The Migration of Young Adults from Non-Metropolitan Counties

Bradford Mills and Gautam Hazarika

This article examines young adult migration from non-metropolitan counties to either different non-metropolitan counties or to metropolitan areas. The results show that expected gains in initial earnings provide young entrants to the labor force with a marked incentive to migrate from their non-metropolitan counties of origin. Initial earnings gains stem, in part, from higher returns to schooling in both metropolitan areas and other non-metropolitan counties. The propensity to migrate is also sensitive to the costs of migration, which, in turn, are correlated with paternal education and the local presence of extended family.

Key words: earnings, migration, non-metropolitan young adults, returns to schooling.

Net migration flows between non-metropolitan and metropolitan areas of the United States have reversed three times over the past thirty years (Fuguitt and Beale). Net out-migration from non-metropolitan areas prior to the 1970s and during the 1980s led to calls for policies to foster the retention of rural populations, while concern largely focused on the preservation of "rural America" and the management of growth during periods of net in-migration. Non-metropolitan counties have consistently been concerned with retaining productive labor, given high migration propensities among educated young adults and the aging of retained populations. Successful rural development initiatives aimed at retaining young adults must be based on a thorough understanding of the reasons for young adult out-migration. This article explores the economic factors underlying such out-migration from non-metropolitan counties.

Frameworks for identifying the benefits and the monetary and non-monetary costs of migration may be traced back to the seminal paper by Sjaastad. Empirical methods to consistently estimate the benefit and cost components of migration decisions have previously been applied (e.g., Robinson and Tomes). However, earlier attempts to identify the underlying components of the migration decisions of non-metropolitan area residents in the United States have either focused exclusively on persistent non-metropolitan–metropolitan area earnings gaps or on the monetary and psychic costs of migration (Hoch; Deaton, Morgan, and Anschel; Broomhall and Johnson). A related body of literature has examined wage differentials faced by workers employed in farming to explain labor flows from the sector (e.g., Gisser and Davila). This article builds on these efforts by developing a formal model of the migration of young adults from non-metropolitan counties in the United States either to other non-metropolitan counties or to metropolitan areas. The model incorporates gains in initial hourly earnings and broadly defined migration costs encompassing the financial, psychic, and employment attainment costs of migration.

The empirical strategy employed is as follows. Initial hourly earnings functions facing young migrants and non-migrants are estimated using a sample of 1476 individuals from the National Longitudinal Survey of Youth (NLYS), who resided in non-metropolitan areas at age 14. Since earnings upon migration are only observed for migrants and earnings upon staying are only observed for non-migrants, the maximum likelihood method of type 2 tobit (Amemiya) is employed to recover selectivity-corrected estimates of an initial hourly earnings function for each group. For every individual in the sample, migrant or non-migrant, these

Bradford F. Mills is an assistant professor in the Department of Agricultural and Applied Economics at Virginia Tech. Gautam Hazarika is a visiting assistant professor in the Department of Agricultural and Applied Economics at Virginia Tech.

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consistent estimates are used to predict initial hourly earnings upon migration and upon remaining in the county of origin. Next, consistent estimates of the influence of individual and county characteristics on the cost component of the migration decision are recovered through probit estimation of a structural equation that includes the log of the ratio of predicted initial hourly earnings upon migration to predicted initial hourly earnings upon remaining in the county of origin as an explanatory variable.

The results highlight the important roles that factors associated with initial earnings differences and migration costs play in explaining the migration behavior of young adults. Unlike typical models of rural to urban migration, the earnings and cost components of the migration decision induce migration to other non-metropolitan areas as well as metropolitan areas. Notably high returns to schooling make other non-metropolitan counties a particularly attractive migration destination for educated non-metropolitan youth. The findings imply that non-metropolitan areas are in aggregate able to provide remunerative employment opportunities to well educated non-metropolitan youth. However, as labor markets for high skill groups are often relatively thin in specific non-metropolitan areas, educated young adults may not find these remunerative positions in their non-metropolitan county of origin.

These findings are developed in the remainder of the article. The next section presents a simple model of migration. The empirical specification, estimation method, and data are then discussed, followed by empirical results and simulations. The article concludes with implications for rural development policy.

A Model of Young Adult Migration

Individual i, resident of a non-metropolitan area, is on the verge of completing his or her desired level of schooling and entering the labor force. Initial hourly earning upon migration is denoted as $W_{i,0,M}$. The growth rate or earnings upon migration is denoted as g_M. Similarly, initial earnings and the growth rate of earnings in the local non-metropolitan labor market are denoted as $W_{i,0,N}$ and g_N, respectively. These growth rates may be interpreted as the coefficients of work experience in standard Mincer earnings functions (e.g., Willis and Rosen). It follows that

$$(1) \qquad W_{i,t,M} = W_{i,0,M} e^{g_M t}$$

and

$$(2) \qquad W_{i,t,N} = W_{i,0,N} e^{g_N t}$$

where $W_{i,t,M}$ and $W_{i,t,N}$ are, respectively, worker i's earnings from migrating and from remaining in the non-metropolitan county of origin at time t after commencement of employment.

The transition from school to work is not frictionless. Assume that, upon completing school, workers receive job offers generated by stochastic processes. Worker i expects to receive a job offer with probability $\lambda_{i,M}$ if she migrates upon completing school. On the other hand, the worker expects to receive a job offer with probability $\lambda_{i,N}$ in the local non-metropolitan labor market. These probabilities are functions of labor market conditions and worker characteristics.

The worker's planning horizon is a period of duration T. Denote the subjective rate of discount as r_i, letting $r_i \succ g_M, g_N$. Then, given (1), the expected present value of the worker's earnings upon migration over time T is

$$(3) \qquad V_{i,M} = \lambda_{i,M} \int_0^T W_{i,0,M} e^{-(r_i - g_M)t}\, dt = \lambda_{i,M} \frac{W_{i,0,M}}{r_i - g_M}\left[1 - e^{-(r_i - g_M)T}\right].$$

Similarly, given (2), the expected present value of her earnings over time T in the local non-metropolitan area is

$$(4) \qquad V_{i,N} = \lambda_{i,N} \int_0^T W_{i,0,N} e^{-(r_i - g_N)t}\, dt = \lambda_{i,N} \frac{W_{i,0,N}}{r_i - g_N}\left[1 - e^{-(r_i - g_N)T}\right].$$

With negligible costs of migration, worker i would migrate if

$$\frac{V_{i,M}}{V_{i,N}} \succ 1.$$

On the other hand, if the costs of migration are substantial, the condition for migration is modified as

$$(5) \qquad \frac{V_{i,M}}{V_{i,N}} \succ C_t.$$

where C_i is an index of the financial and psychic costs of migration, $C_i \succ 1$. Hence, taking logs of both sides of (5) and using (3) and (4), worker i would migrate only if

$$\ln(\lambda_{i,M}) + \ln(W_{i,0,M}) - \ln(r_i - g_M) + \ln\left[1 - e^{-(r_i - g_M)T}\right] - \ln(\lambda_{i,N}) - \ln(W_{i,0,N}) + \ln(r_i - g_N) - \ln\left[1 - e^{-(r_i - g_N)T}\right] \succ \ln C_i.$$

Let

$$(6) \quad I_i^* = \ln(\lambda_{i,M}) - \ln(\lambda_{i,N}) + \ln(W_{i,0,M}) - \ln(W_{i,0,N}) - \ln(r_i - g_M) + \ln(r_i - g_N) + \ln\left[1 - e^{-(r_i - g_M)T}\right] - \ln\left[1 - e^{-(r_i - g_N)T}\right] - \ln C_i.$$

I_i^* may be interpreted as the worker's latent tendency to migrate. Worker i would migrate if $I_i^* \succ 0$ and choose to remain in the county of origin if $I_i^* \le 0$.

Empirical Specification and Estimation

By a Taylor series approximation to the non-linear terms in (6) around the mean value of r_i, $\bar{r}$,

$$(7) \quad I_i^* \simeq \alpha_0 + (\ln W_{i,0,M} - \ln W_{i,0,N}) + (\ln \lambda_{i,M} - \ln \lambda_{i,N}) + \alpha_1 r_i - \ln C_i$$

where

$$\alpha_1 = \frac{1}{\bar{r} - g_N} - \frac{1}{\bar{r} - g_M} + \frac{Te^{-(\bar{r} - g_M)T}}{1 - e^{-(\bar{r} - g_M)T}} - \frac{Te^{-(\bar{r} - g_N)T}}{1 - e^{-(\bar{r} - g_N)T}}$$

$$\alpha_0 = \ln(\bar{r} - g_N) - \ln(\bar{r} - g_M) + \ln[1 - e^{-(\bar{r} - g_M)T}] - \ln[1 - e^{-(\bar{r} - g_N)T}] - \frac{\bar{r}}{\bar{r} - g_N} + \frac{\bar{r}}{\bar{r} - g_M} - \frac{T\bar{r}e^{-(\bar{r} - g_M)T}}{1 - e^{-(\bar{r} - g_M)T}} + \frac{T\bar{r}e^{-(\bar{r} - g_N)T}}{1 - e^{-(\bar{r} - g_N)T}}.$$

Assume that

$$(8) \quad \ln W_{i,0,M} = \mathbf{X}_{i1}\mathbf{B}_1 + e_{i1}$$

$$(9) \quad \ln W_{i,0,N} = \mathbf{X}_{i2}\mathbf{B}_2 + e_{i2}$$

$$(10) \quad \left(\ln \lambda_{i,M} - \ln \lambda_{i,N}\right) + \alpha_1 r_i - \ln C_i = \mathbf{X}_{i3}\mathbf{B}_3 + e_{i3}$$

where the $\mathbf{X}_i$ are exogenous regressors and the e_i are error terms. The term $(\ln W_{i,0,M} - \ln W_{i,0,N})$ in (7) is designated the initial hourly earnings component of individual i's migration decision, whereas the portion $\left(\ln \lambda_{i,M} - \ln \lambda_{i,N}\right) + \alpha_1 r_i - \ln C_i$ is taken to be the cost component.[1] The term $(\ln \lambda_{i,M} - \ln \lambda_{i,N})$, the log of the ratio of the probability of finding a job upon migration to the probability of finding a job in the local non-metropolitan labor market, may be considered related to the net employment attainment cost of migration. Substituting (8)–(10) in (7) yields

$$(11) \quad I_i^* = \mathbf{Z}_i\mathbf{\Pi} + v_i$$

where $\mathbf{Z}_i$ is the union of the regressors $\mathbf{X}_{i1}$ to $\mathbf{X}_{i3}$, and v_i consists of an error from approximation and a linear combination of the errors e_{i1} to e_{i3}. While I^* is unobserved, the migrant status of worker i is known. Assuming v_i is normally distributed, the equation

$$(12) \quad \frac{I_i^*}{\sigma_v} = \mathbf{Z}_i \frac{\mathbf{\Pi}}{\sigma_v} + \frac{v_i}{\sigma_v}$$

$\sigma_v = \mathrm{Var}(v_i)$, may be estimated by probit ML.

Initial hourly earnings of workers who completed schooling and entered the labor force before 1979, the first year of the NLSY, are unavailable. Hence, hourly earnings equations are estimated as

$$(8.1) \quad \ln W_{i,21,M} = \mathbf{X}_{i1}\mathbf{B}_1 + g_U t_{21} + e_{i1}$$

$$(9.1) \quad \ln W_{i,21,N} = \mathbf{X}_{i2}\mathbf{B}_2 + g_R t_{21} + e_{i2}$$

where the $W_{i,21}$ are worker i's hourly earnings at age 21 or the earliest year there-

[1] The individual's subjective rate of discount r_i is arguably not part of the cost component, but because it is naturally unobservable it must be treated as a function of the same set of exogenous regressors.

after when observed out of school, t_{21} is work experience at this time, and the g are, as previously defined, the growth rates of earnings upon migration and remaining in the local non-metropolitan area.[2]

The log of worker i's observed hourly earning is $\ln W_{i,21,M} = \mathbf{X}_{i1}\mathbf{B}_1 + g_U t_{21} + e_{i1}$ if $I^* = \mathbf{Z}_i\mathbf{\Pi} + v_i > 0$ and $\ln W_{i,21,N} = \mathbf{X}_{i2}\mathbf{B}_2 + g_R t_{21} + e_{i2}$ if $I^* = \mathbf{Z}_i\mathbf{\Pi} + v_i \leq 0$. Since $\text{cov}(e_{i1}, v_i) \neq 0$ and $\text{cov}(e_{i2}, v_i) \neq 0$, estimating (8.1) and (9.1) by OLS applied, separately, to samples of migrants and non-migrants may yield inconsistent estimates for the full sample. Assuming e_{i1} and v_i, and e_{i2} and v_i, are bivariate normally distributed, (8.1) and (12), and then (9.1) and (12), may be consistently estimated by the maximum-likelihood method of type 2 tobit (Amemiya).

With consistent estimates of $\mathbf{B}_1$ and $\mathbf{B}_2$, namely $\widehat{\mathbf{B}}_1$ and $\widehat{\mathbf{B}}_2$, worker i's expected initial hourly earnings with no work experience upon migration $\ln \widetilde{W_{i,0,M}}$ and upon remaining in the county of origin $\ln \widetilde{W_{i,0,N}}$ may be generated as $\mathbf{X}_{i1}\widehat{\mathbf{B}}_1$ and $\mathbf{X}_{i2}\widehat{\mathbf{B}}_2$, respectively. It follows that a consistent estimate of $\mathbf{B}_3$ up to a factor of proportionality may be obtained by applying probit ML to the structural equation

$$(13) \quad I_i^* = \alpha_0 + \left(\ln \widetilde{W_{i,0,M}} - \ln \widetilde{W_{i,0,N}}\right) + \mathbf{X}_{i3}\mathbf{B}_3 + \varepsilon_i$$

with ε_i denoting the regression error. The structural equation (13) decomposes worker i's migration propensity I_i^* into its earnings component, $\left(\ln \widetilde{W_{i,0,M}} - \ln \widetilde{W_{i,0,N}}\right)$, and its cost component, $\mathbf{X}_{i3}\mathbf{B}_3$. Note that identification of (13) requires that $\mathbf{X}_{i1}$ or $\mathbf{X}_{i2}$ contains at least one variable that is not included in $\mathbf{X}_{i3}$.

Data and Variables

The primary data source for the study is the NLSY, a unique panel of 12,686 individuals 14 to 21 years of age in 1979 that has been resurveyed annually. Of the full sample, 1899 individuals resided in a non-metropolitan county at age 14. Earnings data at age 21 or the earliest year thereafter when observed out of school were not available for 420 of these individuals. County of residence was unavailable for three additional individuals, leaving a study sample of 1476 persons. An individual is considered a migrant if, by age 21 or the earliest year thereafter when observed out of school, he or she is found residing in a county other than the non-metropolitan county of residence at 14. Migrants to metropolitan areas and to other non-metropolitan areas comprise 30.8% and 15.7%, respectively, of the total sample.[3]

Supplemental data on county unemployment rates for the years 1975 and 1979 were obtained from the Bureau of Labor Statistics. Information on 1975 and 1980 county per capita income, 1980 population per square mile, and 1980 agricultural and manufacturing employment shares were obtained from the 1983 County and City Data Book, U.S. Department of Commerce, Bureau of the Census. County-level employment-growth data for the years 1975 to 1979 were obtained from the 1996 Regional Economic Information System, U.S. Bureau of Economic Analysis.

Log hourly earning in the local non-metropolitan area, $\ln W_{i,21,N}$, is specified as a function of individual human capital attributes (GRADE, AFQT80, EXPER), gender (MALE), race (BLACK), ethnicity (HISPANIC), local economic conditions (AGSHARE, MANUSHAR, COUNEMP, EMPGR, YPERCAP, POSQML), and dummy indicators of region (NC14, SO14, WE14). Log hourly earnings upon migration, $\ln W_{i,0,M}$, are specified as a function only of individual human capital attributes, gender, race, and ethnicity, since destination area characteristics are not observed for non-migrants for the purpose of generating predicted initial earnings from migration.

Years of schooling, the Armed Forces Qualifying Test measure of basic skills, and years of experience are all expected to be positively related to individual stocks of human capital and, therefore, to hourly earnings. Gender, race, and ethnicity characteristics are included because females, as well as racial and ethnic minorities, have been shown to earn less in both metropolitan

[2] Mincer earnings functions often include a squared experience term to account for growing depreciation of human capital are workers age. The squared experience term is dropped in this study because all individuals are close to the date of first employment. Others (e.g. Lazear) have decomposed returns on experience into aging and on-the-job training components.

[3] Most moves to other non-metropolitan areas were not to an adjacent county, as 72.4% of the migrants moved to a different multi-county labor market area as defined by Tolbert and Sizer.

and non-metropolitan labor markets, controlling for levels of human capital (see, among others, Darity and Mason). Non-metropolitan counties with high agricultural shares of employment may have low hourly earnings, given relatively low wages in the sector (Mills). Similarly, since manufacturing wages are relatively high, hourly earnings may be relatively high in counties with high manufacturing shares. The effect of county unemployment rates on hourly earnings is an open empirical question. High county unemployment rates are often indicative of a local surplus of unskilled labor with low earnings potential (Chesire). However, the earnings of other skill groups may not be similarly influenced. High unemployment rates may also be indicative of high rates of employment turnover and a prevalence of vacancies, resulting in upward pressure on local earnings. If employment growth stems from an increase in labor demand, it will also be associated with increased hourly earnings. However, the influence of employment growth may, like the influence of unemployment rates, be concentrated in specific sectors or skill groups. County income per-capita and population per square mile may be positively associated with hourly earnings because of their positive relationships with the cost-of-living. Population density has also been shown to be positively associated with productivity and, therefore, wages (Ciccone and Hall). Dummy indicators of three of the four U.S. census regions are also included in the earnings specification to control for regional differences in cost-of-living and labor productivity.

As discussed, log initial hourly earnings upon migration and upon remaining in the local non-metropolitan area are predicted using type-2 tobit estimates of the wage equations (8.1) and (9.1) with EXPER set to zero since individuals have no work experience at the time of entry to the labor force. These predictions create the variable $\ln W_{i,0,M} - \ln W_{i,0,N}$, termed DIFFEARN, in the structural equation (13). Consistent estimates of factors influencing the cost component of the migration decision are recovered by including all variables from the earnings equations (8) and (9) in the structural equation (13) except AFQT80. The AFQT80 variable is excluded to meet identification conditions. The basic skills measured by the AFQT score influence worker productivity and quickly manifest themselves in hourly earnings, but it is unlikely that they are observed beforehand by employers and are, thus, taken not to influence the probabilities of a job offer. Neither is there reason to believe that these basic skills influence the financial and psychic costs of migration or the rate of discount.

Education may influence the cost component of the migration decision through the relative costs of employment attainment upon migration and upon forgoing migration. However, this effect may be muted if differences in rates of return to schooling of migrants and non-migrants adjust to compensate migrants for migration costs entailed in meeting regional demands for specific types of skilled labor. Gender, race, and ethnicity may also influence migration costs if discrimination affects the relative costs of employment attainment or if groups experience different psychic costs to migration. For example, young men may feel more pressure than women to remain in their counties of origin in order to tend to family financial concerns.

Strong local economic conditions are generally expected to decrease the costs of attaining employment locally and, thus, to deter migration. However, as with initial earnings, the strength of the influence of unemployment rates and employment growth rates may depend on whether unemployment and employment growth are concentrated in specific sector and skill groups or are broad based. As mentioned, high unemployment rates may stem from rapid employment turnover and an abundance of vacancies. Long-term declines in non-metropolitan area agricultural and manufacturing sector employment shares suggest that individuals in counties with high employment shares in these sectors may face relatively high costs of employment attainment. Individuals from counties with high shares of agricultural employment may also have stronger ties to the community that increase the psychic cost of migration and mitigate the influence of agricultural employment share on the propensity to migrate. Population density will generally lower the costs of local employment attainment because densely populated areas provide a larger array of employment opportunities compatible with an individual's specific skills and occupational expertise (Kim).

Three variables (PAGRADE, MAGRADE, NOATTACH) not included in the earnings equations appear in (13) to capture additional financial and psychic costs of migration. More educated parents, particularly fathers since they are more likely to participate in the labor force, can provide their children with better information on employment opportunities outside the local labor market. Thus, father's education is expected to lower employment attainment costs in the destination area labor market. The variable NOATTACH, taking the value 1 if the individual's mother was born outside the individual's state of residence at 14 and the value 0 otherwise, indicates a local absence of matrilineal extended family that may reduce the psychic cost of migration.

Descriptive statistics of all variables in the analysis are presented by migration status in table 1. Migrants show a higher level of educational attainment, have more educated parents, score higher on the Armed Forces Qualification Test, and receive higher hourly earnings. Migrants also tend to come from counties with higher agricultural sector shares of total employment, lower manufacturing shares of total employment, and lower population densities. Migrants are also more likely to have mothers not born in the state.

Results and Simulations

Consistent estimates of the log hourly earnings equations (8.1) and (9.1) are reported in table 2. Being male, AFQT score, county employment growth, and residence in the Western region of the United States all show positive and statistically significant relationships with hourly earnings upon remaining in the non-metropolitan county of origin. The estimated returns to an additional year of schooling are also positive, 3.3%, but the parameter estimate is not statistically different from zero at conventional levels. Similarly, the estimated rate of return to work experience is 2.3%, but not significantly different from zero. Further, the error term in the county of origin log hourly earnings equation is correlated with the error term in the reduced form migration equation (12). Thus, OLS parameter estimates of the earnings equation for individuals forgoing migration would provide biased estimates of the potential earnings for all individuals. Being male and AFQT scores also show positive and statistically significant relationships with hourly earnings from migration. The estimated rates of return to schooling and experience upon migration are 6.3% and 5.8%, respectively. Both parameter estimates are statistically different from zero at the $p = 0.01$ level.

To ascertain whether rates of return to schooling and experience are uniformly low in non-metropolitan counties relative to metropolitan counties, hourly earnings equations for an expanded tri-state migration model incorporating the decisions to migrate to a metropolitan area, to migrate to another non-metropolitan county, or to remain in the county of residence at 14 are also estimated. Consistent estimates of the three earnings equations in this model are obtained by including the selectivity correcting inverse Mills ratios generated from multinomial logit estimation in the corresponding OLS earnings regressions (Lee). Structural parameter estimates of the earnings and cost components of these tri-state migration decisions cannot be recovered, however. Complete identification requires that each earnings equation contain an explanatory variable not included in the others. While the earnings equation for the non-metropolitan county of origin contains county characteristics omitted from the other two earnings equations, no identifying variables with respect to metropolitan migrant and non-metropolitan migrant earnings equations are plausibly justified. The estimates, presented in table 3, reveal that rates of return to schooling and experience are very high, 9.3% and 8.3%, upon migration to another non-metropolitan county. In fact these rates of return are higher than returns to schooling and experience aupon migration to a metropolitan area.

Probit estimates of the structural equation (13) are presented in table 4. The probability of migration from a non-metropolitan county is found to significantly increase in DIFFEARN, the log of the ratio of predicted starting hourly earnings upon migration to predicted hourly earnings in the county of origin. After controlling for these initial earnings differences, the other parameter estimates represent the influence of variables on the cost component of the migration decision. For example, being male is negatively associated with the propensity to migrate at the $p = 0.10$ level, i.e., positively associated with migration costs that

Table 1. Descriptive Statistics

Variable	Description	County Stayers		Migrants to Other Counties	
		Mean	St. Dev.	Mean	St. Dev.
GRADE21**	Years of schooling at age 21 or at completion of schooling	12.347	1.817	13.295	2.612
MALE**	Male = 1	0.529	0.499	0.474	0.500
BLACK	Black = 1	0.169	0.375	0.141	0.348
HISPANIC	Hispanic origin = 1	0.059	0.235	0.071	0.257
PAGRADE**	Father's years of schooling	9.939	3.576	11.138	3.847
MAGRADE**	Mother's years of schooling	10.729	2.711	11.265	2.895
AGSHARE**	Agriculture sector share of employment	0.110	0.081	0.125	0.090
MANUSHAR**	Manufacturing sector share of employment	0.227	0.123	0.202	0.116
COUNEMP*	Average 1975 to 1979 rate of unemployment, county of origin	0.078	0.025	0.076	0.030
EMPGR	Average 1975 to 1979 rate of employment growth, county of origin	0.021	0.020	0.020	0.021
POSQML**	1980 population (000) per sq. mile, county of origin	0.663	0.539	0.520	0.446
YPERCAP	Average 1975 and 1980 per capita income ($000), county of origin	6.174	1.322	6.159	1.273
NOATTACH**	Mother not born in state = 1	0.217	0.412	0.357	0.479
NC14**	North Central region of origin = 1 (Northeast = 0)	0.332	0.471	0.412	0.493
SO14**	South region origin = 1	0.528	0.500	0.437	0.496
WE14*	West region origin = 1	0.081	0.273	0.108	0.311
AFQT80**	% score on 1980 Armed Forces Qualification Test	40.697	27.657	51.618	29.977
EXPER**	Years in labor force after completion of schooling	2.939	1.512	2.607	1.840
LNEARN**	Logarithm of hourly earnings in 1979 dollars	1.477	0.487	1.625	0.524
	Number of observations	801		675	

Note: ** and * indicate difference in county non-migrant and county migrant samples at $P = 0.05$ level and $P = 0.10$ level, respectively.

Table 2. Log Hourly Earnings Equations

	Out-of-County		In-County	
	Coefficient	ASE	Coefficient	ASE
CONSTANT	0.212	0.240	0.286	0.414
GRADE21	0.063	0.014***	0.033	0.024
MALE	0.195	0.042***	0.204	0.038***
BLACK	−0.9E−3	0.065	0.032	0.068
HISPANIC	0.012	0.076	0.043	0.090
AFQT80	0.005	0.001***	0.003	0.001***
EXPER	0.058	0.019***	0.023	0.027
AGSHARE			−0.052	0.381
MANUSHAR			0.211	0.246
COUNEMP			−0.222	0.940
EMPGR			2.695	1.111**
YPERCAP			0.017	0.020
POSQML			0.077	0.050
NC14			0.108	0.097
SO14			0.117	0.098
WE14			0.284	0.119**
Rho	0.203	0.186	0.375	0.136***

*Indicates significance in a two-tailed t-test at the $P = 0.10$ level.
**Indicates significance in a two-tailed t-test at the $P = 0.05$ level.
***Indicates significance in a two-tailed t-test at the $P = 0.01$ level.

Table 3. Selectivity Corrected Log Hourly Earnings Equations in Three State Model

	Migration Status					
	Metropolitan		Other Non-Metropolitan		Non-Migrant	
	Coefficient	ASE	Coefficient	ASE	Coefficient	ASE
CONSTANT	0.519	0.372	−0.203	0.485	0.292	0.342
GRADE21	0.048	0.019**	0.093	0.028***	0.031	0.021
MALE	0.175	0.048***	0.213	0.065***	0.218	0.034***
BLACK	0.010	0.075	−0.034	0.114	0.028	0.054
HISPANIC	0.109	0.092	−0.208	0.122*	0.047	0.073
AFQT80	0.005	0.001***	0.004	0.001***	0.003	0.001***
EXPER	0.059	0.024**	0.083	0.036**	0.018	0.023
AGSHARE					−0.120	0.348
MANUSHAR					0.235	0.199
COUNEMP					−0.303	0.759
EMPGR					2.672	1.044**
YPERCAP					0.019	0.017
POSQML					0.080	0.047*
NC14					0.120	0.082
SO14					0.117	0.081
WE14					0.286	0.101***
Rho	−0.013	0.125	0.041	0.176	0.215	0.140***

*Indicates significance in a two-tailed t-test at the $P = 0.10$ level.
**Indicates significance in a two-tailed t-test at the $P = 0.05$ level.
***Indicates significance in a two-tailed t-test at the $P = 0.01$ level.

inhibit migration. Similarly, father's education and mother's birth outside of the state are positively related to the propensity to migrate. As discussed, father's education is likely to decrease the cost of employment attainment in destination labor markets by providing the young adult with better information on potential employment opportunities, while absence of a matrilineal extended family in the area reduces the psychic costs of migration. Individual schooling levels and local economic conditions do not show a

Table 4. Structural Probit Equations

	Coefficient	ASE
CONSTANT	−1.178	0.446***
GRADE21	0.018	0.043
MALE	−0.121	0.069*
BLACK	0.202	0.125
HISPANIC	0.152	0.153
PAGRADE	0.035	0.012***
MAGRADE	−0.019	0.016
AGSHARE	0.029	0.636
MANUSHAR	0.350	0.462
COUNEMP	−0.040	1.40
EMPGR	4.351	3.231
YPERCAP	0.038	0.035
POSQML	−0.193	0.120
NOATTACH	0.381	0.078***
NC14	0.270	0.213
SO14	0.207	0.219
WE14	0.429	0.365
DIFFEARN	1.887	0.956**

*Indicates significance in a two-tailed t-test at the $P = 0.10$ level.
**Indicates significance in a two-tailed t-test at the $P = 0.05$ level.
***Indicates significance in a two-tailed t-test at the $P = 0.01$ level.

statistically significant influence on the cost component of the migration decision, but the population density variable has a negative coefficient that just fails the test for statistical significance at the $p = 0.10$ level.

Based on earnings equation estimates, a "typical" individual in the sample (male, white, non-Hispanic, living in the south, and possessing mean levels of other characteristics) expects to earn $4.22 per hour upon migration and $4.00 in his county of origin immediately after leaving school, an earnings gap of 5.5%. As shown in figure 1, the ratio of simulated initial hourly earnings upon migration to simulated initial hourly earnings in the county of residence at age 14 increases in work experience, and the earnings gap is 26% after five years of experience.[4] Similarly, the ratio of simulated initial hourly earnings upon migration to simulated initial hourly earnings in the county of origin increases in schooling. The initial earnings gap for migration relative to remaining in the county of origin is 14% with a high school education and 28% with a college education.

Marginal effects calculated from the probit estimate of the structural equation (13) indicate that a 10 percentage point increase in the "typical" ratio of initial hourly earnings upon migration to initial hourly earnings in the county of origin will result in a 7.9 percentage point increase in the probability of migration. Since the earnings gap increases in schooling, raising schooling will increase the probability of migration via the earnings component of the migration decision. The probit estimate of the structural equation (13) also reveals that schooling does not have a statistically significant effect on the cost component of the migration decision. Combining the earnings and cost components in the probit estimate of the reduced form equation (12), the net marginal effect of an additional year of schooling on the probability of migration is a 2.8 percentage point increase in the probability of migration.

Discussion and Policy Implications

Three salient findings summarize the results. First, the migration of non-metropolitan young adults to other non-metropolitan counties is a viable and frequently employed alternative to "non-metropolitan to metropolitan" area migration. Second, the probability of migration from the non-metropolitan county of origin increases in schooling because of a higher rate of return to schooling upon migration. In particular, other non-metropolitan counties are an attractive alternate destination for educated non-metropolitan youth because of notably high returns to schooling. Third, expected gains in initial earnings continue to provide young adults with strong incentives to migrate from their non-metropolitan counties of origin. The propensity to migrate is also sensitive to several indicators of migration costs, specifically paternal education and a measure of extended family in the area.

The results point to areas of opportunity and areas of concern for non-metropolitan counties. Non-metropolitan areas as a whole are able to retain a proportion of educated young adults by offering them high returns to schooling. There are, no doubt, other attractions to remaining in non-metropolitan counties such as area-specific amenity values and lower costs of living, which explain why an average-earnings gap between metropolitan and non-metropolitan areas can persist over time (see, among others, Topel). On

[4] The linear rate of return on experience is not extrapolated beyond five years because estimates are based on individuals at age 21 or the earliest year thereafter when observed out of school.

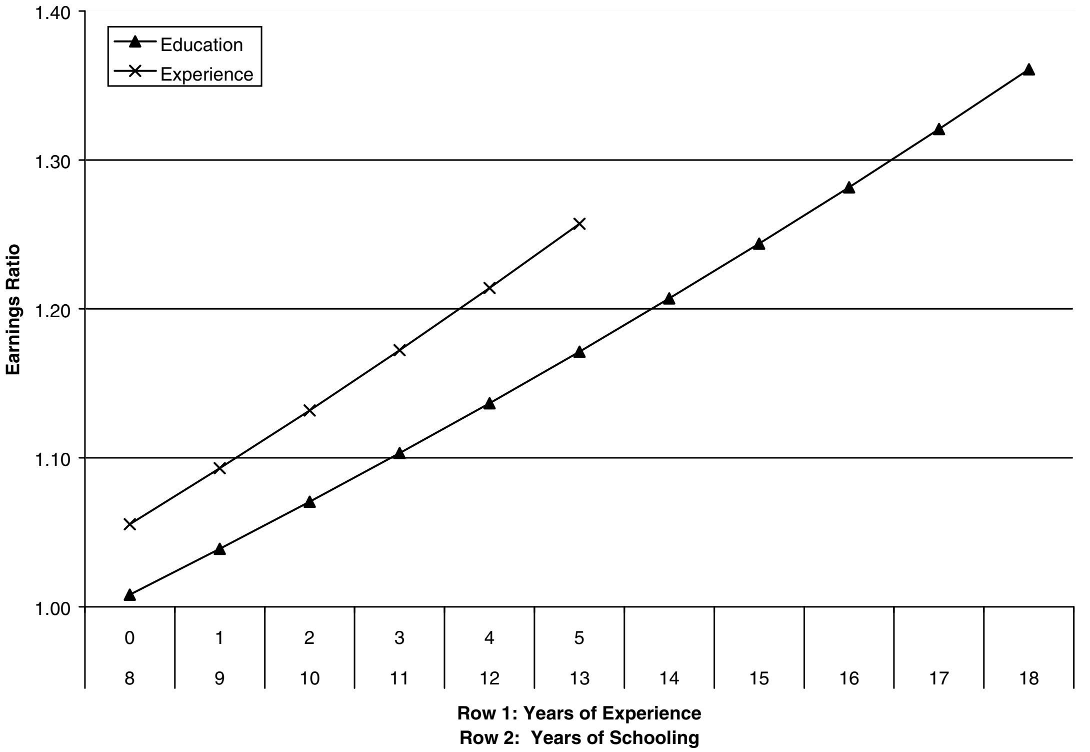

Figure 1. Migrant to non-migrant earnings ratio by education and experience

the other hand, the results suggest that individual non-metropolitan counties face competition for their educated youth not just from metropolitan counties but also from other non-metropolitan counties. The low estimated rates of return to schooling and experience in the non-metropolitan counties of origin are, in this context, of particular concern. Low local returns to schooling create a disincentive to invest in education and contribute to persistently lower levels of educational attainment in non-metropolitan areas. This disincentive may be particularly strong among those individuals with strong preferences to remain in the county of origin. However, a test of the influence of predicted migration propensity on GRADE21 provides no evidence that schooling is endogenous in the reduced form equation (12). Thus, the disincentive to invest in education among those wishing to remain in the county of origin does not appear to be disproportionately large.

The findings motivate the question of why young adults are able to attain high rates of return to schooling upon migration to another non-metropolitan county, but not within their non-metropolitan county of origin. Thin labor markets in many non-metropolitan areas for individuals with at least a college education motivate a plausible explanation. Employment opportunities for highly educated young adults are relatively skill-specific. Few local employment opportunities for highly educated young adults make those preferring to stay in their counties of origin more likely to take jobs that poorly match their specific skills and, thus, pay a lower wage than could be attained upon migration to an area where their skills better match employer needs. Earnings of individuals with low levels of education are relatively unaffected by skill mismatches because low-skilled positions are relatively abundant in non-metropolitan areas. By the same token, rates of return to schooling may be high when migrating to other non-metropolitan areas because individuals must be compensated for migration costs to attain the better skill matches. Diamond and Simon provide evidence of compensating wage differentials in specialized labor markets due to high geographic mobility costs between markets. Similarly, returns to schooling upon migration to other non-metropolitan counties may plausibly be greater than those found in metropolitan labor markets to compensate skilled workers for the risk of moving to labor markets with few alternative employment opportunities.

Migration flows of educated labor may also influence the propensity for further migration. The results show that employment growth positively influences hourly earnings in the local non-metropolitan labor market. Thus out-migration is retarded in high employment growth areas and accelerated in low employment growth areas via the earnings component of the migration decision. Self-enforcing effects may arise from the desire of firms to locate in areas with existing work forces well matched to their labor requirements (Bartik). As a result, firms requiring skilled workers are more likely to locate in areas with existing concentrations of skilled workers. Under such conditions, two stable development paths are possible (Murphy, Shleifer, and Vishny). Initial firm concentration may be sufficient to attract skilled workers to the area. Additional skilled workers create a desirable labor market for the location of additional firms, which in turn attracts additional skilled workers. Alternatively, the existing concentration of skilled workers may be insufficient to attract new firms or even maintain current firms in the area. Worker migration then further reduces the skill base of the local labor force, making the area even less attractive for existing firms.

Significant state and local development resources are devoted to firm attraction and retention programs. Most of the resources are used to provide firms with information on local opportunities and labor market characteristics, as well as incentives to relocate (Isserman). Successful business attraction and retention efforts increase labor demand and create employment. However, non-metropolitan areas experiencing a co-dependent rise in out-migration of skilled workers and firms may be relatively unresponsive to traditional state and local economic development efforts. Coordinated efforts to develop local labor force capacity and to attract firms compatible with that capacity may be necessary, if not sufficient, to retain skilled young adults in such circumstances.

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