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Wei-Yin Hu

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Immigrant Earnings Assimilation: Estimates from Longitudinal Data

By WEI-YIN HU*

How well do immigrants adapt to the U.S. labor market? Do immigrants who have low initial earnings suffer from persistent labor-market disadvantages, or do they experience rapid growth? Different perspectives on these questions underlie much of the current debate about reducing levels of immigration or changing the skill composition of the immigrant flow. If immigrants do not achieve economic success within their lifetimes, then the associated fiscal costs of the social safety net might outweigh the taxes that immigrants pay. If, on the other hand, immigrants today achieve the "American dream," then there may be less need for stricter skill-based admissions criteria. Beyond this policy context, immigrants' economic status is a question of interest because it relates to questions about the sources of income inequality and about the persistence of poverty.

Many studies (reviewed in George Borjas [1994] and Robert LaLonde and Robert Topel [1997]) have examined immigrant earnings growth, with somewhat differing conclusions about the rate at which earnings grow with time in the United States. Most of these studies rely on repeated cross sections from the decennial Census, measuring earnings growth for "cohorts" of immigrants aggregated by country of origin and year of arrival. A well-known and long-recognized problem with these studies is that nonrandom emigration by immigrants will bias cohort-based analyses. The recent availability of nationally representative longitudinal data sets allows researchers to address this source of bias (Hu, 1999; Darren Lubotsky, 1999).

I. Census Data Pitfalls

A direct examination of the Census data shows patterns that are consistent with selective

return migration. Hu (1999) reports that tracking immigrant cohorts across the 1970, 1980, and 1990 Censuses shows broad improvements in reported educational attainment, even among groups that are well beyond standard school-attendance ages. (This is not to deny that immigrants are more likely to attend school at later ages, as documented by Harriet Duleep and Mark Regets [1999].) If this trend is related to a deeper pattern of selective out-migration based on unobservable determinants of earnings, then Census-based estimates of immigrant earnings growth are likely to be overstated. Moreover, the rate of improvement is not uniform across cohorts: in general, earlier cohorts experience the largest improvements in reported schooling (and these improvements are larger than improvements among natives). This latter fact suggests that Census-based estimates of cohort differences will also be biased: they will *understate* the decline in initial earnings across successive arrival cohorts. This understatement occurs because Census data estimate the cohort fixed effects as a mixture of earnings of those who stay and those who leave; since those who leave have lower earnings, the greatest understatement in earnings (relative to the earnings of those who stay) will be for the earliest cohorts (see Hu [1999] for a fuller exposition of this point).

In order to avoid the selectivity bias inherent in repeated cross sections from the Census, I analyze immigrant earnings using a newly available longitudinal data source. The Health and Retirement Survey (HRS) is an ongoing longitudinal survey of the population born between 1931 and 1941. The most useful part of the data set is the matched Social Security earnings records for the period 1951–1991. Hu (1999) reports detailed analyses regarding the appropriateness of comparing Social Security earnings with Census-reported earnings. The main adjustments that are appropriate include the following: (i) Census earnings include income from farms and businesses, and (ii) HRS

* Department of Economics, UCLA, 405 Hilgard Ave., Los Angeles, CA 90095 (e-mail: hu@ucla.edu). This research was supported by a grant from the National Institute on Aging (R03-AG15156) and was completed while the author was a National Fellow at the Hoover Institution.

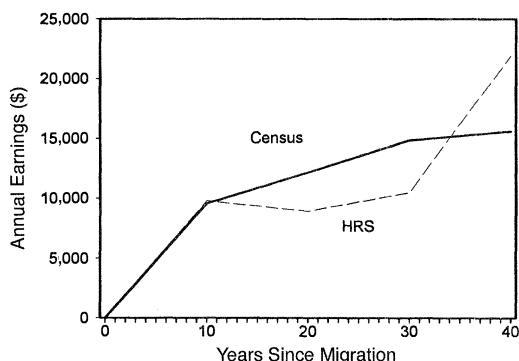


FIGURE 1. ASSIMILATION IN ANNUAL EARNINGS:
HISPANIC IMMIGRANTS

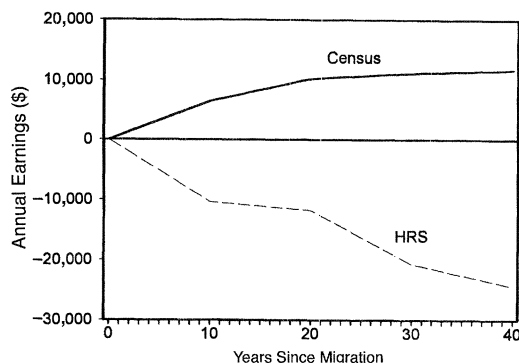


FIGURE 2. ASSIMILATION IN ANNUAL EARNINGS:
NON-HISPANIC WHITE IMMIGRANTS

earnings observations for periods of employment in federal or state government or in the armed services are excluded. Finally, the Social Security earnings are censored at the annual taxable ceiling, requiring the use of censored regression models.

II. Longitudinal Rates of Earnings Growth

I estimated a regression model in which earnings are a function of education, age, time in the United States, a series of year-of-arrival cohort fixed effects, calendar time, and interactions of education with time and of age with time. All of the variables, with the exception of calendar time (and interactions with education and age), are interacted with immigrant status. The effect of time in the United States is specified as a spline with break points at 10, 20, and 30 years after arrival. Hu (1999) reports these results for three outcomes: annual earnings including zeroes, annual earnings excluding zeros, and the incidence of positive earnings. For brevity, I focus here only on the first outcome, which portrays immigrants' overall economic success. I will present results from censored least-absolute-deviations regressions, which are robust to nonnormality and heteroscedasticity. Hu (1999) presents further results (yielding similar conclusions) from maximum-likelihood Tobit and symmetrically censored least-squares estimation.

Figures 1 and 2 plot the rate of earnings growth that is attributable purely to increased time in the United States, separately for His-

panic and non-Hispanic white immigrants. (More detailed groups are unavailable because researchers using the HRS Social Security data are barred from using individual country-of-origin identifiers.) The Census data (for the age groups comparable to the HRS sample) suggest that both groups of immigrants achieve \$10,000 higher annual earnings ten years after arrival (relative to earnings at the time of entry). However, the HRS data suggest a somewhat slower growth for Hispanic immigrants and an earnings *decline* for non-Hispanic white immigrants. It is important to note that this latter earnings decline is not an absolute decline in economic status, but a decline net of age and time effects. This decline might be explained by a pattern in which non-Hispanic white immigrants arrive in the United States knowing they have an attractive job opportunity, and as time in the United States increases, there is regression to the mean, either in terms of wages or unemployment rates (either of which could affect annual earnings).

The slower rate of earnings growth in the longitudinal data suggests that the process of out-migration is one in which individuals with lower earnings are more likely to leave the United States than their counterparts who arrived at the same time. One implication of this fact is that recent arrival cohorts may have lower fiscal costs than their initial earnings imply. If successful immigrants are the most likely to stay, then an initial stock of low-earning immigrants is not a permanent burden on government anti-poverty programs.

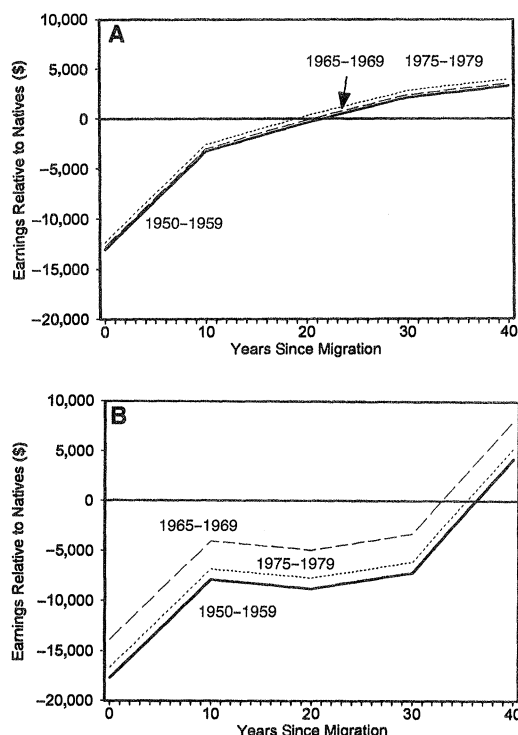


FIGURE 3. ASSIMILATION IN EARNINGS: HISPANIC IMMIGRANTS VERSUS HISPANIC NATIVES, BASED ON (A) CENSUS DATA AND (B) HRS DATA

Notes: The graphs plot relative earnings for three arrival cohorts: 1950-1959, 1965-1969, and 1975-1979.

III. Do Immigrants Catch Up?

In addition to the question of earnings growth due to assimilation, economists are also concerned with whether immigrants' earnings ever catch up to natives' earnings. Figures 3 and 4 plot the earnings profiles for several arrival cohorts relative to natives of the same ethnicity, as estimated with the Census and the HRS data. For Hispanics (Fig. 3), the HRS estimates show that immigrants catch up to natives at a later point than they do in the Census data. For non-Hispanic whites (Fig. 4), two features are salient. First, as before, the earnings growth in the HRS data is actually negative. Second, the decline in immigrant earnings across successive arrival cohorts is steeper in the longitudinal estimates than in the Census estimates. This is due to the fact mentioned in Section I, that the

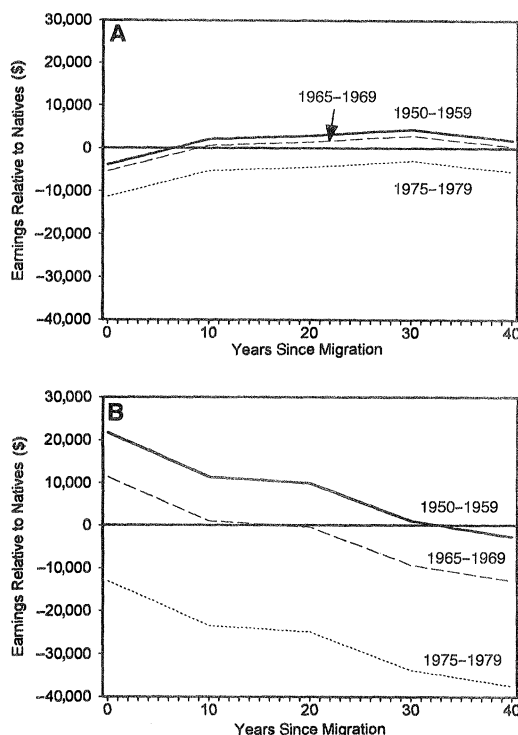


FIGURE 4. ASSIMILATION IN EARNINGS: NON-HISPANIC WHITE IMMIGRANTS VERSUS NON-HISPANIC WHITE NATIVES, BASED ON (A) CENSUS DATA AND (B) HRS DATA

Notes: The graphs plot relative earnings for three arrival cohorts: 1950-1959, 1965-1969, and 1975-1979.

selectivity of return migration seems to be strongest for earlier cohorts. If selectivity on unobservable determinants of earnings is similar to selectivity on educational attainment, then this is exactly the pattern one would expect.

For non-Hispanic whites, then, the two data sets provide very different portraits of economic progress. From the Census data, one obtains a view that these immigrants caught up to natives very quickly, even within ten years for early arrival cohorts. The longitudinal data, on the other hand, reveal that some of these cohorts had earnings advantages relative to natives immediately upon arrival and that they gradually lost this earnings advantage as they assimilated. A caveat to these statements, however, is that Figures 3 and 4 presume a uniform rate of growth for all arrival cohorts. The reality of this assumption is addressed in the next section.

IV. Initial Earnings, Earnings Growth, and Human-Capital Investment

There has been some attention in the immigrant-earnings literature to the question of whether immigrants with lower initial earnings are likely to experience faster earnings growth with time in the United States (Duleep and Regets, 1994; Borjas, 1998). This question is of more than academic interest, because estimates of the fiscal impact of immigration require some estimate of the life-cycle earnings of current (young) immigrants. While considerable evidence shows that recent immigrants have lower initial earnings than immigrants who arrived in earlier decades, it may be possible that the low initial earnings are due to more intensive human-capital investment which will lead to higher earnings later in life. Predictions that assume a single growth rate that applies to all immigrants could be highly misleading as a result. Borjas (1998) points out that a human-capital model does not necessarily imply a negative correlation between initial earnings and earnings growth: the relationship depends on the technology of skill acquisition.

Previous analyses have made comparisons of different immigrant cohorts (divided into groups defined by country-of-origin, education level, and/or age) to address this question, again relying on the decennial Censuses. The existence of nonrandom emigration by immigrants can obviously undermine the usefulness of these comparisons. In order to shed further light on this question, I use the HRS longitudinal earnings data to assess whether, across *individual immigrants*, initial earnings are negatively related to earnings growth. Because the HRS data are censored, I use a Tobit model to predict earnings for censored observations (incorporating the expected residual as well as the regression index, thus yielding $X\beta + E[u|X\beta + u > L]$ where L is the censoring point). In order to reduce the influence of measurement error, I take the average of earnings within the first five years after arrival, and the average of earnings in the five-year period around the time at which the immigrant has been in the United States for 15 years.

A regression of log-earnings growth on the logarithm of initial earnings yields a coefficient of -0.53 (standard error = 0.07), suggesting a

very rapid rate of earnings convergence. Stated differently, a 10-percent difference in initial earnings between two immigrants is reduced to only a 5-percent difference after 15 years. Moreover, this rate of convergence is slightly faster (a coefficient of -0.68) if human-capital variables such as education, age, immigrant year of arrival, and race and ethnicity are controlled, echoing the findings of Borjas (1998). Analyses using medians within five year periods or using 20 years instead of 15 years yield similar results. Results are also similar if observations with censored initial or final earnings are omitted (ignoring obvious sample-selection issues).

It should be noted that the analysis in this section does not relate directly to the question of immigrants' assimilation relative to natives. (The convergence results of Borjas [1998] are similar in this respect, while Duleep and Regets [1999] report strong convergence among immigrant cohorts as well as strong convergence among immigrant cohorts vis-à-vis natives.) If a similar analysis is performed on the longitudinal data for natives, where the "initial" earnings year is chosen to match the distribution of immigrants' years of arrival, log-growth is related to initial log-earnings with a coefficient of -0.60 (standard error = 0.02). Thus, the evidence is that earnings for both natives and immigrants show strong tendencies toward convergence. This does not contradict the earnings-parity results in Section III.

V. Conclusions

Analysis of longitudinal data for immigrants presents a more pessimistic portrait of immigrants' economic success. First, the rate of growth of immigrant earnings was overstated in Census-based studies. Second, the worsening of immigrant earnings for more recent arrival cohorts is steeper than previously suggested.

Against these two negative findings, one must keep in mind an important caveat. The steeper "cohort decline" in earnings may be a sign of greater human-capital investment by more recent immigrants. Longitudinal data suggest a strong degree of earnings convergence: immigrants who start at lower earnings quickly make up a large part of the deficit relative to their immigrant counterparts.

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