

Influence of Poverty on Educational Performance in Louisiana: Emphasis on the Mississippi Delta Parishes

Donald R. Andrews, Southern University

Andrew Washington, Southern University

Ashagre Yigletu, Southern University

Saviour Nwachukwu, Southern University

INTRODUCTION

Concern for economic development especially in rural communities is shifting from concern for employment opportunities to that of business formation as a mechanism for building these economies. Thus, education is a major factor impacting economic development in these regions. This is no where more important than in the Mississippi Delta Region, that has been called a "third world nation in the United States." Gupta indicates that raising capital is a major hurdle that small business in rural communities such as the Mississippi Delta face. In addition, the need for increasing the stock and quality of the human capital available in these areas is of major concern. This paper looks at the influence of poverty on educational performance for an economy that is driven by export-based industries. Agriculture, oil and gas mining, petrochemical manufacturing and water transportation activities are major components of the Louisiana economy.

We will examine the impact that poverty has on achievement scores of children from grades K-8 at the individual school level for students in Louisiana public schools. Twelve parishes in the northeastern section of the state were included for special attention, since they are located along the Mississippi River and are in the poorest part of the State. Results suggest that poverty is a highly significant variable influencing educational performance in these parishes. In a recent article in the Baton Rouge Advocate, it was stated "Healthy children and a healthy educational system are the keys to bringing Louisiana's children out of a vicious cycle of poverty, and community activists must be willing to fight to achieve those goals."

REVIEW OF SELECTED LITERATURE {tc "II. Review of Selected Literature" \ 2}

Research on educational production functions has provided an improved method for understanding the influence of specific inputs on student performance. The Coleman study (1966) which indicated that school controlled inputs have little effect on achievement independent of family background has had a major impact on public attitudes and public policy toward education. Hanushek (1986) and others [Perl (1973); Summer and Wolf (1977)] used micro level data to analyze the impact of teacher and school characteristics on performance in an attempt to overcome some methodological criticisms of the Coleman analysis. These studies found teachers and school inputs to be important in academic achievement.

Higher performance in the private schools relative to the public schools [Murnane (1984)] has generated increased interest in the importance of school controlled inputs in the education process. Coleman and Hoffer (1987) suggest that community structure is important in explaining this differential. Greely (1982) finds that minority students (blacks and Hispanics) in Roman Catholic high schools perform better than those in public schools because of different family backgrounds, personal characteristics and superior instruction. According to Greely, Catholic schools are most successful with the poor.

Datcher-Loury (1989), using data from the ETS-Headstart Longitudinal study on low income black children finds that differences in family behavior and attitudes have large and important long term effects on performance. Andrews et al. (1991) find that school, family and community inputs are significant in the educational process and should be considered in any attempt to improve educational performance. Racial composition, family structure, early school programs, parental education and private school enrollment were all important variables in the estimated model.

Borland and Howsen (1992) incorporate a measure of market concentration (Herfindahl index) in their model to account for the influence of competition on school inputs and student achievement. After applying two stage least squares regression analysis they find that more competition results in higher achievement.

STUDY AREA

A comprehensive assessment of the Delta region was reported in The Mississippi Delta: Beyond 2000 Interim Report published by the U.S. Department of Transportation . The Lower Mississippi Delta is defined as consisting of 219 counties in Louisiana, Mississippi, Arkansas, Tennessee, Missouri, Kentucky and Illinois. This study focused on transportation, human capital development (including education, community development, job training, health, and housing); natural and physical assets (agricultural, natural resources, and the environment); and business and industrial development (technological and entrepreneurial enterprise, small business development, and tourism).

The Interim Report (pages 4 - 8) stated that while significant strides have been made in the region and economic development has been a "powerful engine" for improving the quality of life (transportation and infrastructure construction, job growth, etc.), persistent problems still persist. While the Mississippi Delta region has been described as possessing a tremendous amount of natural resources, the economic development of the region has often lagged behind the rest of the nation. Problems such as persistent unemployment in rural areas and inner cities, lower academic resources and technology allocated to low-income and rural students, nutrition, health care concerns, childcare, hunger, nutrition and food security still must be addressed.

According to the Louisiana Department of Labor's November 1999 statistics, Louisiana achieved record high nonagricultural employment for the decade in 44 of 64 parishes. Fifty-four of the 64 parishes had lower unemployment in 1999 than the year before. Lincoln Parish had the lowest unemployment rate (2.4 percent) and West Carroll had the highest (13.4 percent).

Despite the significant improvement in economic prosperity for the state in the 1998-1999 period, Louisiana remains at the bottom of the scale in certain key areas. According to the Bureau of Economic Analysis, in 1997 Louisiana ranked 22nd in the nation (including the District of Columbia) according to total population (4,351,769), yet its 1997 per capita personal income (PCPI) at \$20,473 was 81

percent of the national average (\$25,298) and ranked 42nd in the United States . However, this was an improvement from PCPI of \$12,010 in 1987 when the state ranked 47th in the United States. The state experienced an average growth rate of 5.5 percent in PCPI over the past 10 years (the national growth rate was 4.7 percent).

Data taken from the U. S. Census Bureau revealed that the percent of persons in the U.S. in poverty for a three year average, 1996-1998, was 13.2 percent (0.15 standard error). For the 1997-1998 period, the nation's poverty rate was 13.0 percent (0.18 standard error). A comparison of Louisiana with the national average showed that its poverty rate over the same time period for the three-year period 1996-1998 was 18.6 percent (standard error 1.36) and 17.7 percent (1.56 standard error) for 1997-1998. See Table 1 below for summary data for the twelve parishes in the northeastern section of the state that we refer to as the Mississippi Delta parishes .

The issue for the region and the state is how do you provide the incentives for this economy to make the transformation into the knowledge-based economy. A critical area for making the transformation is investment in human resource development. Investments in human capital in the form of education and training will be a determining factor in the ability of this region to move forward. This will be a formidable task for the region based on information concerning the performance of the current K-8 public education system and the influence of poverty on school performance. While income alone does not guarantee academic success, the lack of economic and financial resources can prevent the acquisition of needed resources for qualified teaching personnel, buildings, equipment, and technology needed to develop a highly-educated and well-trained workforce.

The problem of educational underachievement for Louisiana students began to be addressed during the 1997 Regular Session of the Louisiana Legislature. The Louisiana Department of Education was allocated \$30 million dollars to achieve a balanced and comprehensive approach to improve the reading and mathematics performance of students in kindergarten through third grade (The LA Department of Education, K-3 Reading and Math Initiative, 1999). While the retention rate in the United States is estimated at six percent, Louisiana's retention rate was 7.4 percent for children in grades K-3 during the 1995-96 school year (Shepard and Smith, 1990). According to the Louisiana K-3 Reading and Math Initiative Study, retention in grades K-3 costs Louisiana taxpayers over \$87 million dollars, since educating a child with both state and local funding is approximately \$4,500 per student per year. Based on data analysis provided by classroom teachers using statewide assessment, the reading levels of Louisiana second and third grade students revealed that 40.74 percent read below grade level, 39.65 percent read on grade level, and only 19.61 percent read above grade level.

Literacy provides the foundation for students to acquire many other skills required to achieve academic success. Failure to do so leads to problems in acquiring requisite knowledge and skills to enable them to become productive employees. Increased domestic competition and globalization may leave many Louisiana children behind if they are unable to achieve at national and international levels. According to the 1999 Kids Count Data Book released by the Annie Casey Foundation, Louisiana's children are at serious risk, due to the high number that are living in poverty, grow up in single-parent homes, lack health insurance, depend on welfare, and have parents who are unemployed with limited education and job skills. Poverty is a major concern for the state as a whole. In 1998, Louisiana ranked among the top three states in the nation for its high incidence of poverty.

Table.1
Income and Poverty Characteristics for Delta Parishes in Study Area

PARISH	PCPI 1989	1989 Poverty Children (Age 5-17)	PCPI 1997	1997 PCPI RANK (64 PARISHES)
Caldwell	\$8,308	38.1%	\$15,892	42
Catahoula	7,862	42.6	14,640	56
Concordia	8,391	40.1	15,511	48
E. Carroll	6,059	69.7	13,611	63
Franklin	7,607	43.5	14,142	59
LaSalle	9,015	23.4	15,684	45
Madison	6,723	58.1	13,892	61
Morehouse	8,547	42.0	15,914	41
Ouachita	10,593	32.6	19,723	13
Richland	7,791	42.9	15,370	50
Tensas	7,896	56.9	16,175	39
W. Carroll	7,611	32.6	13,802	62

Source:

* LEAP, Center for Business and Economic Research, University of Louisiana at Monroe, LA.

**U.S. Department of Commerce, Economics and Statistics Administration, Bureau of Economic Analysis.

[1][2][3][4]REGRESSION ANALYSIS

[5] Ordinary least squares (OLS) regression analysis was used to estimate the impact of school size, poverty, being in the Mississippi Delta and city size on the student performance score variable. This data is being made available from the Louisiana Department of Education to the general public with schools classified as; schools of (1) academic excellence, (2) academic distinction, (3) academic achievement, (4) above average (5) below average and (6) unacceptable. Table 3 below contains the regression results that we obtained using SPSS for windows. The analysis is provided for 817 K-8 public schools located in Louisiana for the 1998-1999 school year. The dependent variable, student performance score (SPS) is a weighted composite of four dimensions of student performance in school. This variable is made up of the LEAP 21 test scores for grades (4, 8) weighed at 60 percent, the Iowa Tests scores (grades 3, 5, 6, 7) weighted at 30 percent, attendance (grades K-8) weighted at five percent and dropouts (grades 7-8) weighted at five percent. The LEAP 21 (Louisiana Educational Assessment Program for the 21 Century) tests measure student learning in English, language arts and mathematics. Beginning in 1999-2000 students in fourth and eight grades whose scores are

unsatisfactory will not be promoted. However, summer school and test retakes will be provided for these students.

Data on the independent variables are obtained from the Department of Education and are provided on school enrollment (Student Count in Grades K-8), poverty (Percent Students in Poverty) as measured by students receiving reduced cost meals and a dummy variable if the school was located in the Mississippi Delta parishes (MISSDIST), where a value of one was assigned to parishes located in the delta and zero otherwise. A dummy variable for community structure (Community SIZE) was used to distinguish between schools that were located in large cities, mid-size cities and large towns being given a value of one, while rural areas, small towns and the urban fringe are given a value of zero. The descriptive statistics of the variables used in the regression are presented in Table 2. The population of 817 schools had a mean performance score of 71.0803. The average number of students (K-8) per school is 442.28. The mean percent of students in poverty as measure by receiving reduced cost for meals is 68 percent. Lastly nine percent of all the schools in the study are in the Mississippi Delta region and 34 percent are in the larger population areas.

**Table 2
Descriptive Statistics**

	Mean	Std. Deviation	N
School Performance Score	71.0803	23.8971	817
Student Count in Grades K - 8	442.2766	201.2445	817
Percent Students in Poverty (%)	67.757%	21.837%	817
MISSDIST	9.058E-02	.2872	817
Community SIZE	.3390	.4737	817

Regression results are presented in Table 3. Results indicate that all independent variables are significant with the expected signs with the exception of MISSDIST and that 70 percent of the variation in school performance can be explained by the independent variables. It was expected that being located in the Mississippi Delta Region would have a negative impact on school performance given that this is an impoverish region. However, given that poverty is accounted for in the model, as well as school size and city/town size results suggest that schools in this region scored approximately three points higher on average than school located outside this area. This could be the results of programs targeted to highly disadvantaged areas. As expected school size, poverty, and larger community size locations all have a negative impact on school performance.

**Table 3.
Regression Results (Dependent Variable: School Performance Score)**

Variables	Constant	Students K-8	Poverty(%)	MISSDIST	SIZE
Coefficients	138.502*** (66.538) ^a	-.0095*** (-3.907)	-.905*** (-41.192)	2.963* (1.800)	-6.437*** (-6.389)
	R ² = .698	Adjusted R ² = .697		Std Error of Estimate 13.15	

^a t-statistics are in parenthesis
*** Significance Level = .01
* Significance Level = .10

Tests for multicollinearity and heteroskedasticity did not reveal any problems. The values for the variance inflation factor (VIF) used to check for multicollinearity were all below 1.2. Information from the residual plots did not provide any nonrandom patterns. Information on the residuals and partial regression plots are provided in the appendix.

SUMMARY AND CONCLUSIONS

Results from the analysis indicate that student performance is significantly related to the variables (size of school, poverty, location in the Delta area and community size) included in the model. The relationship between the dependent variables and the independent variables is highly significant in that 70 percent of the variation in the student performance score are as explained by these four variables. Smaller school size is estimated to have a positive impact on student performance. The most significant variable in the model is poverty. As the percent of students in poverty increases, the level of performance decreases. Larger population areas performed below smaller population areas. Finally, the parishes located in the Delta area performed slightly above other parishes, which was not expected. One possible explanation for this result is that this area has been associated with special poverty assistance programs, with educational assistance being one of the major activities developed.

These results confirm the expectation that student performance is highly impacted by poverty. Poverty levels in Louisiana are among the highest in the nation. This study provides information that a major effort will be required in order for the state to move forward with its desires to transform the economy. Efforts to boost student performance will require activities that provide learning opportunities in low income environments. Additional research is needed to provide information on the specific variables within the poverty factor that are significant to school performance. It is encouraging to observe that the schools located in the Delta area actually scored above other schools once we adjusted for poverty, school size and community size.

Additional research with improved data are needed for analysis in providing a greater insight into educational program activities that can improve performance. Issues such as access to health care, nutrition, learning support resources, student mentoring, school resources and student motivation are all areas that need investigation if the impact of poverty is to be fully understood. A better understanding of the influence of poverty can lead to an improvement in the utilization of scarce resources to combat student performance scores in Louisiana's public schools .

REFERENCES

- Andrews, Donald R., Bichaka Fayissa and Uday S. Tate (1991). An Estimation of the Aggregate Educational Production Function for Public Schools in Louisiana. *The Review of Black Political Economy*, Summer, p. 25-47.
- Betts, Julian R (1996). Is There a Link Between School Inputs and Earnings? Fresh Scrutiny of an Old Literature. In *Does Money Matter? The Effects of School Resources on Student Achievement and Adult Success*, ed. Gary Burtless. Washington, D.C.: Brookings Institution Press, 141-191.
- Borland, Melvin V. and Howsen, Roy M. (1992). Student Achievement and the Degree of Market Concentration in Education. *Economics of Education Review* 11 (1), p. 31-39.
- Coleman, James S. et al. (1966). *Equality of Educational Opportunity*. U.S. Office of Education, National Center for Educational Statistics, Washington, D.C.
- Coleman, James S. and Thomas Hoffer (1987). *Public and Private High Schools: The Impact of Communities* (New York: Basic Books).
- Datcher-Loury, Linda (1989). Family Backgrounds and School Achievement Among Low Income Blacks, *Journal of Human Resources*, Summer, p 528-544.
- Epple, Dennis and Richard E. Romano (1998). Competition Between Private and Public Schools, Vouchers and Peer-Group Effects. *American Economic Review* 88. (1), p 33-62.
- Greely, Andrew M. (1982). *Catholic Schools and Minority Students*, New Brunswick: Transaction Books.
- Hanushek, Eric (1986). The Economics of Schooling: Production and Efficiency in Public Schools, *Journal of Economic Literature*, September, p. 1141-1177.
- Jackson, Pamela. Analysis of the Industry of Education in Southeastern Michigan with Emphasis on School Competitiveness and its Relevance to Student Achievement, Paper Presented at the Annual Meetings of the American Economics Association and the National Economic Association, Boston, Massachusetts, January 7-9, 2000.
- Levin, Henry M. (1991). The Economics of Educational Choice. *Economics of Education Review* 10 (2), pp. 137-158.
- Louisiana Department of Education (1999). *K-3 Reading and Math Initiative, Reaching for Results*.
- Marsha Shuler (2000). Health Care Called Crucial to End Poverty. *The Advocate*, February 16.
- Murnane, Richard J. (1984). A Review Essay – Comparisons of Public and Private Schools: Lessons from the Uproar, *Journal of Human Resources*, Spring, p. 263-277.
- McElroy, Susan Williams, “The Effect of Computer Use in High School on College Enrollment and Early Labor Market Outcomes,” Paper Presented at the Annual Meetings of the American Economics Association and the National Economic Association, Boston, Massachusetts, January 7-9, 2000.
- Perl, Lewis J. (1973). Family Background, Secondary School Expenditure and Student Ability, *The Journal of Human Resources*, Spring, p. 156-180.
- Rouse, Cecilia Elena (1998). Schools and student Achievement: More Evidence from the Milwaukee Parental Choice Program. *Federal Reserve Bank of New York, Economic Policy Review* 4 (1), pp. 61-79.

Summers, Anita A. and Barbara L. Wolfe (1977). Do Schools Make a Difference? The American Economic Review, Summer, p. 639-652.

U.S. Department of Transportation. The Mississippi Delta: Beyond 2000 Interim Report.

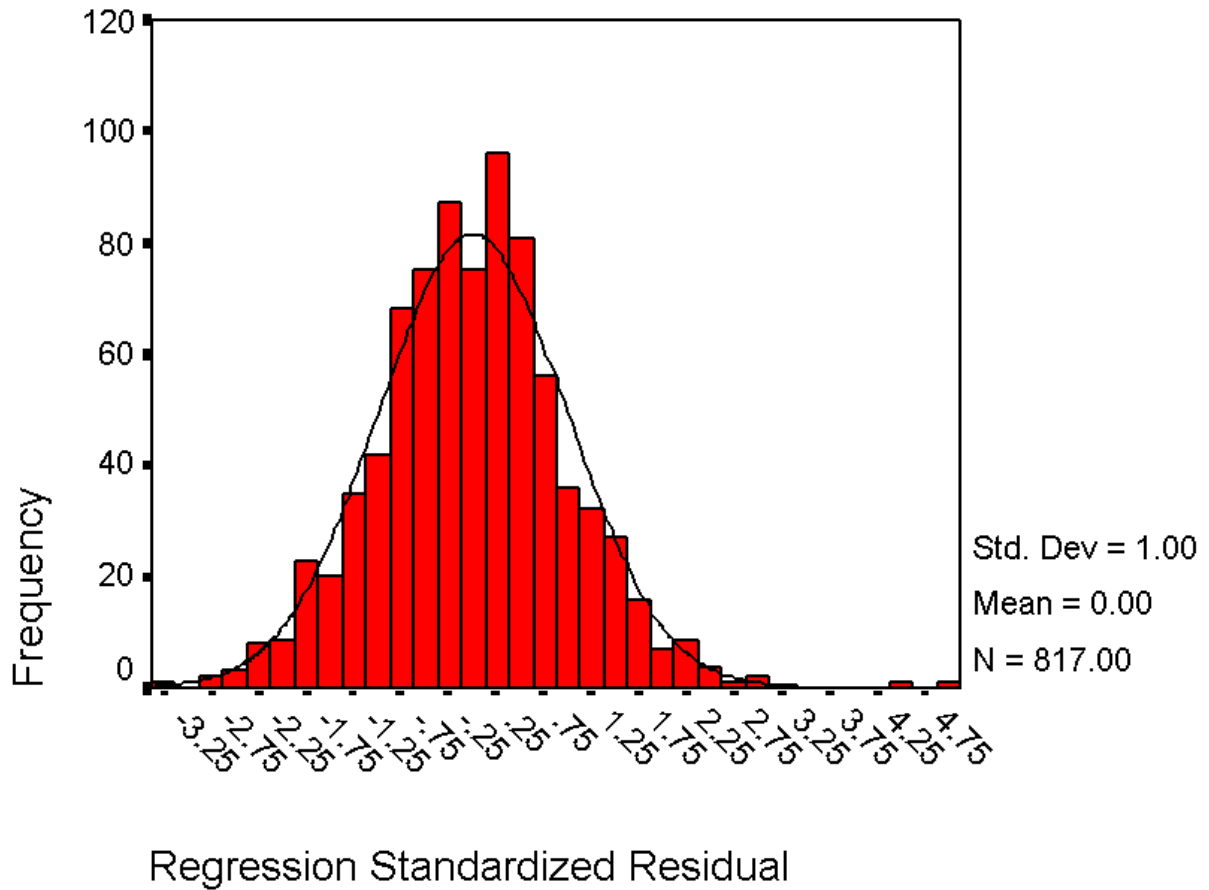
Zanzig, Blair R.(1997). Measuring the Impact of Competition in Local Government Education Markets on the Cognitive Achievement of Students. Economics of Education Review 16 (4), pp. 431-441.

APPENDIX

RESIDUAL PLOT, AND PARTIAL REGRESSION PLOTS
FOR POVERTY AND STUDENT ENROLLMENT

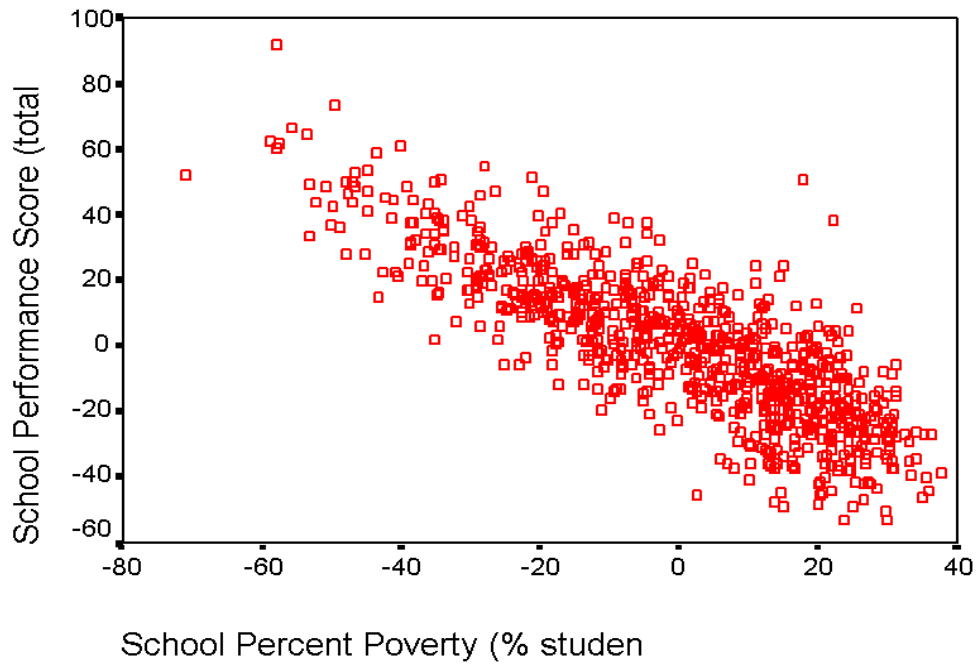
Histogram

Dependent Variable: School Performance Score



**RESIDUAL PLOT, AND PARTIAL REGRESSION PLOTS
FOR POVERTY AND STUDENT ENROLLMENT**

Dependent Variable: School Performance Score



**RESIDUAL PLOT, AND PARTIAL REGRESSION PLOTS
FOR POVERTY AND STUDENT ENROLLMENT**

Dependent Variable: School Performance Score

