S. We find faster earnings growth in the cross-section for immigrants with less than a college education. Both low earning immigrants and natives selectively leave the panel and controlling for a person fixed effect does not greatly change the estimates of immigrant assimilation.

Despite the fact that previous works have emphasized the role of selective out-migration of immigrants in cross-sectional studies of assimilation, this manuscript suggests that the delayed labor market entry of immigrants could also result in biased estimates of relative earnings growth. This appears to be especially true for college-educated workers. The relative earnings of immigrants whose highest level of education is a bachelor's degree decline in the cross-section. However, the inclusion of an individual fixed effect reverses the decline. This is not a result of selective attrition from the panel but due to lower earning immigrants becoming more likely to

work with time in the U.S. Controlling for individual heterogeneity, we find that the earnings of college-educated immigrants also improve in relation to similar natives. The nature of nonrandom attrition and selection into employment varies across education groups and results in different degrees of bias in our cross-sectional estimates of immigrant earnings assimilation, suggesting the importance of a panel study.

We find dramatic difference in estimates of immigrant relative earnings growth between the cross-sectional and fixed effect analyses for college-educated immigrants who arrived in the U.S. in the late 1990s. Further research is necessary to examine whether delayed labor market entry and nonrandom employment also contribute to biased comparisons of earnings between different immigrant entry cohorts and their native counterparts. Such research would greatly contribute to a fuller understanding of the immigrant labor market experience in the U.S.

1.7 Tables

Table 1.1: Self-Reported Year of Arrival vs. SSN Application Year
Absolute Value of Difference

	n	**mean**	s.d.	**24-26**%	**49-51**%	**74-76**%
All immigrants	80100	2.72	4.99	0	0	3.47
Mexican Immigrants	14800	7.09	5.55	3.00	6.53	10.00
Non-Mexican Immigrants	65300	1.80	4.33	0	0	1.00

Notes: This table consists of all immigrants in the 2000 Decennial Census who fulfill our sample criteria and are matched to LEHD earnings in one of the 27 states considered. Sample sizes are rounded to the nearest hundred and the mean of observations falling within the percentiles given are reported instead of the value at the percentile due to confidentiality requirements.

Table 1.2: Sample Characteristics

	(1) Natives	(2) Immigrants
n	434200	80100
Education:		
High School Dropout	10.23	25.27
High School Graduate	60.15	34.40
Bachelor's Degree	19.88	20.67
Graduate Degree	9.75	19.66
Place of Birth:		
Mexico		17.46
India		8.74
Cuba		5.36
China		4.94
Former USSR		4.90
Philippines		3.50
Canada		3.20
UK		2.96
Former Yugoslavia		2.67
Vietnam		2.47

Notes: This table consists of all immigrants in the 2000 Decennial Census who fulfill our sample criteria and are matched to LEHD earnings in one of the 27 states considered. Sample sizes are rounded to the nearest hundred due to confidentiality requirements.

Table 1.3: Place of Birth Composition Comparison

	LEHD Sample		2000 Decennial Public Use Samplee	
	(1)	(2)	(3)	(4)
Place of Birth:				
Mexico	17.46	-	32.48	-
India	8.74	10.59	8.03	11.89
Cuba	5.36	6.49	3.21	4.75
Central America*	5.32	6.45	5.16	7.64
China	4.94	5.98	5.19	7.68
Former USSR	4.90	5.94	3.26	4.83
Philippines	3.50	4.24	2.45	3.63
Canada	3.20	3.88	2.26	3.35
UK	2.96	3.59	2.13	3.16
Former Yugoslavia	2.67	3.23	1.54	2.28
Vietnam	2.47	2.99	1.89	2.79
Japan	1.98	2.40	1.92	2.84
Korea	1.90	2.30	2.62	3.88
n	80100	66100	61650	40560

Notes: The sample depicted in Column 1 is the same as the sample depicted in Table 1.2 Column 2. Column 2 in this table excludes Mexican immigrants from Column 1. Column 3 consists of male immigrants in the 2000 Decennial Public Use data who are age 25-57, live in one of the 27 states that are included in the LEHD sample, and report arriving in the U.S. in 1995-1999 . Column 4 excludes Mexican immigrants from Column 3. Sample sizes are rounded to the nearest hundred due to confidentiality requirements.
*Central America is aggregated due to aggregation in the public use data.

Table 1.4: Log Quarterly Earnings

Panel A

	High School Dropout			High School Graduate		
	2000	2004	2008	2000	2004	2008
I. Natives						
Age	39.99	43.8	47.080	40.36	44.17	47.6893
Log Earnings	8.5178	8.5557	8.6162	8.9269	8.9587	9.0031
n	110800	95500	80900	747500	676500	603900
II. Immigrants						
Age	35.72	39.69	43.62	36.14	40.10	44.03
Log Earnings	8.4382	8.5650	8.6502	8.6149	8.7373	8.8437
% Gap (B-A)	-7.96	0.93	3.40	-31.2	-22.14	-15.94
n	59800	55500	50500	80200	72600	66200

Panel B

	Bachelor's Degree			Graduate Degree		
	2000	2004	2008	2000	2004	2008
I. Natives						
Age	40.23	44.01	47.66	43.68	47.38	51.02
Log Earnings	9.4134	9.4675	9.5317	9.6989	9.7423	9.7916
n	232200	214500	196100	218400	201400	181700
II. Immigrants						
Age						
Log Earnings	35.53	39.37	43.30	35.43	39.09	43.02
	9.2786	9.3259	9.4754	9.3833	9.5476	9.7647
% Gap (B-A)						
n	-13.48	-14.16	-5.63	-31.56	-19.47	-2.69
	48800	41100	37400	43900	37600	34900

Notes: Earnings gaps are computed as the difference in log earnings between natives and immigrants. Sample sizes are rounded to the nearest hundred due to confidentiality requirements.

Table 1.5: Log Quarterly Earnings Regressions: Cross-Sectional

	High School Dropouts (1)	High School Graduates (2)	Bachelor's Degree (3)	Graduate Degree (4)
Age at Migration				
18-25	0.1335*	-0.1787*	0.2886*	0.2015*
	(0.0073)	(0.0063)	(0.0092)	(0.0104)
26-30	0.011	-0.3020*	0.0630*	-0.1039*
	(0.0069)	(0.0061)	(0.0088)	(0.0098)
31-35	-0.1699*	-0.3960*	-0.1604*	-0.3421*
	(0.0070)	(0.0062)	(0.0091)	(0.0098)
36-40	-0.2877*	-0.4825*	-0.2671*	-0.5056*
	(0.0072)	(0.0064)	(0.0096)	(0.0104)
41-45	-0.4198*	-0.5631*	-0.4406*	-0.6406*
	(0.0075)	(0.0066)	(0.0101)	(0.0114)
⩾46	-0.5185*	-0.6092*	-0.5317*	-0.6674*
	(0.0075)	(0.0067)	(0.0103)	(0.0120)
year since migration	0.0619*	0.0755*	0.0456*	0.0776*
	(0.0068)	(0.0061)	(0.0090)	(0.0097)
$(\text{years since migration})^2 * 10^{-4}$	-74.4443*	-132.3229*	-193.9961*	-229.4445*
	(21.4698)	(19.0883)	(28.2430)	(30.2951)
$(\text{years since migration})^3 * 10^{-4}$	5.0475**	12.8594*	24.2114*	26.6379*
	(2.5316)	(2.2459)	(3.3288)	(3.5509)
$(\text{years since migration})^4 * 10^{-4}$	-0.1727+	-0.4803*	-0.9783*	-1.0251*
	(0.0990)	(0.0878)	(0.1304)	(0.1386)
Person FE	n	n	n	n
Observations	2017900	10514400	3505200	3271100
R-squared	0.0363	0.0452	0.0746	0.0734

Notes: Robust standard errors in parentheses. Regressions control for year-quarter dummies and a quartic in age. Column 4 also includes an indicator for professional/Ph.D. degrees. Sample sizes are rounded to the nearest hundred due to confidentiality requirements. * significant at the 1% level, ** significant at 5%, + significant at 10%

Table 1.6: Log Quarterly Earnings Regressions: Person Fixed Effects

	High School Dropouts (1)	High School Graduates (2)	Bachelor's Degree (3)	Graduate Degree (4)
years since migration	0.0413*	0.0722*	0.0588*	0.0950*
	(0.0075)	(0.0063)	(0.0078)	(0.0093)
$(\text{years since migration})^2 * 10^{-4}$	-20.4586	-110.2993*	-142.8379*	-220.3352*
	(23.7065)	(20.0332)	(24.9019)	(29.0032)
$(\text{years since migration})^3 * 10^{-4}$	-0.6919	9.8972*	13.9693*	22.1801*
	(2.7989)	(2.3693)	(2.9758)	(3.4159)
$(\text{years since migration})^4 * 10^{-4}$	0.0662	-0.3351*	-0.4490*	-0.7724*
	(0.1095)	(0.0928)	(0.1174)	(0.1337)
Person FE	y	y	y	y
Observations	2017900	10514400	3505200	3271100
R-squared	0.0189	0.0307	0.0923	0.0792

Notes:Regressions control for year-quarter dummies and a quartic in age. Sample sizes are rounded to the nearest hundred due to confidentiality requirements. * significant at the 1% level, ** significant at 5%, + significant at 10%

Table 1.7: Percent Working, High-skilled Workers by Quartile

Panel A.	Bachelor's Degree Immigrants FE percentile				Bachelor's Degree Natives FE percentile			
	[0-25)	[25-50)	[50-75)	[75-100)	[0-25)	[25-50)	[50-75)	[75-100)
Year								
2000	80.69	84.01	87.46	92.63	78.87	92.68	94.84	95.44
2001	81.53	86.65	88.77	93.21	79.45	92.82	95.04	95.46
2002	80.80	87.05	88.12	92.35	78.90	92.28	94.59	95.08
2003	82.22	88.50	86.79	92.33	78.67	92.19	94.73	95.29
2004	84.22	89.29	88.09	93.26	80.75	93.03	95.12	95.62
2005	86.20	91.82	90.46	94.15	83.85	93.87	95.75	96.44
2006	87.96	93.21	93.63	95.37	87.03	95.14	96.73	97.19
2007	92.50	95.72	96.22	97.11	91.74	96.72	97.98	98.29
2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
n	3400	2000	1800	3200	10900	14300	14900	14400
%	32.69	19.08	17.08	31.15	19.15	25.49	27.64	27.71

Panel B.	Graduate Degree Immigrants FE percentile				Graduate Degree Natives FE percentile			
	[0-25)	[25-50)	[50-75)	[75-100)	[0-25)	[25-50)	[50-75)	[75-100)
Year								
2000	76.96	79.03	84.68	90.52	76.37	91.12	93.34	93.13
2001	76.98	81.37	87.02	92.19	77.25	91.28	93.54	93.65
2002	78.77	82.80	87.88	92.18	77.94	91.22	93.57	93.75
2003	78.79	83.98	88.65	92.09	78.98	91.79	93.48	93.82
2004	80.83	86.28	90.96	93.07	80.76	92.56	94.21	94.71
2005	84.08	89.98	93.28	94.18	83.21	93.99	94.72	95.56
2006	87.32	92.63	95.43	95.89	86.11	95.29	96.08	96.54
2007	92.25	95.86	97.30	97.91	91.01	97.02	97.49	97.93
2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
n	2800	2100	2600	2100	10000	13400	13500	13700
%	34.45	20.98	23.3	21.27	24.53	25.2	25.08	25.19

Notes: This table contains individuals who are seen working in 2008. Percentiles are of the entire education group (both immigrants and natives and those who are not seen working in 2008). Sample sizes are rounded to the nearest hundred due to confidentiality requirements.

Table 1.8: Percent Working, Low-skilled Workers by Quartile

Panel A.	High School Dropout Immigrants FE percentile				High School Dropout Natives FE percentile			
	[0-25)	[25-50)	[50-75)	[75-100)	[0-25)	[25-50)	[50-75)	[75-100)
Year								
2000	69.60	86.67	90.88	92.92	65.10	82.85	90.02	95.12
2001	69.16	88.02	92.14	94.76	64.87	82.35	90.39	95.24
2002	69.35	87.06	93.29	95.25	63.12	81.07	90.64	95.31
2003	66.78	86.93	93.82	95.91	62.49	80.55	90.08	95.47
2004	68.43	87.41	94.36	96.11	63.73	81.68	90.44	95.54
2005	71.48	87.75	94.75	97.08	66.11	84.74	92.47	96.17
2006	76.06	90.38	95.05	97.46	70.82	87.69	94.02	97.25
2007	83.59	93.43	96.63	98.72	79.73	91.27	95.97	97.92
2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
n	1700	5400	4800	2400	3300	5400	7200	8200
%	11.76	38.45	33.11	16.67	14.96	22.05	28.94	34.04

Panel B.	High School Graduate Immigrants FE percentile				High School Graduate Natives FE percentile			
	[0-25)	[25-50)	[50-75)	[75-100)	[0-25)	[25-50)	[50-75)	[75-100)
Year								
2000	78.89	90.71	90.74	92.74	72.48	89.34	94.73	96.25
2001	79.53	92.05	92.66	93.65	72.39	89.33	95.10	96.43
2002	79.25	92.33	93.35	92.38	71.98	88.94	94.84	96.39
2003	79.29	92.35	94.05	93.80	71.56	89.09	94.64	96.40
2004	80.04	93.35	94.68	94.30	73.67	90.04	95.14	96.61
2005	82.53	93.86	95.60	94.66	76.46	91.45	95.62	96.95
2006	85.76	94.58	96.93	95.65	80.26	93.03	96.48	97.59
2007	90.71	96.59	97.49	97.87	87.03	95.50	97.64	98.43
2008	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
n	6800	7100	3000	1600	27300	43700	49700	49500
%	36.71	38.54	16.04	8.71	16.47	24.76	28.43	30.34

Notes: This table contains individuals who are seen working in 2008. Percentiles are of the entire education group (both immigrants and natives and those who are not seen working in 2008). Sample sizes are rounded to the nearest hundred due to confidentiality requirements.

1.8 Figures

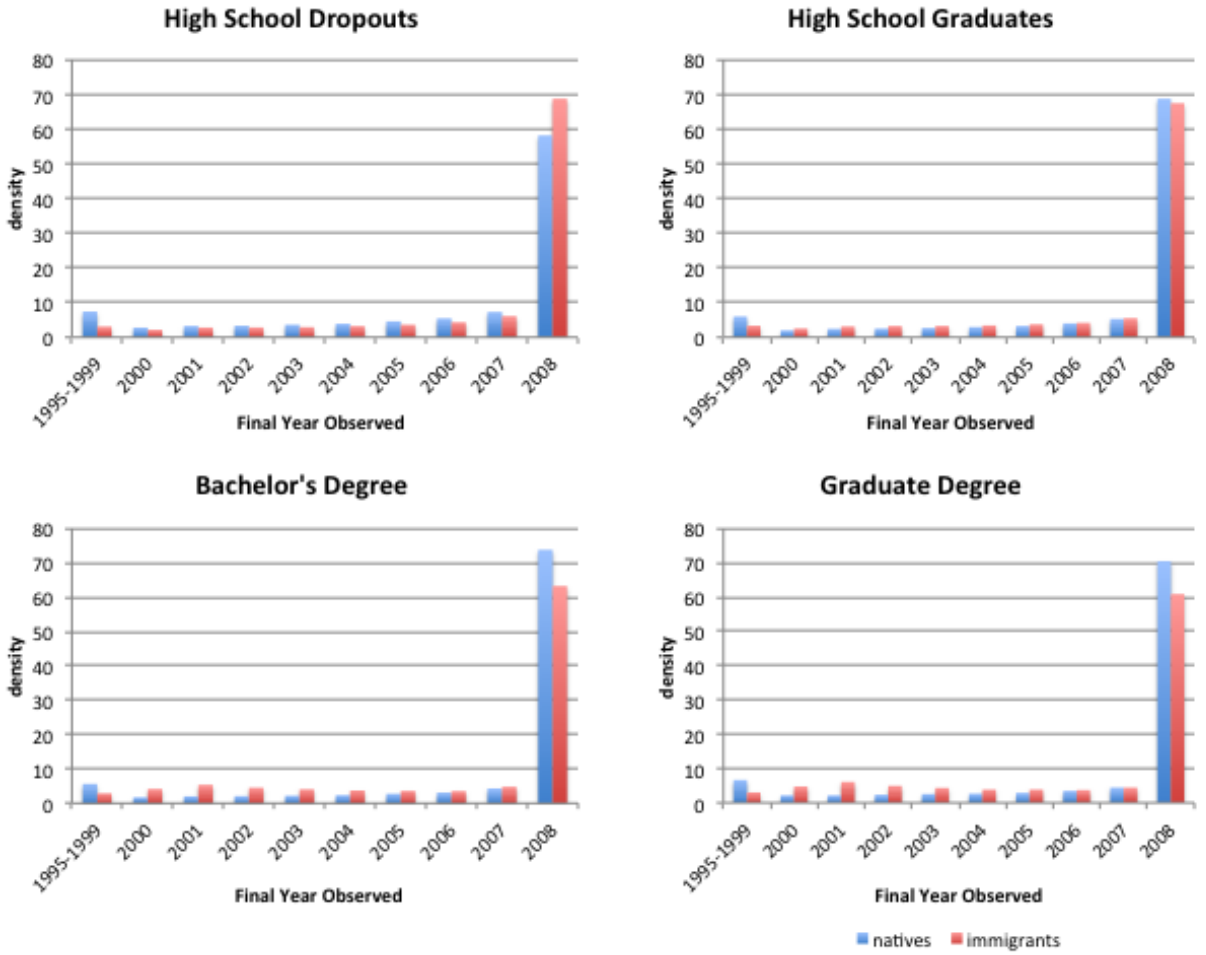

FIGURE 1.1: Distribution of Final Year Observed by Education and Immigrant Status

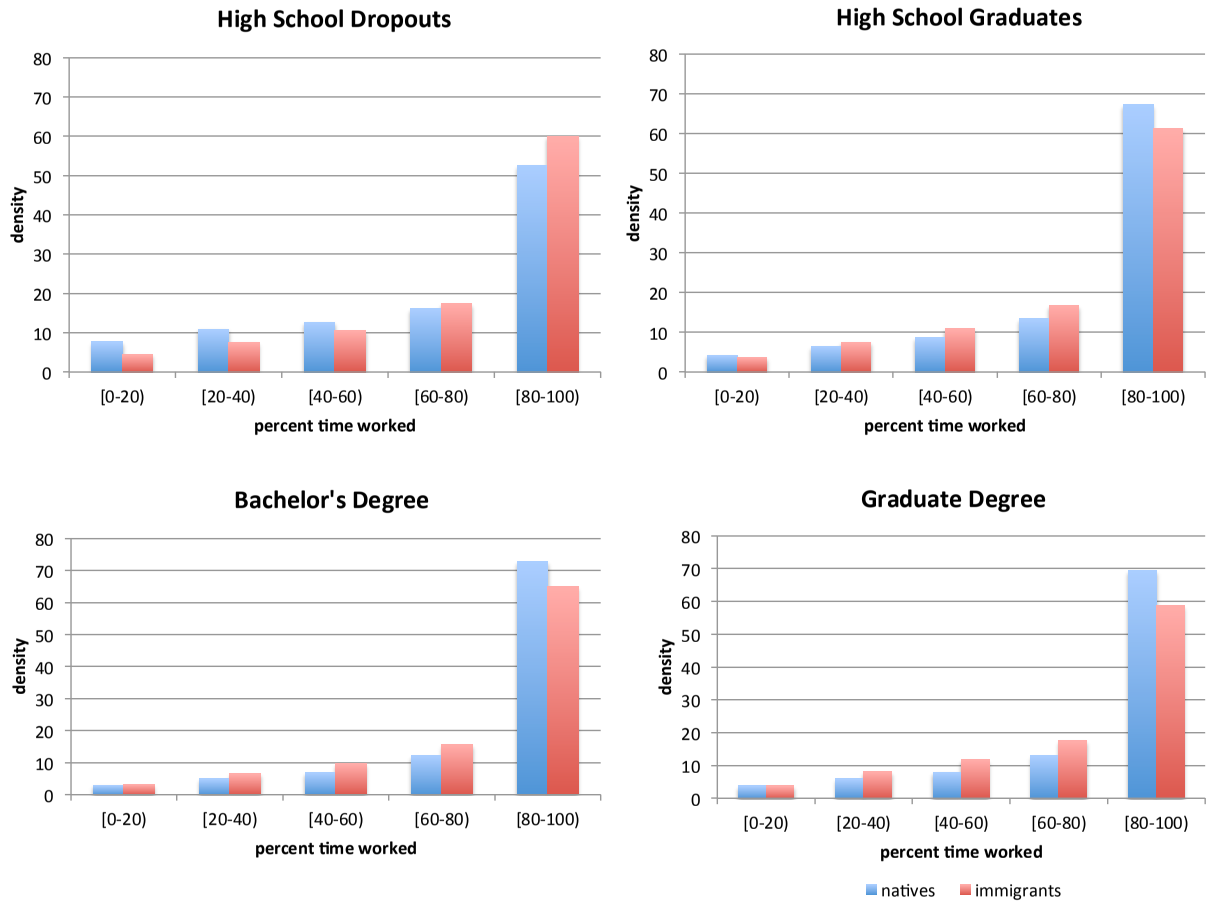

FIGURE 1.2: Distribution of Percent of Time Worked Prior to Attrition by Education and Immigrant Status

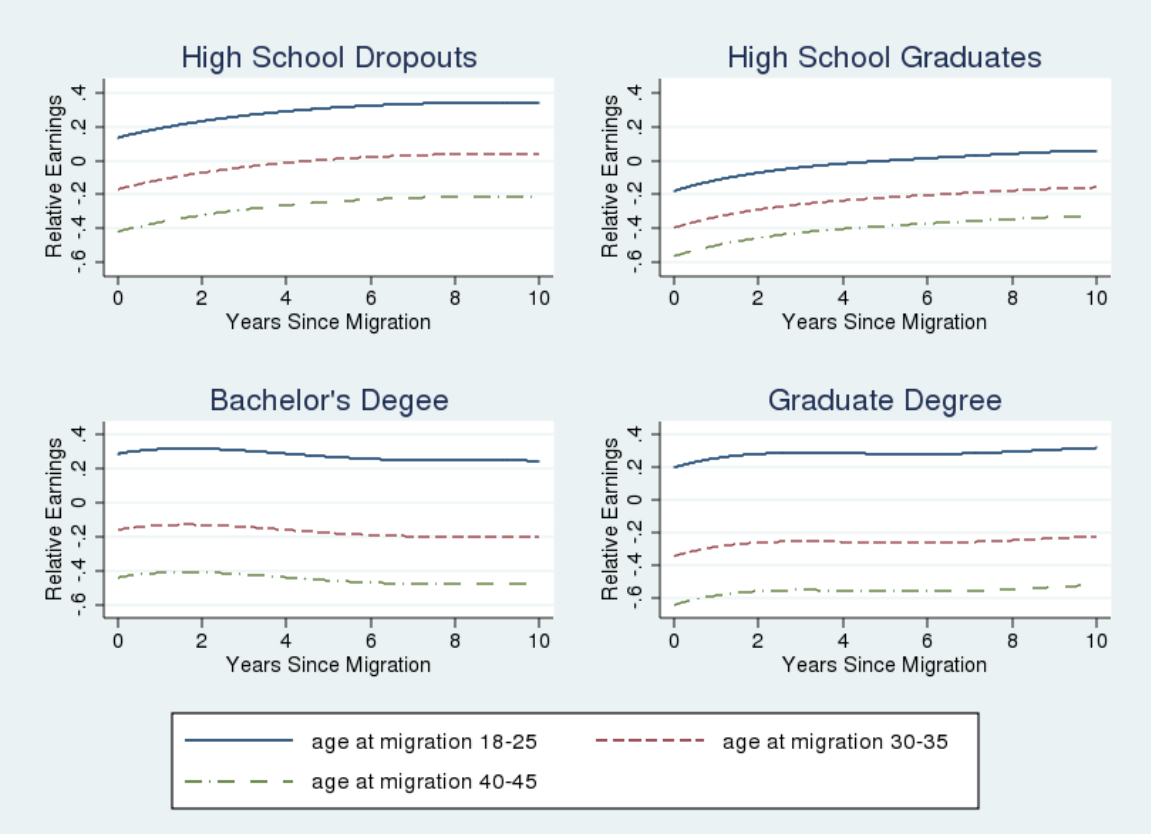

FIGURE 1.3: Cross-Sectional Results- Immigrant Relative Earnings Profiles. Predictions implied by results in Table 1.5

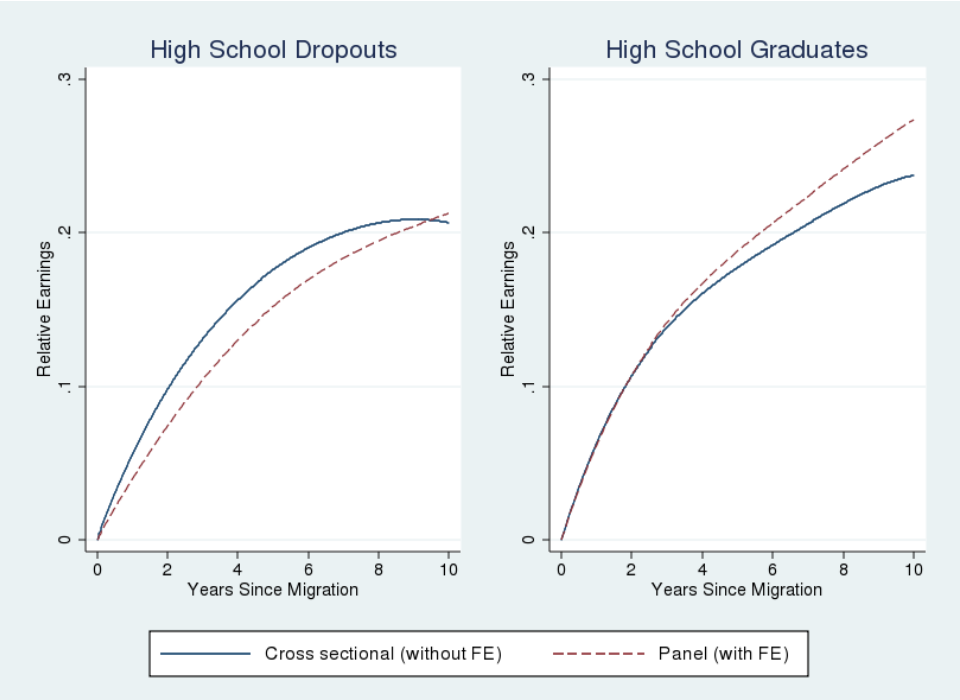

FIGURE 1.4: Immigrant Relative Earnings Growth, Low-Skilled Workers. Predictions implied by results in Table 1.5 and Table 1.6

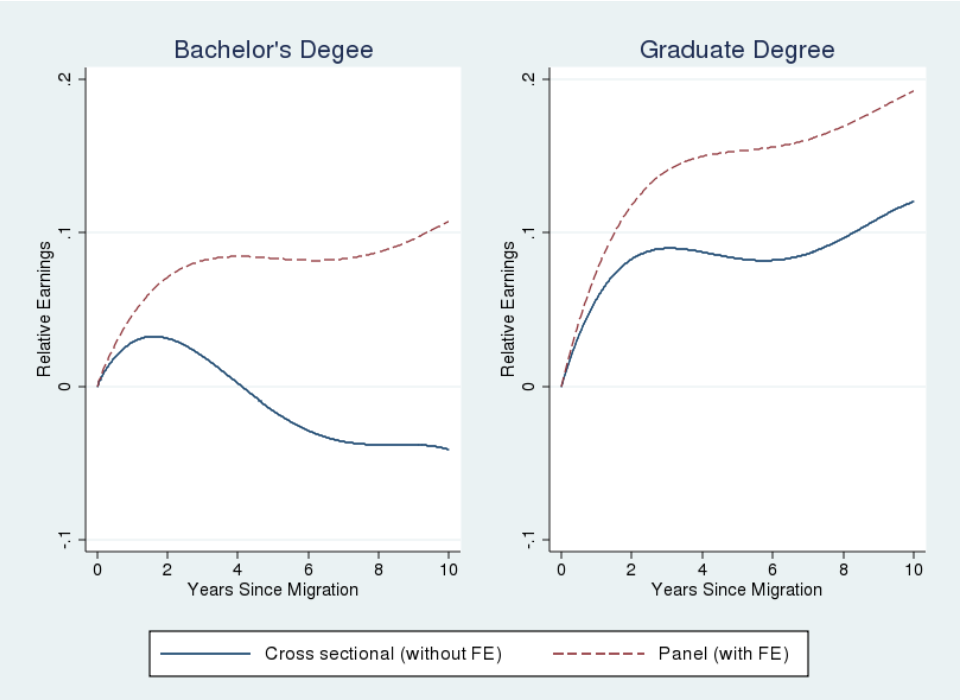

FIGURE 1.5: Immigrant Relative Earnings Growth, High-Skilled Workers. Predictions implied by results in Table 1.5 and Table 1.6

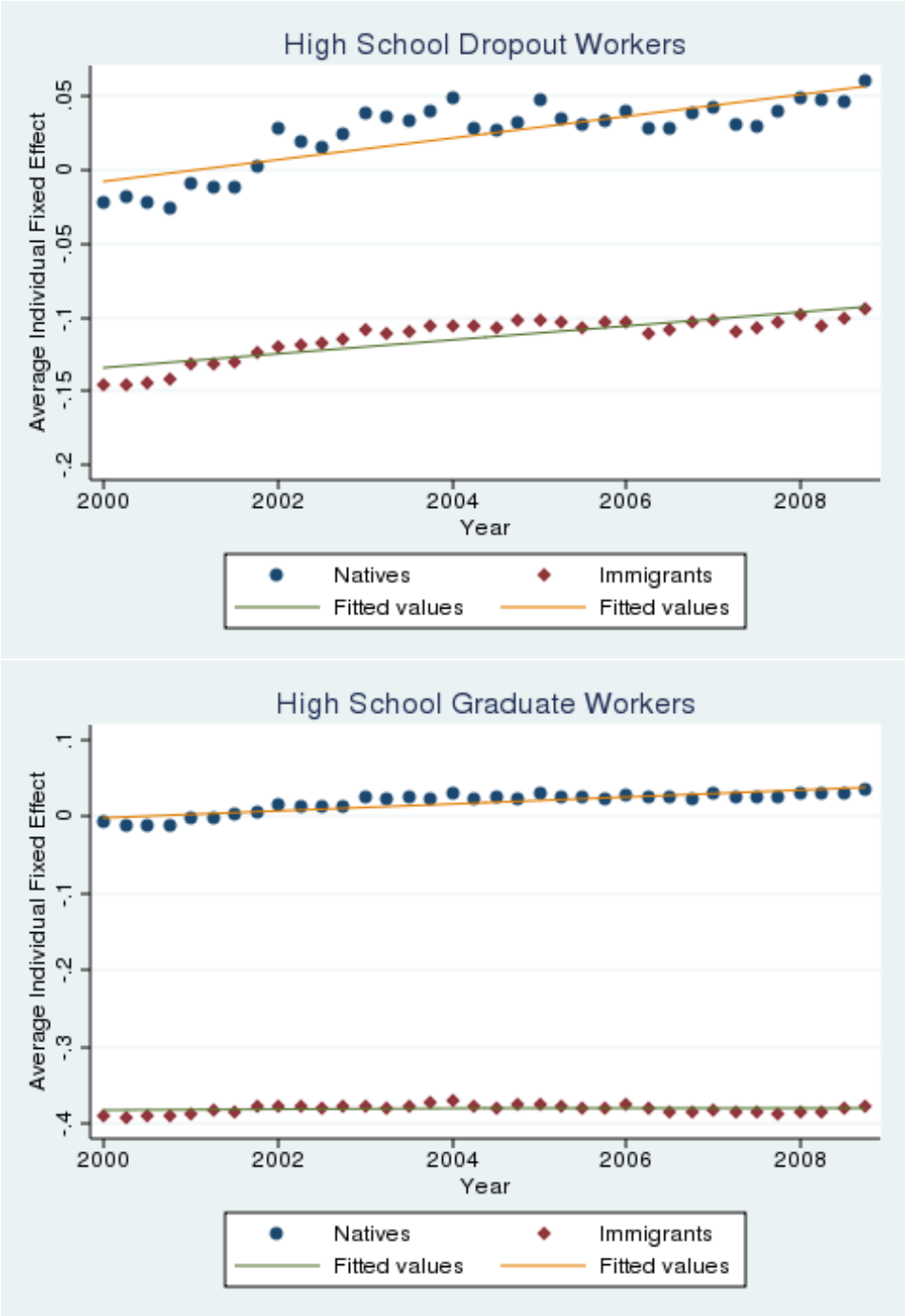

FIGURE 1.6: Worker Quality, Low-Skilled Workers.

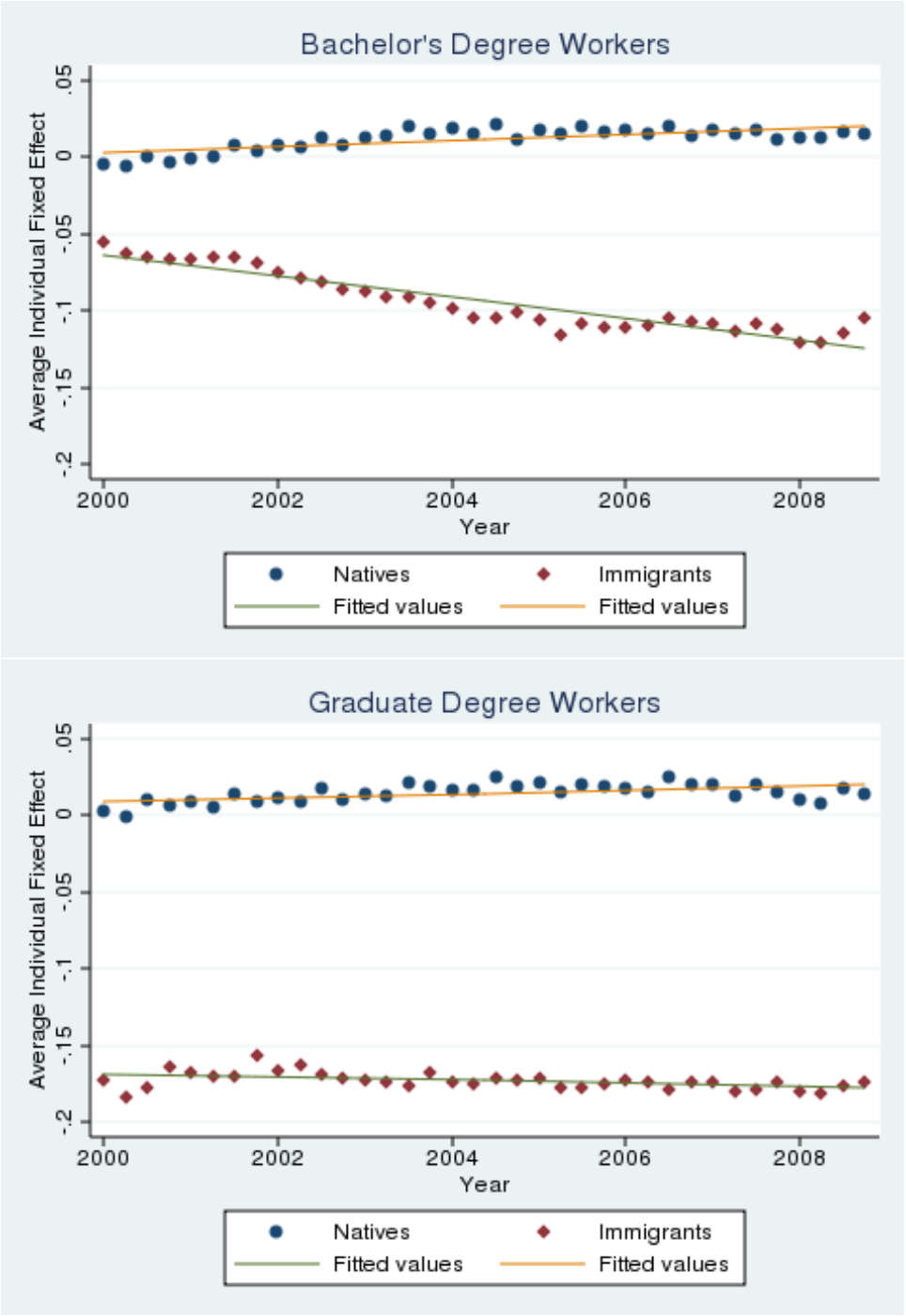

FIGURE 1.7: Worker Quality, High-Skilled Workers.

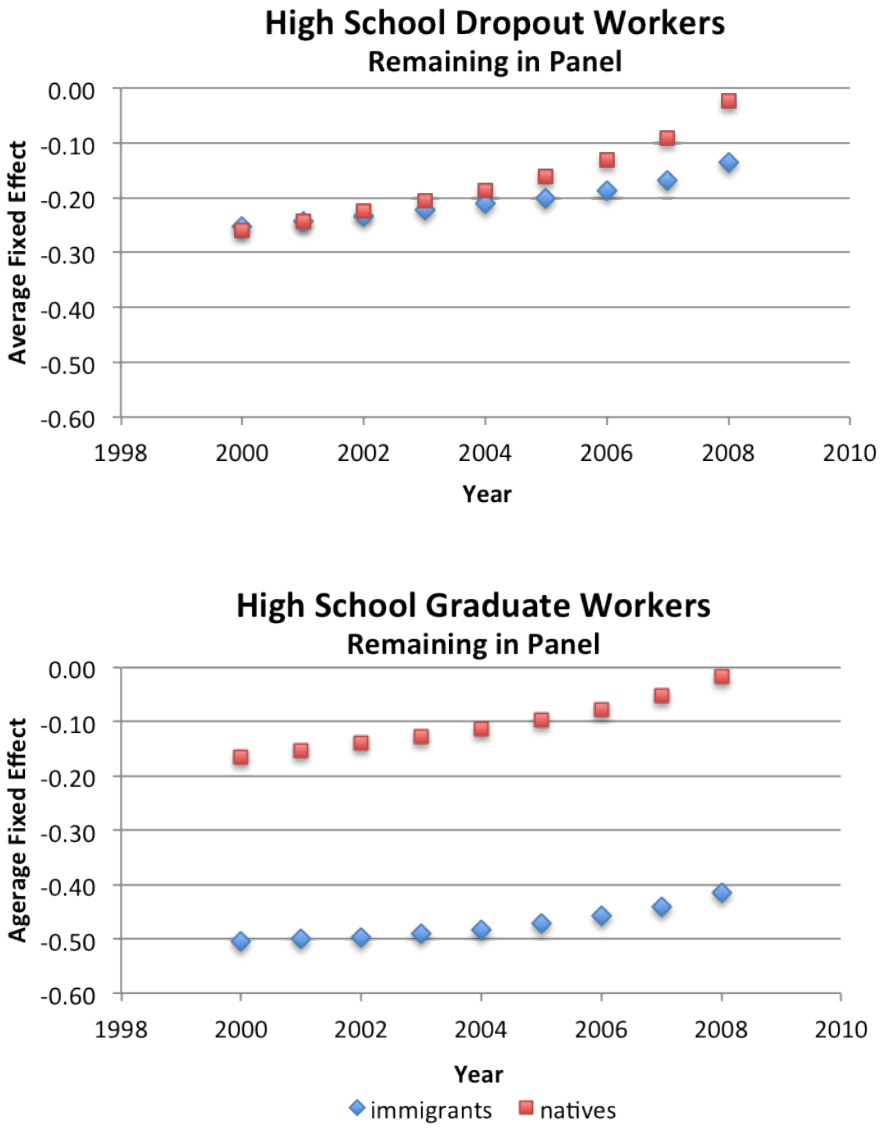

FIGURE 1.8: Selective Attrition, Low-Skilled. This figure reports the average fixed effect of those remaining in the sample in a given year.

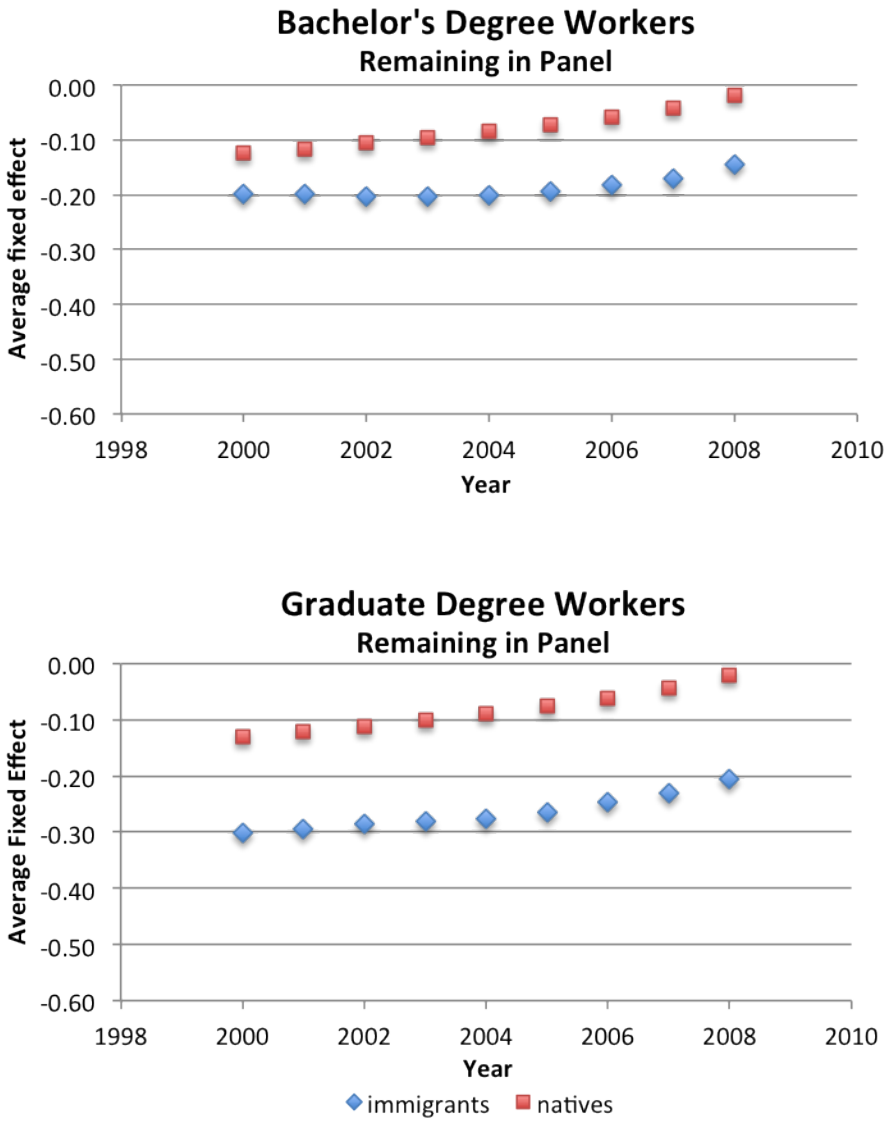

FIGURE 1.9: Selective Attrition, High-Skilled. This figure reports the average fixed effect of those remaining in the sample in a given year.

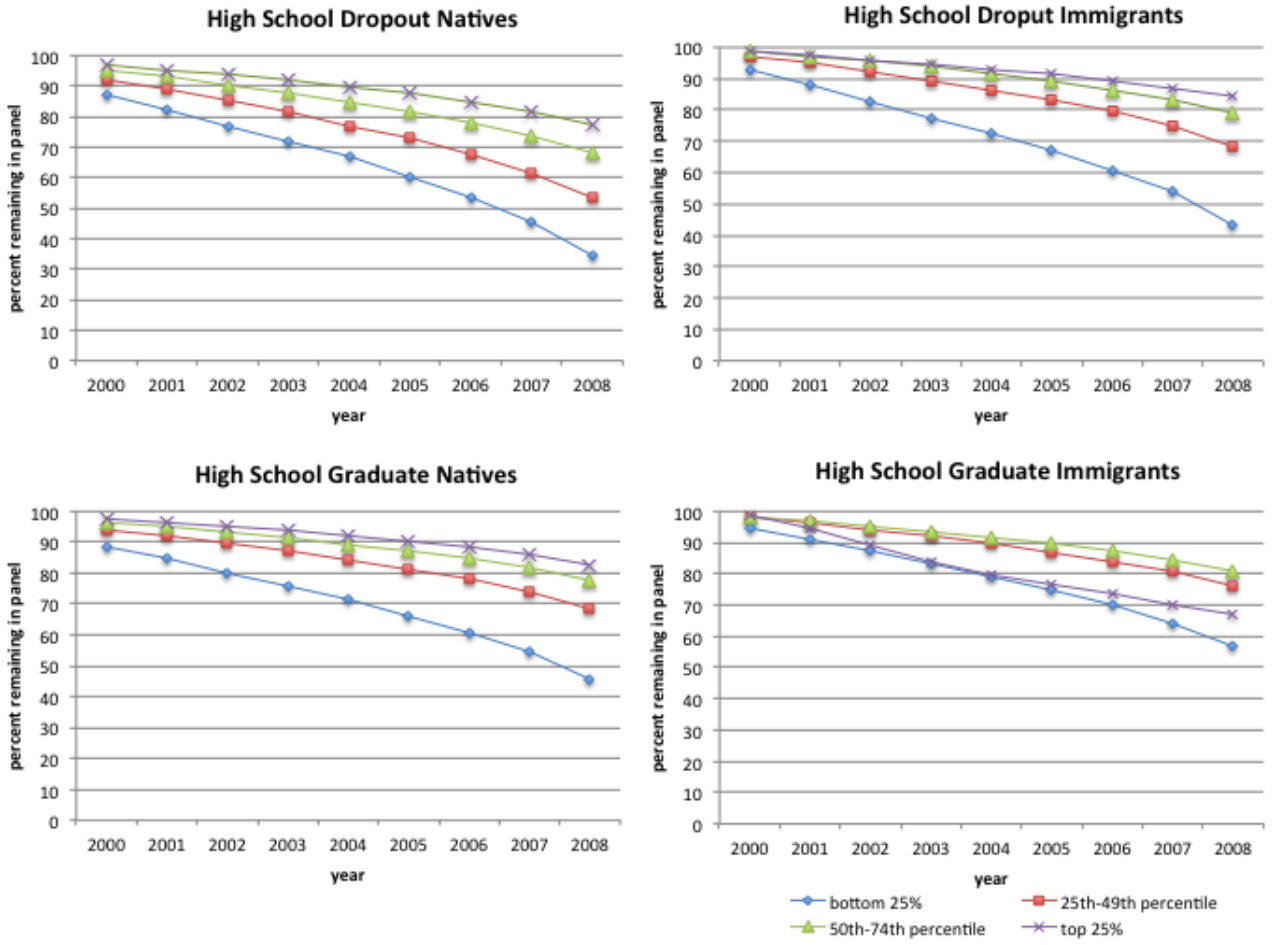

FIGURE 1.10: Selective Attrition by Quartile, Low-Skilled. This figure reports the percent of individuals remaining in the sample in a given year by quartile of the person FE distribution.

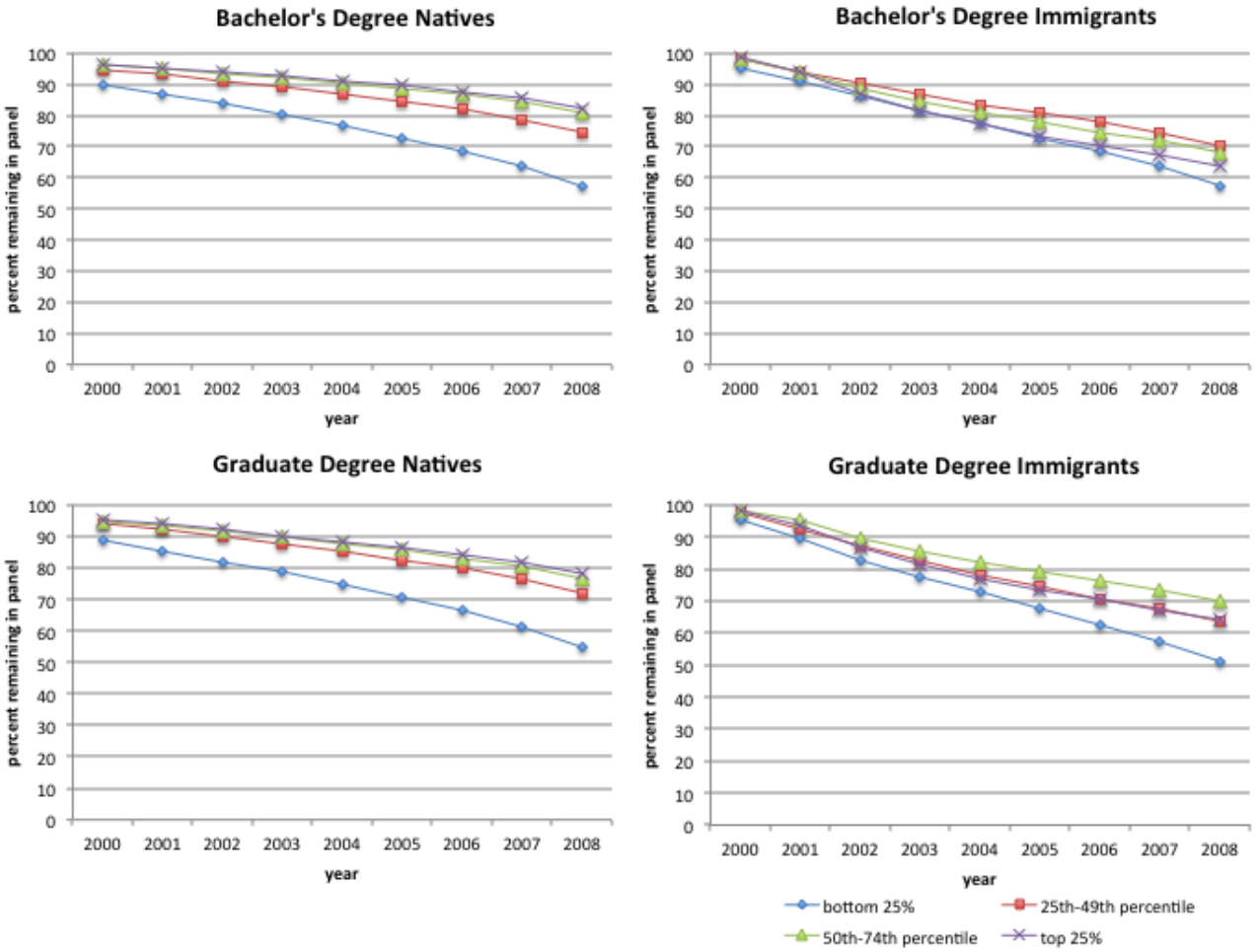

FIGURE 1.11: Selective Attrition by Quartile, High-Skilled. This figure reports the percent of individuals remaining in the sample in a given year by quartile of the person FE distribution.

2

Immigrant Earnings Assimilation: The Role of the Firm

2.1 Introduction

In Chapter 1, we find faster earnings growth of immigrants controlling for nonrandom attrition and selective participation in the covered sector. Many questions related to the assimilation process remain as basic patterns of immigrant labor market mobility are unknown. What accounts for the closing of the wage gap? Do immigrants start at lower paying industries and subsequently move to higher paying ones? What are the characteristics of jobs held by immigrants, such as firm size and structure, and how do these change over time? What are the job tenure patterns of immigrants relative to similar natives?

Lack of suitable data has limited this type of investigation. We address this gap in the literature by exploiting the employer-employee link in the Longitudinal-Employee Household Dynamics, the same data we used in the previous chapter. As in Chapter 1, this paper studies recent immigrants who entered the U.S. in the late 1990s. We investigate the role of earnings related job characteristics in accounting for earnings

differences between immigrants and similarly educated natives over time. We focus on several aspects that the literature suggests drive wage disparities generally. These include location, firm size and structure, and job tenure.

We exclude college educated workers because the decomposition method we use to account for earnings differences between immigrants and natives does not control for a person fixed effect. In the previous chapter, we show that the inclusion of a fixed effect dramatically changes estimates of relative earnings growth for college-educated foreign-born workers so the decomposition would be problematic for the highly educated samples. On the other hand, because the main selection issue for high school dropouts and graduates was panel attrition, we believe limiting the sample to those seen towards the end of the panel period provides meaningful results.

The job characteristics we consider account for 50-94% of the faster earnings growth of immigrants; moving to higher paying industries and gains in job tenure play the greatest roles. While it is true that low-skilled immigrants have unstable work patterns, their native counterparts have even more unstable work patterns. The net result is that immigrants start with less tenure at their employer than natives but 11-13 years later, have on average worked for their employer for as long as or longer than low-skilled native workers. As the return to job tenure is large for low-skilled workers, changes in job tenure have an important role in explaining immigrant earnings convergence.

The paper proceeds as follows. Section 2.2 discusses the literature on immigrant assimilation and the literature on wage dispersion more generally that help inform us on what to consider as drivers for assimilation with detailed employer-employee data. Section 2.3 describes the data and presents descriptive statistics on the sample. Section 2.4 discusses the econometric framework and Section 2.5 presents the results. Section 2.6 concludes.

2.2 Background

Many studies have established that immigrants earn less than native workers upon arrival but converge towards the native-born with time in the U.S. As discussed in Chapter 1, most earlier studies use U.S. Decennial Census data. In addition to the limitations related to the cross sectional nature of the the data discussed in section 2.2, another drawback is that there is limited information on individuals and firms. For this reason, the only mechanisms that have been investigated with this data are the role of self-reported language ability, the relative return to potential labor market experience, and the level of education obtained in the U.S. versus prior to immigration (Chiswick and Miller 1995; Bratsberg and Ragan 2002; Stewart and Hylack 1984).

While such studies have emphasized the importance of worker characteristics in explaining earnings differences between immigrants and natives, these differentials may also reflect employer heterogeneity and differences in job related characteristics. There is a vast literature that explores variation in wages due to industry affiliation, firm size, and job tenure. Although no consensus has been reached on why large firms pay more than small firms, this correlation has long been recognized as an important component of the variation in wages (Brown and Medoff 1989; Troske 1999). More recent work has also explored the relationship between firm size and wage growth (Hu 2003; Ferrer and Lluis 2008). There is also a great deal of work on inter-industry wage differentials and many studies find that industry affiliation impacts wages even after controlling for a variety of individual characteristics (Dickens and Katz 1987; Krueger and Summers 1988; Gittleman and Pierce 2012). Differences in the industry of work and firm size between natives and immigrants may be important in accounting for earnings differences between the two groups. In this paper we explore these differences and consider how they relate to the relative earnings of

immigrants.

Another determinant of earnings growth related to the firm that this paper investigates is job-specific tenure. While there are other reasons for a positive relationship between earnings and tenure, one explanation is that tenure may act as a proxy for accumulation of firm-specific human capital. Numerous studies have found a positive causal effect of seniority on wages (Altonji and Shakotko, 1987; Topel, 1991; Altonji and Williams, 2005; Dustmann and Meghir, 2005). Differences in tenure between immigrants and comparable natives may be an important part of explaining earnings differences between the two groups. Using multiple cross-sectional surveys, McDonald and Worswick (1998) find that controlling for job tenure diminishes the initial earnings deficit as well as the subsequent assimilation of immigrants in Canada. We believe this paper is the first that considers the role of job tenure in immigrant assimilation in the United States.

While the lack of suitable data limited such research in the past, the recent availability of matched employer-employee data has allowed for examining the differences in the workplaces of immigrants and natives. Andersson et al. (2010) find that immigrants in the U.S. are much more likely than natives to have immigrant coworkers and are particularly likely to work with their compatriots. The workplace concentration of immigrants varies substantially across industries and is particularly high among immigrants with limited English skills. Using Canadian matched employer-employee data, Aydemir and Skuterud (2008) consider the relative importance of immigrant wage differentials within and across establishments. They find that non-random sorting across establishments affects wage differentials more than differences in how immigrant and native men are paid within establishments. While Andersson et al. do not directly address the role of the workplace on wage assimilation, Aydemir and Skuterud indicate that workplace sorting contributes to assimilation as male immigrants who are working in Canada longer are in better-paying establish-

ments compared to those who have recently arrived. However, their analysis uses a single cross section which conflates cohort differences and changes within cohorts over time.

Additionally, European matched employer-employee data have been used to examine the relationship between the relative earnings growth of immigrants and firm heterogeneity. Barth et al. (2012) demonstrates the importance of accounting for arrival-year heterogeneity in assessing changes in immigrant job quality over time. They find that foreign-born workers in Norway experience inferior wage growth primarily from failure to advance to higher paying establishments. De Matos (2013) finds that one third of the wage catch-up of immigrants in Portugal is due to firm heterogeneity. Both of these papers estimate a firm fixed effects model. This paper differs in that we consider firm and job characteristics rather than fixed effects which allows us to attribute earnings differences to specific characteristics of the workplace.

2.3 Data and Descriptive Statistics

2.3.1 Data

The LEHD data contains quarterly earnings for individuals who work in Unemployment Insurance (UI) covered employment and is the same data as that used in Chapter 1. In addition to earnings data, the Census Bureau has collected employer information in business censuses and surveys that can be linked to workers. With this data, we can observe the place of employment as well as characteristics of the establishment.

As in Chapter 1, we consider male immigrants who entered the U.S. in 1995-1999 and a 10% random sample of native-born men of the same age who are in the 2000 Decennial Census and who can be linked to LEHD earnings data. In this chapter we focus on those who have less than a college education. We limit our sample to individuals who are 23 years or older in 2000. We only observe education in the

Decennial Census and individuals younger than these ages are less likely to have completed their education. We consider those who are 65 years or younger at the end of our sample period.

Due to the administrative nature of the data, we do not know when individuals leave school to enter full-time work. To avoid including part-time work prior to full-time labor force entry, we consider an individual to be working "full-time" if he earned at least 70 percent of the minimum quarterly wage during that quarter, assuming 40 hours of work per week. Only these quarters of full-time work are included in the analysis.

We limit the analysis to individuals for whom earnings observations are available in 2006 or later. In doing so, we are eliminating immigrants who have left the U.S. before 2006 and our assimilation measures are for those who have lived in the U.S. for at least 7-11 years. As discussed previously, Lubotsky (2007) finds evidence that selective outmigration is partially responsible for the rising relative earnings of immigrants although substantial relative wage growth remains after accounting for this. In the first two columns of Table 2.1, we show basic characteristics of our sample before conditioning on having earnings at the end of our sample period. We see that native workers are more likely than immigrants to be observed both in the last year of the sample as well as after 2005. Unfortunately, we do not have specific information on why earnings are not available in any given year. The individual may have left the country, be unemployed or self-employed, or be working in agriculture or a state that is not a part of the LEHD. In this paper we take the individuals observed in 2006 or later in at least one of the 47 LEHD states as our full sample.[1] Only those individuals with earnings observations in at least one of the last 3 years of the sample period will be considered in all the following analyses and descriptive

[1] By 2006, all 47 states are available in the data so we use all available information to determine whether individuals are in the U.S. at the end of the sample period.

tables.

Our data includes firm characteristics at the main establishment of employment. An individual's main establishment is defined as the one in which he has the most earnings in a given quarter. The characteristics we consider are whether a firm is a multi-establishment entity, its three-digit Standard Industry Classification (SIC), and the size of the establishment in terms of employees. The LEHD has imputed the establishment in which an individual works for those working in a multi-unit firm, which we take to be their workplace. The total number of employees at an establishment is available at the monthly level. We average the monthly employment within quarter and take this as the establishment size in that quarter.[2]

Finally, we construct two other variables to capture work effort related to the firm, an indicator for working at multiple employers in that quarter and a measure of job-specific tenure. Within a quarter, we do not observe when a given job spell begins so we cannot distinguish between an individual with a job-to-job transition and one who is continuously working at two different jobs. To make the distinction, we consider an individual to be working at multiple firms if he works in the same two or more firms in a given quarter as he did in the preceding quarter. Our measure of job tenure is the number of quarters someone is observed working at a particular firm. For consistency across states, we use data from 1995 onwards to construct this tenure measure, despite the availability of earnings data prior to 1995 for some states.

While we observe tenure for all immigrant job spells, tenure is censored for natives who are in jobs that are ongoing during the first quarter of 1995. We consider two subsets of the full sample to explore the role of tenure in earnings assimilation. First, we limit the analysis to earnings observations with non-censored tenure measures,

[2] Six states, AK, AZ, GA, IN, SD, and WY, do not have firm information available until after 1995. Dropping these observations do not impact the baseline results.

eliminating all job spells which began prior to the second quarter of 1995. In this subsample analysis, we are comparing immigrants to natives who start new jobs in 1995 or later. We refer to this as the main sample. We also consider a subsample of young workers for whom we can reasonably assume we see full labor market experience. For this subsample we do not exclude earnings observations of job spells that are ongoing in the first quarter of our sample period. Because we observe these workers at the beginning of their labor market experience, we have a measure of job tenure with minimal censoring. We refer to this subsample as the young sample.

Figure 2.1 displays five hypothetical individuals and their work histories from 1995 to 2008 to depict our samples. The age given is age in 1995 and we assume that all jobs depicted are full-time as described above. The full analysis includes all job spells that are in the sample period and all individuals pictured are in the full sample. To observe the role of tenure we only consider job spells that begin after the first quarter of 1995 for which tenure is not left censored. Hence, we eliminate Job 1 for all three natives pictured. Because Native 1 is not observed in a new job after the start of the sample period, he is not in the main sample. The main analysis includes all jobs after Job 1 for Natives 2 and 3. All jobs are included for immigrants in the main analysis because all foreign-born workers we consider arrived in the U.S. in or after 1995. Finally, in the young sample we consider individuals who are at the beginning of their labor market careers in 1995. This sample consists of all observed job spells including those that are ongoing at the start of the panel. We assume that the degree of left censoring of the tenure measure is negligible for these workers. The young sample analysis includes all job spells of Native 3 and Immigrant 2. We describe these samples more fully below.

2.3.2 Descriptive Statistics

As previously discussed, we limit our analysis to individuals who we observe in 2006 or later. The education distribution changes minimally as we move across the three samples in Table 2.1 for both natives and immigrants. The place of birth distribution for immigrants also remains much the same.[3] In Columns 3 and 4 of Table 2.1, we present the education distributions of natives and immigrants in the full sample. Immigrants are much more likely than natives to be high school dropouts and the most represented place of origin is Mexico. The main sample consists of new job spells for which we can construct a tenure measure. This includes all foreign-born workers in the full sample since all immigrants started their U.S. careers in 1995 or later. Columns 3 and 5 show that when we consider only new job spells, those that started after the first quarter of 1995, we eliminate about 14% of native workers in the full sample. We consider the implications of this sample selection rule on the earnings analysis below.

Table 2.2 presents average quarterly log earnings of native workers in the full sample in Panel A and the main sample in Panels B and C. Panel B includes all job spells for individuals in the main sample including those in which tenure is censored while Panel C excludes the censored observations. We include Panel B although we exclude censored observations in our analysis to show the earnings differences between the excluded observations and those that are included. Comparing log quarterly earnings in Panels A and B we see that for every education level, native average earnings decrease when we exclude individuals who are in a job in the first quarter of the panel and who subsequently never change jobs. Average quarterly earnings in 2000 of natives in the main sample are approximately 4% lower than that of natives in the full sample. In Panel C we exclude job spells of individuals in

[3] We discuss the nature of the selection into the LEHD for immigrants which affects our place of birth distribution in Section 1.3.

the main sample that are ongoing at the start of the panel which leads to a further decrease in average quarterly earnings resulting in earnings that are about 8-9% lower than those in the full sample in 2000.

The immigrant earnings gap is calculated by subtracting native log earnings from that of immigrants. In Panel D we present the earnings gap considering all job spells as well as excluding job spells with censored tenure. Immigrants are at an earnings disadvantage in the raw data when compared to both samples of natives. Compared to their native counterparts, high school dropout (graduate) immigrants have an earnings gaps of about -21% (-32%) in the full sample and -13% (-23%) in the main sample in 2000. For both education groups, the raw earnings disadvantage diminishes with time in the U.S. While the earnings differences across panels A-C are not trivial, the exclusion of noncensored job spells do not qualitatively change the nature of the earnings differences between natives and immigrants.[4] We note that these earnings disparities between natives and immigrants reflect a combination of differences in hours of work and wages. Because the data does not include a measure of hours worked, our analysis will only consider quarterly earnings rather than wage.

Many factors may explain the lower earnings of immigrants and the closing of the earnings gap over time. Table 2.3 displays statistics related to the mobility of workers across firms by educational attainment and immigrant status. We see that native high school graduates work more quarters than their high school dropout counterparts. Despite working less quarters, high school dropout natives are seen working in more main firms than high school graduate natives. On the other hand, the average number of quarters worked is the same for graduates and dropouts among immigrants.

Column 1 indicates that immigrants have a lower average number of quarters of

[4] We include a separate analysis of young workers for whom we observe job tenure for all relevant job spells which we further describe below.

earnings than similarly educated natives in the full sample. We note that this does not necessarily reflect differences in time unemployed between the foreign-born and natives since some immigrants are not in the U.S. at the start of the panel. High school dropout immigrants are also observed in fewer firms on average than their native counterparts in both the full and main samples. Although we observe fewer quarters of earnings for immigrants than natives in the main sample when considering all full-time earnings observations, this is not the case once we eliminate earnings observations in which job tenure is censored. Panel C displays statistics for the main sample of natives after excluding censored observations. The average number of quarters worked diminishes by 5-6 quarters. Going from the full sample to the main sample we eliminate earnings observations of two kinds 1) all observations of those who never start a new job after the first quarter of 1995 (for example someone who is at the same job in all quarters from 1995 to 2008) and 2) the earnings observations of the job held in the first quarter of 1995 for all other native workers.

Next in Table 2.4 , we consider differences in the job characteristics of immigrants and natives in the main sample. While there is limited empirical evidence, low-skilled immigrants are usually thought of as working in smaller "mom and pop" establishments. It is true that in 2000 immigrants who are high school dropouts are likely to work for smaller single-establishment firms. However, by 2008, they are working at larger firms than natives. On average immigrants with less than a high school education have about the same amount of job tenure as similarly educated natives and have been with their employer longer than natives in 2008. One measure of effort, working two jobs, shows that immigrants have twice the rate of native-born workers.

Finally, we consider the industry of the firm. While we include indicators for three-digit SIC codes for the regression analysis, we aggregate these industries into 9 categories in Table 2.5. Immigrants are more likely to be working in Manufacturing,

Retail Trade, and Arts, Entertainment, Recreation, Accommodations, and Food Services than similarly educated natives in 2000. In these education groups, the proportion of immigrants in Mining/Construction and in Finance, Insurance, and Real Estate (FIRE) increases from 2000 to 2008 while there is little change in the proportion of natives in these industries. The proportion of both immigrants and natives in Transportation, Communications, Electric, Gas and Sanitary Services as well as in Educational, Health and Social Services increase from 2000 to 2008.

2.4 Earnings Specification and Decomposition

We estimate baseline earnings regressions in the spirit of those that are found in the immigrant earnings assimilation literature. We then augment these regressions with state fixed effects to consider within-state earnings differences between natives and immigrants. Then we include job characteristic covariates to consider the role of the workplace in earnings assimilation. Finally, we undertake a decomposition analysis to quantify the contributions of the job characteristics considered in accounting for the within-state earnings differences between immigrant and native workers.

Log quarterly earnings is given by:

$$w_{ijt} = \alpha_0 + \alpha_1 Year_{ijt} + \alpha_2 Age_{it} + \beta_1 (Imm_i * AgeMig_i) + \beta_2 (Imm_i * YSM_{it}) + \epsilon_{ijt} \quad (2.1)$$

where the earnings of a native worker i in job j at time t is decomposed by $Year_{ijt}$ and $Exper_{it}$, vectors of quartics in calendar year and potential labor market experience, respectively.[5] Immigrant earnings are further decomposed by the effect of age at migration and the effect of years since migration to the United States. An indicator of immigrant status, Imm_i, is interacted with a vector, $AgeMig_i$, composed of indicators for whether an immigrant arrived at ages 18-25, 26-30, 31-35, 36-40, 41-45, or 46 and older. Natives are the omitted group. The effect of time in the United

[5] Calendar year incorporates the quarter as one fourth of a year such that the second quarter of 1995 is 1995.25.

States is captured by the vector YSM_{it} which is composed of an indicator for 6-10 years since migration and 11 or more years since migration. The vector of coefficients β_1 captures the earnings differences between immigrants of each arrival age cohort and similar natives in the first 1-5 years in the United States. Differential earnings growth of immigrants, controlling for age, is captured in the vector of coefficients β_2.

We estimate equation 2.1 using ordinary least squares separately for high school dropouts and high school graduates. Typically immigrant earnings assimilation equations such as equation 2.1 also include indicators for year of entry in the U.S. Coefficients on these indicators are taken as a measure of "cohort quality." We are only considering those who immigrated in 1995-1999 and do not include such indicators. As discussed above, previous studies have found that immigrants experience an initial earnings disadvantage and, subsequently faster earnings growth compared to native workers. Similar patterns in earnings for our cohort of immigrants would imply negative coefficients in β_1 and positive coefficients in β_2.

Before investigating the role of job characteristics in the process of earnings assimilation, we consider the within-state earnings differences between natives and the foreign-born. We add a vector of state fixed effects, κ_s, and add a superscript *state* on all coefficients in 1 to obtain:

$$w_{ijt} = \alpha_0^{state} + \alpha_1^{state} Year_{ijt} + \alpha_2^{state} Age_{it} + \beta_1^{state}(Imm_i * AgeMig_i) + \beta_2^{state}(Imm_i * YSM_{it}) + \kappa_s + \epsilon_{ijt}^{state} \quad (2.2)$$

By including state fixed effects in the earnings equation, we compare immigrants to natives within their state of residence at time t for each level of education. Changes in β_1 and β_2 between equation 2.1 and equation 2.2 will shed light on how earnings differences between immigrants and natives relate to their locations. For instance, a decrease in β_1 with the inclusion of state fixed effects indicates that immigrants are

more likely to live in states with higher average earnings at the beginning of their U.S. careers than natives of similar characteristics. Next, suppose that estimates of the components of β_2 in equation 1 are positive and these estimates decrease with the inclusion of state controls. This implies that part of the faster earnings growth of the foreign-born is due to the fact that the likelihood of working in higher earning states relative to similar natives is higher for immigrants later in their U.S. experience than in the initial years after migration. If, on the other hand, the estimates of the components of β_2 in equation 1 are positive but increase after controlling for state, this indicates that immigrant earnings grow faster than that of similar natives despite the fact that immigrants become less likely to be working in higher earnings states than their native counterparts with time in the U.S.

We first estimate equations 2.1 and 2.2 by education for the full sample and for the subset of non-censored job spells, the main sample. As described previously, going from the full sample to the main sample, we eliminate all native workers who are employed in the first quarter of 1995 and remain at that job through the entire sample period. We also eliminate the earnings observations of jobs that are ongoing at the beginning of the sample period of natives in the main sample. Differences between the two sets of analyses will shed light on the selective nature of the subsample which will be used for examining the role of the workplace.

To consider the role of the firm, we include a vector of job characteristics, x_{ijt}, along with state fixed effects and add a superscript job on all coefficients in the earnings regression to obtain:

$$w_{ijt} = \alpha_0^{job} + \alpha_1^{job} Year_{ijt} + \alpha_2^{job} Age_{it} + \beta_1^{job}(Imm_i * AgeMig_i) + \beta_2^{job}(Imm_i * YSM_{it}) + \kappa_s^{job} + \theta^{job} x_{ijt} + \epsilon_{ijt}^{job} \quad (2.3)$$

Job characteristic covariates in x_{ijt} consist of indicators for three-digit SIC codes, an

indicator for working in a multi-unit firm, ten establishment size categories, an indictor for working in two jobs, and job tenure. We estimate this for the main sample. To the extent that $|\beta_1^{job}| < |\beta_1^{state}|$ and $|\beta_2^{job}| < |\beta_2^{state}|$, the vector of characteristics in x partially account for within-state earnings differences between foreign-born workers and natives of similar experience and education.

Using a decomposition developed by Gelbach (2009) we quantify the contributions of the characteristics considered. Let $\delta_m = (\beta_m^{state} - \beta_m^{job})$ for $m = 1, 2$, the amount of earnings differences explained by characteristics included in x at various points in the immigrant U.S. experience. Gelbach uses the sample analogue of the omitted variable bias formula as a basis for decomposing the sensitivity of coefficients to the addition of other controls. If x has K components then δ_m can be decomposed into K additive terms with the contribution of the k^{th} variable given by $\delta_m^k = \theta^{k,job} * \gamma_m^k$, where the γ_m^k are attained by estimating the K auxiliary regressions:

$$x_{ijt}^k = \phi_0^k + \phi_1^k Year_{ijt} + \phi_2^k Age_{it} + \gamma_1^k(Imm_i * AgeMig_i) + \gamma_2^k(Imm_i * YSM_{it}) + \kappa_s^k + \eta_{ijt} \quad (2.4)$$

Two things must occur for a factor, x^k, to substantially account for the relative earnings of immigrants at various points in the immigrant U.S. experience. First, the x^k must be strongly correlated with earnings even when conditioning on other controls. To account for initial relative earnings, there must be a large difference between immigrants and natives in the characteristic within the first 5 years of the immigrants' arrival. To account for changes in the relative earnings of immigrants later in their U.S. careers, there must be changes in the immigrant-native difference in that characteristic with time in the U.S.

Finally, we conduct a subsample analysis of young workers for whom we have more complete earnings records and therefore a more representative sample of na-

tives. For the young sample analysis we consider all full-time earnings observations including those of job spells that are ongoing in the first quarter of 1995. We estimate equations 2.2 and 2.3 as well as undertake the corresponding decomposition analysis to investigate whether the results for these workers confirm the results for the main sample.

2.5 Results

In Table 2.6, Columns 1 and 2 present the baseline regressions and Columns 3 and 4 present the same regressions including state fixed effects for the full sample. The literature as a whole has not included state fixed effects. Comparing Columns 1 and 2 to Columns 3 and 4, we see that while the magnitude of the earnings gap changes slightly after controlling for state fixed effects, the qualitative story is the same. The baseline results are similar to past literature (where the majority of immigrants are from these two groups). We see that immigrants start at an earnings disadvantage but converge toward native earnings with time in the U.S. Including age at migration dummies does reveal heterogeneity in initial earnings of the foreign-born. Immigrants who started their U.S. labor market careers before the age of 26 have initial quarterly earnings that are comparable to similar natives while those who arrived at later ages begin their U.S. careers at a substantial earnings disadvantage. All age at migration cohorts who are high school graduates experience an initial earnings deficit. High school graduates close the earnings gap by 8.30 percentage points 6-10 years after migration. After 11-13 years, the initial gap diminishes by 10.46 percentage points which indicates that those who entered before the age of 26 surpass similar natives in earnings. Similarly, immigrants with less than a high school education close the earnings gap by 9.28 percentage points after 11-13 years. The results are largely the same with or without the inclusion of state fixed effects. This indicates that differences in the state of residence do not account for the relative earnings growth

of immigrants in a substantial way.

Because of the nature of the data, we have limited the maximum length of job tenure by only considering job spells that begin after the start of our sample period in the main analysis. We consider the role of tenure and other job characteristics in the earnings assimilation of immigrants compared to this subset of natives. Table 2.7 presents earnings regressions for the main sample. First, we compare the state fixed effects regression results in our main analysis to those in the full analysis.[6] Compared to natives who start new jobs after the start of the sample period, the initial earnings disadvantage of immigrants diminishes. These gains in initial relative earnings are especially large for the older age at migration cohorts. For instance, compared to similarly educated natives in the same state, high school dropout (graduate) immigrants who arrived in the U.S. after the age of 45 are at about a 50% (53%) disadvantage in the full sample but at a 39% (43%) disadvantage in the main sample. Immigrants are at less of an initial earnings disadvantage when compared to natives who began new jobs at similar points in their labor market experience than when they are compared to all similarly educated natives.

Next, we consider relative earnings growth in the main sample. For both education levels, immigrants experience slower relative earnings growth in the main sample than in the full sample. However, much of the substantial gains in relative earnings with time in the U.S. remain after excluding native job spells that are ongoing at the beginning of the sample period. Columns 1 and 2 of Table 2.7 show that the relative earnings of high school dropout and high school graduate immigrants increase by 7-8 percentage points after 11-13 years in the U.S. Excluding native job spells that are ongoing at the start of our sample period does not substantially change the nature of the relationship between time in the U.S. and earnings for immigrants.

[6] Because the effect of including state fixed effects in the baseline regression for the main analysis had a very similar effect as that of the full analysis we do not report the baseline estimates for the main sample.

From this point forward we focus our analysis on the main sample to consider the role of job characteristics and tenure in the process of earnings assimilation. As discussed above, the main sample is not a representative sample of natives but a sample of natives with limited job tenure. While we are not able to explore the role of tenure for the excluded group, our analysis can consider its role in the earnings of immigrants relative to the natives in the main sample who make up about 86% of the full sample. We also report results from the young sample for whom we have more complete earnings records and therefore a more representative sample of natives below.

Before examining the role of the workplace in earnings assimilation, we consider the relationship of the firm characteristics to earnings. Table 2.8 presents coefficients on all job characteristics considered, with the exception of industry (which is included but not reported), in estimation of equation 2.3 by education. Working in a multi-unit establishment has a positive effect on earnings. The coefficients on the establishment size indicators show that earnings is monotonically increasing with firm size. The effect of job tenure is also positive with one quarter increasing earnings by about 1%. Working at two jobs is associated with about 11-21% higher earnings. The estimates of the effect of job characteristics reported in Table 2.8, along with those of the three-digit industry indicators which are not reported, indicate that these characteristics significantly influence earnings for all education levels.

Since job tenure is of particular interest, in Table 2.9 we report coefficients from estimating equation 2.4 where x^k_{ijt} is the the number of quarters observed at a firm. We see that all age at migration cohorts except high school dropouts who entered the U.S. before the age of 31 have lower job tenure than comparable natives in the first five years of U.S. experience. Immigrants accumulate more job tenure than similarly educated natives within a decade after immigration. We examine how these trends in tenure along with changes in the other job characteristics affect earnings assimilation

below.

2.5.1 Main Sample Results

To consider the role job characteristics have on earnings assimilation we turn back to the estimates in Table 2.7. In Columns 3 and 4 are estimates of earnings differences between foreign-born and native workers after controlling for job characteristics. The initial relative earnings of immigrants increase for all age at migration groups with the inclusion of these characteristics for both dropouts and graduates. For high school dropouts, initial relative earnings increase by about 3-12 percentage points. Firm size, whether the firm is a multi-establishment entity, industry, and job-specific tenure explain nearly a quarter of the within-state initial earnings differences between high school graduate immigrants and their native counterparts. High school graduate immigrants' initial earnings increase by 5-10 percentage points which represents 24-56% of the deficits.

We are especially interested in the differences between the regression results with and without the inclusion of job characteristics in the years since migration category coefficients. In Table 2.7, for high school dropouts, the inclusion of job characteristics diminishes the gains in relative earnings of immigrants during the 11th to 13th year of U.S. experience from 6.95% to 0.42%, a decrease of about 94%. This coefficient decreases by about 50% in the corresponding high school graduate analysis.

Collectively, the job characteristics considered, account for a substantial amount of the faster earnings growth of foreign-born workers. In Table 2.10 we present decompositions of the changes in the years since migration coefficients. Since we wish to focus on the process of assimilation we defer discussion of the decompositions of changes in the initial relative earnings to the Appendix. Columns 1 and 3 of Table 2.10 report the contributions of each group of covariates while Columns 2 and 4 display the percentage of the total change the contribution represents. The decom-

positions for the change in the 11 or more years since migration coefficient show that the majority of the explained growth can be attributed to job tenure. About 65% (61%) of the change in coefficient can be attributed to tenure, 32% (37%) can be attributed to industry, and 5% (1%) can be attributed to working in two or more firms in the high school dropout (graduate) regression. This decomposition indicates that low-skilled immigrants attain faster earnings growth than their native-born counterparts as the likelihood of working in higher paying industries and in more than one firm relative to similar natives increases with time in the U.S. As mentioned previously, job tenure is positively correlated with earnings conditional on the other characteristics. The decomposition implies that the faster rate of tenure growth of immigrants compared to that of their native counterparts contributes to their faster earnings growth. The negative sign on the contribution of establishment size in the high school dropout decomposition indicates that this firm characteristic works in the opposite direction from the others. Average firm size did not increase monotonically across the years considered in Table 2.4 for both natives and immigrants for this education level. Since establishment size is positively correlated with earnings conditional on the other characteristics, the decomposition implies the establishment size of immigrant workers relative to similar natives diminishes with time in the U.S.

2.5.2 Young Workers

In the above analysis of the role of job characteristics, the main sample of natives are those who begin new jobs after the start of the sample period. While the earnings patterns of immigrants relative to natives in the main sample are qualitatively similar to the patterns relative to natives in the full sample, selection into the main sample remains an issue. For the subset of young workers we consider below, we have more complete earnings records and therefore a more representative sample of natives. We investigate whether the results for these workers confirm the results for the main

sample.

The young subsample is composed of individuals who we observe at the start of their labor market experience, those who are 18 or 19 years old in 1995. Since we seek to include complete labor market histories in the panel, we further limit the sample to those who live in one of the 27 states at the start of the panel period. For natives, we use the Decennial Census question "Where did you live 5 years ago?" The answer to this question indicates the state of residence of the individual in 1995 which we use to exclude those who lived outside of the 27 states considered. Since most of the immigrants in our sample were not in the U.S. at the start of the panel, we use the state in which they applied for an SSN as their initial state of residence. The sample consists of 15,805 natives and 4,493 immigrants.[7]

For this analysis we consider all full-time earnings observations including those of job spells that are ongoing in the first quarter of 1995. We estimate earnings regressions like those we estimate for the main sample with minor adjustments. Since the age of workers in this subsample restricts the age at migration of immigrants to 18-24 years old, we simply include an indicator for immigrant status rather than indicators for age at migration cohorts in the earnings regressions.

Table 2.11 displays the estimates from the tenure regressions that are relevant to the decomposition for this subsample. While the tenure regressions from the main sample analysis indicate that high school dropout immigrants who arrived in the U.S. before the age of 31 have higher job tenure than similar natives in the first five years of U.S. experience, this is not the case in the young sample. Because we include observations from native job spells that are ongoing in the first quarter of 1995, immigrants at all education levels begin their U.S. experience with lower job tenure when compared to similar natives. Table 2.11 indicates that after 11-13 years

[7] Natives sample sizes are: 2,359 high school dropouts and13,446 high school graduates. Immigrant sample sizes are: 1,716 high school dropouts and 2,777 high school graduates.

in the U.S. high school dropout immigrants have about 2.5 more quarters of job tenure than their native counterparts. High school graduate immigrants diminish the gap in job tenure but do not surpass similar natives.

Columns 1 and 2 of Table 2.12 report earnings regressions with state fixed effects. High school dropouts experience an initial earnings advantage of about 3% while high school graduates start their U.S. careers at a 6% earnings disadvantage. Both groups experience faster earnings growth compared to similar natives. With the inclusion of job characteristics in addition to the state fixed effects, we consider whether the workplace plays a significant role in the assimilation of this subsample as it did in the main sample. Column 3 indicates that for high school dropouts, the inclusion of job characteristics increases the initial relative earnings of immigrants and eliminates all of the subsequent faster earnings growth. Controlling for job related covariates has a similar effect in the high school graduate analysis.

We consider the decomposition of the changes in the 11 or more years since migration coefficients in Table 2.13. As in the main analysis, industry and tenure are the most important factors. About 69% (29%) of the change in coefficient can be attributed to job tenure and 33% (83%) to industry in the high school dropout (graduate) regression. For high school dropout immigrants, working at multiple jobs also contributes to faster earnings growth while for both high school dropouts and high school graduates, firm size works in the opposite direction.

The decomposition results for the young sample are qualitatively similar to that of the results in the main analysis. The dramatic impact of controlling for job characteristics for this subset of workers further suggests the importance of these characteristics. Job related characteristics account for more than half of the change in the relative earnings of foreign-born workers 11-13 years after immigration in the young sample. The same characteristics which contribute significantly to accounting for the faster earnings growth of immigrants in the main sample also contribute

significantly in the young sample analyses.

2.6 Conclusion

Using matched employer-employee panel data we find that low-skilled immigrants who arrived in the U.S. in the late 1990s exhibit earnings assimilation patterns similar to those found in the previous literature. They start at an earnings disadvantage, followed by faster earnings growth compared to similarly educated natives. Of the 94% of the faster earnings growth explained for high school dropout immigrants 65%, 32%, and 5% can be explained by job tenure, industry, and whether a worker is employed at two or more firms. About fifty percent of the faster earnings growth of high school graduate immigrants is explained and industry and job tenure play a similar role as in the high school dropout analysis. These results suggest that firm-specific human capital may play an important part in the assimilation of low-skilled immigrants.

2.7 Tables and Figures

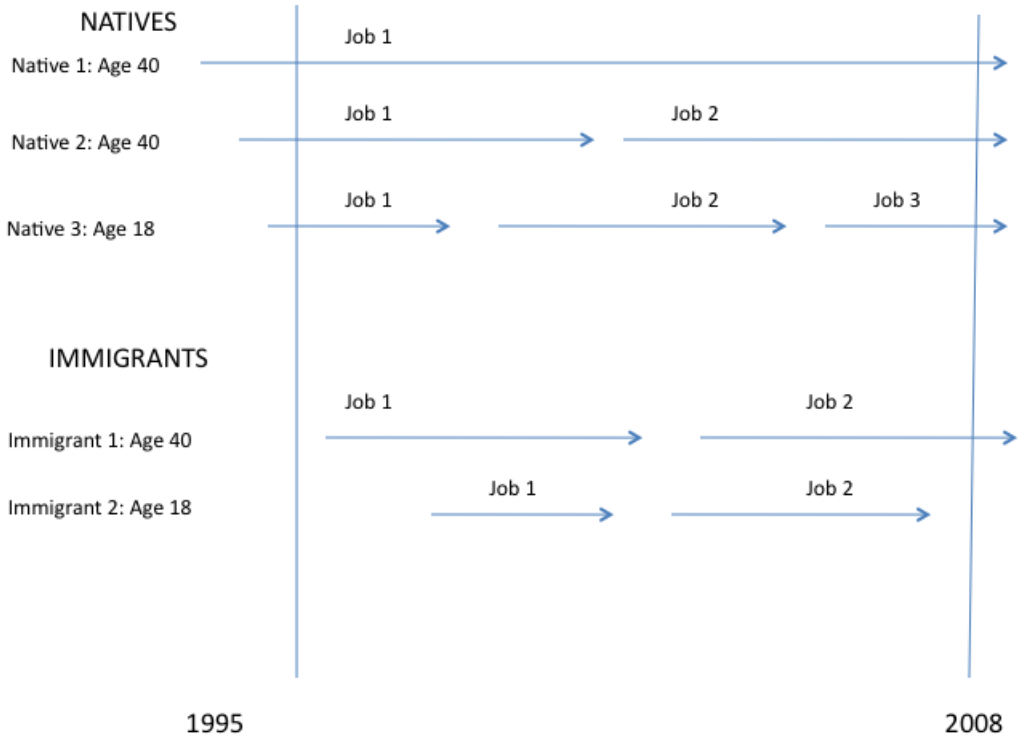

FIGURE 2.1: Sample Selection- This figure depicts hypothetical work histories to depict the differences in samples. Age is given in 1995. The full sample analysis includes all jobs pictured. The main sample analysis excludes all jobs that are ongoing during the first quarter of 1995 (Job 1 for Natives1-3)

Table 2.1: Sample Characteristics

	All Matched		Full Sample		Main Sample	
	(1)	(2)	(3)	(4)	(5)	(6)
	Natives	Immigrants	Natives	Immigrants	Natives	Immigrants
n	505660	99899	429530	80285	370081	80285
Last observation:						
⩾2003	92.01	89.34	100	100	100	100
⩾2006	84.99	80.24	100	100	100	100
2008	76.84	71.74	90.41	89.4	90.19	89.4
Education:						
HS Dropout	10.21	24.37	9.42	25.34	9.89	25.34
HS Graduate	60.73	35.24	60.86	35.68	61.10	35.68
Place of Birth:						
Mexico		16.78		18.18		18.18
India		10.44		11.11		11.11
China		5.05		5.34		5.34
Cuba		4.83		4.71		4.71
Former USSR		4.5		4.5		4.5
Philippines		3.4		3.81		3.81
Canada		3.14		2.87		2.87
UK		2.81		2.59		2.59
Former Yugoslavia		2.56		2.34		2.34
Vietnam		2.32		2.4		2.4

Notes: Columns 1 and 2 consist of all immigrants and a random sample of natives in the 2000 Decennial Census who fulfill our sample criteria and are matched to LEHD earnings in one of the 27 states considered. The full sample is all those who are observed in 2006 or later. The main sample are those in the full sample with at least one job spell that begins after the start of the sample period.

Table 2.2: Log Quarterly Earnings

	High School Dropout			High School Graduate		
	2000	2004	2008	2000	2004	2008
Natives						
A. Full Sample						
Age	38.24	42.26	46.52	38.65	42.50	46.02
Log Earnings	8.8192	8.8522	8.9040	9.0746	9.1169	9.1795
n	90664	91399	83958	669367	687234	649585
B. Main Sample: All Obs.						
Age	37.46	41.5	44.89	37.87	41.72	45.32
Log Earnings	8.7829	8.8161	8.8765	9.0311	9.0743	9.1400
n	79448	80409	75155	561892	579473	554970
C. Main Sample: Excluding Censored Obs.						
Age	36.69	41.22	44.79	37.03	41.40	45.22
Log Earnings	8.7386	8.7992	8.8713	8.9823	9.0568	9.1388
n	65806	74618	73172	450136	530637	537881
D. Immigrants						
Age	34.23	38.25	42.18	34.54	38.3	42.16
Log Earnings	8.6136	8.7200	8.8100	8.7510	8.8867	9.0151
% Gap (D-A)	-20.56	-13.22	-9.40	-32.36	-23.02	-16.44
% Gap (D-C)	-12.50	-7.92	-6.13	-23.13	-17.01	-12.37
n	53497	57343	55028	71917	78516	77247

Notes: Only observations with full-time earnings are used. Earnings gaps are computed as the difference in log earnings between natives and immigrants. The full sample consists of all individuals in the 2000 Decennial long form that fulfill our sample criteria and can be matched to earnings in the LEHD. The main sample consists of those in the full sample who have at least one job spell that starts after the first quarter of 1995. Panel B includes job spells that are ongoing in the first quarter of 1995 while Panel C excludes these observations for those in the main sample.

Table 2.3: Descriptive Statistics

	n	(1) **number of quarters**	(2) **number of main firms**
Natives			
A. Full Sample			
High School Dropouts	37775	30.58	4.81
High School Graduates	247336	35.23	4.35
B. Main sample			
High School Dropouts	34411	29.45	5.14
High School Graduates	214961	34.08	4.81
C. Main Sample excluding censored obs.			
High School Dropouts	34411	24.49	4.64
High School Graduates	214961	27.65	4.22
D. Immigrants			
High School Dropouts	20829	29.76	4.44
High School Graduates	28467	29.67	4.37

Notes: The full sample consists of all individuals in the 2000 Decennial long form that fulfill our sample criteria and can be matched to earnings in the LEHD. The main sample consists of those in the full sample who have at least one job spell that starts after the first quarter of 1995. Panel B includes job spells that are ongoing in the first quarter of 1995 while Panel C excludes these observations for those in the main sample.

Table 2.4: Job Characteristics

	High School Dropout			High School Graduate		
	2000	2004	2008	2000	2004	2008
Natives						
Multi-unit (%)	28.87	30.62	32.61	33.63	35.55	37.57
Firm Size	452.92	497.24	476.52	649.04	663.42	751.59
Tenure (quarters)	7.21	11.53	15.19	7.89	12.77	17.14
Work for 2 or more (%)	4.72	4.05	3.94	5.47	4.82	4.63
n	65806	74618	73172	450136	530637	537881
Immigrants						
Multi-unit (%)	22.10	23.90	27.28	26.84	29.02	31.43
Firm Size	390.18	543.45	536.24	666.77	867.16	1026.47
Tenure (quarters)	7.17	13.17	17.94	6.79	12.66	17.43
Work for 2 or more (%)	8.03	8.01	8.27	9.59	9.15	9.34
n	53497	57343	55028	71917	78516	77247

Notes: This table consists of quarterly earnings in the main sample analysis (observations with non-censored tenure).

Table 2.5: Industry Composition

	High School Dropouts				High School Graduates			
	Natives		Immigrants		Natives		Immigrants	
	2000	2008	2000	2008	2000	2008	2000	2008
Industry								
Mining/Construction	20.98	20.80	15.95	19.06	14.95	15.04	9.53	11.16
Manufacturing	21.86	18.64	28.16	20.64	20.05	17.95	22.98	17.60
Transportation, Comm., Electric, Gas, and Sanitation Services	9.24	11.06	4.14	6.16	9.92	10.82	5.63	8.30
Wholesale Trade	8.77	8.94	8.91	9.34	10.68	10.37	8.71	9.06
Retail Trade	15.78	14.50	20.53	18.22	16.22	14.13	20.40	17.14
Finance, Insurance and Real Estate	2.70	2.95	2.43	3.81	4.15	4.66	3.95	5.70
Professional, Scientific, and Management Services	9.36	10.18	9.06	9.71	11.62	12.48	13.34	12.64
Education, Health, and Social Services	4.33	6.09	2.77	4.67	6.00	8.41	6.38	9.74
Arts, Entertainment, Recreation, Accommodations, and Food Services	6.97	6.83	8.06	8.40	6.41	6.14	9.09	8.66
n	65806	73172	53497	55028	450136	537881	71917	77247

Notes: This table consists of observations in the main analysis (observations with non-censored tenure).

Table 2.6: Baseline Log Quarterly Earnings Regressions: Full Sample

	High School Dropouts (1)	High School Graduates (2)	High School Dropouts (3)	High School Graduates (4)
Age at Migration				
⩽25	-0.001	-0.0909*	-0.0379*	-0.1199*
	(0.0018)	(0.0015)	(0.0019)	(0.0015)
26-30	-0.0975*	-0.2234*	-0.1382*	-0.2510*
	(0.0018)	(0.0016)	(0.0019)	(0.0016)
31-35	-0.2141*	-0.2982*	-0.2485*	-0.3211*
	(0.0021)	(0.0019)	(0.0022)	(0.0019)
36-40	-0.3027*	-0.3605*	-0.3326*	-0.3881*
	(0.0024)	(0.0023)	(0.0025)	(0.0023)
41-45	-0.3860*	-0.4697*	-0.4126*	-0.4937*
	(0.0028)	(0.0026)	(0.0029)	(0.0026)
⩾46	-0.4737*	-0.5105*	-0.4974*	-0.5327*
	(0.0027)	(0.0026)	(0.0028)	(0.0027)
Years Since Migration				
6-10	0.0820*	0.0830*	0.0847*	0.0833*
	(0.0017)	(0.0015)	(0.0017)	(0.0015)
11-13	0.0928*	0.1046*	0.0992*	0.1040*
	(0.0028)	(0.0023)	(0.0028)	(0.0023)
State FE	n	n	y	y
Observations	1792278	9647801	1792278	9647801
R-squared	0.0712	0.0946	0.0843	0.1085

Notes: Robust standard errors in parentheses. Regressions control for quartics in calendar year and age.
* significant at the 1% level

Table 2.7: Log Quarterly Earnings Regressions: Main Sample

	High School Dropouts (1)	High School Graduates (2)	High School Dropouts (3)	High School Graduates (4)
Age at Migration				
⩽25	-0.0054*	-0.0938*	0.0237*	-0.0416*
	(0.0020)	(0.0015)	(0.0019)	(0.0014)
26-30	-0.0807*	-0.1960*	-0.0338*	-0.1259*
	(0.0020)	(0.0016)	(0.0018)	(0.0015)
31-35	-0.1748*	-0.2496*	-0.1114*	-0.1751*
	(0.0023)	(0.0019)	(0.0022)	(0.0018)
36-40	-0.2488*	-0.3032*	-0.1697*	-0.2243*
	(0.0026)	(0.0023)	(0.0025)	(0.0021)
41-45	-0.3205*	-0.3974*	-0.2188*	-0.2952*
	(0.0030)	(0.0026)	(0.0028)	(0.0024)
⩾46	-0.3930*	-0.4261*	-0.2721*	-0.3224*
	(0.0030)	(0.0027)	(0.0029)	(0.0025)
Years Since Migration				
6-10	0.0605*	0.0599*	0.0163*	0.0368*
	(0.0018)	(0.0015)	(0.0017)	(0.0014)
11-13	0.0695*	0.0781*	0.0042	0.0391*
	(0.0029)	(0.0023)	(0.0026)	(0.0022)
State FE	y	y	y	y
Job Characteristics	n	n	y	y
Observations	1468788	6783272	1468788	6783272
R-squared	0.0737	0.0947	0.257	0.2544

Notes: Robust standard errors in parentheses. Regressions control for quartics in calendar year and age. Job characteristics include indicators for three-digit SIC, indicator for multi-unit firm, 10 firm size categories, job tenure, and an indicator for working for two firms.
* significant at the 1% level

Table 2.8: Log Quarterly Earnings Regressions Main Sample- Firm Characteristics

	High School Dropouts (1)	High School Graduates (2)
Firm size=x		
$5< x \leqslant 10$	0.0802*	0.0639*
	(0.0030)	(0.0014)
$10< x \leqslant 20$	0.1329*	0.0998*
	(0.0029)	(0.0014)
$20< x \leqslant 50$	0.1611*	0.1355*
	(0.0027)	(0.0013)
$50< x \leqslant 100$	0.1993*	0.1697*
	(0.0028)	(0.0013)
$100< x \leqslant 150$	0.2199*	0.1813*
	(0.0032)	(0.0014)
$150< x \leqslant 500$	0.2478*	0.1934*
	(0.0029)	(0.0013)
$500< x \leqslant 1000$	0.2900*	0.2238*
	(0.0035)	(0.0015)
$1000< x \leqslant 2000$	0.3117*	0.2448*
	(0.0043)	(0.0017)
$x > 2000$	0.3539*	0.3229*
	(0.0045)	(0.0017)
multi-unit	0.0554*	0.0285*
	(0.0014)	(0.0006)
tenure (quarters)	0.0111*	0.0102*
	(0.0001)	(0.0000)
work at	0.2066*	0.1133*
multiple firms	(0.0029)	(0.0011)
Observations	1468788	6783272
R-squared	0.257	0.2544

Notes: Coefficients from regressions represented in Columns 3 and 4 in Table 2.7.
* significant at the 1% level

Table 2.9: Tenure Regressions: Main Sample

	Job Tenure (quarters)	
	High School Dropouts (1)	High School Graduates (2)
Age at Migration		
⩽25	0.4340*	-0.9768*
	(0.0283)	(0.0196)
26-30	0.7163*	-0.4240*
	(0.0290)	(0.0216)
31-35	-0.1711*	-0.6007*
	(0.0356)	(0.0252)
36-40	-0.4377*	-0.8894*
	(0.0435)	(0.0310)
41-45	-1.0556*	-1.0890*
	(0.0511)	(0.0384)
⩾46	-1.8436*	-1.0242*
	(0.0544)	(0.0401)
Years Since Migration		
6-10	2.3529*	1.2248*
	(0.0293)	(0.0208)
11-13	3.8316*	2.3408*
	(0.0680)	(0.0487)
State FE	y	y
Observations	1468788	6783272
R-squared	0.166	0.174

Notes: Robust standard errors in parentheses. Regressions control for quartics in calendar year and age.
* significant at the 1% level

Table 2.10: Main Sample Decompositions of Change in Coefficient: Years Since Migration 11+

	High School Dropouts		High School Graduates	
	(1)	(2)	(3)	(4)
(1) coefficient w/o job characteristics	0.0695		0.0781	
(2) coefficient w/ job characteristics	0.0042		0.0391	
(1)-(2)	**0.0653**		**0.0390**	
Contribution to change in coefficient		%		%
industry	0.0207	32	0.0144	37
multi-unit	0.0009	1	0.0003	1
establishment size	-0.0019	-3	0.0000	0
job tenure	0.0426	65	0.0238	61
work for 2 or more firms	0.0030	5	0.0005	1

Notes: Coefficients in row (1) correspond to those in Columns 1and 2 of Table 2.7. Coefficients in row (2) correspond to those in Columns 3 and 4 in Table 2.7.

Table 2.11: Tenure Regressions: Young Sample

	Job Tenure (quarters)	
	High School Dropouts (1)	High School Graduates (2)
Immigrant	-0.2641*	-1.2286*
	(0.0559)	(0.0328)
Years Since Migration		
6-10	2.2000*	0.6232*
	(0.0975)	(0.0621)
11-13	2.7265*	0.8522*
	(0.2112)	(0.1343)
State FE	y	y
Observations	110655	504892
R-squared	0.1168	0.1419

Notes: Robust standard errors in parentheses. Regressions control for quartics in calendar year and age.
* significant at the 1% level

Table 2.12: Log Quarterly Earnings Regressions: Young Sample

	High School Dropouts (1)	High School Graduates (2)	High School Dropouts (3)	High School Graduates 4)
Immigrant	0.0287*	-0.0571*	0.0545*	-0.0074**
	(0.0048)	(0.0034)	(0.0046)	(0.0032)
years since migration				
6-10	0.0696*	0.0269*	0.0287*	0.0094**
	(0.0063)	(0.0047)	(0.0058)	(0.0043)
11-13	0.0565*	0.0558*	0.0000	0.0204*
	(0.0102)	(0.0073)	(0.0092)	(0.0066)
State Fe	y	y	y	y
Job Characteristics	n	n	y	y
Observations	110655	504892	110655	504892
R-squared	0.1267	0.21	0.3455	0.3719

Notes: Robust standard errors in parentheses. Regressions control for quartics in calendar year and age. Job characteristics include indicators for three-digit SIC, indicator for multi-unit firm, 10 firm size categories, job tenure, and an indicator for working for two firms.
* significant at the 1% level

Table 2.13: Young Sample Decompositions of Change in Coefficient: Years Since Migration 11+

	High School Dropouts		High School Graduates	
	(1)	(2)	(3)	(4)
(1) coefficient w/o job characteristics	0.0565		0.0558	
(2) coefficient w/ job characteristics	0.0000		0.0204	
(1)-(2)	**0.0565**		**0.0354**	
Contribution to change in coefficient		%		%
industry	0.0184	33	0.0294	83
multi-unit	0.0002	0	-0.0001	0
establishment size	-0.0039	-7	-0.0038	-11
job tenure	0.0388	69	0.0102	29
work for 2 or more firms	0.0030	5	-0.0003	-1

Notes: Coefficients in row (1) correspond to those in Columns 1 and 2 of Table 2.12. Coefficients in row (2) correspond to those in Columns 3 and 4 in Table 2.12.

Appendix A

Appendix

A.1 Decompositions: Main Analysis

Here we examine the decompositions of the initial earnings differences between natives and immigrants in the main sample analysis. Table A3 displays decompositions of the changes in the coefficients of interest for high school dropouts. Columns 1-6 display the decompositions for the changes in initial relative earnings. As discussed in the Results section, the inclusion of job characteristics leads to an increase in relative initial earnings for all age at migration cohorts. The decompositions indicate that the initial earnings deficit of high school dropout immigrants is largely attributable to the industries in which they work and in small part due to working in single establishment firms. The lower job tenure of immigrants who arrived after the age of 30 also contributes to their initial earnings disadvantage. However, as we discussed previously, immigrants who arrived earlier in their careers, start at a tenure advantage. Hence, job tenure goes in the opposite direction in the decomposition for these age at migration cohorts. Because foreign-born high school dropouts work in larger establishments and are more likely to work for more than one firm than

natives at the beginning of their U.S. experience, these characteristics also go in the opposite direction in the decomposition.

Table A4 displays decompositions for the high school graduate regressions. Much like the high school dropout results, the inclusion of job characteristics diminishes the initial earnings deficit of high school educated immigrants. About 87-94% of this is due to industry, 6-19% to job tenure, and 2-3% to working in a multi-establishment firm. Working for two or more firms goes in the opposite direction, indicating that foreign-born high school graduates are more likely to work in multiple jobs than their native-born counterparts. The magnitude of the contribution of establishment size is small and the sign is not consistent across age at migration cohorts.

A.2 Decompositions: Young Subsample Analysis

In Tables A7 and A8 we examine decompositions for the changes in coefficients of interest in the young subsample analysis. Table A7 displays decompositions for low-educated workers. For both high school dropouts and high school graduates, the inclusion of job characteristics results in an increase in initial relative earnings. Column 1 indicates that this is largely due to industry affiliation and to a lesser degree due to job tenure for both education levels considered, indicating that low-educated immigrants work in lower paying industries and have less job tenure at the beginning of their U.S. careers than similar natives.[1] Establishment size and working for 2 or more firms work in the opposite direction in the decomposition indicating that immigrants work in larger establishment and are more likely to work for two or more firms than similar natives.

[1] In Table 13 we saw that all immigrants in this subsample analysis start at a tenure deficit.

A.3 Tables

Table A.1: Decomposition: High School Dropouts

	(1) ⩽ 25		(2) 26-30		(3) 31-35		(4) 36-40	
(1) coefficient w/o job characteristics	-0.0054		-0.0807		-0.1748		-0.2488	
(2) coefficient w/ job characteristics	0.0237		-0.0338		-0.1114		-0.1697	
(1)-(2)	-0.0291		-0.0469		-0.0634		-0.0791	
Contribution to change in coefficient		%		%		%		%
industry	-0.0409	140	-0.0611	130	-0.0695	110	-0.0821	104
multi-unit	-0.0038	13	-0.0035	7	-0.0032	5	-0.0038	5
establishment size	0.0060	-21	0.0043	-9	0.0050	-8	0.0049	-6
job tenure	0.0048	-16	0.0080	-17	-0.0019	3	-0.0049	6
work for 2 or more firms	0.0047	-16	0.0054	-12	0.0062	-10	0.0068	-9
	(5) 41-45		(6) ⩾ 46		(7) YSM 6-10		(8) YSM 11+	
(1) coefficient w/o job characteristics	-0.3205		-0.393		0.0605		0.0695	
(2) coefficient w/ job characteristics	-0.2188		-0.2721		0.0163		0.0042	
(1)-(2)	-0.1017		-0.1209		0.0442		0.0653	
Contribution to change in coefficient		%		%		%		%
industry	-0.0907	89	-0.1014	84	0.0159	36	0.0207	32
multi-unit	-0.0042	4	-0.0054	4	0.0007	2	0.0009	1
establishment size	0.0000	0	0.0024	-2	-0.0005	-1	-0.0019	-3
job tenure	-0.0117	12	-0.0205	17	0.0261	59	0.0426	65
work for 2 or more firms	0.0049	-5	0.0039	-3	0.0020	5	0.0030	5

Notes: Coefficients in row (1) correspond to those in Column 1 of Table 2.8. Coefficients in row (2) correspond to those in Column 3 in Table 2.8.

Table A.2: Decomposition: High School Graduates

	(1) ⩽ 25		(2) 26-30		(3) 31-35		(4) 36-40	
(1) coefficient w/o job characteristics	-0.0938		-0.196		-0.2496		-0.3032	
(2) coefficient w/ job characteristics	-0.0416		-0.1259		-0.1751		-0.2243	
(1)-(2)	-0.0522		-0.0701		-0.0745		-0.0789	
Contribution to change in coefficient		%		%		%		%
industry	-0.0454	87	-0.0658	94	-0.0685	92	-0.0714	90
multi-unit	-0.0017	3	-0.0018	3	-0.0018	2	-0.0020	3
establishment size	0.0010	-2	-0.0021	3	-0.0027	4	-0.0012	2
job tenure	-0.0099	19	-0.0043	6	-0.0061	8	-0.0091	12
work for 2 or more firms	0.0039	-7	0.0039	-6	0.0046	-6	0.0048	-6
	(5) 41-45		(6) ⩾ 46		(7) YSM 6-10		(8) YSM 11+	
(1) coefficient w/o job characteristics	-0.3974		-0.4261		0.0599		0.0781	
(2) coefficient w/ job characteristics	-0.2952		-0.3224		0.0368		0.0391	
(1)-(2)	-0.1022		-0.1037		0.0231		0.039	
Contribution to change in coefficient		%		%		%		%
industry	-0.0915	90	-0.0969	93	0.0100	43	0.0144	37
multi-unit	-0.0021	2	-0.0022	2	0.0002	1	0.0003	1
establishment size	-0.0015	1	0.0012	-1	0.0001	0	0.0000	0
job tenure	-0.0111	11	-0.0104	10	0.0125	54	0.0238	61
work for 2 or more firms	0.0040	-4	0.0045	-4	0.0004	2	0.0005	1

Notes: Coefficients in row (1) correspond to those in Column 2 of Table 2.8. Coefficients in row (2) correspond to those in Column 4 in Table 2.8.

Table A.3: Decomposition: Young Subsample

High School Dropouts	(1) Immigrant		(2) YSM 6-10		(3) YSM 11+	
(1) coefficient w/o job characteristics	0.0287		0.0696		0.0565	
(2) coefficient w/ job characteristics	0.0545		0.0287		0.0000	
(1)-(2)	-0.0258		0.0409		0.0565	
Contribution to change in coefficient		%		%		%
industry	-0.0324	126	0.0082	20	0.0184	33
multi-unit	-0.0022	9	0.0001	0	0.0002	0
establishment size	0.0084	-33	-0.0016	-4	-0.0039	-7
job tenure	-0.0038	15	0.0313	77	0.0388	69
work for 2 or more firms	0.0041	-16	0.0029	7	0.0030	5
High School Graduates	(4) Immigrant		(5) YSM 6-10		(6) YSM 11+	
(1) coefficient w/o job characteristics	-0.0571		0.0269		0.0558	
(2) coefficient w/ job characteristics	-0.0074		0.0094		0.0204	
(1)-(2)	-0.0497		0.0175		0.0354	
Contribution to change in coefficient		%		%		
industry	-0.0425	86	0.0142	81	0.0294	83
multi-unit	-0.0010	2	-0.0003	-2	-0.0001	0
establishment size	0.0049	-10	-0.0042	-24	-0.0038	-11
job tenure	-0.0147	30	0.0074	42	0.0102	29
work for 2 or more firms	0.0036	-7	0.0004	2	-0.0003	-1

Notes: Coefficients in row (1) correspond to those in Columns 1 and 2 of Table 2.13. Coefficients in row (2) correspond to those in Columns 3 and 4 in Table 2.13.

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Biography

Deborah Tammy Rho was born on May 29, 1986 in Athens, Georgia. She graduated magna cum laude from the University of Southern California in 2008 with a B.S. in Economics/Mathematics and a minor in Philosophy. She earned an M.A. in Economics in 2009 and a Ph.D. in Economics as well as a Certificate in College Teaching in 2014 from Duke University. After graduation, she will work as an Assistant Professor of Economics at the University of St. Thomas in St. Paul, Minnesota.