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Three Essays on Immigrants' Socio-Economic Integration in the United States

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Abstract

Using data from the U.S. censuses and American Community Surveys from 1950 to 2010, my dissertation investigates immigrants' socio-economic integration in the U.S. I aim to study the causes and consequences of immigrants' integration in the U.S. and to offer insights on policies that could facilitate immigrants in their assimilation process. The first chapter analyzes the increasing native-immigrant wage gaps since the 1980s. The second chapter studies the increasing wage premiums of intermarried immigrants since the 1980s. The third chapter studies why people live in ethnic enclaves.

I find that technological change and globalization, which have increased the relative price of U.S.-specific social-communication and managerial skills since the 1980s, are important drivers of the widening wage gaps between natives and immigrants as well as the increasing wage premiums of intermarried immigrants. I also find that ethnic enclaves have a "pulling" effect whereby immigration inflows to cities can simultaneously attract co-ethnic natives already living in the receiving cities to remain and entice co-ethnic natives living outside of the receiving cities to migrate in. I also find that this pulling effect is not due to potential monetary benefits in the labor market but is instead likely due to the lower housing prices and non-monetary benefits such as language convenience and ethnic amenities.

Three Essays on Immigrants' Socio-Economic Integration in the United States

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Introduction

The United States is one of the most popular immigrant receiving countries in the world, and its economy is closely tied to the social-economic success of immigrants. Since the U.S. immigration system is laissez-faire toward immigrants' assimilation, it is important and interesting to study immigrants' social-economic integration in order to identify what factors contribute to their socio-economic success and what the consequences of their assimilation progress are. My dissertation investigates three aspects of immigrants' socio-economic integration in the U.S.: the reasons behind the increasing native-immigrant wage gaps, the sources of the increasing wage premiums of intermarried immigrants, and the motivation behind immigrants' tendency to cluster in ethnic enclaves.

The first chapter studies why the gap between native and immigrant wages in the U.S. has increased significantly since the 1980s. Recognizing that part of the increase in wage gap since the 1980s cannot be fully explained by differences in observable characteristics between natives and immigrants, I use the five percent Integrated Public Use Micro Samples of the 1980 and 2000 Censuses and the two versions of the 1 percent metro samples of the 1970 Census to explore whether skill price changes induced by skill biased technological progress, which started in the 1980s, played a role in the increase in wage gaps. I use historical routine employment share to measure local labor markets' likely technology adoption and show that markets that specialized in routine tasks before the technological boom experienced differential increases in native-immigrant wage gaps after the boom. Furthermore, I find that this relationship is not related to differential migration behaviors between natives and immigrants, but it is closely related to immigrants' English language abilities as well as other measures of their social assimilation. Lastly, using alternative time periods, I show that the positive relationship between a local labor market's

historical routine intensity and native-immigrant wage gaps can only be consistently observed after 1980. All of the empirical evidence is consistent with the hypothesis that native workers have better labor market outcomes because they have an advantage in U.S.-specific social skills, and the returns to these skills have increased as a result of technological development.

The second chapter is an article co-authored and published jointly with Delia Furtado in the *ANNALS of the American Academy of Political and Social Science* in 2015. In this chapter, we study the reasons behind the increase in wage premiums associated with immigrants married to natives ("intermarried immigrants") in the U.S. While previous studies show that intermarried immigrants have always earned higher wages than immigrants married to other immigrants in the U.S., we use data from the 1980 – 2000 U.S. Censuses and the 2005 – 2010 American Community Surveys to show that the wage premiums associated with intermarriage have been consistently increasing in the past three decades. Our empirical evidence suggests that this trend is not driven by changing characteristics of intermarried immigrants, but are most likely caused by the increasing returns to characteristics that intermarried immigrants tend to have. Since intermarried immigrants tend to be highly educated and have better English language skills, part of the increase in premiums can be explained by increases in returns to education and to English-language skills. Additionally, we find that the trend of increasing premiums persists even after allowing returns to schooling and English-speaking ability to vary. We argue that communication and management skills becoming more valuable due to technological change and globalization is another important factor driving the increase in intermarriage wage premiums.

In the third chapter, I study why immigrants, even the second or third plus generations, tend to live within ethnic enclaves. Using the Census and American Community Surveys data from 1950 to 2010, I adopt a novel method and analyze the migration patterns and wages of the

native-born of foreign ancestry in response to co-ethnic immigration inflows to their metropolitan areas. My results point to a "pulling" effect of ethnic enclaves whereby immigration inflows to cities simultaneously increase the likelihood that pre-existing co-ethnic natives remain in these cities and the likelihood that out-of-town co-ethnic natives migrate into these cities, relative to natives of other ancestries. I also find that this pulling effect is not due to potential monetary benefits in the labor market but is instead likely due to the lower housing prices in the enclave neighborhoods and non-monetary benefits such as language convenience and ethnic amenities.

My dissertation sheds light on some of the most debated topics in the media today related to immigration in the U.S. First, while part of the decline in economic assimilation in recent waves of immigrants is due to their slower rate of human capital accumulation, changes in market circumstances that continuously increase returns to social and communication skills could also slow down the socio-economic assimilation of immigrants. While the government's immigrant assistance programs that prioritize training for English language skills and formal education are important, supplementary policies designed specifically to improve immigrants' social capital would be especially cost effective if they improve immigrants' economic success rate and decrease immigrants' need for safety net programs. Second, policy makers making decisions related to refugee placement and immigrant settlement should be aware that encouraging newly arriving refugees and immigrants to reside close to their relatives and within their ethnic enclaves is a favorable strategy because they provide a much-needed low cost and socially familiar environment for the newly arriving immigrants during the beginning of their assimilation process.

Chapter One
Honey, Robots Shrunk My Wage!
Native-Immigrant Wage Gaps and Skill Biased Technological Change

Tao Song

Abstract

The gap between native and immigrant wages in the U.S. has increased significantly since the 1980s. While part of this may be attributable to declines in the relative quality of immigrant labor, this chapter explores whether skill price changes induced by skill biased technological progress also played a role. Using historical routine employment share to measure cities' likely technology adoption, I show that local labor markets that specialized in routine tasks experienced differential increases in native-immigrant wage gaps. This is consistent with the hypothesis that native workers have better labor market outcomes because they have a comparative advantage in U.S.-specific social skills, and the returns to these skills have increased as a result of technological development. Results do not seem to be driven by selective migration between cities but are strongly related to immigrants' English language abilities as well as other measures of their social assimilation.

1. Introduction

Throughout U.S. history, the native-born have earned higher wages than the foreign-born (Chiswick, 1978; Alba and Nee, 2003), but these wage gaps have been increasing significantly since the 1980s (Figure 1). While a simple explanation is that the more recent cohorts of immigrants have worse human capital characteristics than earlier cohorts, an alternative is that market circumstances have changed in a way that they disproportionately reward skills in which natives have an advantage in. This would increase wage gaps between natives and immigrants even if the recent cohorts of immigrants had the same human capital characteristics as the earlier cohorts. This chapter formally tests the hypothesis that the growing returns to U.S.-specific social skills induced by skill biased technological change is an important factor driving the increase in native-immigrant wage gaps.

There is evidence that the more recent cohorts of immigrants have worse language skills and lower education levels when compared to natives, and in a series of papers (Borjas, 1990; 1991; 2015), Borjas suggests that these changing characteristics might explain the slower rates of assimilation of the more recent cohorts. In this chapter, I start by showing that the part of the wage gap that cannot be fully explained by differences in observable characteristics between natives and immigrants also increased since the 1980s. I then use cross-city variation in the historical routine task shares to explore whether native-immigrant wage gaps increased more in cities that were more likely to have adopted more technologies.

The literature suggests that skill biased technological change has induced growing returns to social skills.[1] The skill biased technological change model developed by Acemoğlu and Autor (2011) categorizes labor input by tasks and argues that the diffusion of automation can make

[1] See the following seminal works for a comprehensive survey: Katz and Murphy, 1992; Bound and Johnson, 1992; Autor et al., 1998; Autor et al., 2003; Acemoğlu and Autor, 2011.

cognitive and social skills become more highly demanded. Technology complements these skills, while substituting for routine physical skills, and in doing so, yields higher prices for cognitive and social skills relative to routine physical skills (Acemoğlu and Autor, 2011; Autor and Dorn, 2013; Autor et al., 2015; Deming, 2015). Since highly educated workers tend to perform tasks that require relatively more cognitive and social skills, the growing returns to education can be considered a result of the increase in returns to these skills. Empirical evidence supporting this argument can be found in the U.S. (Acemoğlu and Autor, 2011; Autor and Dorn, 2013; and Autor et al., 2015), the UK (Card and Lemieux, 2001), Germany (Fitzenberger and Kohn, 2006), and other OCED countries (Atkinson, 2008). The rise in the return to education over this period has been found to have exacerbated the decline of relative wages of immigrants because immigrants are typically less skilled than the representative native (Lalonde and Topel, 1992).

A separate literature highlights the importance of host-country-specific social skills for immigrants' labor market success. Simple economic theory states that successful transactions occur when buyers and sellers can mutually agree on a price for a good or service that leaves both parties better off, and the process of arrival at such agreement depends critically on the ability of parties to efficiently communicate with one another (Lazear, 1999). While a common language is an obvious prerequisite for effective communication, other types of cultural differences might also forestall mutually beneficial transactions (Vigdor, 2015). For example, a Chinese seller accustomed to a culture where haggling is the norm might set the price of goods higher than the "true" price. In response, buyers in the U.S. might walk away from a viable transaction after seeing the high list price. Empirically, several papers in the immigration literature point to the importance of language and host-country-specific social skills in determining labor market success. In the U.S., immigrants who have higher English proficiency are better substitutes for native workers

(Lewis, 2013) and earn higher wages than immigrants with worse English language skills (Bleakley and Chin, 2004). Using marriage to a native as a measure of social assimilation, Furtado and Song (2015) show that the returns to social assimilation have increased over the past three decades even when holding constant English language fluency. Consistent with the idea that immigrants have a comparative advantage in manual-physical labor intensive occupations and natives have a comparative advantage in social-cognitive occupations, several researchers have shown that natives increasingly pursue jobs more intensive in communication and language tasks in response to immigrant inflows (Peri and Sparber, 2009; Foged and Peri, 2013).

This chapter contributes to both of these literatures by linking changes in native-immigrant wage gaps with skill biased technological change. I argue that native-born workers in the U.S. are relatively better endowed with U.S.-specific social skills because of the language and culture advantages they have over immigrants. Therefore, skill biased technological change, which increases the relative price of such skills, is a likely additional factor explaining the growth of native-immigrant wage gaps.

Figures 1 and 2 show that the native-immigrant wage gap movement matches closely with the recent technological change in the United States. During the 1960s and the 1970s, both the average native-immigrant relative wages and output in IT industries were relatively stable. Starting in 1980, both increased significantly and continued to grow in the next two decades until leveling off in the early 2000s. These patterns may be suggestive of a potential link between technological change and native-immigrant wage gaps, but to provide a clearer causal analysis, I examine whether U.S. cities that were more strongly affected by technological change between 1980 and 2000 also had the largest increases in native-immigrant wage gaps.

Following the literature, I use the routine employment share of local labor markets before the technological change to generate plausibly exogenous variation in technology adoption after the technology boom. To provide insight into the impact of skill biased technological change on native-immigrant wage gaps, I show that MSAs that were historically routine intensive, and therefore more likely to have adopted technology, experienced larger increases in native-immigrant wage gaps between 1980 and 2000, even after controlling for observable characteristics of immigrants and natives. This result is robust to including additional years' data and using an alternative measure of technology adoption. By separating the sample according to immigrants' English language skills and other measures of U.S.-specific social skills, I find evidence that consistently suggests that part of the increase in native-immigrant wage gaps was due to increases in the returns to U.S.-specific social skills brought about by skill biased technological change.

The remainder of this chapter is structured as follows. Section two presents the theoretical framework that guides the empirical model. Section three introduces the empirical model, discusses measurement of key variables, and describes data. Section four presents and discusses the empirical results. Section five concludes the chapter.

2. Theoretical Framework

Skill Biased Technological Change − The Routinization Hypothesis

Basic firm theory dictates that if two factors of production are imperfect substitutes, a decrease in the relative price of one input can create incentives for firms to substitute the less expensive input for the more expensive input. Since the beginning of the 1980s, the U.S. economy has experienced a secular price decline of new technology in the form of automation. This created incentives for employers to substitute technology for expensive labor in performing workplace tasks. Figure 2

presents IT industries' output share in GDP over time, with a time line of key events associated with technological progress. In the 1960s, engineers started to experiment with robotics as a means of industrial development. In 1969, Stanford Arm, a 6-axis robot that could move and assemble parts in a continuous repeated pattern, was created. This style of robotic use to perform routine repeated tasks has continued to be applied in modern day use. The wide utilization of automation in industries, however, did not start until the 1980s. With the introduction of the first PC, IBM-PC, in 1981, technological development entered a period of great progress in the following two decades, marked by continued improvement of PC computing powers and more advanced graphical interface operating systems such as the Windows. Propelled by these improvements, industrial automation started to propagate into various aspects of production, machines became ever more sophisticated, and robotics became a key area to support industrial development and scientific research (Wallén, 2008). For example, the RFID tag was patented in 1983, which drastically changed tracking, identification and transportation; REX became the world's first autonomous excavation machine in 1985; Carnegie Mellon University unveiled Dante, a walking robot for surveying purposes, in 1993; and NASA's Pathfinder landed on Mars in 1997. As a result, the share of IT industries' output in GDP soared beginning in 1980 and continued to experience fast growth throughout the 1990s until diminishing marginal returns slowed down the development in the 2000s. This turning, interestingly, matches closely with the changes in average native-immigrant relative wages shown in Figure 1.

Since a machines' ability to accomplish a task is dependent upon the programmer's ability to write a set of procedures that take into account all possible contingencies, the tasks that current technology perform need to be fairly routine and "codifiable". Thus, routine physical tasks are easily substitutable by technology. Current technology also complements workers who specialize

in non-routine tasks because it frees these workers from doing repetitive work. It is due to this uneven impact of technology on different types of labor inputs that the literature termed the current technological change as "skill biased". Specifically, the skill biased technological change decreases relative demand and relative price of manual routine skills, and increases relative demand and relative price of cognitive and social skills. Indeed, studies find that beginning in 1980, occupations that required higher routine task contents started to experience decreases in employment and wages, and occupations that required more cognitive and social skills experienced significant growth (Plunkert, 1990; Deming, 2015). Workers who tended to have a comparative advantage in cognitive and social skills, such as highly educated individuals (Acemoğlu and Autor, 2011) and women (Beaudry and Lewis, 2014), also experienced a significant increase in relative wages.

This chapter adopts the argument and conjectures that immigrant workers are almost inherently inferior in terms of social skills specific to their host countries due to cultural and language barriers, so as the prices of these skills increase, immigrants should experience falling wages relative to natives, even after controlling for observable characteristics. Therefore, cities that adopt technology more aggressively should experience a more pronounced widening of native-immigrant wage gaps.

3. Measurement, Model, and Data

3.1 Measuring Native-Immigrant Wage Gaps

The goal of this chapter is to test whether technological change impacted native-immigrant wage gaps, so I begin by measuring the trend of native-immigrant wage gaps during technological change. For the purposes of empirical implementation, I focus on the change in the wage gap

between 1980 and 2000 because this time period, as shown in Figure 2, was the fastest growing period of technology and it is considered to be the time that skill biased technological change exerted the greatest impact on the labor market (Autor et al., 2015; Beaudry and Lewis, 2014).

I use the five percent Integrated Public Use Micro Samples (Ruggles et al., 2010) of the 1980 and 2000 Censuses to compute the wage gaps and other labor market variables. I restrict the sample to employed workers ages 18 to 64 who work full time full year.[2] An immigrant is defined as a person born outside of the 50 U.S. states, while a native is defined as a person born inside the 50 U.S. states. In this study, people born in outlaying areas such as Puerto Rico and Virgin Islands are considered immigrants. Due to difficulties of interpreting female labor market outcomes, I restrict the sample to males. In order to highlight the communication skills differences between immigrants and natives, immigrants born in countries with English as the first language are excluded from the sample.[3] I use the natural log of hourly wage to calculate native-immigrant wage gaps. The hourly wage variable is constructed by dividing annual inflation adjusted wages by total hours worked. The total working hours variable is calculated by multiplying hours worked in a typical week with the number of weeks worked in a year. I further restrict the sample to people with hourly wages between 2 and 200 dollars, measured in 1999 dollars. I use census-provided person weights throughout.

Native-immigrant wage gaps are constructed separately for the 118 MSAs that are consistent across the sample years and for the four education groups - high school dropouts, high school graduates, those with some college education (but less than four years) and four-year college graduates.[4] Given the changes in immigrant composition in these two years, I use a

[2] Full time full year is defined as working 35 hours or more in a typical week and working no less than 40 weeks in the previous year, as defined by the usual convention in the literature.
[3] The list of identified English speaking countries is retrieved from the CIA Factbook (2014).
[4] This chapter further categorizes two broad education groups: individuals with at most a high school degree are considered to be low-skilled, while individuals with at least some college education are considered as high-skilled.

regression adjustment process adopted in Beaudry and Lewis (2014) to ensure that the wage gap variable compares wages between otherwise similar native born and immigrants in terms of observable characteristics.

I first estimate the equation $\ln w_{iegt} = \alpha_0 + \alpha_1 H_{iegt} + u_{iegt}$, where $\ln w_{iegt}$ is the natural log of the hourly wage of person i who belongs to education group e and native-immigrant status g (where $g = n$ indicates natives and $g = m$ indicates immigrants) during year t. The vector H_{iegt} contains age, age squared, and a series of race indicators.[5] I estimate the equation for natives and immigrants, and for each education group separately. The wage gap is then evaluated at the city-education level immigrant mean $\overline{H_{emct}}$ where c denotes city, and the adjusted native-immigrant wage gap in education group e in city c during year t is given by $IGAP_{ect} = (\widehat{\alpha_0^n} - \widehat{\alpha_0^m}) + (\widehat{\alpha_1^n} - \widehat{\alpha_1^m})\overline{H_{emct}}$, and $\Delta IGAP_{ec} = IGAP_{ec,2000} - IGAP_{ec,1980}$. I use this measure because I am interested in the impact of skill biased technological change on the part of the wage gap trend that cannot be fully explained by differences in observable characteristics. This regression adjustment process ensures that the estimated native-immigrant wage gap trend is due to differences in intercepts as well as in returns to the observable characteristics between natives and immigrants.[6]

The average unadjusted and adjusted wage gap trends for various demographic groups from 1980 to 2000 are compared in Table 1. The standard errors are obtained by regressing the respective wage gap on a constant. They are used to test whether the means of wage gap trends are significantly different from zero. Both unadjusted and adjusted changes in wage gaps are positive, meaning that the native-immigrant wage differentials have widened between 1980 and 2000. Since

[5] I identify four race groups in this chapter: whites, blacks, Asians, and Hispanics.
[6] An alternative measure of adjusted wage gaps which utilizes differences in regression residuals between native group and immigrant group's wage equations yields interpretations similar to those presented this chapter.

changes in racial composition, age, and education could explain part of the changes in wage gaps, the regression adjusted wage gap trends are all smaller in magnitude. However, the growing wage gaps do not disappear after controlling for observable characteristics and this is the part of the wage gaps that I consider in this chapter.

3.2 Measuring Technology Adoption Tendency

The ideal method to measure the technology adoption tendency of a local labor market requires firm level data on organizations' computer and automation adoption. Beaudry and Lewis (2014) use a measure of PCs per worker in local labor markets in 2000 as the measure of technological progress. Adopting this method in this chapter is challenging because firm-level information is difficult to obtain and PC adoption is only one aspect of technology adoption, as technological progress extends beyond the boundary of computers into automation in various aspects in production. Instead, this chapter uses characteristics of local labor markets before the technology boom to measure each area's likely technology adoption after 1980.

Technological progress greatly reduces the cost of performing routine tasks and causes a decrease in demand for routine labor input (Autor and Dorn, 2013). Therefore, markets that were historically specialized in routine task-intensive industries should adopt technology more aggressively and reallocate labors from routine intensive occupations to non-routine service occupations more extensively. I merge two versions of the 1 percent metro samples of the 1970 Census, and I reference Autor and Dorn (2013) to calculate a routine employment share measure as $RShare_{ec,1970} = \left(\sum_i L^r_{eci,1970}\right) \cdot \left(\sum_i L_{eci,1970}\right)^{-1}$, where the numerator is the total number of hours worked by people in "routine occupations" who belong to education group e in MSA c in

year 1970.[7] The denominator is the total employed hours in all occupations. Intuitively, $RShare_{ec,1970}$ measures the routine employment share of education group e in MSA c in year 1970, and it should correlate positively with technology adoption of that MSA-education cell after 1980. The scale of $RShare_{ec,1970}$ranges from 0.08 to 0.71, with a median of 0.49.

This measure makes two small adjustments to the index adopted in Autor and Dorn (2013). First, I use the 1970 sample instead of the 1950 sample to construct the routine employment share variable. The technical reason is that the 1970 sample has a larger sample size, which provides more accurate calculations. Moreover, I argue that a city's routine employment share immediately before the technology change should have the largest impact of its technology adoption tendency after the technology change.[8] Second, I calculate the routine employment share within education and MSA cells instead of just within the geographical unit. The education distribution of immigrants is largely bimodal in the sense that, relative to natives, high percentages of immigrants either do not have a high school degree or have more than a college education (Baum and Flores, 2011). It is unlikely that the routine concentration of workers in the low skill group in 1970 would have any significant effect on the high skill groups' labor market outcomes from 1980 to 2000, and vice versa. Thus, using this measure, I effectively identify the impact from technology adoption within skill groups.

To test whether $RShare_{ec,1970}$ measures technology adoption well, I follow Autor and Dorn (2013) in considering the relationship between this baseline routine share and future changes

[7] The routine occupations categorization follows Autor and Dorn (2013). Administrative support, retail sales, precision production, craft workers, machine operators, and assemblers are routine intensive occupations; managers, technicians, financiers, public safety are considered high skill non-routine cognitive occupations; while transportation, construction, mining professions, farmers, and service occupations are considered low skill non-routine manual occupations. This grouping method is developed through a procedure where the authors merge job task requirements from the fourth edition of the US Department of Labor's *Dictionary of Occupational Titles* (DOT) to the corresponding census occupation classifications to measure each occupation's routine intensity, and then separate routine intensive occupations from non-routine intensive occupations accordingly.

[8] In fact, replacing $RShare_{ec,1970}$ by $RShare_{ec,1950}$ in my model estimations did not change the results, but the estimated coefficient of the key independent variable became less statistically significant.

in the shares of a city's employment that are in the low skill service sector and within routine task occupations. Results in Table 2 suggest that, regardless of whether baseline shares are computed within education-MSA cells or just MSA-cells, routine task shares in 1970, just like routine task shares in 1950, can successfully predict a local labor market's fall of routine employment and its reallocation into the low skill service sector.[9] Therefore, I consider $RShare_{ec,1970}$ to be a good indicator of local labor markets' technology adoption likelihood.

To provide a visual representation of different degrees of routine employment shares across geographical regions, I aggregate the routine employment shares into the state level and present the map of the United States according to their shares of routine employment in 1970 in Figure 3. The most routine intensive states were the "Rustbelt" states of Illinois, Indiana, Ohio, Pennsylvania, and Michigan, and the least routine intensive states were the states relying on services, such as Nevada.[10] In addition, I present the top and bottom five MSAs ranked by $RShare_{c,1970}$ in Table 3. Routine intensive MSAs are all industry heavy cities and non-routine MSAs are all service oriented.

3.3 Model

Having obtained the measures of changes in native-immigrant wage gaps $\Delta IGAP_{ec}$ and technology adoption likelihood $RShare_{ec,1970}$, I use an empirical model similar to an analysis by Beaudry and Lewis (2014) on technology's impact on the gender wage gaps to test technology's impact on changes in native-immigrant wage gaps:

$$\Delta IGAP_{ec} = \beta_0 + \beta_1 RShare_{ec,1970} + \beta_2 X_c + [\beta_3 Z_c] + \delta_s + \varepsilon_{ec} \quad (1)$$

[9] The larger variation of $RShare_{ec,1970}$ (0.180) comparing to that of $RShare_{c,1970}$ (0.055) is the reason for the smaller point estimates in the second column.

[10] Necessary data are not available in the 1970 sample for the seven states marked in grey: Idaho, Montana, Wyoming, North Dakota, South Dakota, Vermont, and Delaware.

where the coefficient of interest, β_1, measures the impact of technological progress on changes in adjusted native-immigrant wage gaps within MSA-education cells. I expect a positive and statistically significant estimated β_1 if native-immigrant wage gaps increased more in cities that were more likely to adopt technology. Since I use the 1970 sample to calculate $RShare_{ec,1970}$, reverse causality is not a problem because the change in native-immigrant wage gaps from 1980 to 2000 cannot dictate the occupational structure in 1970. However, I acknowledge that markets of different routine intensity might have different social and cultural stance towards immigration, which could cause deterministic trends in wage gaps development, and I will address this potential bias in Section 4.

Following Beaudry and Lewis (2014), I include a vector of city level business cycle and composition controls in 1980: X_c. It contains city level unemployment rate, share of Hispanic workers, share of black workers, share of immigrant workers, and its square form. State fixed effects are labeled δ_s where s denotes states.

In some specifications, I also include industry composition controls Z_c, which are shares of employment in durable and nondurable manufacturing industries, and shares of employment in high skill and low skill service sectors in 1980. Their interaction terms with a broad education group dummy (high school degree or less) are also included because industry mix could have different wage effects on individuals of different education levels (Beaudry and Lewis, 2014). The industry mix controls account for any deterministic trends of local labor markets according to their industrial composition. I do not include these controls in all specifications because industry expansion or contraction due to technological change could be a potential mechanism driving the increase in native-immigrant wage gaps. For example, cities heavily invested in textile manufacturing industries in 1980 might be more negatively impacted by technology as a larger

portion of jobs were rendered obsolete. At the same time, these low skill manufacturing jobs could also be negatively impacted by globalization for reasons unrelated to technology adoption. Due to difficulties in disentangling the effects of technology from globalization, I consider estimated results with and without industry mix controls, but to be conservative, my preferred specification includes them. Thus, my estimates might be considered lower bounds of technological change's impact.

Table 4 presents summary statistics for the key demographic characteristics of immigrants and natives for the years 1980 and 2000. In the two decades after 1980, the natives' average real wage has been stagnant while immigrants' average real wage has decreased, causing the increase in observed wage gaps. Natives have become more educated as the share of natives with at least a college degree increased by 20.7 percent, while the share of natives without a high school diploma decreased sharply by 52.2 percent. At the same time, immigrant population continued to grow but their concentration in both high and low tails of education distribution remained steady. Over the two decades, there has been an increase in the shares of Hispanic and Asian immigrants but a decrease in the share of white immigrants.

4. Empirical Results

4.1 Baseline Regression Results

Table 5 shows OLS estimates of (1), that is, the effect of initial routine employment on the changes in adjusted native-immigrant wage differentials between 1980 and 2000, the standard errors are clustered at the MSA level and are heteroskedasticity-robust. Having $RShare_{ec,1970}$ as the sole independent variable, column 1's positive estimated coefficient on $RShare_{ec,1970}$ shows that the widening native-immigrant wage gaps are associated with cities' historical routine intensities. The

estimated coefficient implies that each additional percentage point increase in routine employment share is associated with a 0.115 percentage point increase in native-immigrant wage gaps.

Since immigrants' labor market outcomes are particularly sensitive to business cycle fluctuations (Orrenius and Zavodny, 2010), the estimated coefficient in this specification might overestimate the effect of technology if the routine intensive cities were also the cities that did not perform well economically after 1980. In order to remedy this concern, the second column adds MSA level business cycle and composition controls. The estimated coefficient barely grows to 0.121, which is not significantly different from 0.115, meaning business cycle and labor supply factors did not affect native-immigrant wage gaps growth.

In column 3, I add state fixed effects to the model. The benefit of including state fixed effects is that they control for any state-level policies that could potentially affect immigrants and natives differently. For example, conservative states, such as Texas or Alabama, might create state policies that disproportionally affect immigrants in negative ways. The estimated coefficient increases marginally to 0.123, suggesting that state policies did not meaningfully influence native-immigrant relative wages.

Finally, I include the industry mix controls in column 4. Including these controls decreases the estimated coefficient to 0.056, and it is significantly different from the estimated coefficient in column 3 at one percent level. This significant drop is not surprising because the estimated coefficient should decrease if immigrants were disproportionally concentrated in industries that were negatively impacted by technology. Since it is difficult to parse out the effect of globalization in the form of offshoring from the effect of technology, I elect to follow Beaudry and Lewis (2014) and include the industry mix controls in my preferred specification. I consider 0.056 as the lower bound of technology change's effect.

The results in the last column in Table 5 say that if routine employment share of education group e in city c increases by one percentage point in 1970, immigrants belonging to that group would experience at least a 0.056 percentage point increase in wage gap from 1980 to 2000. This suggests that cities and education groups that were more likely to adopt technology experienced bigger increases in native-immigrant wage gaps. This offers the first piece of evidence suggesting that the increase in relative price of social skills induced by skill biased technological change may have been one of the reasons why we observe an increase in native-immigrant wage gaps since the 1980s.[11] In the following section, I use the model specification with the full set of controls, including the industry mix variables, as the preferred model.

4.2 Causal Relationship or Internal Migration?

All of the empirical analyses discussed thus far rely on the argument that technological progress had significant impacts on local labor markets. Since the main regression is based on a reduced form model, it is possible that what I observe is merely the effect of changes in labor skill compositions that are correlated with both routine employment shares and changes in wage gaps. That is, if immigrants and native born exhibited distinct sorting behaviors according to skills in routine intensive cities, then the interpretation that increased prices in U.S.-specific social skills induced by technological change was the reason for the increase in native-immigrant wage gaps would become invalid. In this section, I perform additional analyses to parse out whether the positive relationship between routine employment shares and changes in wage gaps is the result of

[11] These results are robust to further adjustments in weights according to the share of workers in each education levels in the local labor market. An alternative difference-in-difference regression was carried out using MSAs with above average $RShare_{ec,1970}$ as the treatment group, similar interpretation was drawn.

compositional changes of labor input in different labor markets or indeed represents a causal relationship.

It is possible that a routine intensive city in 1970 could attract immigrants and natives of different types. It could be that more low skill immigrants, conditional on their formal schooling, moved to routine intensive cities for better job prospects. It is also possible that a city adopting technology more aggressively would be more attractive to high skill natives, again conditional on formal schooling. Either of these selective migration stories could cause a widening of wage gaps for reasons unrelated to the changing skill prices induced by skill biased technological change. The first two columns in Table 6 test this theory. Column 1 presents the results from a regression of changes in low skill (in terms of education level) immigrant share within MSAs between 1980 and 2000 on 1970 routine share. [12] The estimate of coefficient is negative and statistically insignificant, which means that routine intensive cities did not experience any differentially large inflow of low skill immigrants since 1980. Column 2 shows the regression results when I use changes in high skill (also in terms of education level) native born share between 1980 and 2000 as the dependent variable. The insignificance of this estimated coefficient suggests that high skill natives were not moving systematically to cities with high 1970 routine shares. Although it is still possible that these cities attract more immigrants with worse unobserved skills or more natives with better unobserved skills, it seems unlikely that the relationship would be different between observed and unobserved skills.[13]

As an additional test that my estimates are actually measuring impacts of technological change, I use my data and empirical technique to test a standard result in the literature (Acemoğlu

[12] I use $RShare_{c,1970}$ instead of $RShare_{ec,1970}$ as the key independent variable because there is only one observation of skill composition change within a MSA.

[13] I also re-estimated model (1) with only workers who have not moved in the past 5 years to address the differential migration pattern concerns, the estimated coefficient of interest became marginally smaller to 0.043, but it was still statistically significant at 10% level.

and Autor, 2011; Beaudry and Lewis, 2014): Skill biased technological change yields higher skill wage premiums. If my findings do reflect a causal relationship between technological change and native-immigrant wage gaps, then historically routine intensive cities should also experience increases in college wage premiums. The last column of Table 6 presents the regression results when I use changes in college/high-school adjusted relative wages between 1980 and 2000 as the dependent variable.[14] The positive and statistically significant estimated coefficient on the 1970 routine share variable implies that cities that were historically routine intensive also experienced growing skill premiums.

To summarize, I could not find any evidence suggesting that the observed wage gaps trend was caused by potential geographical sorting behaviors of native born and immigrants. All of the evidence presented in this section is consistent with the argument that part of the increase in native-immigrant wage gaps was driven by technological change.

4.3 Heterogeneous Effects

Having presented evidence that technological advancement led to increasing native-immigrant wage differentials, I now examine whether changes in the price of U.S.-specific communication skills drove this relationship.

Even at the most basic level, U.S.-specific communication and social skills rely on English speaking abilities. Therefore, I start by directly comparing the wage trends of immigrants of different English language skills. In theory, if the positive estimated coefficient observed in the baseline regression indeed represents an increase in social skill prices, then the increase in wage gaps in routine intensive cities should be driven by immigrants who do not speak English well.

[14] A similar adjustment process is adopted, and it controls for age, age squared and racial composition.

The first two columns in Section A of Table 7 directly test this conjecture by comparing the changes in native-immigrant wage gaps between immigrants from non-English speaking countries and immigrants from countries that have English as first language. Recall that my original sample consists only of immigrants from non-English speaking countries, the first column of Table 7 is directly replicated from the results in the last column of Table 5. If I carry out the same regression with a sample of immigrants from English speaking countries, then the estimated coefficient on the routine employment share should not be as big as what is observed in the first column. In fact, column 2 of Section A shows that the routine share estimate is negative and statistically significant when using the sample with only immigrants from English speaking countries. One explanation for why immigrants from English speaking countries experienced a *decrease* in wage gaps in routine intensive cities is that immigrants from English speaking countries might have better communication and social skills than native born as they are comfortable navigating at least two social and cultural environments. Given that they do not have language barriers, it is very reasonable that these unobservable social and communication skills would be more valued in cities that experienced the most technological change.

In the next two columns in Section A of Table 7, I separate the sample of immigrants from non-English speaking countries into two sub-categories: immigrants who identify themselves as speaking English well or very well, and immigrants who identify themselves as speaking English poor or not at all. Following the same reasoning, I propose that proficient English speakers should experience a less negative impact from technology in routine intensive cities. The results suggest that each additional percentage point increase in routine employment share in a local labor market in 1970 would cause immigrants who did not speak English well to experience a 0.088 percentage

point increase in wage gaps between 1980 and 2000, while immigrants who spoke English well would only experience a 0.04 percentage point increase.

Lastly, if routine intensive cities did experience a differential increase in returns to communication skills, then the wage gaps between immigrants with different levels of English mastery should also increase in these cities. I regress the changes in adjusted wage gaps between proficient English speaking immigrants and poor English speaking immigrants against routine employment shares, and present the results in Section B of Table 7. The positive estimated coefficient of 0.074 suggests that the wage gaps between immigrants of high and low English language skills also increased significantly in cities that were more likely to adopt technology.

Communication in a work setting requires more than just a textbook ability to speak the dominant language. Sharing ideas about complex concepts and motivating and coordinating teams at work also require a knowledge of the culture and social norms in the host country. I use measures of social assimilation beyond English language ability to separate immigrant groups, and present Table 8 to show impacts of 1970 routine shares on changes in native-immigrant wage gaps among immigrants of different levels of likely social integration. Throughout, the sample of natives is the same.

I first categorize immigrants' potential U.S.-specific social skills according to their age of arrival in the United States. Immigrants' social and language assimilation paths depend strongly on their age of arrival (Bleakley and Chin, 2010), and immigrants who migrated to the U.S. before the age of 18 could be considered "half-natives" because they grew up and went to school in the U.S. Therefore, they should have relatively better labor market outcomes, when compared to other immigrants, in areas that highly value social skills. In practice, I divide the sample into immigrants that migrated before or at the age of 18 and immigrants that migrated after the age of 18 and re-

estimate the model. As can be seen in columns 1 and 2 of Table 8, immigrants migrating after the age of 18 suffered a higher increase in wage gaps when living in high routine share cities, while "half-natives" experienced a significantly tamer impact with only a marginally significant estimated coefficient.

Next, I compare how the relationship between 1970 routine shares and changes in native-immigrant wage gaps differs by how long the immigrants have lived in the United States. Similar to the argument above, long-time immigrants have had more time to acclimate themselves into the host country's social and cultural settings than new immigrants, so they should experience a less negative impact from technology. The third and fourth columns present the regression results when I separate the sample into immigrants who have lived in the U.S. for at least 15 years and those who have lived in the U.S. for less than 15 years. The bigger and more statistically significant estimated coefficient for new immigrants suggests that the increase in returns to U.S.-specific social skills might explain the widening native-immigrant wage gaps.

In the same vein, immigrants who are married to natives, often termed *intermarried immigrants*, should not experience significantly negative effects from technology because they are more socially assimilated into the host country than immigrants married to other immigrants (Furtado and Theodoropoulos, 2010; Furtado and Song, 2015). Furtado and Song (2015) find that intermarriage wage premiums have increased from 1980 to 2000 even when allowing the value of education and English-speaking ability to vary over time, and suggest that the patterns might be driven by increase in demand for social and management skills in the U.S. labor market. I following this reasoning and separate intermarried immigrants from other married immigrants in calculating the native-immigrant wage gaps, and present the results of the two regressions in the columns 5 and 6 of Table 8, respectively. The estimated coefficient for intermarried immigrants is

statistically insignificant as expected while immigrants that are married to other immigrants experienced a significantly larger wage gap increase.[15]

The last four columns of Table 8 categorize immigrants by their potential contact with their ethnic peers.[16] It is likely that immigrants who live in large ethnic enclaves and have more frequent interactions with their ethnic peers would have less exposure to U.S. culture and social norms, and therefore lack U.S.-specific social skills. I use the share of co-ethnics within an MSA to measure the ethnic enclave size, and I use the isolation index of an ethnic group within an MSA to measure the potential contact probability between two co-ethnics.[17] I consider immigrants with above-median ethnic enclave size or above-median isolation index as immigrants with less potential U.S.-specific social skills. While I acknowledge that immigrants who live in larger ethnic enclaves or have more frequent interactions with their ethnic peers might not depend on their U.S.-specific social skills as much as their counterparts, results show that these immigrants still suffered wider native-immigrant wage gaps than immigrants who did not have significant ties with their ethnic peers.

To summarize, in Table 8, I construct various samples to parse out the potential U.S.-specific social skills among immigrants. I test whether immigrants who are more likely to have better social and communication skills experienced less negative impacts from technological change. The empirical results consistently show that they did, and therefore might be considered

[15] Restricting the sample of native born to only married natives in these two estimations neither changes the sign and significance of the estimated coefficients nor the interpretation.

[16] I define ethnic groups by immigrants' country of origin.

[17] I calculate the isolation index as $ISO_{gct} = \frac{\sum_i \frac{group_i}{group_{total,c}} \times \frac{group_i}{population_i} - \frac{group_{total,c}}{population_{total,c}}}{min\left(1, \frac{group_{total,c}}{population_{smallest,c}}\right) - \frac{group_{total,c}}{population_{total,c}}}$, where $group_i$ is the population of immigrants from ethnic group g living in tract i; $group_{total,c}$ is the population of immigrants from ethnic group g living in MSA c; $population_i$ is the total population in tract i; $population_{total,c}$ is the total population in MSA c; $population_{smallest,c}$ is the population of the tract with the least residents in MSA c. Hence ISO_{gct} is the MSA-level isolation index according to country of origin, calculated based on tract-level data. The calculation method is referenced from Glaeser et al. (2008), and I use the tract level information in Table PCT019 of Summary Tape File 3 of 2000 Census to construct the isolation index (U.S. Census Bureau, 2016).

as more evidence suggesting that the increasing returns to U.S.-specific social skills brought about by technological change was a factor causing the growing native-immigrant wage gaps.

4.4 Alternative Explanations and Robustness Checks

Having shown several pieces of evidence supporting technology adoption as driving the increase in native-immigrant wage gaps, I address several alternative explanations for the results. First, suppose that in 1970 some cities experienced a random positive demand shock for goods produced by routine intensive industries and that immigrants were over-represented in these industries. After 1970, local economies would tend to converge back to the pre-shock equilibrium. Subsequently, demand and relative wages of immigrant workers would decrease in those cities as well. This scenario would cause a false positive relationship between 1970 routine employment shares and changes in native-immigrant wage gaps afterwards.

Another potential concern is that changes in native-immigrant wage differentials are driven by changes in labor market discrimination. While I account for the state-wide discrimination against immigrants by including state fixed effects, there may still be within-state discrimination differences. For example, Austin and Dallas have drastically different cultures, even though they are both located in Texas. Discrimination and prejudice may have evolved in different ways in these two cities between 1980 and 2000, in a way that was systematically related to their 1970 routine shares.

In order to address these two concerns at the same time, I perform a placebo regression estimating the relationship between changes in native-immigrant wage gaps from 1970 to 1980 and the 1970 routine employment shares. If the aforementioned two scenarios were true, I should observe a similar positive relationship between the wage gap growth and routine employment share.

On the other hand, if my results are driven by changes in technology that started in 1980, then 1970 routine shares should not lead to increases in wage gaps before 1980. I replicate the original 1980 – 2000 results to column 1 in Panel A of Table 9 for ease of comparison, and I present the placebo regression results in column 2 in Panel A. The statistically insignificant estimated coefficient suggests that the positive relationship between the wage gap trend after the 1980s and the routine employment share in 1970 was not caused by random shocks or discrimination.

To further put the spurious relationship concerns to rest, I estimate the relationship between changes in adjusted native-immigrant wage gaps from 1950 to 1970 and the 1970 routine employment shares. Again, since technological changes started in the 1980s, the routine intensity of cities in 1970 should not retroactively predict wage gap changes before 1970. The statistically insignificant estimated coefficient in the third column of Panel A in Table 9 is offered as confirmation.

Estimations thus far have only focused on the wage gap changes from 1980 to 2000, one could argue that it was a coincidental positive relationship between changes in native-immigrant wage gaps and technology adoption. I can re-estimate the model using additional years of data to address this concern. In practice, I use the five percent sample for the 1990 Census, the merged 3-year 1 percent samples of American Community Survey for 2005-2007, and the merged 3-year 1 percent samples of American Community Survey for 2008-2010. In Panel A of Table 10, I estimate the relationship between 1970 routine employment shares and changes in adjusted native-immigrant wage gaps for the periods from 1980 to 2005 – 2007, from 1980 to 2008 – 2010, and from 1990 to 2008 – 2010. The positive and statistically significant estimated coefficients are robust in all time periods after 1980, suggesting that the positive relationship observed for the 1980 – 2000 period is not a coincidence.

In order to ensure that the findings so far are not driven by the choice of measurement, I develop an additional measure by taking nation-wide routine intensity levels of industries into consideration. According to Autor and Dorn (2013), areas that were historically specialized in routine task intensive *industries* should adopt technology and displace routine labor more quickly. It is possible that the same industry might have different routine intensity in different geographic regions before the technology boom, but it is also reasonable to suppose that an industry, no matter where they are located, might have a similar tendency to adopt technology during the technology boom. Therefore, $RShare_{ec,1970}$ could potentially be a noisy measure in that the same industry adopting the same amount of technology could have different values of $RShare_{ec,1970}$ in different cities. I could sidestep this potential problem by first measure the general routine intensity of an industry calculated from its nation-wide routine employment share. I first separate 231 industries into ten broad industry groups: construction; manufacturing; transport and utilities; wholesale trade; retail trade; finance, insurance and real-estate; business services; personal services and entertainment; professional services; and public administration. Then, I calculate each industry group's nation-wide routine employment share in 1970 as $RS_{j,1970} = \left(\sum_i L^r_{ij,1970}\right) \cdot \left(\sum_i L_{ij,1970}\right)^{-1}$, where the numerator is total number of hours worked by people in "routine occupations" in industry j in 1970, and the denominator is total number of hours employed in industry j in 1970. Thus, an industry that requires more routine labor input would have a bigger $RS_{j,1970}$.

$RS_{j,1970}$ is then assigned to each individual according to the industry group they belong to, and then I take the average of $RS_{j,1970}$ by MSA and education group and call this variable routine intensity index $RIndex_{ec,1970}$ for education group e in MSA c. For example, suppose in 1970 there are only two cities c and d and two industries j and k in an economy. Industry j is more

routine intensive and requires 80 percent of total labor input to be routine labor ($RS_j = 0.8$), while industry k is less routine intensive and requires only 20 percent of routine labor input ($RS_k = 0.2$). Suppose city c employs five people from education group e with two working in industry j and the rest working in industry k, while city d has five workers in education group e with one working in industry j and four working in industry k. Then $RIndex_{ec,1970} = \frac{0.8\times2+0.2\times3}{5} = 0.44$, and $RIndex_{ed,1970} = \frac{0.8\times1+0.2\times4}{5} = 0.32$. Intuitively, $RIndex_{ec,1970}$ uses national level routine intensity of industries to measure the routine intensity of a MSA-education group, and therefore estimates the general technology adoption tendency of industries.

In Panel B of Tables 9 and 10, I test the robustness of the empirical results over all the previously estimated time periods using $RIndex_{ec,1970}$. Despite magnitude differences due to different scales, I consistently find the same positive relationship between $RIndex_{ec,1970}$ and the various wage gap changes after 1980 without observing any meaningful relationship for the wage gap changes before 1980.

5. Conclusion

Motivated by the concurrent movement of native-immigrant wage gaps and technological advancement since the 1980s, this chapter asks whether skill biased technological development plays a role in explaining recent increases in native-immigrant wage gaps. In particular, if technological change increased the returns to U.S.-specific social skills, and natives have a comparative advantage in these skills, then skill biased technological change may have increased native-immigrant wage gaps even holding constant human capital characteristics of both immigrants and natives.

Consistent with this hypothesis, I show that markets that were historically routine intensive, and therefore more likely to adopt technology, experienced more prominent increases in native-immigrant wage gaps. The positive relationship does not seem to be driven by selective migration between cities, and the basic result survives several mechanism checks, placebo regressions, and an alternative technology adoption measure. Taken together, the results in this chapter provide rather strong evidence suggesting that indeed native workers have enjoyed better labor market outcomes than immigrants because they are highly endowed with U.S.-specific social skills, which have become more highly rewarded in the labor market as a result of technological development.

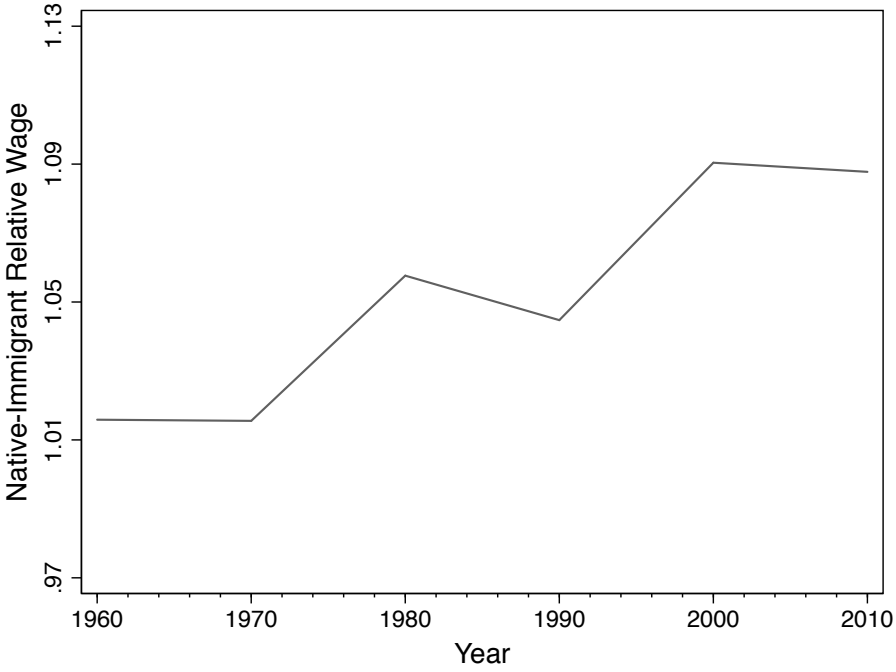
This chapter has several implications for immigration policy. Concerns about the "quality" of recent immigrants and how they are not assimilating economically at the same speed as earlier cohorts have garnered significant media attention. Borjas (2015) suggests that part of the decline in economic assimilation in recent waves of immigrants is due to their slower rates of human capital accumulation, particularly slower English language skill acquisition. My results suggest that even if the recent cohorts acquired English language skills at the same speed as the earlier cohorts of immigrants, they would still have had lower wages and potentially slower wage growth. To address this issue, the government's immigrant assistance programs might prioritize training for English language skills as well as other social and communication skills. Policies designed specifically to improve immigrants' social capital might be especially cost effective if they decrease immigrants' need for safety net programs. Furthermore, such policies could reduce long term inequality between natives and immigrants as immigrants become better able to invest in their children's education and health (Lassem and Sanders, 2013).

The results in this chapter also have implications for policies unrelated to immigration. While a large literature has pointed to the increasing returns to schooling as a result of

technological change, a growing literature has focused on the returns to cognitive and social skills. The results in this chapter reinforce the idea that communication and social skills have become increasingly important, suggesting that these skills should be given more priority in the education of all students, not just the foreign born.

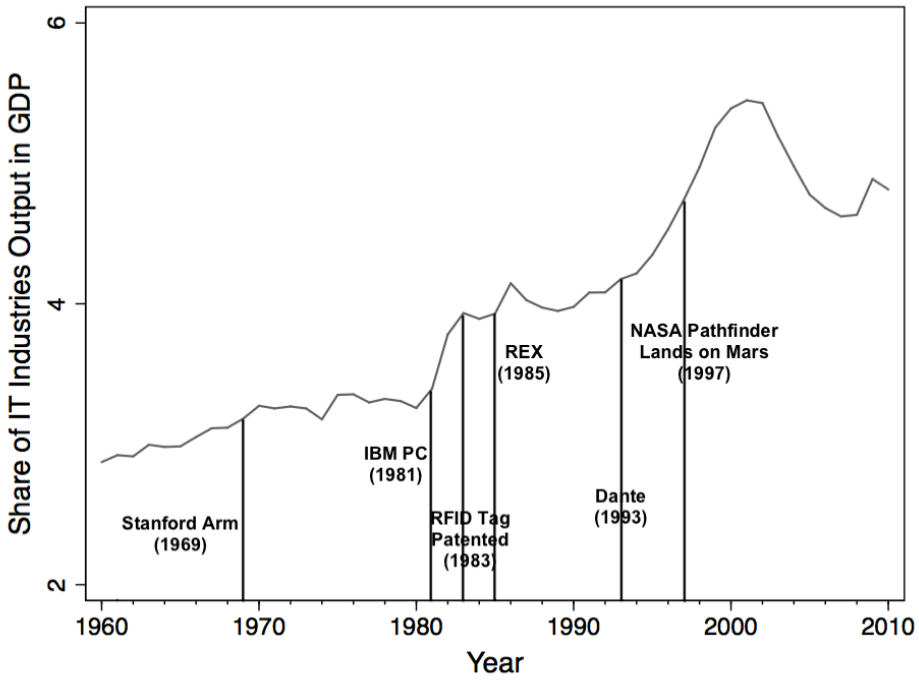
Figures and Tables

Figure 1. Average native-immigrant relative wages, 1960 – 2010



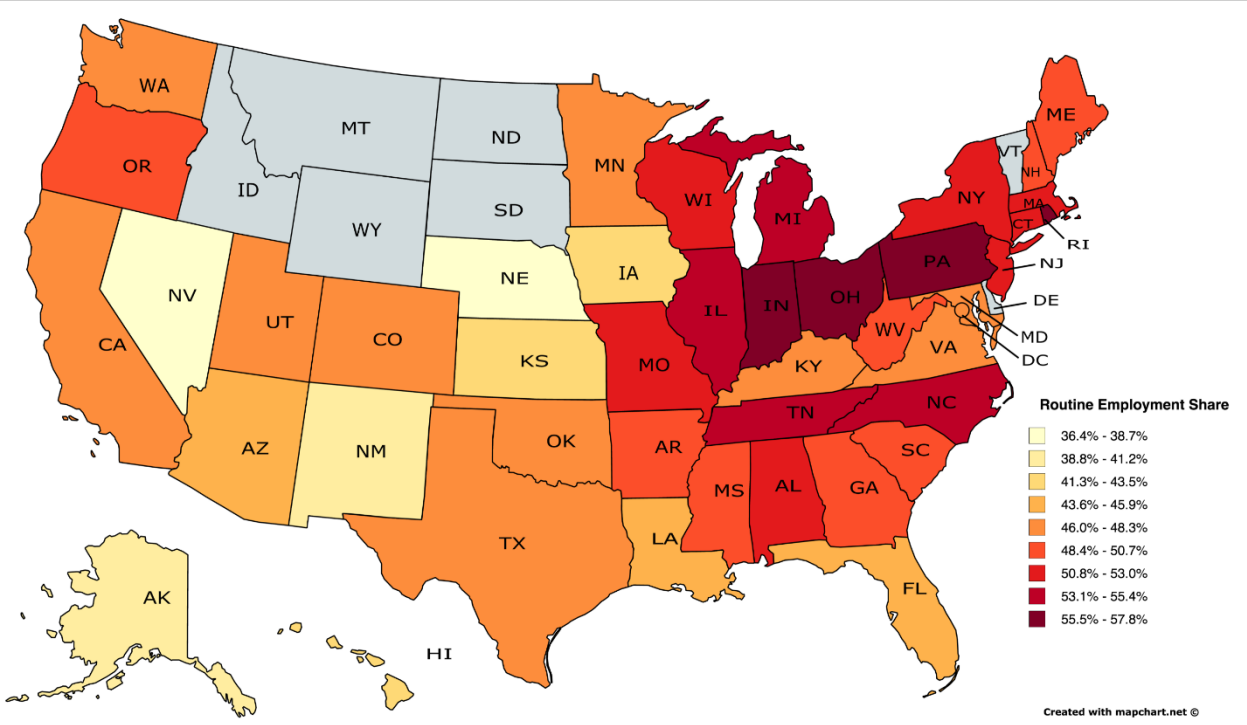
Notes: Simple average native-immigrant relative log hourly wages between 1960 and 2010.
Sources: The sample consists of 5% sample of 1960 Census, merged 2 version of 1% metro samples of 1970 Census, 5% sample of 1980 Census, 5% sample of 1990 Census, 5% sample of 2000 Census, and the 2008 – 2010 3-year sample of American Community Survey.

Figure 2. Technology boom – Share of IT industries output in GDP



Sources: Share of IT industries output in GDP is calculated from the "Gross-Domestic-Product-(GDP)-by-Industry Data" Table from the U.S. Bureau of Economic Analysis. Key technology events are referenced from Card and DiNardo (2002), Wallén (2008), and RobotShop Distribution Inc. (2008).

Figure 3. Routine employment share in 1970 by state



Notes: State level routine employment share in 1970 is calculated from the merged two versions of 1% samples of the 1970 Census. The routine occupations classification is referenced from Autor and Dorn (2013) and categorized as follows: administrative support, retail sales, precision production, craft workers, machine operators, and assemblers are routine intensive occupations; while managers, technicians, financiers, public safety, transportation, construction, mining professions, farmers, and service occupations are considered non-routine occupations. This grouping method is developed through a procedure where the authors merge job task requirements from the fourth edition of the US Department of Labor's *Dictionary of Occupational Titles* (DOT) to the corresponding census occupation classifications to measure each occupation's routine intensity, and then separate routine intensive occupations from non-routine intensive occupations accordingly. Necessary information is not available in the 1970 sample for the seven states marked in grey: Idaho, Montana, Wyoming, North Dakota, South Dakota, Vermont, and Delaware. The map is created by mapchart.net. Darker color represents higher routine intensity.

Table 1 – Native-immigrant wage gaps descriptive statistics, 1980 – 2000

	Unadj. Δ N-I Wage Gap	SE	Adj. Δ N-I Wge Gap	SE
Overall Sample	0.096	0.010	0.035	0.002
High school drop outs	0.083	0.023	0.073	0.003
High school diploma	0.114	0.023	0.042	0.003
Some college	0.123	0.017	0.023	0.004
At least college degree	0.066	0.021	0.003	0.003

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. The unadjusted wage gap is the change in average inflation adjusted wage gap between 1980 and 2000, and the adjusted wage gap is regression adjusted using age and age squared, education level, and race group controls. SE are standard errors obtained from regressing the wage gap against a constant.

Table 2 – Routine employment share and changes in low skill service employment and in routine employment, 1980 – 2000

	$RShare_{c,\ 1970}$	$RShare_{ec,\ 1970}$
Δ Low Skill Svc Emp. Share	0.272^{***}	0.007^{*}
	(0.023)	(0.004)
Δ Routine Emp. Share	-0.668^{***}	-0.018^{**}
	(0.038)	(0.008)

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, and reside in an identifiable metropolitan area. Dependent variables are change in low skill service employment share from 1980 to 2000 and change in routine employment share from 1980 to 2000. $RShare_{c,\ 1970}$ is routine employment share by MSA in 1970, $RShare_{ec,\ 1970}$ is routine employment share by MSA-education group in 1970. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 3 – Top and bottom five MSAs by routine employment share

Top 5	Bottom 5
Jersey City, NJ	Las Vegas, NV
Wilkes-Barre-Hazelton, PA	Salinas-Sea Side-Monterey, CA
Lorain-Elyria, OH	Santa Barbara-Santa Maria-Lompoc, CA
Reading, PA	Fresno, CA
York, PA	West Palm Beach-Boca Raton-Delray Beach, FL

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars.

Table 4 – Descriptive statistics

	1980		2000	
	Native	Immigrant	Native	Immigrant
Age	39.18	39.58	39.52	38.66
Log hourly wage	2.86	2.64	2.86	2.53
Less than high school	19.29	42.75	9.22	35.52
High school	37.49	23.88	32.47	25.41
Some college	18.67	12.87	28.68	17.91
College degree or more	24.55	20.50	29.63	21.16
White	89.45	85.00	90.16	80.64
Black	9.38	3.34	8.50	3.71
Asian	0.71	11.03	0.82	15.25
Hispanic	3.51	43.57	4.19	54.32
Number of observations	1,255,808	91,817	1,192,503	144,391

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars.

Table 5 – Routine employment share and change in native-immigrant adjusted wage gaps within MSA-education groups, 1980–2000

Dependent Variable: Δ N-I Wage Gap	(1)	(2)	(3)	(4)
$RShare_{ec,\ 1970}$	0.115***	0.121***	0.123***	0.056***
	(0.010)	(0.009)	(0.009)	(0.014)
Compositional controls	No	Yes	Yes	Yes
State FE controls	No	No	Yes	Yes
Industry mix controls	No	No	No	Yes
R^2	0.283	0.308	0.373	0.403
Observations	469	469	469	469

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Δ N-I Wage Gap is the change in wage gap that is regression adjusted using age and age squared, education level, and race group controls. $RShare_{ec,\ 1970}$ is routine employment share by MSA and education group in 1970. Compositional controls include share of Hispanic workers, share of black workers, unemployment rate and size of immigrants, and its square form. State FE controls are state fixed effect dummies. Industry mix controls refer to shares of employment in durable and nondurable manufacturing industries, and shares of employment in high skill and low skill service sectors. The impact of the four sector share variables is allowed to vary by broad education group, which is defined as at least some college education versus high school graduates. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.

Table 6 – Routine employment share and change in low skill immigrant share, change in high skill native born share, and change in college/high school relative wages within MSAs, 1980–2000

	(1)	(2)	(3)
Dependent Variable	Δ Low Skill Immi. Share	Δ High Skill Native Share	Δ College/High School Relative Wage
$RShare_{c,\ 1970}$†	0.023	0.319	0.016**
	(0.394)	(0.236)	(0.008)
R^2	0.549	0.598	0.869
Observations	118	118	118

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Wage gaps are regression adjusted using age and age squared, education level, and race group controls. Individuals with at most a high school degree are considered low skilled, and individuals with at least some college degree are considered high skilled. Compositional controls, industry mix controls, state fixed effect dummies are included in the model specification Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.
†: I use $RShare_{c,\ 1970}$ instead of $RShare_{ec,\ 1970}$ for the regressions in this table, as there is only one observation of each dependent variable in each MSA.

Table 7 – Routine employment share and change in native-immigrant adjusted wage gaps (separated by immigrants' English language skills) and change in proficient-poor English speaking immigrant wage gaps within MSA-education groups, 1980–2000
(Panel A: Adjusted native-immigrant wage gaps are separately estimated by immigrants' English speaking skills. Panel B: Adjusted wage gaps between proficient and poor English speaking immigrants)

	A. Wage Gaps between Natives and Immigrants of Different English Speaking Skills				**B. Wage Gaps between Proficient and Poor English Speaking Immigrants**
	Non-English Country	English Country	Poor English Speaker	Proficient English Speaker	Proficient versus Poor English speakers
$RShare_{ec,\ 1970}$	0.056***	-0.042***	0.088***	0.040***	0.074***
	(0.014)	(0.023)	(0.036)	(0.008)	(0.032)
R^2	0.403	0.162	0.266	0.588	0.239
Observations	469	443	459	463	459

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Wage gaps are regression adjusted using age and age squared, education level, and race group controls. Immigrants who self-identify as speaking English well or very well are defined as proficient English speakers. Immigrants who self-identify as speaking English poor or not at all are defined as poor English speakers. $RShare_{ec,\ 1970}$ is routine employment share by MSA and education group in 1970. Compositional controls, industry mix controls, state fixed effect dummies are included in the model specification. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.

Table 8 – Routine employment share and change in native-immigrant adjusted wage gaps (separated by immigrants' potential U.S. specific social skills) within MSA-education groups, 1980–2000

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Immigrated after the age of 18	Immigrated by the age of 18	Live in the U.S. for less than 15 years	Live in the U.S. for at least 15 years	Non-intermarried	Intermarried	Live in Big Ethnic Enclaves	Live in Small Ethnic Enclaves	High Co-Ethnic Contact Likelihood	Low Co-Ethnic Contact Likelihood
$RShare_{ec,\ 1970}$	0.088**	0.034*	0.071***	0.031*	0.070***	0.012	0.066***	-0.035**	0.057***	0.029**
	(0.018)	(0.019)	(0.025)	(0.017)	(0.017)	(0.010)	(0.017)	(0.017)	(0.017)	(0.014)
R^2	0.437	0.480	0.293	0.409	0.376	0.363	0.386	0.209	0.311	0.368
Observations	464	457	454	466	465	457	469	364	469	454

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Wage gaps are regression adjusted using age and age squared, education level, and race group controls. A big ethnic enclave is defined as an ethnic enclave with above medium share of co-ethnic immigrants within an MSA. A small ethnic enclave is defined as an ethnic enclave with below medium share of co-ethnic immigrants within an MSA. Immigrants who immigrated after the age of 18, who have lived in the U.S. for less than 15 years, who are non-intermarried, who live in big ethnic enclaves, or who have high co-ethnic contact likelihood are considered to have low potential social skills; Immigrants who immigrated by the age of 18, who have lived in the U.S. for more than 15 years, who are intermarried, who live in small ethnic enclaves, or who have low co-ethnic contact likelihood are considered to have high potential social skills. $RShare_{ec,\ 1970}$ is routine employment share by MSA and education group in 1970. Compositional controls, industry mix controls, state fixed effect dummies are included in the model specification. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.

Table 9 – Placebo Regressions: Routine employment share and change in native-immigrant adjusted wage gaps within MSA-education groups, 1980 – 2000, 1970 – 1980, 1950 – 1970
(Panel A: independent variable: routine employment share of MSA-education group; Panel B: independent variable: routine employment index of MSA-education group)

Dependent Variable: Δ N-I Wage Gap	1980 − 2000	1970 − 1980	1950 − 1970
Panel A			
$RShare_{ec,\ 1970}$	0.056***	0.000	-0.013
	(0.026)	(0.078)	(0.013)
R^2	0.403	0.199	0.264
Observations	469	438	267
Panel B			
$RIndex_{ec,\ 1970}$	0.185***	0.074	-0.027
	(0.037)	(0.135)	(0.032)
R^2	0.452	0.200	0.263
Observations	469	438	267

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Δ N-I Wage Gap is the wage gap that is regression adjusted using age and age squared, education level, and race group controls. $RShare_{ec,\ 1970}$ is routine employment share by MSA and education group in 1970. $RIndex_{ec,\ 1970}$ is routine employment index by MSA and education group in 1970, weighted by the national average level of routine intensity of industries. Compositional controls, industry mix controls, state fixed effect dummies are included in the model specification. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.

Table 10. Robustness Tests: Routine employment share and change in native-immigrant adjusted wage gaps within MSA-education groups, 1980–2007, 1980 – 2010, 1990 – 2010

(Panel A: independent variable: routine employment share of MSA-education group; Panel B: independent variable: routine employment index of MSA-education group)

Dependent Variable: Δ N-I Wage Gap	1980 − 2007	1980 − 2010	1990 − 2010
Panel A			
$RShare_{ec,\ 1970}$	0.156***	0.239***	0.045***
	(0.028)	(0.033)	(0.013)
R^2	0.444	0.492	0.329
Observations	472	454	470
Panel B			
$RIndex_{ec,\ 1970}$	0.385***	0.495**	0.072**
	(0.069)	(0.059)	(0.032)
R^2	0.486	0.505	0.313
Observations	472	469	470

Notes: The sample consists of employed male workers between the ages of 18 and 64, who are not in school and work full time full year, reside in an identifiable metropolitan area, and earn an hourly wage between $2 and $200 in 1999 dollars. Δ N-I Wage Gap is the wage gap that is regression adjusted using age and age squared, education level, and race group controls. $RShare_{ec,\ 1970}$ is routine employment share by MSA and education group in 1970. $RIndex_{ec,\ 1970}$ is routine employment index by MSA and education group in 1970, weighted by the national average level of routine intensity of industries Compositional controls, industry mix controls, state fixed effect dummies are included in the model specification. Statistical significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent. Heteroskedasticity-robust standard errors that are clustered on MSA level are shown in brackets.

References

Acemoğlu, D., & Autor, D. (2011) Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of Labor Economics* (Volume 4 ed., pp. 1043). Ashenfelter O. and Card D. eds., Amsterdam: Elsevier.

Alba, R. D., & Nee, V. (2003). *Remaking the American mainstream: Assimilation and contemporary immigration.* Cambridge, Mass: Harvard University Press.

Atkinson, A. (2008). The changing distribution of earnings in OECD Countries. *The Rodolfo De Benedetti Lecture Series.*

Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the US labor market. *American Economic Review, 103*(5), 1553-1597.

Autor, D., Dorn, D., & Hanson, G. (2015). Untangling trade and technology: Evidence from local labour markets. *Economic Journal, 125*(584), 621-646.

Autor, D. H., Katz, L. F., & Krueger, A. B. (1998). Computing inequality: Have computers changed the labor market? *Quarterly Journal of Economics, 113*(4), 1169-1213.

Autor, D. H., Levy, F., & Murnane, R. J. (2003). The skill content of recent technological change: An empirical exploration. *Quarterly Journal of Economics, 118*(4), 1279-1333.

Baum, S., & Flores, S. (2011). Higher education and children in immigrant families. *The Future of Children, 21*(1), 171-193.

Beaudry, P., & Lewis, E. (2014). Do male-female wage differentials reflect differences in the return to skill? Cross-city evidence from 1980-2000. *American Economic Journal: Applied Economics, 6*(2), 178-194.

Bleakley, H., & Chin, A. (2004). Language skills and earnings: Evidence from childhood immigrants. *The Review of Economics and Statistics, 86*(2), 481-496.

Bleakley, H., & Chin, A. (2010). Age at arrival, English proficiency, and social assimilation among US immigrants. *American Economic Journal, 2*(1), 165-192.

Borjas, G. J. (1990). Self-selection and the earnings of immigrants: Reply. *American Economic Review, 80*(1), 305.

Borjas, G. J. (1991). Immigration and self-selection. In *Immigration, Trade, and the Labor Market* (pp. 29-76). Abowd J. M., and Freeman R.B. eds., University of Chicago Press.

Borjas, G.J. (2015). The slowdown in the economic assimilation of immigrants: Aging and cohort effects revisited again. *Journal of Human Capital, 9*(4), 483-517.

Bound, J., & Johnson, G. (1992). Changes in the structure of wages in the 1980's: An evaluation of alternative explanations. *The American Economic Review, 82*(3), 371-392.

Card, D., & Dinardo, J. (2002). Skill biased technological change and rising wage inequality: Some problems and puzzles. *Journal of Labor Economics*, 20(4), 733-783.

Card, D., & Lemieux, T. (2001). Can falling supply explain the rising return to college for younger men? A cohort-based analysis. *Quarterly Journal of Economics, 116*(2), 705-746.

Central Intelligence Agency. (2014). Languages. In *The world factbook*. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/fields/2098.html, (accessed May 25, 2014).

Chiswick, B. R. (1978). The effect of Americanization on the earnings of foreign-born men. *Journal of Political Economy, 86*(5), 897.

Deming, D. J. (2015). The growing importance of social skills in the labor market. *NBER Working Paper No. 21473. National Bureau of Economic Research, Inc.*

Fitzenberger, B., & Kohn, K. (2006). Skill wage premia, employment, and cohort effects: Are workers in Germany all of the same type?. *University of Freiburg Working Paper.*

Foged, M., & Peri, G. (2013). Immigrants' and native workers: New analysis on longitudinal data. *NBER Working Paper No. 1931. National Bureau of Economic Research, Inc.*

Furtado, D., & Song, T. (2015). Intermarriage and socioeconomic integration: Trends in earnings premiums among U.S. immigrants who marry natives. *The ANNALS of the American Academy of Political and Social Science, 662*(1), 207-222.

Furtado, D., & Theodoropoulos, N. (2010). Why does intermarriage increase immigrant employment? The role of networks. *The B.E. Journal of Economic Analysis & Policy* 10 (1): 1–31.

Glaeser, E., Cutler, D., & Vigdor, J. (2008). Is the melting pot still hot? Explaining the resurgence of immigrant segregation. *Review of Economics and Statistics*, 90(3), 478-497.

Katz, L. F., & Murphy, K. M. (1992). Changes in relative wages, 1963-1987: Supply and demand factors. *Quarterly Journal of Economics, 107*(1), 35.

LaLonde, R. J., & Topel, R.H. (1992) The assimilation of immigrants in the U.S. labor market. In *Immigration and the Work Force: Economic Consequences for the United States and Source Areas* (pp.67-92), Borjas G. J. and Freeman R. eds., Chicago: University of Chicago Press.

Lazear, E. (1999). Culture and language. *Journal of Political Economy, 107*(S6), S95-S126.

Lessem, R., & Sanders, C. (2013). Decomposing the native-immigrant wage gap in the United States. *2013 Meeting Papers No. 19206. Society for Economic Dynamics.*

Lewis, E. (2013). Immigrant-native substitutability and the role of language. In *Immigration, Poverty, and Socioeconomic Inequality*. Card D. and Raphael S. eds., New York: Russell Sage Foundation.

Orrenius, P. & Zavodny, M. (2010). Immigrants' employment outcomes over the business cycle. *IZA DP 5354. IDEAS Working Paper Series from RePEc.*

Peri, G., & Sparber, C. (2009). Task specialization, immigration, and wages. *American Economic Journal, 1*(3), 135-169.

Plunkert, L. M. (1990). The 1980's: A decade of job growth and industry shifts. *Monthly Labor Review, 113*(9), 3.

RobotShop Distribution Inc. (2008). History of robotics: timeline. (2008). Retrieved on January 8, 2015 from http://www.robotshop.com/media/files/PDF/timeline.pdf

Ruggles, J. S., Alexander, T., Genadek, K., Goeken R., Schroeder, M. B. and Sobek M. (2010) *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota.

U.S. Bureau of Economic Analysis (2016), "*Gross-Domestic-Product-(GDP)-by-Industry Data Table"*, http://www.bea.gov/industry/gdpbyind_data.htm (accessed April 2, 2016).

U.S. Census Bureau; *Census 2000, Summary File 3, Table PCT019*; generated by Tian Lou and Tao Song, using American FactFinder, http://factfinder2.census.gov, (accessed 10 May, 2016).

Vigdor, J.L. (2015). The civic and cultural assimilation of immigrants to the United States. In *Immigration: From Social Science to Public Policy*. Powell B. ed., Oxford University Press.

Wallén, J. (2008). The history of the industrial robot. *Technical report from Automatic Control at Linköpings universitet.* LiTH-ISY-R, 2008.

Chapter Two

Intermarriage and Socioeconomic Integration: Trends in Earnings Premiums among U.S. Immigrants Who Marry Natives

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Abstract

Previous studies show that immigrants to the United States married to natives earn higher wages than immigrants married to other immigrants. Using data from the 1980 to 2000 U.S. censuses and the 2005 to 2010 American Community Surveys, we show that these wage premiums have increased over time. Our evidence suggests that the trends are unlikely to be explained by changes in the attributes of intermarried immigrants but might instead be a result of changes in how these attributes are rewarded in the labor market. Because intermarried immigrants tend to have more schooling, part of the increasing premium can be explained by increases in returns to education. However, we find increasing intermarriage wage premiums over time, even when allowing returns to education as well as English-speaking ability to vary. We believe these patterns might be driven by changes in technology and globalization, which have made communication and management skills more highly rewarded in the U.S. labor market.

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1. Introduction

Immigrants married to the native-born tend to be more socially integrated than immigrants married to other immigrants. In the United States, those married to the native-born typically have better English language skills and know more about U.S. customs and culture both because immigrants with these skills are more likely to marry natives and because sharing a household with a native brings on further social integration. This chapter examines whether the differential between hourly wages of immigrants married to natives and immigrants married to other immigrants has changed in recent decades. We also explore whether changes in observable characteristics of immigrants that choose to marry natives can explain trends in this differential. We test whether the general patterns are robust across education groups and races. Finally, we explore how much of the increasing wage premium for immigrant/native intermarriage might be explained by the fact that education and English-speaking ability have become more highly rewarded in the U.S. economy.

It has been well established in the literature that immigrants married to natives have better labor market outcomes than immigrants married to other immigrants. Intermarriage[19] wage premiums have been found for immigrants in Australia (Meng and Gregory, 2005), the United States (Kantarevic, 2005; Chi and Drewianka, 2014), France (Meng and Meurs, 2009), Germany (Nottmeyer, 2010), Sweden (Dribe and Nystedt, 2014; Nekby, 2010), and the Netherlands (Gevrek, 2011). Immigrants married to natives are also more likely to be employed than those married to nonnatives (Gevrek, 2011; Furtado and Theodoropoulos, 2009).

[19] In this chapter, we use intermarriage synonymously with "marriage to a native" regardless of whether the immigrant's foreign or native-born spouse shares the immigrant's ancestry. Our most recent data (2007–2010 American Community Survey) suggest that 82.3 percent of immigrants who marry other immigrants marry immigrants from the same country of origin. With our data, we are not able to determine whether the natives married to immigrants have a parent or grandparent from the same country as the immigrant, but Duncan and Trejo (2011) show using Current Population Survey data that ethnic attrition is substantial among third-generation Mexicans with only 17 percent of third-generation Mexican children having a majority of their grandparents born in Mexico.

There is disagreement in this literature, however, about whether marriage choice has a causal impact on labor market outcomes or whether unobservable characteristics, such as ambition or general comfort with the host country's language, customs, laws, and institutions, increase the likelihoods of intermarriage and labor market success. Taking instrumental variables approaches, which exploit plausibly exogenous variation in the opportunities for marrying natives (driven by the size of the immigrant population and sex ratios within marriage markets), several papers find that intermarriage premiums persist even when steps are taken to control for the unobservable characteristics of the immigrants who choose to marry natives (Meng and Gregory, 2005; Meng and Meurs, 2009; Furtado and Theodoropoulos, 2009). This may not be surprising given that a native spouse and the native networks acquired through such a marriage can accelerate an immigrant's language proficiency, improve understanding of social and cultural customs, and provide information about local labor markets. Furtado and Theodoropoulos (2010) provide several pieces of evidence that suggest that employment probabilities are higher for immigrants married to natives as a result of access to native networks that are helpful in the job search process. On the other hand, using a similar instrumental variables approach, Kantarevic (2005) finds that the intermarriage wage premium disappears in the United States when steps are taken to control for omitted variables and reverse causality.

The validity of all of these instrumental variables-based studies rests on the assumption that marriage market characteristics do not have direct impacts on labor market outcomes. Questioning this assumption, several papers instead examine earnings profiles of immigrants before and after they marry to determine whether earnings jump post-marriage or whether the immigrants who eventually marry natives always had higher earnings (Nekby, 2010; Nottmeyer, 2010; Dribe and Nystedt, 2014). These papers do not find dramatic earnings jumps for immigrants

married to natives relative to those who marry other immigrants; immigrants married to natives always have higher earnings. This may be because the majority of benefits from marrying a native start during the courting period as opposed to post-marriage, as would be the case for access to native networks. It may also be that the labor market benefits that result from improved host-country language skills and knowledge of social customs can only be observed many years after marriage and existing studies do not follow couples for long enough.[20]

For the purposes of our study, it does not matter whether marriage choice affects earnings or instead earnings (and characteristics associated with earnings) affect marriage choice. What matters is that the immigrants married to natives tend to have better overall social and communication skills in the host society. By examining how intermarriage premiums have changed over time, we can gain insight into how the benefits of having these skills (as measured by wages) have changed despite not having direct measures of linguistic and social skills in the data. We hypothesize that the benefits associated with the characteristics of intermarried immigrants have increased over time.

Technological change, international trade, and international offshoring of jobs have resulted in big changes in U.S. labor markets in the past few decades. Routine tasks once performed by workers with average skill levels in the United States are now carried out by computers and low-wage workers in other countries. Consequently, there has been an increase in labor market demand for workers who perform non-routine tasks that involve in-person interactions, situational adaptability, and persuasive or managerial skills (Autor et al., 2003; Weinberger, 2014). Autor and

[20] Nekby (2010) considers wage impacts three years before the marriage and two years after, while Nottmeyer (2010) uses an unbalanced panel of data from 1984 to 2007. Dribe and Nystedt (2014) look at earnings profiles 10 years before and 10 years after marriage. They find that, in general, immigrants who eventually marry natives earn higher wages well before marriage. However, immigrants from the Middle East and North Africa show no evidence of an intermarriage premium before marriage but earn substantial premiums post-marriage. The authors explain that this may be either because immigrants from these areas have the most to gain from intermarriage or because they are less likely to have significant contact with future spouses before marriage.

Dorn (2013) find that local labor markets that historically specialized in routine tasks experienced earnings growth at the tails of skill distribution with low-skilled laborers moving into the service sector starting in the 1980s. In fact, between 1980 and 2005, the share of hours worked in the service sector among non-college workers increased more than 53.5 percent (Autor and Dorn, 2013). In addition, Acemoğlu and Autor (2011) show that the share of employment in high-skilled non-routine cognitive-intensive professional, managerial, and technical occupations increased by 62.7 percent between 1959 and 2007. This process, through which employment is increasingly concentrated at the top and bottom of the wage distribution, has been referred to in the literature as "job polarization." Because immigrants married to natives are more likely to possess the social interaction skills that are becoming relatively more highly rewarded in the economy, we expect intermarriage earnings premiums to have increased in the past three decades.

Using data from the 1980 to 2000 U.S. censuses and the 2005 to 2010 American Community Surveys, we find increasing hourly wage premiums for immigrants married to natives relative to those married to immigrants. While it is certainly possible that this trend is driven by changes in the unobserved characteristics of intermarried immigrants, this does not seem likely given how robust the pattern is to adding more and more observable characteristics as controls to our models. We also show that intermarriage premiums have increased for immigrants of all education levels, a result consistent with related work showing that social and managerial skills have become more highly rewarded across the skill distribution (Autor and Handel, 2013). What is interesting is that trends are driven completely by whites and Hispanics; there is no relationship between marriage choice and hourly wages for blacks and Asians. We also show that the returns to a college degree and English language fluency can explain part, but not all, of the increasing intermarriage premium.

In the next section, we present the data and describe the empirical model used in the analysis. We then use Section 3 to discuss baseline results, examine whether patterns are robust across demographic groups, and provide some insight into why intermarriage wage premiums have increased over time. We end with concluding remarks in Section 4.

2. Data and Model

Our study draws on the Integrated Public Use Micro Samples (Ruggles et al., 2010) for the 1980, 1990, and 2000 U.S. Censuses and the American Community Survey (ACS) three-year samples for 2005–2007 and 2008–2010. The census data for 1980, 1990, and 2000 are each 5 percent samples of the U.S. population. The ACS 2005–2007 sample contains all observations from the 1 percent ACS samples for 2005, 2006, and 2007 while the 2008–2010 ACS sample merges 1 percent samples for 2008, 2009, and 2010. Weights are adjusted appropriately.

We restrict the sample to married (spouse present) immigrants aged 18 to 64 who are not enrolled in school and work full time full year.[21] An immigrant is defined as a person born outside of the United States, while a native is born in one of the fifty U.S. states. In this study, people born in outlying areas such as Puerto Rico and the Virgin Islands are considered immigrants. We keep only males in the sample because wage information is only available for workers, and women's labor force participation may depend on intermarriage decisions in ways that are difficult to analyze. To ensure immigrants' exposure to the U.S. marriage market, we omit immigrants who arrived in the United States after the age of 18.[22] Because we want to control for local labor market conditions, we keep only immigrants residing in identified metropolitan statistical areas (MSAs).

[21] Full-time full-year work implies working 35 hours or more in a typical week and no less than 50 weeks in the previous year. This criterion is defined by the U.S. Census Bureau.

[22] Results are robust to including all immigrants regardless of age at arrival, but the increase in the intermarriage premium over time is not as stark.

Concerned about respondents misreporting their wages, we drop individuals who report hourly wages of less than $2 and more than $200, measured in 1999 dollars. Finally, for consistency with prior literature on intermarriage (e.g., Meng and Gregory, 2005), we exclude immigrants from English-speaking countries, but the relationships we uncover in the data do not change if we include them.

Figure 1 plots hourly wages (in 1999 dollars) of immigrants married to natives and immigrants married to other immigrants in the past three decades. The figure reveals a widening wage gap, which is consistent with computerization and globalization altering the labor market returns to communication skills. It is also possible, however, that these trends have been driven by changes in the immigrant composition over time and, specifically, changes in the characteristics of the immigrants that marry natives. For example, if, over time, immigrants with more years of schooling have become more likely to marry natives, then the widening wage gap may be explained by changes in the relative skill composition of intermarried immigrants as opposed to changes in the returns to their skills.

Table 1 presents some descriptive statistics on immigrants by marriage type in 1980 and 2008–2010. Not surprisingly, immigrants married to natives are less likely to have less than a high school degree, more likely to have a college degree, and more likely to speak English fluently. What is more important for the purposes of our study is whether the differential by marriage type has increased over time. After all, the first row of Table 1 shows that the share of immigrants married to natives has decreased quite substantially. The fewer immigrants married to natives in 2008–2010 may be especially likely to have characteristics that are valued in the labor market. The table does not reveal especially large differentials in education and English fluency by marriage

type in the later years, but to address this issue more formally and with a larger set of characteristics, we turn to regression analysis.

The following ordinary least squares model is estimated:

$$W_{ioct} = \beta_1 Native_{ioct} + \sum_{t=2}^{5} (\beta_t Native_{ioct} \cdot T_t) + \rho X_{ioct} + \gamma_o + \delta_{ct} + \varepsilon_{ioct}$$

where W_{ioct} is the log hourly wage of immigrant i from country of origin o living in city c in year t. We use a dummy variable $Native$ to identify whether the immigrant has a native spouse. The vector X contains the individual-level controls age, age squared, educational achievement,[23] presence of children in the household, English fluency,[24] years living in the United States, and measures of the size of the immigrant's group residing in his MSA. Country of origin fixed effects, γ, control for the country of origin composition of immigrants in different years. City-year fixed effects, δ, control for characteristics—such as the unemployment rate or industry-structure of a city—which affect everyone living in the same city in the same year.[25] Our variables of interest are a set of interactions between $Native$ and year dummy variables denoted T_t where t = 2, 3...5 represents 1990, 2000, 2005–2007, and 2008–2010, respectively. If the returns to marrying a native are positive and increasing every year, then β_5 should be greater than β_4, which should exceed β_3 and so forth. All of these coefficients are expected to have a positive sign.

[23] We use dummy variables to measure whether immigrants have a high school diploma, some college, and at least a college degree. Less than a high school degree is the omitted category.

[24] This variable is measured with a dummy variable equaling 1 if the immigrant self-reports speaking only English, speaking English very well, or speaking English well, and 0 otherwise. If we instead include separate dummy variables for each of the categories, our results do not change.

[25] We also considered models with controls for spouse characteristics besides nativity. Adding measures of spouse English fluency, education, and employment status do not affect our main findings. We ultimately decided against including them in our baseline empirical specification because it is difficult, for example, to separately identify the impact of spouse nativity from English language fluency. Having a spouse who is fluent in English is a large part of what it means to have a native-born spouse. For ease of interpretation as well as consistency with prior literature, we limit our control variables to characteristics of the immigrants themselves.

3. Results

3.1 Baseline Regressions

Table 2 presents estimates of the effect of marriage to a native on log hourly wage rates for immigrants using several different model specifications. The first column reproduces the information in Figure 1 by showing results from the simplest possible specification without any control variables. The estimates show that in 1980, immigrants married to natives had 17.1 percent higher earnings than immigrants married to other immigrants. The gap increases to 21.3 percent in 1990, 28.0 percent in 2000, 29.3 percent in 2005–2007, and 29.4 percent in 2008–2010.

As discussed previously, these intermarriage wage premiums may indicate causal impacts of association with a native spouse on wages or simply reflect that characteristics that are valued by natives in the marriage market are also valued in the labor market. Since we are using intermarriage simply as a measure of social and communication skills, distinguishing between these explanations is not important. Instead, the challenge in our study is determining whether immigrants who marry natives are becoming more highly rewarded because fundamentals of the economy have changed or because the types of immigrants who marry natives have changed. For example, if only highly educated immigrants marry natives in the 2000s while immigrants of all education levels marry natives in 1980, then increases in the wage effects of marrying a native may simply be explained by changes in the educational qualifications of the immigrants who marry natives.

To address this issue, in column 2, we add controls for age, education, existence of children in the household, veteran status, language fluency, and years in the United States. Estimated coefficients on control variables are consistent with the existing literature: wages generally increase with age but at a decreasing rate; more education increases wages; veterans and fathers

have higher wages; and immigrants who have better English skills earn more, as do immigrants who have lived in the United States for a longer time. When these variables are added to the model, estimates of the coefficients on the intermarriage variables decrease but are still generally positive and increasing over the years. This suggests that immigrants' changing human capital and assimilation characteristics do not fully explain the increasing wage premium.

The country of origin composition of immigrants in the United States has changed quite dramatically in recent decades (Bean and Stevens, 2003). If immigrants from origins more highly represented in the latter years tend to earn lower wages and are less likely to marry natives, then the increasing marriage to a native premium might simply reflect the change in immigrant country of origin composition as opposed to a change in the returns to specific skills. To address this issue, we add country of origin fixed effects to our model.

During the period in our study, immigrants were increasingly moving to places previously inhabited by very few immigrants; these "new destinations" were often small metropolitan or rural areas (e.g., Alba and Nee, 2003; Bean and Stevens, 2003, Massey et al., 2002). If the immigrants in these areas are more likely to marry natives and have better labor market outcomes than the immigrants in traditional destinations, then the increasing intermarriage wage premium may simply be explained by changes in the geography of immigration. To examine this possibility, we add MSA-year fixed effects to the model. In models with MSA-year fixed effects along with our other controls, we are implicitly comparing wages of immigrants living in the same city in the same year with the same observable characteristics.

MSA-year fixed effects take into account all factors, observable and unobservable, within an MSA in a given year that are constant for everyone in the MSA-year. They control for variables such as industry structure and unemployment rate. Likewise, the country of origin fixed effects

take into account all factors that affect immigrants from the same country in the same way regardless of where in the United States they are living. However, two immigrants living in the same city in the same year will experience different labor and marriage markets if they are from different countries of origin, and two immigrants from the same country will experience different markets if they are living in different cities. We know from the intermarriage literature that immigrants are less likely to marry natives when they live in areas with large concentrations of co-ethnics (Safi and Rogers, 2008; Kalmijn and van Tubergen, 2010). We also know that residence in ethnic enclaves is often associated with lower wages (Borjas, 2000; Chiswick and Miller, 2005; Warman, 2007).[26] If intermarried immigrants are becoming less likely to live in ethnic enclaves, then the increasing intermarriage wage premium could simply reflect changes in residential patterns of immigrants who marry natives. To address this issue, we add a variable measuring the share of the MSA population that was born in the immigrant's country of birth, along with its square term, to the model. We note, however, that our size of ethnic group variables were measured at the time of the survey as opposed to when the immigrants were searching for spouses. Unfortunately, our data lack information on age at marriage in the years after 1980 and complete migration histories.

Column 3 of Table 2 shows that when country of origin fixed effects, MSA-year fixed effects, and the size of country of origin group variables are added to the model, the time pattern in the intermarriage wage premiums remains the same. The estimates of the coefficients on the size variables indicate that immigrants residing in ethnic enclaves tend to earn lower wages, but the decrease in earnings is nonlinear in the size variable. Controlling for observable characteristics, in 1980, immigrants married to natives earn 1.4 percent higher wages than immigrants married to

[26] Quasi-experimental evidence based on the way refugees are placed in different locations in Sweden suggests that living in ethnic enclaves improves labor market outcomes for less skilled immigrants (Edin et al., 2003).

other immigrants. In 1990, this differential grew to 4.0 percent, in 2000 to 6.1, in 2005–2007 to 8.2, and by 2008–2010 to 10.3 percent. Thus, relative to immigrants married to immigrants, those married to natives have received an over sevenfold increase in wages over the past three decades. Estimates of all of the coefficients on the intermarriage interactions are jointly and generally pairwise statistically significantly different from each other at the 5 percent level. The only exception is that the estimated coefficient on the 1990 intermarriage interaction is not statistically different from the intermarriage coefficient, suggesting that the returns to intermarriage did not change in a statistically meaningful way between 1980 and 1990.

The results in Table 2 show that controlling for individual-level observable characteristics as well as unobservable characteristics, which vary only by country of origin or MSA-year, does not change the main story. Immigrants married to natives do tend to have characteristics that are valued in the labor market, and so controlling for variables such as education and English fluency results in smaller estimated intermarriage premiums. However, adding more variables to the models does not change the increasing intermarriage premium pattern. It is still possible that the immigrants marrying natives in the more recent years have better unobserved characteristics relative to those marrying immigrants, but it is difficult to think about what such characteristics might be. Failing to find evidence that changes in the composition of intermarried immigrants are driving our results, we cautiously conclude instead that the characteristics of immigrants who marry natives are becoming more highly valued in the labor market.[27]

[27] Additional results not shown here suggest that there is no discernable pattern in either the employment or working hours over the past three decades, implying that positive impacts for immigrants married to natives are channeled through wage premiums as opposed to employment premiums.

3.2 Heterogeneous Effects

In this section, we test the robustness of our results by analyzing how the increasing intermarriage premium is experienced across different demographic groups. We start by separating the sample into four education groups: less than high school, high school degree, some college education, and at least a college degree. Sample sizes are much smaller in these models, and so it should not be surprising that estimates are not as precise. However, the results in Table 3 broadly suggest that across education levels, immigrants married to natives are becoming more highly rewarded over time. Potentially as a result of smaller samples, we cannot precisely identify year-by-year differences in the returns to intermarriage. However, in all but the college graduate category, returns to intermarriage in 2008 to 2010 are statistically different from the returns in 1980 at the 5 percent significance level. This is consistent with the literature suggesting that the returns to social and managerial skills have increased for people of all education levels (Kuhn and Weinberger, 2005).

Table 4 separates the sample into four race categories. Results suggest that our baseline findings are driven by whites and Hispanics. There is no clear pattern in the returns to intermarriage over time for blacks and Asians. In fact, for blacks, there is no evidence of an intermarriage premium at all in time periods outside of 2005–2007. This is consistent with the segmented assimilation theory (Portes and Zhou, 1993), whereby assimilation can lead to negative outcomes for immigrants in certain groups. However, our sample of black immigrants is quite small given the sample size requirements of any analysis making use of country of origin and MSA-year fixed effects, and so we do not put too much weight on these results.

3.3 Mechanisms

Having shown that intermarriage premiums have increased in the past few decades and that these increases appear very robust across segments of the immigrant population, we now explore whether this pattern can be explained by increases in the returns to education or English language fluency. The education premium has been growing in recent decades (Lemieux, 2008; Boudarbat, et al., 2010), especially when comparing college graduates to high school graduates (Lemieux, 2008; Acemoğlu and Autor, 2011; Lindley and Machin, 2014). English language skills may also have become more valued in the labor market.

Table 5 presents results from models adding interactions between the year dummy variables and the language fluency and education variables to our baseline models. The first column adds just the language interaction variables. Estimated coefficients on these interaction terms are all positive and statistically significant, suggesting that English skills are valued more highly in recent years than in the past. However, while allowing the returns to English fluency to differ by year decreases the magnitude of the increasing intermarriage premium, it does not eliminate it.

The second column presents a model adding education interaction terms to the baseline specification. Results suggest large increases in the returns to a college education over time. Even more so than what is suggested by our language results, adding the education interactions to the model decreases the magnitude of the increasing intermarriage premium. This suggests that part of the reason immigrants married to natives have increasingly higher wages relative to immigrants who marry other immigrants is that they tend to have college degrees. However, college degrees do not explain the entire increasing intermarriage premium. Even in models including the full set of education interactions, immigrants married to natives have experienced increasingly higher

wages relative to immigrants married to other immigrants. Intermarriage appears to measure unobserved traits and skills that have become increasingly valuable in the labor market.

The last column of Table 5 shows results from a model that includes the language and education interactions at the same time. The estimated coefficients reflect the same patterns we have already discussed. Estimates are jointly and generally pairwise statistically different from one another at least at the 10 percent significance level.

4. Conclusion

This chapter investigates trends in wage returns to social and linguistic skills in the U.S. labor market by examining intermarriage wage premiums in the past three decades. We show that the intermarriage premium has been increasing over time, suggesting that communication and social skills are becoming more highly valued in the labor market. These basic trends do not appear to be driven by changes in the characteristics of immigrants who marry natives since patterns are robust across models that control for different sets of observable characteristics. We certainly acknowledge the possibility that there are unobserved variables driving our results, but it is not obvious what they might be.

We find an increasing intermarriage wage premium among immigrants of all education levels. This should not be surprising given that automation and computerization have increased the returns to communication across the skill distribution. No consistent pattern in intermarriage premiums or penalties was found for Asians and blacks. If among Asians and blacks, marriage to a native is associated with characteristics that have not become more valuable in the labor market, we should not expect increasing intermarriage premiums within these groups. In future work, a more careful analysis of these race differentials within a segmented assimilation is warranted.

Given that immigrants married to natives tend to have more schooling and are more fluent in English, we considered whether the increasing intermarriage premium is simply reflecting increasing returns to education or language ability. We found evidence suggesting that immigrants with more schooling and better command of English do have higher relative wages in recent years. However, even in models allowing for increasing returns to these variables, the basic pattern in wage premiums remains the same. This suggests that while part of the reason intermarried immigrants have increasingly higher wages is that they have more schooling and better English language skills, intermarriage measures additional traits that appear to have become more valuable in the labor market.

Quite a bit of media attention has been given to the idea that recent waves of immigrants are not assimilating at the same speed as immigrants did in the past. Borjas (2015) shows that immigrants who entered the United States before the 1980s narrowed their initial wage disadvantage by 15 percent during their first two decades in the United States, while recent immigrants had significantly slower rates of economic assimilation. He attributes the slower economic integration of recent immigrants partly to their lower English-language skills. Although we by no means provide conclusive proof, our results suggest that the slowdown in assimilation rates may not only be about changes in the composition of recent waves of immigrants but instead about economic transitions that increasingly reward communication and social skills.

Figures and Tables

Figure 1. Log hourly wages of immigrants married to natives and immigrants married to other immigrants

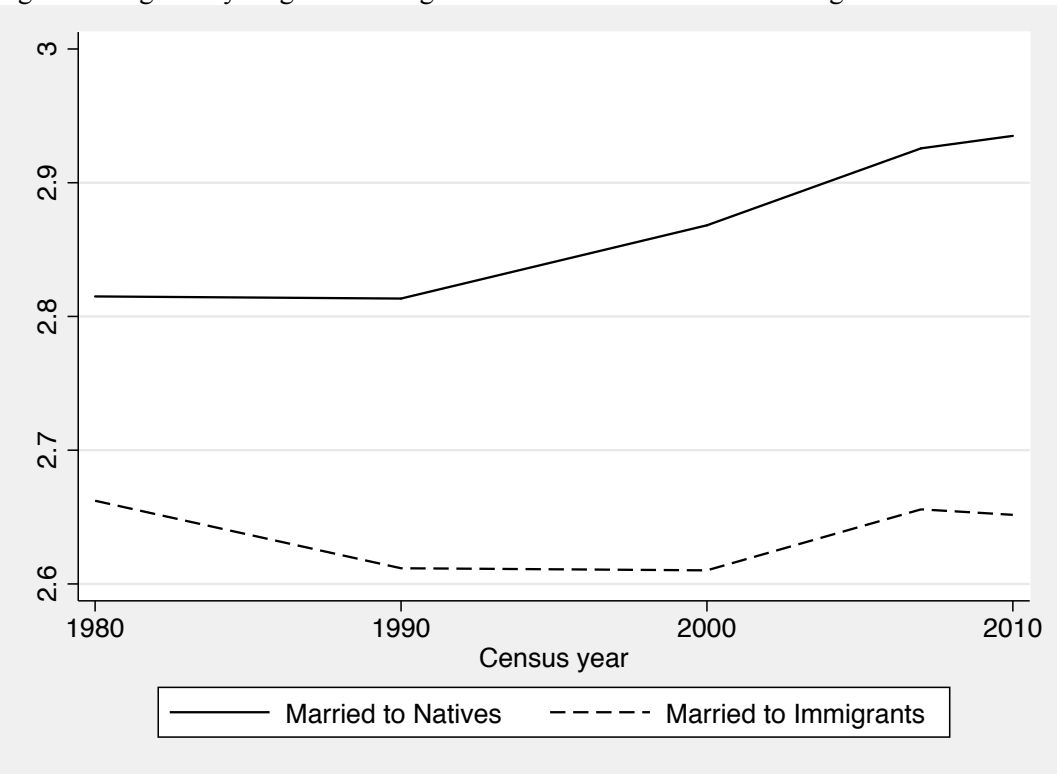


Table 1. Descriptive statistics of select variables

	1980		2008-2010	
	Marriage to a Native	Marriage to an Immigrant	Marriage to a Native	Marriage to an Immigrant
Percentage	56.80	43.20	37.97	62.03
Less than High School	18.50	37.97	10.73	31.44
High School	31.01	27.71	28.22	29.53
Some College	22.42	16.28	22.02	15.37
College Degree	28.06	18.04	39.03	23.66
English Fluency	89.01	59.99	87.50	51.26

Notes: The sample consists of married, foreign born males between the ages of 18 and 64 who immigrated to the U.S. before the age of 18, are not currently enrolled in school, reside in an identifiable metropolitan statistical area, work full time and full year, and earn an hourly wage between $2 and $200 in 1990 dollars. The English fluency dummy variable equals one if the person speaks only English, speaks English very well, or speaks English well.

Table 2. Regression estimates of intermarriage wage premiums

Dependent Variable: Log Hourly Wage	(1)	(2)	(3)
Intermarriage	0.171***	-0.002	0.014
	(0.011)	(0.010)	(0.010)
Intermarriage × 1990	0.042***	0.006	0.026**
	(0.014)	(0.012)	(0.012)
Intermarriage × 2000	0.109***	0.052***	0.047***
	(0.013)	(0.011)	(0.012)
Intermarriage × 2005-2007	0.122***	0.074***	0.068***
	(0.014)	(0.012)	(0.013)
Intermarriage × 2008-2010	0.123***	0.091***	0.089***
	(0.014)	(0.012)	(0.012)
Age	-	0.059***	0.055***
		(0.001)	(0.001)
Age^2	-	-0.001***	-0.001***
		(0.000)	(0.000)
High School	-	0.153***	0.114***
		(0.044)	(0.004)
Some College	-	0.328***	0.263***
		(0.005)	(0.005)
College Degree	-	0.747***	0.631***
		(0.005)	(0.006)
Children in the Household	-	0.032***	0.051***
		(0.004)	(0.004)
Veteran	-	0.004	0.015***
		(0.005)	(0.005)
English Fluency	-	0.182***	0.160***
		(0.005)	(0.005)
Years in U.S.	-	0.004***	0.005***
		(0.000)	(0.000)
Size of Origin Group	-	-	-0.122***
			(0.043)
Size of Origin Group ^{2}	-	-	0.113
			(0.057)
Country of Origin Fixed Effects	No	No	Yes
MSA-Year Fixed Effects	No	No	Yes
R^2	0.043	0.356	0.397
Observations	163,774	163,774	163,774

Notes: The sample consists of married, foreign born males between the ages of 18 and 64 who immigrated to the U.S. before the age of 18, are not currently enrolled in school, reside in an identifiable metropolitan statistical area, work full time and full year, and earn an hourly wage between $2 and $200 in 1990 dollars. The English fluency dummy variable equals one if the person speaks only English, speaks English very well, or speaks English well. Size of origin group refers to the share of the MSA population born in the same country as the immigrant. Significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 3. Regression estimates of intermarriage wage premiums by education

Dependent Variable: Log Hourly Wage	Less Than High School	High School Degree	Some College	College Degree
Intermarriage	0.014	0.032*	0.036	0.057**
	(0.020)	(0.018)	(0.025)	(0.023)
Intermarriage × 1990	0.025	0.025	0.005	-0.002
	(0.025)	(0.022)	(0.028)	(0.028)
Intermarriage × 2000	0.032	0.035*	0.039	0.003
	(0.024)	(0.021)	(0.028)	(0.027)
Intermarriage × 2005-2007	0.055**	0.040*	0.044	0.022
	(0.027)	(0.022)	(0.030)	(0.028)
Intermarriage × 2008-2010	0.076***	0.061***	0.043	0.060**
	(0.026)	(0.022)	(0.029)	(0.027)
R^2	0.204	0.232	0.197	0.162
Observations	41,311	48,847	31,018	42,598

Notes: The sample consists of married, foreign born males between the ages of 18 and 64 who immigrated to the U.S. before the age of 18, are not currently enrolled in school, reside in an identifiable metropolitan statistical area, work full time and full year, and earn an hourly wage between $2 and $200 in 1990 dollars. All control variables and fixed effects shown in column 3 of Table 2 are also included in these specifications. Significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 4. Regression estimates of intermarriage wage premiums by race

Dependent Variable: Log Hourly Wage	White	Black	Asian	Hispanic
Intermarriage	0.006	-0.107	0.101**	0.021
	(0.011)	(0.086)	(0.048)	(0.016)
Intermarriage × 1990	0.027**	0.0090	-0.025	0.017
	(0.014)	(0.103)	(0.056)	(0.018)
Intermarriage × 2000	0.054***	0.117	-0.045	0.043**
	(0.013)	(0.096)	(0.055)	(0.017)
Intermarriage × 2005-2007	0.073***	0.217**	-0.062	0.063***
	(0.015)	(0.101)	(0.055)	(0.019)
Intermarriage × 2008-2010	0.096***	0.064	0.040	0.078***
	(0.014)	(0.099)	(0.053)	(0.018)
R^2	0.401	0.457	0.367	0.338
Observations	99,482	3,521	18,533	91,276

Notes: The sample consists of married, foreign born males between the ages of 18 and 64 who immigrated to the U.S. before the age of 18, are not currently enrolled in school, reside in an identifiable metropolitan statistical area, work full time and full year, and earn an hourly wage between $2 and $200 in 1990 dollars. All control variables and fixed effects shown in column 3 of Table 2 are also included in these specifications. Significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent

Table 5. Regression estimates of intermarriage wage premiums, English fluency premiums, and education premiums

Dependent Variable: Log Hourly Wage	(1)	(2)	(3)
Intermarriage	0.023*	0.038***	0.041***
	(0.011)	(0.010)	(0.010)
Intermarriage × 1990	0.017	0.012	0.008
	(0.013)	(0.013)	(0.013)
Intermarriage × 2000	0.042***	0.025**	0.024**
	(0.012)	(0.012)	(0.012)
Intermarriage × 2005-2007	0.058***	0.038***	0.036***
	(0.013)	(0.013)	(0.013)
Intermarriage × 2008-2010	0.077***	0.060***	0.056***
	(0.018)	(0.012)	(0.013)
English	0.073***	0.158***	0.122***
	(0.011)	(0.005)	(0.019)
English Fluency × 1990	0.081***	-	0.046*
	(0.022)		(0.023)
English Fluency × 2000	0.059***	-	0.011
	(0.020)		(0.021)
English Fluency × 2007	0.094***	-	0.034
	(0.021)		(0.021)
English Fluency × 2010	0.106***	-	0.053**
	(0.020)		(0.021)
College Degree	0.631***	0.375***	0.381***
	(0.006)	(0.014)	(0.015)
College Degree × 1990	-	0.179***	0.170***
		(0.018)	(0.018)
College Degree × 2000	-	0.246***	0.247***
		(0.017)	(0.017)
College Degree × 2007	-	0.298***	0.292***
		(0.018)	(0.019)
College Degree × 2010	-	0.299***	0.287***
		(0.017)	(0.018)
Some College	0.263***	0.182***	0.188***
	(0.005)	(0.014)	(0.014)
Some College × 1990	-	0.077***	0.069***
		(0.017)	(0.017)
Some College × 2000	-	0.078***	0.079***
		(0.016)	(0.017)
Some College × 2007	-	0.108***	0.102***
		(0.018)	(0.018)
Some College × 2010	-	0.081***	0.069***
		(0.017)	(0.018)
High School	0.114***	0.116***	0.122***
	(0.004)	(0.013)	(0.013)
High School × 1990	-	0.022	0.015
		(0.015)	(0.016)
High School × 2000	-	-0.003	-0.003
		(0.014)	(0.015)
High School × 2007	-	0.008	0.002
		(0.015)	(0.016)
High School × 2010	-	-0.009	-0.019
		(0.015)	(0.015)
R^2	0.397	0.398	0.398
Observations	163,774	163,774	163,774

Notes: The sample consists of married, foreign born males between the ages of 18 and 64 who immigrated to the U.S. before the age of 18, are not currently enrolled in school, reside in an identifiable metropolitan statistical area, work full time and full year, and earn an hourly wage between $2 and $200 in 1990 dollars. The English fluency dummy variable equals one if the person speaks only English, speaks English very well, or speaks English well. Size of origin group refers to the share of the MSA population born in the same country as the immigrant. All control variables and fixed effects shown in column 3 of Table 2 are also included in these specifications. Significance levels are noted by the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

References

Acemoğlu, D., & Autor, D. (2011) Skills, tasks and technologies: Implications for employment and earnings. In *Handbook of Labor Economics* (Volume 4 ed., pp. 1043). Ashenfelter O. and Card D. eds., Amsterdam: Elsevier.

Alba, R. D., & Nee, V. (2003). *Remaking the American mainstream: Assimilation and contemporary immigration.* Cambridge, Mass: Harvard University Press.

Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarization of the US labor market. *American Economic Review, 103*(5), 1553-1597.

Autor, D. H., & Handel, M. J. (2013). Putting tasks to the test: Human capital, job tasks, and wages. *Journal of Labor Economics* 31 (S1): S59–96.

Autor, D. H., Levy, F., & Murnane, R. J. (2003). The skill content of recent technological change: An empirical exploration. *Quarterly Journal of Economics, 118*(4), 1279-1333.

Bean, F. D., & Stevens, G. (2003). *America's newcomers and the dynamics of diversity.* American Sociological Association Rose Series in Sociology. New York, NY: Russell Sage Foundation.

Borjas, G. J. (2000). Ethnic enclaves and assimilation. *Swedish Economic Policy Review* 7 (2): 89–122.

Borjas, G.J. (2015). The slowdown in the economic assimilation of immigrants: Aging and cohort effects revisited again. *Journal of Human Capital, 9*(4), 483-517.

Boudarbat, B., Lemieux, T., & Riddell., W. C. (2010). The evolution of the returns to human capital in Canada, 1980–2005. *Canadian Public Policy* 36 (1): 63–89.

Chi, M., & Drewianka, S. (2014). How much is a green card worth? Evidence from Mexican men who marry women born in the U.S. *Labour Economics* 31:103–16.

Chiswick, B. R., & Miller, P. W. (2005). Do enclaves matter in immigrant adjustment? *City & Community* 4 (1): 5–35.

Duncan, B., & Trejo, S. J. (2011). Intermarriage and the intergenerational transmission of ethnic identity and human capital for Mexican Americans. *Journal of Labor Economics* 29 (2): 195–227.

Dribe, M., and Nystedt, P. (2014). Is there an intermarriage premium for male immigrants? Exogamy and earnings in Sweden 1990–2009. *The International Migration Review*.

Edin, P., Fredriksson, P., & Åslund, O. (2003). Ethnic enclaves and the economic success of immigrants: Evidence from a natural experiment. *Quarterly Journal of Economics* 118 (1): 329–57.

Furtado, D., & Theodoropoulos, N. (2009). I'll marry you if you get me a job: Marital assimilation and immigrant employment rates. *International Journal of Manpower* 30 (1–2): 116–26.

Furtado, D., & Theodoropoulos, N. (2010). Why does intermarriage increase immigrant employment? The role of networks. *The B.E. Journal of Economic Analysis & Policy* 10 (1): 1–31.

Gevrek, Z. E. (2011). Role of family structure in immigrants' economic integration. PhD diss., University of Arizona, Tucson.

Kalmijn, M., & van Tubergen., F. (2010). A comparative perspective on intermarriage: Explaining differences among national-origin groups in the United States. *Demography* 47 (2): 459–79.

Kantarevic, J. (2005). Interethnic marriages and economic assimilation of immigrants. IZA Institute for the Study of Labor Discussion Paper 1142, Bonn, Germany.

Kuhn, P., & Weinberger, C. J. (2005) Leadership skills and wages. *Journal of Labor Economics* 23 (3): 395–436.

Lemieux, T. (2008). The changing nature of wage inequality. *Journal of Population Economics* 21 (1): 21–48.

Lindley, J., & Machin, S. (2014). Spatial changes in labour market inequality. *Journal of Urban Economics* 79:121–38.

Massey, D. S., Durand, J., & Malone, N. J. (2002). *Beyond smoke and mirrors: Mexican immigration in an era of economic integration.* New York, NY: Russell Sage Foundation.

Meng, X., & Gregory, R. G. (2005). Intermarriage and the economic assimilation of immigrants. *Journal of Labor Economics* 23 (1): 135–75.

Meng, X., & Meurs, D. (2009). Intermarriage, language, and economic assimilation process. *International Journal of Manpower* 30 (1–2): 127–44.

Nekby, L. (2010). Inter- and intra-marriage premiums revisited: It's probably who you are, not who you marry! IZA Institute for the Study of Labor Discussion Paper 5317, Bonn, Germany.

Nottmeyer, O. (2010). Does intermarriage pay off? A panel data analysis. IZA Institute for the Study of Labor Discussion Paper 5104, Bonn, Germany.

Portes, A., & Zhou, M. (1993). The new second generation: Segmented assimilation and its variants. *The ANNALS of the American Academy of Political and Social Science* 530 (1): 74–96.

Ruggles, J. S., Alexander, T., Genadek, K., Goeken R., Schroeder, M. B. and Sobek M. (2010) *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota.

Safi, M., & Rogers, G. (2008). Intermarriage and assimilation: Disparities in levels of exogamy among immigrants in France. *Population* 63 (2): 239–67.

Warman, C. (2007). Ethnic enclaves and immigrant earnings growth. *Canadian Journal of Economics* 40 (2): 401–22.

Weinberger, C. J. (2014). The increasing complementarity between cognitive and social skills. *The Review of Economics and Statistics* 96 (5): 849–61.

Chapter Three
Why Live in an Ethnic Enclave?
Domestic Migration Response to Immigration Inflows

Tao Song

Abstract

Immigrants, even in the second or third plus generations, tend to live in spatially segregated communities. To understand whether it is monetary or non-monetary benefits that draw immigrants to live in ethnic enclaves in the U.S., I examine migration patterns and wages of the native-born in response to co-ethnic immigration inflows to their metropolitan areas. Since the native-born tend to be perfectly fluent in English regardless of their ancestral background, their residential location choices should not be as constrained as recently arriving immigrants. In addition, because they may share immigrants' preferences for ethnicity-specific amenities and be able to provide ethnicity-specific services in ethnic enclaves, their migration patterns could better reflect the "draw" of ethnic enclaves. My results point to a "pulling" effect whereby immigration inflows to cities simultaneously increase the likelihood that pre-existing co-ethnic natives remain in these cities and the likelihood that out-of-town co-ethnic natives migrate into these cities, relative to natives of other ancestries. I also find that this pulling effect is not due to potential monetary benefits in the labor market but is instead likely due to the lower housing prices and non-monetary benefits such as language and ethnic goods.

1. Introduction

As a country founded by immigrants, the United States is no stranger to mass migrations. While the great majority of migrants were from southern and eastern Europe at the turn of the 20th century, the Immigration and Nationality Act (INA) of 1965 has propelled multiple waves of mass migrations from a diverse group of ethnicities to arrive in the U.S. (Xie and Gough, 2011). Since immigrants tend to locate near the previous landing sites of their fellow countrymen (Bartel 1989, Chiswick and Miller 2002), the U.S. has seen increasingly diverse neighborhoods. These ethnic enclaves have important social functions for their members, such as providing social connections and cultural and language familiarity (Thomas,1958; Logan et al., 2002); but they may also come with costs, such as limited access to a wider labor market and slowed host country language acquisition. This chapter provides insight into why immigrants, even in the second and third plus generations, may choose to live surrounded by co-ethnics even when their English-speaking skills would not preclude them from living anywhere.

Theoretically and empirically, it is ambiguous why immigrants live in areas with many co-ethnics. Some papers argue that immigrants live in ethnic enclaves because they can obtain monetary gains associated with better labor market environments. For instance, ethnicity-specific skills such as ethnic language and knowledge of ethnic culture are more valuable in ethnic enclaves (Portes, 1987), and positive network effects, such as rich job information and positive peer effect within ethnic enclaves, can also help immigrants succeed in the labor market (Damm, 2009; Edin et al., 2003; Yang, 2016). Others suggest that immigrants choose to live in ethnic enclaves for benefits related to language convenience, easy access to ethnic amenities such as ethnic foods and schools (Chiswick and Miller, 2002), and potentially lower housing prices in the ethnic neighborhoods (Saiz and Watchter, 2011). In order to obtain these benefits, immigrants may be

willing to accept worse labor market outcomes in ethnic enclaves caused by slowed host country specific skill acquisition (Lazear, 1999), social networks disseminating information not conducive to labor market success (Bertrand et al., 2000) and geographical limitations (Kain, 1968; Houston, 2005).

One common thread in this literature is that researchers examine immigrants themselves. Newly arriving immigrants are likely to have poor host country specific skills. They might not speak the host country language well and may lack knowledge of host country social and cultural norms. These attributes could certainly restrict them from living outside of ethnic enclaves and decrease their earnings. However, since the second and third plus generation immigrants also tend to cluster in ethnic enclaves and they are less constrained by linguistic and social limitations,[28] why do they still choose to live in ethnic enclaves and potentially face limitations in the labor market?

To answer this question, I estimate migration patterns and labor market outcomes of the native-born with immigrant backgrounds in response to co-ethnic immigration inflows to their cities. This makes several contributions to the literature. First, since natives by nature do not lack host country specific skills, there is less concern that any migration decisions or lower wages associated with living in an enclave can be explained by limitations in English fluency or knowledge of U.S. social norms. Second, because I estimate the migration behaviors and wages of natives for all identifiable ethnicities for the past six decades, the empirical results are less likely to be driven by the unique characteristics specific to a certain policy, a specific ancestry, or a certain time period. Finally, it is important to study the assimilation patterns of immigrants beyond

[28] For example, 92% of the native-born self-identify as speaking English exclusively, well, or very well in the data used in this chapter.

the first generation. After all, socioeconomic mobility achieved by U.S. immigrant families has taken place predominantly across rather than within generations (Duncan and Trejo, 2011, 2015).

Using the data from the 1960, 1970, 1980, 1990, and 2000 Censuses, and the American Community Survey (ACS) five-year sample for 2006–2010, I find that relative to natives of other ethnic groups, an increase in the co-ethnic immigrant population share keeps more co-ethnic natives from leaving the city and pulls more co-ethnic natives living outside of the receiving city to migrate in, relative to natives of other ancestries. I also find that better labor market outcomes are not on average associated with increases in immigrant population shares and therefore are unlikely to explain the attraction of ethnic enclaves.

On the other hand, results on the impact of immigration inflows on the local housing market reveal that the change in immigration inflow of a certain ethnicity in a city is associated negatively with the change in co-ethnic natives' housing values and rent. With the assumption that natives tend to locate in or near the neighborhoods of their co-ethnic immigrants within a city, these results are consistent with a "native flight" phenomenon where natives of other ethnicities leave the neighborhood where immigrants of certain ethnicity cluster, decreasing housing demand in that ethnic neighborhood. Therefore, the lower neighborhood housing prices could be an important reason behind immigrants' tendency of living near their co-ethnics. While there is no way to empirically test the non-monetary benefits of ethnic enclaves with my data, I argue that besides the lower housing prices in the neighborhood, being able to live closer to friends and relatives and having easy access to ethnic amenities could also contribute to the pulling effect of ethnic enclaves.

The rest of the chapter is structured as follows: Section 2 provides a theoretical framework for the empirical analysis, reviews the literature and explains the contribution of this chapter.

Second 3 introduces the datasets and sample. Section 4 explains the empirical models adopted in this chapter. Section 5 discusses empirical results. Section 6 concludes the chapter.

2. Theoretical Framework, Literature and Contribution

2.1 Theoretical Framework and Literature

In attempt to understand why immigrants choose to live in ethnic enclaves, some studies suggest that there could be monetary returns in the labor market within ethnic enclaves (e.g. Portes, 1987). First, there could be higher returns to ethnicity-specific human capital skills such as ethnic language and ethnicity-specific cultural knowledge. These skills are more marketable in ethnic enclaves because, for example, fluency in Mandarin increases marginal productivity and wages of employees working in businesses in Chinatowns as they predominantly cater to Chinese customers. The same linguistic skill, however, would not increase marginal productivity by the same magnitude outside of ethnic enclaves as businesses would be more likely to cater to a wider range of customers. This is one of the principal positive effects of ethnic enclaves suggested by Portes and his associates in their many studies on Cuban immigrants in Miami, Florida (Portes and Bach, 1985; Jensen and Portes, 1992).

The second reason that living in ethnic enclaves could increase members' wages is the positive network effects. Ethnic peers might have better information about job vacancies, establishment of ethnic businesses, sources of loans, or potential good matches between perspective workers and employers (Anderson et al., 2009; Damm, 2009). Accomplished co-ethnics can also help less skilled enclave members improve their marginal productivity through knowledge and experience sharing (Edin et al., 2003, Cutler et al., 2008) and promote better work ethics (Zhou, 2004; Xie and Gough, 2011; Borjas, 1986).

There are, however, many studies suggesting that ethnic enclaves could also negatively impact immigrants' labor market outcomes. First, ethnic enclaves could decrease the rate of host country skill acquisition. Immigrants living in ethnic enclaves have less interaction with natives and therefore have less incentive to acquire host country social skills such as language skills or knowledge about social norms or laws. This could in turn hinder the prospect of obtaining better jobs or higher earnings (Lazear, 1999). Social networks could also provide information not conducive to labor market success. For example, being surround by people who speak the same language significantly increases welfare use for those from high welfare-using groups (Bertrand et al., 2000), and the take-up rate of public program Medicaid is highly correlated within race/ethnicity groups and neighborhoods (Aizer and Currie, 2002). These behaviors could potentially cause higher probability of idleness and lower marginal productivity.

Additionally, the spatial mismatch hypothesis suggests that due to historical discrimination in the housing market, minorities might be forced into living in ethnic enclaves (Kain, 1968; Ihlanfeldt and Sjoquist, 1998). The enclaves, in turn, would create further obstacles for residents' labor market success. Empirical studies find that long and expensive commute to areas with better employment opportunities is a major obstacle for inner city minorities, and it results in minority groups' higher unemployment rates and lower wages.[29] Since immigrants tend to locate in urban neighborhoods and are likely to be impacted by this effect, it is not surprising to find that immigrants living in ethnic enclaves suffer higher likelihood of unemployment and longer commute, comparing to immigrants not living in ethnic enclaves (Liu and Painter, 2012).

Instead, some papers suggest that immigrants could choose to live in ethnic enclaves because they could receive benefits unrelated to the labor market. While it is widely acknowledged

[29] See Houston (2005) for a comprehensive review.

that the increase in demand for housing due to immigration inflows could significantly increase rent and housing prices in receiving cities (Saiz 2003, 2007), the "native flight" phenomenon could lower the housing prices within the specific neighborhoods of ethnic enclaves. When immigrants of a particular ethnicity arrive in a neighborhood, natives of other ethnicities might leave the neighborhood due to their negative preferences toward interacting with the new immigrants. This could subsequently decrease the demand in neighborhood real-estate market and also the equilibrium housing price (Saiz and Watchter, 2011). This would theoretically create an incentive for immigrants to move into ethnic enclaves.

In addition, immigrants might prefer to stay in a familiar and comfortable setting, therefore non-monetary benefits such as linguistic convenience, living near friends and relatives, ethnic foods, ethnic religious institutions and ethnic schools could be attractive to immigrants enough that they are willing to accept the potential lower wages in ethnic enclaves (Chiswick and Miller, 2002).

This review of the theoretical incentives of living in ethnic enclaves suggests that there are many competing factors that could entice people to live in ethnic enclaves, and which factors play a more significant role is an empirical question. In the literature, the estimation of the relationship between ethnic enclaves and labor market outcomes mostly rely on reduced-form relationship between measures of labor market outcomes and measures related to ethnic enclaves. Generally, the literature finds contrasting results in the relationship between ethnic enclave size, typically measured either by population share of immigrants or the logarithm of immigrant population in local markets, and immigrants' labor market outcomes. While some studies find positive labor market outcomes for immigrants living in large ethnic enclaves (Munshi, 2003; Edin et al., 2003; Damm, 2009; Andersson et al., 2009; Yang, 2016), other studies find lower wages (Gonzalez,

1998; Cutler et al., 1999; Beaman, 2012) and slower social and economic integration (Borjas 1995, 1998, 2002, 2015) for immigrants living in ethnic enclaves.

2.2 Contributions

Given the current literature's lack of consensus on ethnic enclave's effects, there are two important contributions to be made. First, most of the research on the impact of ethnic enclaves mainly focus on immigrants' labor market outcomes. There are some issues related to this method. For instance, some immigrants, who are not comfortable with the host country language or social norms, might not be able to survive outside of the ethnic enclaves. If these immigrants are also less productive and therefore earn lower wages no matter where they live, then a negative correlation between ethnic enclave size and immigrants' labor market outcomes could result regardless of the true causal impact. On the other hand, if similar skilled and highly productive co-ethnic immigrants choose to live in close proximity of profitable industries, such as the concentration of Asian computer engineers in Silicon Valley (Dossani and Kumar, 2011), then a positive relationship between co-ethnic immigrant share and wages could be observed, which is unrelated to any direct effects of ethnic enclaves per se. In addition, analyzing the relationship between immigrants' labor market outcomes and immigrant population share also introduce the reflection problem: the treatment group of an ethnic enclave's effect also makes up the enclave, as immigrants and their human capital characteristics directly contribute to the population share and average human capital quality of their ethnic enclaves.

Many papers have attempted to address these problems by exploiting quasi-experiments of exogenous government policies in various countries (Edin et al., 2003; Damm, 2009; Beaman, 2012) or through adoption of instrumental variables (Cutler et al., 2008). The empirical result,

however, still lacks consensus.[30] This lack of consensus is likely related to the second potential contribution to be made in the literature: in the process of correcting the endogeneity problems, papers that use specific government policies as quasi-natural experiments create an issue of generalizability. Because of differences in the content of specific government policies and in the characteristics of countries that adopt such policies, contradictory results could theoretically be observed. For instance, since immigrants are likely to be on welfare for a period of time during their settlement process (Edin et al., 2003), the stark differences between the U.S. welfare system and those of Nordic countries could create different environments for immigrants during their assimilation process. Therefore, the different observed effects of ethnic enclaves among Edin et al. (2003) for Denmark, Damm (2009) for Sweden and Beaman (2012) for the U.S. are hardly surprisingly. As a result, policy discussions deduced from these case studies might be misleading.

In this chapter, I adopt an alternative method and estimate the effect of ethnic enclaves on the native-born in the U.S. Specifically, I first study whether natives of foreign descent are more likely to move to or remain in a city when the city experiences an increase in their co-ethnic immigration inflow, and second I estimate whether these natives experience an increase or decrease in wages as their co-ethnic immigrant population shares increase in their cities of residence.

There are several advantages in this method. First, comparing to immigrants, natives have more freedom in their migration choices. They do not face the obstacle such as unfamiliar host country language or a lack of social, cultural, or legal knowledge about the host country, and they potentially have a wider social network that is not restricted to their co-ethnics. Therefore, they are

[30] Edin et al. (2003), Damm (2009) and Cutler et al. (2008) find positive effects of enclave size on immigrants' labor market outcomes in Denmark, Sweden, and the U.S. (using the 1990 Census), respectively; but Beaman (2012) finds a negative relationship in the U.S. using the refugee data from the 2001 and 2005 administrative records from the International Rescue Committee.

less constrained by the potential limitations that prevent immigrants from looking for alternative residential locations or employment outside of enclaves. At the same time, they may share immigrants' preferences for ethnicity-specific amenities and be able to provide ethnicity-specific services in ethnic enclaves. Therefore, since they are less likely to be "stuck" in ethnic enclaves comparing to immigrants, but are still likely to respond to benefits from ethnic enclaves, their residential location choices would better reflect the "draw" of ethnic enclaves. Second, changes in co-ethnic immigrant share in population is exogenous to natives. There is less concern for reflection problems because migration patterns of natives and their human capital characteristics do not significantly affect immigrant population share and their average human capital quality, so reverse causality is a less severe issue.[31] As a result, studying the relationship between either migration patterns or wages of natives of a city and the city's co-ethnic immigrant population share could shed some light on why immigrants choose to live in ethnic enclaves.

This chapter analyzes the migration patterns and wages of all identifiable ethnic groups within all consistent cities in the U.S. for a long period of time of 1950 – 2010. It relieves some of the previously discussed limitations in generalizability in the literature. Results obtained in this chapter can be considered as the average effect of ethnic enclaves largely free from unobserved characteristics associated with a certain ethnic group, or with a certain city, or with a certain time period. Broad policy discussions related to refugee settlement or immigrant assimilation plans in the U.S. should benefit from the results presented in this chapter.

[31] I acknowledge that the share of immigrants in a city is affected not only by changes in the immigrant population but also by inflows and outflows of natives. However, since the number of natives who migrate between cities every year is small relative to the city population, natives' migration patterns have a much smaller effect on immigrant population share than immigrants' own residential location choices.

While there are numerous studies that estimate the impact of immigration inflows on the native-born's labor market outcomes,[32] very few have attempted to analyze native born's labor market outcomes from the perspective of co-ethnics. The only exception is Yang (2016), where the author uses a quasi-natural experiment in the formation of Chinese communities in California following the INA of 1965. The paper finds that Chinese-Americans are more likely to migrate to California after 1965 comparing to Japanese-Americans and Korean-Americans, and those who move to California enjoy positive economic returns relative to the Japanese and Korean native born. Besides differences in the scope of location and time period, an important difference between Yang (2016) and this chapter is that I use metropolitan statistical areas (MSAs) instead of states as the geographical unit. The reasons is that immigrants tend to cluster in metropolitan cities (Card, 2007) and the typical geographical unit for measurement on ethnic enclave size is cities or even more detailed regions such as neighborhoods.

3. Data

My study draws on the Integrated Public Use Micro Samples (Ruggles et al. 2010) for the 1% 1950 Census, 5% 1960 Census, two versions of the 1% state samples and two versions of the 1% metro samples of the 1970 Census, 5% Census samples of 1980, 1990, and 2000, and finally the ACS five-year sample for 2006–2010. In this study, I define immigrant to be a person born outside of the 50 U.S. states, and I define native born to be a person born inside the 50 U.S. states. People born in outlaying areas such as Puerto Rico and Virgin Islands are considered immigrants. I use MSAs as the geographical unit of local labor market. There are 101 identifiable MSAs that are consistent across the seven samples.

[32] Some examples of seminal works are Card and DiNardo (2000), LaLonde and Topel (1990), Borjas et al. (1997), Card (2007), and Clemons and Hunt (2017).

Since each native born is matched with their co-ethnic immigration inflows, I further restrict my sample of natives to be those of foreign descent. Specifically, I use country of origin as the measure of ethnicity of immigrants, and I use four responses in the censuses to identify a native's ethnicity: the first and the second ancestry and father and mother's country of birth. This is because the ancestry responses are only available for the samples from 1980 and onward and natives' father and mother's country of birth responses are only available for the samples from 1950 to 1970. To define a person's ethnicity, I adopt a priority metric. For the samples from 1980 and onward, the person's ethnicity is identified according to their first ancestry response if their response is not "United States". If the response of the first ancestry is empty or "United States", the individual's ethnicity is defined according to their second ancestry response. Analogously, for the samples between 1950 to 1970, the person's ethnicity is defined according to their father's country of birth. If the person's father is born in the U.S., I use the person's mother's country of birth as the ethnicity identifier. Using this method, I identify 113 unique ethnicities.[33] I further restrict the sample to natives between the ages of 18 and 64 and are not in school.

In terms of labor market outcomes, I use the natural log of hourly wage. The hourly wage data are constructed by dividing annual inflation adjusted wages by total hours worked. The total working hours is calculated by multiplying hours worked in a typical week with the number of weeks worked in a year for the samples after 1980. As for pre-1980 samples, I substitute hours worked last week for hours worked in a typical week because this is what is available in the data. Only natives with observable hourly wages are included in the wage regressions, while all natives are included in the migration regressions.

[33] A list of all 113 ethnic groups is presented in Appendix A. For this chapter, I use the terms "ethnicity" and "country of origin" interchangeably. I also use "native-born" and "natives" interchangeably, they both mean those that are born in the U.S. but identify with a foreign ancestry.

Figure 1 presents the changes in population share of immigrants in MSAs from 1950 to 2010. The average immigrant share in MSAs has decreased during the mid 20th century due to the imposition of strict immigration quotas. With the elimination of the country-specific quota system and the increased immigration cap from 150,000 to 270,000 entrants per year in the INA in 1965, the share of immigrants in U.S. population started to rise (Abramitzky and Boustan, 2016). The racial composition of immigrants has also changed. While the average immigrant share of whites has decreased slightly since 1950, the shares of other races have increased significantly. Notably, the population share of Asian immigrants increased almost 20 times and the population share of Hispanic immigrants increased ten-fold. The growing diversity of immigrants is beneficial for this study, as it creates variation in immigration inflows by ethnicity.

Descriptive statistics of the native-born with foreign ancestry are shown in Table 1. Over the years, more females participate in the labor market. While there is no discernable change in the average age of these natives, they are consistently becoming more and more educated. The inflation adjusted log hourly wage of the native-born has increased from 2.25 to 2.80, a 24 percent increase. Lastly, the average immigrant share by ethnicity-MSA-year cell decreases by 45 percent. This is consistent with the trend found in Figure 1, which suggests that immigrants are becoming more and more diverse ethnically.

Lastly, I present a scatter plot between the immigrant population share by ethnicity-MSA-year and the average wages of natives of the corresponding cell. I observe a negative relationship, suggesting that natives who live in cities that have higher co-ethnic immigrant shares earn lower wages.[34] This is consistent with the recent National Academies of Sciences, Engineering, and Medicine's report on the economic consequences of immigration (Lee, 2017), where it is suggested

[34] In order to construct a more concise and easy-to-examine figure, I exclude wage outliers by dropping the observations in the top and bottom 1 percentiles. Including these outliers does not change the negative relationship or the interpretation.

that the net effect of immigrants on natives' wages is small but negative, and the impact is concentrated on low skilled natives. Since there are many potential explanations such as changes in characteristics of immigration inflows or changes of natives who live in ethnic enclaves, I address these potential reasons more formally by controlling for a large set of characteristics in regression analyses.

4. Models

4.1 Internal Migration Response of Native Born to Co-Ethnic Immigration Inflows

To explore the relationship between immigrant inflows and internal migration decisions, I start by examining the impact of co-ethnic immigration inflows on the likelihood that a co-ethnic native of a city is a pre-existing resident. In practice, I use the following OLS regression.

$$(1) \qquad resident_{irct} = \alpha + \beta \cdot Share_{rct} + X_{ict}\Gamma + \psi_e + \upsilon_{rt} + \rho_{ct} + \theta_{rc} + u_{irct}$$

where $resident_{irct}$ is an indicator variable signifying whether native born person i has lived in city c one or five years before the survey. Specifically, $resident_{irct}$ equals 1 if individual i in ethnicity group r living in MSA c in year t was living in the receiving city c in $t-1$ for the 1950 and 2010 samples, and in $t-5$ for samples of other periods.[35] $Share_{rct}$ measures the population share of immigrants of ethnicity r in MSA c during year t.

I control individual level characteristics by X_{ict}. It includes age and age squared, a gender dummy variable, four racial indicator variables: white, black, Asian, and Hispanic, and two dummy variables that indicate whether the immigrant is married or has children in the household.

[35] This difference in definition is due to changes in questions in the surveys. For the samples in 1950 and 2010, the migration question asks whether the person lived in the same MSA within the past year, but for samples in other periods, the question asks whether the person lived in the same MSA within the past 5 years. This change in definition is accounted for by the year-MSA fixed effects in the model.

Natives' education level is controlled by ψ_e. Ethnicity-year fixed effects are denoted υ_{rt}. Year-MSA fixed effects are denoted ρ_{ct}. Ethnicity-MSA fixed effects are denoted θ_{rc}.

A positive $\hat{\beta}$ would show that immigration inflows to a city increases the likelihood that a co-ethnic native born of that city is a pre-existing resident. Analogously, a negative $\hat{\beta}$ would suggest that in cities with more immigration inflows, co-ethnic natives in those cities are more likely to be new arrivers.

4.2 Immigration Inflow's Effect on Wages

After estimating the correlation between natives' likelihood to be pre-existing residents and co-ethnic immigrant shares, the next step is to understand whether the underlying reason is related to the labor market. Specifically, I test how changes in immigrant shares could affect co-ethnic natives' wages. While the ideal scenario would be to observe two identical cities with different immigrant shares and observe whether co-ethnic natives of the high share city would experience an increase or decrease in their earnings relative to natives of other ethnic groups, in practice, I study whether natives experience an increase or decrease in wages in response to co-ethnic immigration inflows to their cities of residence. I run the following regression.

$$w_{irct} = \alpha + \lambda \cdot Share_{rct} + X_{ict}\Gamma + \psi_e + \upsilon_{rt} + \rho_{ct} + \theta_{rc} + u_{irct} \quad (2)$$

where w_{irct} is the log hourly wage of native born individual i who belongs to ethnic group r and lives in MSA c during year t. Therefore, if $\hat{\lambda}$ is positive, then co-ethnic native born who live in the area of immigration inflows would experience higher wages relative to natives of other ethnic groups, which would suggest that better labor market outcomes are one of the reasons for living in ethnic enclaves. If $\hat{\lambda}$ is not positive, however, then those who choose to live in ethnic enclaves do not do so for better labor market outcomes. All other controls are comparable to Model (1).

5. Empirical Results

5.1 Internal Migration of Co-Ethnic Natives

In this section, I discuss the migration decisions of natives in response to changes in co-ethnic immigration share. The first column of Table 2 shows the regressions result of Model (1) with only one way fixed effects for year, MSA, and ethnicity.[36] These fixed effects take into account all factors, observable and unobservable, in a given year, or within a MSA, or specific to an ethnic group. Therefore, factors such as the changing country-wide migration habit over time,[37] specific characteristics of each city that is consistent over time, and long-term traditions of each ethnic group are held constant. The estimated coefficient of 0.006 suggests a one percentage increase in population share of immigrants of a specific ethnicity in a city is associated with 0.6 percentage points increase in the likelihood that a co-ethnic native in that city is a pre-existing resident instead of a new arriver.

This result, however, could be influenced by other factors. For example, if Chinese-Americans living in cities with higher concentrations of Chinese immigrants are by nature less likely to move than those living in cities with lower concentrations of Chinese immigrants, then the positive estimated coefficient observed in column 1 would not indicate a causal relationship. To address this issue, in the second column of Table 2, I include two way fixed effects of year-MSA, year-ethnicity and MSA-ethnicity. These two way fixed effects take into account all factors specific to year-MSA, year-ethnicity and MSA-ethnicity cells, so factors such as each ethnic group's changing migration pattern over time, and discrimination against a certain ethnic group in a city or in a specific time period are held constant. The estimated coefficient on the immigrant

[36] The standard errors are clustered at the MSA level. Census-provided person weights are used throughout the empirical analyses.
[37] For instance, Saks and Wozniak (2011) show that migration patterns are procyclical and Raven et al. (forthcoming) show that there is a general reduction of migration in the last quarter of the 20th century.

population share decreases to 0.002. It is statistically different from the estimated coefficient in column 1, but it is nevertheless statistically different from zero. This means that factors specific to the two way fixed effects can explain a portion, but not all, of the migration behaviors of natives. Therefore, the positive estimated coefficient still suggests that immigration inflows are positively associated with the likelihood that a co-ethnic native-born resident of that city is a pre-existing resident.

There are individual characteristics that could certainly affect people's migration patterns. The literature suggests that older people are generally less likely to move (Goss and Paul, 1986), married people are more likely to stay put (Navratil and Doyle, 1977), and women and parents could be more likely to remain too. There could also be differences in migration behaviors among different racial groups. Blacks and Asians could have significantly different migration patterns relative to whites (Navratil and Doyle, 1977; Lei and South, 2016; Frey and Liaw, 2005), and there are conflicting findings on whether Hispanics are more or less likely to move than whites (Frey and Liaw, 2005; Schachter, 2003). I include these individual characteristics as control variables in column 3 in case natives with characteristics associated with low likelihood to migrate are concentrated in co-ethnic immigrant receiving cities. The estimated coefficient of 0.002 in column 3 shows that the result is robust to including these control variables.

Lastly, the literature suggests that highly educated people are more mobile (Navratil and Doyle, 1977). Therefore, if the less educated natives are differentially concentrated in cities that experience growths in co-ethnic immigrant shares, then there might not be a causal relationship between immigrant shares and co-ethnic natives' likelihood to be pre-existing residents. The last column of Table 4 incorporates individual education controls. The estimated coefficient on immigrant population share is consistent at 0.002, and it is statistically significant at 5 percent

level. It suggests that when co-ethnic immigrant size in a city increases by one percentage point, the likelihood that a native currently living in that city is a pre-existing resident instead of a new arriver increases by 0.2 percentage points.[38]

The estimated positive coefficient from baseline regression in Table 2, however, is difficult to interpret because a higher likelihood that natives are pre-existing residents instead of new arrivers could have two distinct causes. First, immigrant inflows to a city could discourage co-ethnic natives from other cities to migrate into that city. It is also possible, however, that immigrant inflows also induce out-of-town co-ethnic natives to migrate in but that increases in the likelihood that pre-existing co-ethnic residents remain outweigh the inflows' impacts on co-ethnic new arrivers.

In order to test which of the suggested causes is valid, I test the relationship between immigration inflows and the share of native-born new arrivers to a city that are co-ethnic. In empirical implementation, I estimate the following regression:

$$a\_share_{rct} = \alpha + \beta_r Share_{rct} + \upsilon_{rt} + \rho_{ct} + \theta_{rc} + u_{rct} \quad (3)$$

where $a\_share_{rct} = \frac{\sum_i arriver_{irct}}{\sum_i arriver_{ict}} \times 100\%$.[39] The numerator is the population of native born who belong to ethnicity r and recently moved to city c by year t, the denominator is the total population of native born who recently moved to city c by year t. Therefore, a_share_{rct} measures the proportion of natives who recently moved to city c by year t that belong to ethnic group r. Two way fixed effects are also included in the model.

[38] I also test the balance of the model by regressing $Share_{rct}$ on all covariates. The estimated coefficients on all covariates are non-significant in the two way fixed effects specification.

[39] Similar to the definition of $resident_{irct}$, I define a native born as recently moving to city c in year t ($arriver_{irct} = 1$) if he/she moved to city c in the previous year for the 1950 and 2010 samples; for samples of other periods, a native born is defined as an arriver if he/she moved to city c within the past 5 years.

The first column of Table 3 presents the regression results of Model (3). The estimated coefficient of $Share_{rct}$ is positive and statistically significant. It suggests that when a city experiences an increase in population share of immigrants of a certain ethnicity, the city would also see a higher proportion of natives who recently moved to that city to be of that ethnic group. In the second column, I test the robustness of this result by regressing the natural log of population of co-ethnic arrivers, ln $(\sum_i arriver_{irct})$, instead. The estimated coefficient is also positive and significant. This means that a higher immigrant population share in a city is associated with a larger population of co-ethnic natives who recently arrived in that city.

In the last two columns, I test whether a higher immigrant share is also associated with a larger population share of pre-existing natives in receiving cities to be of the same ethnic group. I use $r\_share_{rct} = \frac{\sum_i resident_{irct}}{\sum_i resident_{ict}} \times 100\%$ and ln $(\sum_i resident_{irct})$ as dependent variables and the OLS regressions yield positive and statistically significant estimated coefficients. This suggests that, for instance, the Chinese immigrant share in San Francisco is positively correlated with both the population of pre-existing Chinese-Americans in San Francisco and the population share of pre-existing Chinese-Americans among all pre-existing natives in San Francisco.

Results from this exercise suggests that when a city experiences an increase in population share of immigrants of a certain ethnic group, the city would simultaneously see more native-born new arrivers and pre-existing residents from that group, comparing to natives of other groups. What is also important is that the estimated coefficients in columns (3) and (4) for pre-existing residents are larger in magnitude than the respective estimated coefficients in columns (1) and (2) for recent arrivers. This suggests that immigration inflows increase the likelihood of pre-existing co-ethnics to remain more than the likelihood of out-of-town co-ethnics to move in. This finding is hardly surprisingly because given the same benefits of ethnic enclaves in a city, out-of-town co-

ethnic natives, unlike pre-existing residents, would have to incur additional costs, such as moving expenses and time, to relocate into immigrant receiving cities.

Given the results in Tables 2 and 3, I can conclude that the empirical evidence is consistent with the argument that ethnic enclaves have a "pulling" effect because immigration inflows can simultaneously attract co-ethnic natives already living in the receiving cities to remain, relative to native residents of other ancestries, and entice co-ethnic natives living outside of the receiving cities to migrate in, relative to natives of other ethnic groups.

5.2 Immigration Inflows' Effects on Wages

Since it is found that immigrant receiving cities attract more co-ethnic natives relative to natives of their ancestries, this section estimates whether the pulling effect is driven by the potentially better labor market outcomes within ethnic enclaves. In the first column of Table 4, I use Model (2) to estimate the relationship between $Share_{rct}$ and native-born co-ethnics' wages. The estimated coefficient on the immigrant population share is -0.004 and is statistically different from zero. The interpretation is that if a city sees the share of immigrants of a certain ethnicity increases by one percentage point, the co-ethnic natives working in that city would experience a 0.4 percentage point decline in log wages on average. This result is comparable to the findings in Beaman (2012) and the National Academies of Sciences, Engineering, and Medicine's report (Lee, 2017), where both found an increase in population of newly arrived immigrants could hurt the labor market outcomes of local residents.[40]

Since it is possible that ethnic enclaves are attractive to pre-existing residents and recent arrivers for different reasons, I test whether there are heterogeneous effects in wages between co-

[40] Although, it is necessary to note that the National Academies of Sciences, Engineering, and Medicine's report focuses on immigrants' impact on the native-born in general, instead of the co-ethnic natives like is done in this chapter.

ethnic natives who choose to remain in the receiving cities and those who choose to move to the receiving cities. Columns (2) and (3) of Table 4 present the results. One percentage point increase in immigrant share decreases a pre-existing resident's wage by 0.3 percentage point, and it decreases the wage of a new arriver by 0.2 percentage point.[41] Therefore, there is no evidence suggesting heterogeneous effects between pre-existing residents and new arrivers.

The conclusion of this sub-section is that immigration inflows are associated with lower wages of natives who live in the enclaves, meaning natives who choose to live in ethnic enclaves receive a pay cut. This suggests that better labor market outcomes of ethnic enclaves are not the reason of living in ethnic enclaves.[42]

5.3 Falsification and Robustness Tests

In this section, I test the robustness of the empirical results from the baseline regressions of Model (1) and Model (2) using a falsification test and two robustness tests. First, since the proposed theory is that immigration inflows have a pulling effect of co-ethnic natives, then co-ethnic natives would need to base their migration decisions on their observation of immigrant inflows. This means that future changes of a city's immigrant population share should not be associated with the co-ethnic natives' migration decisions and should not cause any fluctuations in co-ethnic natives' wages. In the first two columns of Table 5, I regress natives' likelihood to be pre-existing residents and their wages in year t on the future changes in their co-ethnic immigrant population share between years t and $t+1$, $\Delta Share_{rct,t+1}$, where $t+1$ indicates the time period of the following sample, which

[41] The reason that both residents' and arrivers' estimated coefficients are less than the estimated coefficient with the full sample is because a portion of the observations in the sample do not indicate their migration history. They are included in the full sample wage regressions, but are not defined to be either pre-existing residents or recent arrivers.

[42] I also test whether immigration inflows could benefit natives in terms of employability by substituting log hourly wage for an employment indicator variable. The estimated coefficient of $Share_{rct}$ is -0.0007 and it is statistically significant at 5% level. This further suggests that better labor market outcomes are not associated with immigration inflows.

is ten years after year t. The estimated coefficients on both the natives' likelihood to be pre-existing residents and their wages are statistically insignificant, meaning that future changes in immigrant shares do not affect natives' migration decisions or their wages.

Second, natives might take a period of time to observe immigrant inflows before they make any migratory decisions, and the impact of immigration on local labor market might take a period of time to realize itself. Therefore, if the proposed theory in this chapter is true, then the pulling effect and the negative wage effect should be robust if I substitute lagged values of immigrant share $Share_{rct-1}$ for $Share_{rct}$.[43] The positive estimated coefficient on the likelihood of natives to be pre-existing residents in column (3) and the negative estimated coefficient on the natives' wages in column (4) show that the baseline results are robust to changing time periods.

Third, MSAs might be considered too big a geographical unit to measure why people live in ethnic enclaves because ethnic enclaves are usually defined by neighborhoods. While I cannot use neighborhoods as the geographical unit in this chapter due to data limitation, I can use Public Use Microdata Areas (PUMAs) as an alternative and more detailed geographic unit to test the robustness of the baseline results. I present the regression results using PUMAs as the geographical unit in the last two columns of Table 6.[44] The results are consistent with those in the baseline regressions using MSAs. Therefore, I conclude that the baseline results are robust to alternative geographical unit definitions.

[43] Again, $t-1$ indicates the sample of the previous time period, i.e. it is ten years before year t.
[44] PUMAs information is only available for samples of years 1960, 1990, 2000, and 2010.

5.4 Instrumental Variable Estimation: Accounting for Ethnicity-Specific Local Labor Market Shocks

I now use instrumental variable strategy to further parse out the causal relationship between immigration inflows and natives' migration patterns and wages. While the year-MSA, year-ethnicity, and MSA-ethnicity fixed effects could control for all factors, observed and unobserved that could affect these two-way groups equally, there could still be unobserved factors specific to the ethnicity-MSA-year groups that are potentially correlated with immigrant share $Share_{rct}$ and outcomes of natives. For example, suppose there is a positive demand shock for Chinese workers within a city in a year, and the industry responsible for this increased demand is low skilled and pays low wages, then I could theoretically observe Chinese immigrants and Chinese-Americans to cluster in this city, and the Chinese-American's wages would be lower than natives of other ancestries who do not work in this low paying industry in the city.

To test this conjecture, I instrument $Share_{rct}$ with an interaction term between the historical immigrant population share in 1950, $Share_{rc,1950}$, and the ethnic group's home country real GDP during year t, GDP_{rt}. The historical immigrant population share of a certain ethnicity in a city should be correlated with future changes in that city-ethnicity groups' immigration inflows, because immigrants are known to concentrate in their previous ethnic peers' landing sites. Therefore, $Share_{rc,1950}$ would act as a pull factor of immigration in a local labor market. The ethnic group's home country GDP should be correlated with the population of immigrants from that country as it is known that economic success of home countries could decide how many people would emigrate. Therefore, home country GDP is a push factor of immigration. The interaction term of $Share_{rc,1950} \times GDP_{rt}$ would therefore create a IV that predicts the flow and the quantity of immigrants that vary by ethnicity-MSA-year. This IV also satisfies the exclusion restriction: it is

unlikely that the real GDP of the home country or the historical immigrant population share could be related to the current local market shocks in the U.S. that is specific to the ethnicity-MSA-year cells.

In Table 6, I use $Share_{rc,1950} \times GDP_{rt}$ as the instrumental variable for $Share_{rct}$ and re-estimate the baseline regressions. In the first stage, the estimated coefficient on the excluded instrument is negative, and the F-statistics on the excluded instrument is significantly greater than 10. The first column shows the result on the natives' likelihood to be pre-existing residents, and the estimated coefficients is positive and statistically significant. On the other hand, the next three columns consistently show that estimated negative relationship between $Share_{rct}$ and earnings in the OLS regressions disappear in the IV regressions. This means that the ethnicity-MSA-year specific shocks could have indeed simultaneously attracted immigrants and depressed the wages of co-ethnic natives. After the IV treatment, it seems natives' wages neither increases or decreases during co-ethnic immigration inflows. The most important conclusion from this section is that the pulling effect of ethnic enclaves is still significant, and that better labor market outcomes are still not the reason behind this pulling effect.

5.5 Immigration Inflows' Effects on Housing Prices

With the conclusion that the pulling effect of ethnic enclaves is not due to monetary returns in the labor market, it is important to identify other potential reasons of living in ethnic enclaves. While it is difficult to estimate non-monetary benefits of living in ethnic enclaves, I can test whether the "native flight" phenomenon could be the reason for living in ethnic enclaves. That is, I test whether immigration inflows in a neighborhood could lower the local housing prices due to natives of other

ethnicities leaving the area. Empirically, I estimate the following equation referenced from Saiz and Wachter (2011):[45]

$$(4) \qquad \Delta hp_{rct,t-1} = \alpha + \phi \cdot \Delta Share_{rct,t-1} + \xi hp_{rct-1} + \chi Z_{rct} + \upsilon_{rt} + \rho_{ct} + \theta_{rc} + u_{rct}$$

where $\Delta hp_{rct,t-1}$ is a vector of two variables that measure the changes in local housing prices over time: changes in natural log of average inflation adjusted rent for ethnicity group r in city c between time periods t and $t-1$, and changes in natural log of average inflation adjusted housing values for ethnicity group r in city c between time periods t and $t-1$. $\Delta Share_{rct,t-1}$ is the change in co-ethnic immigrant share. I also include two sets of control variables that could influence the local housing market. I include lagged housing prices of ethnicity-MSA-year group in the previous census by hp_{rct-1}, and I control socioeconomic characteristics of ethnicity-MSA-year group by Z_{rct}. Z_{rct} contains the weighted average of years of schooling (approximated by their highest education) and hourly wages for the ethnicity-MSA-year group. The two way fixed effects between ethnicity, year and city $\upsilon_{rt}, \rho_{ct}, \theta_{rc}$ are also included.

With the assumption that natives who live in their co-ethnic immigrant receiving cities would tend to live in or close to the neighborhoods of their co-ethnic immigrants, I can consider $\hat{\phi}$ to be an estimate of the immigration inflow's effect on *neighborhood* housing prices. For example, suppose there are two identical cities with different immigrant shares of a certain ethnicity, a negative $\hat{\phi}$ would mean that the city that receives more, say, Chinese immigrants would also see Chinese-American's housing prices to drop. Conditioning on the assumption that Chinese-Americans tend to live in or close to the neighborhood of Chinese immigrants, such as Chinatown, then $\hat{\phi}$ would measure the effect of immigration inflows on the housing prices of the

[45] Due to data limitations, change in housing quality was controlled for in Saiz and Wachter (2011), but is not controlled in my model.

neighborhood. Therefore, the negative $\hat{\phi}$ would be in line with the "native flight" phenomenon and suggests that part of the reason of living in ethnic enclaves is the lower housing prices within the ethnic neighborhoods, resulted from natives of other ethnicities leaving.

I present the regression results of this exercise in Table 7. The negative estimated coefficients on both the rent and housing values suggest that if the assumption that natives tend to locate themselves within or close to their co-ethnic immigrants' neighborhoods is reasonable, then the results would be consistent with the "native flight" story where the natives tend to leave the neighborhood of another ethnic group during that ethnic group's immigration inflow. As a result, co-ethnic natives could take advantage of the lower housing prices due to the flight and move into ethnic enclaves. Since natives are not bounded by reasons that constrict immigrants' residential location choices, the conclusion drawn in this sub-section is that there is evidence consistent with the argument that one reason of immigrants living in ethnic enclaves is to take advantage of the lower housing prices in the neighborhood.

To summarize, the empirical results in Section 5 suggest a rather intriguing story. Growing ethnic enclaves caused by immigration inflows draw co-ethnic natives to migrate into the neighborhood, relative to natives of other origins. This migration pattern is not caused by monetary returns in the labor market, but is potentially at least partially due to the lower housing prices in the neighborhoods due to the "native flight" phenomenon. Additionally, while given the data limitations there is no way to test for the non-monetary benefits of ethnic enclaves suggested in Section 2, all the empirical results are also consistent with the conjecture that benefits such as living closer to friends and relatives and being able to easily take advantage of ethnic amenities could also contribute to the desire of living in ethnic enclaves.

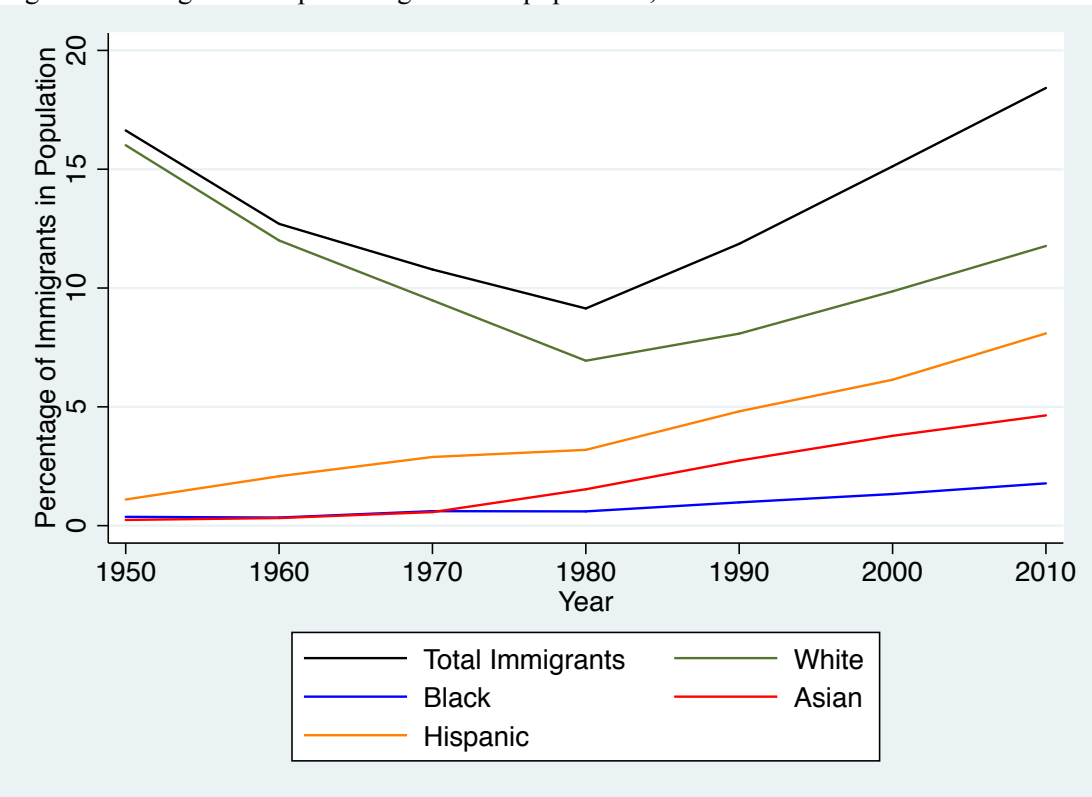
6. Conclusion

Motivated to gain more understanding of why immigrants, even the second or third plus generations, tend to live within their ethnic enclaves, this chapter adopts a novel method and analyzes the migration patterns and wages of the native-born of foreign ancestry in response to co-ethnic immigration inflows to their metropolitan areas. My results point to a "pulling" effect whereby immigration inflows to cities simultaneously increase the likelihood that pre-existing co-ethnic natives remain in these cities and the likelihood that out-of-town co-ethnic natives migrate into these cities, relative to natives of other ancestries. I also find that this pulling effect is not due to potential monetary benefits in the labor market but is instead likely due to the lower housing prices in the enclave neighborhoods and non-monetary benefits such as language convenience and ethnic goods.

The policy implication stemming from the conclusion is related to the refugee placement and immigrant assimilation programs. In the U.S., refugee placement decisions are primarily related to the locations of refugees' relatives, and there is little systematic strategy of skill evaluation and job matching after refugees have settled (Delacretaz et al., 2017). In fact, the U.S. is in general laissez-faire towards immigrants' assimilation after immigrants have landed. Results from this chapter suggest that encouraging newly arriving refugees and immigrants to reside close to their relatives and within their ethnic enclaves is a favorable strategy because they provide a familiar and less costly environment during the beginning of immigrants' assimilation process. While these benefits certainly might outweigh the cost of potential negative wages associated with ethnic enclaves, supplementary policies that help immigrants overcome the potential labor market obstacles within ethnic enclaves, such as those in favor of language training and social programs in enclaves, could also be beneficial.

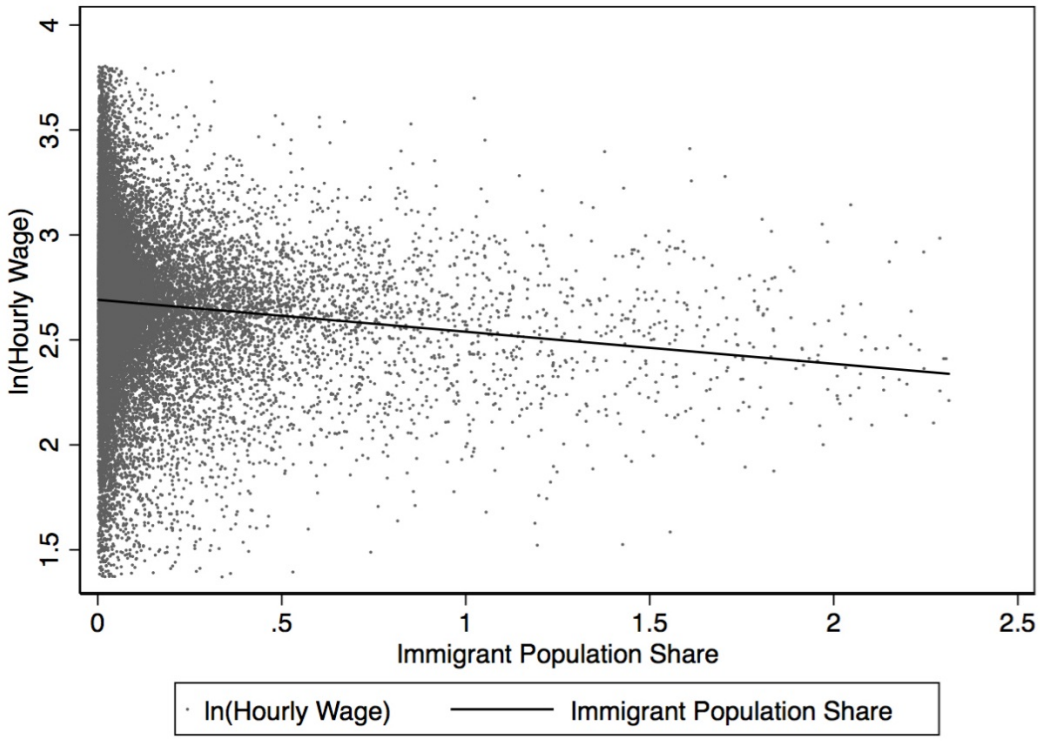
Figures and Tables

Figure 1: Immigrant as a percentage of U.S. population, 1950 – 2010



Notes: The sample consists of all immigrants who reside in identifiable metropolitan areas that are consistent across the six samples of 1950, 1960, 1970, 1980, 1990, 2000 Censuses and the ACS sample of 2005 – 2010.

Figure 2: Log hourly wage of natives and population share of natives' co-ethnic immigrants



Notes: The wage sample consists of all working natives with an identified foreign ancestry, age between 18 and 64, and reside in identifiable metropolitan areas that are consistent across the six samples of 1950, 1960, 1970, 1980, 1990, 2000 Censuses and the ACS sample of 2005 – 2010. The immigrant population share sample consists of calculated population share of immigrants by ethnicity-MSA-year cells of the same seven samples.

Table 1: Descriptive statistics

	1950	1960	1970	1980	1990	2000	2010
Female	0.34	0.32	0.37	0.42	0.45	0.47	0.47
Age	38.04	42.58	46.36	38.04	38.92	40.96	43.31
Less than High School	0.54	0.49	0.37	0.15	0.07	0.04	0.03
High School	0.29	0.30	0.37	0.40	0.32	0.35	0.31
Some College	0.08	0.10	0.12	0.19	0.30	0.24	0.23
College Degree or Higher	0.08	0.11	0.14	0.25	0.31	0.37	0.43
Log Hourly Wage	2.25	2.61	2.84	2.69	2.71	2.79	2.80
MSA-Ethnicity Immigrant Population Share	1.64	1.11	0.76	0.50	0.67	0.80	0.90

Notes: The sample consists of all natives of foreign ancestry, age between 18 and 64, and reside in identifiable metropolitan areas that are consistent across the six samples of 1950, 1960, 1970, 1980, 1990, 2000 Censuses and the ACS sample of 2005 – 2010. The log hourly wage of natives sample consists of inflation adjusted hourly wages of all working native born workers between the ages of 18 and 64, who are not in school and reside in identifiable metropolitan areas that are consistent across the six samples of 1950, 1960, 1970, 1980, 1990, 2000 Censuses and the ACS sample of 2005 – 2010.

Table 2: Immigration inflows and co-ethnic natives' likelihood of being pre-existing residents, 1950 – 2010

	(1)	(2)	(3)	(4)
$Share_{rct}$	0.006***	0.002***	0.002***	0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Female	-	-	0.004***	0.005***
			(0.001)	(0.000)
Age	-	-	0.014***	0.012***
			(0.000)	(0.000)
Age^2	-	-	-0.000***	-0.000**
			(0.000)	(0.000)
Married	-	-	0.022***	0.015***
			(0.000)	(0.000)
Children	-	-	0.046***	0.043***
			(0.000)	(0.000)
Black	-	-	-0.022***	-0.022***
			(0.003)	(0.003)
Asian	-	-	0.019***	0.036***
			(0.004)	(0.003)
Hispanic	-	-	-0.000	0.001
			(0.002)	(0.002)
High School	-	-	-	0.022***
				(0.000)
Some College	-	-	-	-0.014***
				(0.001)
College Graduate	-	-	-	-0.040***
				(0.001)
One Way Fixed Effects	Yes	-	-	-
Two Way Fixed Effects	-	Yes	Yes	Yes
R^2	0.204	0.208	0.279	0.282
N	5,946,084	5,946,084	5,946,084	5,946,084

Notes: The sample consists of all native-born individuals between the ages of 18 and 64 and reside in identifiable metropolitan areas that are consistent across the six samples of 1950, 1960, 1970, 1980, 1990, 2000 Censuses and the ACS sample of 2005 – 2010. The dependent variable is a dummy variable that equals 1 if the native-born has been living in the city before year t. $Share_{rct}$ is the population share of immigrants of ethnicity group r in city c during year t. One way fixed effects include year, MSA, and ethnicity fixed effects. Two way fixed effects include year-MSA, year-ethnicity, and MSA-ethnicity fixed effects. Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 3: Immigration inflows and migration behaviors of co-ethnic natives, 1950 – 2010

Dependent Variable	Population Share of Co-ethnic New Arrivers	ln(Population of Co-ethnic New Arrivers)	Population Share of Co-ethnic Pre-existing Residents	ln(Population of Co-ethnic Pre-existing Residents)
$Share_{rct}$	0.005***	0.106***	0.006***	0.142***
	(0.001)	(0.017)	(0.001)	(0.018)
R^2	0.812	0.939	0.890	0.945
N	30,743	24,656	30,759	25,102

Notes: The sample consists of all native-born individuals between the ages of 18 and 64 and reside in identifiable metropolitan areas. $Share_{rct}$ is the population share of immigrants of ethnicity group r in city c during year t. Pre-existing residents are individuals who lived in the same MSA during year $t-1$ for 1950 and 2010 samples, and during year $t-5$ for samples of 1960 – 2000. New arrivers are individuals who do not live in the same MSA between t and $t-1$ for 1950 and 2010 samples, and between t and $t-5$ for samples of 1960 – 2000. All regressions contain two way fixed effects of year, MSA and ethnicity. Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 4: Immigration inflows and wages of co-ethnic native born, 1950 – 2010

	Full Sample	Pre-existing Residents	New Arrivers
$Share_{rct}$	-0.004***	-0.003***	-0.002*
	(0.001)	(0.001)	(0.001)
Individual Characteristics Controls	Yes	Yes	Yes
Education Controls	Yes	Yes	Yes
Two Way Fixed Effects	Yes	Yes	Yes
R^2	0.265	0.271	0.259
N	5,457,784	3,060,021	1,783,234

Notes: The sample consists of all native-born workers between the ages of 18 and 64, who are not in school and reside in identifiable metropolitan areas. $Share_{rct}$ is the population share of immigrants of ethnicity group r in city c during year t. Pre-existing residents are individuals who lived in the same MSA during year $t-1$ for 1950 and 2010 samples, and during year $t-5$ for samples of 1960 – 2000. New arrivers are individuals who do not live in the same MSA between t and $t-1$ for 1950 and 2010 samples, and between t and $t-5$ for samples of 1960 – 2000. All regressions contain two way fixed effects of year, MSA and ethnicity. Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 5: Falsification tests and robustness tests

	Geographical Unit: MSAs				Geographical Unit: PUMAs	
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	Likelihood of being Pre-existing Residents	ln(wage)	Likelihood of being Pre-existing Residents	ln(wage)	Likelihood of being Pre-existing Residents	ln(wage)
$\Delta Share_{rct,t+1}$	0.000 (0.001)	0.004 (0.003)	-	-	-	-
$Share_{rct-1}$	-	-	0.007*** (0.000)	-0.004*** (0.001)	-	-
$Share_{rpt}$	-	-	-	-	0.002*** (0.000)	-0.002*** (0.000)
R^2	0.182	0.295	0.295	0.263	0.240	0.263
N	4,328,581	3,959,620	5,292,659	4,858,255	9,789,363	8,891,321

Notes: The sample consists of all native-born individuals between the ages of 18 and 64 who are not in school. The falsification test regressions (columns 1 and 2) include the samples between 1950 and 2000. The MSAs robustness test regressions (columns 3 and 4) include samples between 1960 and 2010. The PUMAs regressions include the samples of 1960, 1990, 2000 and 2010. $\Delta Share_{rct,t+1}$ is the change in the population share of immigrants of ethnicity group r in city c between year t and the following census or ACS sample. $Share_{rc,t-1}$ is the population share of immigrants of ethnicity group r in city c in the proceeding sample. $Share_{rpt}$ is the population share of immigrants of ethnicity group r in PUMA p in year t. All regressions contain two way fixed effects of year, ethnicity, and MSA (PUMA). Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Table 6: Instrument variable estimations, 1960 – 2010

Dependent Variable	Likelihood of being Pre-existing Residents	ln(wage)		
		Full Sample	Pre-existing Residents	New Arrivers
$Share_{rct}$	0.008*** (0.001)	0.000 (0.015)	-0.017 (0.015)	-0.001 (0.031)
R^2	0.271	0.269	0.271	0.265
N	3,849,581	3,546,929	2,104,438	1,234,062

Notes: The sample consists of all native-born individuals between the ages of 18 and 64, who are not in school and reside in identifiable metropolitan areas. $Share_{rct}$ is the population share of immigrants of ethnicity group r in city c during year t. Instrumental variable is an interaction term between $Share_{rc,1950}$ and the real GDP of the home countries of each immigration inflows during year t. $Share_{rct}$ is the population share of immigrants of ethnicity group r in city c during year t. Pre-existing residents are individuals who lived in the same MSA during year $t-1$ for 1950 and 2010 samples, and during year $t-5$ for samples of 1960 – 2000. New arrivers are individuals who do not live in the same MSA between t and $t-1$ for 1950 and 2010 samples, and between t and $t-5$ for samples of 1960 – 2000. All regressions contain two way fixed effects of year, MSA and ethnicity. Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

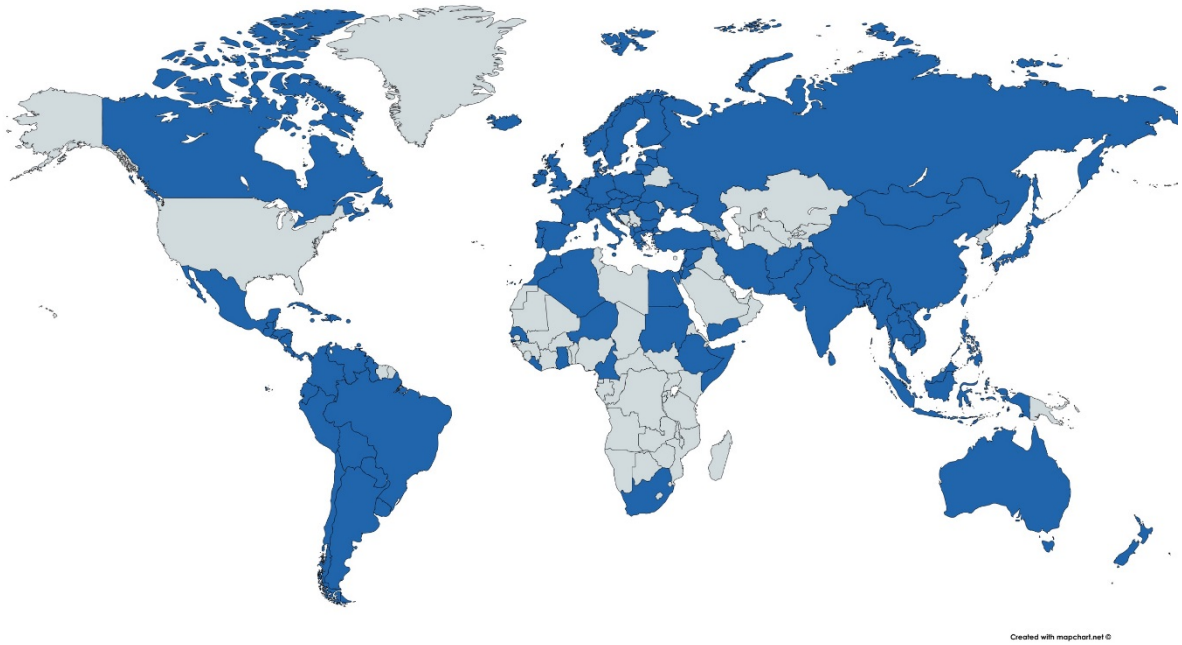
Table 7: Immigration share and MSA housing prices, 1970 – 2010

Dependent Variable	Δln(Rent)$_{t,t-1}$	Δln(House Value)$_{t,t-1}$
$\Delta Share_{rct,t-1}$	-0.028*	-0.074*
	(0.015)	(0.049)
Socioeconomic Controls	Yes	Yes
Lagged Housing Values	Yes	Yes
Two Way Fixed Effects	Yes	Yes
R^2	0.822	0.670
N	8,728	18,322

Notes: The sample consists of all native-born individuals between the ages of 18 and 64, who are not in school and reside in identifiable metropolitan areas. $\Delta Share_{rct,t-1}$ is the change in population share of immigrants of ethnicity group r in city c between period t and $t-1$. Δln(Rent)$_{t,t-1}$ is the change in natural log of average inflation adjusted rent for the renters in ethnicity-MSA-year cells. Δln(House Value)$_{t,t-1}$ is the change in natural log of average inflation adjusted house values for the house owners in ethnicity-MSA-year cells. All regressions contain two way fixed effects of year, MSA and ethnicity. Statistical significance levels are noted as the following: * significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent.

Appendix A – 113 Identified Ethnic Groups

Austrian	Cape Verdean	Guyanese	Macedonian	Singaporean
Afghan	Chilean	Haitian	Malaysian	Slovak
Albania	Chinese	Honduran	Maltese	Somalian
Algerian	Colombian	Hungarian	Mexican	South African
Argentinean	Costa Rican	Icelander	Mongolian	Spaniard
Armenian	Croatian	India	Moroccan	Sri Lankan
Australian	Cuban	Indonesian	Nepali	Sudanese
Azerbaijani	Czech	Iranian	New Zealander	Swedish
Bahamian	Danish	Iraqi	Nicaraguan	Swiss
Barbadian	Dominican	Irish	Nigerian	Syrian
Belgian	Dutch	Israeli	Norwegian	Taiwanese
Belizean	Ecuadorian	Italian	Pakistani	Thai
Bengali	Egyptian	Jamaican	Panamanian	Trinidadian
Bermudan	English	Japanese	Paraguayan	Turkish
Bhutanese	Estonian	Jordanian	Peruvian	Ukrainian
Bolivian	Ethiopian	Kenyan	Polish	Uruguayan
Brazilian	Filipino	Korean	Portuguese	Venezuelan
British	Finnish	Laotian	Puerto Rican	Vietnamese
Bulgarian	French	Latvian	Romanian	Welsh
Burmese	German	Lebanese	Russian	Yemeni
Canada	Ghanaian	Liberian	Salvadoran	Yugoslavian
Cambodian	Greek	Lithuanian	Scottish	
Cameroonian	Guatemalan	Luxembourger	Senegalese	



Notes: Blue-shaded countries/regions are the countries included in this study.

References

Abramitzky, R., & Boustan, L. (2016). Immigration in American economic history. *Working Paper.*

Aizer, A., & Currie, J. (2004). Networks or neighborhoods? correlations in the use of publicly-funded maternity care in California. *Journal of Public Economics, 88*(12), 2573-2585.

Andersson, F., Burgess, S., & Lane, J. (2009). Do as the neighbors do: The impact of social networks on immigrant employment. *IDEAS Working Paper Series from RePEc.*

Bartel, A. (1989). Where do the new U.S. immigrants live? *Journal of Labor Economics, 7*(4), 371.

Beaman, L. A. (2012). Social networks and the dynamics of labour market outcomes: Evidence from refugees resettled in the U.S. *Review of Economic Studies, 79*(1), 128-161.

Bertrand, M., Luttmer, E. F. P., & Mullainathan, S. (2000). Network effects and welfare cultures. *Quarterly Journal of Economics, 115*(3), 1019.

Borjas, G. J. (1986). The self-employment experience of immigrants. *The Journal of Human Resources, 21*(4), 485.

Borjas, G. J. (1995). Ethnicity, neighborhoods, and human-capital externalities. *American Economic Review, 85*(3), 365-390.

Borjas, G., Freeman, R., & Katz, L. (1997). How much do immigration and trade affect labor market outcomes? *Brookings Papers on Economic Activity*, (1), 1-90.

Borjas, G. J. (1998). To ghetto or not to ghetto: Ethnicity and residential segregation. *Journal of Urban Economics, 44*(2), 228-253.

Borjas, G. J. (2002). Homeownership in the immigrant population. *NBER Working Paper Series,* 8945.

Borjas, G. J. (2015). The slowdown in the economic assimilation of immigrants: Aging and cohort effects revisited again. *Journal of Human Capital, 9*(4), 483-517.

Card, D. (2007). How immigration affects U.S. cities. *IDEAS Working Paper Series from RePEc.*

Card, D., & DiNardo, J. (2000). Do immigrant inflows lead to native outflows? *American Economic Review*, 90(2), 360-367.

Chiswick, B. R., & Miller, P. W. (2002). Immigrant earnings: Language skills, linguistic concentrations and the business cycle. *Journal of Population Economics, 15*(1), 31-57.

Clemens, M., & Hunt, J. (2017). The labor market effects of refugee waves: Reconciling conflicting results. *IDEAS Working Paper Series from RePEc*, IDEAS Working Paper Series from RePEc, 2017.

Cutler, D. M., Glaeser, E. L., & Vigdor, J. L. (1999). The rise and decline of the American ghetto. *Journal of Political Economy, 107*(3), 455-506.

Cutler, D. M., Glaeser, E. L., & Vigdor, J. L. (2008). When are ghettos bad? lessons from immigrant segregation in the United States. *Journal of Urban Economics, 63*(3), 759-774.

Delacretaz, D., Kominers, S. D., & Teytelboym, A. (2017). Refugee resettlement. *Working paper.*

Damm, A. P. (2009). Ethnic enclaves and immigrant labor market outcomes: Quasi-experimental evidence. *Journal of Labor Economics, 27*(2), 281-314.

Dossani, R., & Kumar, A. (2011). Network associations and professional growth among engineers from India and China in Silicon Valley. *The American Behavioral Scientist*, 55(7), 941.

Duncan, B., & Trejo, S. J. (2011). Tracking intergenerational progress for immigrant groups: The problem of ethnic attrition. *American Economic Review*, 101(3), 603-608.

Duncan, B., & Trejo, S. J. (2015). Assessing the socioeconomic mobility and integration of U.S. immigrants and their descendants. *The ANNALS of the American Academy of Political and Social Science*, 657(1), 108-135.

Edin, P., Fredriksson, P., & Åslund, O. (2003). Ethnic enclaves and the economic success of immigrants: Evidence from a natural experiment. *The Quarterly Journal of Economics*, 118(1), 329-357.

Frey, W. H., & Liaw, K. (2005). Interstate migration of Hispanics, Asians and blacks: cultural constraints and middle class flight. *PSC Research Report,* No. 05-575. 5 2005.

Gonzalez, A. (1998). Mexican enclaves and the price of culture. *Journal of Urban Economics, 43*(2), 273-291.

Goss, E. P., & Paul, C. (1986). Age and work experience in the decision to migrate. *The Journal of Human Resources, 21*(3), 397-405.

Houston, D. (2005). Employability, skills mismatch and spatial mismatch in metropolitan labour markets. *Urban Studies*, 42(2), 221-243.

Ihlanfeldt, K. R., & Sjoquist, D. L. (1998). The spatial mismatch hypothesis: A review of recent studies and their implications for welfare reform. *Housing Policy Debate, 9*(4), 849-892.

Jensen, L., & Portes, A. (1992). The enclave and the entrants: Patterns of ethnic enterprise in Miami before and after Mariel. *American Sociological Review*, 57(3), 411-414.

Kain, J. F. (1968). Housing segregation, negro employment, and metropolitan decentralization. *Quarterly Journal of Economics, 82*(2), 175-197.

LaLonde, R.J. & Topel, R. H. (1990). The assimilation of immigrants in the U.S. labor markets. *NBER Working Paper Series*, 3573.

Lazear, E. (1999). Culture and language. *The Journal of Political Economy, 107*(6), S126.

Lee, R. (2017). National Academies of Sciences, Engineering, and Medicine: The economic and fiscal consequences of immigration. *Population and Development Review*, 43(1), 168-173.

Lei, L., & South, S. J. (2016). Racial and ethnic differences in leaving and returning to the parental home: The role of life course transitions, socioeconomic resources, and family connectivity. *research article* (report).*34*, 109.

Liu, C., & Painter, G. (2012). Immigrant settlement and employment suburbanisation in the US. *Urban Studies*, 49(5), 979-1002.

Logan, J., Zhang, W., & Alba, R. (2002). Immigrant enclaves and ethnic communities in New York and Los Angeles. *American Sociological Review, 67*(2), 299-322.

Munshi, K. (2003). Networks in the modern economy: Mexican migrants in the U. S. labor market. *The Quarterly Journal of Economics, 118*(2), 549-599.

Navratil, F. J., & Doyle, J. J. (1977). The socioeconomic determinants of migration and the level of aggregation. *Southern Economic Journal, 43*(4), 1547-1559.

Portes, A. (1987). The social origins of the Cuban enclave economy of Miami. *Sociological Perspectives, 30*(4), 340-372.

Portes, A., & Bach, R. (1985). *Latin journey : Cuban and Mexican immigrants in the United States*. Berkeley: University of California Press.

Ruggles, J. S., Alexander, T., Genadek, K., Goeken R., Schroeder, M. B. and Sobek M. (2010) *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota.

Raven, F., Smith, C.L., & Wozniak, A. (forthcoming). Labor market transitions and the decline in long-distance migration in the US. *Demography.*

Saks, R., & Wozniak, A. (2011). Labor reallocation over the business cycle: New evidence from internal migration. *Journal of Labor Economics*, 29(4), 697.

Saiz, A. (2003). Room in the kitchen for the melting pot: Immigration and rental prices. *Review of Economics and Statistics, 85*(3), 502-521.

Saiz, A. (2007). Immigration and housing rents in American cities. *Journal of Urban Economics, 61*(2), 345-371.

Saiz, A., & Wachter, S. (2011). Immigration and the neighborhood. *American Economic Journal: Economic Policy, 3*(2), 169-188.

Schachter, J. (2003). In U.S. Census Bureau (Ed.), *Migration by race and Hispanic origin 1995 to 2000*. Washington, D.C.: U.S. Dept. of Commerce, Economics and Statistics Administration, U.S. Census Bureau.

Thomas, W. I. (1958). *The polish peasant in Europe and America*. New York: New York : Dover Publications. Znaniecki F., eds.

Xie, Y., & Gough, M. (2011). Ethnic enclaves and the earnings of immigrants. *Demography*, 48(4), 1293-315.

Yang, L. (2016). The wage effects of immigration and ethnic enclave residence: Chinese-Americans after 1965. *Working Paper.*

Zhou, M. (2004). Revisiting ethnic entrepreneurship: Convergencies, controversies, and conceptual advancements. *International Migration Review, 38*(3), 1040.