

# **Good Schools Improve Rural Development Prospects**

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# **Good Schools Improve Rural Development Prospects**

## **Executive Summary**

The role of the local school quality in 1980 to 1990 economic development in South Carolina was investigated using school and community-level data. School quality was measured by high school test scores and student-to-teacher ratios. Findings indicate that school quality does matter, especially in the more geographically isolated rural areas. Both population and employment growth were relatively large in hinterland rural areas with lower student-to-teacher ratios, and population growth was greatest in metro-fringe rural areas with schools reporting high average test scores. Yet rural growth also was influenced by other factors (public services and infrastructure availability, low taxes relative to public expenditures, and high quality of life and housing). The economic development benefits of good local schools will be diminished if the rural area is deficient in other factors important to growth.

# **Good Schools Improve Rural Development Prospects**

## **Introduction**

A concern of many rural communities is their ability to attract new jobs and residents. In the past, community development policy focused on presenting rural locations as low-cost alternatives relative to urban areas for businesses and households. This role of low-cost provider was a viable community development strategy during the 1960s, 1970s, and early 1980s. Recently, however, the intensification of global competition, rapid growth of high technology and producer services industries, and introduction of computer-aided technologies in services and manufacturing suggest a new competitive environment. Within this economic environment, greater emphasis is placed by prospective businesses on labor quality, skills, and productivity. And the local quality of life and the availability and quality of public services are increasingly important determinants of both business and residential locations.

One implication of the new economic environment is that rural development policy must place a greater emphasis on the quality of local public schools and human capital development (Berman, Bound and Griliches). Increased investments in public schools permit improvements in school quality and student performance (e.g., test scores, completion rates, vocational skills). Over time, enhanced student performance contributes to both improvements in the quality of the local labor force and in the community's overall quality of life (through lower crime, more enlightened leadership, and enhanced civic responsibility). The community is more successful in attracting, nurturing, and retaining businesses due to higher labor quality. And the region's attractiveness to residents is enhanced by improvements in the local quality of life. Thus, according to Rasmussen (p. 11), "the success of longterm economic development in some places is therefore inextricably tied to the performance of schools.'

In this paper we will demonstrate that local school quality (measured by high school test scores and student-teacher ratios) is related to industrial and residential growth in rural South Carolina. The discussion is organized as follows. First, we review the relationship between school quality and economic development and conditions that can dampen the positive influences of school improvements. Second, we summarize the methods and data used to test for the association between school quality and rural development. Finally, we present the findings and suggest implications for public policy.

## **School Performance and Economic Development: A Critical Assessment**

Critics of local school improvements as an economic development policy argue that the link between school improvements and local growth is neither straightforward nor automatic. School improvements (generally attempted through increased spending) will not improve a community's development prospects if increased expenditures do not improve the quality of local public education, schools improve but students do not take advantage of the educational opportunities, student educational levels improve but graduates leave the area for employment, or labor force quality is enhanced but deficiencies in other social or economic conditions discourage development. A discussion of these potential "kinks" in the school quality economic development "chain" follows.

School Expenditures and Student Performance. A recent review of the economics of schooling literature (see Hanushek) finds no strong evidence of an effect of school expenditures on student achievement levels after controlling for family backgrounds and other educational inputs. The study (p. 1167) concludes that ". . . schools are operated in an economically inefficient manner . . . (and) . . . increased expenditures by themselves offer no overall promise for improving education." Others suggest, however, that a weak school expenditure student performance relationship is evident because much of the increased spending supports non-instructional functions, programs for handicapped and educationally-disadvantaged students, and special offerings for "gifted and talented" students (Walden). Such programs benefit specific students, but they contribute little to the improvement of overall student performance levels. A Tennessee longitudinal class-size experiment (Word et al.) is more optimistic regarding the ability to improve student performance through increased school expenditures, provided the expenditures result in lower student-teacher ratios and improved individualization of instruction. "This research leaves no doubt that small classes have an advantage over larger classes in reading and mathematics in the early primary grades" (Word et al., p. 5).

Enhanced Students' Performances Contribute Little to Labor Quality. A study of the determinants of rural Georgia wage rates concludes that an individual's educational attainment level is associated with wages received (Kraybill and Variyan). Workers in rural labor markets receive a significant wage reward for higher levels of education even in areas located a considerable distance from a major metropolitan area. However, this return to education in rural areas, while positive, is "strikingly" less than the return available in urban areas (Renkow). Investments in rural education can result in even higher incomes if the educated are willing to relocate to the cities. If this out-migration is significant, local investments in education will not be captured in the local work force, and income streams facilitated by improvements in rural schools will be realized in urban America and not in rural America (Carlin and Ross, Gibbs and Cromartie).

Educational Attainment Levels Affected by Local Economic Opportunities. The availability of high wage occupations (e.g., managerial) decrease the drop-out rate and increase the percentage of graduates continuing their education (Johnson and Stallman). Alternatively, increases in the percentage of local jobs in low wage occupations (e.g., services and trades) increase school dropout rates, since such jobs provided rural youth with an incentive to enter the labor market early. Thus current industrial structure, occupational distribution, and employment opportunities provide students with "demonstration effects" pertaining to the potential benefits of education. And a local labor market that offers economic rewards for education to only a few does little to demonstrate the value of education.

Good Schools Are Necessary but not Sufficient for Development. Location factors important to industries include proximity to markets, labor availability, availability and quality of public infrastructure and services, availability of housing, and quality of life (Herzog and Schlottmann). For many firms, numerous locations offer attractive mixes of the firm- specific location factors. Communities with good schools and labor but deficiencies in other factors likely will not be selected because alternative locations are available with quality schools and labor as well as acceptable qualities and quantities for other area characteristics important to the location decision.

In summary, improvements in rural schools are not likely to contribute to local growth and development if students' performances are not enhanced, selective out-migration occurs, or the community is a poor candidate for development due to factors other than schools or labor quality. Thus the relevant issue regarding school quality and economic development must be framed more specifically

Do "good" schools help communities attract residents and jobs if growth is a realistic goal for the area and other necessary conditions for growth are in place?

### **Testing the School Quality -Economic Development Relationship**

To examine the role of school quality in local economic development, we estimated the association between two measures of local school quality and changes in population and employment for rural South Carolina census tracts after controlling for the influences of other area characteristics." In these statistical estimations we assumed that the location decisions of households and businesses may be interrelated. That is, local characteristics important to households' locations may indirectly influence business locations, and similarly, households' location decisions may be indirectly affected by location factors attractive to businesses. Thus, our model allows for the possibility that "jobs follow people" to a location as well as "people follow jobs."

The link between population and employment change may be examined through a two-equation procedure (referred to as a simultaneous system) as provided below.

- (1) 1980 to 1990 change in census tract population was a function of
  - (a) beginning period (1980) population in tract
  - (b) beginning period (1980) employment within 30 miles of tract (area employment)
  - (c) 1980 to 1990 employment change within 30 miles of tract
  - (d) quality of local public schools serving the tract
  - (e) other community and county characteristics relevant to households' location decisions,
  
- (2) 1980 to 1990 change in census tract employment was a function of
  - (a) beginning period (1980) employment in tract
  - (b) beginning period (1980) population within 30 miles of tract (area population)
  - (c) 1980 to 1990 population change within 30 miles of tract
  - (d) quality of local public schools serving the tract
  - (e) other community and county characteristics relevant to business' location decisions,

The above relationships capture the interdependence between population and employment changes in a locality as well as recognize that population and employment changes in surrounding areas may affect a locality's development potential. For example, 1980 area employment and 1980 to 1990 area employment change are measures of employment opportunities within commuting range of a tract and thus may influence tract population growth. Similarly, area population and population change are measures of a tract's labor market potential, and these characteristics may influence employment growth in the tract. A discussion of the potential determinants of local growth follows.<sup>3</sup>

Fringe versus Hinterland Areas. An underlying hypothesis of this study is that the role of school quality in local population and employment change may vary systematically among nonmetropolitan communities. To test this proposition, census tracts were divided into three categories based on population densities and distances from metropolitan areas' cores. The *urban core* was defined as the Census Urbanized Area of the Metropolitan Statistical Area and the surrounding tracts with population densities over 1000 persons per square mile. The *urban fringe* was defined as the area within a 30-mile

distance from the center of the urban core area. The remaining tracts were defined as the *rural hinterlands* (see figure 1 for the location of core, fringe, and hinterland tracts within South Carolina Functional Economic Areas).

Measures of School Quality. Indicators of local school quality used in earlier studies included expenditures per student, graduation rates, drop-out rates, scores on standardized tests, and pupils-to-teacher ratios. For this study we selected test scores (percent of 11th graders scoring above the national average on a standardized test) and pupils-to-teacher ratios for the local high school and feeder elementary and middle schools. Both measures are available at the individual school level, and the measures reflect alternative attributes of the local educational experience. Pupil-to-teacher ratio is a measure for the relative commitment of local resources to education, while student test scores are an indicator of students' socio-economic backgrounds and academic achievements.

The two selected measures of school quality were assigned to rural census tracts by overlaying school attendance zones and census tract boundaries. In many cases, an entire rural tract was served by one high school, thus tract and school measures were identical. In situations where a tract contained two or more high school attendance zones, tract educational quality measures were a weighted sum of the local school measures with weights defined as the proportion of tract population served by each school.

Much diversity was evident among South Carolina's rural tracts in terms of test scores and student-to-teacher ratios. The percentage of a school's 11th graders scoring above the national average ranged from seven percent to 70 percent with a mean score of 43 percent. Pupils-to-teacher ratios ranged from 15 to 29 with a mean value of 22. Interestingly enough, high schools' test scores and pupils-to-teacher ratios were not highly correlated (Pearson correlation coefficient equals .167). Thus the two measures represent relatively distinct school characteristics that may be accorded different degrees of importance by firms and residents.

The tract-level spatial distributions of the school quality measures are provided in figures 2 and 3. Tracts are partitioned into top, middle, and bottom thirds by students per teacher ratios (figure 2) and percent of students scoring above the national average on standardized tests (figure 3). Two interesting observations may be drawn from the figures. First, as noted earlier, little spatial association is evident between areas with high test scores and those with low student-teacher ratios. Good schools, as measured by our two proxy variables, are distributed throughout the state. Second, near each urbanized area are tracts with good schools as well as tracts with less desirable schools. Thus a variety of school quality areas is available to individuals and firms selecting to locate outside the state's urban cores. If school quality is relevant in residential or firm location decisions, evidence of such should be available from the South Carolina data.

Local Amenity Characteristics. School quality is one of a number of local characteristics that may influence population and employment growth. Thus an examination of the importance of school quality on local development must control for these other influences. Local amenities hypothesized to influence residential location decisions were school quality, crime rates, public service availability and costs, proximity to metro areas, housing availability and quality, access to four-lane highways, racial composition, and income levels and distribution. Local characteristics hypothesized to be of

importance in industrial location decisions were labor quality, public service availability and costs, proximity to metro areas, public infrastructure availability, access to four-lane highways, local quality of life, and school quality.<sup>4</sup>

The above measures selected to reflect local characteristics and amenities may be highly correlated with one another. If so, the use of all the variables may lead to estimation problems and unreliable results. Thus we employed factor analysis to identify the highly correlated variables and to permit the selection of a smaller number of relatively independent characteristics from the original set. Separate factor analyses were undertaken for the tract-level data and amenity measures associated with fringe population, fringe employment, hinterland population, hinterland employment.<sup>5</sup>

For both the fringe and hinterland tracts, per capita incomes, poverty rates, and percent nonwhite were highly correlated. Per capita income was selected among these three measures to represent local income levels and quality of life, and a positive relationship between income and population and employment change is hypothesized.

Among fringe tracts, government expenditures per capita, tax rates, percent houses on sewers, density of water and sewer lines, crime rates, and population density were highly correlated. The more densely populated tracts generally were incorporated areas with both city and county services and the accompanying city and county taxes. Tract population density was selected to represent local differences in public services and taxes. No association between population density and population or employment change is hypothesized, since services availability favors growth but the attendant higher taxes discourage new residents and firms. The remaining amenity measures (distance to metro area, quality of the area's labor force, miles of four-lane highways, quality of the housing stock, pupil-to-teacher ratio, student test scores) were not highly correlated with other characteristics for the fringe tracts. All six characteristics were included in the estimations. Of these measures, high school test scores, access to four-lane highways, labor quality, and housing quality are hypothesized to be positively related to population and employment change. A negative relationship with tract-level growth is predicted for pupil-teacher ratio and distance to nearest metro area.

Results of the hinterland factor analysis are similar to the fringe tract results with two exceptions. Among hinterland tracts, access to four-lane roads and population density were highly correlated -reflecting the tendency to locate four-lane roads near the more populous hinterland towns. Population density was selected to represent these two amenity measures, and a positive association with tract population and employment growth was hypothesized. Also, hinterland per capita public service expenditures and local tax rates were correlated. Local millage rates were selected as, the measure for public services availability and costs. As before, the direction of the relationship between public services availability and tract growth is unknown, since increased services are associated with higher taxes.

Summary of the Findings. Estimation results for the models of local growth are provided in table 1. The findings support the hypothesis that changes in local population and employment are interrelated. For both fringe and hinterland tracts, 1980 to 1990 population change was influenced by 1980 employment levels and 1980 to 1990 employment change in the tracts' labor market areas. The results also indicate the merit of separating tracts according to proximity of the metropolitan areas. Fringe and hinterland tracts exhibited different population-employment interdependencies and dissimilar sets of explanatory variables.

Population change in fringe tracts was positively related to the base year population, employment within 30 miles, tract per capita income (proxy for quality of life), population density, distance from the urban core, and quality of housing stock. Population changes were relatively low in fringe areas with rapid employment growth during the period. Fringe employment change from 1980 to 1990 was higher for tracts with larger 1980 employment bases and proximity to four-lane highways.

Population change in hinterland tracts was positively related to 1980 population, 1980-1990 employment change in the area, and tract per capita income and housing quality. Hinterland tract population change was negatively correlated with 1980 area employment and high public expenditures/tax combinations. Employment change in the hinterlands was positively associated with local employment, area population, population density, and per capita incomes.

Of principal interest to this study is the role of school quality on tract-level population and employment changes. Among the fringe census tracts (tracts within 30 miles of an urbanized area), change in employment was negatively related to schools' pupil-to-teacher ratios and positively related to test scores, but the estimated coefficients were not statistically significant. On the other hand, fringe tract population change was positively and significantly related to the percentage of students scoring above the national average on standardized tests. Thus if households associated high student achievements with good schools, local school quality has a positive influence on future residential growth.

The role of school quality in economic development is less ambiguous for the more geographically-isolated hinterland tracts. Both population and employment growth were negatively (and significantly) related to local schools' pupil-to-teacher ratios. Residential and job growth were slowest in tracts with relatively low investments in school resources. In addition, hinterland tract population change was positively, but not significantly, related to local high school test scores. Yet high school test scores were moderately correlated with per capita incomes for the hinterland tracts (correlation coefficient of .41), and hinterland income levels were an important determinant of tract population growth. If individuals associate higher income communities with better schools (not necessarily a correct assumption for rural South Carolina), then the influence of school quality on residential growth also may be captured by the income variable.

In summary, quality local schools, as measured by test scores and student-to-teacher ratios, provided a positive influence on rural economic development. This influence on area growth was evident primarily in terms of the positive relationship between school quality and population change in both fringe and hinterland tracts. The role of school quality for local employment growth is less clear. Hinterland employment growth was more rapid in tracts with lower student-teacher ratios and areas with higher quality labor. And good schools indirectly stimulated hinterland employment through their positive influence on area population. However, no strong direct or indirect relationships between school quality and employment change were detected for fringe tracts.

### **Summary and Implications**

The purpose of this study was to determine if local residential and job growth were influenced by local school quality after controlling for interdependencies between population and employment change and other potential determinants of change. Our findings for rural South Carolina indicate that school

quality does matter, especially in the more geographically isolated rural tracts. Both population and employment growth were relatively large in hinterland tracts with lower student-to-teacher ratios, and population growth was greatest in fringe tracts with schools reporting high average test scores.

Our findings for rural tracts indicate that investments in local schools is a promising strategy for local growth. Yet the results also demonstrate that local growth was influenced by other factors. Economic development was most rapid in areas with requisite public services and infrastructure, low taxes relative to public expenditures, and high quality of life and housing quality. In our opinion, the additional benefits of school quality improvements on local development will be reduced if the community lacks the desired public services, quality of life, and labor market characteristics. Similarly, improvements in these non- school quality attributes may have only limited impacts if local school quality is relatively poor. It is likely that rural location alternatives are sufficiently numerous that prospective households and firms do not have to settle for communities with serious deficiencies in any relevant amenities.

In conclusion, the importance of school quality as a rural economic development strategy depends on the location and characteristics of the community. Improvements in school quality will enhance community development prospects for those communities with the appropriate mix of other amenities. Thus improvements in local schools and students' performances should be viewed as one, of several, components of a holistic community development process. And in the new competitive environment, local school improvements as a development policy should be elevated to a stature equal to that of the more traditional development policies of infrastructure enhancement, labor training, favorable tax rates, and industrial recruitment. Future competition among rural communities for residents and jobs will be intense, and advantages go to communities perceived to provide good schools and the resulting quality labor force and quality of life.

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1. Earlier studies of the roles of schools and education in rural development were inconclusive (see Kriesel, and Deaton; Crihfield; and Killian and Parker). This lack of consistency probably is attributable to differences among the studies in (a) accounting for the influences of non-school quality variations among areas.
2. Tracts were selected over the generally used counties as the level of observation because counties often contain more than one high school (and their respective "feeder" schools). Thus,
3. Additional information regarding the theoretical and statistical models used in this analysis is
4. Amenities and local characteristics were measured at the census tract level unless specified as government expenditures and tax rates, and school test scores. Reliable measures for these characteristics were not available until 1990. One could argue, however, that the relative high (low) values in 1990 also were relatively high (low) in 1980.
5. one another. For example, communities with high public expenditures per resident also tended to have high tax (millage) rates and high population densities. Factor analysis is a means to identify expenditures, and tax rates "move together," only one of the three characteristics was necessary

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Table 1. Influence of Local and Area Characteristics on Fringe and Hinterland Tracts' Population and Employment Change, South Carolina, 1980 to 1990

Local and Area Characteristics	Direction of Influence on Local Population Change*		Direction of Influence on Local Employment Change*	
	Fringe	Hinterland	Fringe	Hinterland
Local Population, 1980	+	+		
Local Employment, 1980			+	+
Area Population, 1980				+
Area Employment, 1980	+	-		
Area Population Change, 1980 to 1990				
Area Employment Change, 1980 to 1990	-	+		
Local Income and Quality of Life	+	+		+
Local Housing Quality	+	+		
Availability and Cost of Local Public Services	+	-		
Distance to Metropolitan Center	+			
Area Labor Quality				+
Availability of Four-Lane Roads/Local Population Density			+	+
Local School Student-to Teacher Ratio		-		-
Local School Test Scores	+			

\* The absence of a direction of influence sign (+ or -) indicates that the influence was not statistically significant at the .10 level.

Figure 1. The Classification of Urban/fringe/hinterland Tracts

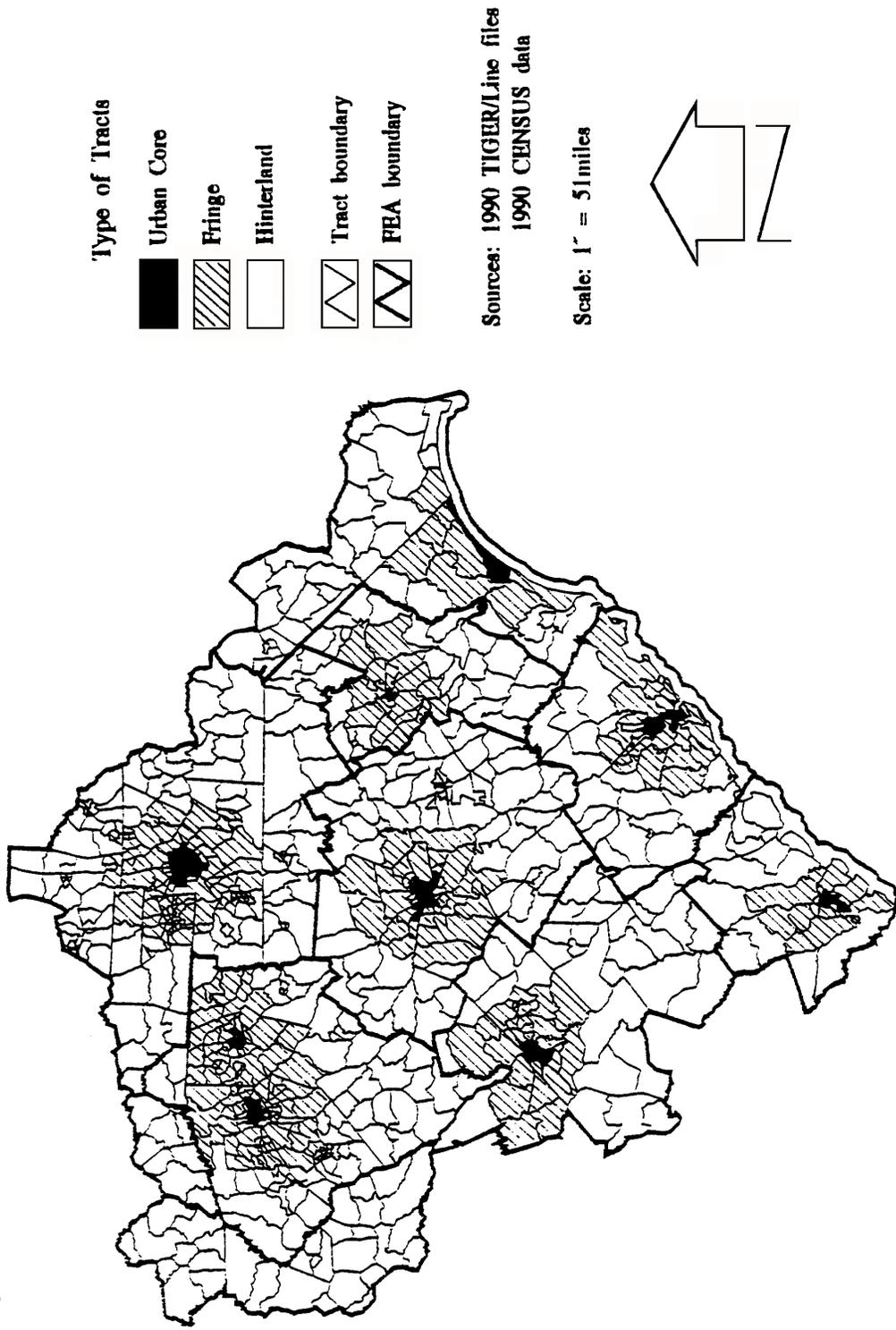


Figure 2. The Distribution of Students Per Teacher by Tract, South Carolina, 1980

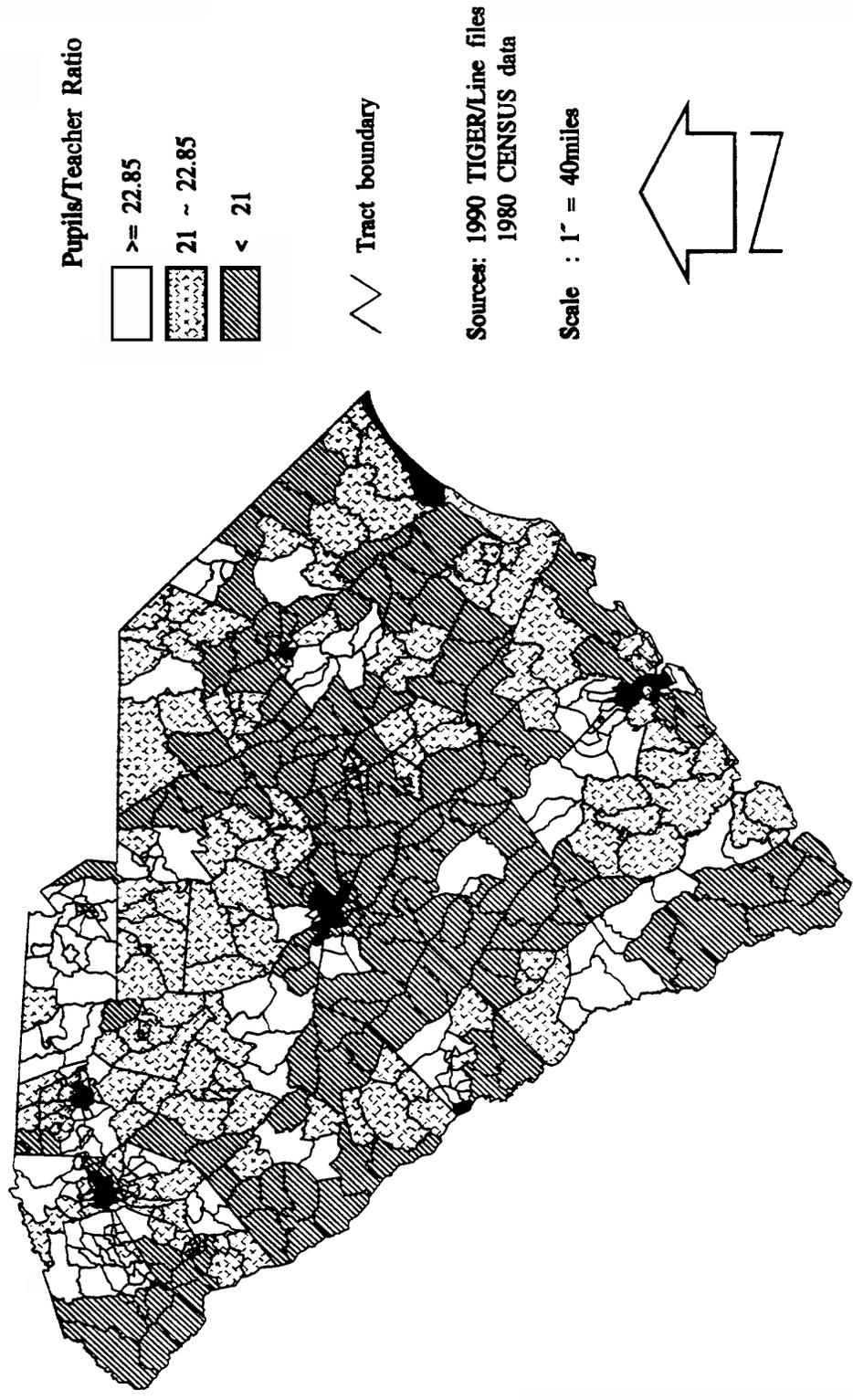
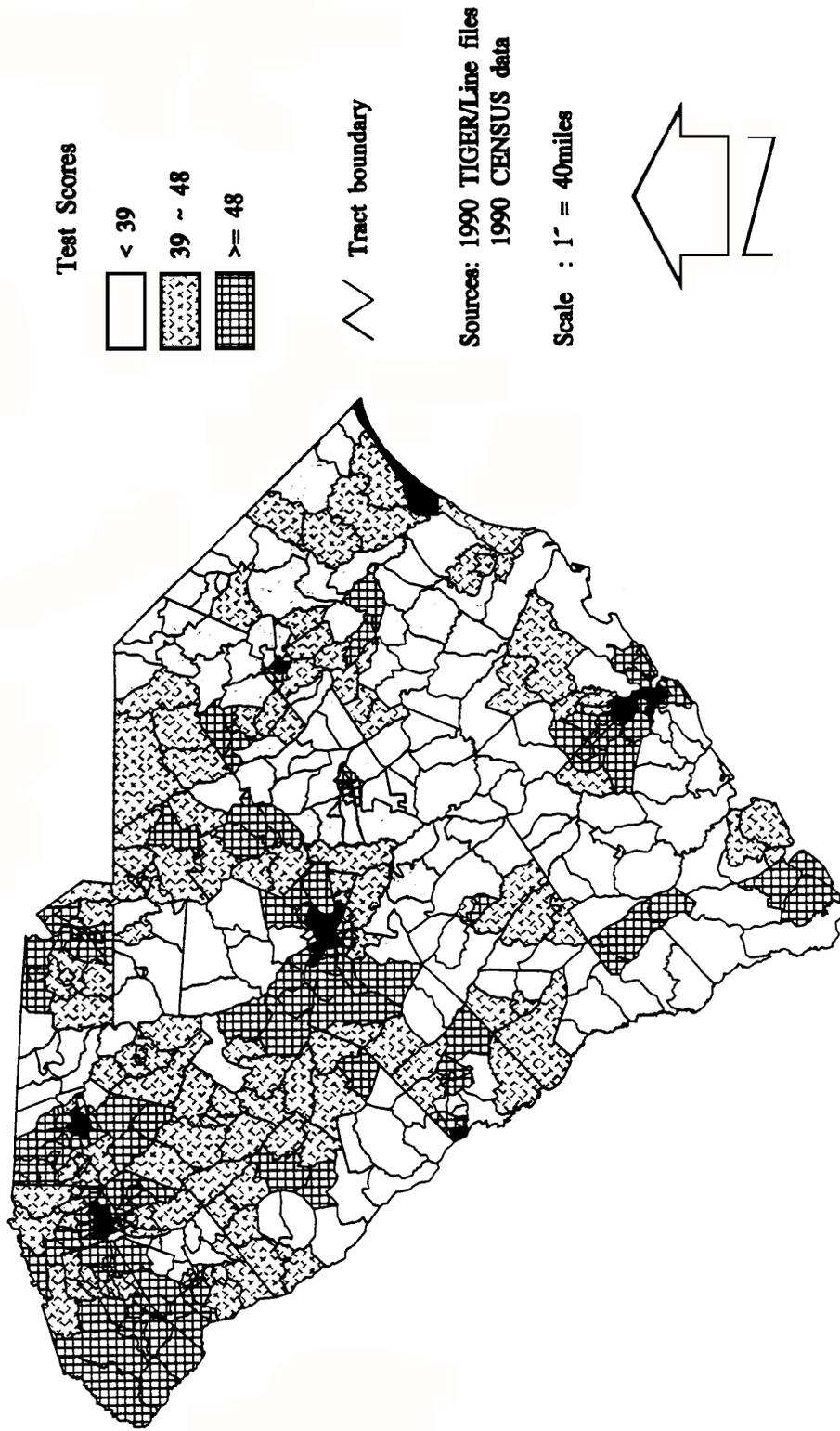
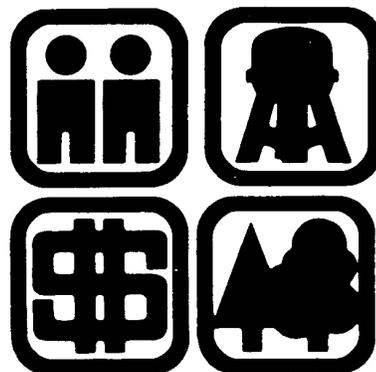


Figure 3. The Distribution of Test Scores by Tract, South Carolina, 1990



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