ASIAN AMERICANS' EARNINGS DISADVANTAGE REEXAMINED:

THE ROLE OF PLACE OF EDUCATION[*]

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Abstract

Past research on Asian Americans' earnings suggests that Asian immigrants earn less than Whites and U.S.-born Asian Americans with comparable backgrounds. However, few studies have explored why Asian immigrants face an earnings disadvantage. This article investigates whether and to what extent this disadvantage can be attributed to the lower value of foreign education in the U.S. job market. By comparing earnings of four groups of workers—Whites, U.S.-born Asian Americans, Asian immigrants who completed education prior to immigration, and Asian immigrants who completed education in the U.S., we examine earnings gaps between Whites and Asian Americans that are attributable to race, nativity, and place of education. Results show that: (1) foreign-educated Asian immigrants earn between 7% and 25% less than U.S.-educated Asian immigrants depending on the level of education; (2) U.S.-educated immigrants, U.S.-born Asian Americans and Whites have similar levels of earnings. We conclude that place of education plays a crucial role in the stratification of Asian Americans, whereas nativity is inconsequential once place of education is taken into account.

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It has been well documented that Asian Americans enjoy relatively high socioeconomic standing in American society. This is true no matter socioeconomic standing is measured by educational attainment, occupational attainment, or income. In 1999, for example, 46 percent of Asian men and 39 percent of Asian women over twenty-five years of age had completed college education, compared with 31 percent of White men and 25 percent of White women. In addition, a higher proportion of Asian Americans (37 percent in 1999) are concentrated in the professional and managerial occupations than Whites (33 percent in 1999). In terms of income, while Asian Americans' per capita income is slightly lower than Whites' ($21,134 versus $22,375 in 1999), their median household income is considerably higher ($51,205 versus $42,504 in 1999) (Humes and Mckinnon 2000).

That Asian Americans compare favorably to Whites on crude indicators of socioeconomic status provides the basis for the popular claim that Asian Americans are a "model minority" in the U.S. (e.g., Waters and Eschbach 1995). However, the characterization of Asian Americans as a model minority is one-sided, if not misleading. Equally salient as their high average socioeconomic status is the situation that Asian Americans are a highly heterogeneous group within itself. Census statistics show that compared to the White population, Asian Americans are *both* more likely to be middle-class and to live below the poverty line.[1] Indeed, *heterogeneity* is an essential feature of Asian Americans. For one thing, the category of Asian Americans comprises

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[1] In 1998, 33 percent of Asian families (compared with 29 percent of White families) had incomes of $75,000 or more. At the same time, 11 percent of Asian families (compared with 6 percent of White families) were in poverty (Humes and Mckinnon 2000).

many ethnic groups who differ in language, culture, and immigration history. For another, while some Asian Americans have lived in the United States for generations, the majority of Asian Americans are immigrants who came to the U.S. for various reasons and from various backgrounds: some immigrated for better economic opportunities, some immigrated as refugees, and many are tied immigrants who came with their families.

Thus, the socioeconomic status of Asian Americans can be best characterized by a high average and a large dispersion. This characterization raises the important question of why some Asian Americans achieve high socioeconomic status while others fall behind—the stratification of Asian Americans. To uncover sources of stratification for Asian Americans, past research has examined the role of ethnicity and immigration status. Research focusing on ethnic differences has found that Asian Americans of East Asian and Asian Indian descent fare much better than those of Southeast Asian descent. In terms of immigration status, Asian Americans born in the U.S. have higher socioeconomic attainment than Asian immigrants. Furthermore, immigrants who have stayed longer in the United States enjoy higher socioeconomic status than immigrants who arrived recently.

This study adds to the current literature another dimension of stratification among Asian Americans—place of education. We hypothesize that whether immigrants completed their education in the United States or in their home countries affects their earnings prospects in the U.S. labor market. Our statistical analysis draws from individual-level data from the 1990 U.S. Census. The results confirm the important role of place of education in determining earnings of Asian Americans. The role of nativity, on the other hand, is not as important as previously thought once place of education is taken into account.

The "Model Minority" Claim Under Fire

Since the 1980s, the characterization of Asian Americans as a model minority has been scrutinized and criticized by scholars who study Asian Americans. In challenging the validity of

the model minority claim, scholars have pointed to two problems: internal heterogeneity and covert discrimination.

First, as mentioned earlier, Asian Americans are very heterogeneous in terms of socioeconomic status. Thus, the "model minority" label invokes an image of success, which mischaracterizes a fairly large portion of Asian Americans with low socioeconomic standing. For this reason, Rumbaut (1995, p.249) calls the label of "model minority" a senseless stereotype of Asian Americans.

In our view, the more compelling challenge to the model minority characterization is the argument that in spite of their high educational attainment, Asian Americans still face covert discrimination in the U.S. It has been argued, for example, Asian Americans do not have the same opportunity as others for promotion to high positions—the so-called "glass ceiling" effect (e.g., Tang 1993, 2000). In addition, a large body of research has pointed out that Asian Americans do not receive wages commensurate to their high levels of human capital. According to this view, Asian Americans have not really achieved *socioeconomic equality* with comparable Whites, as the model minority thesis suggests; they have only achieved parity with Whites "because of their overachievement in educational attainment" (Hirschman and Wong 1984, p.584).

Our study explores Asian Americans' earnings disadvantage in comparison to Whites, taking into account the fact that many Asian Americans are immigrants, and many Asian immigrants had completed their education abroad. Both nativity and place of education are potentially confounding factors for studying Asian Americans' earnings disadvantage relative to Whites. Our approach boils down to the following simple question: if we account for differences in nativity and place of education between Asian Americans and Whites, are Asian Americans still underpaid?

Disentangling the Effects of Race, Nativity and Place of Education

Two previous studies, Hirschman and Wong (1984) and Sakamoto and Furuichi (2002), particularly motivated our study. In an influential article, Hirschman and Wong argue that Asian Americans approach earnings parity with Whites by *overachieving* in educational attainment and that within the same level of educational attainment Asian Americans earn less than Whites. For example, they estimate that Chinese men received about $2,300 less than White men in 1975, even when their backgrounds were controlled for. Sakamoto and Furuichi challenge Hirschman and Wong's overachievement hypothesis by pointing out that U.S.-born Asian Americans earn at least as much as Whites with equivalent educational attainment. Hence, according to Sakamoto and Furuichi, U.S.-born Asians do not need to overachieve in education in order to attain the same levels of earnings as Whites.

The fundamental question facing these and similar studies is: *Do Asian Americans face an earnings disadvantage?* Hirschman and Wong's answer is yes, supported by the observation that Asian Americans earn less than Whites within levels of educational attainment. However, comparing earnings of U.S.-born Asian Americans to those of Whites, Sakamoto and Furuichi report that U.S.-born Asian Americans in general are not disadvantaged. Jointly considering the evidence of the two studies leads us to the inference that the truly disadvantaged subgroup of Asian Americans is those who were not born in the U.S.—Asian immigrants. Given that U.S.-born Asian Americans earn as much as Whites, only if Asian immigrants face an earnings disadvantage, can the average earnings of Asian Americans as a whole be lower than those of Whites with comparable educational attainment.

Many other studies have yielded results consistent with the findings of Hirschman and Wong (1984) and Sakamoto and Furuichi (2002). For example, in a different paper, Hirschman and Wong (1981) find that foreign-born Asians earn much less than Whites and native-born Asians. Barringer, Takeuchi and Xenos (1990) report lower incomes for Chinese, Filipinos, Koreans, and Asian Indians than for Whites with equivalent education and then point to recency of immigration

as a major contributor to Asians' earnings disadvantage. A recent study by Iceland (1999) finds that U.S.-born Asian men receive similar earnings returns to their occupational status as White men; only foreign-born Asian men are disadvantaged.

In this study, we go beyond those well established results by further classifying Asian immigrants into those who completed education in the United States and those who did not (see Figure 1 for our classification scheme of Asian Americans). We set up our study to test whether foreign-educated Asian immigrants face an earnings disadvantage compared to U.S.-educated Asian immigrants, and whether the latter group is disadvantaged compared to U.S.-born Asian Americans. If we find an earnings gap between foreign-educated Asian immigrants and U.S.-educated Asian immigrants, but not between U.S.-educated Asian immigrants and U.S.-born Asian Americans, then we would come to a new conclusion: *only foreign-educated Asian immigrants are disadvantaged*.

[Figure 1 About Here]

The identification of the disadvantaged group among Asian Americans carries important implications for our understanding of sources of inequality in American society. If Asian Americans in general are disadvantaged, then race is a plausible source of inequality. If only *Asian immigrants* are disadvantaged, then non-nativity is a plausible source of inequality. If, as we propose, place of education plays a crucial role in determining immigrants' earnings, so much so that only *foreign-educated Asian immigrants* are disadvantaged, then human capital differentials are an important source of inequality.

Our analysis represents an effort toward understanding why Asian immigrants are disadvantaged. So far this question has received insufficient attention in research on Asian Americans' earnings. Researchers typically take immigrants' disadvantage for granted and do not go beyond the demonstration of the mediating role of English skills (e.g., Hirschman and Wong 1981; Sakamoto and Furuichi 2002). In this study, we shall investigate whether and to what extent

Asian immigrants' disadvantage can be attributed to the lower value of foreign education in the U.S. job market.

Hypotheses: Group Differences in Earnings

U.S. Education versus Foreign Education

Why should place of education matter for immigrants' earnings? First, the quality of education, especially higher education, in many developing sending countries is generally lower than in the U.S. Second, with certain majors, such as law, the training and knowledge conferred at schools in sending countries may not be easily transferable to the U.S. job market (Friedberg 2000). Third, there is evidence that educational credentials play a role in the job market in addition to the intrinsic value of education (i.e., skills and knowledge conferred in schools) (Hungerford and Solon 1987; Jaeger and Page 1996). Higher education attained abroad may be undervalued by American employers, who are not familiar with foreign universities.

In addition to those differences pertaining to educational quality and credentials, an American education has certain "by-products" that may also promote immigrants' career opportunities in the U.S. job market. A formal American education improves English proficiency as well as exposes immigrants to American culture, both of which are very important advantages for immigrants. Last but not least, an American education provides immigrants with resources for job search. These resources include contacts, internships (American job market experience), campus recruiting opportunities, etc.

Intercept Difference and Slope Difference

The disadvantage of being educated in a foreign country versus in the U.S. has the following empirical implication: other things being equal—that is, controlling for other earnings determinants: education, experience, labor input, residence, etc.—foreign-educated immigrants have lower earnings than U.S.-educated immigrants. We first examine overall earnings differences across the groups, assuming the same earnings returns to education, and then explore the possibility

that returns to education vary across the groups. For convenience, we call the first research objective *the intercept difference hypothesis*.

Intercept Difference Hypothesis: Other things being equal, foreign-educated immigrants overall earn less than U.S.-educated immigrants.

The intercept difference is also called "residual difference" in the inequality literature, since in non-interactive regressions it represents the part of the observed gap in the outcome variable left "unexplained" by group differences in other determinants (e.g., Hirschman and Wong 1984). The approach of summarizing group differences with intercept differences is the predominant method adopted by studies of inequality (for example, the inequality between U.S.-born workers and immigrants, between men and women, between Whites and minorities). Because an intercept difference provides a convenient one-number summary of the difference in earnings between two groups, our first attempt is to estimate the intercept difference between foreign-educated and U.S.-educated immigrants.

However, the intercept difference approach relies on the assumption that the earnings gap between two groups is approximately constant across levels of schooling and other earnings determinants. When this assumption is violated—for example, when the gap in earnings increases with years of schooling—intercept difference does not adequately describe the group difference. In our case, it is plausible that education attained in the U.S. yields higher earnings returns than foreign education, resulting in a larger earnings gap at the higher end of educational attainment than at the lower end. Therefore, to supplement the analysis of overall group differences, we further test the hypothesis that the rate of return to education (i.e., percent increase in earnings with an additional year of schooling) is lower for foreign-educated immigrants than for U.S.-educated immigrants. For convenience, we call this *the slope difference hypothesis.*

Slope Difference Hypothesis: The rate of return to education is lower for foreign-educated immigrants than for U.S.-educated immigrants.

The examination of the rate of return to education not only reveals how the magnitude of the disadvantage associated with foreign education varies across levels of education, but also checks the robustness of the method of estimating group differences using intercepts. As mentioned earlier, when the gap in earnings increases or decreases with years of schooling, the intercept difference between two groups does not summarize group differences. Instead, we need to incorporate both the slope difference and the intercept difference to determine if one group is disadvantaged compared to the other. If during the normal range of schooling, say nine to twenty years, one group persistently has higher earnings than the other group, it is safe to say that the latter is disadvantaged, with the magnitude of the disadvantage depending on the level of education. If the earnings profiles (a plot of earnings against years of schooling) of two groups cross over, then the statement about comparative disadvantage is valid only within a certain range of schooling.

Race, Nativity, or Place of Education?

Apart from determining whether earnings or rates of returns to education vary by place of education, we are interested in the relative importance of the role of place of education as compared to those of nativity and race in the stratification of Asian Americans. To separately assess the effects of race, nativity, and place of education on earnings, we classify Asian Americans into three groups: U.S.-born Asian Americans (UBA), U.S.-educated Asian immigrants (UEAI), and foreign-educated Asian immigrants (FEAI).[2] Pairwise comparisons are focused on Whites versus

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[2] Aggregating Asian Americans across different ethnicities facilitates pairwise comparisons of UBA, UEAI, and FEAI. We also analyzed the data with Asian Americans separated into 7 ethnic groups (Chinese, Filipinos, Japanese, Asian Indians, Koreans, Southeast Asians, and other Asians). Although we find some variations across the ethnic groups, the qualitative conclusions we draw in this paper remain the same (results not reported here but available from the authors.)

UBA, UBA versus UEAI, and UEAI versus FEAI (see Figure 1). We make these three comparisons to disentangle the net effects of race, nativity, and place of education on earnings.

1. Earnings differences between Whites and UBA are associated only with race because both groups are U.S.-born and U.S.-educated.

2. Earnings differences between UBA and UEAI are associated only with nativity because both groups are Asians and educated in the U.S.

3. Earnings differences between UEAI and FEAI are associated only with place of education because both groups are Asian immigrants but differ in place of education.

In this research design, comparison of different groups allows us to examine earnings gaps between Whites and Asian Americans that are attributable to race, nativity, and place of education. As a result, we can assess the relative importance of these three factors in determining Asian Americans' earnings.

Generalizing to Hispanics

In an earlier section on "U.S. Education vs. Foreign Education," we gave the reasons as to why a foreign education is not as valuable as an American education in the U.S. job market. These reasons are not specific to Asian immigrants but hold for *all* immigrants. Therefore, we expect the pattern of lower earnings and/or lower rate of return to education for foreign-educated immigrants than other groups to be true for Hispanics as well. Since we are interested in examining an earnings disadvantage as a challenge to the characterization of Asian Americans as the "model minority," we will focus our analysis on Asian Americans and only briefly report the results for Hispanics towards the end of this paper.

Data

We analyze the 1990 Census Public Use Microsample (PUMS) data, with Asians extracted from the 5% sample, Hispanics from the 1% sample, and non-Hispanic Whites from the 0.1% sample.

Then, restricting our sample to 25-to-44-year-old able-bodied full-time male workers, we obtained

21,706 White cases, 35,614 Asian American cases and 20,193 Hispanic cases. [3]

The Census is the only data source we know of that is large enough for the study of Asian

immigrants' earnings. However, since it does not provide direct information on place of education,

we make inferences about place of education based on immigrants' age, educational achievement,

and immigration year using the following procedure. First, we estimated the age at which

immigrants finished schooling by converting the completed grade to years of schooling and adding

six years for the age of starting school. Then we estimated the age of immigration by taking the

difference of birth year and the midpoint of the time interval during which the immigrant

immigrated. Next, we compared for each immigrant the estimated age of school completion to the

estimated age of immigration. The inference of place of education is based on the following rule: *If

an immigrant finished schooling before immigration, she is classified as foreign-educated,

otherwise U.S.-educated.[4]*

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[3] We define full-time workers as those who worked 45+ weeks and 35+ hours per week in 1989.

[4] Note that our classification of immigrants into foreign-educated or U.S.-educated is an

approximation, which involves two uncertainties. First, for each immigrant we do not know his

exact age at immigration. Instead, the immigration age was estimated from the midpoint of the

immigration time interval. Second, for each immigrant we do not know his/her *exact* age of

completing school. The graduation age was estimated from the finished grade using the following

scheme: high school diploma: 18 years; associate degree: 20 years; bachelor's degree: 22 years;

master's degree: 24 years; doctoral degree: 26 years, etc. Generally speaking, this scheme is likely

to have caused an underestimation of age at school completion, with a result that those

U.S.-educated immigrants who did not finish schooling "on schedule" could be misclassified as

foreign-educated. To understand how misclassification of this type could potentially bias our

results, we reanalyzed the data using an alternative coding scheme, which shifts the on-schedule

It should be noted that some immigrants whom we classified as U.S.-educated had some schooling in their home countries prior to immigration. In other words, ours classification is based on the *last* place of education. We assume that whether or not a worker had attained some education in his home country does not matter much on earnings as long as he completed education in the U.S.

Descriptive Statistics

Our analysis involves comparing levels of earnings and rates of return to education for four groups of workers: U.S.-born non-Hispanic Whites, U.S.-born Asian Americans (UBA), U.S.-educated Asian immigrants (UEAI), and foreign-educated Asian immigrants (FEAI). Table 1 presents descriptive statistics for the four groups of workers in our sample.

[Table 1 About Here]

Differences among Asian Americans in socioeconomic status across our three-category classification are apparent. In particular, UEAI and FEAI are quite distinct. The former group has on average about two more years of schooling than the latter group (15.66 years compared with 13.76 years). The median earnings of UEAI are $32,249, almost 30% higher than those of FEAI at $25,000. Indeed, UEAI have even higher levels of earnings and educational attainment than Whites and UBA. An astonishingly high proportion of UEAI—one third—hold advanced degrees. In contrast, FEAI have the lowest levels of earnings and are much more likely than any other group to have less-than-high-school education. Generally speaking, UEAI resemble UBA in socioeconomic status, whereas FEAI have noticeably lower socioeconomic standing.

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graduation age upwardly by two years.   This coding scheme changes the boundary between foreign- and U.S.-educated immigrants, resulting in a slightly weaker effect of place of education on earnings for immigrants.

In addition, UEAI tend to be younger, have less work experience, but have stayed longer in the U.S. than FEAI. The only similarity between UEAI and FEAI, as revealed by Table 1, is their geographic distribution. Both are predominantly urban (97% of UEAI and 98% of FEAI) and are concentrated in the Pacific region.

[Figure 2 About Here]

Figure 2 illustrates the link between our study and previous studies. Based on the 1990 Census data, the first two bar charts reproduce, respectively, the bivariate version of Hirschman and Wong's and Sakamoto and Furuichi's findings. Figure 2-a shows that the Asian Americans on average have the same earnings as Whites, but at each level of educational attainment Asian Americans' earnings are consistently lower than Whites'. Hence, it appears that Asian Americans need to *overachieve* in education in order to attain earnings parity with Whites. Figure 2-b suggests that Asian Americans' earnings disadvantage can be fully explained by nativity. This follows from the observation that U.S.-born Asian Americans have higher earnings than Whites in four out of the five educational categories; it is Asian immigrants who consistently earn less than Whites.

Figure 2-c further classifies Asian immigrants into UEAI and FEAI and compares the earnings of Whites, UBA, UEAI and FEAI at five levels of educational attainment. We observe that UEAI have an evident earnings advantage over FEAI, especially at the highest educational level. However, compared to UBA, UEAI still face an earnings disadvantage. It seems, therefore, earnings differ *both* by place of education and by nativity for Asian Americans. We also note that in the aggregate the earnings of UEAI are the highest among the four groups, but their earnings at each educational level are not. This paradox is attributable to UEAI's concentration in the higher levels of education, as shown in Table 1.

[Table 2 About Here]

Table 2 presents earning ratios for the three Asian groups, each with Whites as reference. As the first row shows, overall, U.S.-born Asians and U.S.-educated Asian immigrants earn 12%

more than Whites. When we control for education, this advantage is reduced for U.S.-born Asians, and reversed for U.S.-educated immigrants. At the same levels of educational attainment, UBA earn between 96% and 109% of Whites' earnings, whereas UEAI only earn between 88% and 102% of Whites' earnings. However, foreign-educated immigrants consistently earn about 14% less than Whites at all levels of educational attainment.

In sum, our preliminary analyses in Figure 2 and Table 2 show that at each level of educational attainment, U.S.-born Asian Americans have the highest earnings among the four groups, followed by Whites and then U.S.-educated Asian immigrants; foreign-educated Asian immigrants have the lowest earnings. Thus, it appears that being Asian (versus White) by itself is not a disadvantage, but foreign birth and foreign education are.

Multivariate Methods

Table 2 and Figure 2 are essentially two-way tables: mean earnings by education and by group. In order to formally test our hypotheses of lower earnings levels and lower rate of return to education for foreign-educated Asian immigrants, we estimate a set of earnings regression models. First, we consider the following equation:

$$Y_{ij} = \boldsymbol{a}_j + \boldsymbol{b}X_{ij} + \boldsymbol{g}Z_{ij} + \boldsymbol{e}_{ij}, \qquad\qquad j = 1, 2, 3, 4 \qquad\qquad (1)$$

where Y_{ij} is log earnings of the ith individual belonging to the jth group in 1989, with $j = 1, 2, 3, 4$, indicating one of the four groups of Whites, UBA, UEAI and FEAI respectively.[5] In this

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[5] We did not use *log of hourly wage* as the dependent variable because our sample includes only full-time workers and many full-time workers are salaried and thus not paid on an hourly basis. Still, we checked the appropriateness of using log of hourly wage as the dependent variable by regressing log of 1989 earnings on log of total hours worked together with other predictors. If the use of log of hourly wage is equivalent to the use of log earnings as the dependent variable, we should find the coefficient of log of total hours worked to be close to 1. It turned out to be 0.53.

specification, a_j represents a group-specific intercept. X is education, measured by years of schooling and bounded between 9 and 20.[6] Z is a set of control variables which include work experience, log of weeks worked in 1989, log of hours worked per week in 1989, English proficiency, urban residency, and region of residency.[7]

To test the intercept difference hypothesis, we estimate equation (1), which assumes no interaction between j (group) and X (education). In other words, the model constrains the regression planes of earnings on the determinants to be parallel for the four groups. The order of the regression planes and their distances from each other, estimated by a_j, reflect the relative earnings of the four groups when other earnings determinants are held constant.

To test the slope difference hypothesis—foreign-educated Asian immigrants have lower rate of return to education than U.S.-educated Asian immigrants—we modify equation (1) to

$$Y_{ij} = a_j + b_j X_{ij} + g Z_{ij} + e_{ij}, \qquad\qquad j = 1, 2, 3, 4 \qquad\qquad (2)$$

where we allow the rate of return to education to vary by group, i.e., b_j indexed by subscript j. We are interested in how b_3 compared to b_4 (i.e., the rate of return to education for UEAI compared to

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Therefore, we chose the more flexible approach with log earnings as the dependent variable while including labor input as a control.

[6] Individuals with nine or fewer years of schooling are all coded as having nine years of schooling. We coded education this way because for U.S.-born Asian Americans and U.S.-educated Asian immigrants, the number of workers with fewer than nine years of schooling is negligible. Estimates of earnings and rates of return to education for years between 0 and 9 are therefore unstable. In addition, bottom-coding allows us to focus on earnings profiles between 9 to 20 years of schooling.

[7] English proficiency is a categorical variable (coded as *very well, well, not very well, not at all*), but is treated as an interval variable in the regressions.

that of FEAI). As was pointed out earlier, a_j represents group differences in earnings only when slopes are the same across groups. Therefore, in addition to testing the slope difference hypothesis, estimating equation (2) checks if the results from equation (1) are robust.

[Figure 3 About Here]

The coefficient of education (b) is interpreted as the rate of return to education, which measures how fast earnings increase proportionately with each additional year of education. Both equations (1) and (2) treat education as a linear predictor of log earnings, which assumes constant rate of return. Although this is a common specification for earnings equations in the literature, there is some indication in previous research that schooling does not have a linear effect on the logarithm of earnings (Hungerford and Solon 1987). For example, years spent in a professional school may have a higher rate of return than years spent in high school.[8] Moreover, years during which a diploma is received, such as the 12th, 16th, and 18th years of schooling, may have a higher rate of return than other years spent in school due to a diploma effect. Since the linear specification of education in equations (1) and (2) may not fit the data, we further estimate both equations with education as a piecewise linear predictor (spline function). This design yields a total of four (two-by-two) model specifications as shown in Figure 3.

Model 1 and Model 2 are designed to test the intercept difference hypothesis. While Model 1 is the same as equation (1), Model 2 extends it by specifying education as a piecewise linear predictor with knots at 12, 16 and 18 years of schooling.[9] Model 1 constrains the rate of return to be

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[8] In this paper, we only consider returns *on time* spent in school, not returns *on total investment*, which would also include tuition and opportunity costs (wages the student would be earning were he not enrolled in school).

[9] 12, 16 and 18 are chosen as knots because (a) they appear to be the inflection points on the scatter plot of group-specific mean earnings against years of schooling and (b) they are the finishing years

constant across 9 to 20 years of schooling. The spline model, Model 2, allows the rate of return to vary in the four segments of schooling, namely, high school education, college education, professional/master's education, and doctoral education. We experiment with Model 1 and Model 2 in search for a better model to gauge the relative earnings levels of the various groups of White and Asian workers.

Model 3 and Model 4 are designed to test the slope difference hypothesis. Again we treat education first as a simple linear predictor in Model 3 (equation 2) and then as a piecewise linear predictor in Model 4. Note that Model 4 allows the rates of return to education to vary for each group and in each segment of schooling, with the constraint that for any two groups the slope difference is the same across different segments of schooling. For example, if the education slopes for Whites are β^1, β^2, β^3 and β^4 during 9-12, 12-16, 16-18, and 18-20 years of schooling, then the slopes for UBA are $\beta^1 + \delta$, $\beta^2 + \delta$, $\beta^3 + \delta$, and $\beta^4 + \delta$ respectively, with δ denoting the overall difference in the education slopes between UBA and Whites. With this constraint, the difference in the rate of return between any two groups is summarized by only one parameter, enabling a simple one-degree-freedom test of the slope difference hypothesis under piecewise linear specification of education. We further check the applicability of this constraint by allowing all spline slopes to vary freely for each group in the full interactive model, which is denoted as Model 5.

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of high school, college and professional/master's degrees, and as such, give easy interpretation to the four coefficients of education for the segments of 9-12, 13-16, 17-18, and 19-20 years of schooling. The four coefficients are interpreted respectively as the rate of return to high school education, the rate of return to college education, the rate of return to professional/master's education, and the rate of return to doctoral education.

Results

<u>Testing the Intercept Hypothesis</u>

[Table 3 About Here]

Table 3 presents regression results for Models 1 and 2. In general, the estimated coefficients are similar across the two models except for the coefficients of education due to specification differences. In both models, the ordering of the four groups from the highest earnings to the lowest earnings is: Whites, UEAI, UBA, and FEAI. The relative earnings differentials across the four groups are given in Figure 4. It is shown that when differences in work experience, English proficiency, labor input, and place of residency are adjusted for, UBA earn 3% less than Whites; UEAI earn 1% more than UBA; and FEAI earn 14% less than UEAI. We argued earlier that in our research design the earnings gaps between Whites versus UBA, UBA versus UEAI, and FEAI versus UEAI represent respectively the net effects of race, nativity, and place of education on earnings. It thus follows that the disadvantages of being Asian versus White, foreign-born versus U.S.-born, foreign-educated versus U.S.-educated are respectively 3%, -1%, and 14%. Using Tukey's test for multiple comparisons, we find in both models earnings differences (a) between UEAI and UBA and (b) between UEAI and Whites not statistically significant at 0.001. All other pairs of comparison are significant at the 0.001 level.[10] In sum, our analysis of Models 1 and 2 yields the following three results.

[Figure 4 About Here]

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[10] These comparisons are: Whites versus UBA, Whites versus FEAI, UBA versus FEAI, and UEAI versus FEAI.

First, both models support the intercept difference hypothesis that foreign-educated Asian immigrants on average earn less than U.S.-educated Asian immigrants, with an estimated gap at 14 percent. Thus, place of education has a substantial effect on earnings of Asian Americans.

Second, earnings differences among Whites, U.S-born Asian Americans and U.S.-educated Asian immigrants are negligible—between 1 and 3 per cent. We therefore conclude that the effects of race and nativity on earnings are minimal.

Third, the rate of return to education varies substantially across different levels of education. When constrained to be constant from nine to twenty years of schooling in Model 1, the rate of return to education is 0.11. In Model 2, it is 0.077 for high school education, 0.112 for college education, 0.146 for master's and professional education, and 0.016 for doctoral education. The variation is considerable.

Testing the Slope Difference Hypothesis

Next we estimate Models 3 and 4, which allow the coefficients of education to vary by group. Model 3 constrains the education coefficient to be the same within each group, whereas Model 4 is more flexible, allowing education coefficients to vary with educational level as well as group. For a compact presentation, only the coefficients of education and their standard errors from the two models are presented in Table 4.

[Table 4 About Here]

Both Model 3 and Model 4 support the hypothesis that the rates of return are significantly lower for FEAI than for UEAI. In both models, the estimated difference in the education slope between FEAI and UEAI is 0.014. This difference appears to be small, but cumulatively it is quite considerable. For example, accumulated over 10 years, the higher rate of returns for UEAI increases their earnings by 15% relative to FEAI. In addition, we find that the rate of return for UEAI is even higher than those for Whites and UBA in both models. This suggests that U.S. education increases earnings of immigrants more than those of U.S.-born workers. One plausible

explanation is that education—if it is attained in the U.S.—helps immigrants overcome the disadvantage associated with foreign birth.

What do these differences in the rates of return to education suggest for the relative levels of earnings for Whites and the three groups of Asians? Once more, we make three comparisons to contrast the effects of place of education, nativity and race on earnings of Asian Americans.

First, the predicted earnings of FEAI based on Model 4 are consistently lower than those of UEAI or any other group across nine to twenty years of schooling, and the earnings gap between FEAI and UEAI widens as education increases. At nine years of schooling, UEAI earn 7% more than FEAI. At twenty years, their advantage increases to 25%. This result confirms both the intercept difference hypothesis and the slope difference hypothesis—foreign education affects negatively the earnings of Asian Americans, and this effect increases with educational attainment.

Next, we compare the earnings of UEAI to those of UBA. UEAI earn less money than UBA at the lowest level of education but then catch up with UBA at 15 years of schooling. This suggests that the disadvantage of being foreign-born versus U.S.-born decreases and even reverses with the attainment of education. Hence, it appears that being foreign-born in itself is not a disadvantage.

Finally we compare the earnings of UBA to those of Whites. The difference is small and statistically insignificant (0-5% in favor of Whites). We concur with Sakamoto and Furuichi (2002) and Sakamoto, Wu, and Tzeng (2000) and conclude that racial differences in earnings between Whites and U.S.-born Asian Americans are negligible.

Predicting Earnings Profiles and Model Selection

[Figure 5 About Here]

For a better description of the earnings profiles for the various groups of White and Asian workers, we estimate Model 5, which is the full "interactive spline-function" model with the constraint of constant between-group slope difference in Model 4 removed. Figure 5 plots the earnings for the

four groups against years of schooling based on Model 5 with all other predictors (work experience, labor input, residency, and English proficiency) fixed at Whites' mean level. Two features of this figure are apparent: (1) the predicted earnings of foreign-educated immigrants are noticeably lower than the other three groups; and (2) the predicted earnings profiles of U.S.-educated Asian immigrants closely track those of U.S.-born Asian Americans and Whites, rather than that of foreign-educated immigrants. Together, they suggest negligible roles of race or nativity, but an important role of place of education, in determining earnings.

Figure 5 also sheds light on model selection. From the figure we could tell that imposing education as a simple linear predictor would distort the true relationship between education and earnings. In particular, this would result in underestimating earnings at 18 years of schooling and overestimating earnings at 20 years of schooling for all four groups. This suggests that the spline specification captures the data much better than the globally linear specification. In comparison, the use of interaction appears not to be as important. According to Baysian Information Criterion, the best model among all five models we estimated is Model 4, the restricted interactive spline model (BIC' = -20060). Its strong competitor is Model 2, the non-interactive spline model (BIC' = -20055).[11]

Further Evaluation of the Results

Length of Stay as a Potential Confounding Factor

We realize that our finding is subject to an alternative explanation. Numerous studies have found that, other things being equal, immigrants who have stayed longer in the United States have higher earnings than immigrants who arrived recently (Chiswick 1978; Barringer, Takeuchi and Xenos 1990). Thus, the earnings gap between foreign-educated Asian immigrants and U.S.-educated Asian immigrants could reflect the difference in the length of stay in the U.S. between the two

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[11] The BIC for the Models 1, 3, and 5 are -19796, -19794, and -19997 respectively.

groups. As Table 1 shows, the median length of stay for foreign-educated Asian immigrants is 9.5 years in contrast to 18 years for the U.S.-educated.[12]

The effect of length of stay on earnings while controlling for total work experience has two interpretations. First, Borjas argues (1987) that the quality of immigrants has been deteriorating over the years. Thus the effect of length of stay could reflect the superior quality of early immigrants relative to recent immigrants. Second, since length of stay is a proxy for U.S. work experience, the effect of length of stay on earnings could mean that U.S. work experience has a higher rate of return than home-country work experience. Given that education and work experience are two key components of human capital (Mincer 1974), the latter interpretation allows us to expand our original thesis: the difference in U.S.-acquired human capital—both in education and in work experience—accounts for earnings disparity among immigrants.

To gauge the earnings gap between UEAI and FEAI with differences in length of stay adjusted for, we estimate just for Asian immigrants an additional model similar to Model 4 that includes length of stay as a three-level categorical variable: 0-5 years, 6-10 years and 10+ years. This model results in a lower intercept but higher slope for UEAI than for FEAI. UEAI earn 4% less than FEAI at nine years of schooling and catch up with FEAI at twelve years of schooling. At twenty years of schooling, UEAI earn 12% more than FEAI. Our results show that controlling for the length of stay definitely reduces the advantage of having an American education. Still, those U.S.-educated Asian immigrants with 12 or more years of education (about 98.5% of them) have an earnings advantage compared to foreign-educated Asian immigrants with comparable backgrounds.

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[12] The measure of length of stay is rather crude because of way the 1990 Census collected information on immigration year. We estimate length of stay by subtracting from 1990 the middle year of the immigration interval.

Potential Selectivity Bias

It has long been postulated that immigrants may be selective in terms of unmeasured skills and thus potential earning capacity (e.g., Borjas 1987; Jasso and Rosenzweig 1990; Jasso, Rosenzweig, and Smith 2001). The validity of our key result that place of education matters is called into question if U.S.-educated Asian immigrants are more selective in terms of unmeasured skills than foreign-educated Asian immigrants. A good proportion of UEAI are student immigrants who first entered the U.S. on student visas, mostly as college and graduate students, and later settled down in the U.S. after graduation. Compared to immigrants who finished education in their home countries, immigrants who sought education in the U.S. might have higher occupational aspirations and abilities. To the extent that student immigrants are a selective group, the earnings disparity between foreign-educated and U.S.-educated immigrants could reflect the effect of selectivity, rather than the effect of place of education.

To better understand the effect of selectivity on earnings for Asian Americans, we separated U.S.-educated Asian immigrants into two groups: (1) "student immigrants" who came to the U.S. for higher education and later settled down, and (2) "young immigrants" who immigrated to the U.S. as minors accompanying their parents.[13] As secondary immigrants accompanying their parents, young immigrants should not be selected on aspirations or ability. In our sample, student immigrants constitute slightly over one third of all UEAI, while young immigrants account for the remaining two thirds. Regression analysis with student immigrants and young immigrants as separate groups yields results contrary to our expectation: student immigrants actually earn no more than young immigrants when education and other earnings determinants are controlled. When length of stay is added as a control variable, student immigrants earn only 3 percent more than young immigrants. Overall, earnings differentials are negligible between U.S. educated Asian

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[13] We assume that those who immigrated after age 18 are student immigrants and those who immigrated before or on age 18 are young immigrants who came with their parents.

immigrants who are potentially selective ("student immigrants") and other U.S. educated Asian immigrants ("young immigrants"). Thus, it appears that selectivity does not account for our main finding about the importance of place of education in determining earnings of Asian Americans.

The Case of Hispanics

We use the same methodology to compare the earnings of U.S.-born Hispanics (UBH), U.S.-educated Hispanic immigrants (UEHI), and foreign-educated Hispanic immigrants (FEHI) to those of Whites. In general, we find strong evidence in support of both the intercept difference hypothesis and the slope difference hypothesis with the Hispanic case. Figure 6 presents predicted earnings for the three groups of Hispanics and Whites at 9 through 20 years of schooling based on the full model (Model 5). The earnings profiles of U.S-born and U.S.-educated Hispanics are amazingly similar except at the highest level of education, which accounts for only 5% of the Hispanic workers in the data. As in the case for Asian Americans, we find a negligible effect of nativity on earnings of Hispanic workers.

[Figure 6 About Here]

Comparing Figure 6 to Figure 5, we note that they share two common features: (1) the earnings profiles of U.S.-educated immigrants are much closer to those of U.S.-born minorities rather than those of foreign-educated immigrants, and (2) the foreign-educated immigrants are evidently disadvantaged. However, the Hispanic case and the Asian case diverge in two aspects. First, we find a sizable earnings gap between UBH and Whites, and the gap appears to be constant across levels of education. Our estimates based on Model 2 indicate an earnings gap between UBH and Whites at 8%. Recall that the gap between Whites and UBA in Model 2 is much smaller—3%. Second, the differences in the slope parameters of education between FEHI and UEHI are greater than those between FEAI and UEAI. Based on Model 3, UEHI's earnings increase by 11% with each additional year of schooling, while FEHI's earnings increase by only 7%. If FEHI and UEHI

started with the same level of earnings at nine years of schooling, FEHI would be making 32% less than UEHI as their educational attainment reaches twenty years.

We further evaluated the robustness of the results for Hispanic immigrants by controlling for length of stay and examining the issue of selectivity. As in the case for Asians, controlling for length of stay reduces the disadvantage of foreign education for Hispanic immigrants. On the issue of selectivity, the potentially selected immigrant group—student immigrants—only accounts for 6 percent of U.S.-educated Hispanic immigrants. Thus it appears that selectivity is unlikely to account for the earnings gap between foreign-educated and U.S.-educated Hispanic immigrants.

Conclusion

In this paper, we argue that one major reason that immigrants earn less than their U.S.-born counterparts is due to the fact that many immigrants completed their education in their home countries, which is worth less in the U.S. job market than education acquired in the U.S. The disadvantage of having a foreign education versus a U.S. education is operationalized as the residual difference in earnings between foreign-educated immigrants and U.S.-educated immigrants when other earnings determinants controlled for. We evaluated the hypothesis by analyzing a sample of 25-to-44-year-old full-time male workers drawn from the 1990 Census individual-level data.

In order to contrast the effect of place of education against the effects of nativity and race, we divided the minority groups (i.e., Asians and Hispanics) into three subgroups: those born in the U.S., those who immigrated to and completed their education in the U.S., and those who immigrated to the U.S. but had completed their education in their home countries prior to immigration. The earnings disparity between U.S.-born minorities and Whites is associated with

the net effect of race.[14] The disparity between U.S.-educated immigrants and U.S.-born minorities is associated with the net effect of nativity. And the disparity between foreign-educated immigrants and U.S.-educated immigrants is associated with the net effect of place of education.

[Table 5 About Here]

Table 5 summarizes our main findings regarding the relative importance of the effects of race, nativity, and place of education on earnings of Asian Americans and Hispanic Americans. For Asians, there is no evidence of an earnings disadvantage associated with being Asian or being foreign-born. There is, however, a disadvantage of being foreign-educated versus U.S.-educated, and the disadvantage increases with years of schooling. If we do not control for the length of stay in the U.S., the earnings gap between foreign-educated and U.S.-educated Asian immigrants ranges from 7% to 25%, depending on the level of education. If we control for length of stay, the gap ranges from 4% in favor of the foreign-educated to 12% in favor of the U.S.-educated.

For Hispanics, we see a race effect —U.S.-born Hispanics earn about 8% less than Whites with equivalent backgrounds. Nativity *per se* does not have an effect on earnings. Place of education has a strong effect on earnings of Hispanic immigrants. If we do not control for the length of stay, the earnings gap between foreign- and U.S.-educated Hispanics ranges from 7% to 36%, depending on the level of educational attainment. If we control for length of stay, the gap ranges from 1% to 27%.

To summarize, our analysis from the 1990 U.S. Census shows that place of education is a crucial determinant of immigrants' earnings. In contrast, nativity *per se* has surprisingly little effect on earnings, both for Asians and Hispanics. Previous studies that found nativity an important

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[14] Strictly speaking, the difference between Hispanics and Whites is an ethnicity effect. For simplicity and analogy with the case of Asians, we call it "race effect."

predictor of Asians and Hispanics' earnings may have in fact picked up the effect of place of education because most immigrants are foreign-educated.

What implications do our results have for the debate on the characterization of Asian Americans as a "model minority"? As mentioned earlier, this study addresses one of the main criticisms of the model minority thesis – Asian Americans face an earnings disadvantage after controlling for education. We have shown in this paper that such a disadvantage—if it exists—is experienced only by a particular group of Asian immigrants, namely, foreign-educated immigrants. This result not only provides new empirical evidence on the stratification of Asian Americans but also calls for a theoretical reinterpretation for the earnings disadvantage of Asian Americans. The prevailing interpretation is that Asians earn less money than Whites within levels of educational attainment as a result of race-based discrimination (e.g., Hirschman and Wong 1984; Min 1995). This interpretation is plausible when all Asian Americans experience a net earnings disadvantage. The identification of foreign-educated immigrants as the only disadvantaged group among Asian Americans suggests that Asian Americans' earnings disadvantage is not race-based; rather, it is associated with human capital differences between U.S.-educated workers and foreign-educated workers. Hence, our take on the model minority debate is as follows: While minority model may be a too simplistic characterization of Asian Americans, its main criticism that Asian Americans experience a residual earnings disadvantage is not supported empirically.

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Table 1: Descriptive Statistics

Variables	Whites	U.S.-Born Asians	U.S.-Educated Asian Immigrants	Foreign-Educated Asian Immigrants
Median hourly wage (in 1989 $)	12.50	14.42	14.73	11.45
Median weekly wage ($)	572	635	635	500
Median annual income ($)	29,000	32,000	32,249	25,000
Mean years of schooling	13.65	14.74	15.66	13.76
Less than high school (%)	8.52	3.28	3.41	15.97
High school (%)	30.47	14.24	8.34	17.08
Some college (%)	30.63	32.65	24.89	23.89
College graduates (%)	20.48	33.49	31.04	24.57
Master and Ph.D. (%)	9.89	16.33	32.31	18.49
Mean age	34.59	33.96	32.36	36.12
Mean years of experience	14.94	13.22	10.70	16.36
Median years of stay in the U.S.	-	-	18	9.5
English proficiency	3.99	3.95	3.73	3.26
Urban residence	0.80	0.91	0.97	0.98
Region (%)				
Pacific	12.51	77.79	52.17	45.64
New England	6.25	1.94	3.99	3.65
Middle Atlantic	15.93	5.79	15.43	20.99
East north central	19.20	3.67	7.90	8.13
West north central	8.32	0.86	1.58	1.72
South Atlantic	16.77	4.31	9.57	10.43
East South Central	6.05	0.57	0.94	0.86
West South Central	9.40	1.65	6.15	6.49
Mountain	5.56	3.42	2.28	2.08
(N)	(21,706)	(6,894)	(8,737)	(19,983)

Table 2: Relative Earnings of Asian Americans by Nativity and Place of Education

	U.S.-Born Asians	U.S.-Educated Asian Immigrants	Foreign-Educated Asian Immigrants
Total	1.12	1.12	0.90
By Educational Attainment			
Less than high school	1.09	1.02	0.87
High school	1.03	0.88	0.84
Some college	1.02	0.89	0.85
College graduates	0.96	0.89	0.87
Master and Ph.D.	1.02	0.98	0.87

Note: The reference category is Whites. The numbers in this table are ratios of mean 1989 earnings for the three Asian groups and Whites (i.e., U.S.-born Asians/Whites, U.S.-educated Asian immigrants/Whites, foreign-educated Asian immigrants/Whites). Because the distribution of earnings is right skewed, the geometric mean is used instead of the arithmetic mean.

Table 3: Estimated Regression Coefficients from Earnings Estimations

	Model 1		Model 2	
	Coefficient	SE	Coefficient	SE
Intercepts				
Whites	1.023	(0.168)	1.389	(0.172)
UBA	0.992	(0.168)	1.357	(0.173)
UEAI	1.003	(0.168)	1.369	(0.172)
FEAI	0.850	(0.168)	1.210	(0.172)
Education	0.110	(0.001)	-	-
9-12 years	-	-	0.077	(0.004)
12-16 years	-	-	0.112	(0.002)
16-18 years	-	-	0.146	(0.004)
18-20 years	-	-	0.016	(0.007)
Experience	0.060	(0.002)	0.063	(0.002)
Experience^2 (*1000)	-1.179	(0.060)	-1.266	(0.060)
English	0.087	(0.004)	0.091	(0.005)
Hours worked per week	0.457	(0.012)	0.448	(0.012)
Weeks worked	1.360	(0.041)	1.373	(0.041)
Urban	0.150	(0.008)	0.150	(0.008)
Region (excluded = Pacific)				
New England	-0.012	(0.011)	-0.015	(0.011)
Middle Atlantic	-0.015	(0.007)	-0.018	(0.007)
East north central	-0.069	(0.008)	-0.071	(0.008)
West north central	-0.180	(0.012)	-0.180	(0.012)
South Atlantic	-0.109	(0.008)	-0.111	(0.008)
East South Central	-0.175	(0.014)	-0.180	(0.014)
West South Central	-0.124	(0.009)	-0.126	(0.009)
Mountain	-0.137	(0.012)	-0.137	(0.012)
N	57320		57320	
R^2	0.2945		0.2980	
Adj. R^2	0.2942		0.2978	

Table 4: Estimated Coefficients of Education from Earnings Estimations

	Whites	U.S.-Born Asians	U.S.-Educated Asian Immigrants	Foreign-Educated Asian Immigrants
Model 3				
Intercept	0.996	1.005	0.843	0.914
(SE)	(0.169)	(0.173)	(0.172)	(0.169)
Education	0.112	0.109	0.120	0.106
(SE)	(0.002)	(0.003)	(0.002)	(0.001)
Model 4				
Intercept	1.359	1.409	1.165	1.219
(SE)	(0.174)	(0.179)	(0.177)	(0.172)
Education (9-12)	0.079	0.074	0.091	0.077
(SE)	(0.004)	(0.005)	(0.005)	(0.004)
Education (12-16)	0.112	0.107	0.123	0.109
(SE)	(0.002)	(0.003)	(0.003)	(0.002)
Education (16-18)	0.144	0.139	0.156	0.142
(SE)	(0.004)	(0.005)	(0.004)	(0.004)
Education (18-20)	0.009	0.003	0.020	0.006
(SE)	(0.008)	(0.008)	(0.007)	(0.008)

Table 5: Summary of Findings

	Non-White vs. White	Non-Native vs. Native	Foreign-Educated vs. U.S.-Educated	
			Without Control for Length of Stay	Controlling for Length of Stay
Panel A: Asians				
Earnings differences	- 3%	No	-7% to -25%	4% to -12%
Differences in returns to education	No	No	-0.014	-0.015
Panel B: Hispanics				
Earnings differences	- 8%	No	-7% to -36%	- 1% to -27%
Differences in returns to education	No	No	- 0.034	-0.028

Note: Estimates of earnings differences between non-Whites and Whites are based on Model 2. Estimates of earnings differences between foreign-educated and U.S.-educated immigrants (both with and without control for length of stay in the U.S.) are calculated for the range of 9 to 20 years of schooling based on coefficients estimated from Model 4.

Figure 1: Research Design: Disentangling the Effect of Race, Nativity and Place of Education

Whites --

                                         Net Effect of Race

            U.S.-Born Asians --------------------------------

Asians

                                         Net Effect of Nativity

                       U.S.-Educated Asian Immigrants

           Asian Immigrants   *Net Effect of Place of Education*

                       Foreign-Educated Asian Immigrants
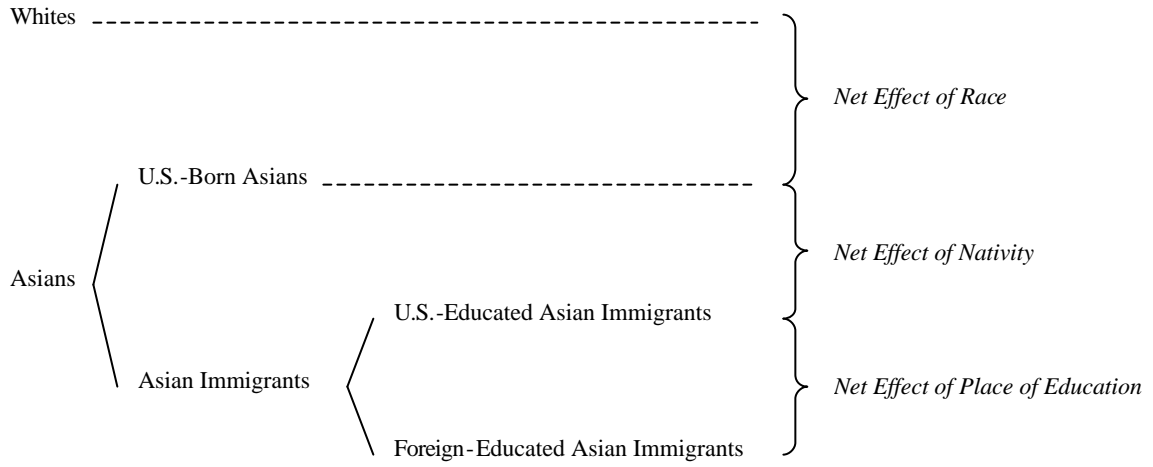
Figure 2-a: Mean Earnings of Whites and Asian Americans

Mean Earnings (thousands)

Less than HS | High School | Some College | College Graduates | Master and Ph.D. | Total

☐ Whites   ☐ Asian Americans
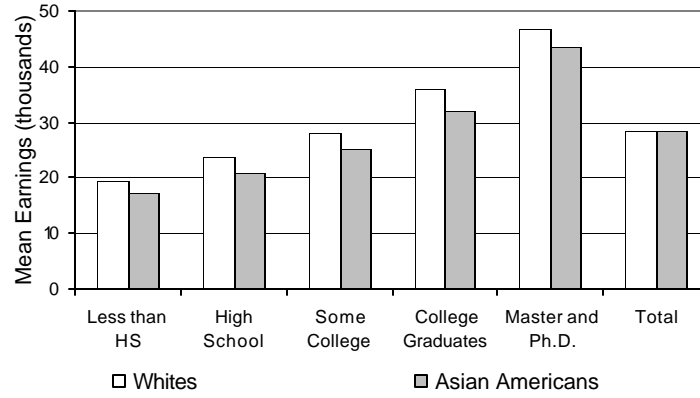
Figure 2-b: Mean Earnings of Whites and Asian Americans by Nativity

Mean Earnings (thousands)

Less than HS | High School | Some College | College Graduates | Master and Ph.D. | Total

☐ Whites   ☐ Native-born Asians   ☐ Asian immigrants
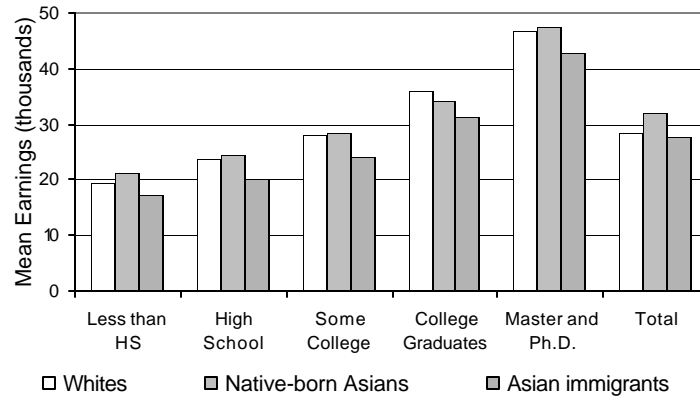
Figure 2-c: Mean Earnings of Whites and Asian Americans by Nativity and Place of Education

Mean Earnings (thousands)

Less than HS | High School | Some College | College Graduates | Master and Ph.D. | Total

☐ Whites   ☐ Native-born Asians
☐ American-educated Asian immigrants   ■ Foreign-educated Asian immigrants
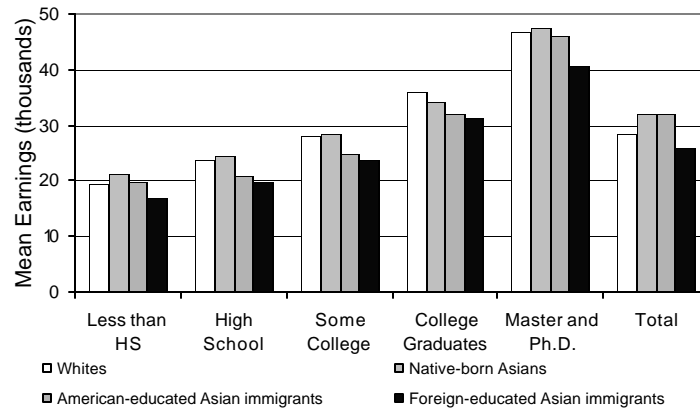
Figure 3: Four Models for Multivariate Analysis

Spline

No   Yes

Model 1   Model 2

No   → Intercept
                                                                   difference?

Interaction

Model 3   Model 4

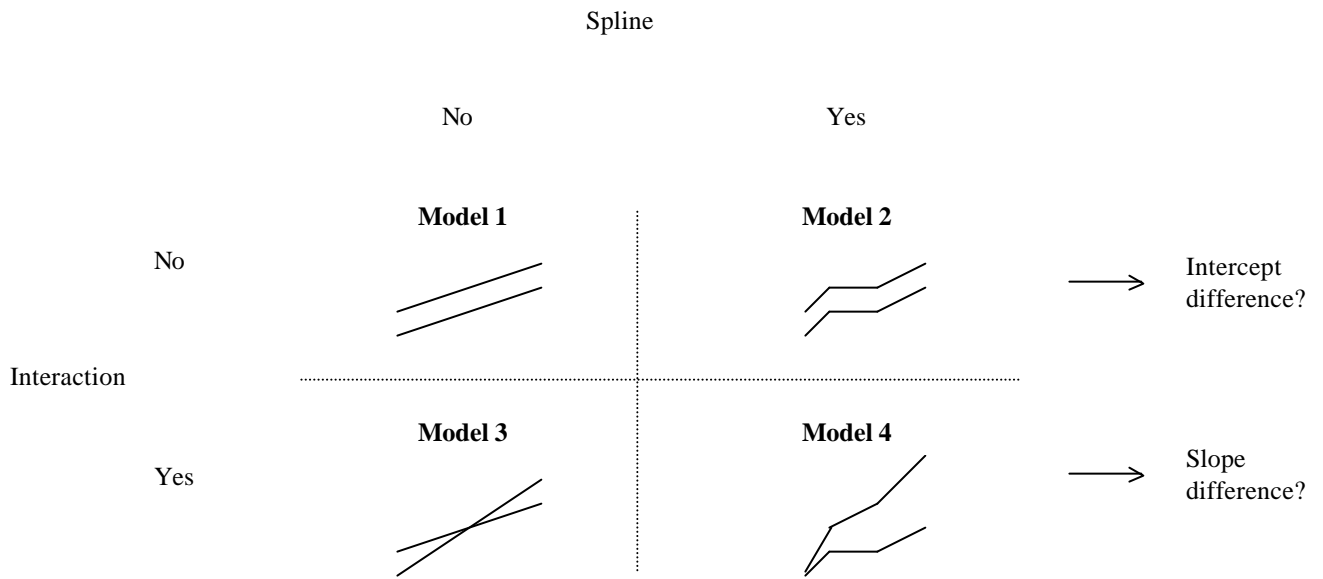Yes   → Slope
                                                                   difference?

Figure 4: Estimated Relative Earnings Based on Model 1 and Model 2

Whites ---

Net Effect of Race = -3%
[(UBA - Whites)/Whites]

U.S.-Born Asians ----------------------------

Asians

Net Effect of Nativity = 1%
[(UEAI - UBA)/UBA]

U.S.-Educated Asian Immigrants

Asian Immigrants

Net Effect of Place of Education = -14%
[(FEAI –UEAI)/UEAI]

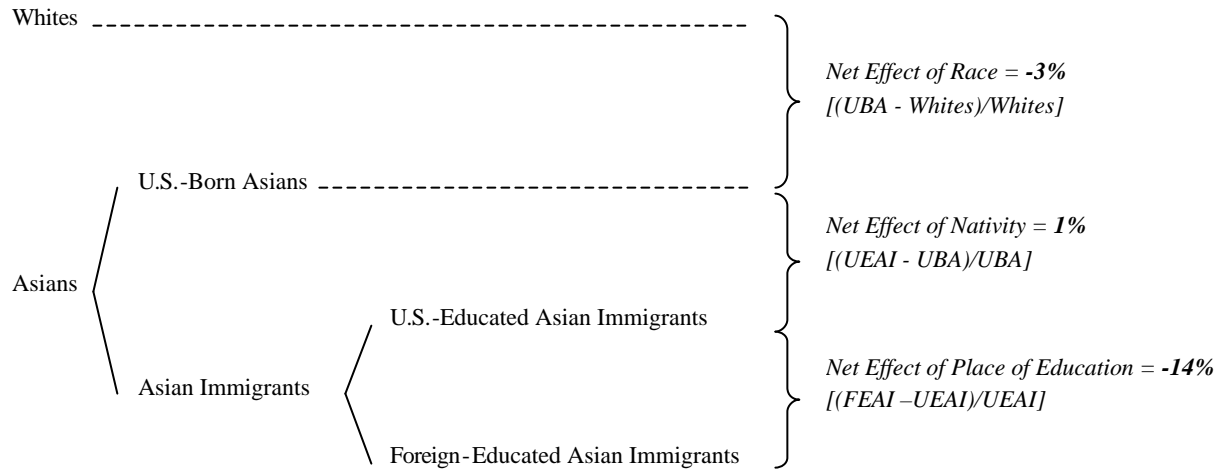Foreign-Educated Asian Immigrants
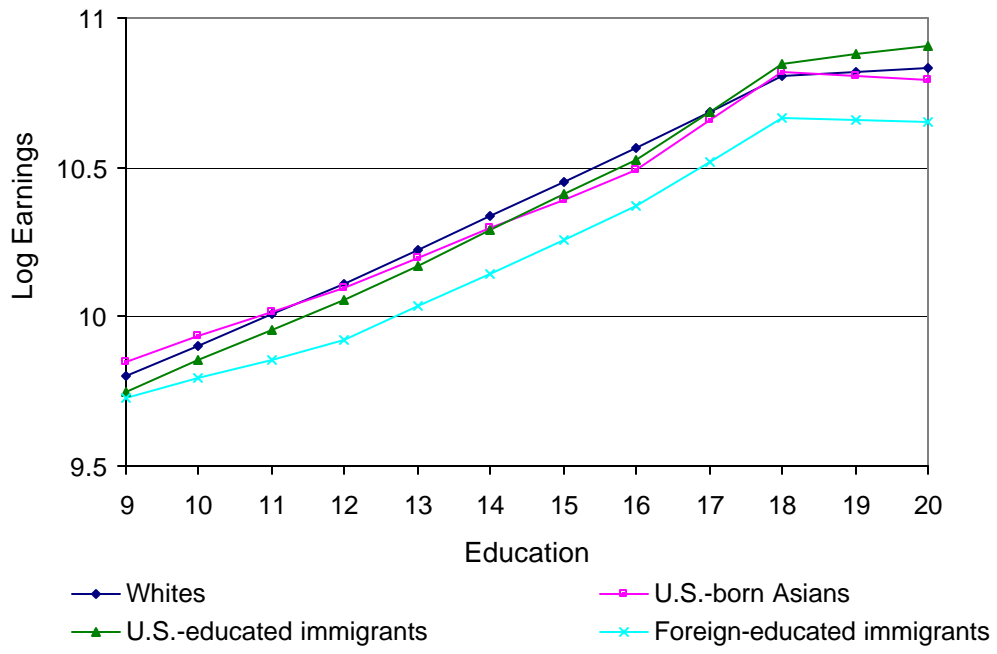
Figure 5: Predicted Log Earnings for Whites and Asian Americans

Figure 6: Predicted Log Earnings for Whites and Hispanics

Legend:
- Whites
- U.S.-educated immigrants
- U.S.-born Hispanics
- Foreign-educated immigrants

X-axis: Education
Y-axis: Log Earnings