

# MIGRANTS FROM A DIFFERENT SHORE: ECONOMIC ASSIMILATION OF IMMIGRANTS FROM CHINA IN THE UNITED STATES

CARL LIN

*Beijing Normal University and IZA*

## Abstract

Since China began its reform and opening-up policy in 1978, migration from China to the U.S. has grown significantly. Using 1990, 2000 censuses and a 2010 survey, I examine how immigrants from China fare in the U.S. labor market. Since 1990, relative wages of immigrants from China have been escalating in contrast to other immigrants. I show these widening gaps are largely explained by individual's endowments, mostly education. Not only the country's immigrants had economically overtaken other immigrants in 2000, but its new cohorts outperformed the old ones since 1980. The evidence of soaring U.S.-earned degrees by immigrants from China can account for this relatively successful economic assimilation. In the meantime, economic outcomes of immigrants from LAC (Latin America and the Caribbean) have been worsening and the deterioration is substantially attributable to the sluggish rise in the educational attainment. The diverse experiences of immigrants from China and LAC show that education plays the major role in the process of economic assimilations in the U.S.

*Keywords:* Immigration, China, Economic Assimilation, Cohort Analysis, Oaxaca  
Decomposition

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Corresponding Author: Carl Lin

Email: [csmlin@bnu.edu.cn](mailto:csmlin@bnu.edu.cn)

Phone: +86 188 106 33343

Fax: +86 105 880 1867

Postal Address: No.19 Xin Jie Kou Outer St., Haidian Dist., Beijing 100875, P. R. China

## I. INTRODUCTION

Most narratives describe the early immigration waves to the U.S. often focus on European newcomers, however, Chinese were also among the country's immigrants drawn by the economic boom associated with the California gold rush in the late 1840s. Significant Chinese immigration began to increase after the Civil War when the expansion of railroads created a demand for Chinese laborers to construct the Central Pacific Railroad (Ting 1995). With the passage of the Chinese Exclusion Act in 1882, it banned most Chinese immigration to the country. The Act, as well as the prohibitions against naturalization, remained in full effect until 1943. It was not until the Immigration and Nationality Act of 1965 that legal Chinese immigration to the U.S. expanded significantly.

Since China began its reform and opening-up policy in 1978, legal immigrants from China admitted to the U.S. have grown steadily with an average of 1/2 million people each decade since 1990. By 2010, there were 1.63 million immigrants from China and they represented the fourth-largest<sup>1</sup> immigrant group in the U.S., accounting for 3.85% of the total immigrant population (see Table I).

[Insert Table I Here]

Work done by economists suggests that economic outcomes of immigrants relative to natives in the U.S. have generally deteriorated since the 1960s (Borjas 1999; Hanson 2006; Zimmermann and Constant 2004). But, there are differences among immigrant groups. Rivera-Batiz (2007) shows immigrants from Latin America and the Caribbean (LAC) have substantially lower wages than other immigrants and the deterioration continues. Lin (2012) examines the

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<sup>1</sup> The largest immigrant group is from Mexico which has 12 million individuals residing in the U.S., 28.23% of total immigrant population in 2010. Mexico (28.23%), Philippines (4.48%), India (4.29%), China (3.85%), Vietnam (3.01%), El Salvador (2.89%), Germany (2.81%), South Korea (2.70%) and Cuba (2.67%) are the top nine sending countries, each having more than 1 million migrants in the U.S. by 2010.

economic performance of an ethnically Chinese immigrant group (mainland China, Hong Kong and Taiwan) showing that they fare better and assimilate relatively successful in the U.S. labor market than other immigrants. These findings are all in concert with the claim by Borjas (1999): National origin matters. As Figure I shows, income gap between China and the U.S. has been decreasing rapidly in which relative GDP per capita of China overtook India in 1992 while those of Mexico and LAC remained constant during the same time.

[Insert Figure I Here]

In the U.S., the evidence also shows that immigrants from China earned lower wages than other immigrants in 1990 (-.74% in hourly wage). After ten years, however, they surpassed other immigrant cohorts in 2000 (10.84% in hourly wage) and the gap widened in 2010 (18.31% in hourly wage). The bifurcation is vividly illustrated in Figure II: Relative wages of other immigrants, Mexico and LAC (excluding Mexico) to natives have been declining while those of immigrants from China have been escalating. In addition, Table II shows that immigrants from China have relatively lower unemployment rates and their labor force participation rates are stable across time. In short, economic outcomes of immigrants from China have notably improved relative to other immigrants since 1990.

[Insert Figure II Here]

[Insert Table II Here]

Why have the labor market outcomes of immigrants from China improved and overtaken other immigrants? Which of these factors, then, is most significant in explaining the trends in the economic outcomes of immigrants from China in the U.S.? This paper examines the explanations behind those changes, providing evidence on their relative importance.

## II. MIGRATION TREND FROM CHINA TO THE U.S.<sup>2</sup>

### *II.A. Legal Migration Flows*

In 1980, legal immigrants from China were about 300,000 individuals. The number increased to 540,000 in 1990 and rose to over 1 million in 2000. By 2010, there were 1.63 million immigrants from China residing in the U.S., 85% of them arrived after 1981.

The first major wave of immigrants from China did not begin until the 1980s. About 30.96% of mainland Chinese arrived in the 1990s. During 2001-2010, the number increased to 39.42% which means roughly 40% of the immigrants from China entered the country after the millennium.<sup>3</sup>

### *II.B. Occupation, Industry and Place of Work*

In the debate over immigration, the question of whether firms respond to immigration has an important policy implication. Native workers are not alone in responding to the changes in the economic environment induced by immigration. Both native- and foreign-owned firms will also want to take advantage of these changes. A well-known fact is that immigrants enter occupations and industries which differ from the occupations and industries that employ the native work force (Borjas 1999). Moreover, immigrants enter different occupations and industries among themselves. Immigration does tend to change the skill composition of the work force in the immigrant-receiving area, possibly altering the industrial structure of the region (Borjas, Freeman and Katz 1997).

Compared to other immigrants and natives in 1990, 2000 and 2010, immigrants from China are over-represented in white-collar jobs (see Table III). For example, in 2010, 41% of

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<sup>2</sup> The analysis in this section uses data drawn from the 1990 and 2000 U.S. decennial censuses, as well as the 2010 American Community Survey (ACS).

<sup>3</sup> The table in this section is not reported, however, it is available upon request.

immigrants from China were in managerial and professional specialties occupation and 25% were in technical, sales and administrative support. On the other hand, they are under-represented in precision production, craft, repair, and also in farming, forestry and fishing. Immigrants from China are also likely to enter and service occupation than other immigrants and natives. Looking at industries<sup>4</sup>, there are few immigrants from China in the agricultural, forestry, fisheries and mining sector. Among all, a notable difference is that immigrants from China are more likely to work in the retail/sales/trade sector compared to other immigrants and natives.

[Insert Table III Here]

Immigrants in the U.S. tend to settle in a limited number of states and cities. This geographic concentration seems to have increased over time. This fact reflects both the immigrants' propensity to enter the U.S. through a limited number of gateway cities and they—unlike natives—do not seem to move much around the country (Borjas 1999; Card and Shleifer 2009). Bartel (1989) finds that once immigrants enter one of the gateway cities, they tend to stay there. Similarly, Jaeger (2007) finds that immigrants tend to locate where former immigrants of the same ethnicity are concentrated. The evidence of immigrants from China supports the above findings showing that they are more likely to work in one of the three metropolitan areas, especially in New York-Northeastern New Jersey.<sup>5</sup>

### *II.C. Educational Attainment*

Decades of social science research have shown that there is a strong and irrefutable link between human capital—an individual's endowment of ability and acquired skills—and social and economic outcomes, which include potential earnings, work effort, assimilation, criminal

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<sup>4</sup> The table of industry is not reported. It is available upon request.

<sup>5</sup> In 2010, 29% (30% in 2000, 40% in 1990) of immigrants from China worked in one of the three metropolitan areas: New York-Northeastern New Jersey, Los Angeles-Long Beach, San Francisco-Oakland-Vallejo. The order has not changed since 1990. The table is available upon request.

activity, drug abuse and life expectancy, etc. (Borjas 1999). In the immigration literature, the seminal works of Chiswick (1978) and Borjas (1985) have established that the skill composition of the immigrant population (and how the skills of immigrants compare to those of natives) determines the social and economic consequences of immigrants.

An important fact of the trend in immigrant skills in the U.S. is the relative educational attainment and economic performance of immigrant population have changed since 1960. The literature has shown that in 1960 immigrant workers, on average, earn more than native workers but since 1990 the educational attainment and wages of immigrants have lagged (Autor and Katz 1999; Borjas 1999; Rivera-Batiz 2007). Furthermore, Autor, Katz and Kearney (2008) and Lemieux (2008) find increased polarization earnings differentials (top- and bottom-ends) in the U.S. labor market since 1990.

Compared to other immigrants and natives, immigrants from China have high educational attainments as reported in Table IV. In 1990, 27.7% of immigrants from China had more than a bachelor's degree (16.38% of other immigrants, 13.57% of natives), then increased to 36.96% and 38.24% in 2000 and 2010, respectively (19.32% and 23.12% for other immigrants, 16.14% and 18.93% for natives). In particular, those who have graduate degrees rose from 13.61% in 1990, to 20.54% in 2000, and to 21.78% in 2010.

[Insert Table IV Here]

#### *II.D. English Language Proficiency*

After arriving in the U.S., immigrants add to their human capital in various ways. Immigrants might enroll in on-the-job training programs or study in schools where they learn skills and acquire information valuable in the U.S. labor market. Perhaps the most important part of the assimilation process is the acquisition of English language proficiency (Borjas 1999). In fact, the

literature has shown that immigrants who understand and speak English earn more than those who do not (Grenier 1984; McManus, Gould and Welch 1983; McManus 1985; Chiswick and Miller 1992, 1995; Rivera-Batiz 1990, 2007). For example, after adjusting for differences in education and other socioeconomic characteristics, McManus (1985) finds that Hispanic immigrants who speak English earn 17% more than those who do not.

Table V shows that average English language proficiency<sup>6</sup> indices of immigrants from China ranged stably from 1.93 to 2.03 while those of other immigrants deteriorated from 2.49 in 1990, to 2.37 in 2000, and to 2.28 in 2010. In short, immigrants from China have lower than average English language skills and the proficiency has not changed much since 1990.

### III. THE EARNINGS OF IMMIGRANTS FROM CHINA

#### *III.A. Data and Summary Statistics*

As section II shows, immigrants from China have fared better in the past two decades. This section uses data drawn from the 1990, 2000 U.S. decennial censuses and the 2010 American Community Survey to analyze their labor market performance and provide explanations to the improvements. The appendix provides a detailed description of the construction of the data extracts and of the variables used in the analysis. To make analysis comparable, observations of immigrants from China are excluded from other immigrants.

The empirical framework follows the standard human capital literature by Mincer (1974), Chiswick (1978) and Borjas (1985) that the natural logarithm of the earnings of a worker  $i$  is given by  $\ln E_i = \beta' X_i + U_i$ , where dependent variable  $\ln E_i$  is the natural logarithm of earnings of worker  $i$ ,  $\beta$  is a vector of coefficients to be estimated,  $X_i$  is a vector of individual human

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<sup>6</sup> An index between 0 to 4. 0: Dose not speak English; 1: Yes, but not well; 2: Yes, well; 3. Yes, very well; 4. Yes, speaks only English.

capital and demographic characteristics affecting earnings of worker  $i$ , and  $U_i$  is a stochastic disturbance term. Human capital and demographic variables included in the vector  $X_i$  are as the following. First of all, education and experience and its square term are used as proxies for human capital. Education is expected to have a positive effect on earnings, while the effect of experience is assumed to initially rise and then fall. The years of work experience capture the skills of workers through seniority and aging in the labor market. Second, English language proficiency<sup>7</sup> has been found to be a key human capital variable influencing the earnings of immigrants. Employment opportunities may be severely limited if the immigrant's knowledge of the English language is not sufficient (Borjas 1999). English language proficiency on labor market outcomes generally finds a positive impact on earnings (Rivera-Batiz 1990, 2007; Chiswick and Miller 1999). Third, usual hours worked can be expected that, holding other things constant, increased hours of work per week will be associated with higher earnings (Rivera-Batiz 2007). Fourth, married with spouse present is the marital status variable. Chiswick (1978) finds that married men tend to have higher labor force participation rates, invest more in human capital, and have better health than men who are not married. For the same age, schooling, and place of residence, married men have higher earnings. Fifth, work in metropolitan areas usually earns more than work in rural areas. Sixth, years since migration and its square term. Chiswick (1978, 1999), Duleep and Regets (1999) and Rivera-Batiz (2007) have suggested that with limited knowledge about labor market institutions in the U.S., recent migrants may accept jobs with wage offers lower than those they would otherwise accept given their skills. As their stay increases and they are able to search for better-paying jobs, earnings will rise and they will be paid wages that correspond more closely to their skill endowments.

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<sup>7</sup> Table V reports the average of the index. Table VI reports the four dummy variables in the regression where Speaks only English is omitted to avoid collinearity.

Table V reports the summary statistics of the variables used in the analysis. It shows that the average annual earnings of immigrants from China are higher than other immigrants in each year and the differentials become larger. In particular, they outperformed native workers in 2010. Education, calculated by completed years of schooling, is the key explanatory variable. The differences between immigrants from China and other immigrants were 1.5 years in 1990, and then rose to 2.6 and 2.7 years in 2000 and 2010, respectively. For labor market experience, the three groups are similar, except in 1990 that immigrants from China had five years more potential labor market experience than other immigrants and natives. In English language skill, immigrants from China, on average, are less proficient than other immigrants in all survey years as discussed in section II.D. As to marital status and place of work, immigrants from China are more likely to be married and to work in metropolitan areas (over 90% in each survey) than other immigrants and natives. Immigrants from China also have fewer years since migration. In short, though immigrants from China work similar hours per week, are less proficient in English language, stay shorter years in the U.S., their better economic performance and rapid economic assimilation experience are particular of interest in this paper.

[Insert Table V Here]

### *III.B. Empirical Analysis*

Table VI reports the results of the empirical analysis. For the convenience of comparing the effects of explanatory variables on earnings across immigrants and across time, I group the OLS estimated coefficients from the earnings equations for immigrants of China and other immigrants by year. The signs of the regression coefficients on the explanatory variables are generally identical and are in line with the theoretical expectations. Nevertheless, there are some significant differences in the magnitude of the coefficients.

[Insert Table VI Here]

The rate of return to education for immigrants from China has been evidently rising over time and overtaken other immigrants in 2000. In 1990, holding other variables constant, one more year of schooling increased Chinese immigrants' earnings for 4.6% (5.5% for other immigrants). In 2000, the number raised to 7.3% (6.8% for other immigrants) and to 8.7% (7.4% for other immigrants) in 2010. A wide array of factors can be connected to the improvement in the rate of return to education such as quality of schooling (Rivera-Batiz 2007). Although there is no universally-agreed standard in comparing the quality of pre-migration education<sup>8</sup>, changes in obtaining U.S.-earned degrees after arrival can be used as an alternative. Getting U.S.-earned degrees means immigrants can acquire skills and information valuable in the U.S. labor market which help them assimilate in the American society. The evidence of fast-growing U.S.-earned degrees by immigrants from China can support this viewpoint.<sup>9</sup> Another explanation to the overtaking of rate of return to education is that it reflects a higher level of schooling for immigrants from China. As Table IV shows, immigrants from China have an overwhelmingly higher proportion of master's, professional and doctorates when compared to other immigrants and natives. Because higher levels of education would result in better earnings, the discrepancy would result in higher observed rate of return to education (Borjas 1999; Rivera-Batiz 2007).

Although the work experiences are similar as reported in Table V, the rates of return to experience for immigrants from China are smaller than those for other immigrants. Since I have the years of residence in the U.S. in the estimation equation (represented by Year Since Migration variable), the interpretation of the coefficient should be holding the number of years that an immigrants has been residing in the U.S. constant, changes in work experience variable

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<sup>8</sup> Hanushek and Kimko (2000) calculate the differences of schooling quality for several countries, however, China is not included in the estimation.

<sup>9</sup> The details are discussed in section IV.B.

are directly related to changes in the number of years of experience the immigrant has had abroad (Rivera-Batiz 2007). Therefore, the results indicate that an increase in years of experience abroad brings proportionally lower returns for immigrants from China than for other immigrants in the U.S. labor market. This, as argued in Rivera-Batiz (2007) and Chiswick and Miller (2009), may be the reason that immigrants from China are less successful in matching their occupational experience abroad with that in the U.S.

Although immigrants from China are less proficient in English language skills than other immigrants, empirical results in Table VI show that English language proficiency has a quite different effect on the earnings of the two groups. First, there is a significant discrepancy of the effect between “English Well” and “English Not Well” on Chinese immigrants’ earnings in all three survey years. Take 2010 for example, the estimated effects of speaking “English Not Well” and “English Not At All” are 53.3% (35.4% for other immigrants) and 65% (36.9% for other immigrants) lower earnings compared to English only speakers. For those who speak “English Well” and “English Very Well”, the estimated effects are 18.3% (26.3% for other immigrants) lower and 7.5% higher (4.8% lower for other immigrants) earnings compared to English only speakers. Second, the coefficients of “English Very Well” are positive (though only year 2000 is statistically significant) in contrast to other immigrants. This may imply language is one of the major barriers for immigrants from China working in the U.S. Once their English improves, the returns to English language skills increase quickly (Rivera-Batiz 1990; Chiswick and Miller 1999).

In sum, the empirical results show that education plays a key role in the better economic performance of immigrants from China in the U.S. labor market.<sup>10</sup> After accounting for sample

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<sup>10</sup> Although I analyze the occupations of each immigrant group in section II.B., occupations do not enter my regression analysis as suggested in Chiswick and Miller (2007, 2009). Instead, I use mean occupational earnings as

selection issues<sup>11</sup>, I investigate why this occurs and provide explanations behind the change.

## IV. EXPLAINING THE EARNINGS GAP

### *IV.A. Decomposing the Gap*

The dispersion in individual earnings or wages can be estimated as in the standard earnings function, which can be simply rewritten and estimated separately for the two demographic groups as  $\ln Y_i^g = \beta_0^g + \sum_{j=1}^n \beta_j^g X_{ji}^g + U_i^g$ , where  $X_{1i}, \dots, X_{ni}$  are  $n$  observable characteristics used to explain the natural logarithm of earnings ( $\ln Y$ ),  $g = a$  denotes other immigrants and  $g = b$  denotes immigrants from China. It is easy to compute the portion of the differentials explained by the regression and rewrite the equation as,

$$\sum_j \beta_j^b \bar{X}_{ji}^b - \sum_j \beta_j^a \bar{X}_{ji}^a = \sum_j \beta_j^b (\bar{X}_j^b - \bar{X}_j^a) + \sum_j \bar{X}_j^a (\beta_j^b - \beta_j^a),$$

where the first sum on the right hand side is “explained by endowments,” while the second is “explained by coefficients”.

Table VII reports the decomposition results. I decompose the earnings gap (in log earnings) between immigrant from China and other immigrants in 1990, 2000, and 2010. For example, the log earnings of immigrants from China and other immigrants in 2010 are 5.988 and 5.719, respectively. The .269 earnings differential can be decomposed into .217 (81% is explained by endowments) and .052 (19% is explained by coefficients). As Table VII shows, most of the

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the dependent variable to account for the fact of differing occupations among immigrants from China and other immigrants. Though I do not report the OLS and ordered probit/logit results, it does not affect the main conclusions of the paper. Earnings and occupational attainment results are available upon request.

<sup>11</sup> I use the two-step procedure based on the work of Heckman (1976) to check for two sample selection issues: decision to work and self-employment. The insignificance of all inverse Mill’s ratio coefficients indicate that my regressions do not suffer from the sample selection problem. In addition, unreported results of regression on females (as well as decomposition, cohort analysis and aging effects) show similar outcomes as males. In short, my sample selection rules should yield consistent results and won’t lead to different conclusions. The results are available upon request.

earnings gaps between immigrants from China and other immigrants are attributable to difference in endowments. The better endowments of immigrants from China can account for most of the earnings gap and the importance increases over time. Next I further decompose the two parts, “explained by endowments” and “explained by coefficients” for each factor, to see what contributes the most to the gaps.

[Insert Table VII Here]

A related issue that has received attention in the literature is that detailed decomposition is not invariant to the choice of the reference category when sets of dummy variables are used (Jones and Kelley 1984; Oaxaca and Ransom 1999; Hoxby and Oaxaca 2001; Gardeazabal and Ugidos 2004; Yun 2005; Jann 2008). If a model includes dummy variables, then the sum of the detailed coefficients effects attributed to the dummy variables is not invariant to the choice of the reference, or omitted, category (Powers, Yoshioka and Yun 2011). Since I have several categorical variables in my regressions, I apply the solution proposed by Gardeazabal and Ugidos (2004) and Yun (2005) and implement the method in Jann (2008).

Table VII also shows the detailed decomposition results. Education accounts for most of the differentials in endowments and coefficients in all years. For example, as I already show 81% of the .217 log earnings gap between immigrants from China and other immigrants can be attributable to difference in endowments in 2010. Detailed decomposition further shows 93% of this “due to difference in endowments” can be attributed to education. In fact, the contributions of education to the earnings gap are substantial across time (93% in 1990, 99% in 2000 and 60% in 2010).

#### *IV.B. U.S.-Earned Degrees*

Analysis in the previous section presents the better endowments of immigrants from China

largely explain the rising earnings gaps to other immigrants in the U.S. In addition, detailed decompositions find that education is the most important contributing factor in explaining the gaps. From assimilationist's point of view, the reasons behind this relatively successful experience of immigrants from China in the U.S. labor market are worth examining.

The research of Chiswick (1978, 1999) and Duleep and Regets (1999) has suggested that immigrants face an initial shortfall or dip in their labor market performance after they arrive in the country. This dip is the result of the adjustment costs that recent immigrants, with limited knowledge about labor market institutions, suffer as they enter the U.S. Borjas (1999) states that in order to experience economic assimilation, an immigrant will often have to acquire skills that are valued by American employers. After arriving in the U.S., immigrants add to their human capital in many ways. They might learn the English language, study in schools, enroll in on-the-job training programs, and so on. The analysis so far has pointed out that education is the most important contributing factor to the relatively successful economic assimilation of immigrants from China. An important question, then, to ask is: How many acquire U.S. degrees after arriving? How do the numbers/percentages change overtime?

Figure III plots the percentages of total U.S.-earned degrees<sup>12</sup> of several immigrant groups from 1990 to 2010. The upward trend is marked for immigrants from China. In 1990, total U.S.-earned degrees of immigrants from China was 8.7% while other immigrants, LAC (excl. Mexico) and Mexico ranged from 15.4%-21.1%. In 2000, the gap narrowed both because the U.S.-earned degrees percentages of immigrants from China kept rising and those of the other groups slowed down (Mexico dropped from 21.1% to 19.3%). From 2000 to 2010, all immigrant groups rose steadily. In sum, the rising U.S.-earned degree of immigrants from China can, in

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<sup>12</sup> I use variables MIGRATE1 in 2001ACS to 2010 ACS and MIGRATE5 in 2000 and 1990 Censuses to determine whether an immigrant obtains his/her highest degree in the U.S. If the immigrant was abroad one year ago and is a high school graduate when interviewed, the reported educational attainment is not U.S.-earned.

some part, explain why they are relatively successful in assimilating into the U.S. labor market.

[Insert Figure III Here]

## V. COHORT AND AGING EFFECTS

The analysis so far has shown the strong economic assimilation of immigrants from China in the U.S. labor market. These results are based on cross-section regressions over 1990 to 2010. Borjas (1985) stresses the differences between cross-section and cohort analyses of earnings determination. In particular, cross-section studies of immigrant earnings growth confound the true assimilation impact with across-cohort changes in immigrants' economic performance. In addition, the cross-section analysis does not account for the effects of aging on the impact of assimilation. In this section I examine how these two effects can affect my results.

### V.A. Cohort Analysis<sup>13</sup>

Consider cohort  $h$ , the 2010 regression predicts that over ten years the “cross-section” growth for cohort  $h$  is given by

$$\hat{Y}_{2010,h} - \hat{Y}_{2010,h+10} = (\hat{Y}_{2010,h} - \hat{Y}_{2000,h}) + (\hat{Y}_{2000,h} - \hat{Y}_{2010,h+10}), \quad (1)$$

where  $\hat{Y}$  is the estimated value of the natural log of earnings. The first term on the right hand side of (1) gives the earnings growth experienced by cohort  $h$  over the ten years and is called the “between-census” growth. The second term on the right hand side estimates the difference in

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<sup>13</sup> There have been concerns about the results of Borjas (1985). Using matched CPS and 1970-1990 censuses, Duleep and Regets (1997, 2002) find different results showing that immigrant year-to-year earnings growth rates are greater than natives in true panel data and they present strong evidence of a systematic and inverse relationship (correlation -.489 for 1980-1990) between entry earnings of immigrants and subsequent earnings growth. Following Duleep and Regets (2002), I group age and education each into two categories and find the correlation between the relative entry earnings (w.r.t. natives) of immigrants from China and their real earnings growth rates for age 18-39 with education 1-12 years cohort is -.745 (-.045 for cohort of age 18-39 with education 13 years and above, -.165 for cohort of age 40-64 with education 1-12 years, and -.791 for cohort of age 40-64 with education 13 years and above). Due to few observations, estimation cannot proceed. However, Lin (2012) reports a statistically significant relationship which suggests a .1 unit decrease of relative entry earnings for a group of Asian immigrants would raise their real earnings growth rate by 4.13% and 3.04% for 2000-2010 and 1990-2000, respectively. The results reinforce the conclusion of this section. They are available upon request.

earnings that occurred over the ten years for individuals with a given number of years since immigration. It compares different cohorts at the same point of their U.S. life cycle and is called the “across-cohort” earnings growth (Borjas 1985). Therefore, equation (1) illustrates the comparison of immigrant cross sections over time can be used to infer the extent to which the underlying assimilation process of immigrant cohorts is changing.

To account for the effect of secular changes in aggregate labor market condition, the cross-section growth in the *relative* earnings of immigrant cohort  $h$  to native workers  $n$  is

$$\hat{\beta}_h - \hat{\beta}_{h+10} = [(\hat{Y}_{2010,h} - \hat{Y}_{2010,n}) - (\hat{Y}_{2000,h} - \hat{Y}_{2000,n})] + [(\hat{Y}_{2000,h} - \hat{Y}_{2000,n}) - (\hat{Y}_{2010,h+10} - \hat{Y}_{2010,n})]. \quad (2)$$

The first bracketed term in (2) gives the difference in the relative earnings of cohort  $h$  between 2010 and 2000. This between-census effect measures the rate at which the earnings profiles of immigrants and natives are converging/diverging (Borjas 1985). The second bracketed term in (2) gives the across-cohort effect.

Table VIII reports the cohort analysis results from equation (1) and (2). In addition to 2010 ACS, I also estimate both equations using 2000 and 1990 census data. The result of interest is the sign in the “across-cohort” growth panel which compares the ten years labor market performance between an old cohort ( $h$ ) and a recent cohort ( $h+10$ ). A negative sign of “across-cohort” growth means giving both cohorts ten years to work in the U.S., the earnings growth of the old cohort is less than those of the recent cohort. In other words, it implies the economic performance of the recent cohort is better if the sign of “across-cohort” growth is negative. For instance, if one look at the three recent cohort differences of “1990-1999 minus 2000-2009”, “1980-1989 minus 1990-1999”, and “1970-1979 minus 1980-1989” in Table VIII, 5 out of 6 in the *absolute* earnings cases and 4 out of 6 in the *relative* earnings cases show negative signs. Notice that the oldest cohort difference (1960-1969 minus 1970-1979) consistently shows that

the economic performance of 1960-1969 cohort is better than 1970-1979 cohort in all survey data. In sum, except the 1960-1969 cohort, the analysis shows an improving economic performance for immigrants from China.<sup>14</sup>

[Insert Table VIII Here]

### *V.B. Aging Effect*

In any cross section, the effect of aging must be taken into account when studying the determinants of earnings. If the potential labor market experience coefficients are roughly similar, the effect of aging on the relative earnings of immigrants would not be very important. But the regression results in Table VI do not show such case. Therefore, it is necessary to estimate how much aging effect may affect my results. Following Borjas (1985), the change in the relative earnings of immigrants to natives due purely to aging effect can be shown as

$$A_i - A_n = 10(\hat{\beta}_{EXP,i} - \hat{\beta}_{EXP,n}) + (\hat{\beta}_{EXP^2,i} - \hat{\beta}_{EXP^2,n})(20EXP - 100) \quad (3)$$

The bottom panel of Table VIII reports the aging effect using (3). In all cases, pure aging effects lead to a decrease of the relative earnings of immigrants from China over time. For immigrant men that are 10 years older in 2010 than in 2000 lowers the relative earnings of immigrants from China by 9.1%-24.1%. For immigrant men that are 10 years older in 2000 than in 1990 lowers the relative earnings of immigrants from China by 18.2%-25.6%<sup>15</sup>. When these quantities are added to the between-census growth, the relative earnings and assimilation rate of immigrants from China, as a result, reduce by aging effect. Despite the fact that pure aging effects do not work in favor of immigrants from China, it does not alter the outcome of relatively

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<sup>14</sup> In the relative earnings cohort analysis, the choice of reference group can be tricky. Borjas (1995) compares immigrants' earnings to their native counterparts and finds little difference. In addition to using all natives as the reference group, I also use Chinese American as the native counterparts for immigrants from China. The results also show a better performance of recent immigrants from China.

<sup>15</sup> These numbers are larger than those in Borjas (1985) which is 12% to 15% for Asian immigrants and in Lin (2012) which is 13.7% to 18.7% for an immigrant group from Hong Kong, Taiwan and China. That means pure aging effect has a greater impact on immigrants from China than other Asian immigrants.

better labor market performance by immigrants from China than other immigrants.

## VI. SUMMARY AND CONCLUSIONS

When China began its reform and opening-up policy in the late 1970s, migration from China to the U.S. has grown significantly since then. The empirical results show the earnings of immigrants from China have grown rapidly as they assimilate into the U.S. while other immigrants show the opposite. The analysis has three major findings: 1. The widening earnings gaps between immigrants from China and other immigrants are largely explained by endowments, mainly due to differences in skills. Detailed decomposition shows that the contributions of education to the earnings gap are substantial across time; 2. The evidence of soaring U.S.-earned degrees by immigrants from China can account for this relatively successful economic assimilation; 3. Cohort analysis shows that the economic performance of immigrants from China has been improving even if allowing for aging effect.

While China was experiencing enormous economic growth in the past thirty years, not only the country's immigrants had economically overtaken other immigrants in 2000 but its new cohorts outperformed the old ones since 1980. In the meantime, relative wages of LAC immigrants have been declining and the gaps (between LAC and other immigrants) are largely due to their sluggish rise in the educational attainment (Rivera-Batiz 2007). The diverse experiences of immigrants from China and LAC show that education plays the major role in the process of economic assimilation in the U.S.

## APPENDIX: DATA AND VARIABLE DEFINITIONS

The data are drawn from the 1990, 2000 Public Use Microdata Samples of the U. S. Census, and the 2010 American Community Survey from IPUMS-USA. In 1990 and 2000 the data extracts form a 5% random sample of the population. The analysis is restricted to men aged 18–

64. A person is classified as an immigrant if he was born abroad and is either a noncitizen or a naturalized citizen; all other persons are classified as natives. People who were born in American Samoa, Guam, Puerto Rico, U.S. Virgin Islands, unknown or at sea are excluded from the analysis. Sampling weights are used in all calculations.

#### *Definition of Annual Earnings*

These variables are calculated in the sample of men who do not reside in group quarters, are employed in the civilian labor force, are not enrolled in school, report positive annual earnings, weeks worked, and weekly hours, and are not self-employed. The annual earnings in 1990 and 2000 are then adjusted for inflation and converted to 2010 constant dollars.

#### *Definition of Weeks Worked Last Year*

In the 2010 American Community Survey, weeks worked in the calendar year prior to the survey are reported as a categorical variable. I impute weeks worked for each worker as follows: 7 for 13 weeks or less, 20 for 14–26 weeks, 33 for 27–39 weeks, 43.5 for 40–47 weeks, 48.5 for 48–49 weeks, and 51 for 50–52 weeks.

#### *Definition of Education and Experience*

Because of differences in the coding of the completed education variable across surveys, in order to compute completed years of education, in the 1990 census I assign 2.5 for grade 1, 2, 3, or 4, 6.5 for grade 5, 6, 7, or 8, 12 for grade 12 and high school graduate or GED. In 2000 census, I assign 2.5 for nursery school to grade 4, 5.5 for grade 5 or 6, 7.5 for grade 7 or 8, 12.5 for some college but less than 1 year.

In all surveys, I assign a one or more years of college credit but no degree 13 years, an associate's degree 14 years, and a bachelor's degree 16 years. Those who have a master's degree are given 18 years, a professional degree beyond a bachelor's degree are given 19 years, and a

doctoral degree corresponded to 20 years of education.

I define work experience as the worker's age at the time of the survey minus years of completed education minus 6. I restrict the analysis to persons who have between 1 and 45 years of experience.

#### *Definition of Year Since Migration*

In the 1990 census, the respondent was asked to report the range of years that included their year of arrival such as 1990 for 1987–1990. I impute year since migration for each worker as follows: 1988.5 for 1987–1990, 1985.5 for 1985–1986, 1983 for 1982–1984, 1980.5 for 1980–1981, 1977 for 1975–1979, 1972 for 1970–1974, 1967 for 1965–1969, 1962 for 1960–1964, and 1954.5 for 1950–1959.

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TABLE I CHANGES IN THE NUMBER OF IMMIGRANTS FROM CHINA AND ALL IMMIGRANTS

Year	China			All Immigrants		
	Number	Growth Rate(%)	Share(%) <sup>a</sup>	Number	Growth Rate(%)	Share(%) <sup>b</sup>
2010	1,633,450	61.44	3.85	42,386,752	28.23	15.98
2000	1,011,805	86.43	3.06	33,055,462	60.26	13.40
1990	542,717	82.25	2.63	20,626,488	45.77	9.16
1980	297,780	63.35	2.10	14,149,840	39.67	6.72
1970	182,300	77.66	1.80	10,130,700	4.80	5.54
1960	102,614	-	1.06	9,667,082	-	5.90

Note: a. Percentages represent the shares to all immigrants. b. Percentages represent the shares to total population in the U.S.

Source: Based on 1% 1960, 1970, 5% 1980, 1990, 2000 Censuses and 2010 ACS; author's tabulations.

TABLE II LABOR MARKET STATUS OF IMMIGRANTS FROM CHINA, OTHER IMMIGRANTS AND NATIVES

Labor Market Status	Year	China	Other Immigrants	Natives
Labor Force Participation Rate	2010	61.19	68.20	63.77
	2000	58.55	61.31	64.45
	1990	62.07	65.03	65.38
Unemployment Rate	2010	8.29	10.28	10.83
	2000	4.47	6.75	5.56
	1990	4.84	7.67	6.02

Note: Persons 16 years of age or older. Unit: %

Source: Based on 5% 1990, 2000 Censuses and 2010 ACS; author's tabulations.

TABLE III OCCUPATIONS OF IMMIGRANTS FROM CHINA, OTHER IMMIGRANTS AND NATIVES

Occupation	Year	China	Other Immigrants	Natives
Managerial and Professional Specialty	2010	40.67	24.11	31.36
	2000	37.88	22.78	28.66
	1990	28.45	21.63	25.62
Technical, Sales, and Administrative Support	2010	24.82	22.58	30.86
	2000	26.54	24.62	32.15
	1990	24.20	26.21	32.72
Service	2010	23.41	21.56	15.70
	2000	17.79	17.40	12.99
	1990	24.67	16.72	12.28
Farming, Forestry, and Fishing	2010	0.25	4.75	1.59
	2000	0.27	4.00	1.44
	1990	0.26	3.80	1.59
Precision Production, Craft, and Repair	2010	2.72	10.41	8.64
	2000	4.62	11.56	10.53
	1990	5.50	10.92	10.65
Operators, Fabricators, and Laborers	2010	8.03	16.22	10.99
	2000	12.81	19.14	13.32
	1990	16.88	19.84	15.66
Military	2010	0.10	0.38	0.86
	2000	0.09	0.50	0.91
	1990	0.05	0.88	1.48

*Note:* Persons 18 to 64 years of age with positive earnings, wages and hours of work. Unit: %.

*Source:* Based on 5% 1990, 2000 Censuses and 2010 ACS; author's tabulations.

TABLE IV EDUCATIONAL ATTAINMENT OF IMMIGRANTS FROM CHINA, OTHER IMMIGRANTS AND NATIVES

Educational Attainment	Year	China	Other Immigrants	Natives
Less than High School	2010	27.60	33.05	33.68
	2000	31.49	39.05	37.35
	1990	36.90	42.07	40.51
High School	2010	21.98	27.75	28.67
	2000	20.90	27.74	30.39
	1990	20.66	23.35	25.78
Some College	2010	12.18	16.08	18.72
	2000	10.66	13.89	16.11
	1990	14.74	18.20	20.13
Bachelor's Degree	2010	16.46	14.15	12.34
	2000	16.42	11.55	10.65
	1990	14.09	9.76	9.09
Master's, Professional and Doctoral Degree	2010	21.78	8.97	6.59
	2000	20.54	7.77	5.49
	1990	13.61	6.62	4.48

*Source:* Based on 5% 1990, 2000 Censuses and 2010 ACS; author's tabulations. Unit: %.

TABLE V SUMMARY STATISTICS

Variables	Year	China		Other Immigrants		Natives	
		Mean	S.D.	Mean	S.D.	Mean	S.D.
Earnings (dollar)	2010	60,354	58,970	45,841	53,417	56,625	56,002
	2000	54,867	54,761	47,696	55,986	57,385	57,054
	1990	47,788	44,726	44,583	42,667	51,359	41,503
Education	2010	14.78	4.57	12.10	4.24	13.74	2.44
	2000	14.52	4.77	11.91	4.54	13.52	2.44
	1990	12.89	5.13	11.37	5.03	12.89	3.33
Experience	2010	21.65	11.12	21.43	10.89	21.82	11.80
	2000	21.00	11.20	19.44	10.60	20.34	10.95
	1990	24.36	10.34	19.37	10.92	19.04	11.22
English Language Proficiency	2010	1.99	1.07	2.28	1.20	-	-
	2000	2.03	1.04	2.37	1.21	-	-
	1990	1.93	1.07	2.49	1.19	-	-
Usual Hours Worked Per Week	2010	42.61	10.37	41.54	9.56	42.92	10.35
	2000	43.56	10.86	43.45	10.13	44.35	9.89
	1990	44.10	13.21	43.00	10.24	43.70	9.80
Married with spouse present	2010	.71	.47	.56	.50	.57	.49
	2000	.74	.44	.59	.49	.63	.48
	1990	.78	.41	.63	.48	.66	.47
Work in Metropolitan Areas	2010	.92	.27	.87	.34	.75	.43
	2000	.93	.25	.86	.34	.75	.43
	1990	.94	.24	.90	.30	.72	.45
Years since Migration	2010	15.28	9.72	18.13	12.16	-	-
	2000	13.45	9.75	16.00	11.52	-	-
	1990	14.71	11.04	15.35	10.69	-	-
Observations	2010	2,930		82,835		428,600	
	2000	8,710		321,463		2,128,150	
	1990	4,663		193,558		2,010,309	

*Note:* Samples are men of 18 to 64 years of age with positive earnings and hours of work, not self-employed, not in the group quarters and not in school. The earnings have been adjusted for inflation and expressed in 2010 dollars.

TABLE VI REGRESSION RESULTS

Variables	Year	China		Other Immigrants	
		Coef.	Robust S.E.	Coef.	Robust S.E.
Education	2010	.087**	.005	.074**	.001
	2000	.073**	.002	.068**	.000
	1990	.046**	.003	.055**	.000
Experience	2010	.036**	.007	.040**	.001
	2000	.020**	.003	.033**	.000
	1990	.026**	.005	.044**	.001
Experience <sup>2</sup> /100	2010	-.066**	.014	-.064**	.002
	2000	-.045**	.007	-.053**	.001
	1990	-.050**	.009	-.068**	.001
Log Usual Hours Worked Per Week	2010	.676**	.072	.993**	.009
	2000	.645**	.026	.791**	.005
	1990	.521**	.035	.812**	.006
Married with spouse present	2010	.123**	.042	.200**	.005
	2000	.173**	.019	.224**	.003
	1990	.167**	.027	.243**	.004
Work in Metropolitan Areas	2010	.165**	.057	.113**	.007
	2000	.063**	.031	.125**	.004
	1990	.102**	.044	.179**	.005
Years since Migration	2010	.019**	.005	.011**	.001
	2000	.023**	.002	.013**	.000
	1990	.045**	.003	.022**	.001
Year Since Migration <sup>2</sup> /100	2010	-.024**	.011	-.013**	.001
	2000	-.022**	.006	-.015**	.001
	1990	-.067**	.009	-.032**	.001
English Very Well	2010	.075	.094	-.048**	.008
	2000	.209**	.043	-.053**	.004
	1990	.017	.052	-.075**	.004
English Well	2010	-.183*	.094	-.263**	.009
	2000	-.021	.043	-.207**	.004
	1990	-.236**	.053	-.200**	.005
English Not Well	2010	-.533**	.103	-.354**	.009
	2000	-.408**	.045	-.317**	.005
	1990	-.564**	.056	-.374**	.006
English Not At All	2010	-.650**	.116	-.369**	.012
	2000	-.452**	.051	-.365**	.006
	1990	-.628**	.064	-.495**	.008
Constant	2010	1.538**	.298	.503**	.036
	2000	1.918**	.117	1.382**	.019
	1990	2.593**	.157	1.205	.025
Observations	2010	2,930		82,835	

	2000	8,710	321,463
	1990	4,663	193,558
Adjusted R <sup>2</sup>	2010	0.485	0.413
	2000	0.428	0.361
	1990	0.412	0.383

*Note:* \* and \*\* indicate that estimate is statistically significant at the 10% and 5% level. The reference category of English language proficiency is English Only.

TABLE VII DECOMPOSITION RESULTS

Variables	Year	China	
		Coef.	Robust S.E.
Log of Earnings (dollar)	2010	5.988**	.002
	2000	5.909**	.002
	1990	5.797**	.003
Difference	2010	.269**	.002
	2000	.133**	.002
	1990	.040**	.003
<b>Aggregate Decomposition</b>			
Explained by Endowments	2010	.217**	.001
	2000	.179**	.001
	1990	.141**	.002
Explained by Coefficients	2010	.052**	.001
	2000	-.046**	.002
	1990	-.101**	.002
<b>Detailed Decomposition</b>			
<b>Due to Difference in Endowments</b>			
Education	2010	.201**	.001
	2000	.178**	.001
	1990	.084**	.001
Experience	2010	.009**	.001
	2000	.052**	.001
	1990	.221**	.002
English Language Proficiency	2010	-.030**	.000
	2000	-.033**	.000
	1990	-.068**	.001
Work Hours (log)	2010	.022**	.001
	2000	-.002**	.001
	1990	.012**	.001
Married with spouse present	2010	.028**	.000
	2000	.034**	.000
	1990	.036**	.000
Work in Metropolitan Areas	2010	.006**	.000
	2000	.008**	.000
	1990	.007**	.000
Years since Migration	2010	-.032**	.000
	2000	-.034**	.000
	1990	-.014**	.001
<b>Detailed Decomposition</b>			
<b>Due to Difference in Coefficients</b>			
Education	2010	.190**	.006
	2000	.067**	.008
	1990	-.126**	.008
Experience	2010	-.075**	.012

	2000	-.285**	.015
	1990	-.440**	.025
English Language Proficiency	2010	.049**	.001
	2000	.065**	.002
	1990	.006**	.002
Work Hours (log)	2010	-1.178**	.025
	2000	-.543**	.029
	1990	-1.090**	.043
Married with spouse present	2010	-.016**	.001
	2000	-.012**	.001
	1990	-.021**	.002
Work in Metropolitan Areas	2010	.022**	.002
	2000	-.027**	.003
	1990	-.034**	.005
Years since Migration	2010	.136**	.006
	2000	.129**	.008
	1990	.333**	.012
Observations	2010		2,930
	2000		8,710
	1990		4,663

*Note:* Log of earnings of other immigrants in 2010, 2000, and 1990 are 5.719, 5.776, and 5.758, respectively. Observations of other immigrants in 2010, 2000, and 1990 are 82,835, 321,463, and 193,558, respectively. Difference = log earnings of China – log earnings of other immigrants. For example, the difference between China and other immigrants in 2010 is  $.279 = 5.988 - 5.709$ . \* and \*\* indicate that estimate is statistically significant at the 10% and 5% level.

TABLE VIII COHORT ANALYSIS AND AGING EFFECT RESULTS

	Cohort Difference	China					
		2010 ACS		2000 Census		1990 Census	
		Abs.	Rel.	Abs.	Rel.	Abs.	Rel.
Cross Section Growth	1990-1999 minus 2000-2009	.385** (.004)	.356** (.004)	-	-	-	-
	1980-1989 minus 1990-1999	.107** (.005)	.097** (.005)	.156** (.005)	.142** (.005)	-	-
	1970-1979 minus 1980-1989	-.043** (.009)	-.017** (.008)	.138** (.007)	.117** (.007)	.488** (.007)	.365** (.007)
	1960-1969 minus 1970-1979	.404** (.015)	.375** (.016)	.426** (.010)	.440** (.010)	.400** (.008)	.404** (.008)
Between Census Growth	1990-1999 minus 2000-2009	.328** (.004)	.369** (.004)	-	-	-	-
	1980-1989 minus 1990-1999	.279** (.005)	.323** (.005)	.410** (.006)	.336** (.005)	-	-
	1970-1979 minus 1980-1989	.098** (.010)	.190** (.010)	.159** (.008)	.086** (.008)	.505** (.007)	.219** (.008)
	1960-1969 minus 1970-1979	.076** (.016)	.124** (.016)	.185 (.010)	.122** (.010)	.348** (.008)	.266** (.008)
Across Cohort Growth	1990-1999 minus 2000-2009	.057** (.004)	-.013** (.004)	-	-	-	-
	1980-1989 minus 1990-1999	-.172** (.005)	-.226** (.005)	-.254** (.005)	-.195** (.005)	-	-
	1970-1979 minus 1980-1989	-.141** (.008)	-.206** (.007)	-.021** (.006)	.031** (.006)	-.017** (.006)	.146** (.008)
	1960-1969 minus 1970-1979	.328** (.011)	.251** (.011)	.241** (.009)	.319** (.009)	.052** (.007)	.139** (.007)
Aging Effect	1990-99	-.091** (.003)		-.182** (.001)		-	
	1980-89	-.241** (.004)		-.198** (.001)		-.214** (.002)	
	1970-79	-.061** (.024)		-.224** (.002)		-.333** (.000)	
	1960-69	-.071** (.031)		-.256** (.002)		-.216** (.002)	

Note: \* and \*\* indicate that estimate is statistically significant at the 10% and 5% level.

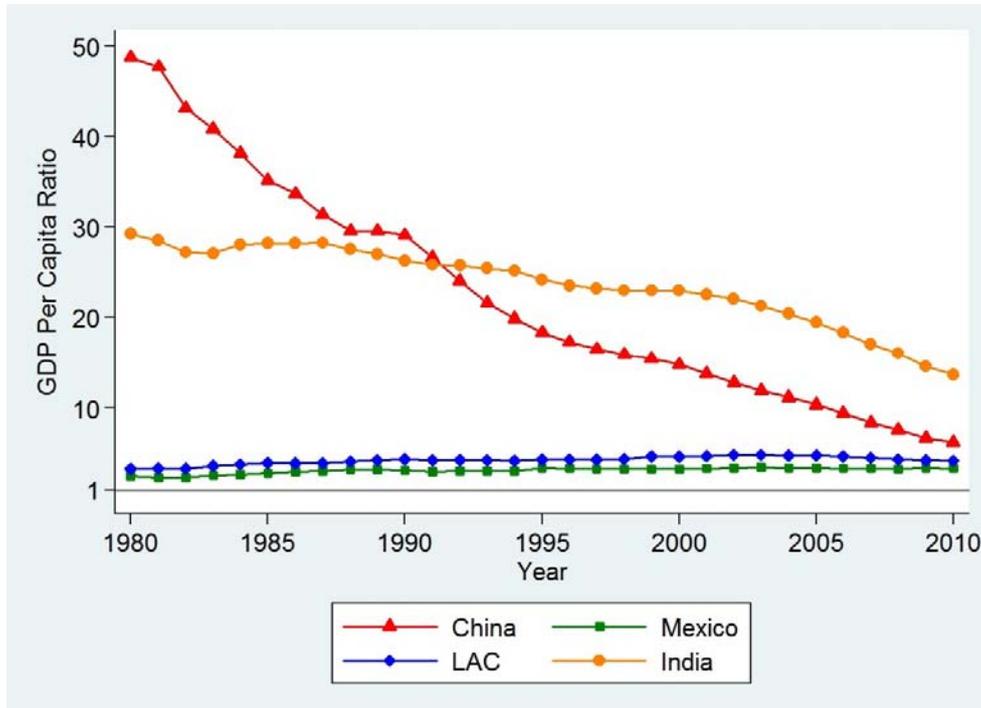


FIGURE I The Declining Income Gap between China and the U.S.

*Note:* The ratio in the vertical axis is the GDP per capita of U.S. divided by the equivalent of that in China, India, Mexico and LAC. The source data are PPP-adjusted and expressed in current international dollars.

*Source:* World Economic Outlook Database, IMF (2012).

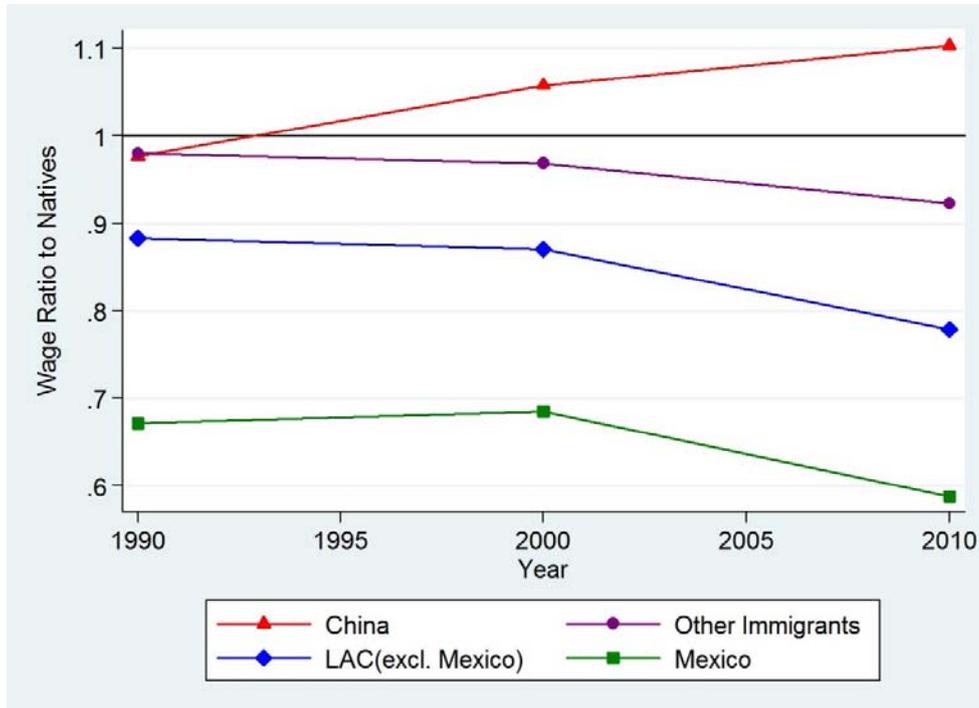


FIGURE II Wage Ratio of Immigrants from China to Natives  
 Source: 5% 1990, 2000 IPUMS-USA and 2010 ACS.

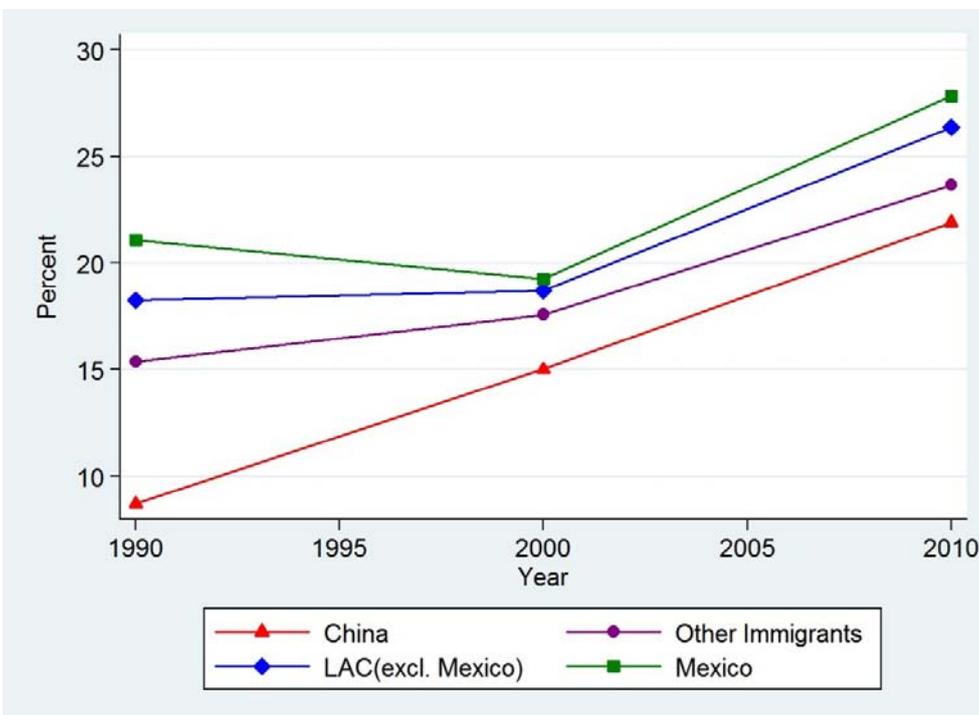


FIGURE III U.S.- Earned Degrees of Immigrants from China  
 Source: 5% 1990, 2000 IPUMS-USA and 2010 ACS.  
 Note: The number of 2010 is the average from 2001 to 2010.