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by

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Abstract

We use both fixed-effects and random-effects regression models to measure the effect of geographic mobility on earnings of labor-force participants in the United States. The results support the human-capital hypothesis: six years after moving, real earnings of male labor-force participants are about 20 percent higher than they would have been had the move not occurred. Men younger than 40, and men with family-unit incomes no more than five times the poverty line, experience even larger benefits from moving. The geographic mobility that is characteristic of the United States' flexible labor market, in general, is beneficial to the movers.

JEL Classification: J60

I. *Introduction*

“Virtually every indicator shows that the United States has a more mobile work force and allows management greater flexibility in hiring, firing, or altering work conditions than the managements have in most other advanced countries” (Freeman, 1994, p.5). The relatively flexible and unregulated nature of America’s labor market has been credited with producing lower unemployment rates and higher work force participation rates during the last two decades than have been achieved in other developed countries. High rates of geographic mobility are part of labor-market flexibility in the United States.[1] In the year prior to March 1990, for example, 3.5 percent of employed individuals, and more than 6 percent of employed 20 to 29 year-olds, moved interstate (U.S. Department of Commerce, 1991, Table F). The propensity of Americans to move is thought to partially explain why their unemployment spells are of shorter duration than those of workers in other developed countries. In 1991, for example, 6.3 percent of unemployed American workers had been unemployed for one year or more, compared with 17.9 percent of unemployed Japanese workers, and 45.6 percent of unemployed European workers (OECD, 1993, Table Q). But does America’s geographic mobility permanently improve the economic status of the individuals concerned by producing, for example, better job matches? Or does it lead to only temporary improvements or even reductions in economic status, through processes such as loss of location-specific knowledge? We address these questions for male labor-force participants and their families. First, we briefly review previous research on the causes and consequences of migration. We then present the methodology to be used in measuring the effect of moving and describe the data set and conventions used in our empirical analysis. Next, we present our estimates of the short-term and long-term effects of moving. Finally, we state our conclusions.

II. *Previous Research*

The literature on the economics of migration is voluminous. Part of it deals with international labor movements and is surveyed by Borjas (1994); part of it deals with internal migration, either within developed countries such as the U.S. (see Greenwood, 1975, 1985 for surveys) or within developing countries (see Todaro, 1976 and Stark and Bloom, 1985, for discussions). Some studies focus on causes of migration, others on effects of emigration on the country or region of origin, still others on effects of immigration on the country or region of destination.

Labor economists typically model moving as an investment in human capital, undertaken only if the benefits exceed the costs (Nakosteen and Zimmer, 1980; Borjas, 1987; Jones 1992). The pecuniary benefits are mostly long term: the resulting increase in lifetime earnings of movers and their families net of any temporary income loss. The monetary costs are mostly short term: the direct costs of transporting family and belongings across country. There may also be nonmonetary benefits, such as access to a more pleasant environment, and nonmonetary costs, such as time required to learn about the new location, loss of social and family support groups, and disruption to children's schooling.[2] The human-capital model of mobility suggests that movers experience substantial and sustained monetary benefits, but is otherwise vague about their magnitude.

Empirical studies of internal migration have focused more on the causes than on the consequences of moving (Greenwood, 1985, p.526). Sandell (1977) and Harris (1981) investigated the effect of migration on the individual's income in a regression framework with controls for individual and location characteristics. Rodgers and Rodgers (1997), using panel data, found that rural-to-urban migration in the U.S. significantly improved the economic status of the movers and their families. This article examines all types of moves, not just those with a rural origin. It also attempts to identify the groups that are most likely to benefit from moving, and it investigates the effect of moving on the earnings of the spouse as well as on the family-unit head.

III. *Definition of the Effect of Moving*

We define the effect of moving on the individual as the difference between the earnings of the mover, several periods after the move, and the earnings that the mover would have achieved at that time had the move not occurred. The latter is unobservable. Its simplest estimate is the mover's earnings prior to the move. This approach has several problems. First, in a dynamic economy, workers' earnings are likely to change whether or not they move. Second, whether they move or not, individuals' earnings will be affected by their increasing work experience and any earnings-enhancing activities such as on-the-job training. For both these reasons earnings prior to moving is not a good estimate of what earnings would have been had moving not occurred. Furthermore, a move, or rather the events that induce workers to move, may have an impact on earnings before the move takes place.[3] For example, workers in firms that are struggling to survive may experience declining earnings prior to being displaced or resigning to seek employment elsewhere. Conversely, upwardly mobile workers may experience increased earnings prior to quitting their current jobs to take up even more lucrative employment elsewhere. Therefore, it is important to identify any unexpected changes in earnings before, as well as after, moving takes place and to keep in mind that a comparison of post-move earnings with earnings *immediately* prior to moving may produce a distorted estimate of the effect of the move.

We estimate the earnings that the mover would have achieved had he not moved by the earnings of a comparison group consisting of "stayers" (people who are never observed to move). The regression-adjusted earnings of stayers is an estimate of the earnings of movers, had they not moved. The adjustment takes into account differences between movers and stayers in earnings-related characteristics (such as human capital, race, and occupation) and the attributes of the regions in which they live, e.g., population density and the rate of unemployment. Bias resulting from self-selection in the decision to move is reduced by including as controls various factors that affect the probability of moving, such as marital status and the presence of school-age children, and by using panel data to model unobserved heterogeneity among workers.

The econometric model that we use to estimate the effect of moving draws on the literature that evaluates the effects of job training on earnings (Ashenfelter, 1978; Ashenfelter and Card, 1985) and in particular is similar to a model used by Jacobson et al. (1993) to measure the effect of job displacement on workers' earnings. The form of the model is:

$$\ell n(Y_{i,t}) = \mathbf{b}' \mathbf{X_{i,t}} + \sum_{k=-3}^{6} g_k D_{i,t-k} + a_i + u_{i,t} \,. \tag{1}$$

$Y_{i,t}$ denotes real[4] earnings (hourly or annual) of person i in year t. The vector $\mathbf{X}_{i,t}$ contains controls for earnings-related characteristics and the region of residence of individual i in year t. It also contains variables that reflect the cost of moving to individual i in year t as controls for self-selection in the decision to move. Finally, $\mathbf{X}_{i,t}$ contains dummy variables that control for the calendar year corresponding to year t, thereby taking account of macroeconomic factors that affect workers' earnings. The dummy variables, $D_{i,t-k}$ (k=-3, -2, -1 , 0, 1, 2, 3, 4, 5, 6) jointly represent the event of moving. When k is positive, $D_{i,t-k}$ equals 1 if a move occurs k years before year t (zero otherwise); when k is negative, $D_{i,t-k}$ equals 1 if a move occurs k years after year t (zero otherwise). The parameters $\gamma_{-3}, \gamma_{-2}, \gamma_{-1}, \gamma_0, \gamma_{+1}, \gamma_{+2}, \gamma_{+3}, \gamma_{+4}, \gamma_{+5}, \gamma_{+6}$ measure the effect on earnings of a move, up to three periods before its occurrence and up to six periods after its occurrence. The parameters, α_i, capture unobserved heterogeneity among workers, measured as either fixed or random effects. The error term, $u_{i,t}$, is assumed to have constant variance, to be uncorrelated across individuals, and to have the same first-order autoregressive structure for each individual: $u_{i,t} = \rho u_{i,t-1} + \varepsilon_{i,t}$, where $\varepsilon_{i,t} \sim$ i.i.d. $N(0,\sigma_\varepsilon^2)$.

IV. *Data, Definitions and Measurement*

Data used to estimate the model come from the 1969-1992 Panel Study of Income Dynamics (PSID), conducted by the Survey Research Center (SRC) of the University of Michigan (Hofferth et al., 1995). The analysis is restricted to males who meet several selection criteria in every year of at least one of the following 14-year sequences:[5] 1972 - 1985; 1973 - 1986; 1974 - 1987; 1975 - 1988; 1976 - 1989; 1977 - 1990; or 1978 -

1991. The selection criteria are: (a) resident of one of the 48 contiguous United States or the District of Columbia;[6] (b) head of a family unit;[7] (c) resident in the family unit rather than in an institution; (d) aged between 24 and 65 years; (e) reporting valid data on hourly and annual earnings; and (f) reporting valid data with which to identify a move. In addition, in the first 11 consecutive years the individual is required: (g) to be in the work force; and (h) to report valid data on other variables used in the econometric analysis presented later in this article.

Female heads of family units were excluded from the analysis because (a) females' labor-market behavior and experiences tend to be different from and more variable than those of males and therefore should be analyzed separately; (b) the PSID arbitrarily declares the family-unit head to be the male, if one is present, and collects more data on the head than on other family members; and (c) as a consequence of (b) there are insufficient observations of female heads of family units for a separate analysis of their geographic moves to be undertaken. We do, however, investigate the effect of moving on the spouses of the male, family-unit heads in our sample.

In this study a "move" in year t is defined as (a) a change of residence reported at the year t interview, and (b) a change of residential county code between year t-1 and year t. An intra-county change of residence is not considered to be a move because it will likely have little impact on the individual's labor-market activity. Individuals were classified as "stayers" or "movers". A stayer is never observed to move in any year in which he satisfies the selection criteria; a mover experiences at least one move in those years in which he meets the selection criteria. To contribute data to our analysis a mover must have at least one 14-year sequence of valid data that has no move prior to the sequence, no move in the first four years, nor in the last three years, of the sequence, and *exactly one* move in the middle seven years of the sequence. Some movers had only one such sequence, in which case that sequence was used in our analysis. Others had more than one sequence, in which case we selected the one with the move occurring earliest in the sequence.[8] This makes best use of movers' data because it allows the longest period over which to observe the effect of a move. In general, the earlier the move in a sequence the more recent is the sequence in calendar time so for consistency we also selected the most recent 14-year sequence of valid data for stayers. The final sample contains one observation on each of 580 stayers and 71 (one-time) movers. Each observation consists of the first 11 years of the sequence, with no move occurring in the first four years.[9] Earnings of movers in the second through fourth years of an observation may be affected by a later move but are not affected by earlier moves; earnings in the last three years of an observation are not affected by later moves. By constructing our observations in this way (and including a control for the current year of observation) we ensure that we compare different cohorts of movers to a group composed of stayers and people who move sufficiently far in the future that their current earnings are not affected by their move.

A further 23 movers satisfied all our requirements except for the fact that they had more than one move in the middle seven years of the sequence. Although Equation (1) could be extended to include another set of 10 dummy variables, $D_{i,t-k}$ (k=-3,-2,-1,0,1,2,3,4,5,6) for each additional move, with 16 two-time movers, 5 three-time movers, 1 four-time mover and 1 five-time mover there are insufficient data to estimate the effects of subsequent moves reliably. Therefore, we excluded multiple movers from the analysis reported in Section V. Recognizing, however, that the exclusion of multiple movers could bias our results we also estimated Equation (1) using data from all 94 movers, 71 single moves and the first move from each of the 23 sets of multiple moves. Our results changed little from those reported in Section V.

V. *Empirical Results*[10]

Table 1 reports descriptive statistics on stayers and one-time movers in the first year of the observation, which is four years before any moves take place. Although future movers work slightly fewer hours per year, have higher real earnings both per hour and per annum, and have higher real family-unit incomes than stayers, the observed differences are not statistically significant at the 10% level. Nevertheless, compared with stayers, future movers are better educated, and are more concentrated in higher-paying occupations (professional, technical, managerial, administrative). Table 1 shows that future movers are younger than stayers. This is expected because moving is costly and early moving implies a longer work life over which to receive compensatory benefits. Being younger, future movers have less work experience than stayers. Since marriage and the presence of children increase the costs of moving it is not surprising to observe that future movers are less likely to be married and have fewer children than stayers. Movers are more likely to originate in the North-Central region whereas stayers are more likely to reside in the North-East or Western regions. Movers are no more likely than stayers to originate in counties with high unemployment rates.

{Table 1 about here.}

Before using our model to estimate the effect of moving we need to establish that it is capable of explaining pre-move differences between the earnings of (future) movers and stayers by differences in their earnings-related characteristics rather than by differences in the effects of these characteristics on earnings.[11] To this end we estimated separate regressions of the form:

$$\ell n(Y_i) = \mathbf{b}^*.\mathbf{X}_i + v_i \qquad (2)$$

for stayers, (future) movers, and both groups combined, using cross-sectional data taken from the first year of each observation, which is four years before any moves take place. A Chow test failed to find evidence, at conventional levels of significance, that the parameters, $\mathbf{b}^*$, are different for movers and stayers.[12] The following decomposition of the difference between the log earnings of stayers and movers, evaluated at their respective mean values:

$$\hat{b}^s \overline{X}^s - \hat{b}^m \overline{X}^m = (\hat{b}^s - \hat{b}^m)\left(\frac{\overline{X}^s + \overline{X}^m}{2}\right) + (\overline{X}^s - \overline{X}^m)\left(\frac{\hat{b}^m + \hat{b}^s}{2}\right) \qquad (3)$$

revealed that about 66 percent of the difference in log hourly earnings can be explained by differences in earnings-related characteristics(the second term on the right hand side of Equation (3)), the remaining 34 percent being explained by differences in coefficients(the first term on the right hand side of Equation (3)). The corresponding figures for log annual earnings are 80 percent and 20 percent, respectively.

Next we tested for self-selection in the decision to move using the following model:

$$\ell n(Y_i) = \mathbf{b}^{\#}.\mathbf{X_i} + \alpha^{\#} D_i + w_i \tag{4}$$

where Y_i is either real hourly earnings or real annual earnings. Equation (4) was estimated using pooled cross-section of data on movers and stayers in the first year of each observation, which is four years before any moves take place. The dummy variable, D_i, equals one if the person is a future mover, zero otherwise. If movers have characteristics not included in **X** that affect both their earnings and their propensity to move, the coefficient of D_i in Equation (4) will be significantly different from zero.[13] We found that the coefficient on the future-mover dummy was not significantly different from zero.[14]

We conclude from these two tests that the observed differences in the earnings of stayers and (future) movers in the first year of an observation are attributable to differences in their observed earnings-related characteristics and the attributes of the regions in which they live and not to unobserved characteristics that influence either earnings or the decision to move or both. These two tests suggest that Equation (1) can accurately estimate the effect of moving.

Equation (1) was estimated as both a random-effects model and as a fixed-effects model. The random-effects model is the more appropriate on theoretical grounds because the individuals who provide observations in our sample are drawn from a larger population of male, labor-force participants who would meet our selection criteria and we extend our conclusions to that population. Furthermore, our two tests on pre-move data indicate that a random-effects estimator will provide unbiased estimation of the moving effects (Bassi, 1984, p.38). On the other hand, the results of the fixed-effects formulation are conditional on the individuals in the sample and therefore apply only to those individuals (Greene, 1993, p.469; Hsiao, 1986, pp.40-41). The fixed-effects formulation is also more restrictive in that it disallows the inclusion of time-invariant characteristics of workers (such as race) in the vector of independent variables.[15] The fixed-effects model does, however, have one major advantage: It ensures that no matter how workers' unobservable characteristics are related to their moving status, the coefficients estimating the effect of moving are unbiased. The random-effects model lacks this feature because it treats individual effects as uncorrelated with the independent variables. Therefore, despite evidence that the random-effects formulation is satisfactory and that the effects of moving will not be biased by self-selection in the decision to move, we estimated both random-effects and fixed-effects models. Estimates of the effect of moving are given in Table 2. Full regression results for the random-effects model (except for coefficients of dummies for the calendar year in which the move occurs) are given in Table 3. All the coefficients have the appropriate sign and most are statistically significant.[16]

{Table 2 about here.}

{Table 3 about here.}

Moving has a significant, positive effect on earnings. A test of the hypothesis that the coefficients on all the moving dummies are zero can be rejected at the five percent level of significance in both random-effects models (see the chi-square statistics for the Wald tests at the bottom of Table 2). The same hypothesis is rejected at the 12 and 6 percent levels of significance in the fixed-effects models with real hourly and real annual earnings, respectively, as the dependent variable (see the *F*-statistics for the tests of linear restrictions on parameters at the bottom of Table 2). The long-term effects of moving estimated with both the random-effects model and the fixed-effects model are remarkably similar particularly in the case of real annual earnings. Six years after moving real annual earnings are about 20 percent above their expected levels according to both models. Furthermore, our results indicate that the benefits of moving are derived from an increase in hourly wages rather than from working longer hours. The random-effects model estimates that six years after moving real hourly wages are about 20 percent higher than expected; the fixed-effects model estimates a more conservative 16 percent increase in real hourly wages. An estimate of Equation (1) with the logarithm of annual work hours as the dependent variable revealed no significant effect of moving on hours worked.

In the first five years after the move the effect on real annual earnings ranges from 11 to 19 percent in both the random-effects and fixed-effects models; the effect on real hourly wages ranges from 11 to 25 percent in the random-effects model and from 3 to 16 percent in the fixed-effects model. There is also evidence that in the two years prior to moving migrants experience unexpected increases in real hourly earnings of about 10 percent and unexpected increases in real annual earnings of about 12 percent. The observed increase in earnings in the year immediately prior to the move could be an artifact of the data. The SRC conducts the annual PSID interviews in spring. If a respondent reports that he has moved since the previous spring then the move could have taken place either in the previous calendar year but after the previous interview or in the current calendar year but before the current interview. Since earnings are recorded in the PSID on a calendar-year basis those that apply to the year when a move is reported, and those that apply to the year immediately prior to when a move is reported, could be a mixture of pre-move and post-move data. There is no obvious reason for the observed increase in earnings two years prior to moving. The phenomenon suggests, however, that at this time in their lives movers are upwardly mobile. For example, the acquisition of an educational qualification that does not show up as a different educational category in the PSID data could lead to a reward in the current job and a move to a better paid job two years later.

The results overall are consistent with the human-capital model of migration, which predicts that moving will lead to increased earnings over the remainder of the mover's lifetime. To put our results in context, a 20 percent increase in real annual earnings of (say) $30,000 (1982-83=100) equals $6,000 per year, which if sustained over (say) 25 years has a present value of about $90,000 at a 5 percent discount rate.

VI. *Who Benefits from Moving?*[17]

The human-capital model predicts that younger people are more likely to move than older people. The question addressed here is whether those older people who do move benefit as much as younger movers. We investigated this issue by estimating Equation (1) separately for people who were younger than 40 and for people 40 years or older in the first year of the observation. Our young stayers had an average age of 36.6 years and our young movers were 34.8 years old on average. Our old stayers were 52.3 years old on average and our old movers had an average age of 53.1. The results from the random-effects model are displayed in Table 4. In the year of the move and in the first five years following the move younger men have real hourly wages that are between 16 and 31 percent higher than expected; six years after moving their real hourly wages are about 24 percent higher than expected. Up to five years following a move younger men have real annual earnings that are between 19 and 26 percent higher than expected; six years after moving their real annual earnings are approximately 28 percent higher than expected. These results are highly statistically significant. In contrast, there is no evidence that older men benefit from moving. There is no statistically significant effect of the move on older men's real hourly wages, and there is some evidence that their real annual earnings fall as a result of moving. It is not simply that older men have fewer years over which to accumulate the net gains of moving; the dependent variable in our model is not lifetime earnings but earnings in a given year. Rather it would seem that older men either make mistakes in their decisions about when and where to move, are not moving voluntarily, or are moving for reasons other than to increase their earning capacity .

{Table 4 about here.}

The human-capital model does not predict whether moving will be more beneficial to those at the bottom or the top of the income distribution. We believe the issue is important because a mobile labor market that increases inequality of income is quite different from one that decreases it. To investigate we estimated Equation (1) separately for people living in family units with an income-to-needs ratio less than or equal to five and for those living in family units with an income-to-needs ratio of more than five in the first year of the observation. Our less affluent stayers lived in family units with an average income-to-needs ratio of 3.5 and our less affluent movers lived in family units with an average income-to-needs ratio of 3.4. Our more affluent stayers lived in family units with an average income-to-needs ratio of 8.2 and our more affluent movers lived in family units with an average income-to-needs ratio of 8.5. The results from the random-effects model are displayed in Table 5.

{Table 5 about here.}

In the year of the move and in the first five years following the move the random-effects model estimates that men in our sample from less affluent family units have real hourly wages that are between 23 and 34 percent higher than expected; six years after moving their real hourly wages are about 39 percent higher than expected. Moving has an even greater effect on the real annual earnings of the men from less affluent family units. In the year of the move and in the first five years following the move the random-effects model estimates that their real annual earnings are between 35 and 45 percent higher than expected and six years after moving about 51 percent higher than expected. All these results are highly statistically significant. There is no evidence, however, that men from more affluent family units benefit from moving. None of the coefficients on the more affluent men's moving dummies is statistically different from zero at levels of significance of 1 percent or less. This result suggests that the mobile nature of the American work force does not widen the distribution of earnings relative to needs.

If the decision to move is taken jointly by the family unit, rather than by the head only, then one would expect to observe significant increases in family-unit income resulting from a move. To investigate we estimated Equation (1) with real annual family-unit income as the dependent variable. The results are given in Table 6. Moving increased real annual family-unit income by approximately 10 percent in the year of the move and up to six years later, but these estimates were not statistically significant at the one percent level. We proceeded to examine the effect of moving on the economic status of the spouse, a task complicated by the fact that the same spouse may not be present in all eleven years of the observation. In our sample 471 out of 580 stayers and 51 out of 71 movers were married to, or cohabiting with, the same woman in all eleven years of the observation. Of these, 185 stayers and 15 movers had spouses who worked in all eleven years of the sequence. Using data on these 200 spouses we estimated Equation (1), first with the dependent variable being the real hourly wage of the spouse and second with the dependent variable being real annual earnings of the spouse. The independent variables refer to the spouse rather than the family-unit head and include her education, work experience, the region in which she resides, the unemployment rate of that region, and the calendar year in which her characteristics are observed. The effect of moving on the spouse's earnings are shown in Table 6. We found no significant impact of moving on the spouse's hourly or annual earnings, except in the second year after the move where there appears to be a temporary increase in her real hourly wage.

{Table 6 about here.}

VII. *Summary and Conclusions*

We have investigated the effect of moving between counties within the U.S. on the economic status of movers. The analysis employed data extracted from the PSID, Waves I-XXV, and was restricted to male labor-force participants and their families. Our results, in general, are consistent with the human-capital model of migration. Six years after a move migrants' real hourly and annual earnings are both approximately 20 percent higher than they would have been had the move not occurred. Furthermore, movers appear to be upwardly mobile prior to the move: two years prior to moving their real earnings are about 10 to 13 percent above their expected levels. We conclude that geographic mobility, a feature of America’s flexible labor market, improves the economic status of the migrants.

The substantial benefits of moving are not universal, however. They were found to be restricted to younger men; men of 40 years or older do not seem to benefit from moving. Benefits accrue to men from less affluent family units; those with family-unit incomes in excess of five times their family-unit needs experience no significant benefits from a move. Finally, we could find little evidence that spouses of migrants directly benefit or lose from moving; the economic gains accrue to the heads of family units, who, in our study, are male.

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Table 1: Descriptive Statistics, Stayers and Movers (4 Years Prior to Moving)

Characteristic	Stayers	1-Time Movers	
Economic Status			
Mean real hourly wage of head ($)	13.5390	14.7946	
Mean real annual labor income of head ($)	30508.4476	33030.2529	
Mean annual family-unit income ($)	41432.7027	43387.5304	
Mean annual hours worked by head	2322.3277	2274.7254	
Proportion working or on leave	0.9949	0.9818	
Education			
Proportion with fewer than 12 grades	0.2591	0.1502	**
Proportion with 12 grades & no further training	0.2612	0.1248	**
Proportion with 12 grades plus nonacademic training	0.1233	0.1417	
Proportion with college but no degree	0.1611	0.2324	
Proportion with college BA but no advanced degree	0.1398	0.2693	***
Proportion with college BA plus advanced or professional degree	0.0555	0.0815	
Other Personal Attributes			
Mean experience (thousands of hours)	30.3396	20.6881	***
Proportion married	0.9483	0.8384	***
Mean number of children under 18 years old	1.6644	1.3739	*
Proportion resident in a metropolitan area	0.7637	0.7042	
Mean age	38.8500	33.1393	***
Proportion nonwhite	0.0901	0.0492	
Proportion with a disability that limits the amount or type of work	0.0661	0.0185	
Region of Residence			
Proportion resident in the North East region	0.2800	0.1521	**
Proportion resident in the North Central region	0.3324	0.5841	***
Proportion resident in the South region	0.2081	0.1689	
Proportion resident in the West region	0.1795	0.0949	*
Occupation			
Proportion in professional or technical occupations	0.1828	0.3354	***
Proportion in managerial or administrative occupations	0.1746	0.2792	**
Proportion in sales or clerical occupations	0.1086	0.0226	**
Proportion in crafts occupations	0.2624	0.1924	
Proportion employed in operatives	0.1884	0.0954	*
Proportion of laborers, farmers & farm employees, service & private household workers	0.0834	0.0750	
Unemployment Rates of County of Residence			
Proportion living in counties with unemployment <2%	0.0181	0.0139	
Proportion living in counties with unemployment 2-3.9%	0.2019	0.1581	
Proportion living in counties with unemployment 4-5.9%	0.3035	0.4491	**
Proportion living in counties with unemployment 6-10%	0.4410	0.3559	
Proportion living in counties with unemployment >10%	0.0355	0.0230	
Number of Observations	580	71	

*, **, and *** indicates a statistically significant difference at the 10%, 5% and 1% level, respectively.

Table 2: Effect of Moving on Economic Status of Head

(Up to 6 Years After and 3 Years Before Moving)

Effect on Current Earnings of a move	Random-Effects Model: Ln(Real Hourly Wage of Head)	Random-Effects Model: Ln(Real Annual Earnings of Head)	Fixed-Effects Model: Ln(Real Hourly Wage of Head)	Fixed-Effects Model: Ln(Real Annual Earnings of Head)
6 years earlier	0.1971**	0.2022***	0.1617**	0.2053**
5 years earlier	0.1500**	0.1463**	0.1328	0.1497*
4 years earlier	0.2533***	0.1152*	0.3229***	0.1155
3 years earlier	0.1110*	0.1256**	0.0617	0.1349**
2 years earlier	0.1526***	0.1799***	0.0285**	0.1917***
1 year earlier	0.1393***	0.1583***	0.0589**	0.1663***
current year	0.1122**	0.1555***	0.0138*	0.1604***
1 year later	0.0972*	0.1184**	0.0901*	0.1210**
2 years later	0.1079**	0.1255**	0.1161**	0.1310**
3 years later	0.0509	0.0891*	0.0366	0.0909*
H_0:**g** =0				
REM: Wald Test: (χ^2)	20.39**	23.10**		
FEM: ***F***-test			1.5623	1.7909*
R^2	0.2561	0.2417	0.7182	0.6739

*, **, and *** indicates statistically significant at the 10%, 5% and 1% level, respectively.

Table 3: Coefficients, Random-Effects Model

Independent Variable	**Ln (Real Hourly Wage of Head)**	**Ln (Real Annual Earnings of Head)**
constant	2.1415***	9.9654***
Education		
12 grades & no further training	0.0955**	0.1100***
12 grades plus nonacademic training	0.1543***	0.1698***
college but no degree	0.2458***	0.2560***
college BA but no advanced degree	0.4118***	0.4438***
college BA plus advanced or professional degree	0.5235***	0.5545***
Other Personal Attributes		
experience (thousands of hours)	0.0095***	0.0136***
experience squared	-0.0000***	-0.0001***
married	0.1019***	0.0630**
number of children under 18 years old	-0.0090	-0.0022
resident in a metropolitan area	0.1942***	0.1778***
nonwhite	-0.0718*	-0.1194***
with a disability that limits the amount or type of work	-0.0452**	-0.1087***
Region of Residence		
resident in the North Central region	-0.0382	-0.0525
resident in the South region	-0.2223***	-0.2283***
resident in the West region	-0.0355	-0.0523
Occupation		
managerial or administrative occupations	-0.0210	-0.0034
sales or clerical occupations	-0.0238	-0.0342
crafts occupations	-0.0258	-0.0523*
employed in operatives	-0.0083	-0.0364
laborer, farmer, service or h'hold worker	-0.1730***	-0.1506***
Unemployment Rates of County of Residence		
living in counties with unemployment 2-3.9%	-0.1037*	-0.1229**
living in counties with unemployment 4-5.9%	-0.1107**	-0.2027***
living in counties with unemployment 6-10%	-0.1359**	-0.2407***
living in counties with unemployment >10%	-0.1567***	-0.2661***
Effect of Moving		
moved, 6 years earlier	0.1971**	0.2022***
moved, 5 years earlier	0.1500**	0.1463**
moved, 4 years earlier	0.2533***	0.1152*
moved, 3 years earlier	0.1110*	0.1256**
moved, 2 years earlier	0.1526***	0.1799***
moved, 1 years earlier	0.1393***	0.1583***
moved, current year	0.1122**	0.1555***
move, 1 year later	0.0972*	0.1184**
move, 2 years later	0.1079**	0.1255**
move, 3 years later	0.0509	0.0891*
no. of observations	7,161	7,161
Estimated autocorrelation coefficient	0.0131	0.0943
R^2	0.2561	0.2417

*, **, and *** indicates statistically significant at the 10%, 5% and 1% level, respectively.

Table 4: Coefficients, Random-Effects Model, Stayers and Movers Classified by Age

(Up to 6 Years After and 3 Years Before Moving)

	Ln(Real Hourly Wage of Head)		Ln(Real Annual Earnings of Head)	
Effect on Current Earnings of a move	**<40 Years Old**	**³ 40 Years Old**	**<40 Years Old**	**³ 40 Years Old**
moved, 6 years earlier	0.2371***	-0.0563	0.2843***	-0.1869*
moved, 5 years earlier	0.2003**	-0.1357	0.2333***	-0.2583**
moved, 4 years earlier	0.3083***	-0.0992	0.1906**	-0.2606**
moved, 3 years earlier	0.2011 ***	-0.2695***	0.2576***	-0.3735***
moved, 2 years earlier	0.1678***	0.0288	0.2370***	-0.1029
moved, 1 years earlier	0.1791***	-0.0622	0.2212***	-0.1035
moved, current year	0.1666***	-0.1519**	0.2369***	-0.1853***
move, 1 year later	0.1253**	-0.0320	0.1634***	-0.0349
move, 2 years later	0.1249**	-0.0051	0.1678***	-0.0537
move, 3 years later	0.0423	0.0396	0.0928	0.0718
no. of observations	4,092	3,069	4,092	3,069
Estimated autocorrelation coefficient	0.1100	0.1088	0.0742	0.1136
R^2	0.2529	0.2254	0.2436	0.2312

*, **, and *** indicates statistically significant at the 10%, 5% and 1% level, respectively.

Table 5: Coefficients, Random-Effects Model, Stayers and Movers Classified by Income-to-Needs Ratio

(Up to 6 Years After and 3 Years Before Moving)

	Ln(Real Hourly Wage of Head)		Ln(Real Annual Earnings of Head)	
Effect on Current Earnings of a move	**income-to-needs £5**	**income-to-needs >5**	**income-to-needs £5**	**income-to-needs >5**
moved, 6 years earlier	0.3908**	0.0705	0.5149***	0.0348
moved, 5 years earlier	0.3368**	0.0227	0.4480***	-0.0253
moved, 4 years earlier	0.3403***	0.1438**	0.4502***	-0.1019
moved, 3 years earlier	0.2280**	0.0031	0.4019***	-0.0392
moved, 2 years earlier	0.2880***	0.0294	0.3455***	0.0413
moved, 1 years earlier	0.2661***	0.0272	0.3513***	0.0226
moved, current year	0.2552***	-0.0123	0.3530***	0.0041
move, 1 year later	0.2023**	0.0135	0.2315**	0.0471
move, 2 years later	0.1065	0.0663	0.1793*	0.0755
move, 3 years later	0.1183	-0.0262	0.1227	0.0454
no. of observations	3,619	3,542	3,619	3,542
Estimated autocorrelation coefficient	0.0624	-0.0155	0.0475	0.2022
R^2	0.2089	0.2076	0.1859	0.2068

*, **, and *** indicates statistically significant at the 10%, 5% and 1% level, respectively.

Table 6: Effect of Moving on Economic Status of the Family Unit and Spouse, Random-Effects Model

(Up to 6 Years After and 3 Years Before Moving)

Effect on Current Earnings of a move	**Ln(Real Annual Income of Family Unit)**	**Ln(Real Hourly Wage of Spouse)**	**Ln(Real Annual Earnings of Spouse)**
moved, 6 years earlier	0.0966	0.0478	-0.2567
moved, 5 years earlier	0.1007*	0.1092	-0.1366
moved, 4 years earlier	0.1031**	0.1554	0.0202
moved, 3 years earlier	0.0498	0.2003	-0.0094
moved, 2 years earlier	0.0907**	0.4848***	0.3314**
moved, 1 years earlier	0.1030**	0.1881*	0.1789
moved, current year	0.0916**	0.0874	0.0180
move, 1 year later	0.0675*	0.2394**	-0.0029
move, 2 years later	0.0977**	0.2753***	0.2286*
move, 3 years later	0.0562	0.1097	0.1058
no. of observations	7,161	2,200	2,200
Estimated autocorrelation coefficient	0.25723	0.0101	0.2316
R^2	0.3398	0.1632	0.1946

*, **, and *** indicates statistically significant at the 10%, 5% and 1% level, respectively.

Endnotes

[1] OECD, 1991, Table 2.14 gives international comparisons of geographic mobility. In 1987, for example, 2.8 percent of the U.S. population moved inter-state, 2.6 percent of the Japanese population moved among 47 prefectures, and 1.3 percent of the French population moved among 22 regions.

[2] Murnane et al. (1981) find evidence that children living in families that move achieve at lower levels than comparable children living in nonmigrating families.

[3] In a similar way Jacobson et al. (1993) distinguish between displacement and the events that lead to displacement in their study of the effects of job terminations on earnings.

[4] The CPI-CU was used to deflate nominal values. (Extracted from The Bureau of Labor Statistics WWW Site. Series ID CUUR0000SA0.)

[5] Allowing the selection criteria to be met in any one of the seven 14-year sequences, and controlling for the calendar year of the observation, increases the number of observations in the analysis. It implicitly assumes that a move in (say) 1975 has the same effect on real earnings in 1978 as a move in 1985 has on real earnings in 1988.

[6] Alaska and Hawaii are excluded because several changes in county boundaries make it difficult to identify inter-county moves.

[7] A family unit in the PSID may consist of a single adult.

[8] The earliest a move can occur is in the fifth year of the sequence; the latest is in the eleventh year of the sequence.

[9] To identify the parameters of Equation (1) in the fixed-effects formulation we must observe the economic status of at least some movers more than three years prior to moving. For this reason we include four years of pre-move data for our first cohort of movers, who move in the fifth year of the observation.

[10] All estimation reported in the paper was performed using LIMDEP, Version 7.0 (Greene, 1995) and employs PSID individual weights. LIMDEP automatically scales the weights so that they sum to the sample size.

[11] The need for such a test is stressed by Lalonde (1986, p.613) in his discussion of how to evaluate training programs using nonexperimental data: “Thus, if the regression-adjusted difference between the post-training earnings of the two groups is going to be a consistent estimator of the training effect, the regression-adjusted pre-training earnings of the two groups should be the same.”

[12] The *F*-statistics were 0.8819 (*P*-value = 0.6534) and 0.9008 (*P*-value = 0.6240) when the dependent variable was the logarithm of the real hourly wage and the logarithm of real annual earnings, respectively.

[13] This test was suggested by Gabriel and Schmitz (1995).

[14] The coefficients were 0.0808 (*P*-value = 0.1572) and 0.0645 (*P*-value = 0.2252) when the dependent variable was the logarithm of the real hourly wage and the logarithm of real annual earnings, respectively.

[15] Time invariant regressors are perfectly collinear with the fixed effects.

[16] The standard errors that underlie the *P*-values reported in all our tables do not take account of the fact that the PSID is a "complex" sample, rather than a simple random sample. However, if our standard errors are multiplied by 1.5, a rough rule of thumb suggested by Hill (1992, pp.62-68), our conclusions do not change. R^2 statistics in Tables 3 through 7 are simple coefficients of determination between ln(Y) and the value of ln(Y) predicted from Equation (1).

[17] Due to limitations on space we report only the results from the random-effects model in the section. The fixed-effects model produced similar results in all cases and they are available from the authors on request.