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**DOES HUMAN CAPITAL AFFECT
RURAL ECONOMIC GROWTH?
EVIDENCE FROM THE SOUTH**

by

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**Does Human Capital Affect Rural Economic Growth?
Evidence from the South**

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How Does Human Capital Affect Rural Economic Growth? Evidence from the South

Introduction

Intense international competition and high technology production processes define the New Economy and dictate the occupations and labor skills needed in today's work place. As a result, nonproduction employment is increasing at the expense of production jobs, and occupational and skill upgrading are occurring within both white- and blue-collar jobs. [4, 11] This upgrading of job skills and educational requirements places nonmetropolitan areas at a disadvantage since rural counties generally have lower educational levels among the adult population. For example, in the 15 southern states, the 2000 percentage of the population (25 and older) with at least some college was 34.8% for nonmetro counties and 47.4% for metro areas. The low level of human capital in rural areas likely contributed to the slow growth of rural economies relative to their metropolitan counterparts. From 1970 to 2000, the Southern nonmetro annual growth rates in real per capita income, population, and employment were 1.7%, .8%, and 1.4%, respectively. During the same period metropolitan growth rates in the South were 1.8% for per capita income, 2.0% for population, and 3.0% for employment.

Rural communities view increased educational investments as an important component of their economic development strategy in an economic environment that stresses competitiveness in international markets and adaptability to sophisticated technologies. At the same time, rural communities are sensitive to the "leakage" of human capital investments outside the community as rural residents move to urban areas with better job opportunities. In this report, we summarize our recent findings on the relationship between additional schooling for rural residents and economic growth across rural counties of the South. We start with an overview of the means

through which a better educated labor force may facilitate local economic development. Next, we summarize the results of our statistical analysis of the association between a more highly educated labor force and county growth rates in employment and per capita income. Our findings reinforce the conventional wisdom that educated labor is critical to future economic development in both urban and rural areas. The economic development returns to education are, however, greater in metropolitan than nonmetropolitan areas.

How Might A Better Educated Labor Force Affect Economic Growth?

A higher level of human capital (as reflected in the share of the adult population with some college) is hypothesized to contribute to more rapid local economic development through a number of channels (Figure 1). First, additional human capital enhances the ability of local businesses to adopt new technologies and respond to changing economic conditions [3]. Second, a well-educated labor force improves a community's chances of attracting new businesses to the area [1]. Labor force quality is especially important in the attraction of establishments in high technology industries and businesses with significant employment in skilled and technical occupations [2]. Third, entrepreneurial activity and small business development in a community benefit from the availability of skilled people in management, technical, and entry-level positions [12]. A well-educated labor force is a critical component to the economic climate conducive to the development, attraction, and retention of entrepreneurs.

The potential economic development benefits of a better educated workforce result from improvements in the general level of education (e.g., more college graduates) as well as increased schooling in specific subject areas (e.g., engineering, computer science, small business development). For example, an improvement in general education enhances businesses' ability

to respond to changing economic conditions. The attraction of high tech activity and the development of entrepreneurs, on the other hand, benefit more from increased education in specific subject/skill areas.

In addition to the direct effects of human capital on firm productivity, a well-educated labor force also facilitates the generation of spillovers or external economies that promote local development [13]. For example, networking and information exchange are critical components of industry cluster development, and the availability of skilled, educated labor facilitates networking and the spread of ideas throughout the cluster [10]. In addition, a well-educated labor force enhances the level of social capital in the community [8], and Jan Flora (5, p. 449) argues that “communities with moderate to high levels of social infrastructure are more likely to have successful, locally-initiated economic development projects than those without.” Finally, Richard Florida [6] proposes that a key to economic growth is the ability to attract and retain members of the “creative class”, individuals with the ability to create new products and businesses and stimulate regional growth. According to Florida (p. 5), an important component of this class is “creative professionals,” individuals with a “high degree of formal education and thus a high level of human capital.”

In summary, improvements in the educational attainment of the local labor force create numerous opportunities for future community development. It is not clear, however, which types of communities can best take advantage of these opportunities, or how the community development impacts will be realized in terms of income, employment, and population change. For example, the dominant economic base in a rural county may affect the ability to translate added human capital into faster county growth—via an enhanced ability to adapt to new technologies, improved learning by doing, etc. Farming counties with large shares of college

educated residents might more readily adapt innovations in seed, chemicals, and machinery to generate higher net farm income compared to farm counties with few residents with a college education. On the other hand, the easy adaptation of new technologies and more sophisticated machinery attributable to higher human capital levels may reduce the employment opportunities in farming counties, forcing some people to find jobs somewhere else. Similarly, manufacturing-based counties with more highly educated labor may be attractive locations for high technology manufacturing firms that require skilled workers (the labor pooling effect). Yet, a high-skill, high-wage labor force likely discourages manufacturing firms that are seeking locations with low labor costs.

Investigating the Labor Quality—Economic Development Relationship

One goal of this project was to estimate the relationship between labor quality in Southern counties in 1980 and measures of county economic growth and development for the period 1980 to 2000. Our measure for the level of human capital in the county is the share of county population aged 25 or older that have attended college. Economic change in the counties is estimated by annual rates of growth in employment, population, and per capita income. The South is defined to include the 15 states of Arkansas, Alabama, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. The general models estimated to identify the role of human capital in economic development are summarized in Table 1. The interested reader may refer to Henry, Barkley, and Li [9] for the results of the statistical analysis.

Summary of the Findings

Results of our analysis indicate that county growth rates in per capita income and employment were positively influenced by increases in the initial level of human capital in the county. The increase in per capita income and employment growth rates was greater in metropolitan than nonmetropolitan counties (Figure 2). Specifically, a 5 percentage point increase in adults attending college resulted, on average, in a 3.5% increase in the growth rate of per capita income in nonmetro areas and a 9.0 % increase in the growth rate in the metro counties. For employment change, the 5 percentage point increase in college attendees contributed to a 5.5% increase in the nonmetro employment growth rate and a 6.8% increase in the metro employment growth rate. County population growth rates, on the other hand, were not significantly related to changes in the county's level of human capital, regardless of whether the county was classified as metro or nonmetro.

Tables 2 and 3 illustrate the impacts of a hypothetical 5 percentage point increase in the share of county population attending college on county per capita income (Table 2) and employment (Table 3). The mean levels of schooling in 1980 (percentage of adults 25+ with some college) for Southern metro and nonmetro counties were 27.0% and 18.7%, respectively. A 5 percentage point increase in county schooling levels resulted in hypothetical metro and nonmetro schooling levels of 32.0% and 23.7%. The hypothetical 5% increase in the counties' educational levels is small, in an absolute sense, yet it represents a relatively large percentage increase in schooling levels for metro (18.5%) and nonmetro (26.7%) counties because the base year levels were low.

The impact of additional human capital was to increase the annual growth rate of real per capita income in metro areas from 1.57% to 1.72%. At the initial annual growth rate of 1.57%,

the average metro county would experience real per capita income growth from \$10,763 to \$14,697 from 1980 to 2000. Alternatively, at the higher annual growth rate of 1.72%, per capita income would have grown from \$10,763 to \$15,134 over the 20-year period. Thus the 5 percentage point change in adults with some college increased county real per capita income in metro areas by an average of \$436. Similarly, the real per capita income in nonmetro counties would have been \$325 higher if college were attended by 5% more of the adult population in the county.

The \$325 increase in mean county per capita income from additional human capital seems, at first, to be rather small. However, the average 2000 population in southern nonmetro counties was approximately 24,700. Thus, the increase in 2000 total income for the average nonmetro county in the South was \$8,027,500 ($\$325 \times 24,700$), and the additional income in the county is realized year after year.

The increase in jobs attributable to added schooling are presented in Table 3. On average, a 5 percentage point increase in adults with some college resulted in 4,684 new jobs in metro areas and 150 additional employees in nonmetro counties. The impact of additional schooling on county employment in nonmetro areas is small (relatively and absolutely). It is likely that many of the nonmetro residents who attended college had to leave the nonmetro areas to find employment fitting their higher level or more specialized education. Moreover, the higher educated rural workers may be attracted to metropolitan areas by the generally higher wages and salaries available in metropolitan labor markets. Thus, many of the 4,684 new jobs in metro areas may be held by rural workers who commute from their nonmetro residences. The impact of this commuting will be evident in the nonmetro county income but not in the employment numbers.

Conclusions

Improvements in educational quality and attainment levels are promoted as important components of state and local development policies in the New Economy. Our findings for the South indicate that such a strategy is appropriate for both metropolitan and nonmetropolitan counties. An increase in the share of adults with some college was associated with more rapid employment and per capita income growth rates in both metro and nonmetro areas. The economic development benefits from higher levels of human capital were greater in metropolitan areas than in nonmetro counties. In nonmetro counties, the principal economic development consequences of more schooling is an increase in county per capita income. The impact of enhanced labor force quality on nonmetro county employment was small.

The limited increase in jobs associated with better educated workers is likely a legacy of the history of rural industrial development. In the past, rural areas were successfully promoted as good locations for businesses seeking a low-skill, low-wage labor market. As a result, rural communities generally are not viewed as the best sites for firms using technologically sophisticated production processes. However, this view of nonmetro labor markets is changing, and job opportunities for the highly educated are becoming more available in rural areas. [11] The key for sustainable economic growth, according to McGranahan and Ghelfi [11:p. 154], is “ . . . raise the quality of local labor to handle new technologies.”

In sum, nonmetro communities must find the means to increase the share of college-educated workers in their labor force. Many of the highly educated in rural areas are natives that attended college locally or returned home after completing college. [7] Thus, rural communities should seek means to increase college attendance by their residents. Reduced high school drop out rates, increased high school graduation rates, enhanced student preparation for college, and

increased college attendance are all critical to improving local labor quality. The alternative to the above for nonmetro communities is a smaller and smaller role in the national and world economies.

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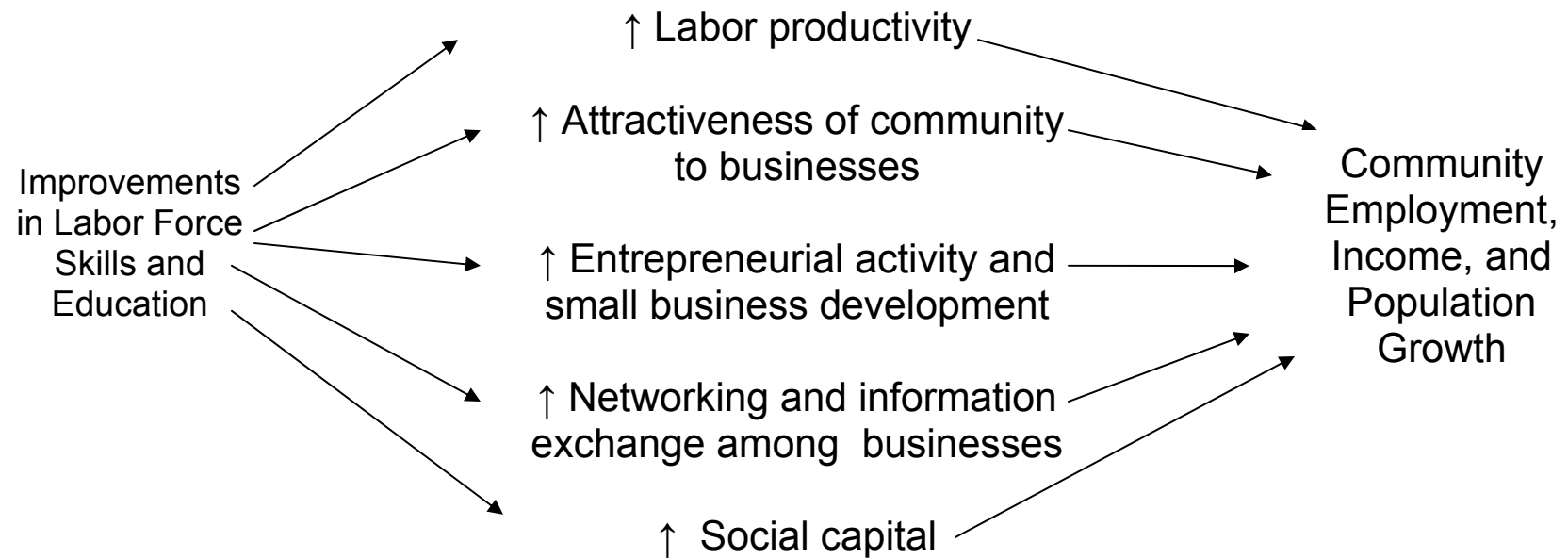


Figure 1.
Potential Contributions of Human Capital Improvements
to Local Economic Development

Figure 2.

Percentage Change in the Annual Growth Rates of County Per Capita Income and Employment Resulting from 5 Percentage Point Increase in the Percent of Persons 25 Years Old or Older with At Least Some College, Southern Counties

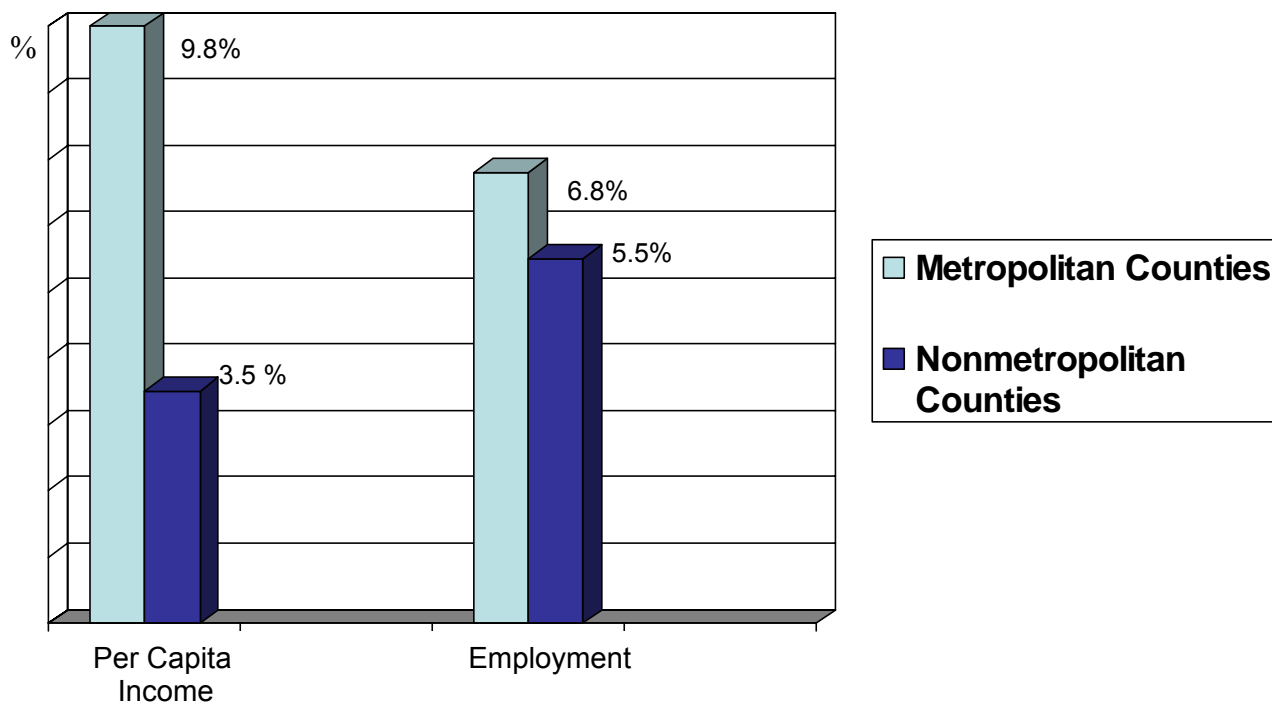


Table 1.
Models Estimated to Identify Factors that Influence County Economic Growth

Models	Measure of Economic Development	Explanatory Variables
<i>Income</i>	growth rate of real per capita income in county	<ul style="list-style-type: none"> ▪ real per capita income in previous year in county ▪ growth rate in real per capita income in counties adjacent to county ▪ share of county population 25 + with some college ▪ control variables for county characteristics that may influence income growth (economic base, share of income from transfer payments, change in workforce, change in physical capital, nonmetro designation)
<i>Employment</i>	growth rate of county employment	<ul style="list-style-type: none"> ▪ employment in county in previous year ▪ county land area (sq. miles) ▪ share of county population 25 + with some college ▪ control variables for county characteristics that may influence employment growth (share of income from transfer payments, change in physical capital, natural amenity level, nonmetro designation)
<i>Population</i>	growth rate of county population	<ul style="list-style-type: none"> ▪ population in county in previous year ▪ county land area (sq. miles) ▪ share of county population 25+ with some college ▪ control variables for county characteristics that may influence population growth (share of income from transfer payments, change in physical capital, natural amenity level, nonmetro designation)

Table 2.
Impacts of Added Education on County Per Capita Income Growth in the South

Years 1980-2000	Metro	Nonmetro
Mean % of 25 yrs. old or older with some coll. (schooling, 1970)	26.95	18.66
Hypothetical increase in schooling (%)	5.00	5.00
Annual income growth rate, 1980-2000 (%)	1.57	1.51
Change in income growth rate (%)	0.15	0.14
New income growth rate (%)	1.72	1.65
Real per capita income (1980), RCPI	\$10,763	\$8,512
Calculated RPCI (2000), using original growth rate	\$14,697	\$ 11,487
Calculated RPCI (2000) after HK increase, using new growth rate	\$15,134	\$11,812
<u>Change in real per capita income</u>	<u>\$436</u>	<u>\$325</u>

Table 3.
Impacts of Added Education on County Employment Growth in the South

Years 1980-2000	Metro	Nonmetro
Mean % of 25 yrs. old or older with some coll. (schooling, 1980)	26.95	18.66
Hypothetical increase in schooling (%)	5.00	5.00
Annual employment growth rate, 1980-2000 (%)	2.76	1.20
Change in employment growth rate (%)	0.19	0.07
New employment growth rate (%)	2.95	1.27
Employment 1980 (number of jobs in county)	72,816	9,081
Calculated employment (2000) using original growth rate	125,518	11,527
Calculated employment (2000) using new growth rate	130,202	11,678
<u>Change in employment</u>	<u>4,684</u>	<u>150</u>