The Impact of Spatially Proximate Population Concentrations on Migration

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Research on migration often fails to explicitly consider the impact that large concentrations of population in spatial proximity has on migration patterns. Furthermore, although it is widely recognized that migration fuels much of the population growth in many areas of the United States, we lack knowledge about the characteristics that attract migrants to specific areas.

The lack of attention to this issue is of special concern because of recent evidence of the selective deconcentration of the U.S. population (Johnson, 2006, Frey and Johnson, 1998). Such deconcentration is particularly pronounced where large urban population concentrations exist in close proximity to large tracts of rural land and in areas rich in natural amenities, recreational opportunities. Prior research suggests that amenities stimulate population growth primarily by attracting migrants to the area (Stewart and Stynes, 1994,Godbey and Bevins 1987, Ratelof, et.al., 2001; Stewart and Stynes, 1994, Bennet 1996, Shumway and Davis 1996; Johnson and beale, 2002; McGranahan, 1999). Recent research confirms the continuing rapid migration and population gains in areas just beyond the urban edge and in recreational areas (Johnson, Nucci and Long, 2006; Frey, 2005). Johnson, Voss Hammer and Fuguitt (2005) note significant differences in the age-specific migration profile of migrants to large urban cores, suburban areas, recreational and other nonmetropolitan areas. A model that estimates the impact of proximate population concentrations on migration patterns will foster a fuller

understanding of the role that space play in the dynamics underlying demographic change.

Data and Methods

We develop a model to estimate the impact of spatial population concentration on migration by producing a measure that takes into account the distance weighted impact of the population in each of the 3100 U.S. counties on each county and combining it with Census Bureau data on county to county migration. It is our expectation that the volume of migration to a given county will be positively correlated with our measure of spatial population concentration.

Rather than measuring population residing within a specific radius of the county, we employ a gravitational potential model with a negative exponential distance decay function. The population with access to the county i is represented as Q_i, and it is a function of the population in other counties P_j, the distance between county *i* and county *j*s, and an empirically derived distance decay coefficient, γ , as follows:

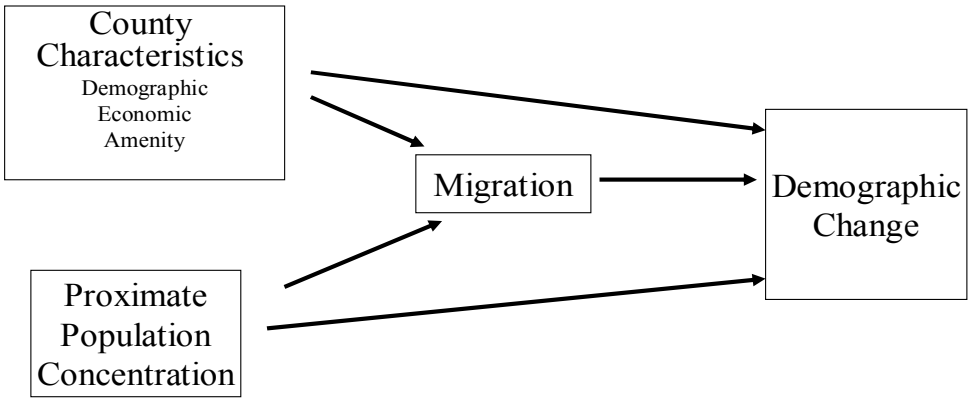
$$Q_i = \sum_{j=1}^{j=J} P_j \left(e^{-\gamma d_{ij}}\right)$$

The distance decay coefficient captures the "friction of distance," the declining willingness to migrate to an area as distance increases.

The County to County migration file released in October of 2003 by the Census Bureau offers researchers an opportunity to examine migration data between every pair of U.S. counties in considerable detail. In addition to the actual inflow and outflow of migrants between each county pair, the file includes information on the age, education, income, race/ethnicity, employment status and household type of the migrants.

We examine these data to identify similarities and differences in the migration streams between U.S. counties. We use a multivariate model incorporating the demographic, economic and amenity characteristics of a county together with the measure of the spatial proximity of population concentrations to predict the patterns of migration to the area (Figure 1). The model will be examined for evidence of spatial autocorrelation and appropriate spatial correction factors will be introduced to address anticipated spatial dependency.

Impact of County Characteristics and Spatially Proximate Populations on Migration and Demographic Change



Research Objectives:

We have two research objectives in this paper. First, to develop a measure that explicitedly takes into account the influence of spatially proximate population concentrations on migration. Second, to incorporate our measure of spatial population proximity into a model that estimates the impact of a variety of demographic, economic and social characteristics of a county on migration. It is our expectation that the

incorporation of this measure into such a model will produce a significant incremental improvement in the ability of the model to estimate migration.

This analysis will document the impact that proximate population concentrations have on migration and underscore the importance of spatial analysis to demographic research. The insights gained from this analysis should improve demographers understanding of the processes that underlay the complex migration patterns that currently play such a prominent role in the population redistribution underway in the U.S.

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