# EMPLOYMENT GROWTH IN THE RURAL SOUTH: DO SECTORS MATTER?

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## I. INTRODUCTION

Over the last twenty-five years, several changes have taken place in the US rural employment dynamics. These changes have been brought about by changes in the country's economy as a whole and also within states. The changes are part of on-going economic restructuring that has transformed the economic landscape in the US since the early 1980s (Blair and Premus, 1987; Carlino, and Mills, 1987.). Rural economic structure has gone through significant changes and traditional goods producing sectors are giving way to service producing sectors (Deller et al, 2001; Morris and Western 1999; Kassab and Luloff 1993; Glasmeier, and Howland, 1994.). New and distinct set of service activities-producer services that exemplify current configurations, the expansion of labor, and regional development have come up. Technological advancement, government regulations and other key factors also account for some of these changes (Deller et al, 2001; Gardner, 2003; Monchuk et al., 2005; Bartik, 2005; England and Brown 2003; Goe et al. 2003).

Nevertheless, the economic restructuring has resulted in different scenarios in the rural south; with some counties—especially metropolitan counties—performing better than others—particularly rural counties (Henry, Barkley and Bao, 1997; Deller et al, 2001; Falk et al. 2003). Excelling counties have recorded high economic growth as manifested in the many foreign investors who have set their national base within the region since 1990. Residents of these areas are perceived to enjoy better labor participation among other economic benefits. The disparity between rural and urban economic opportunities has helped precipitate a drain on the rural workforce as an increasing number of people commute or migrate in pursuit of higher-quality,

better-paying jobs (Greenwood, 1985). The resulting loss of young people portends further economic decline and marginalization for rural areas.

While several studies have highlighted the importance of income and population in rural development, this paper focuses on rural employment growth. The analysis contributes to the understanding of the role of economic sectors in employment growth processes across rural counties in the southeast U.S. The specific objective is to examine the extent to which sectoral employment influence employment development in the rural southeast U.S.

The first step to understanding the importance of the different industrial sectors is to examine employment growth trends, since even within slowly growing economies, important structural shifts occur over time. These shifts often result from regional and even nationwide changes in production, consumption and technology. Analyzing these shifts can help identify prospects for future growth within the region. As shown in Table 1, there are distinctive structural shifts in the historical employment figures across the eight broad industries in the Southeast U.S. over the periods 1970, 1980, 1990 and 2000.

Table1: Southeast Region Employment and Growth, 1970-2000

| Sectors | Employment in the Region | | | | Average Annual Growth Rate |
|---|---|---|---|---|---|
| | 1970 | 1980 | 1990 | 2000 | |
| Agriculture | 77,836 | 141,890 | 216,612 | 330,602 | 4.82% |
| Service | 1,968,008 | 2,810,256 | 4,751,352 | 7,344,848 | 4.39% |
| Finance | 618,381 | 1,061,782 | 1,284,170 | 1,732,768 | 3.43% |
| Retail trade | 1,479,923 | 2,207,395 | 3,204,109 | 4,024,909 | 3.34% |
| Transport | 489,572 | 683,251 | 889,439 | 1,241,543 | 3.10% |
| Construction | 571,871 | 818,976 | 1,105,368 | 1,446,998 | 3.09% |
| Wholesale | 458,588 | 708,712 | 889,028 | 1,093,082 | 2.90% |
| Government | 1,947,813 | 2,512,119 | 2,970,964 | 3,251,857 | 1.71% |
| Manufacturing | 2,138,924 | 2,513,758 | 2,677,526 | 2,592,897 | 0.64% |

One interesting observation from Table 1 is the continued role of agriculture in rural employment development. As previous studies have noted, agricultural productivity growth stimulates rural nonfarm growth, especially where infrastructure and the investment climate are already in place (Barnes and Binswanger 1986; Rosegrant and Hazell 2000).

## II. DATA AND VARIABLE

Southeast United States is defined here to include six states (Alabama, Georgia, Florida, South Carolina, Tennessee, and Mississippi). Within these states, the study area was defined based on the 2003 Rural-Urban Continuum codes, commonly known as the Beale codes (ERS, 2003). The 2003 Urban Influence Codes divide the 3,141 counties in the United States into metropolitan and nonmetropolitan designations, and further refine county types by their urban population and proximity to metropolitan areas (ERS, 2003). There are a total of 304 counties in the study area that meet the criteria of nonmetropolitan, but only 235 are included in the analysis due to data availability. Non-farm employment, population, and other county level data were obtained primarily from Bureau of Economic Analysis (BEA) data complied on the Regional Economic Information System (REIS) dataset. Additional data on farm-employment were obtained from NASS while educational attainment statistics were from the census of population (BEA, 2007).

To answer the question of whether industrial sectors matter in examining employment growth, the analysis follows Mann (2006) by calculating and using the number of enterprises in the selected industrial sectors (agriculture, service, manufacturing and retail sectors) divided by the number of persons aged between 16 and 65 (as a proxy for employable persons) as independent variables. Secondly, the number of working persons in each sector, again measured

against the number of employable persons, was calculated. Both indicators are used independently in order to compare the influence of a broad and varied regional economic structure, as measured by the number of enterprises, to the mere presence of jobs (Mann, 2006).

Also, the paper follows Miranowski and Monchuck (2004) in developing an industry concentration measure. This measure is computed as the squared share in employment summed for the largest three employment categories. Higher values imply less industry diversity while lower values imply a greater degree of industry diversity. Lack of a large population base and opportunity to interact with other individuals may restrict the exchange of new ideas between people and thus hinder the realization of growth spillovers. To examine whether rural areas are apparently disadvantaged in this respect, population density is included in the analysis.

Next, a dummy variable is established to account for the effect of a county's location relative to metropolitan counties (ADJ). Counties with a code of four, six, or eight are nonmetropolitan adjacent counties and are assigned a value of one. Nonadjacent counties coded five, seven, or nine, are assigned a value of zero (ERS, 2003). This variable is expected to positively affect employment growth, i.e. counties that are adjacent to metro areas should be positively related to employment growth. The proximity and access of interstate highways is included in the model, because businesses are expected to locate in areas with better access to markets (Aldrich and Kusmin, 1997). This variable (HWY) is measured as a dummy variable indicating if an interstate highway intersects the county. However, this intersection does not indicate that there is direct access or an exit in the county (Aldrich and Kusmin, 1997). Since the presence of an interstate should aid in market access, a positive relationship is expected

Commuters often form an important part of rural counties in the rural south. Although this includes locals who make their living by working in other municipalities as well as commuters from outside coming daily into one's own county, the focus is on the share of outbound commuters among employable persons in the county; and the variable should indicate presence of labor force which should have a positive relationship with employment growth. Lastly, initial employment, wage and education attainment are included to examine their effects on rural employment growth.

## III. MODEL

The analysis follows Mann's (2006) two scale approach to estimate the impact of sectoral distribution. The estimated OLS regression models are based on a cross-sectional data set of 235 rural counties in selected states in the Southeast United States with employment growth as the dependant variable and the hypothesized set of explanatory variables on the right-hand side. The model is specified in a log-log format and thus, the parameter estimates can be interpreted directly as elasticities.

## IV. RESULTS

The estimated results of the OLS-regression are presented in Table 2. Two different specifications are shown, where the first one focuses on the number of jobs, the second on the number of enterprises in the counties. The first model explains approximately 36% of the variability in employment growth for rural counties over the years 2000-2005, while the second model explains roughly 43 percent.

Table 3. Estimated OLS Regression Results

| | Model I | | | Model II | | |
|---|---|---|---|---|---|---|
| Variable | Coefficient | SE | t-value | Coefficient | SE | t-value |
| Employees (primary sector) | 0.058* | 0.03 | 1.933 | --- | --- | --- |
| Employees (secondary sector) | 0.041** | 0.02 | 2.050 | --- | --- | --- |
| Employees (tertiary sector) | 0.044** | 0.019 | 2.316 | --- | --- | --- |
| Establishments (primary sector) | --- | --- | --- | 0.092*** | 0.034 | 2.706 |
| Establishments (secondary sector) | --- | --- | --- | -0.022 | 0.108 | -0.204 |
| Establishments (tertiary sector) | --- | --- | --- | 0.075** | 0.032 | 2.344 |
| Initial Employment | -0.358* | 0.205 | -1.746 | -0.217** | 0.09 | -2.411 |
| Wage | 0.131*** | 0.042 | 3.119 | 0.053** | 0.021 | 2.524 |
| Less than High School Education | -0.114 | 0.859 | -0.133 | -0.921 | 0.845 | -1.090 |
| College Education | -0.101** | 0.041 | -2.463 | -0.159*** | 0.047 | -3.383 |
| Population Density | -0.272** | 0.135 | -2.015 | -0.315** | 0.157 | -2.006 |
| Out commuting | -0.186* | 0.098 | -1.898 | -0.363 | 0.232 | -1.565 |
| Proximity to MSA | 0.391* | 0.219 | 1.785 | 0.429* | 0.236 | 1.818 |
| Concentration Index | 0.023* | 0.013 | 1.769 | 0.072 | 0.094 | 0.766 |
| Presence of Interstate | 0.163 | 0.201 | 0.811 | 0.028 | 0.018 | 1.556 |
| Constant | 7.554 | 5.281 | 1.430 | 14.145*** | 4.867 | 2.906 |
| F-test | 3.21*** | | | 4.74*** | | |
| R-square | 0.364 | | | 0.427 | | |
| Adj. R-square | 0.316 | | | 0.385 | | |
| N=235 | | | | | | |

*, **, *** represents 10, 5 and 1 percent levels of significance, respectively.

The role of the three sectors in explaining rural employment growth differs greatly as shown by the results in Table 2. For instance, in Model I the impact of an agricultural worker (primary sector) on employment growth is greater (5.8%) than the impact of an industrial (4.1%) and service (4.4%) sector worker. It is also shown that an additional job in the service sector (tertiary sector) has stronger impact on rural employment development than an additional job in the industrial sector. Similarly in Model II, the impact of an agricultural establishment has a

greater impact (9.2%) on rural employment growth than either industrial (2.2%) or service (7.5%) establishments. Another interesting result, seen from the size of the elasticity coefficients and the differences in the adjusted R-square, is that establishments matter more than jobs.

The general conclusion here is that the number of establishments in a county explain employment growth to a larger degree than does the number of jobs, implying that, the number of enterprises is a more important indicator than the number of employees, so that a large number of small firms with economic diversity and stability have more potential to secure the region's future than a small number of large firms. As Mann (2006) notes, although an establishment in the secondary sector, usually a workshop or an industrial plant, is much larger in size than a farm, a farm has more than half of the industrial establishments' effect in enhancing local employment growth.

Turning to other variables, the important role of commuting for rural employment growth is reflected by the two variables: *proximity to MSA* and *out-commuting*. For proximity to MSAs, it is reasonable for one to assume that a county whose neighbors are growing is better positioned to enjoy growth spillovers and other externalities generated by surrounding counties than counties that are isolated. The estimated results support this hypothesis indicating that proximity to MSA increase employment growth by 39 and 43 percent in Models I and II, respectively. On the other hand, it was hypothesized that the presence of labor force (out-commuting), as measured by the share of outbound commuters among employable persons in the county should have a positive relationship with employment growth. To the contrary, the estimated coefficients have the opposite sign and statistically significant only in Model I, indicating that a unit increase in out-commuting decreases rural employment growth by 19 percent.

Initial employment conditions are shown to be associated with strong effects in both models. The observed negative effect suggests that counties with high employment growth levels at the beginning of the period tended to record slower growth rates towards the end of the period, whereas counties with low growth levels in the beginning tended to experience much higher growth rates in later years. This result is consistent with the hypothesis of beta-convergence.

For labor market factors, the analysis looked at wages, education and population density. The results for the variable measuring wages are positive and significantly different from zero at the 1 percent and 5 percent levels in Models I and II, respectively, implying that a unit increase in wages would increase employment growth by 13 percent and 5.3 percent in Models I and II, respectively. On the other hand, the results in both models suggest that education has a negative effect on rural employment growth, but statistically significant only for college education. The fact that a high share of persons with less than high school education is an indicator for employment loss hardly comes as a surprise. For high education however, earlier studies have shown that the higher the level of educational attainment, the faster the growth rates in employment (see Barkley, Henry and Li, 2005). One plausible explanation for the observed negative effect for higher education is the high degree of mobility which educated people enjoy.

Population density was included to examine whether rural areas are apparently disadvantaged with the lack of a large population base which may restrict the exchange of new ideas and thus hinder the realization of growth spillovers. The estimated parameters are negative and significantly different from zero in both models. On the other hand, the parameters for market access as measured by presence of an interstate did not appear to have an appreciable effect on employment growth. In terms of cross industry externalities and spillovers, measured

by the concentration index variable, there is support for the Marshall (1890)-Arrow (1962)-Romer (1986), aka MAR argument since a one percent increase in industry specialization in a county results in a 0.023 percent increase in employment growth. This result contradicts the Glaeser, et al. (1992) and tends to support Schumpeters (1942) original hypothesis that greater industry specialization promotes growth rather than industry diversity.

## V. CONCLUSION

Indicators to measure the quality of rural development are, inter alia, regional income (Hazel and Hojjati, 1995), employment growth (Lewis et al., 2001) and the change in population (Doo-Chul, 1997). While previous studies have focused on income and population development, this paper focused on understanding the role of selected economic sectors in the rural employment growth process. The analysis employed two specifications of OLS regression to understand the role of economic sectors in employment growth processes across rural counties in the southeast U.S. The first specification (number of jobs) explained approximately 36% of the variability in employment growth while the second specification (number of enterprises) explained roughly 43 percent of the variability over the seven year period, 2000 through 2007.

The overall findings suggest that although the share and the social role of agriculture are shrinking in almost all rural areas, agriculture is still an important sector in rural employment growth. Transforming rural nonfarm sector should therefore complement agricultural transformation to complete the rural strategy for increasing rural employment. As previous studies have shown, the rural nonfarm sector not only has the potential to increase agricultural

wages by adding value to agricultural products, but it also has the capacity to increase rural wages through direct employment, due to high labor productivity relative to the farm sector.

## REFERENCES

Aldrich L, Kusmin L. 1997. Rural economic development: What makes rural communities grow? US Department of Agriculture, Agriculture Information Bulletin No. 737 (September).

Arrow, K. J., 1962, "The Economic Implications of Learning by Doing," The Review of Economic Studies, V.29, N.3, pp.155-173.

Barkley, D., M. Henry and H. Li. 2005. Does Human Capital Affect Rural Economic Growth? Evidence from the South In Lionel J. Beaulieu and Robert Gibbs (eds.). *The Role of Education: Promoting the Economic and Social Vitality of* Rural *America*: 10-15.

Barnes, D.F. and H. Binswanger. 1986. "Impact of Rural Electrification and Infrastructure on Agricultural Changes." Economic and Political Weekly 21: 26-34.

Bartik, Timothy. 2005. "Solving the Problems of Economic Development Incentives." Growth and Change, vol. 36, no. 2, pp. 139-166.

BEA, 2006. Regional Economic Information System, Bureau of Economic Analysis, U.S. Department of Commerce. http://www.bea.gov/bea/regional/gsp/

Blair, J.P., and Premus, R. 1987. "Major Factors in Industrial Location: A Review." Economic Development Quarterly, 1, 1: 72-85.

Carlino, G.A., and Mills, E.S. 1987. The Determinants of County Growth. Journal of Regional Growth Science, 27, 1: 39-54.

Deller, Steven C., Tsung-Hsiu Sue Tsai, David Marcouiller, and Donald B.K. English. 2001. "The Role of Amenities and Quality of Life In Rural Economic Growth." American Journal of Agricultural Economics. 83(2):352-365

England, Lynn and Ralph B. Brown. 2003. "Community and Resources Extraction in Rural America." Chapter 24 in D.L. Brown & L.E. Swanson (eds.), Challenges for Rural America in the Twenty-First Century. University Park: The Pennsylvania State University Press

ERS. 2003. Urban Influence Codes. http://www.ers.usda.gov/Data/UrbanInfluenceCodes/

Falk, William F., Michael D. Schulman and Ann R. Tickamyer. 2003. Communities of Work: Rural Restructuring in Local and Global Context. Athens, Ohio: Ohio University Press.

Gardner, Bruce L. 2003. "Causes of Rural Economic Development." Proceedings of the 25th International Conference of Agricultural Economists, Durban, South Africa, August 16-22.

Glaeser, E.L., Kallal, H.D., Scheinkman, J.A., and Shleifer, A., 1992. Growth in cities, *Journal of Political Economy* 100, 1126-1152.

Glasmeier, A., and Howland, M. 1994. "Service-led rural development: Definitions, theories, and empirical evidence." International Regional Science Review, 15: 197-229.

Greenwood, M.J. 1985. "Human Migration: Theory, Models, and Empirical Studies." Journal of Regional Science, 25, 4: 521-44.

Goe, W. Richard, Sean A. Noonan and Sherry Thurston. 2003. "From Extraction to Amenities: Restructuring and (in)conspicuous Consumption in Missoula, Montana." Chapter 5 in W.F. Falk et al. (eds), Communities of Work: Rural Restructuring in Local and Global Context. Athens, Ohio: Ohio University Press.

Henry, M.S., Barkley, D.L., and Bao, S. 1997. "The Hinterland's Stake in Metropolitan Growth: Evidence from Selected Southern Region." Journal of Regional Science, 37, 3: 479-501

Kassab, Cathy and A.E. Luloff. 1993. "The New Buffalo Hunt: Chasing the Service Sector." Journal of the Community, Development Society 24:175-95.

Mann, Stefan. 2006. Population development in rural Switzerland: Do sectors matter? EconPapers, Working Paper Series No. 4: 30710. Available at: http://econpapers.repec.org/paper/agsartawp/

Marshall, A. 1890. Principles of Economics. London: MacMillan & Co.

Miranowski, John and Monchuck, Daniel C., 2004. "Spatial Labor Markets and Technology Spillovers - Analysis from the US Midwest," Staff General Research Papers 12196, Iowa State University, Department of Economics.

Monchuk, Daniel C., John A. Miranowski, Dermot J. Hayes, and Bruce A. Babcock. 2005. "An Analysis of Regional Economic Growth in the U.S. Midwest." Working Paper 05-WP 392, CARD, Iowa State University, April.

Morris, Martina and Bruce Western. 1999. "Inequality in Earnings at the close of the Twentieth Century." Annual Review of Sociology 25:623-657.

Romer, P. M., 1986. "Increasing Returns and Long-Run Growth," Journal of Political Economy, V.94, N.5, pp.1002-1037.

Rosegrant, M. W. and P. B. Hazell. 2000. Transforming the Rural Asian Economy: The Unfinished Revolution. Hong Kong: Oxford University Press.

Schumpeter, Joseph A. 1942. *Capitalism, Socialism, and Democracy*. New York: Harper and Brothers. (Harper Colophon edition, 1976.