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## The Political Economy of the Decline of American Public Education

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THE POLITICAL ECONOMY OF THE DECLINE OF  
AMERICAN PUBLIC EDUCATION

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Working Paper No. 78

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## ABSTRACT

Current concern about the performance of American public schools is, in part, the legacy of past trends. From the mid 1960s to about 1980 virtually all measures of school performance deteriorated significantly. Evidence for a post-1980 improvement is mixed, but at best only part of the earlier decline has been retraced. This paper tries to contribute to understanding of the pre 1980s decline by analyzing the role of some political economic forces operating on public schools. The onset of the decline coincides with substantial changes in the strength of teacher organizations, in the sources of funds for public schools and in pressures for desegregation. I analyze the effect of these changes on a partial measure of the change in school performance across states from 1971 (the earliest available data) to 1981 and from 1981 to 1989. The measure is the change in scores on college entrance exams (which are taken by just under half of 17 year olds.) I find that school performance deteriorated more in states where teacher unionization went furthest, but some of the negative impact is delayed until the 1980s when the deterioration had ceased nationally. School performance also deteriorated more in states which moved earliest to shift the financing of public schools from local school boards to state government. School performance was not adversely affected by pressure for desegregation.

The 1960s and 1970s were also marked by an unprecedented increase in the employment of college educated workers. This might have been expected to increase the political pressure by employers for improved quality of college bound high school graduates. I find, counterintuitively, circumstantial evidence that the reverse may have occurred. In states where the politically significant industries increased employment of college educated workers most, the pre 1980 decline in school performance was largest. That tendency weakened but did not disappear in the 1980s.



The Political Economy of the Decline of American  
Public Education

Sam Peltzman\*

I. Introduction

The state of American public education has become something of a national obsession. A mournful consensus seems to have formed around two conclusions: 1) American schools have performed poorly in comparison with schools in other countries; 2) Things have gotten worse over time. As my title indicates, this paper is more motivated by recent changes in performance than by its average level. It is also motivated by a fact often neglected in discussions of school performance. The overwhelming majority of American elementary and secondary schools are political creatures. They are publicly owned, operated, directed and funded. I want to see if the political character of the market place within which schools operate has something to do with the way they perform. For reasons elaborated subsequently, the data I analyze are incapable of providing a complete explanation of the decline of public school performance. So, even if this decline is entirely

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\* Financial support for this study was provided by grants from the Lynde and Harry Bradley Foundation and the Sarah Scaife Foundation to the Center for the Study of the Economy and State, University of Chicago. I want to thank Karen Lombard for research assistance. I have benefitted from the comments of Kevin Murphy and David Friedman. This study would not have been possible without the cooperation of numerous individuals at the College Entrance Examination Board, the American College Testing Program and in state education departments. I owe special thanks to Richard Sawyer of the American College Testing Program and to Sue Frisch-Kowalski and Howard Wainer of the College Entrance Examination Board for their help and guidance. I am also indebted to Herchel Kasper for making available to me his worksheets on teacher unionization in the late 1960s and to Robert Valletta for data on teacher bargaining laws. Leo Troy provided useful guidance on teacher unionization data.

The Appendix which discusses my measure of change in school performance is a available separately on request to the author.

a political phenomenon, I could not corroborate that. Accordingly I pursue the more modest goal of exploring the plausibility of a link between school performance and politics.

This exploration follows a strain in the economic analysis of politics whose lineage includes Anthony Downs, Mancur Olson and George Stigler<sup>1</sup>. This emphasizes the political effectiveness of compact, organized groups whose members have large stakes in the outcome of the political process. My approach is straightforward, even crude. I try to identify the politically potent groups with a stake in public school performance. Then I let the data show if declining school performance is related to measures of the strength of these groups or more precisely, to measures of the change in their strength. My conclusion is that the plausible role of politics is substantial.

This conclusion needs, right at the outset, to be put into context. Declining school performance is in no group's direct interest. There is no Alliance for Terrible Schools. Nor, probably, is there any meaningful Alliance for Good Schools. This is not the sort of issue which is amenable to direct political control. If it were, good performance would win unanimously every time. The plausible sense in which school performance is a political choice variable is the one familiar to economists: other public objectives may compete with it. This is most obvious in public budget allocation decisions. A business group, for example, may care about the quality of its employees' education but also about the quality of the roads and the tax rate. Whether this group's political heft adds or subtracts from the resources devoted to promoting school performance depends on the weight of these competing objectives. Similar tradeoffs arise in the allocation of resources (including effort

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<sup>1</sup> Anthony Downs, An Economic Theory of Democracy, 1957. Mancur Olson, The Logic of Collective Action, 1965. George Stigler, "The Theory of Economic Regulation," 2 *Bell Journal of Economics & Management Science* 3 (1971).

and energy) within school systems. It is naive (and as shown below, inconsistent with some key results in the literature) to treat school systems as if they seek only to maximize literacy or numeracy.

This paper is organized as follows: The next section reviews the evidence on trends in school performance and the results of the social science literature on the same topic. This is followed by an outline of my political-economic approach to analysis of school performance and a description of some of the changes in the political economy of education that motivate it. Then I analyze a specific measure of the trend of school performance -- changes in average scores on college entrance tests in a state. The goal is to see if cross-state performance changes are plausibly related to changes in the state's political economy. I find that they are. Specifically, I find that the growth of teacher organizations, a shift of financial responsibility to state government, and, more surprisingly, changes in a state's industrial structure all affect school performance. However, these effects are not always simple or easily reconciled with common intuition. When teacher organizations become more important, school performance is rarely unaffected, but it does not always change the same way. When a state's most politically potent industries demand more highly educated workers, school performance deteriorates. I attempt to illuminate these odd results, and then conclude with a summary and discussion of the implications of these cross-section results for national trends in school performance.

## II. The Decline in School Performance

The conclusion that school performance has declined is based primarily on evidence from scores on standardized tests. A Congressional Budget Office survey summarizes this evidence:

"The existence of a sizable drop in test scores during the 1960s and 1970s has been well known for some time. The decline was remarkably pervasive affecting many different types of students in most grades, in all regions of the United States, in Catholic as well as public schools and even in Canadian schools. The drop was apparent in the results of different kinds of tests covering many subjects areas."<sup>2</sup>

The survey goes on to point out that the decline seems to have stopped in the late 1970s or early 1980s and, in most cases, there has been a partial recovery of the previously lost ground.

I will not review this evidence in detail. What is important about it is its pervasiveness and breadth - virtually every available measure of student performance shows lower performance in 1980 than in 1960. The timing is also important. There is no doubt that the American polity is sorely vexed by the sad state of its school. The business sector complains about its maleducated labor force. Proposals abound to permit parents to opt out of traditional public schools. And the current White House incumbent wishes to be remembered as the "education President" who turned things around. But it appears that

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<sup>2</sup> Educational Achievement: Explanations and Implications of Recent Trends, Congress of the United States, Congressional Budget Office, 1987. This is a follow up to Trends in Educational Achievement (CBO, 1986). Both have useful summaries of the evidence underlying this conclusion.



all this is old news. As nearly as one can tell, things have been slowly turning around for over a decade.

Accordingly current concerns have to be put in a temporal context. The lament that "things are worse than they used to be" refers to a process of deterioration which was compressed into a relatively brief period of less than two decades. The meager data available before the 1960s show no deterioration, perhaps even improvement over time. The more voluminous recent data show no further deterioration after around 1980 and some improvement. So today's concerns have to be about the tenuousness of recent improvement or its small size compared to the large preceding decline or to the resources devoted to schools.

Figures 1 and 2 provide some perspective with data reasonably representative of the main facts. Figure 1 shows scores on the two college entrance exams taken by most college bound high school seniors - the Scholastic Aptitude Test (SAT) and the American College Testing Program's ACT Assessment. These scores will form the backbone of the empirical work in this paper and are described in the Appendix. For present purposes, the notable feature of figure 1 is that scores decline from the early 1960s to about 1980 and then level off. Pre-1960 data are sketchy and available only for the SAT. But the earliest available data for 1956 would be roughly at the 1962 level. Figure 2 has the disadvantage of coming entirely from one unrepresentative state (Iowa). But the Iowa tests cover virtually all students instead of just those going on to college, and they yield the only annually equated test data spanning the period of interest. They also allow comparison across grades.<sup>3</sup>

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<sup>3</sup> The tests are administered annually to about 95 percent of Iowa students. For grades 3 through 8, the test used is the Iowa Test of Basic Skills and for grades 9 through 12, it is the Iowa Test of Educational Development. See Trends in Educational Achievement, pp. 95-97, for further detail.

Figure 2 shows scores for fifth graders and high school seniors measured as a difference from the lowest year in standard deviation units. Two features of the figure seem generalizable beyond Iowa. First, the decline among all high school seniors spans roughly the same period (1965-80) and same magnitude as the college entrance tests (the ACT and SAT declines are around .4 S.D.) Second, the decline is shorter and shallower at the lower grades.<sup>4</sup> There is also some evidence in other data of the "cohort effect" strikingly evident in figure 2. This is the tendency of the decline to end later in the higher grades as students move through the system.<sup>5</sup> Some recent evidence also indicates that the substantial post-1980 improvement among non-college bound high school seniors implied by figure 2 may be valid nationally.<sup>6</sup> Taken together the figures suggest that the decline in school performance was cumulative - the end product (high school seniors) fared worse than the intermediate products -- and that it was confined to a specific period

Any explanation of the decline in school performance has to confront this last fact. The question is not just "what went wrong?", but "what went wrong in the 1960s and 70s? And, possibly, "what went right in the last decade?." So far research with such historical focus has been neither voluminous nor conclusive. A recent survey concludes:

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<sup>4</sup> See Trends in Educational Achievement, pp. 62-66.

<sup>5</sup> Trends in Educational Achievement, pp. 99-119.

<sup>6</sup> See Charles Murray and R. J. Herrnstein "What's Really Behind the SAT-score Decline?" Public Interest, Winter, 1992 pp 32-55. They compare performance on a version of the SAT administered sporadically to a national sample of seniors with performance on the SAT itself. They find a post-1980 upturn in scores for the national sample, while, as figure 1 shows, there is none on the SAT.

"The trends most likely resulted from numerous factors, both educational and non-educational... Even taken together the factors examined in this study provide only a partial explanation..."<sup>7</sup>

Indeed, the most notable conclusions are negative. A wide variety of school-specific factors (teacher experience and education, course content, state graduation requirements, etc.) seems to have played no role.<sup>8</sup>

This negative conclusion is echoed in the much larger, less historically focused, literature on student achievement. Put crudely the question animating this research has been "Do the schools matter?" Or, is student achievement so dominated by the social and family background of students that what goes on inside schools has little impact? The research spans a variety of disciplines and methods, and I will not attempt to review it. However, the results contributed by economists are probably typical, and these can be summarized succinctly: schools do not appear to matter very much, (but teachers do.)

The dominant strategy among economists studying the subject has been estimation of the "education production function". This usually takes a form something like:

$$(1) A = f(X, B),$$

where

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<sup>7</sup> Educational Achievement: Explanations and Implications of Recent Trends, p. XII. The burden of the "partial explanation" is borne by changed ethnic composition of students - an increase in the share of lower achieving non-white students. My empirical work adjusts for this factor. (See Appendix). A smaller and less well defined effect results from birth order. Average birth order rose in the period when scores decline, and there is evidence that achievement of first-born children exceeds that of siblings.

<sup>8</sup> Educational Achievement: Explanations and Implications of Recent Trends, pp. 32-34.

**A = some measure of achievement, typically an exam score or the gain in score over a grade**

**X = a vector of measurable educational inputs: teacher/pupil ratios, per student expenditures, teacher experience or education, etc.**

**B = a vector of "student background" characteristics: race, parental income, education, social status, etc.**

Typically (1) is estimated over a cross-section of students or schools, and the most common finding is that holding B constant, the marginal product of the measurable inputs (X) is insignificant while the effect of the background variables (B) is substantial. The one exception is teacher quality. Where it can be measured indirectly (by, in effect, including teacher dummies in a cross-section analysis of student scores) or directly (by the rating of peers or administrators), better teachers produce better students.<sup>9</sup>

This last result is important because it says that school resources really do matter. A school system prepared to spend enough to attract and retain good teachers and to deal with the consequences of firing poor ones would be able to "buy" achievement. The appropriate implication of the educational production function literature is not that resources don't matter, but that schools as currently set up do not allocate extra resources in a way that matters (for achievement).

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<sup>9</sup> An excellent review of the educational production function literature is Eric A. Hanushek, "The Economics of Schooling: Production and Efficiency in Public Schools," Journal of Economic Literature, Vol. 24, no. 3, September, 1986 pp. 1141-77 This is updated in Eric Hanushek. "The Impact of Differential Expenditures on School Performance," Educational Researcher, May, 1989, pp. 45-62.

Even this implication deserves some skepticism. While there is impressive support for the "resources do not matter" result,<sup>10</sup> there is a potentially serious methodological problem that is recognized by practitioners but not easily overcome. It arises because student background can only be measured incompletely and with error. Expenditures could then partly respond to unmeasured background characteristics in a way that lowers their measured productivity. To see the possibility, consider the following model which embeds school spending in a wider public choice framework. Suppose the truth about (1) is that spending does matter ( $A_x > 0$ ), but that other forms of government spending are also valuable. Specifically, assume for expositional purposes that the government maximizes the median voter's utility function.

$$(2) \quad U = U(A, Z), \text{ where}$$

$Z =$  non school expenditures,<sup>11</sup> subject to a budget constraint.

$$(3) \quad \text{Total spending} = X + Z.$$

If the cross partials in (1) and (2) are zero, the first and second order conditions for an optimal allocation of the government budget would yield.<sup>12</sup>

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<sup>10</sup> Hanushek's 1989 survey lists 187 production function studies. They use a wide variety of input variables; he tabulates results for seven of them. For these seven, the average percent of studies reporting a significantly positive coefficient is only 14.5. The maximum value is slightly over 25 percent for teacher experience. "The Impact of Differential Expenditures...", p. 47.

<sup>11</sup> The model could be complicated, with no gain in insight, by treating  $Z$ , like  $X$ , as an input.

<sup>12</sup> The assumption of no interdependencies is obviously restrictive, especially for the production function. The sign of (4) could be reversed if  $A_{XB} \gg 0$ ; that is, if the marginal product of spending is sufficiently higher on high-background students. However, I am unaware of evidence or even intuition which permits signing this term.

$$(4) \quad \frac{dX}{dB} = \frac{-A_X \cdot U_{AA} \cdot A_B}{U_A \cdot A_{XX} + A_X^2 \cdot U_{AA} + U_{ZZ}} < 0.$$

This says that if student background (B) improves, spending will be diverted to non-school projects. The reason is simply diminishing marginal utility of achievement ( $U_{AA} < 0$ ).

Equation (4) also implies that

$$(5) \quad \frac{dA}{dB} > 0.$$

That is, the reduced spending does not go so far as to lower achievement. So, (4) and (5) imply that unmeasured variation in students' background induce a negative correlation between spending and achievement: under optimal budget allocation, the good students achieve more with less expenditure than the bad students.

This illustrative exercise leads me to remain agnostic about the effects of spending on achievement. It is difficult to distinguish "spending doesn't matter" from "spending matters, but this is offset statistically by unmeasured background effects." I react to this difficulty by allowing for, but not emphasizing spending effects. That is, instead of asking "which interest groups want more dollars spent on schools?", I will ask "which groups want more student achievement for a given dollar outlay?". This question has essentially been ignored in the literature. Since the Coleman Report<sup>13</sup> the dominant working hypothesis has been that achievement depends on what goes on inside the schools and/or the characteristics of students. Thus crude measures of school inputs have been embellished

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<sup>13</sup> James Coleman et al., Equality of Educational Opportunity, Washington, D.C.: Government Printing Office, 1966.

with detail on school curricula, teacher backgrounds and education, school facilities, etc. And the usual family background variables have been expanded to include family structure, size, the characteristics of other students, etc.<sup>14</sup> The possibility that the way inputs are translated into outputs or that the desired outputs might be affected by the political environment in which schools operate has been mainly ignored. The main exception to this broad generalization has been investigation of differences in the performance of private and public schools.<sup>15</sup>

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<sup>14</sup> See Hanushek, The Economics of Schooling, pp. 1163-64.

<sup>15</sup> For example James Coleman, Thomas Hoffer and Sally Kilgore High School Achievement: Public, Catholic and Private Schools Compared, New York: Basic Books, 1982 and, more recently, John Chubb and Terry Moe, Politics, Markets and America's Schools, Washington; Brookings: 1990. The Chubb and Moe volume is of special interest, because of its emphasis on the politics of public education. Their basic argument is that democratic politics leads to bureaucratic control of public schools designed to limit their autonomy. The bureaucratic control is designed to impose "higher order values" on the schools, which in practice means that student achievement is sacrificed to other goals. They then go on to estimate a series of production functions like (1) with variables designed to capture the degree of bureaucratic interference in school autonomy. Their primary intermediate finding is that more bureaucratic control leads to lower achievement. The denouement (ch.5) is that a simple private-public school dummy explains at least as much as any set of bureaucratic control variables. (Their sample is of students attending both public and private schools). That is, private schools have less bureaucratic controls and higher student achievement.

For present purposes, Chubb's and Moe's motivation is more important than their specific result. This is their insistence that the political environment within which schools operate should be expected to importantly affect student achievement. As part of their case, they provide a cogent review of the reigning "schools-or-students" research paradigm. Indeed, they argue (ch. 1, esp. pp. 11-18) that this paradigm is itself a product of the political environment. Specifically, they argue that the path of least resistance for the educational research community is to show how schools can be "engineered" to work better without questioning the basic institutional framework within which the schools operate.

## II. The Political Economy of Public Schools: Theory and Facts

My working hypothesis is that school performance deteriorated not because the quality of the raw material declined,<sup>16</sup> but because the political process demanded less performance. Implementing this require some spelling out of how the political process works and what it demands. Here I follow a path probably most closely associated with Stigler's analysis of public regulation.<sup>17</sup> This emphasizes the responsiveness of political decisions to the pressure of organized interest groups and the corresponding inattention to the demands of diffuse, unorganized interests. In common with most of this literature, I will largely ignore the process of politics - how interests organize and the channels by which their interests get translated into political action. The typical presumption in this literature, which I adopt, is that interests with the "right" characteristics will be served. These characteristics are high stakes per member in the political outcome and low costs of organizing political pressure.

If school performance is not all that counts to politically relevant groups, then it is in principle a political choice variable subject to change. To show this more precisely, I sketch a model which shares Becker's emphasis on competition among pressure groups.<sup>18</sup> In my adaptation, I assume there are two politically relevant groups, both of which value

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<sup>16</sup> Some evidence for this assertion is in figure 2, which illustrates the relatively minor deterioration of the performance of younger children. More direct evidence is from IQ scores of pre-schoolers. These rose from the 1930s to 1972. See Annegret Harnischfeger and David Wiley, Achievement Test Score Decline: Do We Need to Worry? Chicago: Cemrel, Inc., 1975, p. 4.

<sup>17</sup> George Stigler, "The Theory of Economic Regulation," Bell Journal of Economics & Management Science, v. 2. Spring, 1971, pp. 3-21.

<sup>18</sup> Gary Becker. "A Theory of Competition among Pressure Groups for Political Influence," Quarterly Journal of Economics v. 98, August, 1983, pp. 371-400.



student achievement and unspecified other things (N). As in Becker, the political process responds to the pressure exerted by the two groups. I summarize this in a political utility function.

$$(6) \quad U = h \cdot H(A,N) + l \cdot L(A,N),$$

where  $H(\quad)$  and  $L(\quad)$  are the two groups preference functions and  $h$  and  $l$  are the political weights attached to these preferences. This says that the groups strive to get their preferences adopted politically, and the more a group succeeds the higher will be the weight placed by the political process on its preferences. A fuller treatment than I wish to pursue here would detail how these weights are determined. For example, each group might have some political "endowment" which depends on factors like its costs or organizing which could be enhanced by its own spending on political pressure or reduced by the other group's spending. For present purposes, treat these weights as parameters.

Because I do not want to emphasize the choice of school spending, I assume that both  $A$  and  $N$  are produced within the school system, which has a fixed budget( $S$ ). And because diminishing returns in production are an inessential complication here, I assume

$$(7) \quad S = A + N.$$

That is, I assume a linear transformation between  $A$  and  $N$ , and, to avoid unnecessary notation, I set the relevant transformation rates equal one. For concreteness, one could think of group  $H$  as "consumers" of education services (students, parents, employers) and  $L$  as "producers" (teachers, administrators, suppliers). Then  $N$  might include teacher salaries, on-the-job consumption and school amenities. These benefit both  $H$  and  $L$  but in different degrees.

The political choice problem here is straightforward. The chooser (an unspecified agglomeration of local school boards and state and even federal supervisory officials) has to pick an (A,N) combination which maximizes political utility (survival, reelection/re-appointment, future benefits) subject to the fixed budget. It is assumed that the well-being of the two groups as summarized by  $H$  ( ) and  $L$  ( ) gets translated into political influence via the weights (h,l). The first-order condition is

$$(8) \quad h[H_N - H_A] + l [L_N - L_A] = 0,$$

$$\text{or } h/l = [L_N - L_A]/[H_A - H_N].$$

This says, unsurprisingly, that the relative political weight (h/l) determines how close each group gets to what it seeks ( $H_A = H_N = 0$ , or  $L_N = L_A = 0$ ). More specifically, suppose H is the group with preferences biased toward A ( $H_N$  is small for all N) while L worries more about N ( $L_A$  is small). Then if H has the substantial political weight ( $h/l \gg 1$ ), A is going to be much closer to the ideal ( $H_A = 0$ ) than N. A somewhat more useful way of putting this result is in terms of comparative statics. Suppose, for each example, that L's political weight increases; (8) implies

$$(9) \quad \text{sign } \frac{dA}{dl} = \text{sign } (L_A - L_N) < 0$$

in the usual case (where N is undersupplied to L). That is if the N - loving group gets stronger politically, A will decline. Similarly, if L's marginal utility from N increases, A will decline.

The preceding is framework rather than analysis. It suggests that some insight about the decline of school performance in the 1960s and 1970s can be gleaned if we ask:

- (1) Which groups with a plausible stake in the output of public schools grew stronger or weaker in this period?

- (2) What mix of output did these groups seek?
- (3) Which strong groups changed their preferred output mix between the early 60s and late 70s?

In general, filling in the detail of preference function is treacherous ground for an economist, so I will concentrate mostly on question (1).

The answer requires some conjecture about what were the important changes in the political economy of public education in the 1960s and 1970s. I will outline three obvious candidates and one obvious non-candidate for such change. The three are obvious because they directly affected school operation. I defer discussion of a non-obvious impact stemming from change in the industrial composition of the economy.

It is best to begin with the non-candidate. Public school performance did not deteriorate in the 1960s and 1970s because of a decline in resources. Table 1 summarizes some aggregate spending and input measures from 1950 on. Clearly schools today are much better endowed than in 1950. More to the point, most input measures grew faster in the 60s and 70s than in the other decades when public schools are performing relatively well. These data are too crude to resolve questions about the marginal effect of expenditures. But they are hardly inconsistent with the skepticism evinced by the educational production literature. Something more than a dearth of resources is needed to explain why school performance declined.

If we focus on the political environment in which these resources were allocated, no history of American public education in the 1960s and 1970s would ignore three changes: (1) the rise of teacher unionization, (2) the shift of financial responsibility from local school boards and (3) the pressure for racial desegregation.

A. Teacher Unionization<sup>19</sup> Before 1960 unionization of teachers was nearly non-existent. Today, three of every four teachers belong to a labor union, and collective bargaining, strike threats and teacher strikes have become an American rite-of-fall. Most of this transformation took place in a few years in the 1960s.

The decisive turning point occurred in 1961, when the American Federation of Teachers (AFT) successfully organized the New York City teachers. The AFT was a traditional AFL-CIO labor union established in 1916. Until the 1960s it was the only teachers' union, but it was tiny (50,000 + members out of 1.5 million teachers). A much larger professional association, the National Education Association (NEA), claimed around half of all teachers as members. The NEA, however, strongly opposed collective action to promote teachers' interests. Its main stated goal was enhancing the professional development of teachers. However, the NEA's hostility to unionization evaporated quickly after the AFT's victory in New York. The AFT subsequently launched organizing drives in the large cities of the Northeast and Midwest, and the NEA perceived a threat to its size.

The NEA responded by competing head-on with the AFT as a conventional labor union. The results of this competition are summarized in Table 2, which shows the evolution of teacher union density since 1960. The first set of estimates by Troy and Sheflin, are simply membership counts as reported by the two unions. The discrete jump in 1962 reflects the authors' crude accommodation to the history just summarized and the

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<sup>19</sup> The subsequent narrative, especially the interplay between the AFT and NEA, paraphrases virtually any independent account of the period. Examples would include: Randall Eberts and Joe Stone, Unions and Public Schools. Lexington, MA: Lexington Books, 1984 ch. 2, Richard Freeman, "Unionism Comes to the Public Sector," Journal of Economic Literature, vol. 14, no. 1, March, 1986, pp. 41-86, and Leo Troy and Neil Sheflin, U.S. Union Sourcebook, W. Orange, NJ: IRDIS, p. 3-3.

lack of better data.<sup>20</sup> They put the entire NEA membership into the union category beginning 1962. However, the NEA's actual transformation was not so swift. It had to campaign for certification as collective bargaining agent at each local level. Meanwhile it continued to serve some of its members as a professional association but not as a bargaining agent. The fragmentary data in the last three columns present a more accurate picture. They show membership in collective bargaining units based on surveys of school districts. By 1967 the NEA had succeeded in organizing more than  $\frac{1}{3}$  of the nation's teachers (representing  $\frac{2}{3}$  of its membership). It built this up to over  $\frac{1}{2}$  by 1982. The same data also show more rapid growth for the AFT than the Troy - Sheflin estimates. Overall, well over half the ultimate success of these unions occurred in 1961-67. The geographic pattern established then persists today. As a broad generalization, the further one gets from the central city of a large SMA and the further South and West one goes in the U.S. the more likely it is that teachers belong to an NEA rather than AFT local.

It will not have escaped the reader's notice that the sudden growth of teacher unionism coincides with the onset of deterioration in school performance. If this is more than coincidence, it would signify in terms of equation (6) or (9), an increase in the political weight ( $l$ ) of a group for whom non-achievement objectives ( $N$ ) weighed more heavily at the margin than for other relevant groups in the previous equilibrium ( $L_A < L_N$ ). An increase in the marginal utility of  $N$  should also not be ruled out given traditional union concerns about matters like pay equalization, job rights, etc.. The history of an aggressive AFT dragging a reluctant NEA into pursuit of such goals would suggest that  $L_N$  rose more where the AFT won out.

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<sup>20</sup> Personal communication with Leo Troy.

The primary candidate for a non-achievement union objective would be labor rents. However, the initial wave of unionization in the 1960s does not appear to have generated much labor rent. The pioneer study by Kasper<sup>21</sup> finds no union wage effect as of 1968. Most subsequent studies of roughly the same period find wage effects under 5 percent.<sup>22</sup> The main evidence on non-wage effects is about contract provisions. A study of a national sample of 151 bargaining agreements<sup>23</sup> found: 1) In 1970 at least 20 percent contained provisions relating to: grievances, teacher evaluation, school hours, rights to exclude pupils, rights to refuse assignments, class size and promotion rules; 2) By 1975 at least 30 percent of all contracts contained provisions in all these areas plus provisions on layoffs and on teacher participation in educational policy, 3) The broad tendency was for AFT locals to attain more provisions earlier than NEA locals. Thus union objectives seem to include shaping the details of the educational production process.

It is hardly controversial that the political weight of teachers rose in the 1960s and 1970s. After all, the theory motivating equation (6) emphasizes the importance of organized interest groups in political competition, and teachers surely became better organized. But just what this implied for school performance cannot be settled by enumerating union preferences or by noting that unionization coincided with deteriorating performance. I address this issue empirically by taking advantage of the uneven early geographic spread of

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<sup>21</sup> Herschel Kasper, "The Effects of Collective Bargaining on Public School Teachers," Industrial & Labor Relations Review, v. 24, Oct. 1970, pp. 57-72.

<sup>22</sup> Wayne Perry "Collective Bargaining by Teachers: Issues and Evidence," Rand Paper P-5934, Rand Corp.; Santa Monica, CA., July, 1976.

<sup>23</sup> Lorraine McDonnell and Anthony Pascal. Organized Teachers in American Schools. Rand Corp. Report R-2407-NIE, Santa Monica, CA, Feb. 1979.

teacher unionism. The question my limited data permit me to address is: Did school performance deteriorate more or less in areas where early union growth was most vigorous?

B. Financing of Public Education. In the American governance system, public authority over elementary/secondary education rests in state government. Typically, a department of state government sets standards for teachers, curricula, text books, etc. for both public and private schools. It also provides some of the funds for public schools. A substantial regulatory and financing role and the responsibility for operating the public schools is delegated to local government units, usually a local school board.

This structure has not changed since the advent of universal public education. However, the relative importance of the governing units has changed. Local school boards used to raise most of their own money. Now most comes from other governments.

The post war history is summarized in Table 3. For most of the first two decades of this period, there was a stable, roughly 60:40 local - state division of the revenue raising burden.<sup>24</sup> Then, in the mid 1960s the local share began declining without interruption to the low 40s until around 1980 where it has remained since.<sup>25</sup>

The first decade of this decline is due mainly to growth in federal spending. This growth reflects the priorities of the War on Poverty, and involves substantial non-

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<sup>24</sup> A substantial increase in the state share had occurred in the wake of the Great Depression.

<sup>25</sup> This shift lags by about a decade another broad centralizing tendency in the structure of public education: the consolidation of school boards. In each of the decades from 1950 to 1970 the number of local school boards fell by over half (from over 80,000 in 1950 to under 20,000 in 1970). Since 1970, this rate of decline has slowed sharply to around 10 percent per decade.

instructional transfer payments.<sup>26</sup> So, this early experience leaves room for doubt about a permanent weakening of local financial responsibility.

The doubt was dispelled in the 1970s. The state share, which had remained steady in the face of the expansion of federal spending, now began to rise substantially. By the 1980s, the relative importance of local and state funds had been nearly reversed.

The conventional wisdom about this shift is that it reflects increased concern about cross-district inequality in per student expenditures.<sup>27</sup> The landmark expression of this concern was the 1971 Serrano decision of the California Supreme Court which held substantial inter district expenditure disparities based on wealth unconstitutional. However, most states which shifted funding responsibility to the state did so without judicial intervention. And there was a considerable geographic disparity in the shift.<sup>28</sup>

I use this disparity to pursue the same strategy as with unions. The national shift toward state financing, like the growth of unions, coincides with the decline in performance. So I ask whether school performance declined more in states where the shift toward state

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<sup>26</sup> The largest single component of federal payments to schools is for child nutrition (e.g. The School Lunch Program). This program accounts for about 40 percent of the growth of the federal share between 1961-63 and the 1976-78 peak. Most of the remaining growth is in grants for special programs for low income children under legislation enacted in 1965.

<sup>27</sup> Kenneth Wong, "Fiscal Support for Education in American States: The Parity-to-Dominance View Examined," American Journal of Education, v. 97, n. 4, August, 1989 pp. 329-357.

<sup>28</sup> Wong, op. cit., pp. 335-36 and pp. 341-47. Wong classifies 31 states' shares as increasing (from 1968-86), and the other 19 as stable. Of the latter 10 actually exhibit small declines. In his data the coefficient of variation around the mean annual increase in State share is 115%.



financing went furthest.<sup>29</sup> If so, it would suggest that part of the national decline in performance was related to the trend toward state financing.

I have no strong priors about how this search for consistency ought to turn out. Suppose that the shift toward state financing has in fact reduced inter-district spending inequality (and suppose spending matters). This could be interpreted, in terms of equation (6), as an increase in the political weight of groups with strong preference for an objective other than the level of achievement (here  $N$  would be the variance of achievement). That view would imply a negative correlation between the changes in average achievement and the state role in financing. However, a necessary condition for maximizing average achievement is equality of the marginal product per dollar of inputs across districts. If wealth disparities across districts lead to violation of that condition when districts are locally funded, the shift toward state financing would increase average achievement in the state.

Finally consider Chubb and Moe<sup>30</sup>, who share this paper's emphasis on the clash of interests in democratic politics as a basic determinant of school performance. Their central argument is that democratic control of schools breeds bureaucratic intervention which inevitably compromises performance. This occurs because, in their view, the bureaucracy must act to subordinate the goals of parents to the often conflicting interests of organized groups if the bureaucracy is to survive politically. While Chubb and Moe do not explicitly discuss school finance, their argument suggests that a shift away from local financing ought to hamper performance. This shift would strengthen another layer of bureaucracy atop that of local school boards. It would also attenuate competition among

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<sup>29</sup> I will ask the same question about the shift toward larger school districts. See *Supra*, n. 25.

<sup>30</sup> *Op. cit.*, *supra*, n. 15.

local school boards for tax revenues. Chubb and Moe's argument presumes that parents value school performance more highly than the influential interest groups. However, all that can be said in general about increased state financing is that it should enhance the weight of groups which can more easily influence state government than local school boards. Just what this portends for school performance is ultimately an empirical matter.

C. School Desegregation. The Brown decision outlawed school segregation in 1954, but it took another decade before substantial political pressure for desegregation began to be exerted. In the wake of the 1964 Civil Rights Act, both de jure segregation in the South and de facto segregation elsewhere came under increased legal attack. The timing of this attack raises an obvious question: did the push for desegregation contribute to the decline in average performance?

The question is more easily asked than answered, given my terms of reference.<sup>31</sup> First, the problem is geographically concentrated. In 1968 (the date of first available data) only 20 of the states had a minority enrollment share over 10 percent. In Table 4, I group these states geographically and summarize their response to the pressures for desegregation over the period when school performance declined nationally. This response was exceedingly uneven. There is a substantial decline in segregation in the South and none at all in the North. By 1980, Northern schools are more segregated than anywhere else. This regional disparity means that no single measure can easily capture the impact of the legal and political pressure for desegregation. Therefore, I decided to exclude consideration of

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<sup>31</sup> Previous answers have been couched mainly in terms of peer group effects: does black performance gain (white performance decline) when schools are desegregated? This is the line of inquiry initiated by the Coleman Report in 1966. The answers have, however, been ambiguous. See Hanushek, *op. cit.*, p. 1163.

desegregation from the formal empirical analysis. However, I will use results of that analysis to shed some light on the plausible role of desegregation.

D. The Role of Employers. I have so far focused on forces that operate more or less directly on the governance structure of schools. However, school boards, state education departments, teachers unions, etc. do not operate in a self-contained political environment. This environment includes other groups with leverage over the political process. I want to allow for the possibility that, if their stake in the outcome is sufficiently great, such groups may exert influence on educational outcomes. To motivate by trite analogy: analysis of the size and allocation of the state highway budget would be incomplete if it focused entirely on the interests of road builders and construction workers. There are interests of road users to consider.

In this paper, I will try to assess the importance of the business interest in public education. Employers, like parents are "users" who probably prefer better educated "output" to the alternative. However, some business interests are better articulated politically than the diffuse interests of parents. This possibility motivates my analysis of the business influence on educational outcomes. Put specifically in the historical context of the paper, I will ask if any of the decline in school performance up to 1980 can be plausibly related to a change in either the weight and composition of politically influential business interests or in the strength of their stake in educational outcomes. The answer I get is that the plausible role of business interests is surprisingly large but counter-intuitive: increased demands for skilled labor have probably weakened the political pressure for school performance.

### E. The Social Background of Public Education

It is well known that several indicators of social cohesiveness began deteriorating noticeably around the onset of school performance decline.<sup>32</sup> Prominent examples would include rising crime rates, and the decline of the nuclear family. The direct effects of these forces on school performance appears to have been small, especially on groups like college bound high school graduates.<sup>33</sup> However there are issues of joint or indirect effects: To what extent does declining school performance mirror a broader process of social disintegration?

This question can be viewed as restating or refocusing the questions I have raised about the role of politics. It is not, however, easily answered with my state level data. Increases in crime rates and in frequency of female-headed households are ubiquitous over the relevant period. There is however enough cross-state variation in such measures to permit some insight. As I show later, such variation seems to have had little impact on my measure of relative school performance.

### III. Data and Results

My unit of analysis is the state, and the dependent variable I focus most attention on is the change in a measure of school performance from 1972 to 1981.<sup>34</sup> This is about

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<sup>32</sup> See Charles Murray, Losing Ground: American Social Policy, 1950-80. New York: Basic Book, 1984.

<sup>33</sup> See, e.g. Educational Achievement: Explanations and Implications of Recent Trends, p. 57.

<sup>34</sup> Here and subsequently, dates refer to the end of academic years.

half the period in which school performance is deteriorating nationally. Unfortunately, pre-1972 data for my dependent variable are lacking. I also analyze the post 1981 data.

The dependent variable is regressed on a short list of independent variables designed to measure changes in the political environment of a state's schools. These changes include: 1) changes in the composition of industry, which I defer to the end of the next sub-section. 2) changes in teacher union density and associated labor legislation and 3) changes in the share of school funds coming from the state government. I also include changes in total expenditures in these regressions.

The dependent variable is the change in the state average score on the two nationwide college entrance exams, the SAT and ACT. The vast majority (around 80 percent) of college entrants take one or the other exam. But college entrants account for only a little more than half of those entering the school system: around 3/4 of 17 years old graduate high school and a similar fraction of these enter college. These proportions have changed little over the period I am studying. So college entrance test scores are necessarily a partial measure of school performance.

Even putting that caveat to one side, there are substantial conceptual and measurement problems that need to be confronted in converting changes in reported test scores in a state into a measure of change in the state's school performance. These are discussed more fully in the Appendix, which deserves more than the usual scrutiny by interested readers. Here I briefly summarize the problems and my solutions:

1. Test takers are a self-selected group, and their decision on whether to take a test and which test to take can be affected by local idiosyncrasies. The two most important consequences of this are: a) As a broad generalization, when more students take a test

average test scores fall even if average achievement does not, and b) for most of the sample period there are substantial differences in the geographic distribution of the SAT and ACT populations and modest differences in the distribution of scores. Thus neither test may be drawing a representative sample of college bound students in a state.

I deal with a) by adjusting (see Appendix for details) test scores in a state for changes in the number of test takers. The second problem can be overcome by combining average SAT and ACT scores in a state into a single index. However,

2. the exams are scored on different scales (and differ psychometrically). Fortunately, an existing literature can be used to combine the two scores, but not without introducing some measurement error.

3. There are pervasive racial differences in the levels of scores (Whites outscore Blacks) and changes over time (Blacks have gained on Whites). This means that changes in test scores will be sensitive to the racial composition of the test taking population for reasons arguably unrelated to school performance. I adjust for the exogenous racial component of test score changes by removing the effect of national trends in racial differences from each state's scores. (See Appendix for details).

Finally I remove the national trend in scores from each state's score.<sup>29</sup> My dependent variable is the coefficient from the regression of the adjusted state score on a time index<sup>30</sup> The regression is run on 1972-81 data, so the coefficient is an estimate of the mean annual change in a state's score less the national change over this period of declining

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<sup>29</sup> This is done by adding to the 1971 score in each state the series (change in state score, t-change in national score, t). This adjustment is done prior to the adjustments for racial composition and numbers of test takers.

<sup>30</sup> I use the regression rather than a simple change to reduce the importance of end points.

national school performance. Subsequently I analyze a similarly constructed state relative performance measure for 1981-89 when national performance was trendless. The Appendix contains a listing of both variables.

A. The Decade of Decline: 1972-81

Table 5 contains regressions of test score changes on input, financing and teacher union variables. The former two are measured over 20 years, because early 1970s high school graduates were in the school system over the previous decade. Union density by state is available only for 1967. But we know that prior to 1960 teacher unionism was virtually non-existent. So these 1967 densities are also 1960-67 changes. Recall (see Table 2) that over half the union gains to date were made in this period. Thus, the union variables are sorting states by how receptive they were to this initial push for teacher unionism. I distinguish between the NEA and AFT in light of the conventional history of this period. I am, in effect, asking if the difference in their heritage matters for school performance.

The answer provided by the regressions is resoundingly positive. There seems to be a sharp contrast between the negative effects of the more militant, more traditional union (AFT) and the positive effects of the professional association (NEA) transforming itself into a union. The mechanism, if any, by which union success affects school performance is, of course, not revealed by these regressions. So the "good union-bad union" result needs to be interpreted cautiously. But it does suggest a complexity in the role of unions (or of the receptivity of teachers and the political process to them) during this period of deteriorating school performance. If we follow the conventional history that the NEA was, in this period, less of a "union" than the AFT, the results say that school performance deteriorated most in environments most hostile and most favorable to unions.

The last regression in the Table is motivated by the possibility that union density is just a proxy for a political climate which is receptive to the organized interests of teachers. Teacher unionization was part of a broad movement in the 1960s toward unionization of state and local government workers and removal of restrictions on what these newly enlarged unions could do. (For example, prior to 1960 few public employees had the right to strike). The degree to which unions succeeded in winning rights from state legislatures varied, and I take advantage of this to answer: does the union effect in Table 5 reflect an increase in the weight placed by the legislature on the organized interests of teachers (and a decrease in the weight on performance)?

The answer is that a shift in political weight is only part of the story. Regression (3) adds an index (really an enumeration) of teacher bargaining rights as of 1972.<sup>31</sup> It can be viewed essentially as a 1960-72 change. This variable (LAW) has a negative coefficient (more teacher union "clout" implies poorer performance), but it doesn't completely replace the union density effects.

A correlation matrix is helpful in interpreting this triad of union variables:

	NEA	AFT
AFT	.36	
LAW	.32	.47

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<sup>31</sup> I also tried an unpublished index constructed from the data base described in Robert G. Valletta and Richard B. Freeman, "The NBER Collective Bargaining Law Data Set," Appendix B in Richard B. Freeman and Casey Ichniowski, When Public Sector Workers Unionize, Chicago: University of Chicago Press: 1988. They construct an index of bargaining rights for all public sector employees. I used their procedures to construct an index for teachers. The results were essentially identical to those in Table 5.

Robert Valletta kindly supplied me with the data base.



This says

1. More "liberal" bargaining laws helped (or were helped by) both the NEA and AFT organizing effort, but it helped the AFT more. This may account for the weakening of the AFT effect from regression (2) to (3). (A test of the null hypothesis that coefficients of the AFT and LAW variables are both zero can be rejected at 5 percent).

2. The NEA and AFT tended to succeed in the same states. So the sharply different effects on performance are not plausibly or entirely proxies for some other state differences.

The good-union-bad-union difference is non trivial. For this purpose, the first two regressions are more meaningful, because they do not hold the legal environment constant. In this sample, the NEA density ranges up to .9 and the AFT density up to .4. Consider then a state with heavy AFT representation (.3). According to the first two regressions, NEA representation of these teachers would have added 2 points per year to the state's average score. This exceeds the standard deviation (1.6) of the dependent variable, and it is around 40 percent of the annual decline (4.5) in national scores in this period.

The other political environment variable in the regressions is the change in the state government share of public school revenues. The results provide modest support for the notion that the shift of financing responsibility modestly aggravated the decline in performance: A shift from one standard deviation below to one standard deviation above the sample mean costs around .7 to .8 score points per year according to these regressions.

Finally, the results in panel A conflict with the bulk of the educational production literature. They suggest that spending matters, or, more properly, that spending mattered in the generally hostile environment of the period. The first regression could also be read to imply that higher teacher salaries are harmful. But the negative coefficient only means

that physical inputs mattered. The coefficients in brackets show what happens when the expenditure data are rearranged by deflating nominal expenditures by teacher salaries. This gives a "real" input measure if non-teacher input prices rose at the same rate as teacher salaries. The bracketed terms show that growth of teacher salaries had no effect on school performance, holding the crude input growth index constant. The latter can be broken into the growth rate of the teacher/pupil ratio and a term involving the growth rate of non-teacher inputs. The result of entering the two components of input growth separately (not shown in the Table) was that each received nearly identical weight.<sup>32</sup> A glance back at the last column of Table 1 shows that the input measure used in the regressions was growing unusually rapidly during the 1960s and 1970s. Thus, if resources really did matter during this period, this unusual input growth actually mitigated the decline in school performance. How much more spending growth would have eliminated the decline entirely? The answer implied by Table 5 is around 3 percent more growth per year over the 20 years (which means around 80 percent higher spending by 1980). The calculation is risky because it goes beyond the range of the cross-section (the sample standard deviation of the input growth rate is .5 percent) and it ignores possible diminishing returns. Also, as will be seen, it offers no guide to current policy.

(1) The role of employers. Equation (6) and the surrounding discussion suggest that school performance will respond to a change in either the political weight or the preferences

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<sup>32</sup> Specifically, it can be shown that the estimated real expenditure growth rate in line A.3 of the Table equals the growth rate of teachers per pupil plus the term:

(difference between growth rate of non-teacher and teacher inputs) x (Share of non-teacher inputs in total cost).

When these two terms are entered separately in a regression like (3) in Table 5, the coefficients were essentially equal (155 and 150 respectively).

of groups with an interest in this performance. So far I have focused on the supplier interests and only on changes their political weight. Here I will try to measure the influence of the demanders of the output of public schools, specifically the influence of employers. And I try to measure both their political weight and their preferences.

Modify (6) to include any number of employer groups who affect political utility:

$$(6)' U = \dots + \sum W_i U_i (A, N),$$

$W_i$  = group  $i$ 's political weight.

I am interested in the change in performance over a specific period of time. The model based on (6) implies.

$$(10) \quad \frac{dA}{dt} \propto \dots \sum w_i \frac{d\left(\frac{\partial U_i}{\partial A}\right)}{dt} + \sum \left[ \frac{\partial U_i}{\partial A} - \frac{\partial U_i}{\partial N} \right] \cdot \frac{dw_i}{dt}$$

That is, increases in the marginal utility of A and in the political weight of groups with high values of the marginal utility of A will be translated into higher A. It will be convenient to drop unneeded notation and terms, focus on a particular industry and simplify (10) as

$$(10)' \quad \frac{dA}{dt} \propto \dots \quad \text{TERM I} \quad \text{TERM II} \quad \frac{dU_A}{dt} + U_A \frac{dw}{dt} + \dots$$

TERM I      TERM II

I tried to estimate (10) from data on the distribution of employment by industry and by skill level. The basic idea is that  $U_A$  is related to the demand for skilled labor and that  $w$  is related to an industry's size.

The data I have are based on worker contribution to value added.<sup>33</sup> So instead of workers, I will speak of their VALUE. Workers are classified into four skill levels according to education attainment, and each worker's VALUE is just the national average compensation of workers in his/her skill class. The skill breakdown of VALUE is available for each state and, within each state, for each of around 50 industry groups (roughly the 2-digit SIC level). The data are available at roughly decade intervals from 1960 to the late 1980s.<sup>34</sup>

I identify "interest group" with "industry." This is obviously crude. It lumps the possibly disparate interests of cattle growers and corn farmers into "agriculture", and it fails to reflect the common interests of, say, steel and auto producers. But it is forced by the data. Also, since I am interested in external pressure on the political process, I exclude from the set of interest groups industries where government is the primary employer.<sup>35</sup> The remaining industries are sufficiently disaggregated so that none exceeds 10 percent of total value nationally. Most are on the order of 1 or 2 percent of total value. I assume that, over this size range, bigger industries have more political influence.

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<sup>33</sup> I am indebted to Kevin Murphy for providing the data and much useful discussion of how to interpret and use them for the problem at hand.

<sup>34</sup> The data come from decennial censuses and from the annual Current Population Survey (CPS). Each CPS has a much smaller sample (1/10) than a Census. To avoid large measurement error in the state-industry cells, it is necessary to pool CPS data. For ease of reference, I will refer to the terminal years of my sample, 1981 and 1989. But "1981" means an aggregate of all CPS data from 1976 through 1988 (so it is centered on 1982). And "1989" means 1985-88 CPS data, so it is centered 1986½. 1960 and 1970 data are from the Census.

<sup>35</sup> These are Postal, other federal, state government, local government, welfare and, of course, education.

This assumption needs refinement for the cross-section context: I need a measure of the relative political influence of an industry in a state. To elaborate: the largest industry in the sample is retailing, but it is roughly the same size everywhere. Thus, whatever they are, the retailing industry's interests will be more or less uniformly represented across the states. Accordingly, the effects of retail industry pressure will be roughly a constant across states. Cross-state variation in the response to industry pressure will arise only because of corresponding variation in the size of industries. From these considerations, my basic proxy for political weight is the industry's relative size, or VALUE RATIO (VR) defined as

$$(11) \quad VR_{ij} = \frac{[\text{Industry } i\text{'s VALUE in state } j / \text{Total VALUE in } j]}{[\text{Industry } i\text{'s VALUE in the U.S.} / \text{Total VALUE in the U.S.}]}$$

The ranking produced by (11) mainly accords with common intuition. That is, it tells us that the auto industry in Michigan, agriculture in the Plains states, textiles in the Carolinas, etc. are politically important locally. However, there are a few aberrations where the denominator of (11) is small.<sup>36</sup> To avoid undue influence of these industries, measures based on (11) are weighted by the numerator - the industry's size in a state.

My proxy for the marginal utility of achievement is the skill level of an industry's work force. Recall that my achievement measure is for college-bound students. My conjecture is that industries which rely most heavily on college-educated workers would have the strongest interest in the quality of college-bound students in the state.<sup>37</sup> Specifically, I rank industries by the fraction of VALUE accounted for by employees who graduated college (FC), with higher values presumably signalling higher values of  $U_A$  in (10)'. The

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<sup>36</sup> For example, the private household service industry scores high in the South. One doubts that the servant lobby is very powerful in these states.

<sup>37</sup> This ignores mobility and the issue of how rents from more achievement are divided.

state-industry-education cells are often too small to permit FC to be reliably estimated for each cell. So I use a three-fold regional breakdown.<sup>38</sup> I assume that  $FC_i$  in a state =  $FC_i$  in the state's region.

I use these measures to estimate the Terms in (10)'. Each of the Terms has two elements, and each Term can be read two ways depending on which element is being conceptually "held constant." Because we are in uncharted terrain, I proceed cautiously and use both readings of each Term. To elaborate, Term I ( $W \frac{dU_A}{dt}$ ) says:  $dA/dt$  will increase if

Ia. The industries with high weight have an increased marginal utility of A, or

Ib. The industries with increased  $U_A$  have a high  $w$ .

Similarly, Term II ( $U_A \frac{dw}{dt}$ ) says  $\frac{dA}{dt}$  increases if

IIa. Industries with high  $U_A$  increase their political weight, or

IIb. The industries whose  $w$  increases have high  $U_A$ .

I then implement these as follows (D means "change over 1960-80"; levels are 1960-80 averages):

Ia. Rank industries by  $VR_{ij}$ . In each state select the top 5.<sup>39</sup> Call these the "high  $w$ " industries. Then compute the weighted average DFC for these high  $w$  industries. (Here and subsequently the weight is the industry's share of state VALUE.) This gives  $\frac{dU_A}{dt}$  for these high  $w$  industries.

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<sup>38</sup> The regions are North (New England, Middle Atlantic, East North Central), South (South Atlantic, East South Central) and West.

<sup>39</sup> Selecting the top 5 industries is, of course, arbitrary. But it reflects the nature of the distribution of VR. Most states have only a few important industries, so VR quickly approaches 1 as one goes down the ranking.

- Ib. Rank industries by DFC in the state's region. Select those industries where this change exceeds the average across all industries in the region. Call these the "high  $\frac{dU_A}{dt}$ " industries. Then compute the weighted average  $VR_{ij}$  (proxy for  $w$ ) for these industries.
- IIa. Rank industries by the level of FC, and select those where this level exceeds the regional average. Call these "high  $U_A$ " industries. Then compute the weighted average DVR for these high  $U_A$  industries.
- Iib. Rank the state's industries by DVR. Select the top 5 (but ignore industries with declining value shares),<sup>40</sup> and call these the "high  $\frac{dw}{dt}$ " industries. Then compute the weighted average FC (proxy for  $U_A$ ) for these industries.

I convert each of the four measures to standard normal variates.<sup>41</sup> Then I average the four standardized variables thereby giving each version of each Term an equal weight. Call this the "Industry Pressure" Index. My prior is that it should be positively correlated with the change in achievement.

Table 6 shows that this is wrong. Industry Pressure does have a substantial impact on performance. But it works exactly opposite to my prior. This is shown by the strong negative coefficient of the Index when it is added (column (1)) to regression (3) of Table 5. Read literally, this says that when the powerful industries in a state increase their

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<sup>40</sup> DVR can be high because an industry grows in a state or because it declines less than the industry declines nationally. It seemed inconsistent with the notion I am trying to capture to count a declining industry among those with the greatest gain in political weight.

<sup>41</sup> The IIa variable had a range of about 8 standard deviations. To eliminate influence of outliers, I converted this variable to a rank before standardizing.

demand for educated labor or when the industries with high demand for educated labor become more powerful, public school performance deteriorates.<sup>42</sup>

The rest of the Table fleshes out this odd result without overturning it. Column (2) is a "median voter" version of (1). Suppose all employers have the same political weight. Then (10)' would reduce to a single term,  $\frac{dU_A}{dt}$ . Given my assumption about this term, an increase in the average college intensity of state employment would raise achievement. Or, since some employees are also parents, the same prediction would follow if better educated parents value achievement more highly.<sup>43</sup> But, as column (2) shows, the politically unweighted 1960-80 change in the college share of the labor force has no effect at all on achievement. When it is added to the Industry Pressure Index, (column (3)) the coefficient is weakly positive. This could mean that the "diffuse interest" in achievement matters a little. Or, it could mean that the utility terms in the Industry Pressure Index should be measured as deviations from average college intensity in the state. This is what is done in the next two regressions.<sup>44</sup> And the result is that any hint that the diffuse interest matters vanishes.

It is hard to escape the conclusion that there is some connection between changes in the education of the work force and changes in achievement but that some work forces (industries) have more influence than others. Unless I have the political weights exactly

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<sup>42</sup> Both are true. When Term I and Term II are entered separately, both have negative coefficients.

<sup>43</sup> In terms of equation (1), this variable, could be interpreted as a change in students' background. A common finding of the educational production function literature is that children of better educated parents have higher achievement.

<sup>44</sup> Specifically, terms (Ia, Ib) involving the change in an industry's college intensity ( $DFC_i$ ) are redefined as  $DFC_i$  minus the change in the state's average college intensity. The assumption here is that  $DFC_i$  is the same for all states in a region.



backwards - unless the relatively least important industries have the most political weight - the results must mean that it is my prior about the utility function that is backward. In this period of deteriorating school performance, resistance to the forces of decline is weakest where the politically powerful industries are increasingly reliant on better educated workers. However odd this result seems it does have the virtue of being consistent with other data:

1. Recall that spending seems to help school performance in this period. I find that high values of the Industry Pressure Index signal less support for performance in this dimension as well. Specifically, when I regress my school input growth measure on per capita income growth and the Industry Pressure Index, the coefficient of the latter is significantly negative ( $t = -3.5$ ).

2. This is also a period of unusual growth in employment of college educated workers. Consider, as a proxy, the difference between the growth rates of the population over 25 with and without college degrees. This difference is higher in the 1960s and 1970s than in any other decade since 1910. It averages 4.5 per cent annually from 1960-80, or about twice the 2.3 per cent average other periods. (The 1980-88 figure is 2.7 percent). So the decline in school performance coincides with a substantial acceleration of college-intensity among adults. This is arithmetically consistent with the cross-section result that increased college intensity in the powerful industries is negatively related to school performance in this period.<sup>45</sup>

Just why or how increased (and high) reliance on educated labor weakens the pressure for school performance is beyond the scope of this paper. Perhaps the beginning

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<sup>45</sup> There is no significant difference in DFC for the powerful industries and the others across the states in my sample. Nor is there a significant difference between FC for the industries with the most growth in power and the others.

of an insight will be provided by the complement of this result. This is that the powerful industries resisting the decline in school performance were those less reliant on college graduates and correspondingly more reliant on the output of the public schools. Looked at this way, an industry's interest in public school performance would depend on the share of its human capital produced by these schools. And this share declined substantially in the 1960s and 1970s.<sup>46</sup>

Differences in the geographic mobility of labor provide a good reason for an industry's "public school intensity" to drive its interest in public schools. College graduates are more mobile than workers educated entirely by public schools. And public schools are a local public enterprise. Thus industries with a lot of college educated labor face a classic "free rider" deterrent to lobbying for better public schools. The benefits of such lobbying can be reaped by employers in other states who hire the locally produced students when they graduate college. Conversely, the public-school-intensive industry cannot so easily free-ride on lobbying efforts in other states, because it is hiring less mobile workers. An important free-rider deterrent to local collective action by the college intensive industries would be consistent with the negative coefficient of my Industry Pressure Index. And it would be consistent with the declining pressure for school performance at a time of increasing employment of college-educated labor.

(2) The Role of Desegregation Pressures.

If desegregation pressures contributed to declining school performance, the states where these pressures were greatest should have had the steepest declines. Examination of the

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<sup>46</sup> If this line of inquiry is plausible, it will have to be shown that the decline in performance among college-bound students is cross-sectionally correlated with that of the other students.

regression residuals indicates that this is not so. For example, the mean residual from regression (1), Table 6 for the states listed in Table 4 is +1.1. times its standard error.<sup>47</sup> For the nine Southern states, this figure is +2.6, and it is -1.0 for the rest. So, there is some evidence that achieving desegregation was beneficial, but no evidence that the need to confront the problem directly compromised school performance.<sup>48</sup>

#### B. The Decline Ends: 1981-89

In the 1980s measured school performance stopped deteriorating. Rapid change in important elements of the external environment also ceased in this decade. By 1980, most of the shift of financial responsibility from local school boards to state governments had been completed. The growth of teacher unionization had ceased. The racial transformation of Southern schools had been completed, and none had begun in the North. Even the growth of inputs slowed markedly.

How did school performance respond to the external environment in this "calmer" period? To get some insight, I repeat the cross-section analysis for 1981-89. One result is that the relative improvement in the 1980s is not due simply to adaptation to the preceding changes in the political environment. For example, the simple correlation between test score changes in the 1970s and 1980s is almost imperceptibly negative (-.12). This means that states which declined most previously did not recover in the 1980s. The first regression in Table 7 shows this another way. It includes all the variables in regression (3), Table 5 as well as updated values of the same variables. If the 1980s were a period of adaptation,

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<sup>47</sup> Essentially identical results are obtained from regression (3), Table 5. MO is not in the regression sample.

<sup>48</sup> The regression may capture indirect effects, such as any effect of desegregation pressures on teacher unionization.

the effects of these lagged variables should be opposite to their effects in the 1970s. But, by and large, this is not the case. The one possible exception is that the favorable effects from early success by the NEA seem to disappear in the 1980s: the negative coefficient of the 1967 NEA share in Table 7 is roughly equal in magnitude to the positive coefficient of the same variable in Table 5. This is consistent with the story that the NEA became more like a conventional union over time.

The only notable results from the current period variables concern expenditures and AFT unionization. The regression suggests that, unlike the 1970s, input growth detracted from performance in the 1980s. The absolute value of the coefficient here is around half the magnitude of its counterpart in Table 5. These seemingly contradictory results raise questions that go beyond the scope of this paper. They include: Did the rapid previous input growth push to the point of vanishing returns? Are marginal school resources more effective in countering a hostile environment, as in the 1970s, than in producing new gains? The answers to such questions have important implications for research strategy as well as public policy.

As for AFT unionization, the results for the 1980s and 1970s are the same. In the second wave of teacher unionization, where the AFT succeeded performance declined.<sup>49</sup> And the magnitude of the effect is nearly the same as in the first period.

The other results are negative. Performance is unaffected in states which lagged in assuming a larger financing role or in granting teachers new bargaining rights. These variables are successively dropped in the remaining regressions in the Table without

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<sup>49</sup> I only have the cross-state distribution of unionization for a single year in this period (1982). However, it is a reasonable conjecture from the aggregate data that the cross-state distribution did not change much subsequently.

affecting other results. Regression (3) is inspired by the consistently negative impacts of early unionization on 1980s performance. It combines early and late unionization into a single 1982 level. The null hypothesis of equal coefficients on the early and late components of this level cannot be rejected. The overall impression of these results is of an increasingly negative impact on achievement as teacher unions matured.

The last regression in the Table adds the updated Industry Pressure Index. The coefficient is again negative, but much smaller and weaker than the counterpart in Table 6. This indicates that as with expenditures, the effects of industry pressure may be sensitive to time period or the overall environment for school performance. The results from the two periods also hint at an interaction between the effects of spending and industry pressure: In both Table 6 and 7, adding the industry pressure variable causes the spending coefficient to move toward zero. The hint here is that spending alters the impact of pressure. I pursued this by adding the interaction of spending and pressure to the regression. The coefficient (not shown) was positive in both periods and significant in the later period. That is, more school spending offsets negative industry pressure. For 1981-89, the partial derivative of achievement with respect to pressure becomes significantly negative at expenditure growth approximately one standard deviation below the mean. This partial is also about the same size as the pressure coefficient in regression (1), Table 6. So there is more commonality in the effects of pressure in the two periods than appears at first glance. But it seems clear that, on the whole, the importance of industry pressure lessened in the 1980s.

#### IV. SUMMARY AND EXTENSIONS

The decline of American public education was episodic and widespread. Most of the damage was done in less than two decades, and no area escaped its impact. This fact makes explanation of the decline difficult. In the argot of statistics, the number of potential explanatory variables exceeds the effective degrees of freedom provided by a single episode.

The decline was not, however, completely uniform regionally. Broadly speaking, the South fared better than the North and West, at least by the measure used in this paper. And there was considerable variety in the experience of state school systems within each region. I have tried to use this regional variety to shed light on one understudied avenue of influence on public school performance - the political environment within which these schools operate. One motivation for this is methodological. I wanted to extend to the public schools a strand of research which stresses the responsiveness of public institutions to pressure from organized interests. Is there any evidence that school performance responds to such pressures? I pursued this question crudely by regressing school performance measures on some plausible proxies for interest group influence. And, detail aside, the main result is that politics seems to matter statistically. The overworked call for further research is, I believe, the appropriate response to this result. My primitive modeling of political influence is surely improvable, and there is no test against alternative theories.

The second motivation for analyzing cross-sectional differences in school performance was to seek insight into the broad national decline in school performance from the mid 1960s to around 1980. For this reason I chose to focus on two changes in the political environment of schools that more or less coincided with the decline. These were the rise of teacher unions and the shift of financial responsibility for schools to state governments.

Was the decline in school performance greatest in those states where these political changes came earliest or went deepest? A positive answer would suggest a partial explanation for the national decline. The results of this research strategy were mixed. The broad answer to the question is indeed positive. But there are problems with the timing and detail of the effect of unions. The decline in performance did go furthest in those states whose legislatures were most responsive to teacher unions and in which the pioneer union (AFT) scored its earliest success. However, early success by the AFT's initially reluctant rival (NEA) is associated with improved school performance in the 1960s and 1970s. This is offset in the 1980s, and there is an unambiguously negative association of union growth and school performance in this period. But by the 1980s the national decline in school performance had ceased.

The timing of the effects of state financing are more consistent with the national trends. School performance declines most in the 1960s and 1970s in those states which shifted earliest from local to state financing. Subsequent shifts in financing responsibility do not seem to matter. This pattern seems inconsistent with the notion that strengthening the hand of bureaucracies remote from the local schools hurts school performance. If that were so, states which lagged in so doing should have experienced declining performance in the 1980s. The more plausible interpretation is that the shift to state financing is a symptom rather than a cause.

That is, early accommodation to political pressures for centralization of financing may be signalling the intensity of those pressures. Then my result would say that achievement receives less political weight in political environments where pressure for centralization is greatest. If the conventional story about the source of this pressure is right,

there would be implied a tradeoff between concern for resource equalization and for performance.<sup>50</sup>

The most interesting slant on the decline in public school performance in this paper comes from analysis of the "consumer" interest rather than the interests of education providers. It begins with the fact that as the public schools deteriorated the social importance of formal education rose dramatically. The share of college graduates among adults (parents) more than doubled over the period of declining public school performance. By the end of this period, a college education had become a new middle-class birthright. This juxtaposition of rising parental education attainment and declining school performance suggests that better educated voters do not constitute a powerful pressure group for better public schools. I was able to confirm this directly: the change in school performance across states is uncorrelated with the change in adult educational attainment. This could be taken as another example of the unimportance of the diffuse interest (here, all parents) in politics.

But there are also concentrated interests among the consumers of public school output. Most of that output is soon hired by businesses, and that interest can be politically important. Indeed, Chubb and Moe<sup>51</sup> argue that the decline in school performance ended because ". . . the business community mobilized [its] formidable political resources behind demands for high-quality academic education - thus focusing and, in effect, serving as a vanguard for the broader, more diffuse constituency for reform at the grassroots." A

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<sup>50</sup> I tried unsuccessfully to extend the result on financing to another contemporaneous form of centralization, the consolidation of local school districts. When the change in the log of school districts is added to Regression (1), Table 6, the resulting t-ratio was 0.1. Similar results were obtained for the residual from a regression of the change in log of school districts on initial district size and the change in the rural share of population.

<sup>51</sup> *Supra*, n. 15, p. 9.



corollary of this is that some weakening of the business interest in public school quality had something to do with the preceding decline. In the context of my paper, this would mean that in states where this interest weakened most school performance declined the most.

I implemented this notion by taking advantage of the geographic concentration of industries. This concentration creates variety in the political role of an industry - the auto industry is more important in Michigan than Montana. Changes in industrial location also change the distribution of political influence. For example, the auto industry's political importance in Kentucky and Tennessee has likely grown as new plants have been built there. If a politically important industry has an increased demand for public school performance, or, if an industry with a high demand for performance grows more important politically, school performance should improve. My finding was that where the politically important industries use of educated labor grew most and where the newly important industries used the most educated labor, school performance deteriorated most. The clear, if counter-intuitive, implication is that increased reliance on educated labor weakens the political demand of business for public school performance.

My measure of "educated labor" was the fraction of (value added by) employees with at least four years of college education. That fraction grew as rapidly for the politically important industries as for the others in the period when school performance was deteriorating. And the implied negative correlation in my data between employment of college graduates and the demand for school quality was strongest in this period. (The correlation remains negative but weakens in the 1980s). One interpretation consistent with all these facts is that in the political market college educated labor is a substitute for elementary/secondary education. Then, when the local public schools provide a smaller

share of the human capital being hired by politically important industries, their stake in, hence their political pressure for, public school quality would diminish. This may be a rational response to the free-rider problem inherent in a college-intensive industry's lobbying for improved local school quality when it draws workers from a national market.

This interpretation implies both good news and bad news for the future performance of public schools. The good news is that credentialization of the American work force has slowed in the last decade. This would mean that the erosion of the share of the public school's claim on the political capital of business has at least abated. The bad news is that this claim is unlikely to grow, let alone return to what it was a generation ago. This means that mobilizing political pressure by employers for improved public school will be harder than a generation ago when local public schools provided the vast bulk of their employees' formal education.

I conclude by grappling with the connection between school performance and social disintegration. I added two social indicators - the 1960-80 growth of crime<sup>52</sup> and of the fraction of children under 18 not living with both parents to regression (1), Table 6. Neither was conventionally significant, but the family structure variable had a "suggestive" positive coefficient ( $t=1.6$ ). None of the other coefficients or t-ratios were much affected by including these variables.

The appropriate lesson of this exercise is not that broken homes are good for school performance. For one thing, prospective college entrants are not the ones primarily affected by a rising prevalence of broken homes and crime. My result does suggest that the need

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<sup>52</sup> I averaged the change in logs of six crimes: murder, rape, assault, burglary, robbery and auto theft.

of a school system to cope with these phenomena does not detract from student performance. Thus the view that declining school performance was just another symptom (or a result) of increased social disintegration in the 1960s is not supported by my data.

The absence of a negative association between school performance and social trends also helps put other results in sharper focus. As it happens, rising crime rates and the decline of the nuclear family tended to go farthest in the same political environments that were most receptive to the initial pressure for teacher unionizations. These were environments that could be characterized as "liberal." All this is summarized by the correlation matrix in Table 8 which just adds the two social trends in a state and a measure of bedrock "liberalism" in the state's electorate to the teacher union variables. The correlations are all positive and range from roughly .2 to .6<sup>53</sup>. There is; of course, both a liberal and a conservative interpretation of these facts (and of the decline in school performance). The liberal interpretation might be that hostile environments (which breed declining school performance) require liberal policy responses. The conservative interpretation would reverse this causality. My results suggest that neither view is quite right when applied to declining school performance. While social trends and the political environment that attended the growth of teacher unions have common elements; these elements have disparate effects in school performance. These disparate effects argue against interpreting my results as merely reflecting a common set of characteristics that create a hostile environment for school performance.

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<sup>53</sup> For my sample size of 44, a correlation over .3 is significant at 5 percent.

**TABLE 1. REAL EXPENDITURES AND TEACHER  
INPUT PER PUPIL . 1950-89**

YEAR	REAL EXPENDITURES PER PUPIL (1989) (1)	PUPILS PER TEACHER (2)	EXPENDITURES PER PUPIL + TEACHER SALARIES (INDEX 1950 = 100) (3)	ANNUAL GROWTH RATES PER PUPIL, PAST DECADE (%)		
				REAL EXPENDITURES (4)	TEACHERS PER PUPIL (5)	EXPENDITURES + TEACHER SALARIES (6)
1950	\$1079	27.3	100.0			
1960	1551	25.8	103.9	3.6%	0.6%	0.4%
1970	2625	22.3	130.9	5.3	1.5	2.3
1980	3556	18.8	193.2	3.0	1.7	3.9
1989	4509	17.5	211.0	2.6	0.7	1.0

SOURCE: National Center for Education Statistics, Digest of Education Statistics and Bureau of Census, Statistical Abstract of the U.S., various issues.

Real Expenditures: Current Expenditures deflated by Consumer Price Index.

Growth rates are annual change in log of figures in columns (1) – (3) × 100 from previous year, except column (5).

TABLE 2. TEACHER UNION DENSITY. U.S., 1960-89

YEAR OR PERIOD	TROY/SHEFLIN ESTIMATES			ALTERNATE SOURCES		
	NEA	AFT	TOTAL	NEA	AFT	TOTAL
1960	0.0%	3.7%	3.7%			
1961	0.0	3.5	3.5			
1962	50.6	3.5	54.1			
1963	50.6	4.9	55.5			
1964	51.7	5.3	57.0			
1965	52.7	6.0	58.7			
1966	52.9	5.8	58.7			
1967	53.3	6.6	59.9	36.5	11.2	47.7
1968	51.2	5.8	57.0			
1969	45.4	7.4	52.8			
1970	47.2	8.2	55.4			
1971	48.3	8.6	56.9		10.8	
1972	52.1	9.2	61.3		10.9	
1973	58.3	8.3	66.6		15.3	
1974	62.9	13.5	76.4		16.7	
1975	70.6	15.3	85.9		18.1	
1975-80	68.9	15.6	84.5		20.2	
1982	59.3	18.9	78.2	51.9	20.6	72.5
1983-86	60.2	18.9	79.1			
1987-89	64.4	19.7	84.1			

**Sources:**

- (1) Leo Troy and Neil Sheflin, U.S. Union Sourcebook, W. Orange N.J.: IROIS, 1985.
- (2) Unpublished worksheets supplied to author by Herschel Kasper, Oberlin College.
- (3) AFT Membership by States and Locals for Membership Years 1973-74 (1979-80).  
Washington: National Education Association Organizing Unit, 1975 (1981).
- (4) U.S. Bureau of the Census, 1982 Census of Governments, v. 3, n. 3. Washington: 1984.
- (5) U.S. Department of Education Digest of Education Statistics, Washington; various years.
- (6) U.S. Bureau of the Census, Statistical Abstract of the U.S., Washington; various years.
- (7) NEA Handbook, Washington: National Education Association, various years,

**Note:** All figures are percentage of public school instructional employees organized. Denominator from (5) and (6). The union membership data are as follows: The Troy/Sheflin figures are from (1) through 1982. The authors provide membership counts from (7) for the NEA and from annual reports for the AFT. For 1983 on I use (7) and (6) to extend these series. The "Alternate Sources" are as follows:

1967. From (2) I obtain the total number of teachers in bargaining units represented by NEA, AFT, jointly by AFT and NEA and by independent unions. I ignore the latter (26,000 of 965,000 organized teachers) and attribute half of the (65,000) jointly represented teachers to the AFT and half to NEA.

1971-80. From tabulations in (3).

1982. The total is the number of education employees of local governments belonging to collective bargaining units from (4). I then allocate this total by assuming that the 1982 AFT density is the same as in 1980 (from (3)). A small part of the total (and of all reported AFT and NEA totals except (2)) comprises community college faculty.

**TABLE 3. SOURCES OF REVENUE FOR  
PUBLIC SCHOOLS BY LEVEL OF GOVERNMENT. 1946-89.**

PERIOD	PERCENTAGE OF REVENUES FROM:		
	LOCAL	STATE	FEDERAL
1946-50	58.4%	38.8%	2.8%
1951-55	57.4	38.4	4.2
1956-60	56.5	39.2	4.3
1961-63	56.6	39.0	4.4
1964-66	53.5	39.1	7.5
1967-69	52.4	39.2	8.4
1970-72	52.2	39.1	8.7
1972-75	48.5	42.7	8.8
1976-78	46.7	44.0	9.3
1979-81	43.9	47.3	8.8
1982-84	44.9	48.2	6.8
1985-87	43.8	49.7	6.5
1988-89	43.5	50.3	6.2

Source: Digest of Education Statistics

**TABLE 4. SCHOOL SEGREGATION TRENDS, 1968-80  
STATES WITH MINORITY ENROLLMENT SHARE OVER  
10 PERCENT IN 1968**

STATE GROUP (AND MEMBERS)	MINORITY ENROLLMENT, 1968	PERCENT OF MINORITY STUDENTS IN SCHOOLS WITH MORE THAN HALF MINORITY STUDENTS		CHANGE: 1980- 1968
		1968	1980	
A. Deep South (SC, GA, AL, MS, LA)	38.7%	89.6%	63.3%	-26.3%
B. Other South (VA, NC, FL, AR)	25.4	74.8	48.3	-26.5
C. Border (DE, MD, TN, MD, TX) -excluding DE	18.6	68.7	55.2	- 13.5
	18.5	74.5	67.6	- 6.9
D. North (NY, NJ, PA, OH, MI, IL)	14.1	74.1	74.6	+ 0.5

Source: Statistical Abstract of the U.S., 1971 and 1982 editions. All entries are averages across the states in the group.



TABLE 5. RELATIVE TEST SCORE  
CHANGES, STATES, 1972-81

INDEPENDENT VARIABLES	(1)		(2)		(3)	
	COEF	t	COEF	t	COEF	t
A. Input Growth: Annual Rate of Change, 1961-81, in						
1. Expenditure Per Pupil	146	3.3				
2. Teacher Salaries	-123	1.9				
3. "Real" Expenditure per pupil (-1-2.)	$\begin{bmatrix} 23 \\ 146 \end{bmatrix}$	$\begin{bmatrix} 0.5 \\ 3.3 \end{bmatrix}$	144	3.3	152	3.5
B. Change in State Government Share of Public School Revenue, 1961-81	- .032	1.8	-.034	1.9	-.028	1.6
C. Teacher Union Density, 1967						
1. NEA Share	2.27	2.4	2.18	2.4	2.38	2.6
2. AFT Share	-4.67	2.3	-4.68	2.3	-3.41	1.6
D. Teacher Bargaining Rights Law; Index, 1972					-.052	1.6
$\bar{R}^2$ /SEE	.25/1.41		.27/1.40		.29/1.37	

**NOTE:**

**Dependent variable: Coefficient of regression of average test score on time, 1972-81. The average test score is a weighted average of state mean on the SAT and ACT assessment. See appendix for detailed description of test scores and adjustments for changes in number and racial composition of test takers.**

**Expenditures per pupil, Teacher salaries: U.S. Department of Education, Digest of Education Statistics, various years. Annual growth rate computed from changes in logs of variables.**

**State government share of public school revenue: Digest of Education Statistics and National Education Association, Estimates of School Statistics, various years. Data from the two sources occasionally disagree. In these cases I average the two figures.**

**Union density variables: From worksheets supplied to author by Herschel Kasper. See note to Table 2 for further details. The data are used in Kasper, op cit.**

**Teacher bargaining rights Thomas A. Kochan, "Correlates of State Public Employee Bargaining Laws," Industrial Relations, v. 11, October, 1973, pp. 322-37. This is a count of provisions of state laws as of 1972 related to bargaining rights of teacher unions. The count is structured so that higher values mean more union rights. The maximum value of the index is 26; the mean (S.D.) is 8.8 (7.3) in my sample.**

**Sample size = 44 states. Idaho, Iowa, Missouri and Wisconsin are excluded due to lack of data on ACT. See appendix for further details.**

**TABLE 6. INDUSTRY PRESSURE AND TEST  
SCORE CHANGES, 1972-81**

INDEPENDENT VARIABLES	(1) COEF.  t	(2) COEF.  t	(3) COEF.  t	(4) COEF.  t	(5) COEF.  t
1. Industry Pressure Index	-1.10 3.3		1.24 3.6	-1.27 *3.7	-1.28 *3.6
2. Change in Share of College Grads.		7.37-3 0.1	0.87 1.3		-.023 0.4
3. Real Expenditure Growth	94 2.2	151 3.4	81 1.9	80 1.9	81 1.9
4. Change in State Govt. Share of Revenue	-.023 1.4	-.028 1.6	-.022 1.4	-.023 1.5	-.023 1.5
5. Union Density a. NEA b. AFT	2.69 3.3 -4.25 2.2	2.37 2.6 -3.43 1.6	2.56 3.2 -4.62 2.4	2.18 2.8 -4.71 2.5	2.22 2.8 -4.66 2.4
6. Teacher Bargaining Law	-.033 1.1	-.053 1.5	-.035 1.2	-.034 1.2	-.034 1.2
$\bar{R}^2$ /SEE	.44/1.22	.27/1.39	.45/1.21	.47/1.19	.45/1.21

Note: Industry Pressure Index is an estimate of the sum of the two sets of terms on the right-hand side of equation (10). See text for construction and sources.

Change in share of College Graduates is the 1960-80 change in the share of total VALUE in a state accounted for by college graduates.

See note to Table 5 for definition of all other variables.

\*Deviations of industry college intensity from state mean are used to compute Index. See text.

TABLE 7. RELATIVE TEST SCORE CHANGES,  
1981-89

REGRESSION & PERIOD FOR INDEPENDENT VARIABLES	TYPE OF INDEPENDENT VARIABLE						$\bar{R}^2$ SEE
	EXPENDI- TURES	STATE REV SHR	UNIONIZATION		LAW	INDUSTRY PRESSURE	
			NEA	AFT			
1A. CURRENT FORM COEF  t	D7189 -70 1.6	D7189 .017 0.6	D6782 -1.15 0.9	D6782 -4.70 2.1	D7284 .017 0.3		
B. LAGGED FORM COEF  t	D6181 -38 0.9	D6181 -.024 1.0	L67 -1.97 1.7	L67 -2.13 0.9	L72 .028 0.7		<u>.11</u> 1.39
2A. CURRENT FORM COEF  t	D7189 -75 1.9	D7189 .002 0.1	D6782 -0.91 1.0	D6782 -3.98 2.0			
B. LAGGED COEF  t			L67 -1.67 1.8	L67 -2.18 2.9			<u>.16</u> 1.35
3. CURRENT FORM COEF  t	D7189 -72 1.9		L82 -1.20 1.8	L82 -3.38 2.9			<u>.21</u> 131
4. CURRENT FORM COEF  t	D7189 -59 1.4		L82 -1.05 1.5	L82 -3.26 2.8		D7087 -0.28 0.7	<u>.20</u> 1.32

Note:

**Dependent Variable:** Coefficient of regression of average test score on time, 1981-89.

**Lagged independent variables** are those used in regression (3), Table 5. **Current independent variables** are the updated counterparts of these lagged variables. "Form" identifies the type of variable and time the period. D means change or rate of change; L means level. Thus "D7189" means "change from 1971 to 1989"; L72 means "level as of 1972", etc.

**Sources** of current independent variables: Expenditures, state revenue share: see note to Table 5.

**Unionization:** See note to Table 2. Sources (3) and (4) provide state data on AFT membership in 1980 and total union density in 1982. I allocate the latter among unions as described in the note to Table 2.

**Teacher Bargaining Law:** The data base and procedures described in Appendix B of Freeman and Ichniowski, op. cit., supra, n. 31 are used to construct indexes of teacher bargaining rights as of 1972 and 1984, and the change in these indexes is used in Regression 1.

**Industry Pressure Index.** See note to Table 6 and text. Initial values of the components are from 1970 Census of Population. Terminal values are from the 1985-1988 Current Population Surveys.

TABLE 8. CORRELATION MATRIX. SOCIAL CHANGE AND POLITICAL ENVIRONMENT, 1961-80

VARIABLE	1. Liberalism	2. Family	3. Crime	4. NEA	5. AFT
1. Liberalism of the Electorate: McGovern share in '72 minus Goldwater share in '64					
2. Family Structure: Change in share of children <18 not living with both parents 1960-80	.36				
3. Crime: Average change in logs crime rates, 6 serious crimes, 1960-80	.23	.28			
4. NEA share 1967	.47	.44	.25		
5. AFT share 1967	.56	.54	.23	.36	
6. LAW: Index of Teacher Union Bargaining Rights, 1972	.57	.45	.29	.32	.47

NOTE:

Sources:

Liberalism, Crime. Statistical Abstract of the U.S., various years.

Family: U.S. Census of Population, v.1 U.S. Summary, Characteristics of the Population, 1960, 1970, 1980

NEA, AFT, LAW: See Note to Table 5

Sample: 44 states, as in Tables 5-7

Figure 1. SAT AND ACT SCORES

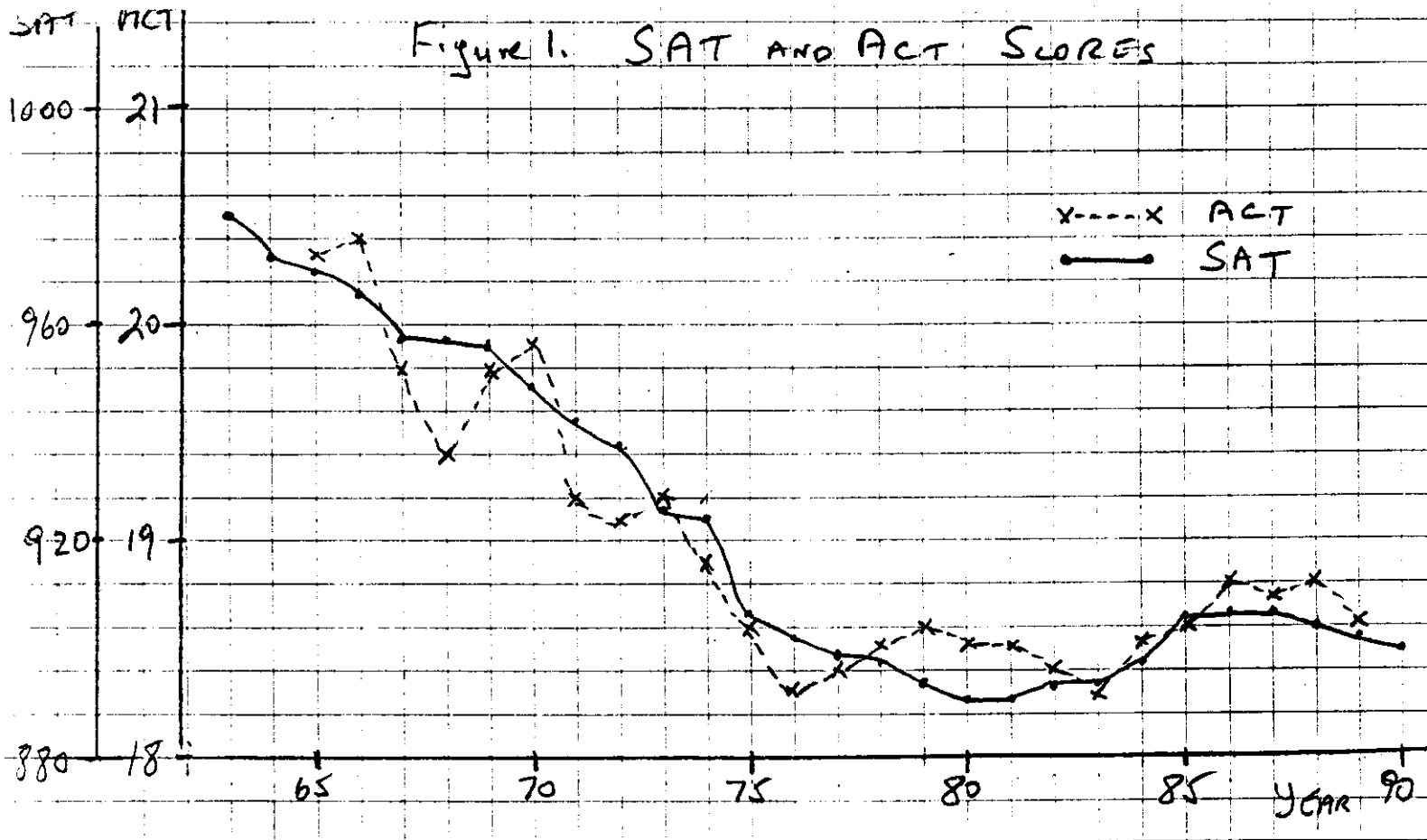


Figure 2. IOWA TEST SCORES, GRADES 5 AND 12

