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Do Migrating Seniors Affect Business Establishment and Job Growth? An Empirical Look at Southeastern Nonmetropolitan Counties, 2000 - 2004

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Abstract

Migrating seniors are choosing to live in nonmetropolitan areas. Many nonmetropolitan communities are, in turn, focusing on recruiting retirees as an economic development strategy. This paper applies a regional growth model to measure the impact of migrating seniors (between 1995 and 2000) on employment and business establishment growth in the southeastern United States from 2000 to 2004. This region is a popular senior destination due to low taxes, mild climate, inexpensive housing, and proximity to friends and families. The economic impacts of senior migration are spatially heterogeneous across the region, suggesting alternative policy implications for urban and nonurban communities.

Keywords: Senior migration; Job growth; Spatial forecasting; Spatial heteroskedasticity and autocorrelation; Southeastern U.S.

JEL classification: C51; O18; R11

1. INTRODUCTION

In the 1970s, rural industrialization transformed rural economies in the United States. This transformation was fueled, in large part, by the migration of manufacturing firms out of urban areas in search of low-cost labor (Johnson 2001). However, with innovations in telecommunications and information technologies, conglomeration of financial markets, and the formation of new international trade agreements, the competitive advantage of rural economies waned as the distance between foreign and domestic markets contracted and access to low-cost labor abroad increased. To remain competitive, firms adopted a new production paradigm that exploited information technologies and embraced technological innovation. Some firms moved operations overseas, others regeared by focusing less on commodities and more on niche markets; and the nature of local service and retail markets was transformed by big-box chains (Leibtag 2006; Goetz and Swaminathan 2004).

As a result, the economic engine that manufacturing was for many rural areas gave way as demand increased for a broader range of service providers, small-business creation, and new economic challenges and opportunities. Since the late 1990s, rural areas have struggled as firm investment flowed back to urban centers able to provide skilled labor, business services, and access to product and input markets. Rural areas lacking a skilled workforce or the ability to provide business services were at a relative disadvantage with respect to attracting investment and retaining businesses. Some rural communities adapted to these changes by attracting small businesses and creating environments conducive to their growth (Low, Henderson, and Weiler 2005). Other rural areas succeeded with traditional industrial recruiting strategies as evidenced by the growth of the automobile industry and animal production and processing in the southeastern states. Still other rural areas endowed with natural resources adapted by promoting themselves as recreational tourism destinations or seasonal or retirement communities.

For the first time in more than 50 years, the population of rural counties grew during the “Rural Renaissance” of the 1970s as out-migration of young adults decreased and in-migration of older people at or near retirement increased (Galston and Baehler 1995). The trend was reversed in the 1980s, but during the 1990s a half-million more persons aged 50 or older moved into nonmetro counties than out of them (Fuguitt, Beale, and Tordella 2002). Recent estimates project that between 2007 and 2025 at least 400,000 retiring baby boomers each year – with an average of $320,000 to spend on a new home – will migrate beyond their state borders (Vestal et al. 2006). Trends suggest that many of these retirees will relocate to the nonmetropolitan counties in the south (Jones, Kandel, and Parker 2007). For example, from 1995 to 2000, the south led the nation in net in-migration among the population 65 and over (He and Schachter 2003).

The potential of senior recruitment as a component of community economic development has prompted interest in identifying and quantifying the economic impacts of senior migration. While research suggests that retiree in-migration positively impacts local government finances in the short run, the broader economic impacts are less clear. Serow

(2003) and Longino (2001) provided extensive literature reviews about the economic impacts of senior migration. Serow focused on economic impact studies, dividing the literature that used secondary data into those studies that analyzed aggregate relationships between elderly migration behavior and selected economic outcomes (e.g., Li and MacLean 1989; Glasgow and Reeder 1990; Day and Bartlett 2000) and studies that used input-output models to trace the overall effects of levels and distributions of retiree spending (e.g., Hodge 1991; Serow and Haas 1992; Bennett 1993; Siegel and Leuthold 1993; Stallman, Deller, and Shields 1999; Shields, Stallman, and Deller 1999; Barkley and Henry 2000; Esch and Gliem 2004; Miller et al. 1994; Miller 2005; Park et al. 2007). The findings of these studies were specific to communities, time periods, and data sets; but several overarching themes were drawn from this body of research.

Retiree-aged newcomers to nonmetropolitan counties tended to be better educated, married, and had higher incomes compared to "aging in place" retirees (Jones, Kandel, and Parker 2007) and native residents more generally (Park et al. 2007). Migrating retirees potentially stimulated economic and fiscal growth, bringing intangible assets such as professional skills, capital assets, and potential volunteer services that could help finance business start-ups and expansions, create jobs, and increase the overall quality of life (Galston and Baehler 1995). As such, recruiting seniors may be an attractive addition to a community development portfolio. But the decision to integrate retiree recruitment into economic development strategies is complex, potentially producing a mix of anticipated results and unintended consequences (e.g., Park et al. 2007; Rowles and Watkins 1993). The injection of disposable income and possibly labor into communities by migrating seniors may influence economic growth differently, depending on the age cohort profile, the depth and breadth of the basic and nonbasic sectors of the local economy, and economic linkages up through the rural-urban hierarchy. Glasgow and Reeder (1990) found a strong correlation between newcomer retirees and job growth in the service sector. But service occupations typically associated with the retiree-based industry (e.g., staff, retail clerks, housekeepers, guide services) may be relatively low-paying, potentially increasing income gaps (Galston and Baehler 1995). On the other hand, demand for high-tech jobs associated with health care provision (e.g., Park et al. 2007) or growth in other sectors supporting expanding service and retail value chains (e.g., Shields, Deller, and Stallman 2001) may increase with senior in-migration. But population grows as labor responds to new job opportunities, potentially increasing congestion that stresses local traffic infra-structure and tests the patience of commuters (Park et al. 2007; Schluter and Lee 2002).

Understanding the sources of economic growth helps planners determine their positions relative to their neighbors, enabling them to adjust strategic plans (Partridge and Rickman 2003). Development planners often compare their economic progress with other counties on a regional level, and job or business establishment growth is usually the metric in these comparisons (Low, Henderson, and Weiler 2005). The objective of this paper is to contribute to the overall understanding of the relationship between senior recruitment and economic development by determining whether senior migration between 1995 and 2000 was associated with short-run economic growth in metropolitan and nonmetropolitan counties of 13 states in the southeastern U.S. from 2000 to 2004 (AL, AR, GA, KY, LA, MD, MO, MS, NC, SC, TN, VA, and WV).[1] To achieve this objective, a reduced-form version of a regional adjustment model is used to measure the impact of cohort migration on employment and business establishment growth. To test the sensitivity of these results across the empirical distribution of counties, we employ quantile regression to gauge the impact of in-migrating seniors on employment growth. In a second simulation, we estimate employment and business establishment growth following an increase in the 55–69 age in-migrating cohort using forecasts from a spatial lag process model. We then compare these results across an integrated rural-urban classification system suggested by Isserman (2005).

The remainder of the paper is organized as follows. The empirical section describes the equations used to measure the impacts of inter-county migration in-flow and out-flow between 1995 and 2000 on business establishment and job growth from 2000 to 2004, along with local control variables. Estimation procedures, spatial econometric issues, and simulation analyses are discussed in the methodological section. A description of the growth, adjustment, and control variables and their sources is next, followed by a discussion of the results. The last section concludes.

2. EMPIRICAL MODEL

Typical regional adjustment models are two-equation migration models allowing feedback between employment and population during the growth process (e.g., Carlino and Mills 1987; Deller et al. 2001; Bao, Henry, and Barkley 2004; Edmiston 2004; Carruthers and Vias 2005; Carruthers and Mulligan 2007). We estimate the reduced form of a modified regional adjustment model suggested by Carruthers and Vias and Carruthers and Mulligan.

(1a) $$\Delta PD_{i,t} = a_0 + a_1 \ln(ED_{i,t-k}) + a_2 \ln(PD_{i,t-k}) + \mathbf{a}'_3 \mathbf{X}_{i,t-k} + u_{i,t,\,PD}$$

(1b) $$\Delta ED_{i,t} = b_0 + b_1 \ln(PD_{i,t-k}) + b_2 \ln(ED_{i,t-k}) + \mathbf{b}'_3 \mathbf{Z}_{i,t-k} + u_{i,t,\,ED}$$

where t denotes a time period, k a time lag, and (**a**, **b**) are reduced-form parameters.

We focus our attention on the reduced-form employment growth equation because the focus of this empirical analysis is on the impact of migrating seniors on job and business establishment growth. The reduced-form equation (1b) is estimated conditional on: (1) adjustment variables (lagged employment, business establishment, and population

[1]Florida is not included in our analysis because the focus is on "new-generation" retirement communities in the southeastern states. This includes the "half-back" generation of migrating seniors: northerners who retired to Florida only to change their minds and move "half-way back." Our primary interest is in counties located in states that have the potential to attracted seniors hoping to avoid the congestion typically associated with Florida and locate closer to family and friends in the midwest and northern states.

density) and (2) variables that control for local community structure, demographics, physical and natural amenities, lagged economic growth proxies, regional heterogeneity, and spatial interrelationships between counties.

3. ESTIMATION ISSUES AND ECONOMETRIC METHODS

Recent years showed an increasing number of applied studies in geography, economics, and regional science in which the spatial dimension of population and economic growth were incorporated in regression models (e.g., Wojan, Lambert, and McGranahan 2008; Cho et al. 2007; Monchuk et al. 2007; Lambert, McNamara, and Garrett 2006; Boarnet, Chalermpong, and Geho 2005; Cohen and Paul 2005; Bao, Henry, and Barkley 2004; Moreno et al. 2004). This surge was fueled by recent theoretical developments in spatial econometrics along with better access to spatial data and the increased availability of easy-to-use computational tools.

Most regional adjustment studies use a spatial process model going back to Whittle (1954), in which an endogenous variable is specified to depend on spatial interactions between cross-sectional units plus a disturbance term. The interactions are modeled as a weighted average of nearby cross-sectional units, and the endogenous variable comprising the interactions is usually referred to as a spatially lagged variable. The weights are grouped in a matrix identifying neighborhood connections, which forms the distinctive core of spatial process models. The model is termed a spatial autoregressive lag model in the terminology of Anselin and Florax (1995). Whittle's spatial autoregressive lag model (SAR) was popularized and extended by Cliff and Ord (1973, 1981), who distinguished models in which the disturbances follow a spatial autoregressive process. The general model, which contains a spatially lagged endogenous variable as well as spatially autoregressive disturbances in addition to exogenous variables, is called a spatial autoregressive model with autoregressive (AR) disturbance of order (1,1) (SARAR) (Anselin, 1988; Kelejian and Prucha 2006); $\mathbf{y} = \rho\mathbf{W}_1\mathbf{y} + \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\varepsilon}$, $\boldsymbol{\varepsilon} = \lambda\mathbf{W}_2\boldsymbol{\varepsilon} + \mathbf{u}$, $\mathbf{u} \sim \text{iid}(\mathbf{0}, \boldsymbol{\Omega})$, where $\mathbf{W}_1$ and $\mathbf{W}_2$ are (possibly identical) matrices defining interrelationships between spatial units, and $E[\mathbf{uu}'] = \boldsymbol{\Omega}$. The reduced-form version is $\mathbf{y} = (\mathbf{I} - \rho\mathbf{W}_1)^{-1}\mathbf{X}\boldsymbol{\beta} + (\mathbf{I} - \rho\mathbf{W}_1)^{-1}(\mathbf{I} - \lambda\mathbf{W}_2)^{-1}\mathbf{u}$, or for notational convenience, $\mathbf{y} = \mathbf{AX}\boldsymbol{\beta} + \mathbf{ABu}$. Spatial process models are typically estimated using maximum likelihood or generalized method of moments (GMM) procedures. A GMM approach is used in this study because we have no reason to believe that the errors generated by our models follow some predetermined distribution.

A county with a given change in employment or business establishment growth may be surrounded by other counties with similar growth rates. Feedback between spatial units may be significant, meaning that growth in one county is dependent on or explained by growth in surrounding counties. Significant interaction suggests information spillovers, thick labor markets, or forward-backward economic linkages across space (Anselin 2002; Moreno et al. 2004). This hypothesis is tested by the significance of the autoregressive parameter ρ. In this application, the lag process is modeled using a row-standardized first-order queen contiguity matrix that identifies local neighborhoods of counties. However, the parametric and structural assumptions about the error process are relaxed.

Spatial error dependence occurs when omitted variables follow a spatial structure such that $\neq \sigma_u^2\mathbf{I}$ (Anselin 1988). Nonspherical errors may be simultaneously caused by heteroskedasticity or autocorrelated error processes and are usually linked to heterogeneity associated with cross-sectional spatial units (Kelejian and Prucha 2006). Inclusion of fixed effects is one approach to tackle this problem. But in cases where the causes of spatial heterogeneity cannot be identified by discrete units (such as census blocks or states), the researcher must specify spatial structure *vis-à-vis* $\mathbf{W}_2$, often-times with little in the way of theoretical guidance.[2,3] Instead, we take a nonparametric approach motivated by Conley (1999) and Kelejian and Prucha (2007a) and apply a heteroskedastic-spatial autocorrelation robust (HAC) covariance matrix estimator to account for potential spatial error dependence. Therefore, the econometric model we estimate is $\mathbf{y} = \rho\mathbf{W}_1\mathbf{y} + \mathbf{X\beta} + \boldsymbol{\varepsilon}$.

3.1 Heteroskedastic-Spatial Autocorrelation Robust Standard Error Estimation

The approach taken by Conley (1999) and Kelejian and Prucha (2007a) extends the Newey-West class of heteroskedastic-autocorrelation consistent (HAC) covariance matrices developed for time series analysis to dependence between cross-sectional units. Recall the asymptotic covariance matrix of the general method of moments (GMM) estimator (Hansen 1982): $V(\boldsymbol{\beta}_{GMM}) = (\mathbf{M'PM})^{-1}\mathbf{M'P\Psi PM}(\mathbf{M'PM})^{-1}$, $\boldsymbol{\beta}_{GMM} = [\rho, \boldsymbol{\beta}]$. In the case of the spatial lag process model estimated with instrumental variables (SAR-IV, i.e., the GMM estimator), $\mathbf{M} = [\mathbf{W}_1\mathbf{y}, \mathbf{X}]$ (spatially lagged dependent and exogenous variables, respectively), $\mathbf{P} = \mathbf{Q}(\mathbf{Q'Q})^{-1}\mathbf{Q'}$, and $\mathbf{Q} = [\mathbf{X}, \mathbf{W}_1\mathbf{X}, \mathbf{W}_1^2\mathbf{X}]$ (instrumental variables, including the spatially lagged exogenous variables with higher-order lags, respectively). $\boldsymbol{\Psi}$ is a relational matrix that generates weighted averages of the cross-products of residuals based on a nonparametric kernel density estimator $K(d_{ij}/d_{max})$ that determines cross-product pairs (i, j) over a certain distance (d_{max}) at a decaying rate. The individual elements of this matrix are $\psi_{kl} = \sum_i \sum_j K\left(d_{ij}/d_{max}\right)\varepsilon_i\varepsilon_j$, where $K(d_{ij}/d_{max})$ is a bounded, symmetric, real, and continuous function that integrates to one. Typical candidate functions include Parzen, Bartlett, Epanechnikov, or tri-weight kernels. Our application uses the Barlett kernel: $[K(d_{ij}/d_{max}) = (1 - |d_{ij}/d_{max}|)]$.[4] When $K(d_{ij}/d_{max}) = 0$ for all $d_{ij} > d_{max}$, and $K(d_{ij}/d_{max}) = 1$ for $d_{ij} = 0$.

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[2]In the case of the lag model, the relationship between $\mathbf{W}_1\mathbf{y}$ and $\mathbf{y}$ is usually much clearer. Hypotheses about how agents or spatial units react to and interact with one another can be guided by the choice of elements in $\mathbf{W}_1$ (e.g., Bao, Henry, and Barkley 2004; Aten 1997; Fingleton 2007).
[3]In many empirical studies, the spatial autoregressive parameter (λ) is considered a nuisance parameter, suggesting that the main advantage gained from estimating it is one of efficiency rather than theoretically informed information. In other studies, researchers assume that the error parameter explains some unobservable pattern of "knowledge spillovers" due to heterogeneity across spatial units (e.g., Cohen and Paul 1995). Since it is difficult to separate measurement error (which may cause spatial error autocorrelation) from potentially interesting economic information stemming from so-called "knowledge spillovers," we assume the former interpretation of the parameter.
[4]Experimentation with alternative kernel structures yielded no inferential differences.

The kernel applied in this analysis is adaptive because d_{max} is allowed to vary at each cross-sectional unit (c.f., Anselin and Lozano-Gracia 2007; Kelejian and Prucha 2007a). This contrasts to other studies that set d_{max} to some prespecified distance as a cutoff point (e.g., Rappaport 2003). For every observation *i*, the vector of distances between *i* and all other observations is sorted in ascending order. The number of neighbors surrounding *i* is determined by an adjacency matrix identifying the neighbors of county *i*. This value is used as a cutoff point in the sorted distance vector to select d_{max}, the last distance entry in the truncated vector corresponding with spatial unit *i*. The mechanism permits $K(d_{ij}/d_{max})$ to expand or contract across cross-sectional units, conditional on the number of neighbors surrounding a given county and thereby reweighting residual cross-products according to a localized neighborhood structure. The weights attributed to counties not adjacent to county *i* are zero. In this study, the road distance (in miles) between county seats was used as the inter-county distance measure.

3.2 Forecasting Job Growth with the Spatial Lag Model

Generating spatial predictions of economic growth using statistical results may supplement a broader set of tools policy makers use to gauge the impact of development strategies on their local economies relative to their neighbors. As sensitivity analysis, we forecast the county-level change in employment growth across a rural-urban classification system using the predicted values generated by the spatial lag model following a net increase of 500 in-migrants in the 55- to 69-year cohort. We use an unbiased and efficient predictor of the spatial lag model in the simulation (Kelejian and Prucha 2007b). The estimator is efficient because it incorporates information about the correlation between the spatially lagged dependent variable and the error term. In their study, Kelejian and Prucha (2007b) found that the "intuitive predictors" commonly used in the literature, $\hat{\mathbf{y}} = (\mathbf{I} - \hat{\rho}\mathbf{W}_1)^{-1}\mathbf{X}\hat{\boldsymbol{\beta}}$ and $\mathbf{y} = \hat{\rho}\mathbf{W}_1\mathbf{y} + \mathbf{X}\hat{\boldsymbol{\beta}}$, were suboptimal predictors in terms of bias and mean squared error loss because they omit information about correlations between the lagged dependent variable and the error terms. A spatial predictor that includes information about correlation between the spatially lagged variable and the disturbance terms is (Kelejian and Prucha 2007b),

(2a) $$\hat{y}_i = \mathbf{m}_i'\hat{\boldsymbol{\beta}}_{GMM} + \frac{\operatorname{cov}(\varepsilon_i, w_{i.}y)}{\operatorname{var}(w_{i.}y)} w_{i.}\left[\mathbf{y} - (\mathbf{I} - \hat{\rho}\mathbf{W}_1)^{-1}\mathbf{X}\hat{\boldsymbol{\beta}}\right]$$ ($i.$ the *i*th row of $\mathbf{W}_1$),

(2b) $$\operatorname{cov}(\varepsilon_i, w_{i.}y) = \hat{\sigma}_\varepsilon^2 \boldsymbol{\iota}'(\mathbf{I} - \hat{\rho}\mathbf{W}_1')^{-1} w_{i.}$$ ($\boldsymbol{\iota}$ an *n* by 1 vector with a 1 selecting observation *i*, zeros everywhere else; and $\hat{\sigma}_\varepsilon^2 = n^{-1}\hat{\boldsymbol{\varepsilon}}'\hat{\boldsymbol{\varepsilon}}$),

(2c) $$\operatorname{var}(w_{i.}y) = \hat{\sigma}_\varepsilon^2 w_{i.}(\mathbf{I} - \hat{\rho}\mathbf{W}_1)^{-1}(\mathbf{I} - \hat{\rho}\mathbf{W}_1')^{-1} w_{i.}'.$$ [5]

[5]The SARAR(1,1) process would have $\operatorname{cov}(\varepsilon_i, w_{i.}y) = \operatorname{cov}(u_i, w_{i.}y)$. In any case, the covariance term is zero only when $\rho = \lambda = 0$ (Kelejian and Prucha 2007b).

Using the econometric results, employment growth is forecasted following an increase of 500 arrivals of the 55–69 migrating cohort; $\Delta{*}MIG^{55\text{-}69} = \ln[(\text{Arriving}^{55\text{-}69} + 500)/\text{Leaving}^{55\text{-}69}]$, and then compared to baseline job growth predictions. Results are compared across an urban-rural classification system that integrates the Office of Management and Budget's (OMB)[6] metropolitan/nonmetropolitan classification system with Isserman's (2005) rural-urban density classification system. The system suggested by Isserman is easily integrated into the OMB urban-core/nonmetropolitan taxonomy. Combining these systems separates counties as "urban" and "rural" based on population density and settlement patterns as well as how these counties are economically linked to urban core economies. An advantage of the approach is that it appreciates the blending of urban and rural populations in a county, the presence of urban people and places in nonmetropolitan counties and the presence of rural people and places in metropolitan counties, and the concept of linkages of counties to hierarchical urban core economies.[7] In other words, Isserman's classification method provides nuance to the more rigid metro/nonmetro county dichotomy. The estimated regression parameters are used in this simulation, and the predicted values are estimated by equation 4.

3.3 Estimating Quantile Effects of Migrating Seniors on Job Growth

Quantile regression was used to test whether the mean marginal effects of migrating seniors on job growth were tenable across the entire distribution of counties. The null hypothesis is that the mean value of the coefficients (reported in Table 3) are not different from the parameters estimated at different locations across the distribution of employment growth across counties. The usual SAR-IV regression was applied in this context by estimating the predicted values of the spatial lag variable and then including these predicted values in a second-stage quantile regression. The standard errors of the quantile regressions were estimated using a bootstrap procedure (1,000 replications).[8]

4. MEASUREMENT VARIABLES, DATA SOURCES, AND DATA LIMITATIONS

The job and business establishment growth models are:

(3) $\Delta J_{2000\text{-}2004} = f(W\Delta J_{2000\text{-}2004}, \Delta J_{1990\text{-}2000}, \Delta MIG_{1995\text{-}2000}, ES_{2000}, S_{2000}, DC_{2000}, LM_{2000}, CS_{2000}, A_{2000}),$

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[6]www.census.gov/population/www/estimates/00-32997.pdf.

[7]Based on Isserman's taxonomy, rural counties are those counties with a population density of less than 5,000 persons per square mile and less than 10 percent of the population living in urban centers with populations less than 10,000 persons. Urban counties are those with 500 or more persons per square mile, an urban population of more than 90 percent, and a total urban population of more than 50,000. Mixed urban and mixed rural counties are those that do not fall into these categories and are differentiated by a population density criteria (< 320 persons per square mile for mixed rural, > 320 persons per square mile for mixed urban).

[8]The SAS software was used in the regression analyses.

(4) $\Delta B_{2000\text{-}2004} = f(W\Delta B_{2000\text{-}2004}, \Delta B_{1990\text{-}2000}, \Delta MIG_{1995\text{-}2000}, ES_{2000}, S_{2000}, DC_{2000}, LM_{2000}, CS_{2000}, A_{2000})$.

where ΔJ (ΔB) is the natural log ratio of employment (business establishments) in 2004 over employment (business establishments) in 2000; WΔJ (WΔB) the spatial lag of job (business) growth; ΔMIG is the natural log ratio of arriving over exiting migrants for the 25–39, 40–55, 55–69, and 70+ age cohorts; ES are economic structural variables, including the lagged adjustment variables; S are settlement characteristics; A are physical and natural amenities; DC are demographic characteristics; CS is proxy community structure; and LM are labor market indicators. Equations (3) and (4) are log-log linear models. Change in the total number of establishments comes from County Business Patterns (CBP). Change in the number of jobs is from the BEA REIS data files (Table 1).

State fixed effects are included to control for unobserved heterogeneity shared by counties located in the same state. The state fixed effects were constrained as $\Sigma_{States} d_{State} = 0$. Therefore, *t* tests on the coefficients report differences from the overall average growth of the sample rather than a particular reference group (Neter et al. 1996). Metropolitan and nonmetropolitan counties are identified using the OMB classification scheme. While any definition of "metro" versus "nonmetro" is arbitrary, these categories retain information about intercounty dependency in particular and broader, regional economic linkages in general.

4.1 Migration Cohorts: 25–39, 40–54, 55–69, 70 and Above

The natural log of the ratio of In-to and Out-of county migration patterns between 1995 and 2000 was used to measure the impact of migration by age cohort on employment and business growth between 2000 and 2004. Specifically, four migration cohorts were constructed to test the effects of migrating individuals on employment and business establishment growth: 25–39, 40–54, 55–69, and 70+ year groups (Figure 1). Age cohorts were interacted with a dummy variable indicating whether a county was classified as a metropolitan or nonmetropolitan county according to the OMB metro/ nonmetropolitan definition.

Changes in net migration between 1995 and 2000 for the four migrating age cohorts were calculated using data from the 2000 decennial U.S. Census (Figure 1). A significantly higher percentage of metropolitan counties had positive net migration ("net inflow") for the 25–39 and 70+ age cohorts, while the reverse was true for the 55–69 age cohort, with more nonmetropolitan counties having net inflow than metropolitan counties (Table 2). Conversely, net outflow, or counties where more individuals in the cohort migrated out than migrated in, was more common in nonmetropolitan counties for the 25–39 and 70+ cohorts, while the opposite was true for the 55–69 cohort.

Metropolitan counties experienced greater employment growth and saw more new business establishments than nonmetropolitan counties from 1990 to 2000. Between 2000 and 2004, changes in both employment growth and business establishments followed the

TABLE 1

Summary Statistics of Study Measures for Metropolitan and Nonmetropolitan Counties

	Nonmetropolitan			Metropolitan		
Variable	Mean		S.E.	Mean	S.E.	Source
Migrating Cohorts						
Ln (In-migrants/Out-migrants), 25-39	0.063	*	0.014	0.225	0.020	U.S. Census, 2000
Ln (In-migrants/Out-migrants), 40-54	0.213	*	0.015	0.288	0.020	U.S. Census, 2000
Ln (In-migrants/Out-migrants), 55-69	0.437	*	0.019	0.326	0.025	U.S. Census, 2000
Ln (In-migrants/Out-migrants), 70+	-0.053	*	0.025	0.131	0.029	U.S. Census, 2000
Control Variables						
Settlement						
Ln Population Density, 2000	3.739	*	0.026	4.819	0.057	ARF, 2005
% Commuting Workers, 2000	0.042		0.003	0.049	0.004	ARF, 2005
Economic Structure						
Ln Employment, 2004/Employment, 2000	0.997	*	0.003	1.050	0.005	REIS, BEA, 2004
Ln Employment Density, 2000	2.940	*	0.031	4.045	0.069	REIS, BEA, 2004
Ln Employment, 1990–2000	4.755	*	0.005	4.821	0.023	REIS, BEA, 2004
Ln Establishments, 2004/Establishments, 2000	0.007	*	0.004	0.054	0.004	CBP, 2004, 2000
Ln Establishment Density, 2000	-0.212	*	0.031	0.867	0.069	CBP, 2000
Ln Establishments, 1990–2000	0.106	*	0.005	0.234	0.010	CBP, 1990, 2000
Employment Index, 2000	0.121	*	0.002	0.134	0.002	REIS, BEA, 2004
% Small Business Establishments, 2000	0.775	*	0.002	0.753	0.003	U.S. Census, 1998
% Land is Farmland, 1997	0.407		0.009	0.401	0.011	Ag. Census, 1997
Demographic Structure						
Ethnic Diversity (Index), 2000	0.735		0.007	0.717	0.009	ARF, 2005
% Population Above 65, 1999	0.145	*	0.001	0.116	0.001	ARF, 2005
Labor Market						
Ln Per Capita Income, 2000	9.874	*	0.006	10.067	0.010	ARF, 2005
% Population with HS Diploma, 2000	0.686	*	0.003	0.759	0.004	ARF, 2005
% Unemployed	0.061	*	0.001	0.041	0.001	ARF, 2005

	Nonmetropolitan			Metropolitan		
	Mean		S.E.	Mean	S.E.	Source
Community Governance and Fiscal Policy						
Ln Per Capita Special Govt., 1997	-9.375	*	0.138	-10.832	0.216	U.S. Census, 1998
Total Levied Property Taxes/Total County Expenditures, 1997	0.187	*	0.003	0.226	0.005	U.S. Census, 1997
Physical and Natural Amenities						
Ln Road Density	0.457	*	0.005	0.596	0.013	ESRI
Ln Per Capita Municipal Govt., 1997	-8.778	*	0.064	-10.199	0.164	U.S. Census, 1998
Natural Amenity Index	-0.085		0.046	-0.042	0.052	USDA–ERS
Distance (Miles) to Nearest Metro County	44.371		0.887	—	—	ESRI

Notes: ARF, Area Resource Files (www.arfsys.com); REIS, Regional Economic Information System (www.bea.gov/regional/docs/reis2005dvd.cfm); ESRI, Environmental Systems Research Institute; BEA, Bureau of Economic Analysis (www.bea.gov); CBP, County Business Patterns (www.census.gov/epcd/cbp/view/cbpview.html); *, metropolitan and non-metropolitan measure are significantly different at the 10% level (t-test).

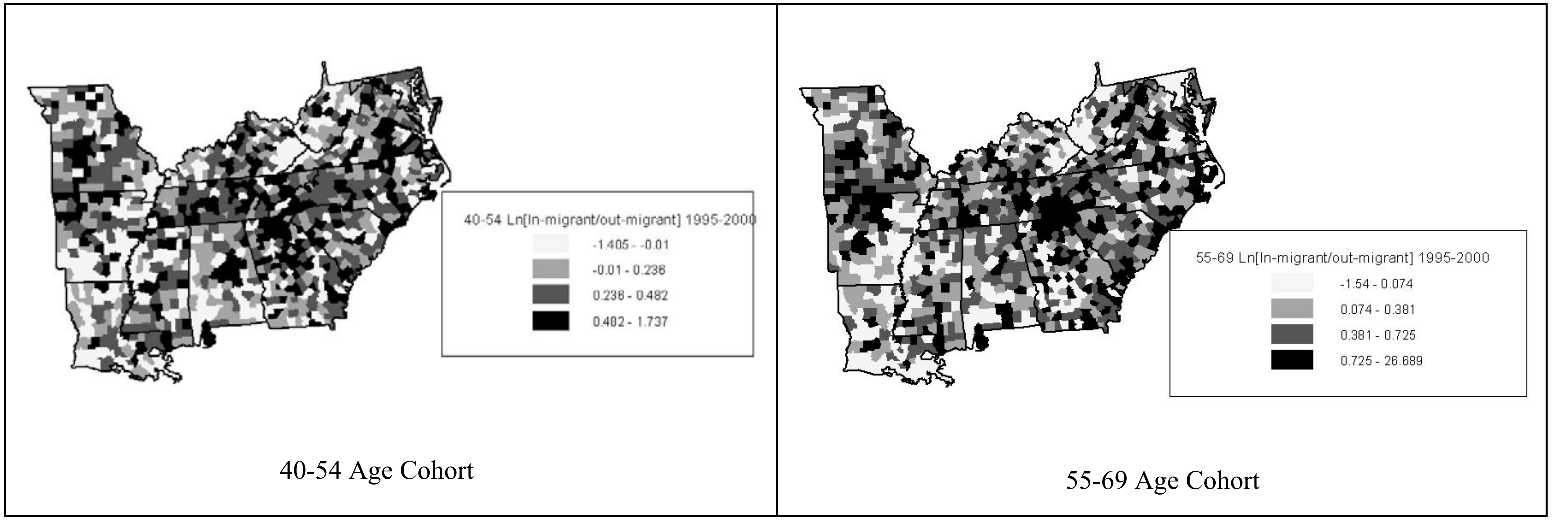

FIGURE 1. Distribution of Ln[In-Migrants/Out-Migrants] from 1995 to 2000

TABLE 2

Percent of Metropolitan and Nonmetropolitan Counties in the Southeast with Net Inflow or Net Outflow Among the 25–39, 40–54, 55–69, and 70+ Age Cohorts, 1995 - 2000

	Net Inflow				Net Outflow			
Cohort	Metro	Nonmetro	t test		Metro	Nonmetro	t test	
25 - 39	73%	58%	-3.46	*	27%	42%	3.42	*
40 - 54	78%	73%	-1.24		22%	27%	1.20	
55 - 69	75%	83%	1.94	*	25%	17%	-2.02	*
70 +	64%	47%	-3.86	*	35%	53%	3.90	*

Notes: *, differences between nonmetropolitan and metropolitan county percents are significant at the 10% level. Sample size for metropolitan counties is 405; sample size for nonmetropolitan counties is 668

same pattern but exhibited more tempered changes. Correspondingly, employment and establishment density were significantly higher in metropolitan counties.[9]

We hypothesize that the impact of the age cohorts on job growth will vary depending on the specific cohort and the levels of growth characterizing urban core counties and noncore counties. For example, all else equal, it is hypothesized that members of the 40–54 cohort will have the largest impact on economic growth because (1) they command relatively higher wages than other cohorts due to their accumulated human capital and (2) they are more likely to have children. In contrast, on average, members of the 25–39 cohort are more likely to earn relatively lower wages and occupy entry-level jobs. Workers with such credentials are attractive to firms looking to minimize training costs and retain their human capital investment while hoping to expand or further develop markets in new locations. In addition, the nonmetropolitan category is quite broad and includes communities adjacent to metropolitan-urban centers. Individuals in this cohort may be relocating to nonmetropolitan counties that are in close proximity to their work. Growth of these so-called "bedroom" communities on the urban fringe stimulates local demand for retail goods and services. In locations already experiencing growth momentum, the marginal impact of this group on job growth may be greater in places where economic growth is expected to be relatively faster than other areas. Such a relationship between economic growth and in-migration of this cohort is similar to the Fujita, Krugman, and Venables (1999) notion of increasing returns to scale economies.

The migrating senior populations are represented by the 55–69 and 70+ age cohorts. The profile of the 55–69 cohort suggests that a net migration increase of this cohort would have different effects on economic growth. The 55–69 migrating cohort has relatively more accumulated wealth than younger cohorts and is more likely to purchase new homes or durable goods, spend savings or fixed incomes on services and retail goods, but

[9]REIS, BEA, 2004 and CBP, 2000

overall contribute less to local labor supply and productive capacity. The positive net migration of the 55–69 cohort is expected to boost employment growth in succeeding time periods as the regional economy adjusts to the influx of new residents. On the one hand, migrating seniors may play an active role in small-business generation and job creation, particularly when one considers that those seniors who migrate are likely to be wealthier than those who do not (Serow 2003) or may have experience in managing businesses. On the other hand, the cohort is also easing out of the workforce. The composition of retail goods and services demanded by this cohort is also expected to be different from the 40–55 cohort. First, household size of the 55–69 cohort is likely smaller than the 40–54 age cohort. Second, holding other factors constant, an entirely different array of health care services is demanded by this cohort than younger cohorts. Unfortunately, the data set does not allow us to test these details. But while we might expect that in-migration of this cohort will be positively associated with economic growth measures, the effect may be heterogeneous across economies growing at different rates. We test this hypothesis using quantile regression.

4.2 Economic Structure Variables

A diversified industry base and work force increases the likelihood of acquiring workers with the necessary skill sets to fill positions at all levels of production. In addition, a workforce with diverse skill sets may provide some flexibility with respect to the pace and direction of business growth. Galston and Baehler (1995) hypothesized that communities with higher levels of occupational diversity will be more capable of successfully responding to economic shocks or declines. A Herfindahl index was constructed to measure job concentration across economic sectors based on BEA 2000 employment data. The measure was calculated as $\Sigma_k s_{ki}^2$, where s_{ki} are the shares of workers employed in the agriculture; forestry and mining; wholesale; retail; service; finance, insurance, real estate; and manufacturing sectors in a county. Complete specialization in a single sector would yield an index value of 1, while uniform distribution of employment across all sectors would yield a value of 0.1111 (i.e., 1/9). Thus, the Herfindahl index is expected to be negatively correlated with job and business growth, assuming *a priori* that occupational diversity is correlated with economic growth.

Entrepreneurs stimulate economic growth (Low, Henderson, and Weiler 2005; Monchuk et al. 2007), and most new jobs are created by small firms (Edmiston 2007). The prevalence of small businesses may also signal favorable business environments to entrepreneurs because most of these firms are locally owned. Thus, the percentage of businesses with less than 10 employees is expected to be positively correlated with employment growth. However, with respect to business establishment growth, counties with relatively more small business may be at a disadvantage with respect to attracting additional establishments because existing business establishments may signal entry barriers to new entrants (McAffee 2004).

All else equal, counties where agriculture plays an important role in local economies tend to have more land in agricultural production. The percent of land in agricultural production was used to measure the relationship between employment and business establishment growth in counties where agriculture is a relatively important economic sector.

4.3 Settlement Patterns

The percent of workers commuting to other counties, employment density, and population density measured in 2000 control for settlement patterns.[10] Employment (jobs in 2000 divided by county mi^2) and business establishment density (total business establishments in 2000 divided by county mi^2) are lagged variables that measure the influence of settlement patterns as well as the adjustment process towards equilibrium. Population density measured in 2000 is an adjustment variable in both models. Assuming *a priori* that growth will be slower in counties with relatively higher employment density, lagged employment and business establishment density should be negatively correlated with employment and business establishment growth. On the other hand, consistent with previous population-employment growth models, the expected relationship between initial levels of population density on employment (business establishment) growth is positive. The percent of workers commuting to other counties is a second measure of settlement patterns.

4.4 Demographic Structure

The Alessina and Ferrara (2004) ethnicity index measures the effects of ethnic diversity on employment growth. Their measure is constructed as one less the sum of the squared shares of races, but the sum of the squared shares is used here (whites, blacks, Hispanics, Asians, Native Americans, and others). An index value of one indicates a completely homogenous population while an index value of 0.166 indicates the maximum diversity in a population, given the U.S. census categories. The proportion of the population over 65 in 1999 was included in the growth models. There are no *a priori* expectations regarding the relationship between this measure and employment or business establishment growth. In the past, this measure might reflect a history of population decline (McGranahan 1999). However, many rural counties have become magnets for some retirees, so a high proportion of the population at the official retirement age may reflect county attractiveness to this age group.

4.5 Labor Markets

Labor market characteristics – as reflected by the unemployment rate, per capita income, and the proportion of the population with high school diplomas – are from the 2005 Area Resource Files.[11] Counties with higher per capita incomes may be attractive to labor, but the relationship is ambiguous with respect to potential employers. Higher levels of per capita income are correlated with high wages, which may be unattractive for some

[10] Area Resource Files, 2005, www.arfsys.com
[11] www.arfsys.com

employers. On the other hand, higher per capita income may signal potential demand markets, which would be attractive to retail and service businesses. Counties with higher unemployment rates may be attractive to firms, signalling an available labor pool. The proportion of the population with a high school diploma reflects human capital potential and, in urban analysis, has been linked to economic growth.

4.6 Community Governance and Fiscal Policy

Local governance structure and organization may influence employment or business establishment growth (Carruthers and Vias 2005). Municipal governments facilitate development of urban amenities, including public utilities. The per capita number of municipal government districts in a county was used to measure this relationship.[12] Higher taxes may negatively influence the decisions to relocate and pursue a new career. But higher spending by local governments may have the opposite effect. The county-level taxes over total county expenditures are included in the growth equations to control for local government spending-earning patterns.[13]

4.7 Physical and Natural Amenities

Previous studies suggest that spending on roadways may promote employment decentralization by increasing inter-county commuting (Haughwout 1999). Road networks may also have a positive effect on business location that ultimately impacts job growth. The cumulative state and federal highway miles in a county (ESRI) were normalized by county size to measure the influence of accessibility conferred by road networks on changes in job and business establishment growth. In addition to road network density, the distance between nonmetropolitan counties and the nearest metropolitan county (ESRI) was included in the growth equations to control for affects related to urban core accessibility (e.g., Partridge et al. 2007).[14]

Abundance in natural resources, scenic vistas or waterways, and mild climate are important determinants in the decision to relocate (Rapusingha and Goetz 2004; McGranahan 1999). Deller et al. (2001) found that rural areas endowed with relatively more natural amenities experienced higher rates of economic growth. The Economic Research Service's natural amenity index was used to measure the effects of a county's natural resource endowments and climatic attributes on job growth. The amenity index is expected to correlate with economic growth as job-seekers or new businesses are drawn to scenic places.

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[12]Census of Governments, 1997
[13]Census of Governments, 1997
[14]Following Partridge et al. (2007), we included additional distance measures between noncore to micropolitan and metropolitan counties, and micropolitan to metropolitan counties to control for urban hierarchical effects on growth. These variables were redundant with respect to job and business establishment growth during the study period and were omitted.

5. RESULTS AND DISCUSSION

The employment and business establishment growth models explained 30 and 34 percent of the variation in the data, respectively (Table 3). The significance of the spatial lag coefficients suggest clustering of job and business establishment growth across the region. Counties with relatively higher job or business growth rates are dependent upon surrounding counties with similar growth rates. First, the relationships between the adjustment and control variables and the growth measures are briefly summarized. Many of the results are consistent with previous regional growth analyses and are not discussed in detail. More attention is given to the effects of migrating seniors on employment and business establishment growth.

5.1 Adjustment and Control Variables

Lagged population density was positively associated with job and business growth (Table 3). Lagged employment (business establishment) density was negatively related with job (business establishment) growth, which is consistent with a growth trajectory towards an equilibrium level (Carruthers and Mulligan 2007). Employment growth (2000–2004) was not correlated with lagged employment growth (1990–2000), suggesting a slow down in job growth momentum in the early years of the decade; but business creation (2000–2004) was positively correlated with lagged business growth (1990–2000). Job growth was slower in counties where employment was more concentrated, suggesting that industry diversification was associated with job growth. This result may be consistent with firms' refocusing their production objectives away from commodities to specialized markets, the rise of the service industry, and the growth of other sectors such as real estate, recreation, and tourism. On the other hand, counties with relatively more small business establishments in 2000 were less likely to experience continued business expansion from 2000–2004, suggesting the presence of structural and strategic barriers to entry into new or existing markets due to incumbent businesses (McAfee 2004).

Demographic and community structure variables were not important with respect to explaining job and business establishment growth, except for the percent of the population 65 or above in 1999. Counties where a larger percentage of the population was older than 65 experienced job growth decline between 2000 and 2004. It is important to distinguish this variable (a level measure) from the 55–69 cohort migration variable, which measures a proportional change over time with respect to a specific cohort (discussed below). This result may be picking up the effects of out-migration of younger persons seeking job opportunities in other counties, thereby shifting demographic structure towards an older population, holding other factors constant (McGranahan and Sullivan 2005).

Per capita income was positively associated with employment growth, suggesting that labor is attracted to relatively affluent counties. Educational attainment was positively related with employment and business establishment growth, suggesting that

TABLE 3

Regression Coefficients for Job and Business Growth, 2000–2004

Variable	Job Growth	Business Growth
Migrating Cohorts		
Ln (In-Migrants/Out-Migrants), 25-39	-0.0206*	0.0025
Ln (In-Migrants/Out-Migrants), 40-54	0.0322**	-0.0046
Ln (In-Migrants/Out-Migrants), 55-69	0.0181**	0.0142*
Ln (In-Migrants/Out-Migrants), 70+	-0.0060	0.0087*
Metro Counties (1 = Yes)	-0.0025	-0.0150
Metro × Ln (In-Migrants/Out-Migrants), 25-39	-0.0140	0.0138
Metro × Ln (In-Migrants/Out-Migrants), 40-54	0.0769**	0.0574**
Metro × Ln (In-Migrants/Out-Migrants), 55-69	-0.0312	0.0036
Metro × Ln (In-Migrants/Out-Migrants), 70+	0.0118	-0.0129
Control Variables		
Settlement		
Ln Population Density, 2000	0.0841***	0.0354**
% Commuting Workers, 2000	0.1618*	0.0151
Economic Structure		
Ln Employment Density, 2000	-0.0709***	
Ln Employment, 1990-2000	0.0110	
Ln Establishment Density, 2000		-0.0340**
Ln Establishments, 1990-2000		0.0723**
Employment Index, 2000	-0.1499**	0.0350
% Small Business Establishments, 2000	0.0873	-0.2214**
% Land is Farmland, 1997	0.0045	-0.0121
Demographic Structure		
Ethnic Diversity (Index), 2000	0.0138	0.0089
% Population Above 65, 1999	-0.4176***	-0.0984
Labor Market		
Ln Per Capita Income, 2000	0.0799**	0.0378
% Population with HS Diploma, 2000	0.1951***	0.2042***
% Unemployed	0.1868	-0.2432
Community Governance and Fiscal Policy		
Ln Per Capita Special Govt., 1997	0.0004	-0.0001
Total Levied Property Taxes/Total County Expenditures, 1997	0.0548	0.0136
Physical and Natural Amenities		
Ln Road Density	-0.0183	-0.0176
Ln Per Capita Municipal Govt., 1997	-0.0023	-0.0033***
Natural Amenity Index	0.0051**	0.0070***
Distance (Miles) to Nearest Metro County	0.0001	0.0002
State Fixed Effects		
Alabama	0.0052	-0.0215**
Arkansas	0.0030	-0.0152*
Georgia	0.0060	0.0080
Kentucky	-0.0004	-0.0017
Louisiana	0.0165	0.0028

	Job Growth	Business Growth
State Fixed Effects (Continued)		
Maryland	0.0202**	0.0284***
Mississippi	-0.0095	-0.0177
Missouri	-0.0011	0.0677***
North Carolina	-0.0099	-0.0108
South Carolina	-0.0334***	-0.0193*
Tennessee	-0.0004	-0.0289***
Virginia	-0.0154	0.0135
Spatial Lag	0.2061**	0.1840**
Constant	-0.3476	-0.5009*
Adjusted R^2	0.3000	0.3400

Notes: *, **, *** significant at the 10%, 5%, and 1% levels, respectively

employers and new businesses place a premium on the availability of a trainable or skilled workforce.

Consistent with previous growth studies (e.g., Cromartie 2001; Deller et al. 2001), counties endowed with natural amenities experienced job and business growth between 2000 and 2004. Physical amenities and other public services were not associated with job or business establishment growth during the study period. The per capita number of municipal governments was negatively associated with business establishment growth, suggesting that new business start-ups may be averse to counties with relatively more governing institutions per capita.

5.2 Migration Cohort Effects on Job and Business Establishment Growth

Jobs and businesses grew in nonmetropolitan counties where more 55- to 69-year-olds arrived relative to those leaving (Table 3). In metropolitan counties, inflow-outflow changes in this cohort were not different from nonmetropolitan counties. Net migration in the 25–39 age cohort was negatively associated with job growth in nonmetropolitan counties. Neither of these outcome variables was associated with net migration of this cohort for metropolitan counties. Jobs increased in counties where there was positive net migration of persons aged 45 to 54, and the effect was stronger in metropolitan than in nonmetropolitan counties. Business establishment growth was associated with positive net migration of this cohort in metropolitan counties, but the effect was not significant in nonmetropolitan counties. Business establishment growth was also associated with net migration of the 70+ cohort.

5.2.1 Quantile Regression Sensitivity Analysis

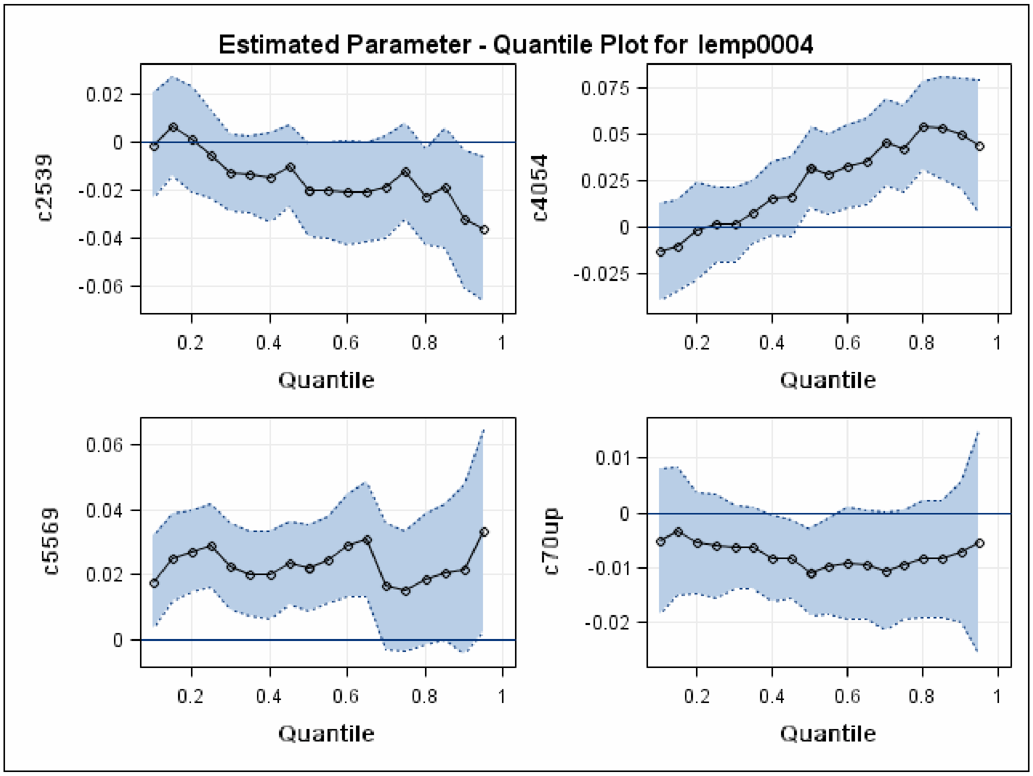
In nonmetropolitan counties, the mean elasticity of job growth with respect to an increase in net migration of the age 55–69 cohort was 0.02 percent (Table 3). The null hypothesis that this value was homogenous across the distribution of job growth could not be rejected (Figure 2). The effect of migrating 55- to 69-year-olds appears to be constant where 2000–2004 job growth in counties was below the 70th percentile. In counties where job growth was above the 75th percentile, the relationship between migrating 55- to 69-year-olds and job growth appears to be unrelated. The cutoff point corresponds with a job growth rate of about 1.03 percent in nonmetropolitan counties. For these counties, other factors were more strongly related with changes in job growth than the net flow of the 55–69 cohort. As suggested by Jacobs (1961), counties with limited access to the physical and cultural amenities provided by the urban core are unlikely to grow rapidly, and the positive impact of attracting the 55–69 cohort is clear. These results suggest that migration of the 55–69 cohort can have a measurable impact in nonmetropolitan counties characterized by slow to moderate job growth, but that in-migration of this cohort is not likely to be the catalyst of rapid growth. This role is reserved for the 40–54 cohort. Below about the 55th percentile, the marginal effects of migration of the 40–54 cohort on job growth are not different than zero, but are positive and significant throughout the top half of the distribution (Figure 2). This cutoff roughly corresponds with the switching point in the distribution where job growth (as opposed to contraction) dominates in nonmetropolitan counties. This pattern suggests that in-migration of the 40–54 cohort is an important contributor to job growth in rapidly-growing nonmetropolitan counties; the faster the growth, the greater the marginal contribution of the cohort. Therefore, the 40–54 job growth phenomena may be a part of a larger urban expansion/ decentralization process, which might clarify policy recommendations geared to recruit seniors.

These results may be encouraging for nonmetropolitan counties considering policies to attract migrating seniors. While attracting seniors is unlikely to contribute much to job growth in nonmetropolitan counties with rapidly expanding economies, it does appear that recruitment of this cohort may have a moderate impact on job growth in counties experiencing slow to moderate job growth in the short run. For nonmetropolitan counties with relatively fast job growth (above the 65th percentile), a retiree recruitment campaign may not be desirable because these counties may be at risk of losing some of the rural characteristics migrating seniors desire, and because even successfully attracting seniors may have little or no marginal impact on job growth.

The relationship between the 70+ migrating cohort and job growth is generally consistent with the mean regression results. The relationship is negative but not significant across the distribution, except around the median point of the distribution. Quantile results corresponding with the relationship between the 25–39 cohort and job growth were consistent with the mean regression models, having no statistical relationship with job growth across the quantiles.

5.2.2 Forecast Simulation of a 500 Person Increase in 55–69 Cohort on Nonmetropolitan Job Growth

A change in job growth following the arrival of 500 more individuals in the 55–69 cohort was simulated. Predicted values were generated using the coefficients from the



Notes: c2539 = the percent change in employment (lemp0004), given a percent change in the natural log of the ratio of in-migrant/out-migrants of age cohort 25–30, etc. The dished lines and shaded lines and shaded areas are 95 percent confidence intervals based on 1,000 bootstrap samples.

FIGURE 2. Quantile Regression Results for Changes in Employment (2000–2004) with Respect to Migration into Nonmetropolitan Counties

employment growth regression (Table 3). The percent changes between the baseline predicted job growth and the simulated change in job growth are compared across an integrated urban-rural classification system suggested by Isserman (2005). The taxonomy combines Isserman's rural-urban density taxonomy with the OMB's nonmetropolitan/metropolitan distinction.

The percent change in job growth in metropolitan counties with strictly urban populations and mixed urban populations was not significant (-0.09 ± 0.10 percent and 0.08 ± 0.13 percent, respectively; mean ± 95 percent confidence interval). The simulated change in jobs was positive in metropolitan counties with population densities less than 320 persons per square mile ("Mixed Rural" metropolitan counties, 0.16 ± 0.06 percent), but negative in metropolitan counties that were sparsely populated (counties with at least 90 percent of the population identified as rural, or urban areas with populations less than 10,000; -0.19 ± 0.10 percent). On average, the changes in job growth following the arrival of 500 members of the 55–69 cohort for nonmetropolitan counties with mixed rural populations and completely rural populations was not significant (-0.04 ± 0.11 percent and 0.03 ± 0.09 percent, respectively).

Comparison of the simulated empirical distributions reveals a more intriguing picture (Figure 3, Table 4). The variability of the simulated change in job growth increases as population density decreases in metropolitan and nonmetropolitan counties.

Adjacency and access to the urban core economy appears to play an important role with respect to job growth response to increases in the 55–69 cohort. The upside variability of the simulated change in job growth increases as population density decreases in the urban core-metropolitan counties. The trend is also apparent in the noncore nonmetropolitan counties. For the least populated counties in the nonmetropolitan cluster ("rural nonmetro"), the downside variability is greatest with respect to job growth, followed by the metropolitan counties with the lowest population densities, then the nonmetropolitan counties with mixed-rural populations. For counties with relatively lower population densities, the downside variability associated with counties in metropolitan core areas with moderately low population densities (< 320 persons per mi^2) is lowest. Job growth response to an additional 500 individuals in the 55–69 cohort is most variable in counties with relatively low population densities located in metropolitan or nonmetropolitan counties as evidenced by the wide tails of the distributions associated with these counties, especially in the positive range of the simulated change.

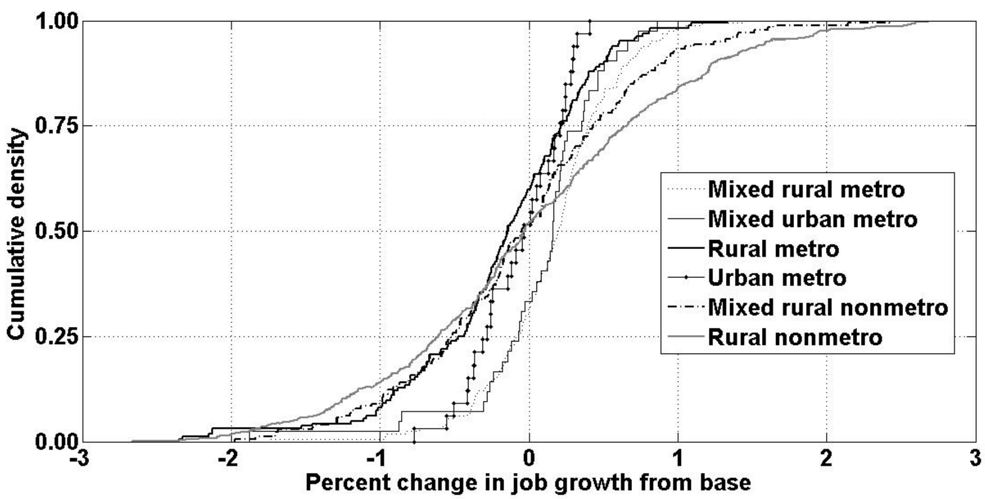


FIGURE 3. Simulated Change in Employment and Business Establish Growth Following an Increase of 500 Members of the 55–69 Cohort Across the Integrated Urban-Rural Density and Metro/Nonmetropolitan Classification

TABLE 4

Distribution Comparison of the Simulated Percent Change in Job Growth Following an Increase of 500 Arrivals of the 55–69 Cohort

	N	Minimum	25th Pctl	50th Pctl	75th Pctl	Maximum	Mean	S.E.*
Metro, Urban	33	-0.768	-0.282	-0.033	0.210	0.407	-0.061	0.052
Metro, Mixed Urban	42	-1.878	-0.067	0.160	0.352	0.863	0.076	0.072
Metro, Mixed Rural	166	-1.743	-0.070	0.200	0.400	1.434	0.160	0.033
Metro, Rural	164	-2.347	-0.454	-0.144	0.216	1.335	-0.190	0.049
Nonmetro, Mixed Rural	178	-1.976	-0.522	-0.049	0.431	2.422	-0.036	0.057
Nonmetro, Rural	490	-2.664	-0.609	-0.033	0.659	3.042	0.026	0.044

Notes: *S.E., standard error

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6. CONCLUSIONS

In this empirical analysis, a reduced-form partial regional adjustment model was used to examine the impact of migrating cohorts on changes in job and business establishment growth in 13 southeastern U.S. states from 2000 to 2004. Specific attention was given to in-migration of the 55–69 age cohort because (1) the southeastern region is a popular retirement location for seniors with the financial means to relocate, and (2) some community planners and policy makers perceive recruiting this age cohort as a way to increase employment and local income through promotion of retirement communities, setting their sights on ways to capitalize on the mounting wave of baby-boomers seeking new retirement destinations in the southeast.

Net migration of the 55–69 cohort between 1995 and 2000 was positively associated with job and business establishment growth in nonmetropolitan counties. Quantile regression sensitivity results suggest that the correlation between job growth and in-migration of this cohort was uniformly positive in nonmetropolitan counties where job growth was low to moderate, but not significant in nonmetropolitan counties where job growth was highest. The change in job growth, given an increase in the number of in-migrating 55- to 69-year-olds was forecasted across counties in the southeastern states. A comparison of the distributions revealed that the pay-off in terms of job growth could be relatively large (a 1 – 3 percent increase in jobs) in counties with relatively low population densities and access to urban centers, and in noncore counties with relatively low or very low population densities. However, there was a considerable amount of variability associated with these pay-offs, suggesting that decision makers considering senior recruitment as a job development strategy might consider senior recruitment as a component of a broader package of economic development strategies.

The results of the simulation are only suggestive, but have some implications with respect to retiree recruitment as a means of simulating aggregate job growth. As with any development initiative, some strategies are "better fits" for certain communities than others. While the pay-offs may be high for nonmetropolitan counties (e.g., 2.4 to 3.0 percent increases in aggregate job growth), there are certainly risks associated with recruitment campaigns as evidenced by the downside variability in the simulated distributions (as much as a 2.7 percent decrease in some cases). For the most part, the probability of larger pay-offs coincide with counties with moderate population densities and access to urban centers. These findings largely agree with Jacob's (1961) notion that rural areas are more likely to experience economic growth when they are integrated into an urban economy and that job growth rates tend to be higher in counties closer to the upper tiers of the urban hierarchy (Partridge et al. 2007). On the other hand, it seems apparent that very remote rural counties have the potential to be the biggest winners with respect to recruiting seniors. But, like their more densely populated cousins in the urban-rural hinterland, there may be more risk associated with senior recruitment campaigns.

This study is not without limitations. Further research could look at growth at two-digit NAICS levels. This would allow comparison of economic growth at the sector level as a function of migrating seniors. However, due to disclosure issues, this type of data is not readily available.[15] In addition, the regional adjustment models and variants of the general form remain the workhorses of understanding job growth and population dynamics, and their use continues in many empirical studies. But alternative econometric approaches could be modified to address the empirical questions asked here. One approach includes structural vector autoregression (SVAR) models (Partridge and Rickman 2003, 2006). The advantage of the SVAR approach is that theoretically informed restrictions corresponding with economic growth theory can be imposed and directly tested in the econometric model, making it easier to parse correlation from causation. However, appropriately modeling spatial interaction or dependence remains a challenge in the SVAR approach. Incorporating such interactions between spatial units may uncover important information about broader regional linkages and spatial externalities influencing local growth over time. Lastly, given data limitations, our conclusions about the economic impact of migrating 55–69 or 70+ persons are limited to discussion about the cohort as a whole and may or may not include individuals who would categorize themselves as retirees.

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[15]Isserman (2006) suggested a method whereby employment levels can be computed using a back-calculating method. The Economics Research Service also has access to an enhanced county business pattern data set, but the information is proprietary.

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