

## AN ANALYSIS OF FACTORS INFLUENCING REGIONAL LABOR FORCE MIGRATION, 1960-1970\*

Robert Pfeiffer and Curtis Braschler

---

### INTRODUCTION

The migration of labor is an important mechanism through which an efficient spatial allocation of resources is achieved and maintained. Many studies were designed to determine the efficacy of the market as an allocator of labor between various regions of the economy. However, most of these have concentrated on the allocation mechanism between major metropolitan labor markets or major sub-regions in the general economy. This study was designed to ascertain the effectiveness of labor allocation between rural and metro regions and between different rural regions in the three-state area of Missouri, Kansas and Illinois.

Interregional labor force migration has generally been studied in the context of neoclassical economic theory, with its emphasis on marginal productivity analysis. In this concept, regional differences in wages and employment opportunities cause labor to migrate to areas of economic growth and away from lagging regions [8].

Certain migration patterns observed in the United States in recent decades have not been consistent with this theory. In particular, levels of gross outmigration have shown little, if any, relationship to economic conditions at areas of origin [4, 5]. This has led to formulation of migration theory which recognizes factors in addition to economic motives. An important contribution was made by Everett S. Lee, whose theory explicitly considers the personal characteristics of migrants, as well as risk and uncertainty as important factors [6].

### METHODOLOGY AND DATA SOURCES

The major objective of this study was to determine the relationship between observed rates of outmigration and rates of economic growth among regions. The two major differences between this study of migration and others using the push-pull variation of labor migration theory was the choice of the regional unit of observation and the source of data.

Choice of the regional unit of observation was contingent upon several considerations. Ideally, such a unit should comprise a single labor market. If the choice of region is too small, movement within may be local residence change rather than economically-motivated employment change. On the other hand, choice of large regions such as states or multi-state regions may ignore large differences within regions. The final choice was to use county data as basic units of observation. Data on these units were then combined into multi-county labor market regions in order to minimize the observing of noneconomically motivated movements and to improve the sampling validity of the choice of the basic data unit. Percentage changes in employment were used as basic variables for measuring level of change in economic activity between regions because of availability and reliability. Rates of unemployment were considered as measures of regional economic activity, but were ruled out because they reflect conditions at a point in time. Thus, changes in those rates over a 5-year period may not accurately reflect actual conditions within a region.<sup>1</sup>

---

Robert Pfeiffer is Economist, Economic Research Service, USDA, Little Rock, Arkansas; and Curtis Braschler is Professor of Agricultural Economics, University of Missouri, Columbia Missouri.

\*Contribution from the Missouri Agricultural Experiment Station, Journal Series Number 7678.

<sup>1</sup>Income and unemployment data were used by the Area Redevelopment Administration to designate areas for public works programs. Counties with low incomes were distinctly rural, while high unemployment counties were essentially urban places.

## Sources of Data

The Continuous Work History Sample (CWHS) maintained by the Social Security Administration was the source of migration data. The CWHS file is based on a one percent sample of the covered work force and has been in development since 1957. The file contains a record of each job held by each worker included in the sample and data on age, sex, race, industry wage class and location by county. The Bureau of Economic Analysis has developed a migration file covering the intervals of 1960-65 and 1965-70 from the CWHS file. Using this file, it is possible to estimate, for any grouping of counties for any two points in time, the number of immigrants, outmigrants and nonmigrants along with characteristics relating to each group.

## Classification of Areas

Employment change for the time interval of 1960 to 1970 was used as a measure of economic activity; and counties in the three-state study region (Missouri, Kansas and Illinois) were grouped into four growth classifications.<sup>2</sup> The classifications were as follows:

County Class	Percent Change In Employment 1960-1970	No. of Regions
1	>30	8
2	≥10; ≤30	11
3	> 0; <10	8
4	<0	10

Finally, each of the four classes was subdivided into regional units in order to provide as much geographic continuity as possible. A total of 37 units were obtained, 18 of which were urban areas (SMSAs) and 19 of which were rural. Of the rural regions, nine experienced decreases in total employment while ten showed slow to moderate increases.

## Regression Analysis

Finally, data were analyzed in the framework of a multiple regression model. Regression analysis provided another analytical method for controlling for mobility difference between regions.

Two regression models were estimated. The dependent variable in both models was migration rate determined from CWHS data. Model I was estimated for all areas using employment data from the Census Bureau Reports as the primary independent variable relating to the level of economic activity. Model II

was estimated only for rural areas using employment data from the CWHS file.

Model I was specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + u$$

where

Y = outmigration expressed as the number of outmigrants per thousand workers from region i

X<sub>1</sub> = percentage change in employment in region i

X<sub>2</sub> = past immigration into region i in the previous time period

X<sub>3</sub> = education level expressed as the number of persons 25 years and older having completed four years of high school or more as a proportion of the total population in region i

X<sub>4</sub> = number of persons in the 20-24 year age cohort as a percentage of the total labor force

X<sub>5</sub> = rate of unemployment in region i

u = random variable

β<sub>0</sub> = constant or intercept term

β<sub>i</sub> = population parameters in regression model.

Model II used the same dependent variable with the following independent variables:

X<sub>1</sub> = changes in the size of work force covered by Social Security (surrogate for employment change)

X<sub>2</sub> = same as X<sub>2</sub> in Model I

X<sub>3</sub> = same as X<sub>3</sub> in Model I

X<sub>4</sub> = ratio of agricultural employment to total employment in region i.

Several considerations were paramount in selection of these variables for the two models. A number of factors could theoretically affect an individual's (or family's) willingness and ability to move. Two of the most pervasive are age (X<sub>4</sub>) and educational achievement (X<sub>3</sub>). In the first place, young people are believed to be more mobile because of having more time over which to amortize the costs of moving. They also have fewer ties to their present area of residence; i.e., moving is less disruptive, both economically and socially. It is generally recognized that education level and mobility are likely to be associated. Well-educated people are likely to have

<sup>2</sup>County employment figures were calculated from unpublished data compiled by the Bureau of Economic Analysis, Department of Commerce. These data have been adjusted for commuting patterns.

greater access to and ability to act upon information relating to job opportunities in areas outside their current residence.

A third independent variable ( $X_2$ ) relating the past migration patterns of a given population to its current mobility status was included in the model. Prior research has shown this to be an important indicator of mobility [7]. People who have moved at least once are thought to be more mobile, since they would be expected to have fewer cultural ties and a lower degree of locational attachment. In terms of the regression model, the coefficient of this variable was expected to be positive.

### Model I

Results of the regression analysis for Model I are shown in Table 1. The coefficient relating to employment change ( $X_1$ ) was not significant in any of the equations for either period of time. It had the expected negative sign only when data from rural regions were included in the analysis. This coefficient appeared to be reasonably stable over time; the negative sign indicates that limited job opportunities in rural areas exerted some pressure for outmigration, but the relationship appeared weak.<sup>3</sup>

Coefficients attaching to previous immigration ( $X_2$ ) were significant in four of the six equations estimated, and appear to be the most consistent factors in "explaining" observed rates of outmove-

ment. This influence may have been greater during the latter half of the decade with respect to rural regions. It was hypothesized that this variable provides a means of accounting for the increased mobility status of people who had prior moving experience. In addition, past rates of migration are likely to serve as a "carrier" for other variables affecting mobility of a given population.

Different age structures of regional populations, as specified in the model, were not significant factors in levels of outmovement. Likewise, educational achievement did not appear important. Coefficients for these variables were negative when urban regions were included in the model. There seems to be no theoretical basis for expecting a negative relationship for either variable.

### Model II

In the second model, two changes were made and equations estimated for rural areas. Employment change ( $X_1$ ) in Model II was specified and defined as change in size of covered work force in each period. Thus, data relating to employment and migration are from the same source in Model II (CWHS). This was done to generate a more compatible data set with regard to these variables. A bias in the CWHS migration estimates may exist, since agricultural areas are likely to have a high proportion of self-employed workers (self-employed people are not included in the

TABLE 1. REGRESSION ANALYSIS RESULTS FOR MODEL I, ALL AREAS AND TWO TIME PERIODS

Equation	$\beta_0$	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$	$\beta_5$	$R^2$
<u>All Areas:</u>							
1960-65	114.9	-.063 (.043)	.866* (.188)	-.103 (.102)	-.556* (.209)	.743 (.862)	.530
1965-70	156.2	-.048 (.041)	.624* (.126)	-.049 (.167)	-.070 (.131)	-.107 (.617)	.571
<u>Metropolitan Areas:</u>							
1960-65	-51.2	.006 (.008)	1.022* (.242)	-.051 (.124)	-.515* (.233)	3.651* (1.700)	.818
1965-70	28.0	.087 (.906)	.399 (.235)	.212 (.331)	-.129 (.161)	1.393 (1.224)	.763
<u>Rural Areas:</u>							
1960-65	29.4	-.074 (.103)	.402 (.353)	.224 (.208)	.057 (.500)	.734 (1.412)	.242
1965-70	-64.3	-.055 (.774)	.661* (.219)	.339 (.306)	.439 (.309)	.773 (1.022)	.493

\*Significant at the .05 level

Standard errors are shown in parentheses.

<sup>3</sup>It may well be that employment change is significant for specific age categories. If reliable data existed on outmigration rates for the young adult category (16-25), this hypothesis could be tested using the framework of this model, omitting age as an independent variable.

sample). If this is true, outmigration estimates from rural areas would be understated. Because of this possibility, an additional variable defined as ratio of agricultural employment ( $X_4$ ) to total employment was included in Model II. Age and unemployment was deleted after earlier analysis produced insignificant results. Thus, each region was weighed according to the relative importance of agriculture in its overall economy.

Resulting equations are somewhat more satisfactory in that each coefficient has the expected signs for both periods (Table 2). Previous immigration was statistically significant in both equations. If, as is widely believed, the migration process is selective of the young and better educated, a high rate of immigration into an area would tend to alter composition of the population in favor of these groups. This would facilitate higher rates of outmigration in a subsequent time period than would otherwise be the case. The volume of previous immigration thus serves as a proxy for mobility status.

While the coefficients of employment change in Model II are not significant, they are larger relative to their standard errors. This means that employment opportunities (or lack of same) exert a greater influence than that indicated in Model I. Both models were in agreement concerning the influence of education (not significant).

A null hypothesis stating no relationship between employment change and opportunity and outmigration could not be rejected. Results suggest that much of the movement observed among regions is motivated by something other than economic considerations. Mobility status, as reflected by previous patterns of immigration, was an important factor even

in rural areas. Beyond this, few cause and effect relationships could be determined. Thus, the study demonstrates difficulties associated with establishing generalizations concerning any single facet of the migration process. Rather, it indicates the necessity of viewing migration as a product of a wide array of forces, some of which are not amendable to quantification.

## SUMMARY AND CONCLUSIONS

This study differs from earlier ones in that an attempt was made to define regions that are as nearly homogeneous as possible with respect to economic growth forces. The major objective was to analyze the relationship between employment growth and levels of outmigration in rural areas. A relatively new data source, the Continuous Work History Sample, was the source of much migration and employment data.

Two regression models were used to analyze data. The following conclusions appear warranted on the basis of the regression equation estimated:

- (1) Employment conditions in the sample areas did not exert a major influence on observed volume of outmigration. This was true for both urban and rural areas. In rural areas, however, employment appears to be a more important factor, since coefficients for this variable have the expected sign in both time periods and are larger relative to their standard errors.
- (2) Variables related to characteristics of migrants themselves, namely age levels and education achievement, were not important predictors of outmigration. Variables measuring past levels of migration were important factors in both urban and rural areas. They appeared to be consistent over time.
- (3) Finally, certain limitations should be noted. Since the sample area included only a three-state area, it would be unwise to generalize the data to all regions. Also, it was assumed that employment change would provide the most pervasive description of economic conditions in the sample areas. A number of other indicators might be used for a more complete description of the areas.

TABLE 2. REGRESSION ANALYSIS RESULTS FOR MODEL II, RURAL AREAS ONLY AND TWO TIME PERIODS

Time Period	$\beta_1$	$\beta_2$	$\beta_3$	$\beta_4$
1960-65	-.111 (.114)	.421* (.199)	.005 (.135)	-.035 (.122)
1965-70	-.106 (.098)	.716* (.217)	.107 (.164)	-.128 (.189)

\*Significant at the .05 level

Standard errors are shown in parentheses. For the 1960-65 data, the constant term is 157.5 and the  $R^2$  is .302. The equation for the 1965-70 data has a constant of 127.7 and the  $R^2$  is .456.

## REFERENCES

- [1] Beale, Calvin L. "Demographic and Social Considerations for U.S. Rural Policy," *American Journal of Agricultural Economics*, 51, May 1969, pp. 410-427.
- [2] Cartwright, David and K. Horowitz. "Migration Data from the Social Security Continuous Work History Sample," Unpublished Memorandum, Bureau of Economic Analysis, U.S. Department of Commerce, 1973, mimeograph.
- [3] Ford, Thomas R. *The Southern Appalachian Region*, Lexington: The University Press, 1970.
- [4] Lansing, John B. and Eva Mueller. *The Geographic Mobility of Labor*, University of Michigan, Survey Research Center, 1967.
- [5] Lowry, Ira S. *Migration and Metropolitan Growth: Two Analytical Models*, San Francisco: Chandler Publishing Company, 1966.
- [6] Lee, Everett S. "A Theory of Migration," *Demography*, 3 (1966), pp. 47-57.
- [7] Miller, Edward. "Is Outmigration Affected by Economic Conditions?" *Southern Economic Journal*, 39, January 1973, pp. 396-405.
- [8] Richardson, Harry W. *Regional Economics*, New York: Praeger Publishers, 1969, Chapter 12.
- [9] Census of Population. *General Social and Economic Characteristics*, Department of Commerce, Bureau of the Census, Missouri, Kansas and Illinois, 1960 and 1970.
- [10] U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Analysis Division. Migration Data from the Social Security Continuous Work History Sample (Computer tapes, obtained through the Public Affairs Information Service, College of Administration and Public Affairs, University of Missouri, Columbia).
- [11] U.S. Department of Commerce, Bureau of Economic Analysis. Unpublished County Employment data prepared from the 1970 and 1960 Censuses of Population (computer printouts).

