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Part 2 of 2

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ASSIMILATION AND THE EARNINGS OF YOUNG INTERNAL MIGRANTS

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I. Introduction

Since the pioneering work of Chiswick (1978), empirical studies of the earnings of international migrants have included the duration of residence in the destination country as a key explanatory variable. This variable measures the amount of time an immigrant has had to adjust to his new environment. One of the consequences of international migration is that the human capital which immigrants accumulated in their previous country may not transfer perfectly to their new country. This prompts immigrants to invest in knowledge and skills relevant to their current labor market, with the result that immigrant earnings grow as more of this country-specific human capital is acquired. Such a process of labor market assimilation has proven to be an empirically important aspect of the post-migration earnings profiles of international migrants.

In this paper we present evidence that a similar phenomenon occurs for young internal migrants in the United States. Using data from the National Longitudinal Survey of Youth, we examine how the hourly earnings of interstate migrants are affected by the number of years they have spent in their destination state. We find that these migrants experience a relatively short period of labor market adjustment in which they earn lower wages than do otherwise similar natives. Cross-section estimates imply that internal migrants suffer an initial wage disadvantage of about ten percent, but this differential vanishes within a few years because of the more rapid earnings growth enjoyed by migrants. First-difference estimates produce similar results, although the precision of these estimates is low. As might

be expected, earnings assimilation proceeds more quickly and ends sooner for internal migrants than for comparable international migrants. In addition, the rate of assimilation for internal migrants depends upon the distance moved and employment opportunities in the destination state, with faster assimilation taking place for intraregional migrants and those moving into growing labor markets.

The next section discusses the empirical framework that has been developed for measuring immigrant earnings assimilation and how this framework can be adapted to study internal migration. Section III describes the data, and section IV presents cross-section and first-difference estimates of labor market assimilation by internal migrants. For purposes of comparison, section V reports assimilation estimates for a similarly aged group of international migrants. Section VI investigates how the speed at which internal migrants assimilate varies with the distance moved and local economic conditions in the destination. Section VII summarizes the main results of the analysis.

II. Assimilation and Migrant Earnings

Following Chiswick (1978), economists have used the human capital framework to analyze the labor market assimilation of international migrants. The U.S. earnings of natives and immigrants are typically modeled by a regression equation of the form

$$(1) \quad \ln w = X\beta + \gamma_1 E + \gamma_2 E^2 + \delta_0 M + \delta_1 M \cdot T + \delta_2 M \cdot T^2 + \epsilon,$$

where w represents the hourly wage, X is a vector of worker characteristics,

E measures labor market experience, M is a dummy variable identifying international migrants, T measures years since migration, and ϵ is a random error term.

The basic idea underlying equation (1) is that labor market experience in a foreign country is not a perfect substitute for U.S. experience, so that, holding total experience constant, immigrant earnings rise with the amount of U.S. labor market experience. As the immigrant worker spends more time in this country, he acquires skills relevant to the U.S. labor market and knowledge about job opportunities which native workers have already acquired. The coefficient δ_0 represents the immigrant earnings differential (relative to natives) upon arrival in the United States, and is expected to be negative because of country-specific skills and knowledge which natives possess but immigrants initially lack. The coefficients δ_1 and δ_2 measure how immigrant earnings vary with the length of time spent in this country. Assimilation should cause immigrant earnings to grow more rapidly over time than native earnings ($\delta_1>0$), but this effect should diminish over time as the immigrant accumulates U.S. experience and thereby becomes more like a "native" ($\delta_2<0$).

These expectations have been confirmed by a number of studies of immigrant earnings.[1] For example, Chiswick (1978) finds that white male immigrants initially earn substantially less than demographically comparable natives, but this deficit disappears after immigrants have spent 10-15 years in the United States, and immigrants go on to eventually earn significantly more than natives. Studies by Carliner (1980), Borjas (1982), and Stewart and Hyclak (1984) provide additional evidence that duration of U.S. residence has an important effect on immigrant earnings. More recently,

Borjas (1985, 1989) argues that immigrant earnings assimilation has been seriously overestimated because the cross-section data employed by these studies confounds earnings growth for a given immigrant cohort with the secular decline in immigrant quality that has been occurring across cohorts. Abbott and Beach (1987) uncover a similar pattern in Canadian data. However, although these papers suggest that immigrant earnings growth may not be as rapid as previously believed, and that immigrant overtaking of natives in terms of earnings may not be the universal phenomenon which earlier estimates implied it to be, the recent studies still find assimilation to be an important determinant of earnings for many immigrant groups.

Because assimilation has proven to be a key factor affecting the earnings of international migrants, it is reasonable to suppose that a similar type of learning and adjustment process might influence the post-migration earnings profiles of workers who relocate within a country. After all, local labor markets across the United States display enormous diversity in terms of the types of jobs available and the specific worker skills that firms demand. In addition, the legal and institutional environment within which a labor market operates can vary not only from state to state, but also from county to county, and even from city to city. Although the scope for assimilation is obviously much narrower for internal migrants than for international migrants, there still appears to exist a large amount of labor market savvy and information about job opportunities which is location-specific. If internal migrants acquire this knowledge over time as they become more familiar with their new locale, then the earnings of internal migrants should increase with duration of residence in much the same way as

do the earnings of international migrants.

By adapting the framework which has been developed for the study of earnings assimilation by international migrants, we seek to determine whether an analogous process of assimilation occurs for young internal migrants. For a number of reasons, young workers seem to be an especially promising sample in which to look for assimilation. First of all, early in their careers workers change jobs and locations frequently as they seek to gain varied labor market experiences and also search for an optimal job match (Topel 1986). A related point is that young workers are not tied down with a lot of job-specific human capital, and this makes them more mobile and more responsive to economic incentives. Because they have a long working life remaining over which to collect returns, they are also more likely to invest in the kinds of labor market skills and information which can produce earnings assimilation. Finally, young workers frequently occupy jobs in the service, trade, and construction sectors where labor markets tend to be less formal and local knowledge plays an important role in obtaining employment.

To our knowledge, no previous research has directly estimated the effect of years since migration upon the earnings of internal migrants.[2] Although the concept of location-specific human capital has been emphasized in studies of repeat and return migration (DaVanzo and Morrison 1981; Herzog and Schlottmann 1982; DaVanzo 1983), it has apparently escaped notice that some of this location-specific capital may involve knowledge about the local labor market and therefore would be expected to influence the post-migration earnings path.

However, several studies do provide indirect but suggestive evidence on

the earnings assimilation of internal migrants. Masters (1972) reports that U.S. blacks who leave the south initially earn less but eventually earn more than blacks who were born and remain in the north. Yezer and Thurston (1976) for the United States and Grant and Vanderkamp (1980) for Canada find that recent internal migrants earn less than earlier migrants, and that this differential increases with the distance of the move. Polachek and Horvath (1977) and Krumm (1983) present evidence from panel data which suggests that the post-migration wage growth experienced by movers within the United States exceeds that of non-movers. None of these studies, however, provide an explicit empirical model of migrant earnings assimilation, nor do they fully exploit the variation which exists across migrants with respect to duration of residence. We attempt to rectify these shortcomings in the empirical work reported below.

III. Data

We analyze the assimilation of young migrants using the 1979-1986 waves of the National Longitudinal Survey of Youth (NLSY). Respondents are between the ages of 14 and 22 at the time of the first interview, and the subsequent annual interviews provide a detailed history of each individual's labor force activity and migratory behavior. Because many of the respondents are still in school during the early years of the survey, we use labor market information from the 1986 interview in order to maximize the number of employed workers available for analysis. This also allows us to observe the longest possible history of an individual's past residential locations.

The NLSY provides information on an individual's state of birth, his

state of residence at age 14, and his state of residence at the time of each of the eight interviews. To focus exclusively on internal migration and to avoid the potentially confounding effects of earnings assimilation due to international migration, we exclude individuals born outside of the United States or ever observed to reside abroad. A "native" is defined to be an individual whose state of residence in 1986 is the same as at age 14 and for all observed years in between. A "migrant" has changed states at least once between age 14 and the 1986 interview. For migrants, state-specific human capital will be measured by the number of years since age 14 that the individual has resided in his current (1986) state.[3] This variable represents the internal migration analog to the "years since migration" variable used to analyze the earnings assimilation of international migrants.[4] Note that our assimilation measure allows location-specific human capital to be accumulated intermittently through repeat and return migration, whereas studies of international migration typically only know the duration of an immigrant's most recent spell in the United States.

The sample is further restricted to civilian wage and salary workers with positive earnings and hours of work in the calendar year preceding the 1986 interview and for whom nonmissing data is available for all of the variables used in the analysis. In addition, to ensure that we are observing the behavior of workers with a more or less permanent attachment to the labor market rather than the part-time work of students, we require that the individual not be currently enrolled in school and that his completed years of education did not change between the 1985 and 1986 interviews.

The dependent variable is (the natural logarithm of) average hourly

earnings, computed as the ratio of annual earnings to annual hours of work. Observations with computed hourly earnings less than $1 or greater than $100 were considered outliers and have been excluded. As for the empirical counterparts of the other variables in equation (1), labor market experience (E) is computed as age-education-6, and the variables migrant status (M) and years in the current state (T) are as defined above.

The control vector of worker characteristics (X) also requires some discussion. The process of labor market assimilation often involves job mobility as migrants improve themselves by obtaining higher-paying positions. This implies that we do not want to control for characteristics of the individual's job such as industry, occupation, union status, or government employment, since one of the main ways that migrants can benefit from any location-specific labor market knowledge they acquire is by using this knowledge to secure a better job. Therefore, we only include personal and family background variables in the vector X, such as education, gender, race, marital status, and health. To control for regional cost-of-living differences, we also include dummy variables indicating whether the individual resides in the central city of an SMSA or elsewhere in an SMSA, as well as a vector of dummy variables designating in which of the nine census geographic divisions the individual currently resides.

Table 1 presents means and standard deviations for the full sample, as well as separately for natives and migrants. The migrant sample is further divided into a sample which excludes return migrants. The definition of return migrants and the reason they are sometimes excluded from the analysis will be discussed below.

Almost 30 percent of the young workers in our data are migrants in the

TABLE 1
MEANS OF NLS YOUTH DATA

Variable	Full Sample	Natives	Migrants	
			All	Excluding Return Migrants
Migrant to current state	.29	0.00	1.00	1.00
	(.45)	(0.00)	(0.00)	(0.00)
Years in current state	-	-	6.34	5.29
			(3.71)	(3.49)
Annual earnings	12432.73	12121.45	13213.45	13934.28
	(8774.78)	(8394.85)	(9620.96)	(9836.81)
Annual hours worked	1825.58	1823.91	1892.78	1873.89
	(720.16)	(717.12)	(727.95)	(729.43)
Average hourly earnings	6.64	6.49	7.00	7.25
	(4.37)	(4.22)	(4.73)	(4.83)
Age	24.78	24.61	25.20	25.32
	(2.23)	(2.24)	(2.15)	(2.16)
Experience	6.26	6.23	6.32	6.33
	(2.66)	(2.65)	(2.66)	(2.67)
Education	12.53	12.38	12.88	12.99
	(2.04)	(1.91)	(2.29)	(2.30)
Married, spouse present	.42	.42	.43	.46
	(.49)	(.49)	(.50)	(.50)
Divorced, separated, or widowed	.10	.09	.13	.12
	(.30)	(.28)	(.34)	(.33)
Female	.50	.50	.49	.50
	(.50)	(.50)	(.50)	(.50)
Black	.26	.27	.24	.23
	(.44)	(.45)	(.43)	(.42)
Hispanic	.13	.14	.09	.08
	(.33)	(.35)	(.28)	(.27)
Health limits work	.03	.03	.03	.02
	(.18)	(.18)	(.18)	(.16)
Resides in central city of SMSA	.44	.43	.45	.46
	(.50)	(.50)	(.50)	(.50)
Resides in SMSA, not central city	.28	.28	.28	.27
	(.45)	(.45)	(.45)	(.45)
Sample Size	5199	3717	1482	1049

Note: Standard deviations are in parentheses. Data are from the 1986 interview of the National Longitudinal Survey of Youth.

sense that they have not continuously resided in their current state since the age of 14, and migrants have spent on average about six years in their current state since the age of 14. Given that the average age of migrants in the sample is 25, this implies that since the age of 14 a typical migrant has lived for five years outside his current state. Mean annual earnings for migrants exceed the corresponding figure for natives by over $1000, while average annual hours worked by migrants are only slightly higher, resulting in an average hourly earnings advantage of 7.9 percent for migrants. However, migrants tend to be older and more educated than natives, and they are also less likely to be black or Hispanic. Because these factors are known to be associated with higher earnings, the migrant advantage in unstandardized earnings may disappear after we control for observable variables.

IV. Estimates of Assimilation by Internal Migrants

Because of well-known differences between male and female wage equations (Mincer and Polachek 1974), we initially carried out our analysis separately by gender. However, the separate regressions revealed similar patterns of earnings assimilation, and we were unable to reject the hypothesis that the coefficients on the migrant status and years in current state variables are identical for males and females.[5] In order to keep the sample as large as possible, and also to simplify presentation of the empirical results, the regressions reported below pool across gender. At the same time we allow for gender differences in the effects of experience, education, and marital status in order to accommodate the most important ways in which the wage determination process has been found to diverge for

males and females.

Table 2 presents ordinary least squares estimates of hourly earnings regressions for the full sample.[6] The coefficients on the control variables are fairly unremarkable and can be discussed briefly. These coefficients generally appear to be reasonable both in terms of sign and magnitude. The returns to experience and education are sizable. Consistent with previous research, being married has a large positive effect on the hourly earnings of males, but a zero or negative effect for females. Minorities, especially blacks, earn less than otherwise similar whites, and health problems also depress wages. Finally, rural workers earn less than demographically comparable urban or suburban workers, possibly due to cost-of-living differences.

We now turn to the migrant variables which are the primary focus of this paper. In column (1), the dummy variable for migrant status is entered without the years in current state variables. After controlling for demographic characteristics, internal migrants to a state earn roughly three percent less than natives, which indicates that the migrant hourly earnings advantage in the unstandardized data is reversed when we condition on observable individual traits.

The regression reported in column (2) adds the years in current state variables which are meant to proxy for the amount of state-specific labor market capital accumulated by migrants. These variables are statistically significant determinants of hourly earnings. The estimated coefficients reveal a pattern of earnings assimilation whereby internal migrants to a state initially earn ten percent less than demographically comparable natives, but over time the hourly wage earned by migrants converges toward

TABLE 2
HOURLY EARNINGS REGRESSIONS
Full Sample
(N = 5199)

Variable	(1)	(2)	(3)
Migrant	-.0347 (.0164)	-.0999 (.0412)	-
Migrant × (years in state)	-	.0332 (.0143)	-
Migrant × (years in state)^2	-	-.0027 (.0011)	-
Migrant × (1-2 years in state)	-	-	-.0755 (.0299)
Mirgant × (3-4 years in state)	-	-	.0098 (.0392)
Migrant × (5-6 years in state)	-	-	.0273 (.0366)
Migrant × (7+ years in state)	-	-	-.0455 (.0213)
Female	-.1060 (.1513)	-.0970 (.1513)	-.0953 (.1513)
Experience	.0846 (.0157)	.0851 (.0157)	.0843 (.0157)
Female × experience	-.0339 (.0224)	-.0345 (.0224)	-.0342 (.0224)
Experience^2	-.0024 (.0011)	-.0024 (.0011)	-.0024 (.0011)
Female × experience^2	.0015 (.0016)	.0015 (.0016)	.0015 (.0016)
Education	.1189 (.0061)	.1207 (.0062)	.1194 (.0061)
Female × education	.0089 (.0088)	.0083 (.0088)	.0082 (.0088)
Married, spouse present	.1865 (.0228)	.1860 (.0228)	.1867 (.0228)
Female × (married, spouse present)	-.2137 (.0318)	-.2128 (.0318)	-.2129 (.0318)
Divorced, separated, or widowed	.0717 (.0400)	.0701 (.0400)	.0733 (.0400)

Table 2 (continued)

Variable	(1)	(2)	(3)
Female × (divorced, separated, or widowed)	-.0989	-.0958	-.0970
	(.0524)	(.0524)	(.0524)
Black	-.1737	-.1740	-.1736
	(.0185)	(.0185)	(.0185)
Hispanic	-.0364	-.0371	-.0357
	(.0245)	(.0245)	(.0245)
Health limits work	-.1425	-.1421	-.1442
	(.0398)	(.0398)	(.0398)
Central city of SMSA	.1248	.1248	.1252
	(.0184)	(.0184)	(.0184)
SMSA, not central city	.1447	.1446	.1446
	(.0200)	(.0200)	(.0200)
R^2	.2151	.2160	.2161

Note: Standard errors are in parentheses. Dependent variable is the natural logarithm of average hourly earnings. Also included as independent variables are dummies for the nine census geographic divisions.

that of natives because of the more rapid wage growth experienced by migrants. This is broadly similar to the pattern of assimilation reported in studies of the earnings of international migrants. Our estimate of the quadratic in years in current state implies that after about six years of residence the hourly wage of migrants equals that of natives.

The column (2) regression relies on the standard quadratic specification of years of residence in the current state. Column (3) introduces a less restrictive specification by instead using dummy variables for various duration of residence intervals. For migrants who have spent less than seven years in their current state, these estimates reveal the expected pattern of earnings increasing with duration of residence but at a decreasing rate, although the only statistically significant difference occurs within the first two years of arrival when migrants earn about eight percent less than otherwise similar natives. However, migrants with seven or more years of residence in their current state also earn significantly less than natives. This puzzling result is also implied by the column (2) estimates of the quadratic specification of assimilation, since after six years in the current state the negative quadratic term dominates the positive linear term and migrant earnings fall with duration of residence.

One possible explanation has to do with an aspect of the NLSY data which makes the sample of migrants with long durations of residence somewhat peculiar. We do not know an individual's state of residence between age 14 and the first interview in 1979, so this information was imputed using the method described in footnote 3. Because between 1979 and 1986 we have only eight annual observations on an individual's location, most migrants with long durations of residence accumulated some of these years in their current

state from the imputed period between age 14 and 1979. Moreover, migrants, by definition, must have changed their state of residence sometime between age 14 and 1986, therefore many migrants with durations of residence of seven years or more are return migrants in the sense that they resided in the same state in 1979 and in 1986, but they left that state for a year or two in between. It is likely that these return migrants differ in substantial ways from other migrants.[7] In particular, low earnings in the initial state may have prompted these individuals to move in the first place, and even lower earnings in the destination state might have precipitated their return to the initial state. This could explain the negative coefficient on the dummy variable indicating migrants with seven or more years in the current state.

To investigate this issue, we reestimated the wage regressions excluding return migrants from the sample. Return migrants are defined to be those individuals who previously left and subsequently returned to the state where they live in 1986. The results are presented in table 3. The estimates are similar to those reported in table 2 where return migrants are included, except that in column (3) of table 3 the coefficient on the dummy variable for migrants with seven or more years in the current state is no longer significantly different from zero. The estimated coefficients from the quadratic specification reported in column (2) of table 3 indicate that internal migrants initially earn about 11 percent less than natives, but within three years the migrant wage disadvantage vanishes. The concavity of the quadratic implies that after six years of residence migrants earn almost four percent more than natives, and the wage differential falls back to zero after nine years. This suggests a pattern of very rapid earnings

TABLE 3
HOURLY EARNINGS REGRESSIONS
Sample Excluding Return Migrants
(N = 4766)

Variable	(1)	(2)	(3)
Migrant	-.0151 (.0187)	-.1141 (.0471)	-
Migrant × (years in state)	-	.0466 (.0204)	-
Migrant × (years in state)^2	-	-.0037 (.0017)	-
Migrant × (1-2 years in state)	-	-	-.0734 (.0303)
Mirgant × (3-4 years in state)	-	-	.0540 (.0424)
Migrant × (5-6 years in state)	-	-	.0347 (.0415)
Migrant × (7+ years in state)	-	-	-.0148 (.0279)
Female	-.1227 (.1569)	-.1168 (.1569)	-.1081 (.1569)
Experience	.0876 (.0161)	.0864 (.0162)	.0862 (.0161)
Female × experience	-.0362 (.0232)	-.0359 (.0232)	-.0367 (.0232)
Experience^2	-.0026 (.0011)	-.0025 (.0011)	-.0025 (.0011)
Female × experience^2	.0016 (.0017)	.0016 (.0017)	.0016 (.0017)
Education	.1183 (.0064)	.1192 (.0064)	.1186 (.0064)
Female × education	.0109 (.0092)	.0104 (.0092)	.0099 (.0092)
Married, spouse present	.1882 (.0238)	.1878 (.0238)	.1879 (.0238)
Female × (married, spouse present)	-.2101 (.0330)	-.2088 (.0330)	-.2084 (.0330)
Divorced, separated, or widowed	.0682 (.0430)	.0675 (.0429)	.0711 (.0429)

Table 3 (continued)

Variable	(1)	(2)	(3)
Female × (divorced, separated, or widowed)	-.0858 (.0558)	-.0828 (.0558)	-.0843 (.0557)
Black	-.1654 (.0193)	-.1662 (.0193)	-.1664 (.0193)
Hispanic	-.0362 (.0253)	-.0376 (.0254)	-.0369 (.0254)
Health limits work	-.1542 (.0426)	-.1541 (.0426)	-.1533 (.0426)
Central city of SMSA	.1247 (.0191)	.1252 (.0191)	.1258 (.0191)
SMSA, not central city	.1474 (.0209)	.1477 (.0208)	.1479 (.0209)
R^2	.2160	.2169	.2174

Note: Standard errors are in parentheses. Dependent variable is the natural logarithm of average hourly earnings. Also included as independent variables are dummies for the nine census geographic divisions.

assimilation in which migrant wages catch up to those of natives after a couple of years and from this point on migrants essentially earn the same as demographically comparable natives. The dummy variable specification reported in column (3) reveals a similar pattern. Internal migrants earn seven percent less than natives during their first two years in a state, and wage differentials for migrants with longer durations of residence are not statistically significant.

Up to this point the analysis has relied solely on cross-sectional variation and has not fully exploited the panel aspect of the NLSY data. Borjas (1989) shows that estimates of earnings assimilation by international migrants can vary greatly depending upon whether cross-section or longitudinal data is used. To explore this issue with our data, we directly estimate the extent to which the wage growth experienced by internal migrants exceeds that of natives.

Consider once again the earnings function described by equation (1). Differencing across observations on earnings at two distinct points in time for the same individual, we obtain

$$(2) \quad \Delta(\ln w) = \Delta X\beta + \gamma_1 + \gamma_2 \Delta E^2 + \delta_1 M + \delta_2 M \cdot \Delta T^2 + \Delta\epsilon .$$

In order to maintain a large sample size and also to avoid placing undue limitations on the possible range of the years in current state variable for migrants, we analyze wage growth between 1985 and 1986. Equation (2) follows from equation (1) because our definition of an internal migrant is person-specific but not year-specific, hence $\Delta M=0$; because our sample excludes individuals still acquiring schooling in 1985 and 1986, hence $\Delta E=1$;

and finally because we exclude from the wage growth regressions those individuals whose state of residence changes between 1985 and 1986, hence $\Delta T=1$ for all migrants. We do this to avoid confusing the earnings growth experienced by an internal migrant after he arrives in the destination with the earnings differences across locations which are known to influence the initial decision to migrate (Nakosteen and Zimmer 1980; Robinson and Tomes 1982; Falaris 1988). The sample restrictions previously placed on the 1986 cross-section data now must be met for 1985 as well as for 1986 in order for an individual to be included in the sample.

The first-difference regression described by equation (2) provides estimates of the same assimilation parameters (δ_1 and δ_2) that were previously estimated by the cross-section regression corresponding to equation (1). However, by comparing the post-migration wage growth of natives and migrants, equation (2) focuses on the most immediate implication of the hypothesis of earnings assimilation by internal migrants. Table 4 presents ordinary least squares estimates of first-difference wage growth regressions motivated by equation (2). The dependent variable is the change in the natural logarithm of average hourly earnings between 1985 and 1986. The regressions reported in columns (1) and (2) were estimated on the full sample of natives and migrants, while those in columns (3) and (4) exclude return migrants.

In columns (1) and (3), only the migrant status and years in current state squared variables are included along with an intercept. The estimated intercepts indicate that nominal wage growth averaged ten percent between 1985 and 1986 for natives in the sample. Since the consumer price index increased by 1.9 percent over this period, this implies annual real wage

TABLE 4
WAGE GROWTH REGRESSIONS

Variable	Including Return Migrants (1)		Excluding Return Migrants (3)	
		(2)		(4)
Intercept	.0983	.1661	.0983	.1698
	(.0085)	(.0188)	(.0084)	(.0191)
Migrant	.0373	.0220	.0502	.0338
	(.0363)	(.0362)	(.0391)	(.0390)
Migrant × Δ(years in state)^2	-.0015	-.0003	-.0035	-.0019
	(.0024)	(.0024)	(.0029)	(.0029)
Δexperience^2	-	-.0059	-	-.0062
		(.0014)		(.0015)
Δ(married, spouse present)	-	.0320	-	.0350
		(.0300)		(.0309)
Δ(divorced, separated, or widowed)	-	.0017	-	.0201
		(.0471)		(.0484)
Δ(health limits work)	-	-.0377	-	-.0399
		(.0354)		(.0367)
Δ(central city of SMSA)	-	.0020	-	.0050
		(.0373)		(.0393)
Δ(SMSA, not central city)	-	-.0600	-	-.0430
		(.0386)		(.0406)
R^2	.0003	.0063	.0004	.0065
Sample Size	4216	4155	3964	3904

Note: Standard errors are in parentheses. Dependent variable is the change in the natural logarithm of average hourly earnings between 1985 and 1986.

growth of around eight percent. The point estimates for the migrant dummy variable indicate that, during the first year after arriving in a state, migrants experience wage growth from four to five percentage points higher than that of natives. In addition, the negative coefficients on the squared years in current state term suggest that this wage growth advantage gradually dissipates as the migrant accumulates more time in the state. Consider the wage growth regression in column (3) which excludes return migrants. The point estimates of δ_1 and δ_2 are virtually identical to those from the corresponding cross-section regression reported in column (2) of table 3; therefore the first-difference and cross-section regressions imply remarkably similar patterns of earnings assimilation by internal migrants. However, the first-difference coefficients are measured with much less precision than the cross-section estimates, resulting in first-difference parameter estimates that fail to achieve statistical significance.[8] A similar conclusion follows from comparing the column (1) estimates which include return migrants with the corresponding cross-section estimates from column (2) of table 2.

The wage growth regressions in columns (2) and (4) of table 4 include additional explanatory variables measuring changes in those control variables that can vary over time.[9] Therefore these regressions correspond exactly to equation (2) above. The point estimates of the assimilation parameters are once again reasonably similar to those obtained from the cross-section estimates, but these coefficients continue to be very imprecisely measured. The overall explanatory power of the regressions is extremely low, and the only variable with an effect significantly different from zero at the five percent level is the change in experience squared. To

sum up, the first-difference wage growth regressions yield estimates of internal migrant assimilation that are consistent with those obtained from cross-section regressions of wage levels, although the imprecision of the first-difference estimates cautions against making too much of this point.[10]

V. Estimates of Assimilation by Comparable International Migrants

It would be interesting to compare the labor market assimilation of internal migrants with that experienced by international migrants to the United States. However, our estimates of internal assimilation are for a rather narrow group of young migrants, and previous estimates of international assimilation are not available for a comparable sample of immigrants. To facilitate such a comparison, table 5 presents estimates of earnings assimilation by U.S. immigrants similar in age to the internal migrants studied above. The dependent variable is once again average hourly earnings, and the regression reported in column (1) employs a cross-section of individuals between the ages of 21 and 29 from the 1980 U.S. Census. In the present context, natives refer to individuals born in the United States, and immigrants are those born in a foreign country but now living in the the United States. The control variables are very similar to those used in the previous regressions for internal migrants. Assimilation is captured by a quadratic in the number of years that have passed since the immigrant arrived in the United States.[11]

The cross-section results reveal a pattern of immigrant earnings assimilation which closely resembles that detected by Chiswick (1978) and others who studied broader age groups. The estimates in column (1) imply that these young immigrants start out earning about 11 percent less than

TABLE 5
HOURLY EARNINGS REGRESSIONS FOR INTERNATIONAL MIGRANTS
Census Data

Variable	1980 Cross-Section (1)	1970/1980 Pooled (2)
Immigrant	-.1055 (.0056)	-
Immigrant × (years in U.S.)	.0169 (.0009)	.0019 (.0014)
Immigrant × (years in U.S.)^2	-.00046 (.00004)	-.00004 (.00003)
Immigrant × (arrived in 1975-80)	-	-.1603 (.0069)
Immigrant × (arrived in 1970-74)	-	-.0427 (.0102)
Immigrant × (arrived in 1965-69)	-	.0118 (.0126)
Immigrant × (arrived in 1960-64)	-	.0369 (.0172)
Immigrant × (arrived in 1950-59)	-	.0473 (.0226)
Immigrant × (arrived before 1950)	-	.0526 (.0418)
Female	-.1659 (.0294)	.0541 (.0239)
Experience	.0341 (.0018)	.0208 (.0017)
Female × experience	-.0122 (.0027)	-.0235 (.0022)
Experience^2	-.00008 (.00009)	-.000005 (.000052)
Female × experience^2	.00069 (.00015)	.00053 (.00008)
Education	.0575 (.0011)	.0609 (.0010)
Female × education	.0062 (.0018)	-.0006 (.0013)
Married, spouse present	.1035 (.0052)	.1863 (.0070)

Table 5 (continued)

Variable	1980 Cross-Section (1)	1970/1980 Pooled (2)
Female × (married, spouse present)	-.0921 (.0081)	-.2047 (.0106)
Divorced, separated, or widowed	.0433 (.0108)	.0889 (.0108)
Female × (divorced, separated, or widowed)	-.0574 (.0149)	-.1087 (.0149)
Black	-.0536 (.0070)	-.1009 (.0071)
Hispanic	-.0792 (.0046)	-.1146 (.0048)
Health limits work	-.0637 (.0122)	-.0854 (.0106)
SMSA	.0948 (.0052)	.1428 (.0051)
Intercept	.6279 (.0198)	-.0269 (.0194)
Observation drawn from 1980 Census	-	.6848 (.0100)
R^2	.0879	.3333
Sample Size	111837	123812

Note: Standard errors are in parentheses. Dependent variable is the natural logarithm of average hourly earnings.

comparable natives, but this differential disappears after the immigrant has spent eight years in the United States, and immigrants eventually earn as much as five percent more than natives after eighteen years of U.S. residence, at which point assimilation ceases and immigrant earnings no longer increase with years since migration.[12]

Therefore, both young internal migrants and young international migrants go through a period of post-migration labor market adjustment in which they acquire location-specific skills which cause earnings to grow more rapidly for them than for native workers.[13] However, differences in the assimilation patterns of internal and international migrants are also quite revealing. Internal migrants appear to completely assimilate within a couple of years, whereas the earnings assimilation process for international migrants stretches on for well over a decade. The finding that earnings assimilation takes place at a faster pace and ends sooner for internal migrants compared to international migrants makes economic sense given the fact that larger investments in location-specific capital are required of international migrants.[14]

The cross-section estimates of assimilation by international migrants presented in the first column of table 5 do not control for the possibly confounding effects of secular changes in the quality of immigrant cohorts. By tracking immigrant cohorts across successive censuses in the manner described by Borjas (1985, 1987), it is possible to separately identify assimilation and cohort effects. Column (2) of table 5 reports the results of estimating such a regression on a pooled sample of observations from the 1970 and 1980 U.S. Censuses. Individuals selected from the 1970 Census are between the ages of 21 and 29, and in order to follow this same group ten

years later, individuals taken from the 1980 Census are between 31 and 39. The coefficients on the years in U.S. quadratic measure assimilation, while the year of arrival dummies pick up earnings differences across immigrant cohorts. Note that years in the United States and year of arrival are perfectly collinear in a single cross-section, but pooling the 1970 and 1980 cross-sections solves this problem. Finally, the dummy variable indicating that an observation comes from the 1980 Census captures a period effect, which among other things accounts for inflation since nominal wages are used.[15]

The column (2) estimates indicate large differences in the earnings of immigrant cohorts, even when assimilation is held constant. For example, immigrants arriving in 1975-80 earned upon arrival sixteen percent less than demographically comparable natives, whereas immigrants arriving in 1965-69 did not suffer any initial wage disadvantage. The pooled regression also implies a much slower rate of immigrant earnings assimilation than do the cross-section estimates (compare the column (1) and column (2) estimates of the coefficient on the linear years in U.S. term). Therefore, the differences between internal and international migrants with regard to the rate of assimilation become even larger if we use the pooled rather than cross-section estimates.

VI. Determinants of Assimilation by Internal Migrants

Internal migrants have been shown to experience a relatively short period of labor market adjustment in which they earn lower wages than do otherwise similar natives. What factors determine the severity of this initial wage disadvantage for migrants? Two candidate variables which may

influence the rate of assimilation by internal migrants are the distance of the move and economic conditions in the destination. Previous studies by Yezer and Thurston (1976) and Grant and Vanderkamp (1980) suggest that the initial wage disadvantage increases with the distance moved, which makes sense if labor market knowledge and human capital are more transferable between nearby as opposed to distant regions. In addition, if much of what we call labor market assimilation involves learning how to locate and obtain the best jobs available in a given area, then growing labor markets in which jobs are plentiful may afford less of a natural advantage to natives over recent immigrants.

Table 6 presents selected coefficients from wage regressions which examine these hypotheses. The sample is the same used for the regressions reported in table 3, which means that return migrants have been excluded.[16] To simplify interpretation of the results, migrant status and duration of residence have been collapsed into two dummy variables: one indicating migrants with less than three years in the current state, and another identifying all other migrants.[17] The control variables are the same ones used in table 3, but these coefficients are not reported as they change very little. In column (1), the migrant dummies are entered without further interactions, and the estimates imply that migrants earn seven percent less than natives during their first two years in a state, but after this the migrant wage differential disappears.

The regression reported in column (2) tests for the effects of distance moved and local economic conditions on migrant earnings assimilation. To proxy for the distance of the move, we create a dummy variable identifying migrants who moved within rather than across regions, where regions are

TABLE 6
HOURLY EARNINGS REGRESSIONS
Sample Excluding Return Migrants
(N = 4766)

Variable	(1)	(2)
Migrant × (1-2 years in state)	-.0739 (.0303)	-.2220 (.0607)
Migrant × (3+ years in state)	.0118 (.0216)	.0094 (.0217)
(Migrant within census region) × (1-2 years in state)	-	.1161 (.0572)
State employment growth rate, 1980-86	-	.2482 (.1357)
Migrant × (1-2 years in state) × (state employment growth rate)	-	.6595 (.3229)
R^2	.2170	.2192

Note: Standard errors are in parentheses. Dependent variable is the natural logarithm of average hourly earnings. Also included as independent variables are the control variables used in table 3.

defined as the four census regions: Northeast, North-Central, South, and West. In our sample, more than half of those who migrated across state lines also crossed regional boundaries. As a barometer of the local economy, we use the percentage growth in nonagricultural employment experienced by the state between 1980 and 1986.[18] This is calculated from U.S. Bureau of the Census (1987, table 641). State employment growth over this period ranges from the decline of almost eight percent suffered by West Virginia to the remarkable growth of over 32 percent enjoyed by Arizona. The rate of employment growth occurring in the state of residence averages ten percent for natives but over 12 percent for migrants in our sample. This is consistent with the accepted wisdom that migrants tend to relocate in areas with expanding economic opportunities.

Column (2) introduces interactions between recent migrant status and the intraregional migrant and employment growth variables.[19] By identifying recent migrants who did not change census regions, we allow the initial wage differential to vary for interregional and intraregional migrants. State employment growth is included by itself as well as interacted with the dummy variable for recent migrants. The estimates indicate that, holding constant employment growth in the destination state, interregional migrants suffer a much larger initial wage disadvantage than do migrants who remain within the same census region. For example, those moving across census regions to a state which experienced zero employment growth initially earn 22 percent less than natives of that state, but this wage disadvantage falls to only 11 percent if instead the migrant originates within the same census region. Similarly, the initial wage disadvantage is 16 percent for interregional migrants moving to a state with employment growth of ten percent, and the

corresponding wage differential for intraregional migrants is a mere four percent. These results confirm previous empirical findings and suggest that labor market assimilation is especially important for long-distance internal migration.

The estimated coefficients also reveal that, holding constant the distance moved, migrants suffer less of an initial wage disadvantage when they relocate in expanding labor markets. All workers earn higher wages in states with more rapid employment growth, but the wages of recent migrants increase by a larger amount than do the wages of natives and other migrants, with the net result that the initial wage differential between natives and migrants tends to be smaller in economically growing states. Considering interregional migrants, individuals moving to states with zero employment growth earn 22 percent less than natives during their first two years of residence, whereas migrants to a state with the mean employment growth rate of around ten percent earn only 16 percent less, and those moving to a state growing as rapidly as Arizona suffer virtually no wage disadvantage. A similar pattern occurs for intraregional migrants. This suggests that booming labor markets reduce the need for the types of local market knowledge which migrants may initially lack. It is evident that migration distance and destination economic conditions have sizable impacts on the initial labor market performance of internal migrants.

VII. Conclusion

The process of labor market assimilation, known to be important for international migrants, is also useful for understanding the earnings of young workers who move between U.S. states. Our cross-section estimates

imply that internal migrants to a state initially earn about ten percent less than demographically comparable natives, but because the earnings growth experienced by recent migrants exceeds that of natives, this wage differential disappears within a few years. First-difference wage growth regressions produce similar but imprecise point estimates. Earnings assimilation is found to take place at a faster pace and end sooner for internal migrants as compared to similarly aged international migrants.

Moreover, the initial wage disadvantage suffered by internal migrants depends upon the distance moved and economic conditions in the destination labor market. Individuals moving within the same census region experience much less earnings disruption than do interregional migrants, and the initial wage differential between natives and migrants is smaller in states enjoying more rapid employment growth. An important implication of our findings is that, because of the period of labor market adjustment which internal migrants go through, estimates of the wage gain to migration which compare earnings prior to moving with earnings immediately after moving may seriously understate the full gain which migrants will eventually realize.

FOOTNOTES

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1. Greenwood and McDowell (1986, pp. 1760-1767) provide a useful survey of this literature.

2. See Greenwood (1985) for a recent survey of research on internal migration.

3. Calculation of this variable is straightforward except for the time period between age 14 and the 1979 interview, since the NLSY does not provide state of residence information for the intervening years. We therefore employed the following procedure. If an individual's state of residence both at age 14 and in 1979 matched that for 1986, then all of this time period was included as years in the current state. If neither of these potential matches occurred, then none of this time period was counted. If only one match occurred, then half of the intervening years were assigned as years in the current state.

4. Alternative definitions of migrant status and years in the current state were tried using the individual's location history since age 18 or age 21 rather than age 14. These alternative measures produced results qualitatively similar to those reported below, and the age 14 definition is less problematic since for certain individuals in the sample we do not know their state of residence at age 18 or age 21.

5. Interaction terms between these variables and sex were not statistically significant either individually or jointly.

6. These regressions implicitly constrain the effects of the control variables to be the same for natives and migrants. This assumption was

tested by estimating separate wage regressions for the native and migrant samples, and the data do not come close to rejecting the joint hypothesis that the coefficients of all of the control variables are the same in the two samples. Furthermore, estimates of the assimilation parameters obtained from these separate regressions are virtually identical to the corresponding coefficients of the pooled regressions reported in table 2.

7. Of course, non-return migrants also comprise a self-selected sample, and this can bias least squares regressions comparing the hourly earnings of natives and migrants. For this reason, native and migrant wage equations were reestimated using the standard selectivity correction techniques developed by Heckman (1979). We found no evidence of selectivity bias. The selectivity corrected coefficients were very similar to those estimated by least squares, and the selection variables included in the second-stage wage regressions were not significantly different from zero. Note that although the selectivity corrected estimates account for possible endogeneity of the migration decision, the timing of the migration (i.e., the years in current state variable) is still assumed to be exogenous.

8. Hamermesh (1989) documents how measurement error in the dependent variable can lead to first-difference estimates which are much less precise than the corresponding cross-section estimates.

9. In order to simplify presentation of these estimates, the regressions reported in columns (2) and (4) of table 4 ignore the interaction terms between sex and selected control variables which were included in the cross-section regressions. This simplification does not appreciably affect the results.

10. Differences between cross-section and longitudinal estimates of

the earnings assimilation which accompanies international migration are due to unmeasured skill differences across immigrant cohorts, so it is not surprising that similar cohort effects do not appear to bias our cross-section estimates of assimilation by internal migrants. The cohort differences in international migrant flows only show up over long time periods and are usually attributed to changes in U.S. immigration policy or changing political conditions abroad (Borjas 1987). The sample of internal migrants we study are all similar in age, grew up under the same system of political and social institutions, and made their migration decisions within the same relatively brief span of about a decade. Moreover, no legal restrictions are placed on the interstate mobility of U.S. residents, and no major changes have recently made it more or less difficult to migrate from one state to any other.

11. The Census data only report year of immigration within intervals of five or ten years, so a continuous measure of years since migration was constructed by using the midpoints of these reporting intervals.

12. Similar results were obtained from an alternative specification in which the quadratic in years since migration was replaced with dummy variables indicating when the immigrant arrived in the United States.

13. Given that there exists human capital which is country-specific but not state-specific, it is surprising that the initial wage disadvantage suffered by internal migrants relative to natives appears to be similar in magnitude to that experienced by international migrants. However, it is difficult to compare these estimates of the initial wage differential since the data for international migrants lump together all those with less than five years in the United States. Moreover, as noted below, the initial wage

differential for international migrants varies across immigrant cohorts.

14. Interestingly, Borjas (1987) reports that a similar pattern exists among immigrants to the United States from different source countries. Immigrants originating in countries with economies more closely resembling the United States (i.e., countries with higher levels of per capita GNP) tend to have higher earnings upon arrival and experience more rapid rates of assimilation than do immigrants from less developed countries.

15. In order to separately identify the period, assimilation, and cohort effects, the period effect is assumed to be the same for natives and immigrants.

16. None of the results change if we instead use the full sample which includes return migrants.

17. This aggregation of the migrant dummies cannot be rejected by the data, and it is consistent with the assimilation pattern revealed by the more general specifications reported in table 3.

18. An alternative measure, the unemployment rate in the local labor market, produced similar results.

19. For ease of interpretation, this regression includes only the most important interaction terms. For example, we omit an interaction identifying intraregional migrants with more than two years in the current state, and we omit a similar interaction between state employment growth and migrants with long durations of residence. We also exclude interactions between intraregional migrant status and state employment growth. The regression was initially estimated with a complete set of interactions, but none of the omitted interactions proved to be statistically significant, and their inclusion did not appreciably affect the reported coefficients.

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