RURAL ELEMENTARY AND SECONDARY EDUCATION: FUNDING AND ALLOCATION ISSUES

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Education reform remains a critical public policy issue after more than a decade of discussion and reform in public elementary and secondary education in the United States. Curriculum reform was recently the focus of a special supplement to the *Wall Street Journal*. What American education must do to provide the human capital base to maintain and sustain the United States' economic competitiveness, however, remains a critical public policy question. Policymakers, parents and businessmen do not know just what educational dollars should purchase, but they know that they are not getting it!

The 1980s saw a wave of education reform at the elementary and secondary level in response to a public belief that American schools were failing the nation by turning out students who lacked skills to be competitive in a global economy. This belief was supported by studies of organizations such as the National Commission on Excellence in Education, the Business-Higher Education Forum, and the Southern Growth Policy Board.

A key theme in calls for educational reform has been, and continues to be, competitiveness in a global economy. Anthony Carnevale, economist for the American Society for Training and Development, estimates the annual economic costs of this poorly educated work force at approximately $25 billion in remedial training and lost productivity.

While education policy is directed at affecting school outcomes, it is strongly related to funding. To increase service levels or school output, public schools must raise more funds through local sources, increase the level of transfers received from other units of government, or use existing funds more efficiently. Thus, increasing levels of education output require new or expanded local or state tax support, or a better understanding of the education process so gains can be made in production efficiency. As rural areas continue to face difficult economic times, education funding and efficient allocation of resources within school systems will become increasingly important issues for rural schools. Without strong fiscal support for rural education and improved efficiency in the development and delivery of

education programs, rural education will not be able to provide the human capital base needed to sustain rural economies. Students who graduate from these schools will lack the skills and abilities to compete for employment in a competitive work force.

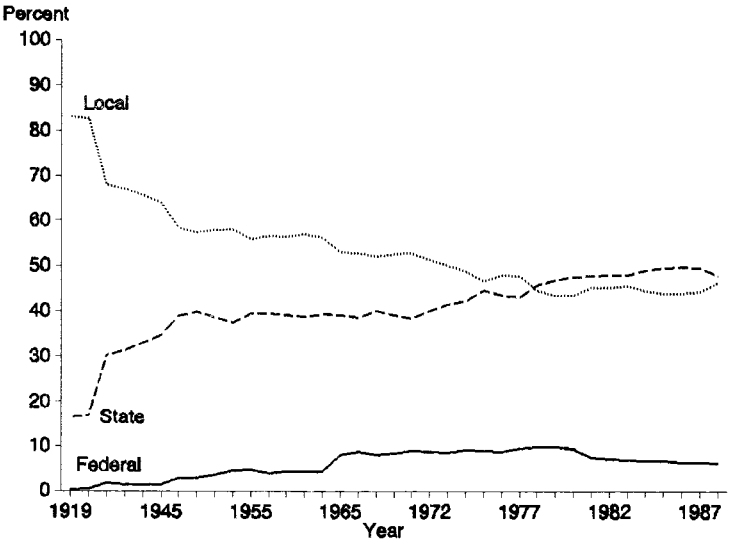
Public Elementary and Secondary Funding

Public elementary and secondary education has undergone dramatic changes in size, structure and funding levels over the past fifty years. There has been a dramatic decline in the number of school districts while student enrollments soared. In 1949-50 there were 83,718 school districts in the United States with an enrollment of about 25 million students (U.S. Department of Education). Average school district size was 300 students. By 1990, national student enrollment had increased to more than 40 million students, while the number of school districts dropped to fewer than 16,000 and average school district size had increased to slightly more than 2,600 students. The decline in the number of one-teacher schools underscores the changes that occurred in rural education. In 1953, there were over 42,000 one-teacher schools in the United States representing 31 percent of all public schools (U.S. Department of Education). The number of one-teacher schools had declined to 729 by 1987, making up less than a tenth of a percent of the nation's 84,427 schools. Rural and urban school districts closed, consolidated and grew in response to the continuing economic and demographic restructuring of rural communities.

Increased funding for education accompanied student enrollment growth. Nationally, total per pupil expenditures for education (measured in constant 1990 dollars) increased from $449 in 1920 to $5,717 in 1990. Per pupil expenditures increased 33 percent over the reform decade of the 1980s. The funding growth for public education has been accompanied by a shift from local government as the primary source of funds for education to a shared local-state government funding system (Figure 1). Funding for public elementary and secondary education shifted from an average of 83 percent local sources (primarily property taxes), 17 percent state funds and less that 1 percent federal funds in 1920 to an average of 46 percent local, 48 percent state and 6 percent federal. There remains, however, considerable variation in distribution of funding support by source across states. At one extreme is Hawaii with about 87 percent of funding for public education coming from state sources. New Hampshire is at the other extreme with 91 percent of total school funding coming from local sources.

Instructional services accounted for 67 percent of budgeted school district funds for the 1988-89 school year according to the Education Research Service (Robinson and Protheroe). At-school administration represented 6 percent of the budget and central administration 5 percent. About 8 percent of the budget was allocated to student

Figure 1. Public Elementary and Secondary School Funding, by Source, 1919-1988



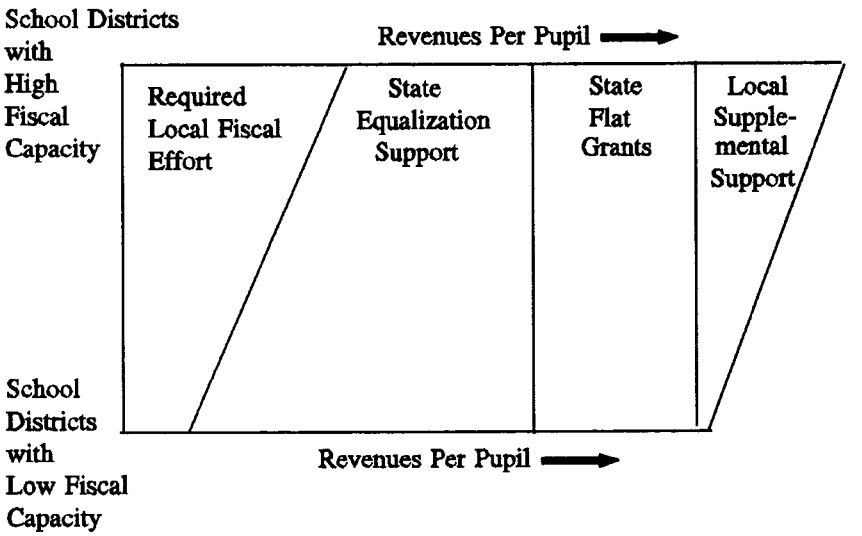
services (health, attendance, transportation, food, student activities). Maintenance and operations (9 percent), utilities (3 percent) and other current expenditure (3 percent) were the other budget categories. About 78 percent of current school expenditures (total expenditure less capital outlay, debt service and state pension contributions) is for staff salaries.

The growing state involvement in education funding has impacted local education as state mandates and regulations influenced almost all aspects of public education. State school finance systems provide flexible instruments for promoting state education policy objectives (Salmon). State funding systems have been structured to promote consolidation, curricula and student services policies at the district level through fiscal incentives and/or penalties based on compliance with state guidelines.

Most state school aid programs use a combination of flat grants and fiscal equalization grants to allocate state funds to school districts. Funds are generally allocated to achieve equity in per pupil expenditures, with little consideration to the actual costs associated with education. School districts can raise additional supplemental funds through tax levies in excess of the locally required fiscal effort. The structure of state education aid formulae directly affects rural education by determining funding levels available to rural school districts. Figure 2 illustrates a school funding system graphically.

Flat grants are allocated to school districts on some unit measure, such as average daily membership, independent of the district's

Figure 2. State School Funding: A General Model



Source: Adapted from Salmon, Dawson, Lawson and Johns.

wealth or fiscal capacity. The fiscal impact of flat-grant funding for metropolitan versus rural schools is generally considered neutral because allocations are independent of school size, local fiscal capacity, or other measures of school district size, wealth or performance. If a flat-grant system funded education at a level sufficient to achieve state and local education objectives, all districts would be treated equally. Most flat grants, however, do not provide enough resources to fully fund education needs. Local funds are required to supplement state funds. To the extent that rural communities lack the fiscal capacity to raise sufficient revenue to support education, they are negatively affected by state reliance on a flat-grant system to allocate state aid funds.

Equalization grants are allocated to school districts in accordance with the district's fiscal capacity. Wealthier districts are required to raise a higher level of local funds than districts with less capacity in order to obtain state equalization funds. Equalization funding systems attempt to equalize per pupil funds to assure equity for pupils across school districts, equalize access to revenue to provide taxpayer equity, or some combination of the two approaches (Verstegen). If a large share of state funds are allocated through equalization grants, rural areas tend to benefit. Equalization grants are the primary means of allocating state aid for education in most states (Salmon, et al.; Verstegen). Forty-one states used equalization grants as the primary method for allocating funds in the 1986-87

school year compared to eight that relied primarily on flat grants. The other state, Hawaii, has full state funding.

The components of state school aid programs and how they are measured impact school districts' fiscal situation. Pupil numbers, local fiscal capacity, transportation grants, cost-of-living adjustments, scale economies provisions, growth trends, capital and debt service programs, and incentive grants are among the factors that influence the level of funding available for education in rural school districts. How states measure these factors for funding purposes has important implications for rural education funding. Rural school districts tend to receive more equalization support when multiple measures are used to assess local fiscal capacity than when states rely solely on some measure of per pupil property valuation. Incorporating income measures into fiscal capacity measures, therefore, favors rural communities in state equalization allocations.

Many state education finance programs provide special support to rural school districts recognizing that small, rural school districts face higher operating costs (Bass). Twenty-four states allocate funds to rural areas in excess of the average per pupil guarantee on the basis of size and isolation factors. Sixteen states allocate additional transportation funds based on density factors. Nine states allocate funds to schools to plan or conduct cooperative programs.

Rural Schools

Rural school districts vary in size, structure and wealth. While many rural schools have wealth sufficient to meet the local share of funding requirements, many do not. Evidence suggests that small schools face higher per pupil cost for education. Fox concluded from a review of thirty-five school-size economies studies conducted in the 1970s that the minimum high school cost size was in the 1,400 to 1,800 pupil range. More recently, DeBoer and McNamara estimated a minimum school district cost size of 4,876, although most size economies were achieved when districts reached 1,800 students. Other research suggests minimum cost-size thresholds with enrollments of 500 students (Walberg and Fowler). Higher per pupil costs of small districts are associated with minimum fixed costs for inputs such as facilities, teaching and administrative staff, equipment and transportation that are required to deliver a basic education program.

School districts experiencing declining enrollments, many of which are rural districts, face higher and increasing costs. A study of Michigan schools indicated that declining enrollments result in sharp increases in per pupil expenditures because of limited short-term flexibility in purchasing inputs (Cavin, Murname, and Brown). Over time the expenditure level declines as school districts adjust input purchases to expected current enrollment. Some of the increase is the result of increased overhead associated with state and federal

requirements for maintaining and reporting data on various school operations (Anderson and Mark).

Rural Fiscal Capacity: Funding Implications

Rural communities throughout the United States have experienced economic decline as their economic and population bases continue to respond to changing economic conditions. In a 1990 study, Green and Schneider identify 583 counties with employment dependency on farming, mining and textile sectors that are experiencing fiscal stress because of declines in income and employment, declining property valuation and population out-migration. Drabenstott and Welch summarized the rural economy's performance during the 1980s as weak, especially in counties with strong dependency on farming and mining. Further, rural growth was proportional to rural places' proximity to metropolitan areas. The more remote a county, the less economic activity.

Local governments in America first began using property tax revenue to finance education in 1646 (Walker). Approximately $71 billion in local school revenue was raised from property taxes in 1987. Agricultural counties experienced dramatic declines in real property valuation as land values fell an average 27 percent from 1982 through 1989 (U.S. Department of Agriculture). Declines in agricultural income further impacted communities as the property values of towns declined about $15 for every $1,000 drop in permanent farm income (Stinson). Consequently, school district fiscal stress has been especially severe in farm states (Chicoine).

Average rural income of $18,142 is 74 percent of the average metro income. Rural household income levels are about 28 percent lower than metro levels (Economic Research Service). Young, educated persons continue to migrate from rural areas, potentially impacting rural communities' chances for attracting future economic investment which would sustain and expand their income, employment and tax base. Declines in a community's total assessed valuation of real and personal property can severely impact school districts' ability to raise funds locally.

A shrinking income and employment base suggests increasing fiscal stress, as all taxes including property taxes, are paid out of income (Reeder). Rural governments already spend 38 percent less per capita than their urban counterparts. Part of this difference is the result of lower service costs in rural areas. Reeder suggests the lower spending also reflects lower service delivery levels because low incomes and tax bases limit local government's ability to provide more than basic services. Policymakers must be concerned about maintaining a rural educational system that will prepare rural youth to be productive members of society, recognizing that a large share of these people will migrate from rural communities in search of in-

come and employment found in metropolitan areas. Rural communities' ability to provide the financial support necessary to operate effective educational institutions will be a critical issue as rural schools approach the 21st century.

Policy Options for Supporting Rural Education

Future funding of rural education will become an increasingly important issue as fiscally stressed rural governments seek financing to support local services. The current budgetary problems facing state governments make it unlikely that they will be able to come to the aid of rural school districts. Several policy options have been suggested (Alexander, Bass, Honeyman, Salmon) that would provide financial assistance to rural schools. The current fiscal difficulties of state governments suggest that restructuring of equalization formulae to aid rural areas is more likely than general increases in the level of state aid to public elementary and secondary education. However, metro areas, given their fiscal condition, are likely to strongly resist efforts to allocate funds away from themselves. Policy options that state and local education policymakers should consider include:

- Increased federal funding for public elementary and secondary education.
- Full state assumption of public school funding through flat-grant programs to fund education through local school districts.
- State use of equalization formulas that provide supplemental funds to small school districts to offset higher per pupil costs associated with small schools.
- Use of multiple economic indicators to determine local fiscal capacity for state equalization formulae. Property value measures tend to overestimate rural communities' fiscal capacity relative to urban areas.
- Expanded state categorical grants to school districts that are undergoing enrollment decline to offset both long- and short-term increases in per pupil costs.
- Expanded state funding of transportation programs so that a disproportionate share of rural school funds are not allocated to transportation activities.
- Creation of state capital outlay and debt service programs that provide funds to rural schools that do not have the fiscal capacity to build and maintain school facilities.

How Should Funding for Education be Allocated?

As noted in the introduction, for over a decade national studies have focused on the declining performance of the nation's schools.

The first part of this paper has focused on several aspects of school financing and the potential implications for rural education. Schools have become more costly in both nominal and real terms while performance is perceived to be declining. This section will examine issues in allocating education funds. First, however, we examine aggregate measures of education for general insight into historic school performance trends.

Education Performance

Public education has seen strong growth in real per pupil funding over the past several decades. State and federal regulations and mandates have opened access and established standards for school systems to assure all students receive a socially-acceptable, minimum level of education. Methods of how to assess schools' success in terms of students learning or other education outcomes, however, remain limited. One of the difficulties in assessing the success of American education is lack of criteria to measure how effectively schools have educated students or prepared them for the work place. Imbedded in this evaluation issue is an understanding that work place preparedness is not the only function of public education, nor necessarily the primary function.

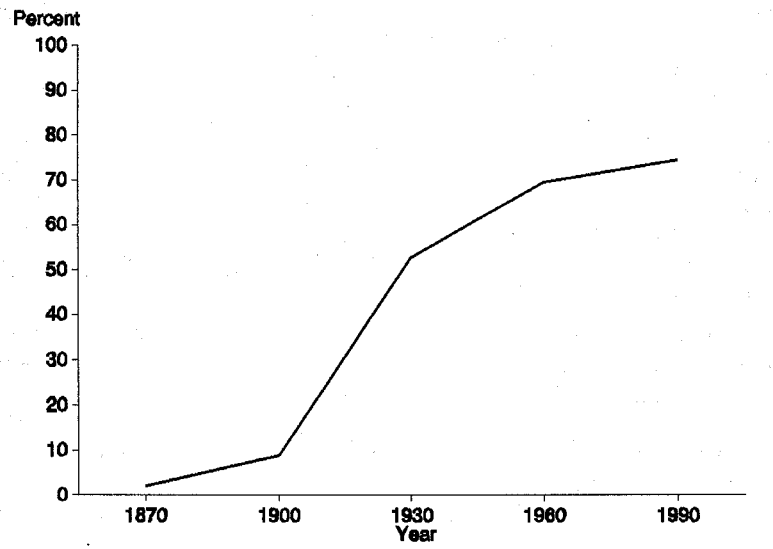
How can the success of the American public education system be measured? Assessing gains in the general education level of the American population is one method of measuring the system's production. In 1870, the 16,000 students who graduated from high school represented about 2 percent of the 815,000 19-year-olds in the United States (Figure 3). This percentage grew steadily through 1968-69, peaking at just over 77 percent. The ratio dropped to 71 percent by 1980 and began a slight increase through 1990. The 2,592,000 students that graduated from high school in 1990 were about 74 percent of the 19-year-old population.

The dropout rate is another measure that is used for evaluating schools' success. Among persons aged 16 through 24 years old, the number of high school dropouts[1] declined from 17 percent in 1967 to 12 percent in 1990 (Figure 4). Blacks appear to have made the greatest gains with the percentage of black dropouts declining from 29 percent to 13 percent. The percentage of the Hispanics population classified as dropouts fluctuated around 30 percent over the 1972-1990 period ending with a 32 percent dropout rate showing little improvement.

Statistics on high school graduation and dropout rates suggest that schools have had mixed success in educating the American population. While the share of black Americans completing high school has increased dramatically, there has been little improvement in the

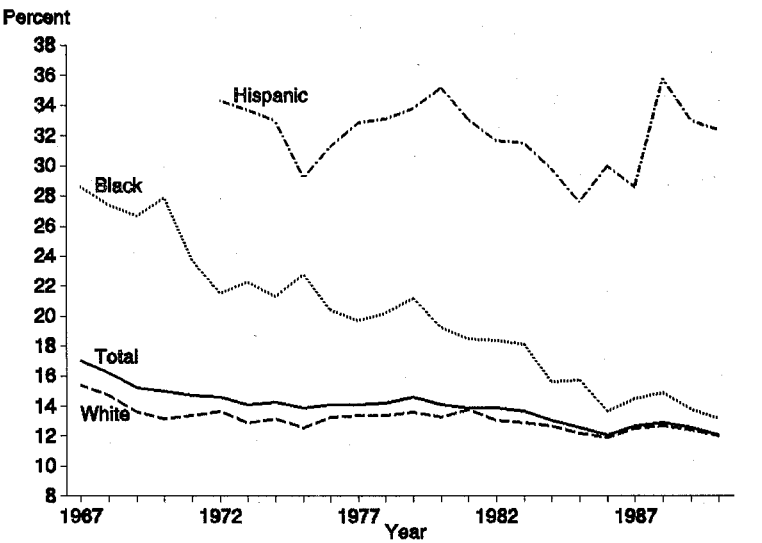
[1]Dropouts are classified as persons not enrolled in school who do not have a high school diploma or GED certificate. Data are based on sample surveys of civilian noninstitutional population.

Figure 3. High School Graduates as a Percent of 17-Year Old Population, 1870-1990



Source: *Digest of Education Statistics*, 1991, Table 95.

Figure 4. Percentage of High School Dropouts Among Persons 16-24 Years Old, 1967-1990



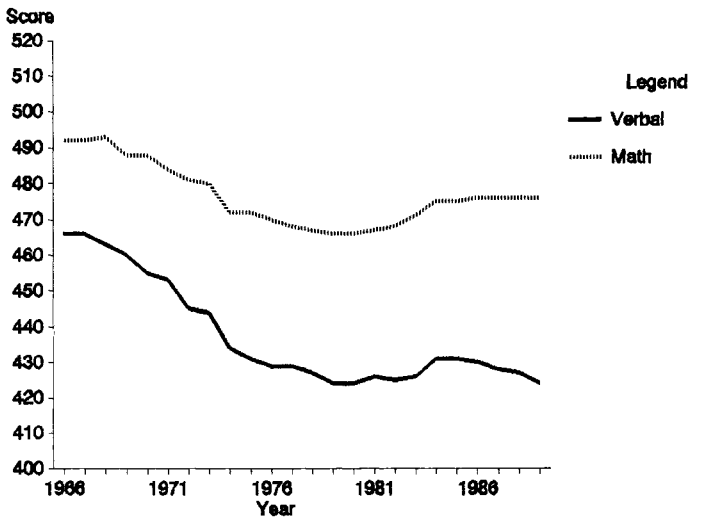
Source: *Digest of Education Statistics*, 1991, Table 98.

number of whites or Hispanics completing education. The percentage of persons in the United States completing high school rose steadily to a plateau of about 75 percent. For the past twenty years the nation has not been able to improve on this share with roughly 25 percent of the population quitting school before completing high school.

High school completion and dropout rates mask issues of education quality and graduates' ability to participate productively in American society upon completion of high school. Completing twelve years of elementary and secondary education does not assure that individuals have developed either the skills or the motivation to be productive citizens.

Standard achievement test (SAT) scores are frequently used as an indicator of student performance with the implication that test scores also measure school performance. Figure 5 shows the historical pattern of verbal and math SAT scores since 1966. Similar data for the decade prior to 1966 shows a fairly stable path from 1956 to 1963 with a sharp decline from 1963 to 1989. The raw data shows a modest upturn starting about 1980. Hanushek attributes a part of the decline from 1963 to 1980 to the increase in number of children per family during that period (Hanushek, 1992, p. 105). This conclusion comes from a study utilizing Iowa Test Scores in which he identified a negative relationship between test scores and family size. Apparently a reversal in family size toward smaller families has had a modest positive effect on SAT scores since the early 1980s.

Figure 5. Average SAT Scores by Subject



Source: *Digest of Education Statistics*, 1991, Table 123.

The Challenge of Reconciling Conflicting Data

Despite improvements in school inputs such as teachers, school performance does not seem to have improved. Looking at just raw data on student performance and school inputs, many observers would agree with the statement by Hanushek,

> The data on the schooling sector suggests a number of puzzles . . . the constantly rising costs and "quality" of the inputs of schools appear to be unmatched by improvement in the performance of students. It appears from the aggregate data that there is at best an ambiguous relationship and at worst a negative relationship between student performance and the inputs supplied by the schools (Hanushek, 1986, p. 1148).

Schools absorb a large proportion of public expenditures at the local and state level. Through provision of funds, mandates and administrative guidelines, many of the inputs that affect school performance are controlled by state policymakers. Given the nature of the problems involved, the sometimes conflicting nature of the recommendations made to improve the system and frequent conflicting results of studies of the system, how are policymakers and average citizens able to organize this complex information and make decisions that will improve performance and efficiency of the system? What might we as policy educators do that would enable more informed and rational decisions about the system?

One thing we can add to the education debate is a conceptual framework for analyzing the education process. Although many parts of education involve more than economics, economic theory, especially production economic theory, provides a framework for organizing input-output relationships and provides a basis for making decisions about allocating resources to attain desired outcomes. The approach also permits empirical identification of those inputs that may be related to desired outcomes.

All economists (and any student who has taken an introductory economics course) have been exposed to the production function concept. They are familiar with the concept, what goes into it, and how it may be used. Many agricultural economists have used the concept in empirical work in analyses that attempt to measure efficient allocation of resources, productivity of specific resources (inputs) and optimum levels of output.

The production function concept applied to agricultural production, such as corn produced on an acre of land, is quite readily understood. Bushels of corn produced in one production period are considered to be a function of the amount and composition of fertilizer applied, amounts of herbicides and insecticides, machine services, labor, seed and other minor inputs. Specification and measurement of the output is straightforward. The problem becomes somewhat more difficult when it comes to specifying and measuring

the various inputs as well as normalizing for variations in inherent land productivity. Both the conceptual model and its empirical application are well understood by economists.

Specification and estimation of a production function becomes more complex when the concept is applied to education. First, there is no clear conceptual model, as there is for corn production, to guide researchers' specification and estimation of an education production function. Education theory does not tell us how students learn. Second, selection and measurement of both outcomes and inputs must rely on researchers' intuition, prior research and available data. Variables that are chosen do not necessarily measure factors that impact student learning.

Despite these difficulties, the production function approach is appealing because of its immediate application to policy considerations. According to Hanushek, statistical estimates of educational production functions have entered into a variety of judicial and legislative proceedings and have formed the basis for a number of intense policy debates. However, the approach has not been universally accepted, particularly among education decision makers. Hanushek believes the criticism of the approach is in part a reaction against the specific results.

Specification of a general model for education is straightforward. Education outcomes are directly related to a series of inputs from school, household, student, peer and community sources (Levin). School inputs are generally under the administrative control of the school. The "non-school" inputs are generally not. Variables used to measure outcomes and inputs are discussed below.

Output Measures. A number of variables have been used to specify education outcomes for production function analysis. Proportion of youth who complete a given year of education, achievement levels measured by standardized test scores, ability and desire to pursue post-secondary education, ability to exercise responsible citizenship, ability to adjust to changing social and economic demands, and ability to be financially successful in professional careers after school are measures that have been used in research as education outcomes (Deaton and McNamara, p. 8). The breadth and diversity of output measures illustrate the difficulty of settling on one output measure. However, rather than attempt to incorporate multiple objectives into production function analysis, researchers have opted for use of standardized test scores as the indicator of educational outcome. Availability of standardized test scores in contrast to lack of standardized data on the other output measures has been the prime consideration in relying on test score data as the measure of educational outcomes.

School Inputs. School attributes, from school building age and teacher characteristics, to expenditure levels, have been used to

measure schools' production inputs. Researchers have generally used school data available through secondary sources assuming that the data measures production inputs and that differences in the amount and quality of the inputs impact education outcomes.

Teachers are the primary school resource in terms of budget share. Production models have focused on examining their impact on education. It is hypothesized that additional teacher training, a higher proportion of teachers with advanced degrees, increased expenditures for teachers and smaller class size improve both the quantity and quality of schools inputs, thus are expected to have a positive effect on student performance. A review of data on teacher characteristics clearly suggests pupils per teacher have decreased and teacher training has increased.

The teacher corps in elementary and secondary schools has a higher proportion of teachers with more experience than it had twenty years ago. Today, more than one-fifth of all elementary and secondary teachers have twenty or more years of experience. There has been a steady decline in the proportion of teachers with four or fewer years of experience since the early 1970s (Table 1). Median years of experience has increased from nine years in 1966 to fifteen years in 1986, and the proportion of teachers with graduate degrees has more than doubled to 50 percent. Public school teachers' salaries, when measured in constant dollars, increased from 1959 through 1969, leveled off and then declined until the decade of the 80s. Since 1980 teacher salaries have risen significantly (Figure 6). Teachers appear better qualified and are being compensated with higher salaries.

Along with the increase in quality of teacher input, classes have become smaller which should allow teachers to devote more attention to each student with an expected positive effect on student performance. Pupil-teacher ratios in public schools for grades K through 12 declined by 37 percent from 1955 to 1991 (Figure 7), having a significant impact on teacher cost per pupil.

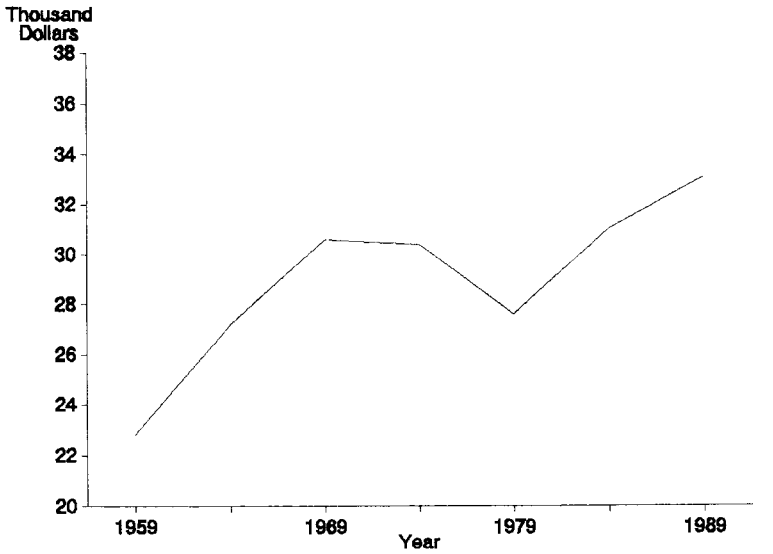
Family inputs tend to be measured by socio-demographic characteristics of families including parental education, income and family size. Peer inputs, when included, are typically aggregate summaries

Table 1. Characteristics of Public School Teachers: 1966-88.

	1966	1971	1976	1981	1988
Teacher Experience	32.2	32.3	27.1	14.1	na
1-4 years (%)	21.6	18.5	14.3	21.8	21.4
Greater than 20 years (%)	9	8	8	11	15[a]
Median (years)	23.3	27.5	37.5	49.6	51.4
Education					
Masters degree or more (%)					

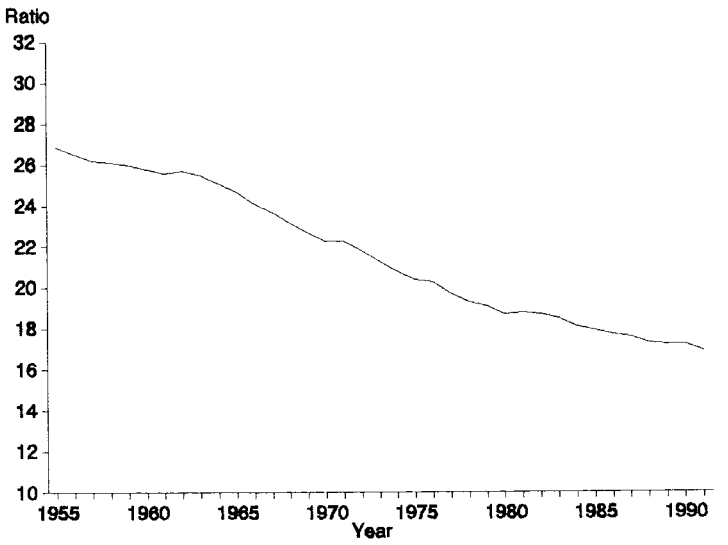
Source: *U.S. Statistical Abstract*, 1982, 1985; *Digest of Education Statistics*, 1991.
[a]1986.

Figure 6. Estimated Average Annual Salary of Teachers, 1959-1990 (in constant 1990 dollars)



Source: *Digest of Education Statistics*, 1991, Table 72.

Figure 7. Pupil-Teacher Ratios, Public Schools, Kindergarten to Grade 12



Source: *Digest of Education Statistics*, 1991.

of the socio-demographic characteristics of other students in the school. These measures are generally used as variables to control for the impact of non-school inputs in studies focusing on the impacts of school supplied inputs.

A summary of selected results from 187 production function studies of education which have been reviewed by Hanushek is presented in Table 2. One immediately notes that only a small proportion of all studies show any of the variables to have a statistically significant effect on student achievement. In several cases in which the variable is significant, the coefficient has the wrong sign.

Table 2. Summary of Estimated Expenditure Parameter Coefficients from 187 Studies of Educational Production Functions.

Input	Number of Studies	Number Statistically Significant	
		+	−
Teacher/pupil ratio	152	14	13
Teacher education	113	8	5
Teacher experience	140	40	10
Teacher salary	69	11	4
Expenditures/pupil	65	13	3
Administrative inputs	61	7	1
Facilities	74	7	5

Source: Hanushek, Eric A., "The Impact of Differential Expenditures on School Performance," *Educational Researcher*, May 1989, p. 47.

The effect of class size as measured by the teacher/pupil ratio was estimated in 152 of the studies. Regression estimates, which held constant family background and other inputs, show class size to be statistically significant in only twenty-seven cases. In thirteen of those cases decreasing class size has a negative influence on student performance.

Teacher education, teacher experience and teacher salary, the three measures presumed to measure teacher quality, show similar ambiguous and often negative results. Teacher education shows a significant effect in only thirteen of 113 studies with five of these cases showing a negative effect. Teacher experience was found to be significant in more of the studies than any other measure of teacher input with fifty of 140 studies showing significance for this input. However, ten of those cases showed a negative relationship. Only fifteen of sixty-nine studies showed teacher salary to have a significant effect on student performance.

Expenditures per pupil are significant in sixteen of sixty-five studies. This measure is closely correlated with teacher education, experience and teacher salary, but is included in many studies as a measure of economic wealth and/or the importance placed on education by the community. Most data do show a strongly positive simple cor-

relation between school expenditures and achievement, but the strength of the relationship disappears when differences in family background are controlled for (Hanushek, 1986, p. 1162).

These studies show only a weak and sometimes inconsistent relationship between teacher quality as measured by education, experience and salary. However, other studies have shown that teacher "quality" does make a difference. Data generated over a four-year period by the Gary Income Maintenance Experiment enabled Hanushek (1992) to use a different approach to relate teachers to student performance. Using an approach equivalent to using a separate dummy variable for each teacher in the sample, it was possible to show that teacher differences have dramatic effects on student performance. A limitation of this approach, however, is that precise characteristics of teachers and schools that are important are not measured, primarily because it is a very difficult task.

Other results that emerge from Hanushek's literature review indicate family background is clearly very important in explaining student achievement. Regardless of how measured, more educated and more wealthy parents have children who perform better on average.

Public schools have no control over family background. They are required to accept essentially all potential students that live within the district regardless of the preparation they have received prior to beginning the more formal learning process. Changes going on in family structures have had dramatic impacts on the amount of preparation (or lack of it) provided to prospective students. Much has been written about the deterioration of the home environment in the U.S. over the past two or three decades. We had three papers at this conference a year ago which dealt with specific aspects of that deterioration. In one of those papers Karen Craig stated, "As the role of parents in supporting learning of children within the home deteriorates, there is an acceleration of risk associated with an optimal education experience which costs the whole society" (Craig, p. 160).

Conclusions

The synthesis of studies using the production function approach leaves little on which to make policy recommendations for improvement of school performance. The most appropriate conclusions focus on what not to do:

- There appears to be little merit for schools to put additional money into lowering class size. This directly increases school expenditures and within a wide range of class sizes no appreciable effects on performance are evident.
- There is little merit in requiring teachers to pursue additional graduate courses merely to meet tenure requirements. There may be merit in additional courses to gain special knowledge in

an additional subject area but more courses in the same area may not translate into improved student performance.

- Since there is no systematic evidence that expenditures are related to performance, policies should not be formulated principally on the basis of expenditures.

The most positive result that emerges from these studies is that teacher quality does matter. Teacher quality, which is inferred to mean teaching skills, positively affects student performance. While there is evidence principals can distinguish good teachers from bad teachers on their faculties through observation, there do not appear to be indicators that can be used to objectively differentiate the teachers. Consequently there are risks associated with hiring of teachers. Once hired, teachers tend not to be rewarded on the basis of observable teaching skills, but rather on scales rewarding time employed rather than merit. For a variety of reasons, the system does not provide school administrators the opportunity to spend marginal dollars in a manner that would encourage higher productivity.

Do such limited, ambiguous and negative results suggest that the quest for a production function for education has led researchers down a primrose path? The debate has been going on for some time. In an article published in 1989, Monk concludes that,

> . . . the presumed existence of the education production function lies at the heart of administrative efforts to improve educational productivity. Second it is not possible to dismiss the existence of the education production function on empirical grounds. Third it is difficult, if not impossible, to dismiss its existence on conceptual grounds. For these reasons, the education production function is well suited to serve as the conceptual base of a policy-oriented research program (p. 34).

Policymakers representing rural schools face serious challenges. On one hand they must work with state officials to assure that state dollars will be available to support rural education as local economies lose the ability to support education through existing tax policy. On the other hand, these officials must insure that school district funds are used effectively and efficiently.

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