Asian-Americans' Earnings Disadvantage Reexamined: The Role of Place of Education[1]

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Past research has reported that Asian-Americans, and Asian immigrants in particular, have lower earnings than do whites within the same levels of education. However, few studies have explored why this earnings disadvantage exists. 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—U.S.-born whites, U.S.-born Asian-Americans, U.S.-educated Asian immigrants, and Asian immigrants who completed education prior to immigration, we examine earnings gaps between whites and Asian-Americans that are attributable to race, nativity, and place of education. Our results show that (1) there is no earnings difference across U.S.-born whites, U.S.-born Asian-Americans, and U.S.-educated Asian immigrants, and that (2) foreign-educated Asian immigrants earn approximately 16% less than the other three groups of workers. We conclude that place of education plays a crucial role in the stratification of Asian-Americans, whereas race and nativity per se are inconsequential once place of education is taken into account.

It has been well documented that Asian-Americans enjoy a relatively high socioeconomic standing in American society. This observation holds true regardless of whether socioeconomic status is measured by educational

attainment, occupational attainment, or income. A casual examination of statistics released by the U.S. Census Bureau confirms this. For example, in 2000, 44% of Asian men and 40% of Asian women over 25 years of age had completed college education, compared with 28% and 26% of non-Hispanic white men and women. In addition, a higher proportion of Asian-Americans than whites (39% vs. 33%) worked in professional and managerial occupations. In terms of income, while Asian-Americans' per capita income was slightly lower than whites' ($22,352 vs. $23,415), their median household income was considerably higher ($55,521 vs. $45,904) (U.S. Census Bureau 2001).

The observation that Asian-Americans compare favorably to whites on major indicators of socioeconomic status has given rise to the popular claim that Asian-Americans are a "model minority" in the United States (Hurh and Kim 1989; Waters and Eschbach 1995). However, the characterization of Asian-Americans as a model minority is incomplete. Equally noteworthy as their high average socioeconomic status is the heterogeneity of Asian-Americans as a group. Census statistics show that, when compared to the white population, Asian-Americans are *both* more likely to be middle class and to live below the poverty line.[2] Indeed, heterogeneity is an *essential* feature of Asian-Americans. First, the category of Asian-Americans comprises many ethnic groups who differ greatly in language and culture. Second, while some Asian-Americans have lived in the United States for generations, the majority of Asian-Americans are recent immigrants who came to the United States for various reasons and from various backgrounds: some immigrated for better economic opportunities, some immigrated as refugees, and some are tied immigrants who came with their families.

Thus, the socioeconomic status of Asian-Americans can be characterized best by *a high average and a large dispersion*. This characterization invites the important question of the stratification of Asian-Americans—that is, Why do some Asian-Americans achieve high socioeconomic status while others fall behind? To uncover the underlying causes of stratification for Asian-Americans, past research has examined the roles of ethnicity and immigration status. Research focusing on ethnic differences has found that Asian-Americans of East Asian and Asian Indian descent fare better than those of Southeast Asian descent (Barringer, Takeuchi, and Xenos 1990). In terms of immigration status, Asian-Americans born in the United States attain higher socioeconomic status than Asian immigrants (Chiswick 1983). Furthermore, immigrants who have been in the United States

[2] In 2000, 34.8% of Asian families (compared with 26.6% of white families) had incomes of $75,000 or more. At the same time, 10.2% of Asian families (compared with 7.8% of white families) lived in poverty (U.S. Census Bureau 2001, 2002).

longer enjoy better socioeconomic outcomes than immigrants who have arrived recently (Lee 1994).

This study adds to the current literature another dimension of stratification among Asian-Americans—place of education. We hypothesize that where 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 of the 1990 U.S. census and the 1993 National Survey of College Graduates. The results of our analysis demonstrate that place of education plays an important role in determining earnings of Asian-Americans, whereas race and nativity per se are inconsequential once place of education is taken into account.

THE "MODEL MINORITY" LABEL CHALLENGED

Since the 1980s, the characterization of Asian-Americans as a model minority has been scrutinized and criticized by scholars who study Asian-Americans. Challenges to the validity of the model minority claim have been based primarily on two arguments: internal heterogeneity and covert discrimination (Kim and Lewis 1994).

As we stated earlier, the existing literature has documented large degrees of heterogeneity among Asian-Americans in terms of socioeconomic status. While some established Asian ethnic groups (e.g., Japanese, Chinese, Asian Indians, and Filipinos) enjoy a relatively high socioeconomic status in comparison with the non-Hispanic white population, recent immigrants of Vietnamese, Laotian, Cambodian, and Hmong origins have faced difficult circumstances, such as low levels of educational attainment, low labor force participation rates, and excessively high poverty rates. Many scholars object to the model minority label because it mischaracterizes a fairly large portion of Asian-Americans with low socioeconomic standing (Hurh and Kim 1989).

Scholars have also challenged the model minority characterization with the argument that despite their high socioeconomic attainment, Asian-Americans still face covert discrimination in the labor market. It has been asserted, for example, that Asian-Americans do not have the same opportunity as whites in getting jobs commensurate with their education, particularly in obtaining supervisory positions—the so-called "glass ceiling" effect (Tang 1993, 2000; Kim and Lewis 1994). In addition, a large body of research maintains that Asian-Americans do not receive wages commensurate with their high levels of educational attainment and need "overachievement in educational attainment" to attain overall parity with whites (see Hirschman and Wong 1984, p. 584). According to this view,

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Asian-Americans have not achieved real socioeconomic equality with whites as the model minority thesis implies. Rather, the apparent overall parity in status attainment masks an underlying inequity in the process that generates economic rewards (Hirschman and Wong 1984; Hurh and Kim 1989; Takaki 1989; Min 1995).

In light of the model minority debate, our study explores Asian-Americans' earnings disadvantage in comparison to whites. We improve upon previous research in this area by taking into account the fact that many Asian-Americans are immigrants and that many Asian immigrants completed their education abroad. Both nativity and place of education are potential confounding factors for studying Asian-Americans' earnings disadvantage. Building on the past research result that Asian-Americans face an earnings disadvantage within levels of education (e.g., Hirschman and Wong 1984), we pose the following question: Are Asian-Americans still disadvantaged if we account for differences in nativity and place of education between Asian-Americans and whites?

DISENTANGLING THE EFFECTS OF RACE, NATIVITY, AND PLACE OF EDUCATION

Two previous studies, Hirschman and Wong (1984) and Sakamoto and Furuichi (2002), have particularly motivated our study. In an influential article, Hirschman and Wong argued that Asian-Americans approach earnings parity with whites by *overachieving* in education and that Asian-Americans earn less than whites within levels of educational attainment. For example, they estimated that in 1975 Chinese men received about $2,300 less than comparable white men. Sakamoto and Furuichi challenged Hirschman and Wong's overeducation hypothesis by pointing out that U.S.-born Asian-Americans earn at least as much as whites of 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 these and other similar studies (see also Hirschman and Wong 1981; Chiswick 1983; Barringer et al. 1990; Zhou and Kamo 1994; Iceland 1999) attempt to resolve is, *Do Asian-Americans face an earnings disadvantage?* Hirschman and Wong's answer was yes, supported by the observation that Asian-Americans earn less than whites within levels of educational attainment. However, comparing *U.S.-born* Asian-Americans to whites, Sakamoto and Furuichi reported 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 the group who was not born in the United States, that is, Asian immigrants.

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) found that foreign-born Asians earn much less than whites and native-born Asians. Barringer et al. (1990) reported lower incomes for Chinese, Filipinos, Koreans, and Asian Indians than for whites with equivalent education. They then pointed to the recency of immigration as a major contributor to Asians' earnings disadvantage. Furthermore, research has shown that U.S.-born Asian men receive earnings returns to their occupational status that are similar to those of white men; only foreign-born Asian men are disadvantaged (Iceland 1999).

In this study, we go beyond those well-established results by further dividing Asian immigrants into those who completed education in the United States and those who did not (see fig. 1 for our classification of Asian-Americans). We set up our study to test whether foreign-educated Asian immigrants face an earnings disadvantage in comparison with U.S.-educated Asian immigrants, and whether the latter group is disadvantaged in comparison with 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*.

The accurate identification of the disadvantaged subgroups among Asian-Americans carries important implications for our understanding of the sources of inequality for Asian-Americans. If Asian-Americans in general are disadvantaged, then racial discrimination is a plausible source of inequality. If *only Asian immigrants* are disadvantaged, then the earnings inequality likely lies in nonnativity. If, instead, *only foreign-educated Asian immigrants* are disadvantaged, we argue that the unequal labor market outcomes between Asians and whites result from human capital differences between the two groups. Hence, our research represents an effort not only to ascertain the existence of Asian-Americans' earnings disadvantage, but also to understand, if the disadvantage exists, the causal mechanisms behind it.

In the literature on Asian-Americans, there are two perspectives concerning Asian-Americans' earnings disadvantage within levels of education. The first perspective, so widely accepted in the literature that it is sometimes mistakenly taken as a consensus, is that this earnings disadvantage is indicative of racial discrimination against Asian-Americans in the labor market (Hirschman and Wong 1984; Hurh and Kim 1989; Waters and Eschbach 1995). For example, in their book *Race and Ethnic*
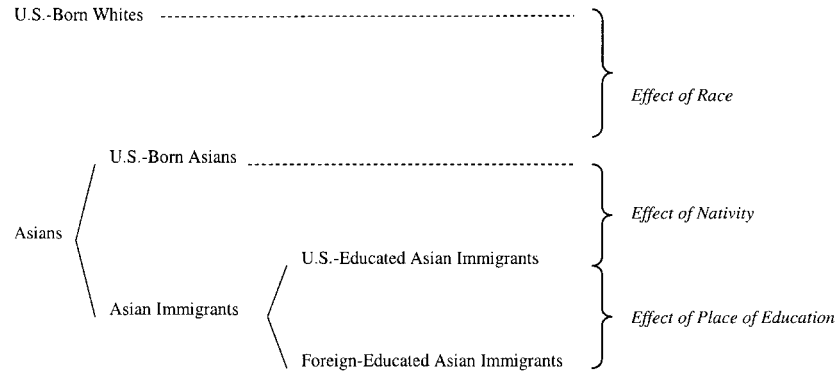
FIG. 1.—Research design: disentangling the effects of race, nativity, and place of education

Relations, Feagin and Feagin (1993, p. 354) assert that "perhaps the clearest indicator of continuing discrimination is the fact that the incomes of Japanese Americans are lower than they should be, given this group's high level of education."

In contrast, the second perspective attributes Asian-Americans' earnings disadvantage not to racial discrimination, but to immigration. It is widely recognized that immigration plays a crucial role in the stratification process of Asian-Americans. The circumstances of immigration—for example, the timing of immigration, the sending country, the immigration category, and the settlement location upon immigration—have long-term effects on the socioeconomic well-being of immigrants and their offspring. In particular, Sakamoto and Furuichi (2002) have demonstrated that nativity could explain away the racial disparity in earnings between whites and Asians. Hence, they maintain that Asians' earnings disadvantage is not due to race-based discrimination against Asians-Americans in the labor market, but is rooted in Asian immigration.

Building on the second perspective, we proceed to ask the question of *why* Asian immigrants are disadvantaged. Certainly, foreign birth by itself should not depress wages; rather, it is highly likely that other causal mechanisms associated with foreign birth are at work, such as initial economic resources, acculturation, English fluency, social networks, and human capital. Because it is difficult to tease out all the potential explanations in an empirical study, in this article we have the limited aim of testing a proposition based on the human capital explanation. More specifically, we investigate whether or not, and to what extent, Asian immigrants' disadvantage can be attributed to the lower value of foreign education in the U.S. labor market.

Our study puts to test the prevailing view in the sociology literature

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that Asian-Americans face earnings discrimination in the labor market. In the literature, earnings discrimination is typically operationalized as the residual earnings difference between Asian-Americans and whites when productivity-relevant factors, in particular human capital factors (education and experience), are controlled for (e.g., Chiswick 1983; Hirschman and Wong 1984; Sakamoto and Furuichi 2002). However, when estimating the residual earnings difference, previous studies have failed to distinguish between education attained in the United States and education attained abroad. By examining residual differences after accounting for place of education, as well as levels of education, our study sheds new light on the debate concerning whether and why Asian-Americans face an earnings disadvantage in the U.S. labor 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 United States. For example, in 2000, the high school pupil-to-teacher ratio, a widely used measure of educational quality across countries, was 19 in China, 25 in Vietnam, and 34 in India, but as low as 15 in the United States.[3] 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 (Stewart and Hyclak 1984; Friedberg 2000). Third, there is evidence that educational credentials play a role in the job market independent of the intrinsic value of education, that is, skills and knowledge acquired in schools (Hungerford and Solon 1987; Jaeger and Page 1996). Thus, higher education attained abroad may be undervalued by American employers, who are generally unfamiliar with foreign universities.

In addition to those differences pertaining to educational quality and credentials, an American education also yields other benefits that help to promote immigrants' career opportunities in the U.S. job market. A formal American education improves English proficiency and increases immigrants' exposure to American culture, both of which are very important advantages for immigrants. In addition, an American education also provides immigrants with resources for the job search. These resources include contacts, internships (American job market experience), campus recruitment, and so on.

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[3] These statistics come from UNESCO statistical tables at www.uis.unesco.org/. Retrieved November 6, 2003.

Labor economists have long argued that immigrants' human capital attained abroad is not fully compatible with the host economy and thus is discounted in the labor market (Chiswick 1978; Duleep and Regets 1997; Stewart and Hyclak 1984; Friedberg 2000). This argument has found support in several empirical studies. For example, Stewart and Hyclak (1984) analyzed the 1970 U.S. census data and found that the returns for human capital attained abroad are significantly lower than those for human capital attained after immigration. In a study using census data from Israel, Friedberg (2000) demonstrated that immigrants' earnings disadvantage relative to native workers can be fully explained by the lower value of foreign human capital. However, to date no empirical study has examined the implications of foreign human capital for Asian immigrants' earnings in the U.S. labor market.

Race, Nativity, or Place of Education?

In this study, 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). Pairwise comparisons are focused on U.S.-born whites (UBW) versus UBA, UBA versus UEAI, and UEAI versus FEAI (see fig. 1).[4] We make these three comparisons to disentangle the net effects of race, nativity, and place of education on earnings. Specifically,

1. *Race effect* is operationalized as the earnings difference between UBW and UBA because both groups are U.S.-born and U.S.-educated but differ by race;
2. *Nativity effect* is operationalized as the earnings difference between UBA and UEAI because both groups are U.S.-educated Asians but differ by nativity;
3. *Place of education effect* is operationalized as the earnings difference between UEAI and FEAI because both groups are Asian immigrants but differ in place of education.

In this research design, comparisons of the different groups allow us to attribute earnings gaps uniquely to race, nativity, and place of education.

[4] Aggregating Asian-Americans across different ethnicities facilitates pairwise comparisons involving UBW, UBA, UEAI, and FEAI. We also analyze the data with Asian-Americans separated into seven ethnic groups (Chinese, Filipinos, Japanese, Asian-Indians, Koreans, Southeast Asians, and other Asians).

As a result, we can assess the relative importance of these three factors in contributing to Asian-Americans' earnings disadvantage.

Intercept Difference and Slope Difference

Our previous discussion regarding the disadvantage of foreign education leads to the following expectation: foreign-educated Asian immigrants have lower earnings than U.S.-educated Asian immigrants, after controlling for other earnings determinants. In testing the effect of place of education on Asian-Americans' earnings, we first examine the overall net earnings difference between UEAI and FEAI, assuming the same rate of earnings return to education, and then we explore the possibility that the rate of return to education may vary across these two groups. For convenience, we call the overall group difference in earnings between FEAI and UEAI *the intercept difference hypothesis for the place of education effect*, that is, other things being equal, foreign-educated Asian immigrants overall earn less than U.S.-educated Asian immigrants.

Since the research design of our study involves comparisons by race, nativity, and place of education, we also test *the intercept difference hypothesis for the race effect*—other things being equal, U.S.-born Asian-Americans overall earn less than U.S.-born whites—as well as *the intercept difference hypothesis for the nativity effect*—other things being equal, U.S.-educated Asian immigrants overall earn less than U.S.-born Asians. By testing the race effect and the nativity effect, we reevaluate Hirschman and Wong's overeducation thesis and Sakamoto and Furuichi's nativity thesis.

The intercept difference is also known as "residual difference" in the inequality literature, since in noninteractive regressions it represents the part of the overall group disparity in the outcome variable left "unexplained" by group differences in other determinants. The approach of summarizing group comparisons with intercept differences is the predominant method adopted by studies of inequality (Cole 1979). Because an intercept difference provides a succinct one-number summary of the contrast between two groups, our first attempt is to estimate the intercept differences across the group classification scheme, as displayed in figure 1.

However, the intercept difference approach relies on the assumption that the earnings gap between two groups is approximately constant across different levels of schooling (as well as other control variables). When this assumption is violated, an intercept difference does not adequately characterize the differences between two groups. Instead, we need to incorporate both the slope difference and the intercept difference to determine if one group is disadvantaged in comparison with the other at

particular levels of education. In our case, it is plausible that education attained in the United States yields a higher rate of earnings returns than foreign education, resulting in a larger earnings gap between UEAI and FEAI at the higher end of the educational attainment distribution 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., percentage increase in earnings with an additional year of schooling) is lower for foreign-educated Asian immigrants than for U.S.-educated Asian immigrants. For convenience, we call this *the slope difference hypothesis for the place of education effect*.

DATA

Our study is based primarily on an analysis of the 1990 Census Public Use Microsample (PUMS) data, with Asians extracted from the 5% sample and non-Hispanic whites extracted from the 0.1% sample. The analytical sample consists of 25- to 44-year-old able-bodied full-time male workers, with 36,195 Asian-American cases and 22,683 white cases.[5] For a study of Asian immigrants' earnings, the PUMS data provide a large nationally representative sample. However, unfortunately for our study, it does not contain a direct measure of a key variable of interest—place of education. To remedy this deficiency, we construct a proxy measure of place of education using information from the 1993 National Survey of College Graduates (NSCG). The NSCG was administered by the U.S. Census Bureau to a nationally representative sample of persons who were identified on the 1990 census as holding bachelor's or advanced degrees. The survey contains detailed information on education and, in particular, a direct measure of place of education. In addition, most of the original variables from the 1990 census are conveniently provided in the NSCG data file. Figure 2 illustrates the relationship between the two data sources by population coverage and variable coverage. Each data set has its own limitation. Basing our analyses on the NSCG data alone would limit the scope of this study to individuals with bachelor's and advanced degrees; if we use only the census data, we do not have an accurate measure of place of education.

Our solution to the above dilemma is to borrow information from the NSCG data to construct a proxy measure of place of education for the census data, capitalizing on the fact that NSCG is essentially a follow-up survey of a subsample of the 1990 census PUMS—those with bach-

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[5] We define full-time workers as those who worked 45+ weeks and 35+ hours per week in 1989.
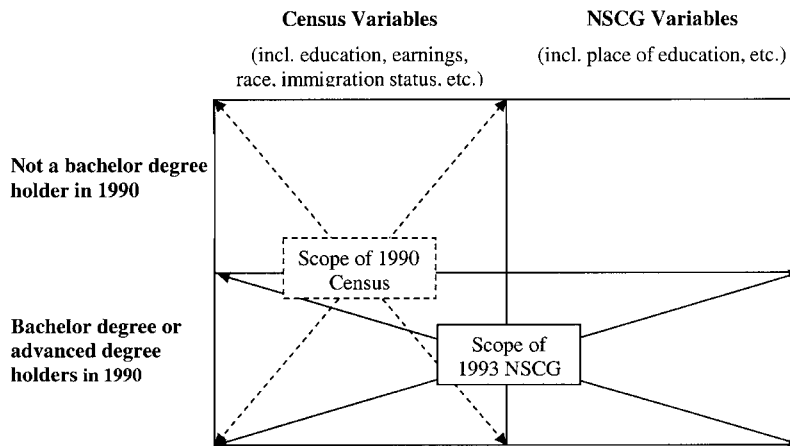
FIG. 2.—Comparison of the scopes of the 1990 census PUMS and the 1993 NSCG

elor's or advanced degrees. The basic idea of our proxy measure is that place of education can be predicted with reasonable accuracy from a few variables available on the census form: age, ethnicity, education, and year of immigration. As a simple example, most college graduates complete their education at age 22. If a person immigrated to the United States at age 20 and reported having a college education on the census form, it is highly likely that he attained college education in the United States. On the other hand, if he immigrated at age 28 and reported having a college education, his education was probably attained abroad prior to immigration.[6] Below, we describe our method of constructing the proxy measure and then discuss its limitations.

In the first step, we use the NSCG as the training data set to "learn" a classification rule for distinguishing between UEAI and FEAI among Asian immigrants with higher education. To do that, we build a model with place of education as the outcome and a few census variables as predictors. We limit the predictors to variables available from the census so that the classification rule "learned" from the NSCG can later be applied to the census data set to impute place of education. After experimenting with several classification methods, we finally chose a binary logit model with age, immigration year, education, and ethnicity as predictors, and

[6] The emphasis is on the place where education was completed. Immigrants whom we classified as U.S.-educated may have had some schooling in their home countries prior to immigration. We assume that whether or not a worker had attained some education in his home country does not matter much for earnings as long as he completed education in the United States.

the following classification rule: if an immigrant's predicted probability of being foreign-educated is greater than 0.5, he is classified as foreign-educated, otherwise U.S.-educated. Our classification model results in a misclassification rate of 14% for the NSCG data.

The next step is to impute place of education for the census data set. We divide all cases of Asian immigrants into two subsamples: those with college or advanced degrees and those without degrees. For the first subsample, we apply the classification rule as derived from the NSCG data. For the second subsample without college degrees, since we could not estimate a classification model due to the lack of a direct measure of place of education, we simply predict place of education by comparing an immigrant's age at immigration against his age at completing the highest level of schooling, calculated as years of schooling plus six years.

Our procedure for predicting place of education is subject to error resulting from two main sources. The first is that year of immigration is crudely measured in the 1990 census on an interval scale rather than on a yearly scale. In using this variable, we impute the yearly scale using midpoints. While this measurement error in year of immigration could potentially lead to misclassification, the resulting prediction error is unlikely to be correlated with earnings. Hence, this is a simple case of measurement error in the independent variable with the consequence of attenuated regression coefficients (Greene 2003). To put it in another way, the estimated earnings disparity between UEAI and FEAI is biased toward zero.

The second source of error is that some individuals may have discontinuous or prolonged education histories so that their ages at completing the highest level of education do not follow the standard pattern commonly assumed (Mincer 1974). In this case, our procedure tends to misclassify immigrants with discontinuous or prolonged education histories as foreign-educated when they are in fact U.S.-educated. We suspect that this prediction error is correlated with earnings capacity. However, the direction of the correlation could be either negative or positive. On the one hand, if a late age of completing college indicates lower ability, we tend to misclassify individuals with lower earnings potentials as FEAI. On the other hand, if going back to school after a period of work indicates higher motivation to succeed in the labor market, our procedure tends to misclassify individuals with higher earnings potentials as FEAI. Thus, the second source of error may introduce biases in favor of our hypothesis in the first scenario and against our hypothesis in the second scenario.

Another key variable in our study is educational attainment. The 1990 census measures education in terms of attained degrees rather than years of schooling. For comparing rates of return to education across groups, it is desirable to have a parsimonious measure of education. Therefore,

we use years of completed schooling as a continuous measure of education. However, for a study of earnings, attained degree is a better measure of education because there are earnings premiums to degrees that are not captured by the corresponding years of schooling (Jaeger and Page 1996). For example, workers with professional degrees and master's degrees spend about the same number of years in school (around 18 years), but the former group on average earns 46% more than the latter group in our sample. For that reason, we retain the information on degree type in our study.

The primary objective of our study is to compare the earnings of white workers and three groups of Asian workers while controlling for education and other productivity-related variables. Since less than 1% of the U.S.-educated Asian immigrants and the U.S.-born Asians in our sample never completed the ninth grade, the comparisons are meaningless at the very low end of the educational attainment distribution. Thus, we delete from our sample individuals who never completed the ninth grade.

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 (UBW), 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.

Differences across the four groups of workers in socioeconomic status are evident. By and large, U.S.-educated Asian immigrants enjoy the highest status—as measured by earnings, education, and occupation— followed by U.S.-born Asians, U.S.-born whites, and foreign-educated Asian immigrants. FEAI have the lowest income and occupational attainment, and UBW have the lowest educational attainment. Particularly notable in table 1 is the contrast between the two groups of Asian immigrants. U.S.-educated immigrants have on average two more years of schooling (16.17 years vs. 14.17 years) and earn 37.5% more ($33,000 vs. $24,000) than foreign-educated immigrants. In addition, an astonishingly high proportion of UEAI—one-third—work in professional occupations. In contrast, only 13% of FEAI are professional workers. Moreover, UEAI tend to be younger, have less work experience, but have stayed longer in the United States than FEAI. Finally, the three Asian groups are also different in ethnic composition, with U.S.-born Asian-Americans composed almost exclusively of Japanese, Chinese, and Filipinos, and Asian immigrants being more diverse in ethnic composition.

Figures 3–5 illustrate the link between our study and previous studies.

TABLE 1
DESCRIPTIVE STATISTICS

Variable	UBW	UBA	UEAI	FEAI
Median annual income (in $1989)	29,000	32,000	33,000	24,000
Mean years of schooling	13.96	14.97	16.17	14.17
%high school or below	38.47	17.72	8.87	33.73
%some college	31.25	33.01	20.96	29.85
%college graduates	20.41	33.15	30.51	25.65
%master and Ph.D.	9.87	16.12	39.67	10.77
Occupation:				
%managerial	15.39	18.63	18.32	14.71
%professional	13.46	21.46	32.59	13.23
%technical, sales, and administra-				
tive support	22.2	26.74	28.21	28.59
%service, farming, production, and				
other	48.95	33.18	20.88	43.48
Mean age	34.47	33.91	33.4	36.01
Mean years of experience	14.52	12.94	11.23	15.84
Proportion living in urban areas	.80	.91	.98	.97
Proportion speaking English less than				
very well	0	.03	.30	.54
Median years of U.S. stay	. . .	. . .	13	7
Ethnicity:				
%Chinese	. . .	27.64	36.71	16.23
%Filipino	. . .	17.43	12.26	26.18
%Japanese	. . .	48.24	4.59	8.44
%Asian Indian	. . .	1.74	19.04	17.38
%Southeast Asian	. . .	1.98	7.92	11.53
%Other Asian	. . .	.57	14.62	16.22
N	22,683	7,189	12,565	16,441

Based on the 1990 census data, figures 3 and 4 reproduce, respectively, the bivariate version of Hirschman and Wong's and Sakamoto and Furuichi's findings. Figure 3 indicates that Asian-Americans on average have the same earnings as whites, but at each level of educational attainment their 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 4 suggests that Asian-Americans' earnings disadvantage can be explained away 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, whereas Asian immigrants earn consistently less than whites. Figure 5 further divides 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 generally have an earnings advantage over FEAI, except
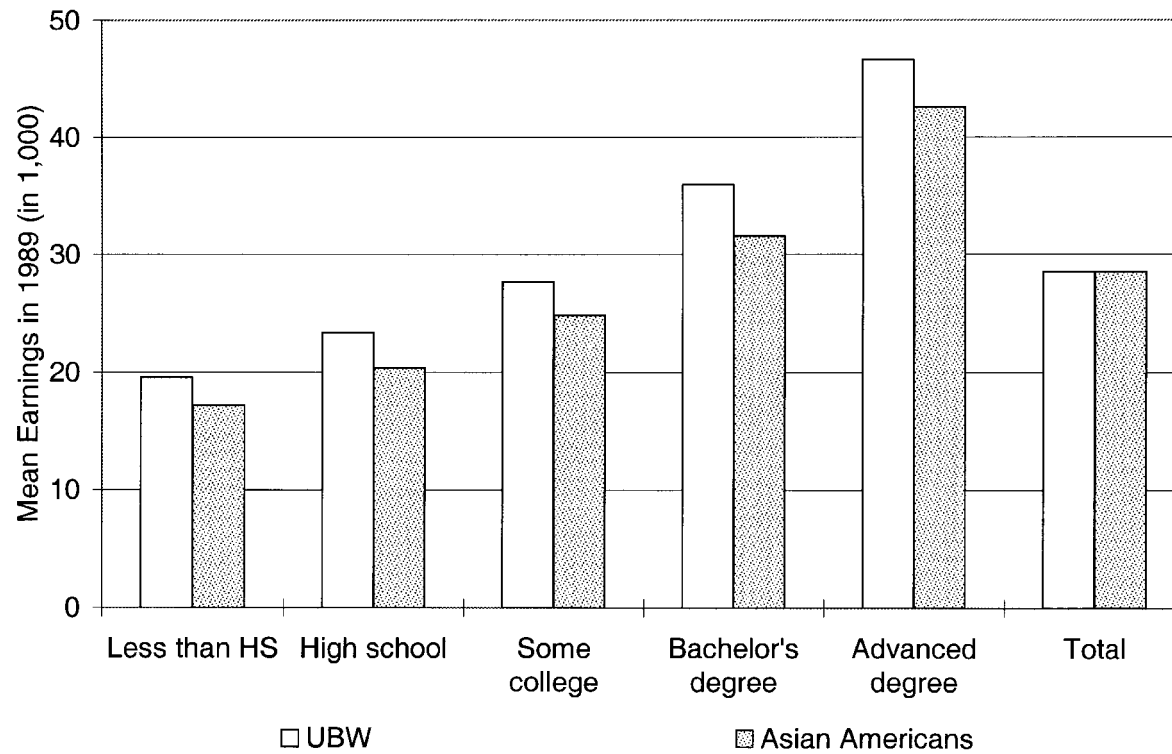
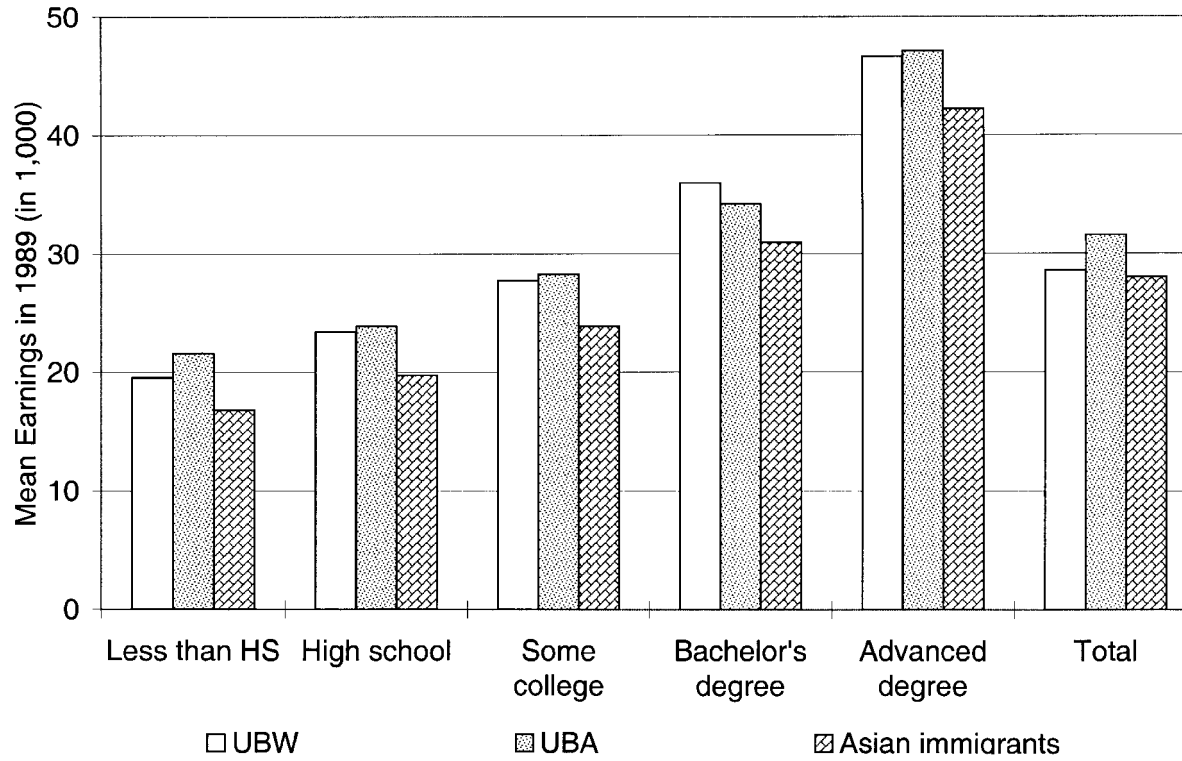FIG. 3.—Mean earnings of whites and Asian-Americans

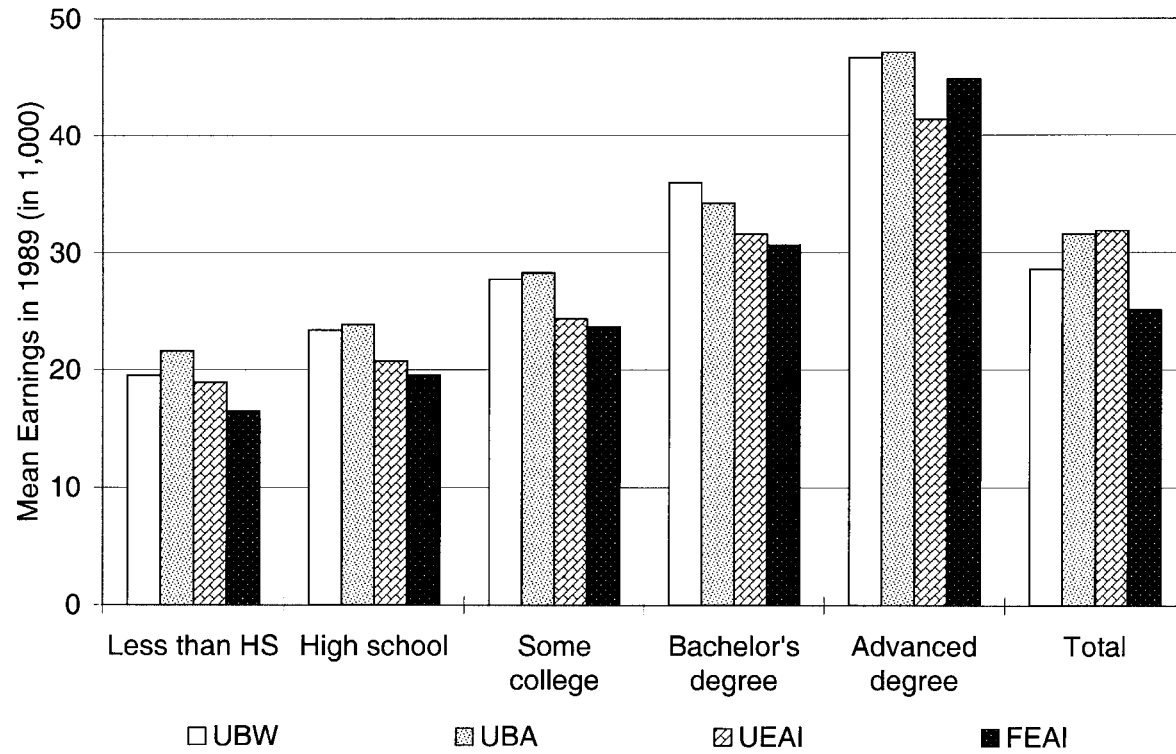Fig. 4.—Mean earnings of whites and Asian-Americans by nativity

FIG. 5.—Mean earnings of whites and Asian-Americans by nativity and place of education

among advanced degree holders.[7] However, compared to UBA, UEAI still face an earnings disadvantage. It seems, therefore, that earnings differ *both* by place of education and by nativity among Asian-Americans. We also note that in the aggregate the earnings of UEAI are the highest of the four groups, but this is not true within levels of educational attainment. This paradox is attributable to UEAI's concentration in the higher levels of education, as shown in table 1.

In sum, our preliminary analyses in figures 3–5 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. The earnings of foreign-educated Asian immigrants are the lowest. Thus, it appears that being Asian (vs. white) by itself is not a disadvantage, but foreign birth and foreign education are.

MULTIVARIATE METHODS

In order to formally test our hypotheses of lower earnings and lower rate of return to education for foreign-educated Asian immigrants, we estimate a set of earnings regression models. For our baseline model, model 1, we consider the following equation:

$$y_{ij} = \alpha_j + \beta x_{ij} + \boldsymbol{\gamma}' \mathbf{z}_{ij} + \varepsilon_{ij}, \quad j = 0, 1, 2, 3, \tag{1}$$

where y_{ij} is log annual earnings of the ith individual belonging to the jth group in 1989, with $j = 0, 1, 2, 3$, indicating UEW, UBA, UEAI, and FEAI, respectively. In this specification, α_j represents a group-specific intercept, and x is years of schooling, bounded between 9 and 20. Vector $\mathbf{z}$ is a set of control variables that includes potential work experience, log weeks worked in 1989, log hours worked per week in 1989, English proficiency, residence, and an indicator for professional degree.[8]

The coefficient of education β is interpreted as the rate of return to education, which measures how fast earnings increase proportionately with each additional year of education. In equation (1), we treat education as a linear predictor of log earnings and thus assume a constant rate of return. Although this is a common specification for earnings equations in

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[7] Further analysis indicates that FEAI's earnings advantage relative to UEAI at the highest level of educational attainment is due to their higher proportion of professional degree holders. Among advanced degree holders, 53.6% of FEAI (compared to 7.6% of UEAI) hold professional degrees; professional degree holders on average earn 30% more than workers with doctoral degrees and 46% more than workers with master's degrees.

[8] English proficiency is a categorical variable (coded as *very well*, *well*, *not very well*, *not at all*). The professional degree variable allows for an earnings premium for having a professional degree beyond what is predicated based on 18 years of schooling.

the literature, previous research has also indicated that schooling does not have a linear effect on the logarithm of earnings (Hungerford and Solon 1987). For example, years spent in college may have a higher rate of return than years spent in high school. Since the linear specification of education may not fit the data, our second model uses a piecewise linear function (spline function) of education with knots at 12 and 16 years of schooling. The spline function breaks up education into three segments of 9–12, 12–16, and 16–20 years of schooling:

$$s^1(x) = \begin{cases} x - 9 & x \le 12 \\ 3 & x > 12, \end{cases}$$

$$s^2(x) = \begin{cases} 0 & x \le 12 \\ x - 12 & 12 < x \le 16 \\ 4 & x > 16, \end{cases}$$

$$s^3(x) = \begin{cases} 0 & x \le 16 \\ x - 16 & x > 16. \end{cases} \tag{2a}$$

Using the spline function of equation (2a) for education, we derive model 2 as:

$$y_{ij} = \alpha_j + \beta^1 s^1(x_{ij}) + \beta^2 s^2(x_{ij}) + \beta^3 s^3(x_{ij}) + \gamma' \mathbf{z}_{ij} + \varepsilon_{ij}, \quad j = 0, 1, 2, 3,$$

$$\tag{2b}$$

where β^1, β^2, and β^3 represent the rates of return to high school education, college education, and graduate education respectively.

Both models 1 and 2 test the intercept difference hypothesis. A common feature of the two models is the absence of interaction between group and education. In other words, both models constrain the regression planes of earnings to be parallel for the four groups. The order of the regression planes and their distances from each other—indicated by α_j—measure the relative earnings of the four groups when other earnings determinants are held constant.

For model 3, which tests the slope difference hypothesis, we modify equation (1) to

$$y_{ij} = \alpha_j + \beta_j x_{ij} + \gamma' \mathbf{z}_{ij} + \varepsilon_{ij}, \qquad j = 0, 1, 2, 3, \tag{3}$$

where we allow the rate of return to education to vary by group, that is, β is indexed by subscript j. We are interested in how β varies by group and particularly in whether Asian immigrants receive a higher rate of return to U.S. education (β_2) than to foreign education (β_3). As we pointed out earlier, α_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 (3) serves to check if the specification for model 1 (i.e., eq. [1]) is appropriate.

Model 3 shares with model 1 the assumption that the education effect is constant across years of schooling. To avoid potential misspecification, we modify model 3 (eq. [3]) by replacing the constant education effect with a piecewise linear specification, which results in model 4. Thus, we have a total of four (two-by-two) model specifications, as shown in figure 6.

Similar to model 3, model 4 also tests the slope difference hypothesis, but with a more flexible piecewise linear specification for education. Of the four models, model 4 is the most general, allowing the education slope to vary across education levels, as well as across groups.

$$y_{ij} = \alpha_j + \beta_j^1 s^1(x_{ij}) + \beta_j^2 s^2(x_{ij}) + \beta_j^3 s^3(x_{ij}) + \gamma' \mathbf{z}_{ij} + \varepsilon_{ij}, \quad j = 0, 1, 2, 3,$$

$$(4a)$$

where β_j^1, β_j^2, and β_j^3 are respectively the rates of return to high school education, college education, and graduate education for group j.

With a total of 12 parameters for the education effect, model 4 has the disadvantage of being too complicated as a test of the slope difference hypothesis. Since it yields three education coefficients per group, there is no easy way to compare the estimated rates of return to education across groups. Therefore, we wish to impose some structure on model 4 to obtain a parsimonious model that permits an easier comparison of the β coefficients across groups. Toward this goal, we estimate model 4*, defined as follows:

$$y_{ij} = \alpha_j + (\beta^1 + \delta_j)s^1(x_{ij}) + (\beta^2 + \delta_j)s^2(x_{ij}) + (\beta^3 + \delta_j)s^3(x_{ij})$$

$$+ \gamma' \mathbf{z}_{ij} + \varepsilon_{ij}, \quad (4b)$$

where δ_j represents group differences in the rates of return to education. Note that model 4* allows the rates of return to education to vary both by group and by levels of education, but it imposes the constraint that group differences in slope are the same across levels of education. For example, the slopes for whites are $\beta^1 + \delta_1$, $\beta^2 + \delta_1$, and $\beta^3 + \delta_1$ for high school, college, and graduate education, and the slopes for UBA are $\beta^1 + \delta_2$, $\beta^2 + \delta_2$, and $\beta^3 + \delta_2$. The slope differences between UBA and whites are therefore $\delta_1 - \delta_2$ for all three segments of education.[9] With this constraint in place, the difference in the rate of return to education between any two groups is summarized by only one parameter, enabling a

[9] For convenience, δ_1 can be normalized to be "0" in estimation. The difference in slope between whites and UBA then becomes δ_2.

Spline

No   Yes

Model 1   Model 2

No   Intercept

                                                          difference?

Interaction

Model 3   Model 4*

Yes   Slope

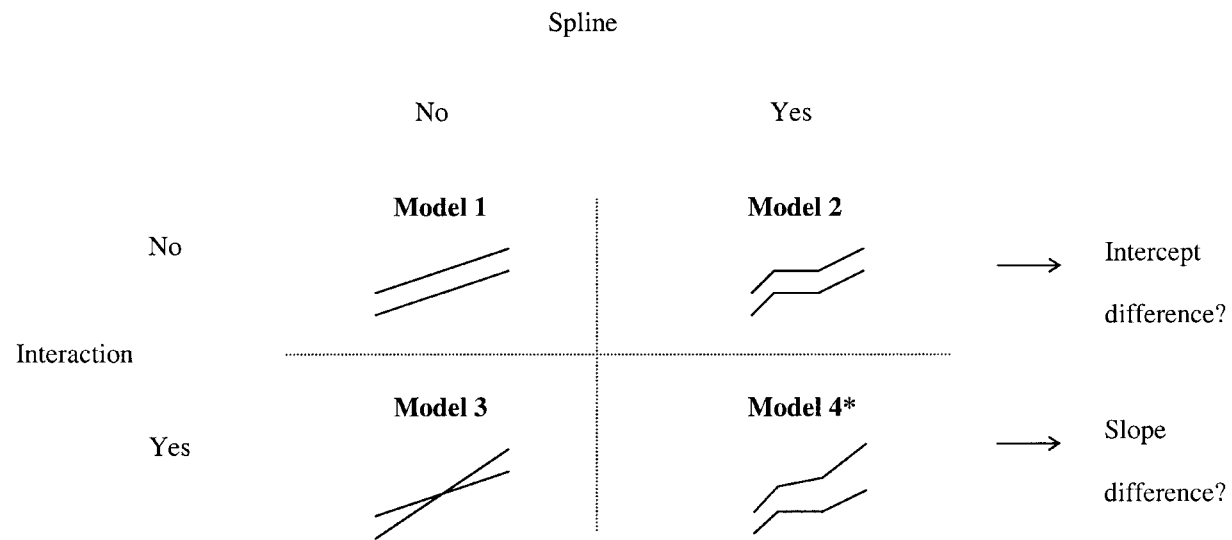   difference?

FIG. 6.—Four models for multivariate analysis

one-degree of freedom test of the slope difference hypothesis under the piecewise linear specification of education.

The five models may be organized into four nesting levels to facilitate model comparisons via F-tests. In order of decreasing restriction, the four levels are 1, 2 and 3, 4*, 4. Of the five models, any two of them—with the exception of models 2 and 3—are related through nesting and thus directly comparable through F-test.

Since the analytical sample is disproportionate by race, with Asian-Americans drawn from the 5% PUMS and whites drawn from the 0.1% PUMS, we weigh the cases accordingly in the regression analysis. We also conducted the analysis without weights, but the results are almost identical. To save space, we present only weighted results in the next section.

RESULTS

Testing the Intercept Hypothesis

Table 2 presents regression results for models 1 and 2. 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 to the lowest earnings is UBW, UEAI, UBA, and FEAI. To compare two groups' earnings after controlling for all the other variables in the models, we take the difference in intercept between the respective groups and exponentiate it. Through this procedure, the results from model 2 reveal that UBA earn 5% less than UBW, UEAI earn 5% more than UBA, and FEAI earn 16% less than UEAI. Group differences in earnings estimated from model 1 are almost identical. Furthermore, t-tests of pairwise group differences indicate that only the difference between UEAI and FEAI is statistically significant (p-value < 0.001). The 5% earnings difference between UBW and UBA is not statistically significant in model 1 (p-value $=$ 0.057) and only marginally significant in model 2 (p-value $=$ 0.05). The difference between UBA and UEAI is not significant in either model.

Recall that in our research design the earnings differences between UBW and UBA, between UBA and UEAI, and between FEAI and UEAI represent the net effects of race, nativity, and place of education respectively (fig. 1). With this in mind, we draw two substantive conclusions from models 1 and 2. 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 of 16%. That is, place of education has a substantial effect on the earnings of Asian-Americans. Second, earnings differences across the other three groups—U.S.-born whites, U.S.-born Asian-Americans, and U.S.-

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TABLE 2
ESTIMATED REGRESSION COEFFICIENTS FROM EARNINGS ESTIMATIONS

	MODEL 1		MODEL 2	
	Coefficient	SE	Coefficient	SE
Intercept:				
UBW	1.008	.151	1.270	.158
UBA	.958	.153	1.218	.161
UEAI	.992	.153	1.265	.160
FEAI	.857	.152	1.116	.160
Education	.103	.001		
High school			.081	.005
College			.113	.001
Graduate			.075	.003
Professional degree	.355	.013	.388	.013
Experience	.051	.002	.052	.002
Experience^2 per 1,000 units	−.890	.058	−.934	.058
English (reference = speak English only):				
Very well	−.068	.013	−.068	.013
Well	−.147	.024	−.147	.024
Not well	−.146	.031	−.144	.031
Not at all	−.356	.116	−.355	.116
Log of hours worked per week in 1989	.417	.011	.417	.011
Log of weeks worked in 1989	1.433	.037	1.426	.037
Urban residence:				
Division (reference = New England)	.157	.005	.155	.005
Middle Atlantic	−.012	.010	−.012	.009
East north central	−.057	.009	−.056	.009
West north central	−.175	.011	−.174	.011
South Atlantic	−.114	.009	−.116	.009
East south central	−.171	.012	−.172	.012
West south central	−.107	.010	−.108	.010
Mountain	−.117	.012	−.118	.012
Pacific	.038	.010	.036	.010
R^2	.29		.29	

NOTE.—N = 58,878; R^2 = .29.

educated Asian immigrants—are small to negligible. This leads us to conclude that the effects of race and nativity on earnings are minimal.

Furthermore, we also observe that the rate of return to education varies substantially across levels of education. When constrained to be constant from 9–20 years of schooling in model 1, the rate of return to education is 0.103. In model 2, it is 0.081 for high school education, 0.113 for college education, and 0.075 for graduate education. According to the F-test comparing model 1 to model 2, the variation in the rate of return to education

TABLE 3
Estimated Coefficients of Education from Earnings Estimations

	UBW	UBA	UEAI	FEAI
Model 3:				
Intercept	1.009	.987	.901	.814
	(.151)	(.243)	(.207)	(.188)
Education ...	.103	.101	.109	.106
	(.001)	(.013)	(.009)	(.008)
Model 4*:				
Intercept	1.272	1.231	1.021	1.074
	(.158)	(.248)	(.214)	(.193)
Education:				
9–12	.081	.081	.097	.084
	(.005)	(.014)	(.010)	(.009)
12–16	.113	.112	.128	.116
	(.001)	(.013)	(.009)	(.008)
16–20	.074	.073	.089	.077
	(.004)	(.013)	(.009)	(.008)

Note.—Nos. in parentheses are SEs.

is statistically significant (p-value < 0.001). Although this result does not change our conclusions concerning earnings comparisons across the four groups, it suggests that the piecewise linear specification of education is preferable to the globally linear specification.

Testing the Slope Difference Hypothesis

We now turn to the results of 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, with education coefficients varying with educational level, as well as with group. For simplicity, only the coefficients of education and their standard errors are presented in table 3.

In both models 3 and 4*, UEAI have the highest rate of return to education, followed by FEAI, and then by UBW; UBA have the lowest rate of return to education. However, the slope difference between UEAI and FEAI is relatively small and not statistically significant. Thus, the slope difference hypothesis that the rate of return to foreign education is lower than the rate of return for domestic education is not supported. F-tests indicate that models 3 and 4* do not significantly improve the goodness-of-fit over their noninteractive counterparts of models 1 and 2 (with p-values at 0.89 and 0.37, respectively). Since the rate of return to education is basically the same for all groups, intercept differences adequately capture group differences in earnings.
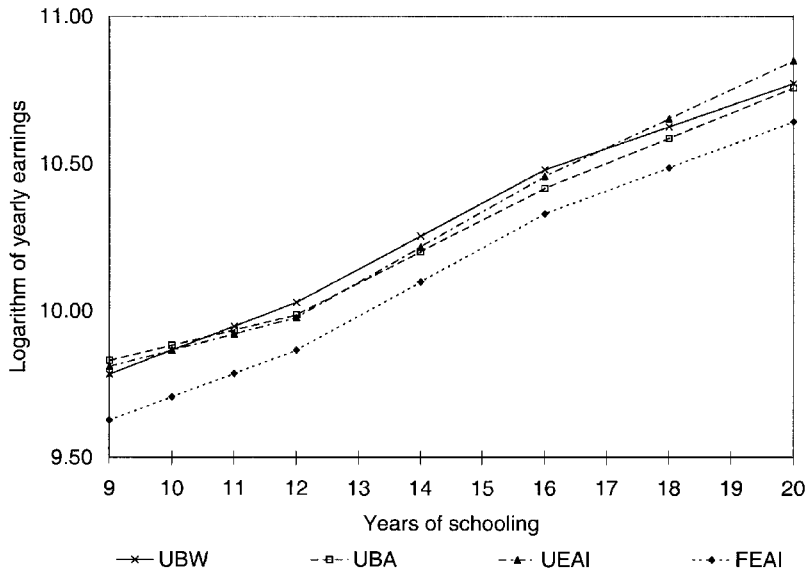
FIG. 7.—Predicted log earnings for whites and Asian-Americans (based on model 4)

Predicting Earnings Profiles and Model Selection

For a more conservative description of the earnings profiles for the various groups of white and Asian workers, we estimate model 4, which is the full interactive model allowing the slopes of education to vary freely for each segment of education and for each group. Figure 7 plots the earnings for the four groups against years of schooling based on model 4, with all other predictors (professional degree, work experience, labor input, residency, and English proficiency) held at the sample means. It is evident from figure 7 that the predicted earnings of foreign-educated immigrants are noticeably lower than those of the other three groups and that the predicted earnings profiles of U.S.-educated Asian immigrants closely track those of U.S.-born Asians and whites. Taken together, these two features suggest that race and nativity play negligible roles in determining Asian-Americans' earnings, but that the role of place of education is considerably more important.

Figure 7 also sheds light on the issue of model selection. We observe that for all four groups of workers the slope of education is steeper for college education than for high school education and graduate education. This suggests that the piecewise linear specification of schooling effects captures the data better than the globally linear specification. On the other hand, the slopes of education do not vary appreciably across groups, indicating no significant interaction between group effects and the rates

of return to education. Thus, based on figure 7, we prefer model 2 to the other models. According to the Bayesian information criterion (BIC), model 2 is also the best model among the five models. The BIC statistics are $-20,256$ for model 1, $-20,331$ for model 2, $-20,224$ for model 3, $-20,301$ for model 4*, and $-20,237$ for model 4.

Ethnic Differences

Given that our focus in this article is on the role of place of education in determining Asian-Americans' earnings, we have so far purposefully avoided discussing ethnic differences among Asian-Americans. However, as we emphasized in the introduction of the article, ethnic diversity is an important dimension of Asian-Americans' socioeconomic heterogeneity. Numerous studies have established that immigrants' labor market performance varies substantially across countries of origin, with those from East Asia receiving higher earnings than immigrants from Southeast Asia (Chiswick 1983; Barringer et al. 1990). To the extent that educational quality and skill transferability differ by immigrants' origin countries (Bratsberg and Terrell 2002), the magnitude of the earnings disadvantage associated with foreign education should vary accordingly. Furthermore, due to a homogenizing effect of U.S. education and work experience, we expect ethnic differences in earnings to be smaller among UEAI than among FEAI.

To better understand the relationship between place of education and ethnic variation in earnings, we refine model 2 by expanding each Asian category as defined in figure 1 into seven ethnic groups so that the intercept parameter α is now indexed by ethnicity-specific categorization. That is, we let α_{jk} denote the intercept for the jth (1 = UBA, 2 = UEAI, 3 = FEAI) Asian category and kth ethnicity (1 = Chinese, 2 = Filipino, 3 = Japanese, 4 = Korean, 5 = Asian Indian, 6 = Southeast Asian, 7 = other Asian), and α_0 denote the intercept for whites. This expansion yields 21 Asian groups plus non-Hispanic U.S.-born whites for a total of 22 groups. Except for the redefinition of groups, the regression model is the same as model 2. The results are given in table 4.

To facilitate interpretation, we present the ratio of each Asian group's earnings to those of native-born non-Hispanic whites, controlling for all other variables in the model. Essentially, the entries in table 4 are $\exp(\alpha_{jk} - \alpha_0)$. We first compare relative earnings of UBA, UEAI, and FEAI (i.e., variation across j) within each ethnic group and then examine the ethnic variation (i.e., variation across k) within each category of UBA, UEAI, and FEAI. Two findings emerge. First, there is no significant earnings difference between UBA and UBW or between UEAI and UBW for any of the ethnic groups, but the difference between FEAI and UBW

TABLE 4
Adjusted Relative Mean Earnings by Ethnicity, Nativity,
and Place of Education

	UBA	UEAI	FEAI
Chinese	1.00	1.00	.80***
Filipino	.90	.92	.77***
Japanese	.94	1.03	1.39***
Asian-Indian	.99	1.08	.87**
Korean	.92	.98	.89*
Southeast Asian ...	.87	.97	.87**
Other Asian	.87	.96	.77**

Note.—The entries are the ratios of Asian groups' earnings to those of U.S.-born white workers who are comparable in education, experience, English skills, labor input, and residence.
* $P < .05$, two-tail t-test result for the difference between the corresponding Asian group and UBW.
** $P < .01$.
*** $P < .001$.

is statistically significant within each ethnicity. Second, ethnic variation in earnings is small and statistically insignificant among U.S.-born and U.S.-educated Asians, but huge among foreign-educated Asians.[10] For example, foreign-educated Japanese earn two-fifths more than comparable native-born whites, but Filipinos earn 23% less than whites.

The analysis of ethnic variation calls for a more nuanced interpretation of our earlier results based on collapsing all Asian ethnicities into a single group. The ethnic model shows that foreign education does not invariably depress immigrants' earnings. Foreign-educated Japanese immigrants, for example, perform exceptionally well in the U.S. labor market in comparison to U.S.-born and U.S.-educated Japanese. We suspect that Japanese immigrants' higher earnings are attributable to their superior educational quality and their high concentration in managerial positions as a consequence of Japan's economic globalization (Fang 1996). For the majority of Asian immigrants, however, foreign education does lead to an earnings disadvantage. Hence, the existence and magnitude of the disadvantage of foreign education depend on immigrants' origin countries. Furthermore, while our results are consistent with the well-documented observation that there is a large degree of ethnic variation in earnings among Asian-Americans, they also suggest that such ethnic variation is limited to immigrants with foreign education. We interpret this finding

[10] In order to test the statistical significance of ethnic variation among UBA and UEAI, we estimated a model with ethnic groups collapsed within the categories of UBA and UEAI, i.e., a model with the following 10 groups: UBW, UBA, UEAI, and the seven ethnic groups of FEAI. The F-test comparing this model to the original ethnic model of 22 groups resulted in a p-value of 0.795, supporting the simplified ethnic model.

to mean that the widely reported and accepted ethnic variation in earnings is mainly attributable to human capital differences across ethnic groups among immigrants who immigrated to the United States as adults, since the earnings of Asian workers who were either born in the United States or educated in the United States do not differ appreciably by ethnicity.

Causal Mechanisms

The previous regression analyses produced compelling evidence that foreign-educated Asian immigrants face an earnings disadvantage when compared to U.S.-educated Asian immigrants of similar backgrounds. However, our interpretation that this disadvantage is due to lower human capital endowments of foreign-educated Asian immigrants is only intuitive because the previous analyses did not address the actual mechanisms through which foreign education generates this disadvantage. In the following, we report an additional analysis based on the NSCG to explore the question of mechanisms.

We expect that a significant part of FEAI's earnings disadvantage is attributable to their difficulty in obtaining desirable jobs. The NSCG measured whether respondents' jobs are related to their highest degrees and whether their jobs involve supervisory responsibilities. This information allows us to explore two aspects of FEAI's occupational experience: (1) compared to UEAI, FEAI are less likely to hold career-track jobs that are suitable to their educational backgrounds; and (2) FEAI are less likely to be promoted to supervisory positions—the so-called glass ceiling effect.

The top half of table 5 shows that foreign-educated Asian immigrants are less likely to work in jobs that are closely related to their highest degrees compared to UEAI (47% vs. 63%). Note that workers holding jobs closely related to their highest degrees earn much more (on average 30% more) than those working in unrelated jobs. Furthermore, table 5 shows a substantial interaction effect between foreign education and job/degree relatedness: if FEAI work in unrelated jobs, they face an earnings disadvantage of 20%; however, if they work in degree-related jobs, the gap reduces to only 9%.

The results on supervisory responsibilities, reported in the bottom half of table 5, are similar. The percentage of workers with supervisory responsibilities is slightly lower among FEAI than that among UEAI (50% vs. 55%). As expected, workers with supervisory responsibilities earn more than other workers, by 26% on average. Holding a job with supervisory responsibilities attenuates FEAI's earnings disadvantage in a manner similar to holding a degree-related job: the earnings gap of 23% between

TABLE 5

Decomposition of FEAI's Earnings Disadvantage: Unsuitable Jobs and the Glass Ceiling Effect

	Distribution (%)		Adjusted Earnings ($)		Earnings Ratio (%)
	FEAI	UEAI	FEAI	UEAI	FEAI to UEAI
Job/highest degree relatedness:					
Closely related	47.4	62.7	44,329	48,952	90.6
Moderately related	24.7	25.7	38,758	46,602	83.2
Not related	28.0	11.6	30,510	37,998	80.3
Total	100.0	100.0			
Supervisory responsibilities:					
Yes	49.6	55.2	45,698	48,884	93.5
No	50.4	44.8	33,507	43,438	77.1
Total	100.0	100.0			

Note.—This table is based on our analysis of the 1993 NSCG. Cols. 1 and 2 are distributions of FEAI and UEAI in two job characteristics. Cols. 3 and 4 give predicted earnings with covariates—degree type, major, residence, and fluency of English—held at their sample means. Col. 5 is the ratio of col. 3 to col. 4.

FEAI and UEAI among workers with no supervisory responsibilities reduces to only 7% among workers with supervisory responsibilities.

DISCUSSION: PLACE OF EDUCATION OR ASSIMILATION

A key finding from the preceding regression analyses is that foreign-educated Asian immigrants generally earn much less than the other groups—U.S.-born whites, U.S.-born Asians, and U.S.-educated Asian immigrants. However, before we can conclude that this evidence supports our thesis that Asian-Americans' earnings disadvantage is largely due to the lower value of human capital obtained abroad, it is necessary to address an alternative interpretation: assimilation.

It has long been known that a salient feature of immigrants' earnings trajectory is earnings assimilation—the phenomenon that immigrants' earnings grow faster than native workers so that the former gradually approach the latter with the increase of length of stay in the United States (Chiswick 1978; Duleep and Regets 1997; LaLonde and Topel 1992; Lofstrom 2002). In our study, the median length of stay in the United States is seven years for FEAI and 13 years for UEAI (see table 1). Thus, it appears that FEAI's earnings disadvantage may be attributable to the assimilation effect. In other words, the earnings gap between FEAI and UEAI may not reflect the disadvantage of foreign education, but rather the fact that UEAI are at a later stage of the assimilation process than FEAI.

We concede that assimilation is a plausible alternative explanation and that the data used in this study do not allow us to put it to a direct test. The difficulty lies in our inability to estimate the effect of place of education on earnings while controlling for potential work experience and assimilation (measured by years of stay in the United States) at the same time, since place of education is a function of the latter two variables. That is, if an immigrant's potential work experience exceeds his years of stay in the United States (i.e., he finished schooling before immigration), he is foreign-educated; otherwise, he is U.S.-educated. Consider an "experiment" where the treatment group is UEAI, the control group is FEAI, and the outcome variable is earnings. If the two groups are to have the same amount of work experience, they cannot have the same length of stay, since UEAI needed extra time to complete education in the United States. If the two groups are to have the same length of stay, they cannot have the same amount of work experience, since UEAI took some of this time to complete education. Thus, we cannot estimate the causal effect of place of education net of work experience and years of stay in the United States because groups appropriate for this comparison do not exist.

Nonetheless, it is useful to take a closer look at assimilation as a plausible explanation. In the sociological literature, assimilation is often used synonymously with *acculturation* (Alba and Nee 1997). In our view, this interpretation of assimilation, especially when assimilation is operationalized as length of stay in the United States, is too narrow. We propose that assimilation encompass two processes through which immigrants narrow the earnings gap with native workers: acculturation *and* the accumulation of U.S.-specific work experience. When new immigrants first arrive in the United States, they basically forgo their work experience attained abroad, as the return to foreign work experience is very low (Friedberg 2000; Schaafsma and Sweetman 2001). As immigrants gain experience in the United States and demonstrate their productivity, their earnings grow quickly. For that reason, we should not attribute all of the effect captured by length of stay to acculturation. Rather, a significant part of this effect is due to the accumulation of work experience in the U.S. labor market.

This interpretation of the assimilation process diverges from the assimilation-as-acculturation view and emphasizes the human capital factor in the stratification process of immigrants. More specifically, in recognizing the importance of *labor market specific* human capital (i.e., work experience), it is consistent with our theoretical argument that immigrants earn less than native workers because of the lower value of human capital attained abroad. Recall that both education and work experience are key components of human capital (Mincer 1974). It is in this sense that our thesis about place of education does not represent a major departure from

the assimilation theory. Rather, it provides the theory with a concrete mechanism through which assimilation works to advance immigrants' labor force outcomes—the attainment of human capital specific to the U.S. labor market.

CONCLUSION

Why do Asian-Americans experience an earnings disadvantage? More specifically, why do Asian immigrants experience an earnings disadvantage? In this article, we advanced the thesis that Asian immigrants earn less than their U.S.-born counterparts because many immigrants completed their education in their home countries and foreign education is less valuable in the U.S. job market than education acquired in the United States. We evaluated this hypothesis by analyzing a sample of 25- to 44-year-old full-time male workers drawn from the 1990 census, with the earnings disadvantage operationalized as the residual group difference in earnings when other earnings determinants are controlled for.

In order to contrast the effect of place of education against the effects of nativity and race, we divided Asian-Americans into three subgroups: those born in the United States, those who immigrated to and completed their education in the United States, and those who immigrated to the United States but had completed their education in their home countries prior to immigration. Under this research design, the earnings difference between U.S.-born Asian-Americans and U.S.-born whites is associated with the effect of race; the difference between U.S.-educated Asian immigrants and U.S.-born Asian-Americans is associated with the effect of nativity; and the difference between foreign-educated Asian immigrants and U.S.-educated Asian immigrants is associated with the effect of place of education.

Our study did not find an earnings disadvantage associated with being Asian or being foreign-born. There is, however, a disadvantage of being foreign-educated versus U.S.-educated: FEAI on average earn 16% less than UEAI, net of other relevant factors. In addition, the magnitude of the disadvantage varies by immigrants' origin countries. At one extreme, foreign-educated Japanese earn as much as 39% more than U.S.-born whites, and at the other extreme, foreign-educated Filipinos earn 23% less than U.S.-born whites. The overarching finding of the study is that place of education plays a crucial role in determining Asian-Americans' earnings, while race and nativity per se do not have any significant impact on Asian-Americans' earnings. Due to the fact that most Asian-Americans are immigrants and a large proportion of immigrants are foreign-educated, previous studies that found an earnings disadvantage associated with

being either Asian-American or immigrant Asian-American may have in fact picked up the effect of place of education.

Our results have direct implications for the debate on the characterization of Asian-Americans as a "model minority." As reviewed in an earlier section, one of the main criticisms of the model minority thesis is that Asian-Americans face an earnings disadvantage after controlling for education. This study shows that such a disadvantage is experienced only by a subgroup of Asian immigrants, namely, foreign-educated immigrants. This result not only provides empirical evidence on the stratification of Asian-Americans but also calls for a new theoretical interpretation of the earnings disadvantage of Asian-Americans. The widely accepted wisdom in the literature 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 viewpoint is tenable only when *all* Asian-Americans experience a net earnings disadvantage. The identification of foreign-educated immigrants as the only disadvantaged group among Asian-Americans in this study suggests that Asian-Americans' earnings disadvantage is rooted in human capital differences between U.S.-educated workers and foreign-educated workers, rather than in race-based discrimination. While we agree that "model minority" is too simplistic a characterization of Asian-Americans, we did not find empirical support in this study for a main criticism of this characterization, namely, that Asian-Americans face an earnings disadvantage due to racial discrimination in the U.S. labor market.

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