The Impact of Scenic Amenities on Rural Employment Growth

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Abstract: Throughout the 1990s, scenic rural areas have experienced faster employment growth than their counterparts. But, rural employment growth relies on a much broader set of county characteristics than just scenic amenities. Analysis provides insight into the role of scenic amenities in rural employment growth, generally and at the sector level.

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1. Introduction

Throughout history, the presence of natural resources has played an integral role in the development of rural areas. American pioneers first forged west following the valleys of U.S. rivers. Today, rural areas with high levels of scenic amenities are experiencing faster population and employment growth than their counterparts (McGranahan, 1999; Henderson and McDaniel, 1998). This evidence suggests that rural areas should take full advantage of scenic amenities when forming an economic development strategy.

Scenic amenities promote economic growth in rural areas, but how important scenic amenities are relative to other community characteristics remains to be seen. For instance, are scenic amenities more important to rural economic growth than access to metropolitan areas, transportation, and industry clusters? Or, do the benefits of scenic amenities affect the development of some sectors, such as services, more than other sectors? Answering questions like these will help rural leaders tailor economic development strategies to fit their area.

The objective of this paper is twofold. First, it examines the importance of scenic amenities on rural employment growth, both generally and relative to other local characteristics. Second, it analyzes whether the benefits of scenic amenities are more important to some sectors than to others. The results from this analysis will help rural development specialists and policy makers as they initiate strategies to stimulate economic growth in rural America.

An amenity is an attribute that enhances a location as a place of residence. Studies have generally recognized the role of scenic amenities on rural economic growth (Drabenstott and Smith, 1990; Henry and Drabenstott, 1996; O'Huallachain and Satterthwaite, 1992), but

measures of scenic amenities have been imperfect, limiting research in this area. The USDA recently measured the concentration of scenic amenities in rural counties with an index and used this index to study population change, employment growth, and migration (McGranahan, 1999).

The USDA index focuses on natural amenities, which pertain to the physical rather than social or economic environment, and purposefully excludes man-made amenities such as historical buildings or casinos. The index was constructed by combining six measures of climate, topography, and water area that reflect environmental qualities most people prefer (McGranahan, 1999). The six measures are warm winter, winter sun, temperate summer, low summer humidity, topographic variation, and water area. As such, the USDA index is somewhat biased toward Western and Southern states (Figure 1). Another drawback of the USDA index is that it weights all six measures equally. These six measures, as well as others, probably impact rural areas differently. However, the USDA computes an index for every county allowing researchers to discover the impact of varying degrees of scenic amenities on rural employment growth. Thus, it is the most comprehensive measure of scenic amenities currently available.

In this paper, the USDA index of scenic amenities will be incorporated into a model of rural employment growth at the county level. The influence of amenities on rural employment growth will be examined along with other county characteristics such as urbanization, localization of industries, market access, labor characteristics, transportation, and fiscal policies. Results from the model should provide a much better estimate of the relationship between scenic amenities and rural employment growth than currently exists. The analysis will also provide insight into the importance of natural scenic amenities relative to other county characteristics. Finally, applying the model to employment growth at the sector level should reveal the impact of scenic amenities on different sectors of the rural economy.

Section 2 describes economic growth trends in rural counties by analyzing the relationship between various measures of rural economic growth and scenic amenities. In Section 3, an empirical model is developed and applied to rural employment growth in general, and across sectors. Section 4 describes the data used in the analysis. Results are presented in Section 5 with a discussion undertaken in Section 6. Final conclusions about the impact of scenic amenities on rural employment growth are presented in Section 7.

2. Rural Counties Recover in the 1990s

In the 1990s, rural counties recovered some of the jobs lost during the 1980s twin crises in the energy and agricultural sectors. From 1990 through 1997, rural employment growth overall averaged just over two percent annually compared to just over one percent annually from 1980 to 1989. However, rural employment growth in the 1990s was concentrated, with only a third of rural counties growing faster than the U.S. average (Figure 2). Therefore, it is essential to understand the factors contributing to rapid employment growth in certain rural counties.

Rural economic growth relies, in part, on the level of scenic amenities

One obvious factor contributing to rural employment growth is the presence of scenic amenities. Scenic rural areas have experienced faster employment growth than their counterparts. In fact, employment growth escalates as the level of scenic amenities rises in rural counties. Rural counties possessing the highest level of scenic amenities grew 3.1 percent annually from 1990 through 1997 compared to 1.9 percent average annual growth in rural counties with the lowest level of scenic amenities (Table 1).

In addition to adding jobs at rapid rates, scenic rural counties entice workers and retirees to relocate. Scenic amenities present non-financial incentives to workers in the area, while

offering urban retirees shelter from the hustle and bustle of city life. From 1990 through 1997, population growth rose 1.6 percent annually in rural counties with the highest level of scenic amenities, but growth was stagnant in rural counties with the lowest level of scenic amenities.

Per-capita personal incomes, on the other hand, remained fairly stable at all levels of scenic amenities. Scenic rural areas often have a high concentration of tourism, recreation, and retail jobs, which tend to pay less than other professions. Thus, income growth in scenic rural counties mirrors growth in other counties, despite having faster employment and population growth rates.

Scenic amenities do not guarantee economic growth

Nonetheless, the success of rural counties relies on a broader set of county characteristics than scenic amenities. Indeed, some rural counties have added jobs rapidly in the 1990s without possessing a high degree of scenic amenities. For example, Pennington County, Minnesota experienced 3.5 percent employment growth in the 1990s despite have a lower level of scenic amenities. Other county characteristics relevant to rural employment growth include urbanization economies, localization of industries, market access, labor force characteristics, infrastructure, and fiscal policies. These county characteristics are important when identifying the strengths and weaknesses of a particular area. By identifying the strengths and weaknesses of an area, rural leaders can formulate more effective economic development strategies.

A careful analysis of various county characteristics also aids policy makers and economic development specialists in developing and implementing rural policy initiatives. Understanding the relationship of scenic amenities, as well as other county characteristics, to rural employment

growth leads to more effective public policy. It also helps rural leaders tailor economic development policies to their area.

Numerous factors impact rural employment growth

Two specific hypotheses are tested in this paper. The first hypothesis is that scenic amenities are positively related to rural employment growth, but their impact on rural employment growth is not stronger than other county characteristics. It is believed that scenic amenities enhance the attractiveness of rural counties leading to job gains. However, other county characteristics provide a stronger foundation for employment growth in rural areas. Thus, development policies should focus on a broad set of county characteristics rather than try to attract workers and jobs based solely on the topography of the land.

The second hypothesis is that the importance of scenic amenities varies across industry. Since tourism and recreation jobs are part of the broader service sector, rural counties with scenic amenities should see faster employment growth in the service and government sectors than their counterparts. Moreover, the extent to which scenic areas are preferred retirement destinations, the need for personal services such as health care and public services such as utilities, should increase. In addition, the more tourists that visit a rural county, the greater the demand for retail goods such as gasoline, food, clothing, and souvenirs. Thus, retail employment growth should rise as the level of scenic amenities rises in rural areas. In contrast, the manufacturing industry generally requires larger blocks of flat land to build plants, leading to slower manufacturing employment growth in counties with higher levels of scenic amenities.

Scenic amenities spur services, retail, and government sectors

Indeed, preliminary analysis of 1990s county-level employment data suggests that employment growth in the retail, services, and government sectors soared in rural counties with high levels of scenic amenities. From 1990 to 1997, average annual employment growth in the retail, services, and government sectors rose 3.8, 7.0, and 2.3 percent, respectively, in rural counties with the highest level of scenic amenities (Table 2). Rural counties with the lowest level of scenic amenities in the 1990s experienced average annual employment growth in the retail, services, and government sectors of 2.2, 1.8, and –0.5 percent, respectively.

As expected, manufacturing employment slowed noticeably in rural counties with higher levels of scenic amenities. Manufacturing employment growth edged up 1.6 percent annually in counties with the highest level of scenic amenities. But, manufacturing employment jumped 5.7 percent annually in counties with the lowest level of scenic amenities. Since, manufacturing jobs tend to pay more than service or retail sector jobs, higher income levels are also observed in rural counties with lower levels of scenic amenities.

Although preliminary analysis confirms the hypothesis that the importance of scenic amenities varies across industry, the importance of scenic amenities relative to other county characteristics remains a question. To determine the importance of scenic amenities on rural employment growth, in general, and relative to other county characteristics, an empirical model must be estimated.

3. Empirical Model

Descriptive analysis and anecdotal evidence suggest that rural counties with high levels of scenic amenities experience faster employment growth than their counterparts. This

relationship holds for the service, retail, and government sectors; however, the relationship deteriorates for the manufacturing sector. As community leaders search for development strategies to stimulate rural growth, the contribution of scenic amenities is important to recognize. Yet, strategies based on the level of scenic amenities may be misplaced since other county characteristics impact rural employment growth as well.

In this section, the impact of scenic amenities on rural employment growth is analyzed with an empirical model. The empirical model is built upon location theory following O'Huallachain and Satterthwaite (1992). Location theory states that firms search for locations that minimize costs while meeting the firms' needs. Any aspect of the rural community that reduces firm costs leads to greater growth. The model developed by O'Huallachain and Satterthwaite is modified for this analysis and presented in Equation 1.

$$(1) \qquad E_{Li} - E_{0i} = aE_{0i}^{\alpha} U_i^{\beta} \exp(cZ_i + \varepsilon_i)$$

where E_{li} is the employment for industry *i* in the terminal period, E_{0i} is the employment for industry *i* in the initial period, U_i is the civilian labor force, and Z_i is a vector of variables describing the geographic area.

Following Henry and Drabenstott (1996), the log transformation of Equation 1 further modifies the model and leads to Equation 2.

$$(2) \qquad Ln(E_{Li} - E_{0i}) = Lna + \alpha LnE_{0i} + \beta LnU_i + cZ_i + \varepsilon_i$$

The empirical model provides an estimate of localization economies, urbanization effects, and other county characteristics. The impact of localization and urbanization economies on rural

employment growth is measured by α and β, respectively.[1] The influence of other county characteristics on rural employment growth is captured by *c*.

One drawback of the empirical model in Equation 2 is that the analysis is restricted to industries in counties experiencing positive employment growth. However, the potential bias should be mitigated by the notion that the forces leading to employment growth differ from the forces driving employment decline (Henry and Drabenstott, 1996; O'Huallachain and Satterthwaite, 1992).

O'Huallachain and Satterthwaite (1992) use the above empirical model to analyze MSA high-tech employment growth between 1977 and 1984. Their analysis measured the impact of localization and urbanization economics on high-tech industry growth. In their model, they included a climate index variable to measure the quality of life in the MSA and the reduced costs associated with the attraction of firms and individuals. Their climate index included temperature extremes, duration of hot and cold days, and annual heating-degree days. In general, the climate measure was not found to significantly impact MSA employment growth in the various high-tech industries analyzed.

Henry and Drabenstott (1996) implemented a version of the empirical model to analyze growth in rural hinterlands of the Bureau of Census Component Economic Areas. They did not include a measure of scenic amenities in their model, but they state that anecdotal evidence points to scenic amenities as one driver of employment growth in rural hinterlands.

This paper extends the literature by applying the model in Equation 2 to employment growth in rural counties. Incorporating the USDA scenic amenity index into the model provides

[1] McDonald (1989) interprets α greater than 1 to mean that increases in E_{0i} lead to faster growth rates in the rural industry. α greater than 0 but less than 1 that increases in E_{0i} lead to faster absolute growth, but slower growth rates, while α less than 0 mean that increases in E_{0i} lead to declines in industry growth. A positive β indicates that

additional insight into the impact of scenic amenities on rural employment growth. Applying the empirical model to sector-level employment models can explain the impact of scenic amenities on different sectors of the rural economy.

4. Data

The empirical model is first employed to analyze rural counties experiencing total employment growth between 1990 and 1997. Using annual employment data for 1990 and 1997 reported on the REIS CD by the Bureau of the Census, average annual employment growth in 2262 rural counties is calculated. The model is then applied to rural counties experiencing average annual employment growth in the manufacturing, service, retail, and government sectors. Disclosure problems and employment declines in various sectors of the rural economy reduced the number of counties to 2,081 overall. Only 1277, 1979, 2067, and 1766 rural counties can be analyzed for manufacturing, service, retail, and government, respectively.

Independent Variables

Various county characteristics that impact firm costs are included as explanatory variables in the empirical model. Explanatory variables include agglomeration economies, market access, infrastructure, labor characteristics, and fiscal policies in addition to the scenic amenity index described earlier. Descriptive statistics for both dependent and independent variables are provided in Table 3.

Agglomeration: The presence of agglomeration economies in the rural community lowers the average costs of production in two ways. First, urbanization economies reduce firms'

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a larger labor force encourages growth in the industry, while a negative β indicates a larger labor force hinders industry growth.

average cost of production by providing the advantages of improved infrastructure, a wide array of personal and business services, and larger labor markets (O'Huallachain and Satterthwaite, 1992). Higher labor force levels should encourage higher levels of rural employment growth. The labor force in the rural county, *LABOR*, measures the presence of urbanization economies (O'Huallachain and Satterthwaite, 1992; Henry and Drabenstott, 1996).

Second, localization economies reduce the cost of information to firms (O'Huallachain and Satterthwaite, 1992). A rural community with a cluster of related firms indicates the presence of factors that currently support firm success. A cluster of firms improves the sharing of knowledge amongst related firms. Given today's movement toward a more knowledge-based economy, the cost savings associated with localization economies should enhance employment growth in rural areas. The level of sector employment in 1990, *SECTOR*, is used to measure localization economies.[2]

Labor: Local labor characteristics influence the average cost of production for firms. Lower labor costs lead directly to lower production costs, *ceteris paribus*. Lower wages or income levels should encourage rural employment growth. Labor costs are measured as the annual non-farm income per person in the rural county in 1990. Dividing the annual non-farm income by the annual non-farm employment in the county as reported by the Bureau of the Census, *INCOME*, leads to the per person non-farm income measure.

The quality of the labor force also influences the average cost of production for firms. A higher skilled labor force is expected to be more efficient and reduce the costs of production. Thus, locations with higher quality should lead to higher rural employment growth. The

[2] This variable will change for each sector model that is estimated, accounting for the multiple reported descriptive statistics in Table 3.

percentage of the county's population that is 25 years or older with a high school diploma in 1990, *GRADRATE*, measure the quality of labor force in the area.

Market Access: A measure of personal income growth is included to measure market access (O'Huallachain and Satterthwaite, 1992). Locations providing better access to markets should lead to lower production costs and higher rural employment growth. Per capita income growth between 1990 and 1997, *PCIGROW*, is used to measure market access.

Scenic Amenities: The USDA index briefly described in the introduction measures the level of scenic amenities in each county. Higher levels of scenic amenities should lead to faster employment growth in rural areas, as scenic amenities attract workers, firms, retirees, and tourists. The index, *AMENSCAL*, is derived from the summation of six standardized indexes measuring warm winter, winter sun, temperate summer, low summer humidity, water area, and topographic variation (McGranahan, 1999).

Transportation Infrastructure: Interstate access is another community characteristic that lowers the average cost of production. Access to a national road system allows firms to distribute finished products to customers or acquire inputs from suppliers in distant markets at a lower cost. Therefore, a positive relationship is expected between interstate mileage and rural employment growth. The rural interstate mileage in the county in 1992, *INTSTATE*, is included in the empirical model to measure interstate access.

Public Expenditures: Higher levels of local government expenditures should reduce a firm's average costs of production. Local provision of infrastructure such as water and waste removal systems can improve the productivity of firms. Public provision also leads to sharing of costs among firms and residents. Yet, financing the provision of local expenditures raises costs of production for firms. The level of local per capita government revenues generated divided by

the per capita local government expenditures in 1987, *GOVRATIO*, obtained from the Bureau of the Census measures the ratio of government revenues to expenditure. Counties with lower *GOVRATIO* values are able to generate non-local revenues to finance local expenditures. Since this implies a reduction in direct local expenses for businesses, it should be negatively related to rural employment growth.

Regional Variables: Regional dummy variables were included for the Midwest, South, and West to account for regional characteristics not incorporated into the empirical model. The regions are combinations of the Bureau of Census regions.[3]

5. Empirical Results

The empirical model in Equation 2 is estimated by ordinary least squares regression for total employment growth and for employment growth in the manufacturing, service, retail, and government sectors. The empirical model provides good fit for rural employment growth in general and by sector. The adjusted R-square statistic for total rural employment growth is 0.65. For the manufacturing, service, retail, and government sector employment growth models, the adjusted R-square is 0.49, 0.67, 0.66, and 0.47, respectively.

In the total employment growth model (Table 4), all variables except *GOVRATIO* are significant at the 0.10 level. In the manufacturing growth model (Table 5), five variables are significant at the 0.10 level: *LABOR*, *SECTOR*, *GRADRATE*, *PCIGROW*, and *MILES*. Eight of

[3] *MIDWEST* includes the states of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. *SOUTH* includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, West Virginia, New Mexico, Oklahoma, and Texas. *WEST* includes the states of California, Colorado, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

the eleven explanatory variables are significant in the service model (Table 6).[4] All of the variables were significant in the retail growth models at the 0.10 level (Table 7). In the government sector model (Table 8), seven variables are significant: *LABOR*, *SECTOR*, *WAGE*, *AMENSCAL*, *MIDWEST*, *SOUTH*, and *WEST*. In all five models, the significant variables, except *GRADRATE* in the manufacturing model, had the expected sign.

6. Discussion of Results

Empirical results indicate that scenic amenities encourage rural employment growth. The scenic amenity variable, *AMENSCAL*, in the model of total rural employment growth was significant and positive, indicating that higher levels of scenic amenities lead to faster employment growth. Additionally, an elasticity was calculated for the scenic amenity variable which indicates that, on average, rural counties with a one percent higher level of scenic amenities experience a 0.003 percent higher increase in total employment growth. This supports the preliminary descriptive analysis that rural counties with higher levels of scenic amenities experience faster employment growth. Thus, community leaders can utilize scenic amenities when creating economic development strategies.

Consistent with the preliminary descriptive analysis, scenic amenities do not support growth in all sectors of the rural economy. Scenic amenities impact rural employment growth in the service, retail, and government sectors, but they do not foster rural employment growth in the manufacturing sector. The scenic amenity variable is not significant in the model of manufacturing employment, but it is significant and positive in the four models of total, service, retail, and government employment. Elasticity measures indicate that, on average, rural counties

[4] It is important to note that by replacing *AMENSCAL* with the six individual amenity indexes, *INTSTATE* became positively significant.

with a one- percent higher level of scenic amenities enjoy a 0.003 percent higher increase in service employment, a 0.013 percent higher increase in retail employment, and a 0.015 percent higher increase in government employment. Therefore, rural leaders must recognize that an economic development strategy based on the presence of scenic amenities may attract or deter expansion of certain industries.

The empirical results also indicate that other county characteristics have greater effects on rural employment growth than scenic amenities. For example, elasticity measures imply that, on average, the education level of the population, urbanization of the economy, access to markets, and localization economies have larger impacts on rural employment growth in general, and at the sector level than do scenic amenities. In fact, scenic amenities, when significant, have the smallest elasticity and marginal impacts of all the community characteristics in the models. Thus, economic development specialists and policy makers must consider several other community attributes in conjunction with scenic amenities when setting rural policies.

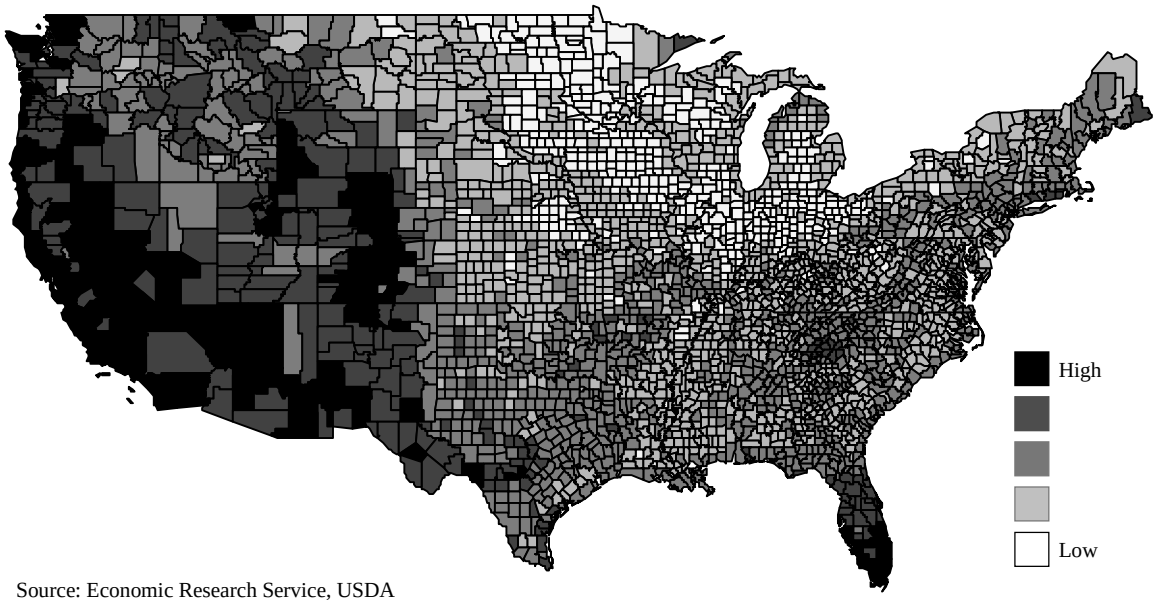
7. Conclusion

The 1990s marked a turning point for rural areas as employment growth recovered from the 1980s. Nonetheless, employment gains were not widespread as roughly one-third of the rural communities grew faster than the national average. Scenic amenities are often identified as the driving force behind successful rural communities. Indeed, results of this paper support the hypothesis that scenic amenities impact rural employment growth in general, and at the sector level. Results also support the hypothesis that scenic amenities impact the service, retail, government, and manufacturing sectors in different ways. However, other community characteristics appear to have larger impacts on rural employment growth than scenic amenities.

In this paper, the relationship between scenic amenities and rural employment growth in the 1990s was analyzed both descriptively and empirically. Higher levels of scenic amenities, as measured by the USDA index, enhanced rural employment growth overall and in the service, retail, and government sectors. However, the benefits of scenic amenities are not bestowed on the manufacturing sector. In fact, manufacturing job growth slows in rural counties with higher levels of scenic amenities. Therefore, rural communities targeting manufacturing industry expansion should focus development efforts on other community attributes.

While scenic amenities do support rural employment growth, other community attributes are just as important, if not more so, than scenic amenities. The presence of urbanization benefits, localization of industries, transportation, and market access all influence rural employment growth. Development efforts should consider these attributes as rural communities set forth to encourage rural economic growth. The fact that scenic amenities may not be the most significant attribute of rural employment growth should encourage rural communities lagging in employment growth and possessing lower levels of scenic amenities. Taken together, results suggest that scenic amenities should be the capstone, not the cornerstone of rural development strategies.

Figure 1: Scenic Amenity Levels



Source: Economic Research Service, USDA
Levels are based upon standard deviations from the mean.
Categories are (High) over 2, 1 to 2, 0 to 1, -1 to 0, and (Low) under -1.

Figure 2: Average Annual Employment Growth, 1990-1997

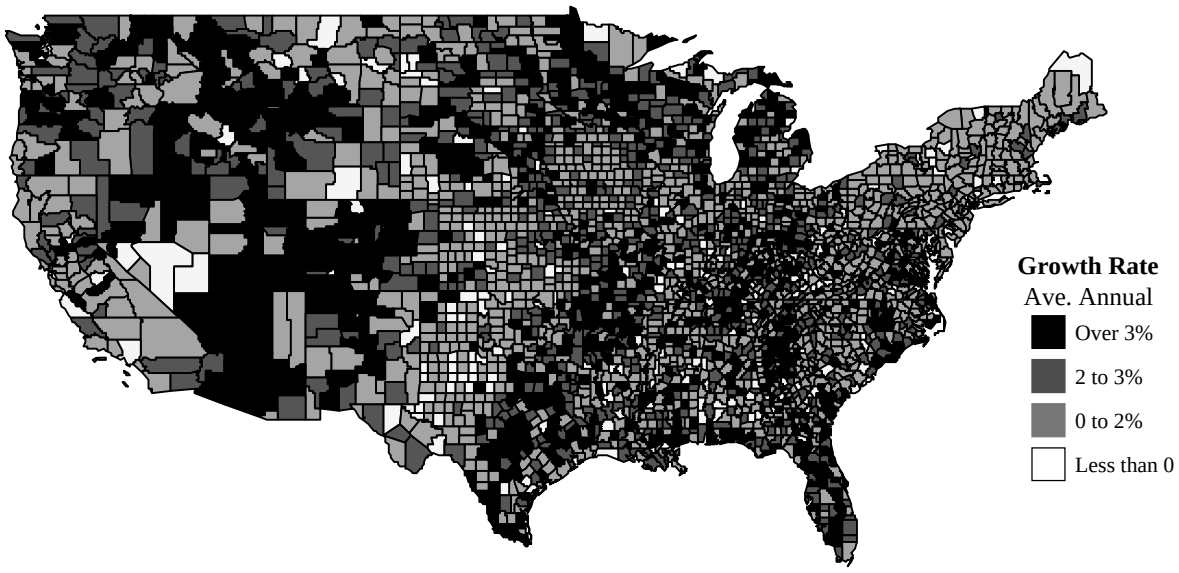


Table 1: Economic Growth Rates by Amenity Rank and Proximity to Metropolitan Area

Amenity Rank*	Proximity	Number of Counties	Population	Employment	Per Capita Income
1 (Low)	Metro	4	0.30	1.89	4.54
	Adjacent	7	0.09	1.75	3.61
	Non-adjacent	4	-0.51	2.17	2.62
	Total	**15**	**-0.01**	**1.90**	**3.60**
2	Metro	101	1.15	2.60	4.29
	Adjacent	155	0.52	2.14	3.98
	Non-adjacent	178	-0.09	2.08	3.81
	Total	**434**	**0.42**	**2.22**	**3.98**
3	Metro	321	1.21	2.30	4.17
	Adjacent	387	0.70	2.10	4.30
	Non-adjacent	531	0.10	1.66	3.68
	Total	**1239**	**0.58**	**1.96**	**4.00**
4	Metro	263	1.59	2.61	4.16
	Adjacent	332	1.07	1.96	3.96
	Non-adjacent	388	0.77	2.08	3.85
	Total	**983**	**1.09**	**2.18**	**3.97**
5	Metro	64	2.07	3.04	4.19
	Adjacent	67	2.14	3.10	3.62
	Non-adjacent	118	1.56	3.03	3.71
	Total	**249**	**1.85**	**3.05**	**3.81**
6	Metro	43	2.44	3.03	3.67
	Adjacent	32	2.85	4.60	3.70
	Non-adjacent	40	1.86	3.31	3.89
	Total	**115**	**2.35**	**3.56**	**3.76**
7 (High)	Metro	15	0.86	1.29	3.51
	Adjacent	12	2.49	5.72	3.49
	Non-adjacent	11	1.66	2.85	3.51
	Total	**38**	**1.60**	**3.14**	**3.50**
Grand Total		3073	0.90	2.23	3.95

Source: Economic Research Service (USDA)

* Amenity rank is determined by the counties deviation from the mean of the amentiy scale index.The *Deviations from the Mean*

1 = Over -2 (Low) 2 = -1 to -2 3 = 0 to -1 4 = 0 to 1 5 = 1 to 2
6 = 2 to 3 7 = Over 3 (High)

Table 2: Rural Employment Growth by Sector

Average Annual Growth 1990-1997

Amenity Rank	Total	Retail	Service	Government	Manufacturing
1 (Low)	1.90	2.23	1.79	-0.50	5.74
2	2.09	2.54	2.85	0.40	2.38
3	1.84	2.43	3.03	0.95	1.09
4	2.02	2.91	3.13	1.56	0.48
5	3.06	3.89	4.24	1.75	1.29
6	3.88	4.45	4.94	2.29	1.27
7 (High)	4.35	3.77	7.04	2.30	1.60
Rural Total	2.13	2.79	3.22	1.18	1.14
# of Counties	2260	2242	2124	2260	2137
Metro Total	2.51	3.01	3.77	1.23	0.85

Amenity Rank: Deviations from the mean, 1 = Under -2, 2 = -1 to -2, 3 = 0 to -1, 4 = 1 to 0, 5 = 1 to 2, 6 = 2 to 3, and 7 = Over 3.

Table 3: Descriptive Statistics

Dependent Variables	Observations	Mean	St. Dev.	Minimum	Maximum
Total	2081	6.74	1.34	0.00	9.98
Manufacturing	1277	5.05	1.55	0.00	8.62
Service	1980	5.71	1.37	0.00	9.48
Retail	2067	5.27	1.36	0.00	8.51
Government	1766	4.71	1.32	0.00	8.55
Ln(LABOR)	2081	11.17	0.96	7.75	13.84
Ln(SECTOR)					
Total	2081	8.71	1.07	4.48	11.35
Manufacturing	1277	6.61	1.55	2.30	10.23
Service	1980	7.24	1.11	3.14	10.38
Retail	2067	6.93	1.14	2.71	9.72
Government	1766	7.07	0.91	3.40	9.90
GRADRATE	2081	0.68	0.10	0.32	0.96
WAGE	2081	15.41	3.30	4.69	35.72
PCIGROW	2081	3.94	1.42	-16.20	8.97
AMENSCAL	2081	0.04	2.27	-6.40	11.15
INTSTATE	2081	8.99	18.27	0.00	330.00
GOVRATIO	2081	1.03	0.14	0.00	4.45

Table 4: Total Employment Growth Results

Variable	Coefficient	Std. Error	T-Value	P-Value	Elasticity[A]
*Ln (LABOR)**	0.845	0.092	9.167	0.000	0.845
*Ln (SECTOR)**	0.194	0.084	2.303	0.021	0.194
*GRADRATE**	1.522	0.269	5.651	0.000	1.034
*WAGE**	-0.030	0.006	-4.930	0.000	-0.463
*PCIGROW**	0.169	0.014	12.189	0.000	0.667
*AMENSCAL**	0.087	0.011	7.797	0.000	0.003
*INTSTATE**	0.002	0.001	1.951	0.051	0.018
GOVRATIO	-0.104	0.130	-0.802	0.423	
*MIDWEST**	0.803	0.092	8.765	0.000	
*SOUTH**	0.562	0.096	5.862	0.000	
*WEST**	0.829	0.105	7.872	0.000	
Constant	-6.201	0.464	-13.362	0.000	
R-Square Adj.	0.650				
Observations	2081				

[A]Elasticity may be read as rural counties with an 1 percent higher level of an attribute are estimated to experience a 1 percent higher level of employment growth. For example, rural counties with 1 percent higher wage levels should have a predicted 0.463 percent lower change in employment growth. Elasticities are only calculated for significant explanatory variables.

Note: Ln(Sector) is the log of the total non-farm employment level in 1990.

* Significant at the 0.10 level or better.

Table 5: Manufacturing Sector Employment Growth Results

Variable	Coefficient	Std. Error	T-Value	P-Value	Elasticity[A]
*Ln (LABOR)**	0.262	0.070	3.76	0.00	0.262
*Ln (SECTOR)**	0.528	0.039	13.68	0.00	0.528
*GRADRATE**	-0.893	0.473	-1.89	0.06	-0.615
WAGE	0.010	0.011	0.91	0.37	
*PCIGROW**	0.152	0.031	4.95	0.00	0.628
AMENSCAL	-0.006	0.020	-0.30	0.76	
*INTSTATE**	0.003	0.002	1.75	0.08	0.028
GOVRATIO	-0.135	0.267	-0.50	0.61	
*MIDWEST**	0.530	0.186	2.85	0.00	
SOUTH	0.101	0.196	0.79	0.43	
WEST	0.254	0.211	1.51	0.13	
Constant	-1.786	0.720	-2.479	0.013	
R-Square Adj.	0.486				
Observations	1277				

[A]Elasticity may be read as rural counties with an 1 percent higher level of an attribute are estimated to experience a 1 percent higher level of manufacturing employment growth. Elasticities are only calculated for significant explanatory variables.

Note: Ln(Sector) is the log of the manufacturing sector employment level in 1990.

* Significant at the 0.10 level or better.

Table 6: Service Sector Employment Growth Results

Variable	Coefficient	Std. Error	T-Value	P-Value	Elasticity[A]
*Ln (LABOR)**	0.446	0.068	6.54	0.00	0.446
*Ln (SECTOR)**	0.597	0.059	10.21	0.00	0.597
*GRADRATE**	0.468	0.274	1.71	0.09	0.317
WAGE	-0.008	0.006	-1.30	0.20	
*PCIGROW**	0.110	0.015	7.26	0.00	0.436
*AMENSCAL**	0.048	0.011	4.23	0.00	0.003
INTSTATE	0.002	0.001	1.35	0.18	0.013
GOVRATIO	-0.095	0.134	-0.71	0.48	
*MIDWEST**	0.387	0.092	4.22	0.00	
*SOUTH**	0.420	0.097	4.35	0.00	
*WEST**	0.705	0.107	6.61	0.00	
Constant	-4.567	0.474	-9.63	0.00	
R-Square Adj.	0.665				
Observations	1980				

[A]Elasticity may be read as rural counties with an 1 percent higher level of an attribute are estimated to experience a 1 percent higher level of service employment growth. Elasticities are only calculated for significant explanatory variables.

Note: Ln(Sector) is the log of the service sector employment level in 1990.

* Significant at the 0.10 level or better.

Table 7: Retail Sector Employment Growth Results

Variable	Coefficient	Std. Error	T-Value	P-Value	Elasticity[A]
*Ln (LABOR)**	0.693	0.071	9.74	0.00	0.693
*Ln (SECTOR)**	0.379	0.059	6.44	0.00	0.379
*GRADRATE**	1.497	0.271	5.53	0.00	1.016
*WAGE**	-0.019	0.006	-3.35	0.00	-0.295
*PCIGROW**	0.049	0.014	3.58	0.00	0.192
*AMENSCAL**	0.057	0.011	5.20	0.00	0.001
*INTSTATE**	0.003	0.001	3.38	0.00	0.030
*GOVRATIO**	-0.297	0.129	-2.30	0.02	-0.306
*MIDWEST**	0.582	0.090	6.50	0.00	
*SOUTH**	0.568	0.094	6.03	0.00	
*WEST**	0.766	0.103	7.44	0.00	
Constant	-6.306	0.508	-12.41	0.00	
R-Square Adj.	0.663				
Observations	2067				

[A]Elasticity may be read as rural counties with an 1 percent higher level of an attribute are estimated to experience a 1 percent higher level of retail employment growth. Elasticities are only calculated for significant explanatory variables.

Note: Ln(Sector) is the log of the retail sector employment level in 1990.

* Significant at the 0.10 level or better.

Table 8: Government Sector Employment Growth Results

Variable	Coefficient	Std. Error	T-Value	P-Value	Elasticity[A]
*Ln (LABOR)**	0.571	0.071	8.03	0.00	0.571
*Ln (SECTOR)**	0.428	0.070	6.08	0.00	0.428
GRADRATE	0.194	0.337	0.58	0.56	
*WAGE**	-0.028	0.007	-3.75	0.00	-0.430
PCIGROW	0.017	0.019	0.94	0.35	
*AMENSCAL**	0.093	0.015	6.32	0.00	0.015
INTSTATE	0.002	0.001	1.27	0.20	
GOVRATIO	0.098	0.168	0.59	0.56	
*MIDWEST**	0.384	0.124	3.10	0.00	
*SOUTH**	0.651	0.129	5.06	0.00	
*WEST**	0.484	0.142	3.40	0.00	
Constant	-5.135	0.505	-10.18	0.00	
R-Square Adj.	0.467				
Observations	1766				

[A]Elasticity may be read as rural counties with an 1 percent higher level of an attribute are estimated to experience a 1 percent higher level of government employment growth. Elasticities are only calculated for significant explanatory variables.

Note: Ln(Sector) is the log of the government sector employment level in 1990.

* Significant at the 0.10 level or better.

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