Journal of Economic Perspectives—Volume 10, Number 4—Fall 1996—Pages 3–8

Symposium on Primary and Secondary Education

Francine D. Blau

There is a strong consensus among economists that formal education is an important determinant of individual earnings as well as of economic growth.[1] Yet considerable controversy continues to surround many important policy-related issues. Chief among these are, first, the effect of the level of resources invested in education on student outcomes and, second, the educational financing structure that would optimize desirable outcomes of the system, including equity and efficiency. This symposium focuses on these two questions, which in turn are central to developing a sound educational policy. The topic of this symposium is of critical national importance, not least because school enrollments are rapidly surpassing previous peaks and are expected to approach the 50 million mark in less than 10 years.

Recent economic trends have served to magnify the importance of these issues. Over the past 25 years, the U.S. labor market has experienced a pattern of substantially widening wage inequality. Since mean real wages have been stagnating, this has meant that the real wages of workers at the bottom of the wage distribution have fallen dramatically.[2] Given evidence that the returns to skills have risen, including those skills measured by cognitive test scores (Murnane, Willett and Levy, 1995), and that this development underlies a sizable portion of the growing

[1] See, for example, Griliches (1977); Psacharopoulos (1985); Card (1995); Denison (1974); and Mankiw, Romer and Weil (1992).

[2] Studies of these trends include, for example, Bluestone and Harrison (1988); Levy and Murnane (1991); Katz and Murphy (1992); and Juhn, Murphy and Pierce (1993).

■ *Francine D. Blau is Frances Perkins Professor of Industrial and Labor Relations, School of Industrial and Labor Relations, Cornell University, Ithaca, New York, and Research Associate, National Bureau of Economic Research, Cambridge, Massachusetts. Her e-mail address is fdb4@cornell.edu.*

dispersion of wages, many have advocated increased investment in the education and training of American workers as a solution to these labor market problems—and also as an avenue for increasing America's productivity growth. Since primary and secondary education provide the basic skills that individuals bring to any further education or training they undertake, schooling at this level necessarily plays an important role in any effort to upgrade the skills of American workers.

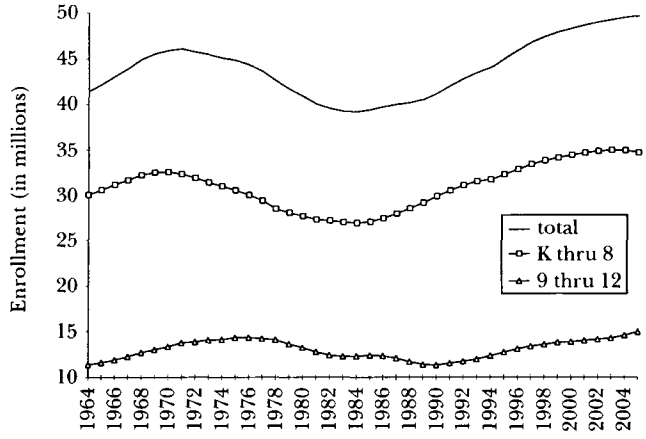
There are a number of reasons to be concerned about whether the education sector is up to the challenges it faces. American students perform poorly on standardized tests compared with their peers abroad. Despite some narrowing of performance differences, large gaps in test scores persist between students from families of different socioeconomic status and, not coincidentally, between white and minority students. Schools are under stress from the breakdown of family structures, the rise in child poverty, the persistence of youth crime and drug usage, increased immigration of students from abroad with poor language skills and academic preparation, and even factors like the increase in television viewing.

As the education sector struggles to cope, it is coming under increased cost pressure from enrollment increases. Figure 1 shows primary and secondary enrollments in public schools for the 1964 to 1995 period and Department of Education projections for 1995 to 2005. Enrollments grew rapidly during the 1950s and 1960s with the influx of the baby boom cohort into the school system. Total enrollments peaked in 1971 and declined through 1984. However, as the baby boomers have entered the childbearing years, the large size of this cohort has caused enrollments to swell again, even though the number of children per woman has remained relatively low. Between 1984 and 1995, total primary and secondary enrollments increased at an average annual rate slightly in excess of 1 percent and are expected to grow at about the same pace over the next decade. Just keeping up with this increase in students will tax the resources of many school districts.

A firm understanding of the relationship between inputs and outputs in the education sector is crucial to formulating policy. The Coleman report (1966), released 30 years ago, first focused public and scholarly attention on this question. The study was motivated by concern over inequality in the provision of educational resources across schools and their student populations. Based on an intensive analysis of the school-level data, the report reached a surprising conclusion: after controlling for the important effect of family background on student achievement, there was little evidence that the level of school resources had a statistically significant effect on student test scores. This influential study spawned a voluminous literature as economists endeavored to estimate "production functions" for education. The findings of these studies have generally been interpreted as supportive of the fundamental conclusions of the Coleman report; see, for example, Hanushek's (1986) widely cited survey of the evidence.

In his contribution to this symposium, Eric Hanushek argues that the empirical evidence on school resources and student outcomes continues to support this interpretation of the research findings. He begins by reviewing the time series evidence, which indicates that while there have been large increases in per pupil

Figure 1
Enrollment in Public Educational Institutions at the Primary and Secondary Level, 1964–2005



Notes: Figures for 1993 and 1994 are estimates. Figures for 1995–2005 are projections.
Source: U.S. Department of Education, *1995 Digest of Education Statistics.*

expenditures over the past 25 years, student achievement has been fairly stagnant. However, such time series findings are difficult to interpret since other factors have also changed. Some would argue that children have become more difficult to educate because of factors mentioned earlier, like rising child poverty rates. On the other hand, reductions in family size and increases in the average level of parents' education should have worked to make the average student easier to educate. Changes in the labor market for teachers are another factor to be considered. Increased labor market opportunities for women in other areas may well have exerted upward pressure on the wages of teachers (Flyer and Rosen, 1994; Hanushek and Rivkin, 1996). For these reasons, Hanushek looks to his review of the cross-sectional studies based on micro-level data to assist in interpreting the aggregate trends.

The paper by David Card and Alan Krueger offers cautious support for the alternative position that resources do matter, on average. As they note, this issue has attracted attention recently for two reasons. First, several meta-analyses have challenged the interpretation of the existing literature as supporting a conclusion that changes in the level of school expenditures have no effect on student outcomes. For example, in one such study, Hedges, Laine and Greenwald (1994) suggest that a reanalysis of the studies provides "strong support for at least some positive effects of resource inputs and little support for the existence of negative effects." Second, a number of studies, including Card and Krueger's (1992) own influential paper, suggest that stronger positive results are obtained between school resources and students' educational attainment and subsequent labor market earnings than for

test scores. It might be argued that the impact of school resources on subsequent earnings, both directly, controlling for educational attainment, and indirectly, via their effects on the level of schooling achieved, is a better measure of their effect on labor market productivity than are test scores. The latter point goes to the heart of one of the many difficulties in attempting to estimate production functions for the education sector; what is the appropriate measure of "output"?

Not surprisingly, a host of other econometric issues are raised in measuring the effects of school resources. As the original Coleman report noted, it is essential to control for the effects of family background, since a student's performance in school results both from school inputs and family inputs. If a researcher does not control for family background, then when analyzing a data set in which children from wealthier families attend schools with smaller class sizes and better-paid teachers, the researcher will find a positive correlation between student outcomes and school resources. But that correlation may simply mean that students from wealthier families are primed to do better in school. Conversely, to the extent that students from poor families are more likely to be assigned to remedial classes with higher resources per student, an incautious researcher who does not control for family background would conclude that greater school resources reduce student outcomes.

Another key empirical issue is how the level of aggregation of the data may affect empirical studies. Hanushek points out that studies measuring school resources at a relatively aggregate level—perhaps by comparing inputs and student performance across states—may be difficult to interpret due to differing policy environments. As Hanushek notes, states differ in their autonomy "in setting regulations and policies, in providing financial support and incentives for schools, and in overall organization of schools and labor laws." The direction of such a bias is unclear on a priori grounds; it depends on the correlations among the omitted variable, the state policy environment and school resources. However, Hanushek argues that the empirical pattern suggests an upward bias.

In contrast, Card and Krueger point to a problem of endogeneity of school resources within schools or school districts. The relation between school resources and student performance will be more difficult to interpret if abler, more highly motivated students are attracted to magnet schools or enriched classes, or, on the other hand, if weaker students receive supplemental remedial resources. Card and Krueger also argue that measurement error will tend to cancel itself out in studies with aggregate data, especially those that average school resources over the course of students' careers, but can cause greater problems in studies that measure resources at the school level, using one year of data.

In an effort to overcome some of these econometric problems, Card and Krueger present new evidence from a "natural experiment." They investigate the consequences for student achievement of early twentieth-century differences between North and South Carolina in the school resources devoted to black and white students in each state, as well as the impact on student outcomes of convergence over time between the two states in school resources.

The controversy over the productivity of the education sector and how to improve it takes place in the context of the issue of school financing. Caroline Minter Hoxby addresses this topic in her contribution to the symposium. Hoxby points out that local school financing tends to display the market-like characteristic that households can, over time, sort themselves into the type of school they want and flee or punish inefficient or unproductive school districts, thus approaching a higher level of (private) allocative and productive efficiency. However, local school finance also creates a likelihood of inequality, as wealthier households group together. Some believe that centralized school finance mechanisms offer a way to promote equity and better address issues of externalities that education may create for society, although Hoxby challenges this. She also points out that it can be quite difficult to design a centralized system that will provide schools with proper incentives for allocative and productive efficiency, at least without a considerable effort and the ability to collect information about educational preferences and performance that is decentralized across students, parents, teachers, school administrators, state authorities, academic researchers and others.

While the United States has traditionally used local financing of schools, Hoxby notes that reforms over the past 25 years have tended to promote greater centralization of school finance, often at the state level. An indicator, albeit an imperfect one, of the expanding degree of centralization is that in the majority of states, the majority of school district revenue comes from state sources, and central city districts with poor residents spend more per pupil, on average, than is typical for their states. Given the tradeoffs implicit in local and centralized finance systems, it is possible that greater centralization has contributed to the problems with productive efficiency that many perceive in the public school system. Hoxby suggests that a combination of local school finance and appropriately specified categorical aid and voucher schemes might be capable of achieving a better balance of efficiency and equity than a centralized system.

References

Bluestone, Barry, and Bennett Harrison, *The Great U-Turn: Corporate Restructuring, Laissez-Faire and the Threat to America's High Wage Society.* New York: Basic Books, 1988.

Card, David, "Schooling, Earnings, and Ability Revisited." In Polachek, Solomon, ed., *Research in Labor Economics.* Vol. 14, Greenwich, Conn.: JAI Press, 1995, pp. 23–48.

Card, David, and Alan B. Krueger, "Does School Quality Matter? Returns to Education and the Characteristics of Public Schools in the United States," *Journal of Political Economy,* February 1992, *100*:1, 1–40.

Coleman, James S., and others, *Equality of Educational Opportunity.* Washington, D.C.: U.S. Government Printing Office, 1966.

Denison, Edward F., *Accounting for United States Economic Growth 1929–1969.* Washington, D.C.: Brookings Institution, 1974.

Flyer, Frederick, and Sherwin Rosen, "The New Economics of Teachers and Education." NBER Working Paper No. 4828, August 1994.

Griliches, Zvi, "Estimating the Returns to Schooling: Some Econometric Problems," *Econometrica,* January 1977, *45,* 1–22.

Hanushek, Eric A., "The Economics of School-

ing: Production and Efficiency in Public Schools," *Journal of Economic Literature,* September 1986, *24,* 1141–77.

Hanushek, Eric A., and Steven G. Rivkin, "Understanding the 20th Century Growth in U.S. School Spending." NBER Working Paper No. 5547, April 1996.

Hedges, Larry V., Richard Laine, and Rob Greenwald, "Does Money Matter? A Meta-Analysis of Studies of the Effects of Differential School Inputs on Student Outcomes," *Educational Researcher,* April 1994, *23*:3, 5–14.

Juhn, Chinhui, Kevin M. Murphy, and Brooks Pierce, "Wage Inequality and the Rise in Returns to Skill," *Journal of Political Economy,* June 1993, *101,* 410–42.

Katz, Lawrence F., and Kevin M. Murphy, "Changes in Relative Wages, 1963–87: Supply and Demand Factors," *Quarterly Journal of Economics,* February 1992, *107,* 35–78.

Levy, Frank, and Richard J. Murnane, "U.S. Earnings Levels and Earnings Inequality: A Review of Recent Trends and Proposed Explanations," *Journal of Economic Literature,* September 1991, *30,* 1222–381.

Mankiw, N. Gregory, David Romer, and David N. Weil, "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics,* 1992, *107*:2, 407–37.

Murnane, Frank, John B. Willett, and Frank Levy, "The Growing Importance of Cognitive Skills in Wage Determination," *Review of Economics and Statistics,* 1995, *77*:2, 251–66.

Psacharopoulos, George, "Returns to Education: A Further International Update and Implications," *Journal of Human Resources,* Fall 1985, *20*:4, 583–604.

This article has been cited by:

1. Cristian Barra, Marinella Boccia. 2022. What matters in educational performance? Evidence from OECD and non-OECD countries. *Quality & Quantity* **56**:6, 4335-4394. [Crossref]
2. Laura López-Torres, Diego Prior, Daniel Santín. 2019. Assessing the effect of educational programs on public schools' performance. *Applied Economics* **51**:48, 5205-5226. [Crossref]
3. Laura López-Torres, Diego Prior. 2016. Centralized allocation of human resources. An application to public schools. *Computers & Operations Research* **73**, 104-114. [Crossref]
4. Laura LLpez Torres, Diego Prior Jimmnez. 2012. EVALUACIIN Y REDISEEO DE LA RED PPBLICA EDUCATIVA. UN ANNLISIS CENTRALIZADO. (Evaluation and Redesign of Public Education Network. A Centralized Analysis.). *SSRN Electronic Journal* **37**. . [Crossref]
5. Kyprianos P. Prodromidis, Prodromos I. Prodromidis. 2008. Returns to education: the Greek experience, 1988–1999. *Applied Economics* **40**:8, 1023-1030. [Crossref]
6. Victoria Gunnarsson, Stéphane Carcillo, Marijn Verhoeven. 2007. Education and Health in G7 Countries: Achieving Better Outcomes with Less Spending. *IMF Working Papers* **07**:263, 1. [Crossref]
7. Peter V. Marsden. 2005. The Sociology of James S. Coleman. *Annual Review of Sociology* **31**:1, 1-24. [Crossref]
8. Wolfgang Franz. Investitionen in das Humankapital 75-98. [Crossref]
9. Bernt Bratsberg, Dek Terrell. 2002. SCHOOL QUALITY AND RETURNS TO EDUCATION OF U.S. IMMIGRANTS. *Economic Inquiry* **40**:2, 177-198. [Crossref]
10. Wolfgang Franz. Investitionen in das Humankapital 74-97. [Crossref]