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# Patterns of In-Migration and Out-Migration: Human Capital Movements in the Lower Mississippi Delta Region

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# PATTERNS OF IN-MIGRATION AND OUT-MIGRATION: HUMAN CAPITAL MOVEMENTS IN THE LOWER MISSISSIPPI DELTA REGION

**By Donald E. Voth, Molly Sizer, and Frank L. Farmer[1]**

## INTRODUCTION

The lower Mississippi River Delta region received intense scrutiny during a brief period from October 1988 until September 1990 because of the establishment of a temporary commission to study its problems and to identify strategies for improving the welfare of people in the Delta (Public Law 100-460). The Lower Mississippi Delta Development Commission (LMDDC) held a series of hearings, commissioned a series of conferences and research studies, and issued several reports, the major ones being a preliminary report (LMDDC, 1989) and a final report (LMDDC, 1990). One of the issues which permeated nearly all of the debate and discussion about the Delta was its human resource base. Recommendations ranged from explicitly stimulating out-migration (Venus, 1990) to focusing upon various methods of improving and enhancing the quality of the labor force in place (LMDDC, 1990). Of course, one of the major factors affecting the "quality" of the Delta's labor force is migration. Previous work has shown, for example, that, based upon 1975-80 net age- and education-level-specific migration rates, the Rural Core Delta counties would retain, throughout the lifetime of a cohort, fewer than half of their most highly educated members (Voth et al., 1994).

The current research examines patterns of migration into and out of counties in the Lower Mississippi Delta region in further detail. We focus upon this specific region for several reasons. First, although its boundaries are indistinct, it does make up a relatively coherent socio-

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economic, cultural, and environmental subregion. Second, its economic circumstances and human resource base continue to be a matter of concern at both national and state levels. Finally, focusing upon a specific region provides some coherence to the analysis of migration, which clearly follows relatively distinct "streams."

We use a unique data base available from the Census Bureau's County-by-County Migration Flows file for 1980 to explore two aspects of migration behavior in the seven-state region in which the Lower Mississippi Delta Region is located (Arkansas, Illinois, Louisiana, Kentucky, Mississippi, Missouri, and Tennessee). First, using exploratory factor analysis, we identify the prevailing patterns of in-migration and out-migration among 30 age/educational categories. Second, we examine, in a preliminary fashion, the relationships between characteristics of counties and the identified patterns of in- and out-migration.[2]

## The Relevance of Migration for Local Rural Development

Migration patterns play a profound role in the areas of both origin and destination, through a set of mutual cause/effect relationships, relationships which are, as yet, only poorly understood (Sastry, 1992). Although the numbers themselves are important, the impact of migration is much more than merely a gain or loss of population. The age structure in the communities of both origin and destination can be affected because migration varies greatly among age groups. The racial/ethnic composition can also be changed dramatically in the migration process (e.g., south to north). Further, the "qualitative aspect" of the human capital base of each community can be altered as migration often affects the average educational attainments of residents.

Until recently, advocates of rural development seemed to be unanimous in emphasizing the importance of the quality of the local labor force and the role that education plays in determining that quality. The assumption is that improvements in the educational levels of local people will contribute to economic development, implying that there is either an existing or potential local demand for more highly educated residents (e.g., Sizer-Killian & Parker, 1991). However, a recent comprehensive

[2]Additional work is now underway to extend this analysis by considering the impact of detailed socio-economic characteristics of the origin and destination counties on the patterns of in-migration and out-migration in the Delta region.

overview of the relationship between rural economic development and education questions this link:

> Our central conclusion is that education's potential as a local rural development strategy is probably quite limited. Rural areas appear to have been hampered more by their small size and remoteness in the 1980's than by a lack of qualified workers. Rural areas generally could not hold on to the better educated workers that they had. Urban jobs in the 1980's were more available and better paying than rural jobs for these workers, and they migrated from rural to urban areas. This "brain drain" lowered the workforce education levels of rural young adults. Other evidence that low education was generally not a hindrance is that employment growth in rural areas with relatively high educated populations was generally no greater than in other rural areas. Local dropout rates were completely unrelated to economic growth (McGranahan, in ARED, 1991, pp. 1-2).

Both published and unpublished research performed by the senior author tends to support the sobering conclusions of the ARED authors (Miller et al., 1984). In the 1984 research, it was shown that efforts to enhance specific job training opportunities in Arkansas counties during the 1960s and 1970s contributed to only one major outcome--increased out-migration of youth. Recently tabulated results from a broad survey in southern Arkansas shows a strong propensity for those who have received specific, job-oriented training to plan to leave the local community (unpublished data).[3]

In sum, the human resource base of many communities, especially rural communities, is determined both by migration patterns and by the educational investments made within the local region. In many cases, the former may be much more important than the latter (Voth et al., 1992, 1994).

[3]Unfortunately, the fundamental importance of migration in determining the nature of the human resource base of rural areas in the South is frequently overlooked by analysts who use data on local educational levels to assess and, usually, condemn, educational policies (Lyson, 1989). In fact, when viewed in terms of their capacity, southern states and localities invest at least as much in education as do those in other regions of the country.

**Understanding Migration Patterns: Push-Pull Theory and the Life Cycle Model**

Perhaps the most comprehensive theoretical perspective for treating migration sociologically is the "push-pull" perspective, first proposed by Ravenstein (1889) and articulated in more detail by Lee (1966). Key elements of this perspective are the characteristics of places of origin and destination which, respectively, "push" or "pull" migrants. The actual decisions to migrate are affected, in addition, by (1) the characteristics, attitudes, and values of real or potential migrants and (2) the nature and number of intervening opportunities. For example, the propensity to migrate varies greatly with the life cycle (Long, 1988), since the salience of various push and pull factors varies with age, and can be dramatically altered by major life cycle events such as going to school, completing school, obtaining employment, marriage, death of a spouse, retirement, etc. (Greenwood, 1975; Sastry, 1992).

In his review of the push-pull theory, Bogue enumerated a wide range of factors which repel and attract migrants (1969). Many of these involve economic factors associated with life cycle development. Hence, a significant portion of the impact that the specific characteristics of migrants have upon migration, or the nature of migration selectivity, can be specified from a "human capital" frame of reference (Becker, 1964). From this perspective, families, society, and individuals themselves invest in the individual, building a "capital" resource, primarily through formal education and skills training. At a subsequent stage in the life cycle, this "capital" is exploited as the person enters the workforce to earn income and build net worth. Later, at least in an ideal world, the accumulated wealth is spent maintaining a pleasant lifestyle during retirement and/or is transmitted to subsequent generations.

If we recognize that these stages overlap substantially (e.g., earnings are spent maintaining a lifestyle throughout all of life, not only during retirement), they provide a powerful framework for understanding how potential migrants respond to various push and pull factors of various communities of residence. Extensive investment in one's human capital requires obtaining advanced education early in life, something that can be done only in communities with appropriate institutions, such as colleges and universities. Exploiting this capital requires finding communities that provide optimum employment opportunities. Finally, retirees, who can

take their income with them virtually anywhere, may seek communities with appropriate amenities.

The nature and extent of investment in one's human capital varies substantially from person to person, family to family, and, especially, among social classes. Consequently, one simple model cannot be applied to all potential migrants. Indeed, there is evidence that the United States labor force has become increasingly bifurcated into one group that is qualified only for unskilled labor and another that can benefit from the increased incomes and life chances associated with dynamic knowledge and information industries (e.g., Bluestone & Harrison, 1988). Thus, both life cycle stage and the eventual level of investment in education and skills training can be expected to be major determinants of migration behavior, as people move from community to community making these investments, exploiting them, and spending the income and wealth to which they have access.

In large part, migration patterns are a consequence of identifiable push and pull factors associated, in the aggregate, with the communities of destination and origin, in combination with the personal characteristics of potential migrants. Many of the most salient personal characteristics are determined by the life cycle in general, by the occurrence of specific life cycle events, and by the extent of investment in one's human capital, that is, formal education.

Some key theoretical and methodological implications emerge from this discussion:

1. The "out" and "in" components, that is, the push and pull factors of migration behavior, should, to the extent feasible, be analyzed separately. Net migration, while useful for some things, clearly combines very different behaviors.

2. Both in- and out-migration patterns may differ significantly by key characteristics of migrants. Based on the human capital perspective discussed above, age and educational level are two of the most critical dimensions of this differentiation.

3. Finally, and perhaps most importantly, the experience of different types of communities with respect to both in-migration (pull) and out-migration (push) will be highly specific to different types of migrants.

Unfortunately, data limitations make the type of analysis required by these observations very difficult and rare. Most information about migration that can be made place-specific is limited to net migration. What is needed is the ability to examine migration by life cycle stage and educational level and to examine in-migration and out-migration separately.[4]

## DATA SOURCES, METHODS, AND PROCEDURES

A unique data set from the 1980 Census is employed for the measurement of migration, the dependent variables.[5] In 1980, respondents were asked where they lived in 1975, allowing the comparison of in-migrants with out-migrants and the calculation of rates on in-migration, out-migration, and net migration by specific age/educational level categories of the population. These migration stream data tapes were obtained for all seven states of the Lower Mississippi Delta region. For each of the 653 counties (including St. Louis City), the total numbers of non-migrants (non-movers and local movers), in-migrants, and out-migrants involving all other origins and destinations were calculated for the respective age/educational groups that are available. These 30 groups are shown in Figure 1. This does not, of course, exploit the richness of information available in this source, since it combines diverse migration streams and all migration distances that cross county boundaries, including immediately bordering counties.

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[4]There is an extensive literature on the relative advantages of different measures of migration. This literature is summarized briefly by Galle et al. (1993) in their defense of net migration. We insist that, like the contrast between "crude" rates of population dynamics (e. g., births, deaths, etc.) and the more refined rates based upon "at risk" populations, no measure is in general better than the other. Each is "better" for specific purposes. Like a population's fertility and mortality performance, the analysis of push and pull factors virtually requires "refined" analysis, with migration being disaggregated into its in-migration and out-migration components. That is what we do here. See also Long and Boertlein (1990) for a detailed discussion of the different measures of migration.

[5]1980 U.S. Census of Population, Census of Population, 1980: County to County Migration Flows (U. S. Bureau of the Census, n.d.). This data set, which is available on tape on a state-by-state basis, is in the form of a matrix of all counties (or county equivalents) by all counties of the U. S., with each cell containing tables with counts of the numbers of persons falling into a variety of socio-economic categories. It is based upon a 50% sample of the "long form," which was about a 17% sample. Hence, the sampling proportion was about 8-9%. This analysis is based upon Segment 5, Table M-17 (Sex by Years of School Completed and Age). Other published reports based upon these data include Voss and Fuguitt (1988, 1989) and Voth, et al. (1989). U. S. Bureau of the Census (1990) presents a discussion of the advantages and disadvantages of this data set compared with other sources.

**Figure 1. Age/educational level groups for which in- and out-migration rates are calculated.**

| | 18-24 Yrs Old | 25-34 Yrs Old | 35-44 Yrs Old | 45-64 Yrs Old | 65 + Yrs Old |
|---|---|---|---|---|---|
| **Elementary** | Group 1 | Group 7 | Group 13 | Group 19 | Group 25 |
| **1-3 High School** | Group 2 | Group 8 | Group 14 | Group 20 | Group 26 |
| **4 High School** | Group 3 | Group 9 | Group 15 | Group 21 | Group 27 |
| **1-3 College** | Group 4 | Group 10 | Group 16 | Group 22 | Group 28 |
| **4 College** | Group 5 | Group 11 | Group 17 | Group 23 | Group 29 |
| **5+ College** | Group 6 | Group 12 | Group 18 | Group 24 | Group 30 |

**Creation of Dependent Variables--Patterns of In-Migration and Out-Migration**

For each of the 653 study counties, we calculated 30 age/educational level-specific rates of in-migration and 30 age/educational level-specific rates of out-migration. Because many counties had zeros in the denominators for the calculation of these rates, we used the sum of all persons in the entire respective age group (e.g, the column totals in Figure 1) as the base for the denominators. The in-migration rate for Group 6 in the $i^{th}$ county, for example, was the number of in-migrants aged 18 to 24 with 5 years or more of college in county I, divided by the total number of 18 to 24-year-old residents in county I at the beginning of the period (sum of non-migrants and out-migrants), regardless of educational level, multiplied by 100. Thirty in-migration rates and 30 out-migration rates were calculated in this manner for each county. These rates are referred to as INRATE1, INRATE2, etc., and OUTRATE1, OUTRATE2, etc. in the rest of the paper:

$$INRATE_{ni} = \frac{\text{\# of in-migrants in age/education group n in county I}}{\text{\# of residents in age group a in county I}} * 100$$

$$OUTRATE_{ni} = \frac{\text{\# of out-migrants in age/education group n in county I}}{\text{\# of residents in age group a in county I}} * 100$$

where n = 1 to 30 age/educational level groups shown in Figure 1, a = 1 to 5 age groups shown in Figure 1, and I = 1 to 653 study counties.

One could, of course, attempt to analyze each of these 60 sets of migration rates separately. However, since we expect that migration behavior will, to some extent at least, follow a systematic pattern throughout the life cycle, this property-space should be reducible to fewer than 60 underlying patterns. The patterns that emerge should be of interest in their own right. To identify these migration patterns, we subjected the 30 in-migration and the 30 out-migration sets of rates each to a separate exploratory factor analysis (using SPSS's principal components analysis and a varimax rotation). The resultant factors were then used to describe the patterns of human capital migration in the Delta.

**Independent Variables**

We used ordinary least squares regression to examine the relationships between county-level characteristics and these migration factors. We focused on identifying the unique migration experienced by the counties of the Lower Mississippi Delta region, in the context of the surrounding counties not in the Delta. Thus, we used a limited set of binary (0,1) independent variables: (1) the set of county types indicating the "delta" status of the counties, (2) the states within which the counties are located, and finally, and (3) whether or not the county contained a college or university.

**Delta county types.** Defining the "Delta region" is fraught with difficulty, difficulty which the Lower Mississippi Delta Development Commission (LMDDC, 1989, 1990) neither avoided nor resolved. Its final definition of the Delta appears quite arbitrary, including 219 counties in seven states (Arkansas, Illinois, Kentucky, Louisiana, Mississippi, Missouri, and Tennessee). It is an extremely heterogeneous group of counties, among which rural counties with relatively large proportions of black people, two criteria which would seem to be central to any definition of the Lower Mississippi Delta region, are a clear minority. Following work done by Reinschmeidt and Green (1989), we have used a somewhat smaller Delta and have classified the counties into six distinct groups, of which four are regarded as being in the Delta. The groups are as follows:[6]

Rural Core Delta counties: 43 nonmetro counties along the Mississippi River extending from the Missouri boot heel to the southwest corner of Mississippi.

Rural Fringe Delta counties: 133 nonmetro counties grouped around these Core Delta counties in all directions. This group of counties is somewhat larger in the LMDDC designation, especially in

[6]Except for the treatment of the metropolitan counties, this classification follows that of Reinschmeidt and Green. Whereas Reinschmeidt and Green called only two metropolitan counties, Crittenden and Jefferson in Arkansas, Delta counties and identified another group of 24 metropolitan Delta-adjacent counties as "non-Delta," we have created three categories of metropolitan counties analogous to the rural counties. These include Metropolitan Core Delta counties, of which there are 5, including Crittenden and Jefferson in Arkansas, Shelby and Tipton in Tennessee, and Desoto in Mississippi, and Metropolitan Fringe Delta counties, of which there are 19.

Illinois and Kentucky, where areas that are more properly Appalachian were added by LMDDC after the first Delta definition had been made in October of 1988.

Rural Non-Delta counties: 377 nonmetro counties in the seven Delta states, but not in the LMDDC region.

Metro Core Delta counties: 5 metro counties within the region outlined by the Rural Core Delta counties.

Metro Fringe Delta counties: 19 metro counties at the edges of the Delta region.

Metro Non-Delta counties: 76 metro counties in the seven states, but not in the LMDDC region.[7]

## RESULTS

### Overall Patterns of Migration

Previous research has shown the overall patterns of migration among the respective age and educational level categories for the sub-regions of Lower Mississippi Delta regions (Voth et al., 1994). Space does not allow a detailed repetition of all of those findings here, but in short, the results showed a substantial "brain drain," especially from the Rural Core Delta counties.[8]

It is our objective here to examine these migration patterns in more detail, first by developing clusters or factors of age- and education-specific

[7]See Voth et al. (1992; 1993) for a fuller discussion of the distribution of these counties among the seven states.

[8]Using the same data source and the same metropolitan and non-metropolitan classification of the Delta region, Voth et al. (1994a) aggregated in- and out-migration to calculate net migration rates for the 30 age/educational level categories used here. Using these net migration rates, they calculated the probability of retaining persons of the various education levels throughout the lifespan using a quasi-cohort procedure. Of those persons obtaining college degrees, Rural Core Delta counties could expect to retain fewer than 50%, whereas the Metropolitan Fringe Delta counties, at the opposite extreme, could expect to retain 160%.

migration rates and then by relating these factors to Delta regions and the presence or absence of educational institutions.

## Major Patterns of In- and Out-Migration

Table 1 presents the factor analysis of the 30 in-migration sets of rates, and Table 2, the factor analysis of the 30 out-migration sets of rates. Six factors met the selected eigenvalue criteria in each case, explaining, respectively, 65.7 percent and 54.7 percent of the total variability.[9]

**Table 1. Factor analysis of in-migration rates.**

| Variable | Factor | Eigenvalue | % of Variance | Cumulative % |
|---|---|---|---|---|
| INRATE1 | 1 | 8.70 | 29.0 | 29.0 |
| INRATE2 | 2 | 4.72 | 15.7 | 44.7 |
| INRATE3 | 3 | 2.24 | 7.5 | 52.2 |
| INRATE4 | 4 | 1.68 | 5.6 | 57.8 |
| INRATE5 | 5 | 1.21 | 4.0 | 61.8 |
| INRATE6 | 6 | 1.17 | 3.9 | 65.7 |

**Table 2. Factor analysis of out-migration rates.**

| Variable | Factor | Eigenvalue | % of Variance | Cumulative % |
|---|---|---|---|---|
| OUTRATE1 | 1 | 6.90 | 23.0 | 23.0 |
| OUTRATE2 | 2 | 3.92 | 13.1 | 36.1 |
| OUTRATE3 | 3 | 2.04 | 6.8 | 42.9 |
| OUTRATE4 | 4 | 1.31 | 4.4 | 47.2 |
| OUTRATE5 | 5 | 1.20 | 4.0 | 51.3 |
| OUTRATE6 | 6 | 1.03 | 3.4 | 54.7 |

Based upon the size of the factor loadings, the factors are identified with their defining variables in Figures 2 and 3. The highest factor loadings used to define the factors are underlined in Tables 1 and 2

[9]The correlation matrix among the 30 in-migration rates and the 30 out-migration rates, which is the basis for this factor analysis, can be obtained from the authors upon request.

**Table 1 (cont). Factor analysis of in-migration rates, rotated factor matrix (factor loadings).**

| Variable | Commu-nality | In-Factor 1 In-migration of more highly educated adults | In-Factor 2 In-migration of more highly educated elderly persons | In-Factor 3 In-migration of relatively uneducated elderly persons |
|---|---|---|---|---|
| INRATE1 | .77 | .08 | .08 | -.07 |
| INRATE2 | .83 | .11 | .05 | .22 |
| INRATE3 | .84 | .19 | .13 | .18 |
| INRATE4 | .81 | .06 | .10 | -.06 |
| INRATE5 | .77 | .23 | .11 | -.12 |
| INRATE6 | .70 | .14 | .07 | -.08 |
| INRATE7 | .60 | .02 | -.11 | .20 |
| INRATE8 | .60 | .16 | -.07 | **.61** |
| INRATE9 | .78 | .50 | .11 | **.59** |
| INRATE10 | .77 | **.73** | .19 | .30 |
| INRATE11 | .74 | **.80** | .17 | .01 |
| INRATE12 | .70 | **.59** | .19 | -.02 |
| INRATE13 | .61 | -.13 | -.02 | .36 |
| INRATE14 | .55 | .12 | .04 | **.69** |
| INRATE15 | .74 | .46 | .20 | **.66** |
| INRATE16 | .64 | **.67** | .28 | .30 |
| INRATE17 | .72 | **.79** | .21 | .07 |
| INRATE18 | .71 | **.65** | .17 | -.02 |
| INRATE19 | .65 | -.23 | .16 | **.60** |
| INRATE20 | .71 | .09 | .43 | **.71** |
| INRATE21 | .78 | .18 | **.63** | **.58** |
| INRATE22 | .67 | .35 | **.65** | .35 |
| INRATE23 | .66 | .41 | **.68** | -.00 |
| INRATE24 | .49 | .34 | **.51** | .01 |
| INRATE25 | .41 | -.06 | .33 | **.54** |
| INRATE26 | .45 | .17 | .43 | **.46** |
| INRATE27 | .62 | .18 | **.67** | .30 |
| INRATE28 | .52 | .12 | **.68** | .11 |
| INRATE29 | .47 | .04 | **.65** | .16 |
| INRATE30 | .37 | .06 | **.60** | .01 |

and entered in Figures 2 and 3. Thus, for example, the heaviest loadings of in-migration Factor 1 are on INRATE10 (Group 10, .73, 25 to 34-year-olds with 1-3 years of college), INRATE11 (Group 11, .80, 25 to 34-year-olds who finished college), and INRATE12 (Group 12, .59, 25 to 34-year-

**Table 1 (cont). Factor analysis of in-migration rates, rotated factor matrix (factor loadings).**

| Variable | In-Factor 4 In-migration of highly educated young people | In-Factor 5 In-migration of youth and adults with very low levels of education | In-Factor 6 In-migration of young people with relatively low levels of education |
|---|---|---|---|
| INRATE1 | -.11 | **.63** | **.59** |
| INRATE2 | -.00 | .15 | **.86** |
| INRATE3 | **.57** | -.15 | **.64** |
| INRATE4 | **.89** | -.08 | .07 |
| INRATE5 | **.82** | -.11 | .03 |
| INRATE6 | **.81** | -.05 | -.07 |
| INRATE7 | -.14 | **.72** | .10 |
| INRATE8 | -.21 | .31 | .24 |
| INRATE9 | -.13 | -.07 | .38 |
| INRATE10 | .16 | -.17 | .25 |
| INRATE11 | .18 | -.19 | .05 |
| INRATE12 | **.56** | -.09 | -.02 |
| INRATE13 | -.06 | **.68** | -.08 |
| INRATE14 | -.03 | .23 | .05 |
| INRATE15 | .01 | .03 | .24 |
| INRATE16 | .06 | .04 | .13 |
| INRATE17 | .17 | .15 | .01 |
| INRATE18 | .51 | .04 | -.01 |
| INRATE19 | -.06 | .46 | .03 |
| INRATE20 | -.06 | .10 | .02 |
| INRATE21 | -.04 | -.03 | .13 |
| INRATE22 | .04 | -.03 | .08 |
| INRATE23 | .05 | .16 | .08 |
| INRATE24 | .33 | .02 | -.03 |
| INRATE25 | .02 | .11 | -.03 |
| INRATE26 | -.03 | -.15 | .00 |
| INRATE27 | -.03 | -.19 | .11 |
| INRATE28 | .11 | -.08 | .06 |
| INRATE29 | .16 | -.01 | .04 |
| INRATE30 | .08 | .05 | -.06 |

olds with post-graduate training), and also on INRATE16 (Group 16, .67, 35 to 44-year-olds with 1-3 years of college), INRATE17 (Group 17, .79, 35 to 44-year-olds who completed college), and INRATE18 (Group 18, .65, 35 to 44-year-olds with post-graduate training). Thus, this factor is called "Highly educated adults in-migration."

**Table 2 (cont). Factor analysis of out-migration rates, rotated factor matrix (factor loadings).**

| Variable | Commu-nality | Out-Factor 1 Out-migration of highly educated persons | Out-Factor 2 Out-migration of post-high school (technical education) adults | Out-Factor 3 Out-migration of youth and young adults with some high school |
|---|---|---|---|---|
| OUTRATE1 | .55 | -.13 | -.03 | .03 |
| OUTRATE2 | .45 | -.11 | -.08 | **.57** |
| OUTRATE3 | .65 | -.11 | .20 | **.68** |
| OUTRATE4 | .44 | .11 | **.54** | .22 |
| OUTRATE5 | .72 | **.81** | .14 | -.06 |
| OUTRATE6 | .64 | **.79** | -.00 | -.06 |
| OUTRATE7 | .59 | -.21 | -.04 | .01 |
| OUTRATE8 | .36 | -.15 | -.06 | **.53** |
| OUTRATE9 | .66 | -.05 | .42 | **.64** |
| OUTRATE10 | .64 | .36 | **.68** | .13 |
| OUTRATE11 | .80 | **.85** | .21 | -.07 |
| OUTRATE12 | .81 | **.86** | .20 | -.10 |
| OUTRATE13 | .48 | -.05 | -.28 | .24 |
| OUTRATE14 | .32 | -.03 | .02 | **.54** |
| OUTRATE15 | .59 | .06 | **.48** | **.46** |
| OUTRATE16 | .58 | .22 | **.71** | .08 |
| OUTRATE17 | .43 | .36 | **.49** | -.04 |
| OUTRATE18 | .69 | **.74** | .32 | -.10 |
| OUTRATE19 | .54 | -.05 | -.15 | .41 |
| OUTRATE20 | .45 | -.03 | .24 | .16 |
| OUTRATE21 | .62 | .14 | **.46** | .34 |
| OUTRATE22 | .54 | .18 | **.64** | -.01 |
| OUTRATE23 | .54 | .15 | **.66** | -.18 |
| OUTRATE24 | .46 | **.55** | .34 | -.05 |
| OUTRATE25 | .45 | -.03 | -.05 | **.46** |
| OUTRATE26 | .35 | .03 | .08 | .06 |
| OUTRATE27 | .42 | .08 | .26 | .16 |
| OUTRATE28 | .58 | .10 | -.02 | .02 |
| OUTRATE29 | .64 | .07 | .00 | .11 |
| OUTRATE30 | .43 | .13 | .25 | -.10 |

As can be seen, especially in Figures 2 and 3, these underlying migration factors break out in what seem to be logical patterns along the dimensions of educational level and age, with educational level appearing to play a more prominent role than age. For the more highly educated (at least some college), the in-migration factors very neatly follow a pattern

**Table 2 (cont). Factor analysis of out-migration rates, rotated factor matrix (factor loadings).**

| Variable | **Out-Factor 4** Out-migration of of persons with lowest levels of education | **Out-Factor 5** Out-migration of elderly with low levels of education | **Out-Factor 6** Out-migration of elderly with high levels of education |
|---|---|---|---|
| OUTRATE1 | **.70** | -.05 | -.19 |
| OUTRATE2 | .25 | .21 | .01 |
| OUTRATE3 | -.17 | .31 | -.00 |
| OUTRATE4 | -.28 | -.08 | .08 |
| OUTRATE5 | -.19 | -.07 | .03 |
| OUTRATE6 | -.07 | -.01 | .02 |
| OUTRATE7 | **.72** | -.15 | .01 |
| OUTRATE8 | .21 | -.11 | -.07 |
| OUTRATE9 | -.16 | .22 | -.07 |
| OUTRATE10 | -.16 | .06 | -.01 |
| OUTRATE11 | -.12 | .09 | .02 |
| OUTRATE12 | -.06 | .09 | .04 |
| OUTRATE13 | **.58** | -.00 | .06 |
| OUTRATE14 | .16 | -.03 | .06 |
| OUTRATE15 | -.23 | .31 | -.07 |
| OUTRATE16 | -.09 | .10 | -.02 |
| OUTRATE17 | -.06 | -.02 | .22 |
| OUTRATE18 | -.07 | .10 | .10 |
| OUTRATE19 | **.59** | .03 | -.02 |
| OUTRATE20 | .13 | **.59** | -.05 |
| OUTRATE21 | -.28 | **.42** | .16 |
| OUTRATE22 | .00 | .30 | .10 |
| OUTRATE23 | .03 | .21 | .12 |
| OUTRATE24 | -.04 | .10 | .15 |
| OUTRATE25 | .35 | .24 | .23 |
| OUTRATE26 | .02 | **.58** | .09 |
| OUTRATE27 | -.17 | **.49** | .22 |
| OUTRATE28 | -.14 | **.74** | .00 |
| OUTRATE29 | -.09 | .03 | **.78** |
| OUTRATE30 | .00 | .15 | **.57** |

of young people moving to invest in or build their human capital (INFACT4, Figure 2), adults moving to use this human capital productively (INFACT1, Figure 2), and then moving again to spend the wealth (INFACT2), implying quite specific pull factors. The only thing that appears exceptional about this is that the latter occurs so early in life.

**Figure 2. Distribution of in-migration factors among 30 age/educational levels with factor loadings for each of the 30 sets of rates.**

| | 18-24 Yrs Old | 25-34 Yrs Old | 35-44 Yrs Old | 45-64 Yrs Old | 65 + Yrs Old |
|---|---|---|---|---|---|
| Elementary | .59 | .63 | .72 In-Factor 5 | .68 | .60 | .54 |
| 1-3 High School | .86 In-Factor 6 | .61 | .69 | .71 | .46 |
| 4 High School | .64 | .57 | .59 | .66 In-Factor 3 | .58 | .63 | .67 |
| 1-3 College | .89 | .73 In-Factor 1 | .67 | .65 In-Factor 2 | .68 |
| 4 College | .82 In-Factor 4 | .80 | .79 | .68 | .65 |
| 5+ College | .81 | .56 | .59 | .65 | .51 | .60 |

**Figure 3. Distribution of out-migration factors among 30 age/educational levels with factor loadings for each of the 30 sets of rates.**

| | 18-24 Yrs Old | 25-34 Yrs Old | 35-44 Yrs Old | 45-64 Yrs Old | 65+Yrs Old |
|---|---|---|---|---|---|
| Elementary | .70 | .72 Out-Factor 4 | .58 | .59 | .46 Out-Factor 3 |
| 1-3 High School | .57 | .53 | .54 | .59 | .58 |
| 4 High School | .68 | .64 | .46 | .48 .46 | .42 .49 Out-Factor 5 |
| 1-3 College | .54 | .68 | .71 Out-Factor 2 | .64 | .74 |
| 4 College | .81 | .85 | .49 | .66 | .78 Out-Factor 6 |
| 5+ College | .79 | .86 Out-Factor 1 | .74 | .55 | .57 |

Out-Factor 3

Three factors represent the migration of persons with lower levels of education: INFACT3, which is made up of relatively poorly educated elders, together with adults with low levels of education; INFACT5, which includes persons aged 18 through 44 with the lowest levels of education; and INFACT6, young people with education up through high school.

The first in-migration factor identified (INFACT1, in-migration of highly educated adults), which represents nearly 30 percent of the variance, is that migration which is perhaps most important to communities, as it represents acquisition by destination communities of what are, presumably, potentially highly productive individuals.

Out-migration patterns seem less a matter of age than of educational level (clustered horizontally rather than vertically in Figure 3).

It is important to note that although the in- and out-migration factors do overlap somewhat, they certainly do not mirror each other. These differences in patterns are, of course, expected from the combination of a push-pull and life cycle interpretation of migration behavior. They imply that any simple set of age- and educational-level-specific net migration rates would combine quite different processes into one measure.

## Relationships Between County Characteristics and Patterns of In-Migration and Out-Migration

In the second step of our analysis, we calculated factor scores for each of the 12 factors to be used in the analysis of the county-level differences in in-migration and out-migration patterns. A series of regression analyses were performed, two for each of the 12 migration factors. The first included only the dummy variables for county type, excluding the Metropolitan Non-Delta county group. The second included the states and the presence or absence of a college or university. The results are presented in Tables 3 and 4.

**In-Migration: Differences Among County Groups.** The differences among county groups for the in-migration factors were all significant at the .05 level (Table 3: Model A). However, the variation explained was relatively low. The largest adjusted $R^2$ is .17 for In-Factor 1 (Table 3, In-migration of highly educated adults), for which all the rural counties are substantially lower than the urban counties. As expected, the Rural Core Delta counties tended to show lower in-migration for all factors, except for the in-migration of the most poorly educated persons (In-Factor 5), of whom these counties have the highest in-migration.

**Table 3. Regression of in-migration factors on Delta county types.[1]**

| Model A: | **In-Factor 1** In-migration of more highly educated adults | **In-Factor 2** In-migration of more highly educated elderly adults | **In-Factor 3** In-migration of relatively uneducated elderly persons | **In-Factor 4** In-migration of highly educated young people | **In-Factor 5** In-migration of youth and adults with very low levels of education | **In-Factor 6** In-migration of young people with relatively low levels of education |
|---|---|---|---|---|---|---|
| **Metro Non-Delta cos. (excluded category)** | | | | | | |
| **Metro Fringe Delta cos.** | .01 (.771) | .03 (.527) | .02 (.699) | -.03 (.512) | -.00 (.919) | -.02 (571) |
| **Metro Core Delta cos.** | -.07 (.067) | -.01 (.740) | -.00 (.942) | -.06 (.149) | .00 (.947) | .02 (.620) |
| **Rural Non-Delta cos.** | -.52 (.000) | -.12 (.050) | .10 (.118) | -.18 (.004) | .07 (.231) | .12 (.047) |
| **Rural Fringe Delta cos.** | -.52 (.000) | -.04 (.466) | .16 (.005) | -.14 (.018) | .13 (.019) | .00 (969) |
| **Rural Core Delta cos.** | -.34 (.000) | -.14 (.003) | -.06 (.198) | -.14 (.002) | .15 (.001) | -.03 (.471) |
| **Adjusted $R^2$ * 100** | 17.12 (.000) | 1.31 (.019) | 1.92 (.004) | 1.14 (.030) | 1.53 (.010) | 1.27 (.021) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

**Table 3 (cont.). Regression of in-migration factors on Delta county types, states, and the presence of a college or university.[1]**

| Model B: | **In-Factor 1** In-migration of more highly educated adults | **In-Factor 2** In-migration of more highly educated elderly adults | **In-Factor 3** In-migration of relatively uneducated elderly persons | **In-Factor 4** In-migration of highly educated young people | **In-Factor 5** In-migration of youth and adults with very low levels of education | **In-Factor 6** In-migration of young people with relatively low levels of education |
|---|---|---|---|---|---|---|
| **Metro Non-Delta cos. (excluded category)** | | | | | | |
| **Metro Fringe Delta cos.** | .00 (.890) | .01 (.741) | .03 (.409) | -.01 (797) | -.01 (.805) | -.04 (.334) |
| **Metro Core Delta cos.** | -.05 (.138) | -.04 (.270) | -.02 (.521) | -.03 (.445) | -.02 (.599) | .02 (.599) |
| **Rural Non-Delta cos.** | -.49 (.000) | -.10 (.121) | -.00 (.970) | -.02 (.727) | -.04 (.455) | .12 (.072) |
| **Rural Fringe Delta cos.** | -.50 (.000) | -.06 (.282) | .07 (.224) | .02 (.731) | .07 (.217) | -.00 (.966) |
| **Rural Core Delta cos.** | -.33 (.000) | -.21 (.000) | -.15 (.002) | -.03 (.478) | .12 (.007) | -.04 (.405) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

**Table 3 (cont.). Regression of in-migration factors on Delta county types, states, and the presence of a college or university.[1]**

| Model B: | **In-Factor 1** In-migration of more highly educated adults | **In-Factor 2** In-migration of more highly educated elderly adults | **In-Factor 3** In-migration of relatively uneducated elderly persons | **In-Factor 4** In-migration of highly educated young people | **In-Factor 5** In-migration of youth and adults with very low levels of education | **In-Factor 6** In-migration of young people with relatively low levels of education |
|---|---|---|---|---|---|---|
| **Arkansas (excluded category)** | | | | | | |
| **Louisiana** | .05 (.255) | -.33 (.000) | -.22 (.000) | .02 (.745) | -.00 (.904) | .04 (.472) |
| **Mississippi** | .08 (.099) | -.26 (.000) | -.26 (.000) | .00 (.988) | .02 (.605) | -.11 (.032) |
| **Tennessee** | -.04 (.399) | -.31 (.000) | -.18 (.001) | -.00 (.925) | .12 (.015) | -.04 (.453) |
| **Missouri** | .13 (.017) | -.26 (.000) | .07 (.193) | .10 (.077) | -.13 (.011) | -.02 (.692) |
| **Kentucky** | -.05 (.367) | -.44 (.000) | -.24 (.000) | .06 (.285) | .32 (.000) | .01 (.852) |
| **Illinois** | .10 (.054) | -.38 (.000) | -.26 (.000) | .03 (.610) | -.20 (.000) | -.08 (.187) |
| **Presence of a college or university = 1** | .07 (.057) | .10 (.007) | -.22 (.000) | .40 (.000) | -.13 (.000) | -.01 (.756) |
| **Adjusted $R^2$ * 100** | 20.30 (.000) | 12.14 (.000) | 18.88 (.000) | 15.29 (.000) | 23.17 (.000) | 2.09 (.012) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

**In-Migration: Addition of States and College or University.** The addition of the seven states and the presence of a college or university increases the explanatory power of the models, with the highest $R^2$ now achieving .23 for the in-migration of those with low levels of education (Table 3: Model B). The addition of these variables had only a minor impact upon the differences among Delta county types. All rural counties still have lower rates of in-migration of the more highly educated adults (In-Factor 1), and the Rural Core Delta counties still tend to have lower rates of all in-migration factors except the in-migration of those with very low levels of education (In-Factor 5).

Interesting patterns emerge among the seven Delta states. Arkansas's high rates of in-migration of both elderly groups (In-Factor 2 and In-Factor 3) show up quite distinctly. Kentucky, like the Rural Core Delta counties, shows particularly high rates of in-migration of those with the lowest levels of education (In-Factor 5, beta coefficient of .32), while Illinois shows distinctly lower rates of in-migration for this group (beta coefficient of -.20).

Finally, as one might expect, the presence of a college or university influences several of the in-migration factors. Its most important positive influence is upon the in-migration of highly educated young people (In-Factor 4, beta=.40) and its strongest negative impact is on the in-migration of elderly with lower levels of education, (In-Factor 3, beta= -.22).

**Out-Migration: Differences Among County Groups.** The differences among county groups were smaller for out-migration (Table 4: Model A). Only three of the six models were significant at the .05 level (Out-Factor 2, Out-Factor 3, and Out-Factor 4). In these models, the rural counties all showed lower rates of out-migration of youth and adults with some post-high school education (Out-Factor 2) and higher rates of out-migration of youth and young adults with some or completed high school educations (Out-Factor 3). Rural Core Delta counties also showed higher rates of out-migration of persons with the lowest levels of education (Out-Factor 4), a category for which they also had higher rates of in-migration.

**Out-Migration: Addition of States and College or University.** Addition of these dummy variables increases the explanatory power of the regression models somewhat (Table 4: Model B). However, the model for the out-migration of elderly persons with low levels of education still has an adjusted $R^2$ of only .01 and is not significant at the .05 level. The pattern of differences among Delta county types changes very little from

**Table 4. Regression of out-migration factors on Delta county types.[1]**

| Model A: | **Out-Factor 1** Out-migration of highly educated persons | **Out-Factor 2** Out-migration of post-high school (technical education ) adults | **Out-Factor 3** Out-migration of youth and young adults with some high school | **Out-Factor 4** Out-migration of persons with lowest levels of education | **Out-Factor 5** Out-migration of elderly with low levels of education | **Out-Factor 6** Out-migration of elderly with high levels of education |
|---|---|---|---|---|---|---|
| **Metro Non-Delta cos. (excluded category)** | | | | | | |
| **Metro Fringe Delta cos.** | -.03 (.532) | -.04 (.387) | -.06 (.179) | .01 (.803) | -.01 (.742) | -.04 (.407) |
| **Metro Core Delta cos.** | -.05 (.238) | .04 (.307) | .04 (.370) | .03 (.392) | -.03 (.436) | -.05 (.192) |
| **Rural Non-Delta cos.** | -.07 (.235) | -.34 (.000) | .24 (.000) | .08 (.206) | -.14 (.021) | -.13 (.036) |
| **Rural Fringe Delta cos.** | -.07 (.203) | -.37 (.000) | .22 (.000) | .04 (.459) | -.16 (.006) | -.06 (.328) |
| **Rural Core Delta cos.** | -.07 (.129) | -.20 (.000) | .21 (.000) | .20 (.000) | -.10 (.035) | -.06 (.171) |
| **Adjusted $R^2$ * 100** | -0.23 (.626) | 7.27 (.000) | 4.68 (.000) | 2.39 (.001) | 0.66 (.098) | .15 (.307) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

**Table 4 (cont). Regression of out-migration factors on Delta county types, states, and the presence of a college or university.[1]**

| Model B: | **Out-Factor 1** Out-migration of highly educated persons | **Out-Factor 2** Out-migration of post-high school (technical education ) adults | **Out-Factor 3** Out-migration of youth and young adults with some high school | **Out-Factor 4** Out-migration of persons with lowest levels of education | **Out-Factor 5** Out-migration of elderly with low levels of education | **Out-Factor 6** Out-migration of elderly with high levels of education |
|---|---|---|---|---|---|---|
| **Metro Non-Delta cos. (excluded category)** | | | | | | |
| **Metro Fringe Delta cos.** | -.00 (.896) | -.06 (.162) | .00 (.920) | .00 (.830) | .03 (.554) | -.02 (.711) |
| **Metro Core Delta cos.** | -.02 (.683) | .06 (.131) | .04 (.247) | .00 (.798) | -.03 (.407) | -.04 (.295) |
| **Rural Non-Delta cos.** | .10 (.101) | -.25 (.000) | .14 (.010) | -.00 (.954) | **-.17 (.007)** | **-.11 (.084)** |
| **Rural Fringe Delta cos.** | .09 (.106) | -.32 (.000) | .17 (.001) | -.00 (.934) | -.18 (.003) | -.03 (.656) |
| **Rural Core Delta cos.** | .04 (.427) | -.19 (.000) | .16 (.000) | .17 (.000) | -.13 (.008) | -.05 (.331) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

**Table 4 (cont). Regression of out-migration factors on Delta county types, states, and the presence of a college or university.[1]**

| Model B: | **Out-Factor 1** Out-migration of highly educated persons | **Out-Factor 2** Out-migration of post-high school (technical education ) adults | **Out-Factor 3** Out-migration of youth and young adults with some high school | **Out-Factor 4** Out-migration of persons with lowest levels of education | **Out-Factor 5** Out-migration of elderly with low levels of education | **Out-Factor 6** Out-migration of elderly with high levels of education |
|---|---|---|---|---|---|---|
| **Arkansas (excluded category)** | | | | | | |
| **Louisiana** | -.02 (.706) | **.01 (.821)** | -.24 (.000) | -.08 (.090) | -.23 (.000) | -.06 (.268) |
| **Mississippi** | -.00 (.992) | .00 (.876) | -.27 (.000) | .02 (.611) | -.13 (.008) | -.08 (.154) |
| **Tennessee** | -.07 (.188) | -.17 (.001) | -.25 (.000) | .08 (.134) | -.23 (.000) | -.09 (.095) |
| **Missouri** | .09 (.079) | .06 (.230) | .20 (.000) | -.15 (.006) | .07 (.229) | .03 (.612) |
| **Kentucky** | -.01 (.855) | -.24 (.000) | -.12 (.021) | .22 (.000) | -.21 (.000) | -.04 (.464) |
| **Illinois** | .06 (.237) | .06 (.229) | -.09 (.075) | -.26 (.000) | -.06 (.275) | .04 (.526) |
| **Presence of a college or university =1** | .42 (.000) | .19 (.000) | -.23 (.000) | -.03 (.450) | -.06 (.157) | .02 (.635) |
| **Adjusted $R^2$ * 100** | 17.28 (.000) | 19.69 (.000) | 29.86 (.000) | 19.29 (.000) | 10.34 (.000) | 1.07 (.090) |

[1]First numbers in each column are beta coefficients; numbers in parentheses are probability that the coefficient is not signficantly different from zero.

that described in Model A. State differences are particularly evident for Out-Factor 3 and Out-Factor 5, but they also exist for Out-Factor 2 and Out-Factor 4. For Out-Factor 3, Arkansas appears to have the highest out-migration of youth and young adults with some high school (Out-Factor 3) and of elderly with low levels of education (Out-Factor 5). Interestingly, Arkansas also exhibited the highest rates of in-migration of this latter group, as is indicated above.

The out-migration of people with the lowest levels of education (Out-Factor 4), which roughly parallels In-Factor 5 (the in-migration of youth and adults with very low levels of education), is especially high in Kentucky. Both are correspondingly low in Illinois (Tables 3 and 4). The 12 counties which had, simultaneously, the highest values on these two factors (In-Factor 5 and Out-Factor 4) were Gallatin, Jackson, Lewis, Menifee, Owen, Powell, Robertson, Whitley, and Wolfe Counties in Kentucky; Sunflower County in Mississippi; and Lake and Polk Counties in Tennessee (see Voth & Ramey, 1994). Interestingly, 6 of the 9 Kentucky counties are found in a line which roughly parallels the Daniel Boone National Forest. Only 2 rural Delta counties are represented, Sunflower in Mississippi, which is a Rural Core Delta county, and Lake in Tennessee, which is a Fringe Rural Delta county.[10]

The presence of a college or university has its greatest impact, as might be expected, upon the out-migration of highly educated persons (Out-Factor 1, beta=.42). The counties with colleges or universities also have lower rates of out-migration of young people with some high school education (Out-Factor 3, beta=-23). These two correlations, together with the high rates of in-migration of highly educated youth (In-Factor 4), clearly illustrate the function these counties play in the process of human capital formation. They receive more young people who ultimately report high levels of education (In-Factor 4), lose fewer young people who have completed high school (Out-Factor 3), and ultimately lose many highly educated persons (Out-Factor 1). And, incidentally, they receive fewer

[10]The distinctiveness of Kentucky as both a recipient and an origin of significantly more people with low levels of education came as something of a surprise to the authors. We would have expected this to be more true, perhaps, of the Rural Core Delta counties. Do these patterns represent the persistence of migration patterns already documented many years ago (Brown et al., 1963; Schwarzweller, 1963), patterns which even in the 1940s and 1950s involved both out-migration and return (counter-stream) migration from areas of eastern Kentucky to some of the midwestern cities to the north, such as Cincinnati? It will be interesting to see whether these patterns have prevailed into the 1985-1990 period.

elderly persons with low levels of education (In-Factor 3) and receive more elderly persons with high levels of education (In-Factor 2). This illustrates that, in addition to producing human capital, a college or university is also an important amenity attracting particular groups of elderly.

A focus, finally, upon the overall impact of the county classification reveals differences between the rural and urban counties; however, these differences are not as clear as might have been expected, given the assumed uniqueness of the Lower Mississippi Delta region. In general, rural counties lose fewer youth with some post-high school education (less than 4 years) and more youth with a high school education. Where they differ most from urban counties is in the much lower rates of in-migration of the most highly educated young people (In-Factor 4) and adults (In-Factor 1). Many of these were likely those who left rural areas upon completing high school (Out-Factor 3), but who did not return after completing school. The Rural Core Delta counties did receive fewer of all in-migrants except those with the lowest levels of education (In-Factor 5), although several of these correlations are low and non-significant. They also *lost* more of those with the lowest levels of education (Out-Factor 4). This suggests that the 43 Rural Core Delta counties experience a somewhat unique pattern of the cycling in and out of persons with very low levels of education, across a wide range of ages.

## SUMMARY AND CONCLUSIONS

Applying exploratory factor analysis to age- and educational-level-specific in-migration and out-migration rates for the 653 counties included in the seven Lower Mississippi Delta states has provided insight into a distinct pattern of migration. The overall pattern corresponds closely to what would be expected when migration is viewed as a process of human capital formation and utilization through the life cycle. Subsequently, the identified factors allowed an examination of the migration experiences of counties in the Lower Mississippi Delta region. The counties of the region are classified as rural and urban and in terms of their proximity to the Core Delta region. We expected that the Delta counties--especially the Rural Core Delta counties--would differ substantially from the others. The patterns of migration of all rural counties differ substantially from all urban counties but, with a few exceptions, relatively little among themselves, whether in the Delta region or not. An exception to this is the Rural Core Delta counties, which evidenced higher rates of both in- and out- migration

of people with the lowest levels of education. However, having 9 of the 12 counties with the highest rates of *both* in- and out-migration of poorly educated people, Kentucky seems to stand out even more than the Rural Core Delta counties.

Further, counties with colleges and universities see the in- and out-migration of the most highly educated young people and the in-migration of highly educated elderly persons. Arkansas dominates the in- and out-migration of elderly people, while Kentucky and the Rural Core Delta counties dominate both the in- and out-migration of persons with the lowest levels of education.

This analysis illustrates a unique and valuable approach to combining the interactions between the push and pull of structural characteristics of the origin and destination communities and the intervening life-cycle characteristics of the (potential) migrants themselves. Rather than argue about which level of analysis is *most* important, we have demonstrated that migration patterns vary systematically with the age and educational levels *and* with some key characteristics of the counties of origin and destination. Moreover, this analysis demonstrates the potential of the unique data set utilized and of examining in- and out-migration rates separately within highly specific population groups.

Further steps in this research approach include an extension of the analysis with a fuller set of community characteristics and an update of the analysis to the 1985-90 period using the County-by-County Migration Flows data file from the 1990 Census of Population and Housing. This work is proceeding. In order to exploit the important differences between in- and out-migration, we will examine the impacts of the independent variables upon in- and out-migration, and even upon net-migration, simultaneously, and thereby overcome the problem of zero denominators.

As generalizations and specific numerical coefficients from this kind of detailed analysis of migration streams emerge, the basis for modeling population futures and the impacts of local socio-economic change upon those futures should be greatly enhanced. Even more important, however, is the potential for creative linking of county-level aggregate migration data to specific community features and, especially, to long-standing migration patterns and streams.

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