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DO PRIVATE SCHOOLS FORCE PUBLIC SCHOOLS TO COMPETE?*

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Since the 1980s, public policy analysts and sociologists of education have increasingly focused on differences in school performance between public and private schools, but ignored the effect on public school student performance of the wide variation among states in the size of the private school sector. I demonstrate that public school students in states with large private school sectors have improved educational outcomes. Contrary to assumptions underlying the school-choice movement, however, the improved performance of public school students is not the result of increased organizational efficiency, but instead is the product of increased resources provided to public schools. The state thus takes an active role in protecting public sector providers. Institutional forces of inertia are less salient predictors of organizational behavior than are dynamic political processes and public school resource dependency on state financial sources of support.

Since the 1980s, public policy analysts and sociologists of education have increasingly focused on contrasts between schools in the public and private sectors. In particular, researchers have debated the effects of a school's environment—a competitive or noncompetitive market—on its performance, structure, and conduct. While focusing on the comparison between private and public school sectors, researchers have ignored the effects of variations in the size of the private school sector on performance of the public schools. Thus, the implicit assumption underlying existing research is that variation of between 1 percent and 20 per-

cent in the size of the state's private school sector has no appreciable impact on public schools.

I demonstrate that private schools' market share has a significant impact on the performance of public schools: In states with large private school sectors, public school students have improved educational outcomes, as school-choice advocates predict. Contrary to assumptions underlying the privatization movement, though, improved public school student performance is not the result of increased organizational efficiency generated to strengthen competitiveness in the market for students. Rather, improved performance in states with large private school sectors is obtained by increasing resources provided to public schools: The state takes an active role in protecting the position of public sector providers. Increased resources at the school level, not organizational changes caused by increased competition, affect student outcomes.

LITERATURE REVIEW

Differences between public and private schools in student achievement have been the focus of sociological attention since the 1980s (Coleman, Hoffer, and Kilgore 1982; Alexander and Pallas 1985; Chubb and Moe 1990). Researchers have focused on two main

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issues: the magnitude of school-level effects on student performance, and identification of the causal mechanisms producing these school-level effects (e.g., educational resources, peer influences, and organizational structure). The insights of organizational theory have often been applied to analyses of these between-school differences.

School-Level Effects

Sociologists of education have focused on school-level effects since the significance of peers was highlighted in the work of Coleman et al. (1966). Although a consensus has emerged as to the general existence of school-level effects, debate continues concerning the magnitude of their influence, researchers' ability to accurately measure these effects, and the particular types of school-level differences that predict school outcomes (Jencks and Brown 1975). The effects of peer influences have been most clearly accepted (Kerckhoff 1986).

Measures of school effects involving the quantity or quality of resources have been less consistent in predicting student outcomes. Other indicators that have been examined include expenditures per student, teachers' salaries, and percentages of teachers with advanced degrees. Analyses of the influences of these measures, however, has often been limited by the lack of controls for variation among states. Because the costs of operating a school, the cost of living, and the educational attainment of the labor pool vary by state, the meaning of these school-level measures is ambiguous when one does analysis on a national sample. School-level effects are also mediated by within-school stratification, such as curricular tracking, that provides unequal access to school resources and structures peer interactions (Gamoran and Mare 1989). Even with these methodological problems, research has generally demonstrated the influence of class size and student/teacher ratio on student achievement in a variety of educational settings (Robinson 1990).¹

¹ Hanushek et al. (1994) recently drew attention to the counter-argument in a report on public education that called for "budget-neutral reform," such as the imposition of "two-tier employment

Other research has focused on explaining the difference in student achievement between public and private schools. The influential study by Coleman et al. (1982) documented a higher level of student achievement (as measured by cognitive test scores) in private schools relative to that in public schools, even after controlling for many school selection and background characteristics. Although their results were challenged by other sociologists who included additional statistical controls in their models (Alexander and Pallas 1985), their study nevertheless pointed to student behavior and the disciplinary climate of the school—peer effects—as accounting for "the greatest difference between private and public schools" (Coleman et al. 1982:178). Other researchers have viewed school-level effects largely as the product of the internal organization of the school (Chubb and Moe 1990).

Organizational Theory and School-Level Effects

In the last decade, scholars have been increasingly interested in whether institutional and organizational factors can explain school outcomes. Different organizational theories, by focusing on different institutional processes, offer contrasting predictions as to the effect of the size of the private sector on student performance in public schools.

Nonsignificant or negative effects of competition from the private school sector on public school performance would be predicted by many institutional approaches (Meyer and Rowan [1977] 1983; Scott and Meyer 1988; Chubb and Moe 1990). Meyer and Rowan ([1977] 1983) have argued that a

contracts," "fewer tenure guarantees," and the use of computers to "reduce the demand for school personnel." Hanushek's arguments are based on his earlier work (Hanushek 1989), which reviewed existing research and concluded that there is no systematic relationship between school resources and school performance. Hanushek's analysis was methodologically crude and his findings were subsequently refuted by a more sophisticated meta-analysis (Hedges, Laine, and Greenwald 1994). Economists Card and Krueger (1992) have also demonstrated that levels of school resources are indeed systematically related to student outcomes.

direct relationship between organizational behavior and efficiency does not necessarily exist; rather institutional norms, values, and behaviors resist small changes in the external environment and do not respond to competitive pressures. These theorists highlight an institutional inertia that dampens effective organizational adaptation to changing environmental conditions.

School-choice advocates have appropriated portions of this theoretical framework to argue that public schools are by nature impervious to reform efforts. Chubb and Moe (1990) contended that public schools are "highly bureaucratic and systematically lacking in the requisites of effective performance" because they are "governed by institutions of direct democratic control" (p. 67).

Institutional approaches, like those advanced by Scott and Meyer (1988) or Chubb and Moe (1990), generally do not expect any positive changes in public school performance because of external environmental changes, such as changes in the size of the private school sector. Changes in private schools' market share thus should have little effect on the norms, values, and practices of the institution. In fact, institutional theorists might predict a decline in public school outcomes as the size of the private school sector increases, because public schools would probably be left with a student body of lower socioeconomic origins and thus less beneficial peer effects (also see Hirschman 1970).

Contrary to these pessimistic predictions, positive effects of competition from the private school sector have been found in empirical investigations of institutions of higher education. Positive effects would also be predicted, though for different reasons, by other sociological and economic perspectives on organizations. Several studies have demonstrated that institutions of higher education are responsive to changes in competitive pressures. Zajac and Kraatz (1993) proposed a "diametric forces model" to explain the behavior of institutions of higher education that are subjected to contradictory institutional and environmental pressures. Competitive market pressures have also been shown to produce organizational changes in public community colleges (Brint and Karabel 1989). Furthermore, a study of interstate variation in public post-secondary enroll-

ments demonstrated a positive correlation between the size of the private sector and tuition rates at public two- and four-year colleges (Quigley and Rubinfeld 1993).

Positive effects of competitive pressures would also be predicted from two mechanisms highlighted in organizational theory: efficiency and resource dependency. Efficiency-based arguments have been promoted by school-choice advocates who argue for expanding the private school sector in order to increase competitive market forces that they believe will create greater organizational efficiency. Examining the school-choice movement, Cookson (1994) noted that supporters often look to the unfettering of market forces as a panacea for problems in the public schools. As an example of this "market messiah" mentality, Cookson cited the National Governors' Conference 1986 report *Time for Results*, which concluded that "schools that compete for students, teachers and dollars will, by virtue of their environment, make those changes that will allow them to succeed" (Cookson 1994: 34).

The general success of private schools relative to public schools has often been explained by this narrow interpretation of the neoclassical economic model. Thus private school supporters often attribute low public school performance to an absence of "competitive markets." Thus, public schools are argued to have insulated themselves by achieving a "monopoly position" and to have flourished only by creating a "non-competitive environment" (Peterson 1990).

A more sophisticated application of neoclassical theory, however, would also emphasize the role of resource dependency (Pfeffer and Salancik 1978). According to this approach, public schools, when faced with increased competition from the private sector, would seek additional support from government sources to ensure survival.

Positive responses to competitive pressures would also be predicted by political approaches that developed out of earlier institutional models. Although institutional approaches, like those of Scott and Meyer (1988) and Chubb and Moe (1990), often incorporate the state into organizational analyses, they do so in a static and limited way. Although an institutional framework includes an appreciation for the state's role in

legitimizing organizational behavior and establishing and participating in governance structures, there is little recognition that the state is a *dynamic* actor that responds to changes in markets and organizational fields. In a critique of nonpolitical institutional approaches, DiMaggio (1988) noted that institutional reproduction is a process that requires organizational and individual agency. This institutionalization process is “profoundly political and reflects the relative power of organized interests and the actors who mobilize around them” (DiMaggio 1988:13). Thus, a political approach recognizes that the state not only legitimizes organizational behavior and participates in governance structures, but also actively and continuously intervenes to maintain the stability of organizational fields.

The dynamic nature of the state’s role in maintaining organizational and market stability has been highlighted in recent political approaches within the sociology of organizations. Fligstein (1990) demonstrated that the state has continuously interacted with economic actors over the past century and a half to define the rules of competition leading to corporate “conceptions of control” and stability within organizational fields. In the literature that addresses the educational system, however, the state has usually been characterized either as a force that simply expands its level of influence (Peterson 1990), or as a static and uniform force that thwarts meaningful reform (Chubb and Moe 1990). I adopt the wider conception of a dynamic state that works to maintain the stability of organizational fields.² Thus, a political approach would expect the state to respond to threats to organizations in the public sector by actively intervening to limit the destabilizing influences of strong competition from the private sector on the overall organizational field.

Organizational theory thus provides contrasting predictions about the effects on pub-

lic school outcomes of variation in size of the private school sector. Free market advocates predict that as the private school market share increases, public schools will become more “efficient” and improve performance using existing organizational resources. Institutional approaches emphasize the forces of inertia within a set of multidirectional environmental forces, and thus predict a negligible change or an actual decline in public school outcomes as the private school sector increases (because of the less beneficial peer effects associated with those students remaining in the public schools).

Finally, political approaches or approaches that emphasize organizational resource dependency do not predict that school organizations would become more “efficient” using existing resources, but look for evidence that the state actively intervened to maintain the stability of the organizational field. These approaches recognize that school outcomes are part of a political process in which public schools have organizational and political allies that can provide support to combat competition from the private sector. Although the state is also subject to competing political forces and actors, political activities by unions, educational bureaucrats, teachers, parents, students, and community members historically have been influential in determining state levels of support for the public schools. Thus a political approach focuses on identifying evidence that the state worked to maintain the position of the public school sector. Although this intervention could involve changes in legislation that would discourage private school enrollment, a more likely response would be to increase resources to those public schools threatened by the private school sector. A political or resource dependency model recognizes that an organization’s environment and the structure of competition—“the rules of the game”—are open to manipulation in the context of a dynamic political process.

HYPOTHESES

My purpose is to examine the effect of the size of the private school sector on academic performance in the public schools in light of the above organizational theories’ identification of contrasting institutional and environ-

² By focusing on state intervention, I do not intend to suggest an autonomous state. Rather, the state largely operates to mediate conflict. Thus its actions are the product of complex political processes. In this paper, I focus on the state’s final determination of school resource levels; the political roles of various interest groups in affecting these outcomes is only speculated upon.

mental forces. Two hypotheses developed from the insights of organizational theory are tested:

H₁: Competition from private schools affects the organizational structure of public schools.

Although private school competition could affect the behavior of public schools in many ways, I focus on the relationship between the size of the private school sector and public school resources, particularly student/teacher ratios. Both political and resource dependency approaches suggest that school resources should increase in the face of increased competitive pressures. Institutional approaches, which highlight organizational inertia, expect no variation in resource levels or only effects resulting from ineffective organizational adaptation—for example, schools may be slow to adjust resource levels in response to changes in the public schools' share of student enrollments. Per-student educational expenditures and the ratio of teachers to total school staff are also examined to determine if schools receive additional funds to decrease student/teacher ratios or are simply devoting additional resources to instruction. Only in the latter case are they responding to competitive pressures by altering the schools' organizational structure to become more efficient deliverers of instructional inputs.

H₂: By changing the organizational structure of the public schools, competition from the private school sector affects student outcomes in the public schools.

Students' cognitive growth as measured by performance on standardized tests is used to assess differences in outcomes in the public schools. The research will determine whether the size of the private school sector in a state has an effect on standardized test performance in the public schools. The research will also explore whether these effects are the result of changes in peer climate, changes in the amount of school resources, or greater organizational efficiency brought about by increased competitive pressure.

To examine these hypotheses, I model two relationships. First, with states as the units of analysis, I examine the effect of the size of the private school sector on school re-

sources as measured by the student/teacher ratios. Certain features of student/teacher ratios make them an ideal measure of school resources. First, the student/teacher ratio is a good indicator of what Sørensen and Hallinan (1977) termed "opportunities for learning"—the smaller the student/teacher ratio, the more opportunities a student has to receive direct instruction from the teacher. Second, the ratio can be calculated at the school level as a measure of site resources or at the state level as a measure of a state's commitment to the public school sector. Third, the ratio partially controls for variation among states in cost of living and related costs of operating a school, because dollars spent on teacher salaries are internally adjusted for local labor costs and living costs.

Second, with students as the units of analysis, I determine whether being in a state with a smaller student/teacher ratio helps students' cognitive outcomes. In particular, the analysis focuses on the most reliable and frequently used measure of student and school outcomes: performance on standardized tests. I use 12th-grade test scores, controlling for 10th-grade test scores—a widely used approach to assessing school-level effects (see Coleman et al. 1982; Alexander and Pallas 1985; Gamoran and Mare 1989).

The results from these sets of regressions will help adjudicate between competing organizational explanations of variation in school-level performance. Although the analysis cannot identify the theoretical approach that best explains school behavior in general, it is designed to identify those *organizational forces* that are the most salient predictors of the overall pattern of effects. As Zajac and Kraatz (1993) noted in their study of higher education, environmental and institutional forces can operate simultaneously. Although institutional forces may exist, their presence, rather than making schools impervious to change, might function only to dampen the effects of competitive environmental forces.

DATA AND METHODS

For the two levels of analysis, I use two distinct sources of data and sets of variables. Both analyses employ statewide measures of the size of the private school sector, public

Table 1. Definitions and Descriptions for State-Level^a Variables Used in the Analysis

Variable	Mean	S.D.	Definition (Data Source) ^b
Private school sector, 1980	9.60	4.79	Percent of all primary and secondary school students enrolled in private schools (C).
Change in private school sector	-1.22	5.36	Percentage-point difference in private school sector (1980 minus 1950) (B,C).
Student/teacher ratio, public schools, 1980	17.09	2.11	Students per teacher based on average daily attendance (C). ^c
Student/teacher ratio gap, 1980	1.86	2.40	Ratio for public schools minus ratio for private schools, based on enrollments (B,C). ^d
Income per student, 1980 (in thousands)	\$41.14	\$6.37	Total state income per enrolled K-12 student (A,C).
Adjusted income per student, 1980	-.05	1.25	Income per student divided by state's average teacher salary—z-scored for individual-level data (A,C). ^e
Public school expenditures per student, 1980 (in thousands)	\$2.24	\$.58	Current expenditures on day schools for elementary and secondary age students (C).
Average teacher salary, public schools, 1980 (in thousands)	\$17.91	\$3.25	Average teacher salary in state (C).
Federal support, 1980	10.82	4.21	Percent of state educational revenues that are federal funds (C).
Church members, 1980	50.45	11.59	Percent of state residents that are church members (A).
Percent metropolitan	62.13	23.25	Percent of state population living in a metropolitan area (A).
Percent African American, public schools, 1980	14.26	17.01	African American enrollment as percent of all public school enrollment (C).
Percent Catholic school enrollment	55.65	19.96	Catholic enrollment as percent of all private school enrollment (C).

^a All variables based on data from 50 states and the District of Columbia, except change in private school sector, which omits Alaska and Hawaii.

^b *Data Sources:* A = *Statistical Abstract of the United States 1982-1983* (U.S. Bureau of the Census 1983); B = *Biennial Survey of Education in the United States 1948-1950* (U.S. Department of Health, Education, and Welfare 1954); C = *Digest of Educational Statistics 1982* (National Center for Education Statistics 1982).

^c Calculation is based on attendance rather than enrollment because the former is the basis for educational funding. Student/teacher ratio does not consider noninstructional duties, and the mean is thus lower than the actual ratio of students to teachers in an average classroom.

^d Both public and private ratios calculated on the basis of enrollment information because private schools do not report attendance figures.

^e Variation in state school costs were measured as average public school teacher salaries in the state because public school teacher salaries are not strongly correlated with private sector market share (Pearson correlation coefficient = .24, $p > .05$); payrolls, even without including other employee benefits, make up more than half of the school district costs (Rafuse 1990); and no other appropriate nonsalary based measure of costs of living is available at the state level.

school student/teacher ratio, income per student, federal support, and percent metropolitan. Tables 1 and 2 provide descriptive statistics and information on the coding of all variables. The Appendix provides information by state on the size of the private school sector, student/teacher ratio and the representativeness of the student-level sample.

The State-Level Analysis

The first level of analysis uses states as the unit of analysis. States are particularly appropriate for analyzing the effect of the size of the private school sector because in the U.S. educational system much decision-making authority rests at the state level. Further-

Table 2. Definitions and Descriptive Statistics for Variables Used in the Student-Level Analysis

Variable	Mean	S.D.	N	Definition
<i>Student Characteristics</i>				
Test score, 12th grade	42.30	15.41	8,241	Sum of correct answers on a battery of tests including two sections of mathematics, one section of reading, and a section of vocabulary.
Test score, 10th grade	37.98	14.28	9,505	Sum of correct answers on a battery of tests (similar to 12th-grade battery).
Educational expectations, 10th grade	4.11	2.51	10,186	Tenth grade estimate of education respondent thought he or she would receive. ^a
Student socioeconomic status	-.17	.74	10,111	Composite index provided in the HSB dataset based on father's occupation, father's education, mother's education, family income and a summary of household possessions and educational resources.
Number of siblings	3.20	2.48	9,618	Number of siblings (up to 16).
Two-parent household	.76	.43	10,617	Two-parent household (not necessarily biological) = 1, otherwise 0.
Male	.50	.50	10,673	Male = 1, otherwise 0.
African American	.15	.36	10,673	African American = 1, otherwise 0.
Hispanic	.15	.36	10,673	Hispanic = 1, otherwise 0.
Asian	.03	.18	10,673	Asian = 1, otherwise 0.
Other non-White	.03	.18	10,673	Other non-White = 1, otherwise 0.
Religiosity	.60	.49	9,603	Coded 1 if the student reported attending religious services three or more times per month, otherwise 0.
<i>School Characteristics</i>				
School socioeconomic status	-.17	.39	10,673	Mean socioeconomic status of all students surveyed in school. ^b
School in central city	.24	.43	10,673	Central city school = 1, otherwise 0.
School not in a metropolitan area	.31	.46	10,673	School not in a standard metropolitan area = 1, otherwise 0.
Alternative public school	.03	.17	10,673	Over-sampled alternative schools = 1, otherwise 0. ^c
Hispanic public school	.12	.33	10,673	Over-sampled schools originally identified as having more than 30 percent Hispanic students = 1, otherwise 0. ^c

^a Educational expectations were coded as follows: Less than high school = 0; high school graduate = 1; less than two years of post high school vocational training = 2; less than two years of college = 3; two or more years of vocational training = 4; two or more years of college = 5; college graduate = 6; Master's degree = 7; Doctorate or other advanced degree = 8.

^b On average there were 12.6 students per school surveyed; this measure had a .532 correlation with the student S.E.S. variable.

^c In the actual realized sample 66.0 percent of the students from these schools were Hispanic compared to 7.6 percent in the regular sample of public schools (official educational statistics report 8.0 percent of the public school students in 1980 as Hispanic). The correlation between the Hispanic student variable and the Hispanic public school variable was .526. The alternative public school and Hispanic public school categories were highly concentrated in a small number of states: 65.6 percent of all students sampled in alternative public schools were from Louisiana, Michigan, New York, or Pennsylvania; 72.9 percent of all students sampled in Hispanic public schools were from California, Florida, or Texas.

more, states currently are responsible for the largest share of public school funding, and this share has been increasing. In 1980, states provided 46.8 percent of public school funding compared to 9.8 percent from federal sources and 43.4 percent from local and other sources (National Center for Education Statistics 1982).

The Appendix indicates that although the private school sector tends to be largest in the mid-Atlantic states (which have high levels of income, urbanization, unionization, and percentage of African Americans in the public schools), growth in the private school sector since 1950 was largest in the South, where fundamentalist schools have served as a refuge for White students leaving integrated public schools (see Erikson 1986). The states with the biggest decline in private school sector from 1950 to 1980 also highlight the declining role of Catholic schools (see Greeley, McCready, and McCourt 1976).³

The state-level analysis examines the effect of the size of the private school sector on public school resources as measured by the student/teacher ratio, controlling for state income per student, percent metropolitan, federal support, Catholic school enrollment in the private sector, and change in the size of the private sector. The analysis also identifies the effects of the size of the private school sector on "organizational efficiency," as measured by the ratio of teachers to total staff employed in a state's public school system, and on state expenditures per-student in the public schools. These analyses control for income per student, federal support, percent metropolitan, and teacher salary. Thus, the research determines whether an increase

in the size of the private school sector is associated with changes in school resources at the state level. Forces that generate increased efficiency (emphasized by school-choice advocates) will be identified if the relationship between size of the private school sector and student/teacher ratios is simply a result of schools using existing resources to hire more teachers. Institutional inertia will be highlighted if the variation in student/teacher ratios is the result of changes over time in the size of the private school sector rather than the absolute size of the private school sector. The mechanisms of resource dependency and political processes are suggested if school resource levels are affected not only by economic and demographic factors, like state income levels, but also by the size of the private school sector.

The state-level analysis is conducted on 1950 and 1980 data compiled from several statistical sources. Education data for 1980 are from the *Digest of Education Statistics* (National Center for Education Statistics 1982); education data for 1950 are from the *Biennial Survey of Education in the United States 1948–1950* (U.S. Department of Health, Education, and Welfare 1954); demographic data for 1980 are from the *Statistical Abstract of the United States* (U.S. Bureau of the Census 1983). Regressions are conducted on the 50 states and the District of Columbia, except those that require information on private school enrollment in 1950, which was unavailable for Hawaii and Alaska. Analysis is conducted on data unweighted for the state's population size.

The Student-Level Analysis

The student-level analysis uses the High School and Beyond (HSB) dataset to focus on the achievement of public school students as measured by 12th-grade test scores. The sample does not include private school students because the goal is to examine the effects of private sector market share on public school performance. OLS regression models use 12th-grade test scores as the dependent variable and control for 10th-grade test scores, 10th-grade educational expectations, socioeconomic background, gender, race, religiosity, number of siblings, whether a two-parent household, and oversampled high

³ In unreported results, two sets of regressions predicting size of the private school sector in 1980 and percentage point change in the size of the private school sector 1950–1980 from a range of state-level variables were run. Coefficients for 1980 state-levels of income per student, church membership, percent metropolitan, unionization and percentage of African Americans in the public schools are all positive and statistically significant predictors of the size of 1980 private school sector. In the regression on changes in the size of the private school sector, the only significant predictor was the percentage of African-American students in the state's public schools.

schools (i.e., alternative public schools and public high schools with a high percentage of Hispanics). Three models are run with these standard student-level control variables. These three models are run again adding three state-level controls (income per student, federal support, and percent metropolitan) that are shown in the state-level analysis to affect school resource levels net of the size of the private school sector. Because these models include extensive individual- and school-level controls, these state-level variables do not have significant effects and do not affect the earlier results.⁴

Model 1 includes the size of the private school sector in the state in which the student's school is located. Model 1 thus addresses the question: Does the size of the private school sector affect student performance in the public schools? To control for changes in the peer environment produced by an increase in the size of the private school sector, Model 2 adds to Model 1 the average socioeconomic background of students in a respondent's school. Finally, to test for the effect of the private school sector on public school resources, Model 3 adds to Model 2 a measure of the average student-teacher ratio of the state. Thus Models 2 and 3 address the question: Are the effects on student outcomes a result of changes in the peer climate, changes in school resources, or simply varying rates of organizational efficiency brought about by market competition? Free market advocates argue that competition itself can lead to more productive use of existing resources, and thus the size of the private school sector variable should remain signifi-

cantly positive even after peer effects and school resources are incorporated in the model. Organizational "efficiency" is identified if increases in the size of the private school sector (i.e., net of changes in peer effects and school resources) have a positive effect on public school students' test scores. Institutional inertia is identified if there are no changes in public school students' test scores other than those related to changes in peer climate. Resource dependency and political forces that indicate the state's role in maintaining stable organizational environments are highlighted if changes in public school students' test scores are a result of increased material resources as reflected in student/teacher ratios.

The student-level analysis is conducted on a sample of 10,673 public school students from the HSB dataset. The HSB study was a two-stage stratified probability sample. In the first stage, 1,015 schools were selected. I eliminated 29 of these schools from the analysis because fewer than five students responded to the survey, making estimates of the school-level socioeconomic status unreliable. In the second stage, students at each school were randomly sampled. HSB oversampled alternative schools and schools with a high percentage of Hispanics (Carroll 1987). Estimates are based on unweighted data; the stratifying variables of race and oversampled public high schools are included as independent variables in the equations.

I transferred state-level data to the student-level data file by generating state locations for schools in the HSB dataset. The state location for each school was determined by comparing the 1980, 1981, and 1982 unemployment rates provided in the HSB Local Labor Market file with those same figures as reported in the *Employment and Earnings May 1983* and *Employment and Earnings June 1982* (U.S. Department of Labor 1983, 1982). For each school, a state match could be made. The 1980, 1981, and 1982 state unemployment rates were compiled by the National Opinion Research Center staff and based on the zip code of the school.

The HSB survey includes students from all 50 states and the District of Columbia. Although the survey was not designed to generate representative data at the state level, in

⁴ Originally, the likelihood of high school graduation was used as a second measure of student outcomes. In a logistic regression, the pattern of significant effects was similar to that found using test scores if state-level variables were not included in the model. When state controls were included, the effects of the key independent variables were highly unstable, depending on which state variables were included. In particular, the student/teacher ratio was a weak predictor of the likelihood of high school graduation, and state-level measures, like percent metropolitan and state laws mandating school attendance, were strong predictors. The analysis presented here focuses on the traditional measure of gain in test scores, where results are relatively unaffected by extraneous state-level variations.

Table 3. OLS Coefficients for the Regression of Three Dependent Variables on Selected Independent Variables: State-Level Analysis, 1980

Independent Variable	Dependent Variable							
	Public School Student/Teacher Ratio			Student/Teacher Ratio Gap ^a			Public School Expenditures per Student	
	Model 1	Model 2	Model 3	Model 1	Model 2	Model 3	Model 1	Model 2
Intercept	15.064** (1.051)	16.588** (1.127)	17.889** (1.491)	.584 (1.205)	−.367 (1.322)	4.352 (1.406)	−.835 (.340)	−.557 (.336)
Private school sector	−.209** (.062)	−.220** (.063)	−.175* (.071)	−.266** (.071)	−.357** (.074)	−.191** (.067)	.027** (.010)	.032** (.009)
Income per student ^b	−.423* (.207)	−.513* (.208)	−.485* (.207)	−.189 (.238)	−.013 (.244)	.091 (.195)	.026** (.009)	.027** (.008)
Average teacher salary, public schools	—	—	—	—	—	—	.133** (.016)	.095** (.020)
Federal support	.119 (.061)	.033 (.070)	−.005 (.075)	.220** (.070)	.306** (.082)	.168* (.071)	−.008 (.010)	.001 (.010)
Percent metropolitan	.044** (.013)	.037** (.013)	.036** (.012)	.023 (.015)	.033* (.015)	.028* (.012)	−.009** (.002)	−.005* (.002)
Change in private school sector	—	.076 (.054)	.060 (.055)	—	−.135* (.063)	−.195** (.052)	—	−.011 (.008)
Percent Catholic school enrollment	—	—	−.022 (.017)	—	—	−.081** (.016)	—	—
Number of states	51	49	49	51	49	49	51	49
R ²	.37	.47	.49	.37	.46	.66	.81	.79

^a Public school student/teacher ratio minus private school student/teacher ratio.

^b Income per student in Models 1 through 3 predicting public school student/teacher ratio and public-private student/teacher ratio gap use the adjusted z-scored measure; Models 1 and 2, which predict the public school expenditures per student, use the unadjusted income per student measure because the dependent variable is also in terms of dollars and public school teacher salary is further used as a control.

p* < .05 *p* < .01 (two-tailed tests)

a national sample like this the state-level errors should be random and thus not bias estimates of effects for variables that vary by state. For example, although the effect of going to school in Vermont could not be reliably estimated, the effect of going to school in a state whose private school sector is 7 percent could be accurately estimated.

FINDINGS

Competitive Effects on Public School Organization: State-Level Analysis

Table 3 provides three sets of regressions predicting student/teacher ratios, the difference in student/teacher ratios between pub-

lic and private schools, and per-student expenditures in public schools.

Student/teacher ratio. Three models are estimated for the regressions predicting student/teacher ratios. Model 1 tests the effects of size of the private school sector, income per student, federal support, and percent metropolitan on public school student/teacher ratios and on the difference between public and private school student/teacher ratios (unionization was not included in these models as it did not have statistically significant effects). Model 2 adds the percentage-point change in the size of the private sector market from 1950 to 1980 to Model 1 to determine if student/teacher ratios are related to size of the private school sector or simply in-

dicating that states are slow to adjust resource levels to adapt to changing enrollments. Model 3 adds the percentage of Catholic school enrollment in the state's private school sector. Catholic schools have tended to adopt the pedagogical philosophy and practices of the "common school," which is associated with larger class sizes. Competition from Catholic private schools characterized by large class sizes might affect the type of adjustments that public schools make (or could affect the difference between private and public school student/teacher ratios in the state).

For predicting student/teacher ratios, the results for Model 1 show that as 1980 private sector share increases, the number of students per teacher in the public sector significantly decreases. The estimate indicates that for each increase of five percentage points in the private school sector, public schools would be expected to operate with one less student per classroom teacher (after controlling for statewide income per student, federal support, and percent metropolitan).⁵ The results from Models 2 and 3 indicate that the change in the size of the private school sector and the percentage of Catholic school enrollments in the private school sector do not significantly affect this outcome. The size of the private school sector, not the inability of states to adjust to changes in student populations, or the presence of competition from Catholic schools, accounts for a significant portion of the variation in public school student/teacher ratios.

In the second set of regressions in Table 3, the dependent variable is the public school student/teacher ratio minus the private school student/teacher ratio in each state (i.e., the gap in educational resources between public and private schools). The results from these regressions largely replicate the findings for student/teacher ratios in the public schools. After controlling for income per student, federal support and percent metropolitan, the larger the private school sector in a state, the smaller the gap between the public and private school student/teacher ratios with private schools having

smaller classes than public schools. Models 2 and 3 indicate that change in the size of the private school sector and the percentage Catholic enrollment in the state's private school sector are also each significant predictors of the state-level differences between public and private student/teacher ratios. Thus, although the change in the size of the private school sector did not affect public school student/teacher ratios, it affects the gap in student/teacher ratios between public and private schools, indicating that the slowness of private schools to adjust to changes in student enrollment levels is partially responsible for the size of the gaps in student/teacher ratios between the two school sectors. Controlling for the percentage of Catholic school enrollments in the private sector dampens the magnitude of this difference, but the effect remains significant.

The larger the private school sector, therefore, the smaller the private school advantage in the "opportunities for learning" represented by the student/teacher ratio. An examination of predicted values based on Model 3 in the second set of regressions shows this dramatically. Assuming 1980 state means on income per student, federal support, percent metropolitan, change in the size of the private school sector, and percentage of Catholic school enrollments in private schools, the difference in student/teacher ratios between private schools and public schools in a state would be 3.4 students per teacher when the private school sector is 1 percent, and 1.7 students per teacher when the private school sector is 10 percent. When the private school sector reaches 19 percent, the expected value for a state with mean values on the other variables is 0 (i.e., public and private schools would have identical student/teacher ratios).⁶

Public school expenditures. The final set of regressions in Table 3 examines per-student public school expenditures. Results are similar to those for student/teacher ratios. (In these two models, unadjusted measures for

⁵ In an unreported analysis, results are essentially similar using an unadjusted measure of income per student.

⁶ Using the ratio of the difference between the two sectors' student/teacher ratios to the public school ratio as the dependent variable for this regression produced similar results.

income per student are used because both dependent and independent variables appear in the equations in dollar amounts and teacher salaries are included as a statistical control.) The results confirm findings from previous research that have shown up to 85 percent of the state-level variation in per student expenditures is explained by teacher salaries and student/teacher ratios (U.S. Advisory Commission on Intergovernmental Relations 1990). The results also show that after controlling for income per student, federal support, percent metropolitan, and average teacher salary, per-student expenditures increase significantly with the size of the private school sector in the state. This effect is unaffected by the 1950–1980 change in the private school sector (Model 2). The results from this regression predict increases of slightly over \$100 per student (in 1980 dollars) for each 4 percentage point increase in private school sector.

An examination of the relationship between size of the private school sector and “organizational efficiency,” as measured by the ratio of teachers to total staff employed in the public schools, provides additional evidence identifying the organizational process whereby private sector competition affects student/teacher ratios. The zero-order correlation between size of the private school sector and “organizational efficiency,” defined as the ratio of teachers to total staff employed in the public schools, is not significant ($r = .20$). Thus, contrary to “market messiah” predictions of increased efficiency, the low student/teacher ratios in states with large private school sectors are not a result of schools devoting a greater portion of organizational resources to increase the number of teachers relative to other school staff. As is demonstrated in Models 1 and 2, the lower student/teacher ratios are largely the result of higher levels of public school expenditures per-student in these states.

The results in Table 3 indicate that public school systems respond to challenges from the private sector by devoting additional resources to increasing the “opportunities for learning” and thus increasing the competitiveness of the public schools. The results also suggest that more than just institutional inertia (e.g., public school bureaucracies that are slow to adjust staffing levels in response

to changes in the number of public school students) is responsible for changes in student/teacher ratios.⁷ Public schools have had a great deal of time to adjust staffing requirements to the gradual changes in the private school sector that occurred between 1950 and 1980, and the results in Table 3 suggest that the change in the size of the private school sector is not a significant factor producing these outcomes. (Change in the size of the private school sector is significant only in predicting the difference in student/teacher ratios between public and private schools). The results thus suggest that state educational budgets cannot be understood as a simple reflection of the number of students that share a fixed level of resources, but are the product of a complex annual political process that occurs in state legislatures (Kirst and Garms 1980). Although the precise mechanisms remain unclear, the results from Table 3 suggest that the size of the private school sector affects these political decisions. Do these differences in state resources affect student outcomes? Does the effect of size of the private school sector operate on student outcomes other than through the mechanism of change in school resource levels (e.g., in increased “efficiency” or an increase in negative peer effects)? To address these questions requires a student-level analysis.

Competitive Effects on Public School Outcomes: Student-Level Analysis

Table 4 provides results from OLS regressions on 12th-grade test scores. Model 1 shows that—as school-choice advocates argue—the presence of increased choices in the school marketplace has a beneficial influence on student performance in the public schools. Students learn more in public

⁷ A similar interpretation of results might maintain that the movement of high socioeconomic status students away from the public schools simply mechanically triggers an institutional increase in per-student revenues, because state and federal “categorical” educational funds are often tied to the number of low-income, poorly performing students. Public school students in states falling in the upper quartile on size of the private school sector, however, are less eligible for such funds because they tend to be in more affluent states.

Table 4. OLS Coefficients for Regression of 12th-Grade Test Scores on Selected Independent Variables: Student-Level Analysis

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	5.253** (.460)	5.310** (.460)	7.614** (1.011)	6.657** (.753)	6.585** (.753)	8.188** (1.064)
<i>Student-Level Variables</i>						
Test score, 10th grade	.887** (.008)	.885** (.008)	.884** (.008)	.885** (.008)	.883** (.008)	.883** (.008)
Student socioeconomic status	.537** (.139)	.385* (.150)	.391** (.150)	.519** (.139)	.391** (.150)	.394** (.150)
Male	1.045** (.169)	1.061** (.169)	1.064** (.169)	1.045** (.169)	1.059** (.169)	1.060** (.169)
Two-parent household	.166 (.217)	.178 (.217)	.170 (.217)	.168 (.217)	.176 (.217)	.170 (.217)
Educational expectations, 10th grade	.659** (.041)	.657** (.041)	.660** (.041)	.665** (.041)	.663** (.041)	.663** (.041)
Asian	-1.518** (.467)	-1.497** (.467)	-1.264** (.476)	-1.400** (.471)	-1.391** (.471)	-1.233** (.476)
Number of siblings	-.079* (.038)	-.081* (.038)	-.081* (.038)	-.088* (.038)	-.088* (.038)	-.086* (.038)
African American	-1.251** (.288)	-1.201** (.288)	-1.173** (.289)	-1.093** (.294)	-1.069** (.294)	-1.091** (.294)
Hispanic	-1.572** (.318)	-1.528** (.319)	-1.501** (.319)	-1.525** (.320)	-1.487** (.321)	-1.502** (.321)
Other non-White	-1.451** (.534)	-1.413** (.534)	-1.397** (.534)	-1.401** (.534)	-1.373* (.534)	-1.389** (.534)
Religiosity	.191 (.174)	.214 (.174)	.200 (.174)	.206 (.175)	.220 (.175)	.210 (.175)
<i>School-Level Variables</i>						
Alternate public school	.199 (.575)	.318 (.576)	.254 (.576)	.123 (.576)	.230 (.578)	.194 (.578)
Hispanic public school	1.169** (.331)	1.351** (.338)	1.409** (.339)	1.294** (.339)	1.451** (.346)	1.445** (.346)
School in a central city	.113 (.232)	.231 (.236)	.159 (.238)	.087 (.232)	.194 (.237)	.149 (.238)
School not in a metropolitan area	-.244 (.199)	-.103 (.206)	-.192 (.209)	-.281 (.209)	-.165 (.215)	-.183 (.215)
School S.E.S.	—	.729** (.280)	.751** (.280)	—	.638* (.285)	.686* (.286)
<i>State-Level Variables</i>						
Private school sector	.057** (.020)	.056** (.020)	.038 (.021)	.047* (.023)	.050* (.023)	.026 (.026)
Student/teacher ratio, public schools	—	—	-.118* (.046)	—	—	-.117* (.055)
Income per student (adjusted)	—	—	—	-.040 (.086)	-.047 (.086)	-.098 (.090)
Federal support	—	—	—	-.079** (.030)	-.069* (.030)	-.046 (.032)
Percent metropolitan	—	—	—	-.006 (.006)	-.007 (.006)	.001 (.007)

Note: For all six models, N = 6,910 and R² = .79.

* p < .05 ** p < .01 (two-tailed tests)

schools that face competition from the private sector. However, Model 1 does not control for peer effects. Public schools facing a challenge from the private sector may experience a “brain drain,” in which the “best and brightest” students enroll in the private schools. Results from Model 2, which controls for peer influences, substantiate the significance of peer effects. However, although the peer effect is significant, the estimate for the size of the private school sector does not significantly decrease in magnitude. Apparently test scores in the public schools respond to two contrasting social forces: The lower school socioeconomic status resulting from the drain of advantaged students from the public schools in states with large private school sector is counterbalanced by the higher school socioeconomic status in these states that results because these states tend to be more affluent.⁸

Model 3 adds the measure of public school resources—the average student/teacher ratio in the state’s public schools.⁹ When this vari-

⁸ An examination of the mean school socioeconomic status for schools in states in the upper and lower quartiles on size of private school sector states demonstrates this tendency. Public schools in states that fall in the lowest quartile on size of the private school sector (less than 6.5 percent) had a mean school socioeconomic status of $-.29$ compared to $+.38$ for private schools and $-.21$ for all schools in those states. Public schools in states that fall in the highest quartile on size of the private school sector (more than 12.5 percent) had a mean school socioeconomic status of $-.15$ compared to $+.13$ for private schools and $-.07$ for all schools in those states.

Two other estimates of the control variables in this set of regressions are worth discussing. Asians have lower than expected 12th-grade performance (relative to the omitted White category) because of Asian students’ higher mean educational expectations (5.44 compared to 4.01 for Whites). Regressions run without controlling for educational expectations showed no significant difference in outcomes between Whites and Asians. Public schools with a high percentage of Hispanics also perform better than regular public high schools, possibly because of the large numbers of “voluntary” immigrants who, *ceteris paribus*, have higher than expected school outcomes (Ogbu 1987).

⁹ Similar results are obtained using a school-level student/teacher ratio taken from school administrator reports of the number of students di-

able is added, the effect of the size of the private school sector is greatly diminished and loses significance. The student/teacher ratio measure shows that the more students per teacher, the less students learn as measured by standardized test scores. Overall, results indicate that public school students have greater gains on test scores in states with a large competing private sector, and this result is largely explained by the increased resources available to public schools facing greater competition from the private sector.

These findings are largely replicated in a second set of regressions, which controls for other state level variables shown to influence school resource levels (Models 4–6 in Table 4) in Table 3 above. Adding controls for state-level income per student, federal support, and percent metropolitan produces little change in coefficients for key variables (size of private school sector, school socioeconomic status, and public school student/teacher ratio). In Models 4 and 5, federal support is associated with low test scores (predictably, as much federal aid is targeted to poorly performing schools in economically disadvantaged areas), but this effect disappears after state-level student/teacher ratios are considered.¹⁰

In sum, results from the student-level analyses demonstrate that, although size of the private school sector has a positive influence on student outcomes, this effect is largely a result of greater resources provided to schools in these states.

vided by the number of teachers at the school (the square root of the measure is employed to deal with outliers). Estimates of the key variables with this alternative measure in Model 3 are: private school sector .037 (.021), school socioeconomic status .715 (.294), and school student/teacher ratio $-.178$ (.081). In Model 6, results are: private school sector .028 (.025), school socioeconomic status .624 (.300), and school student/teacher ratio $-.169$ (.082). For both models, the R^2 remains .79. The state-level measure is utilized in the reported results to ensure comparability with the state-level effect for the size of the private sector and to avoid problems of missing data.

¹⁰ None of the three additional state controls that predict size of the state’s private school sector (percent African American students in the state’s public schools, unionization, and church membership) had significant effects when added to the model.

CONCLUSIONS

I have focused on how public schools are affected by the size of the private school sector. I have demonstrated that state-level student/teacher ratios differ substantially between public and private school sectors in states with relatively few private schools, and are closer to equality in states with a larger private school sector. Furthermore, these student/teacher ratios affect student outcomes and are responsible for much of the difference in public school student performance related to competition from the private school sector.

I have not examined the effects of the size of the private school sector on within-school stratification and organization. Future research should examine how the structure of tracking varies with size of the private school sector. Public schools may respond to competition by allocating additional state funds to increase specialized vocational programs. For example, Brint and Karabel (1989) have shown that public community colleges historically have adopted this market niche strategy. Public schools may also respond to competition by using additional resources to increase the size of the academic track in order to challenge the private schools' emphasis in this curricular area.

I have not examined the effect of size of the private school sector on the organization and behavior of private schools (with the exception of a comparison of student-teacher ratios between sectors in Table 2). Future research should compare the performance of public and private schools in states with varying sizes of the private school sector. As Levin (1989) suggested, this will require not only a comparison of "private good" outcomes (e.g., individual test scores), but also "public good" outcomes (e.g., citizenship, social responsibility, and multicultural understanding). One prediction can be made on the basis of this research: Because of the effect of school-level resources, the performance of students in private and public schools on standardized tests should be most similar in states with large private school sectors.

On a theoretical level, the results suggest that competitive forces do change the behavior of public secondary schools, but they im-

prove public schools through increased funding, not increased efficiency. Theoretical approaches that highlight resource dependency and dynamic political processes provide the best framework for understanding why public schools threatened by competition from private schools can rely on organizational and political allies for additional resources. Although institutional inertia may exist, its effect is not to eliminate, but simply to dampen, the response of the public schools to market pressures. To understand variation among states in levels of educational funding, however, research is needed to document the specific actions and interests of actors in local political arenas. By 1980, public school financing had become increasingly dependent on state sources, and "elite political activity" to pressure state governments had increased (Kirst and Garms 1980). Competition from the private sector may stimulate such political activity. Public school advocates would be expected to mobilize support to increase funding in the state legislature, while simultaneously pursuing legal strategies to ensure increased funding for economically or developmentally disadvantaged students. Courts and legislatures may be more sympathetic to defending the quality of public schools when private schools are a significant threat.

Another mechanism whereby the size of the private school sector may affect school resource levels is suggested by Romer and Rosenthal (1984). Examining school district referenda in Oregon, they noted that voter decisions were made on the basis of "fiscal illusions"—voters were unaware of actual levels of federal and state support for local school districts—and political "agenda control" inflated locally-financed per-student expenditures by between 15 and 40 percent. I speculate that voters in areas with a large private school sector may be unaware of the savings to their public schools brought about by the absence of substantial numbers of private school students. In such states, public school advocates may be more effective at using the challenge from the private sector to control the political agenda and ensure higher funding levels for public schools.

This study has policy implications concerning the role of the private sector in elementary and secondary education. First, a large private school sector does not act as

simply as school-choice advocates have predicted: Problems in the public schools cannot be magically corrected through the invisible hand of an expanded competitive market system without additional funding. Second, the results highlight the effects of school resources on student performance in the public schools, reasserting the primacy of material resources for student outcomes. Finally, because the primary benefit to public schools of an expanding private sector is the indirect effect through resource allocation, a more effective strategy for improving performance

in the public schools than expanding competition from the private school sector may be direct political mobilization to increase allocations for public schools.

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Appendix. Selected Variables by State

State	Private School Sector (Percent)		Student/Teacher Ratio, Public Schools, 1980	Student/Teacher Ratio Gap, 1980 ^a	Sample Representativeness	
	1980	Change 1950–1980			High School and Beyond ^b	Department of Education ^c
Alabama	8	5	19.7	3.69	1.24	1.73
Alaska	4	—	15.4	3.17	.08	.20
Arizona	7	2	18.8	2.46	1.38	1.18
Arkansas	4	2	17.4	2.02	1.13	1.03
California	11	3	20.9	2.11	10.76	10.19
Colorado	6	–2	17.1	3.29	1.07	1.29
Connecticut	14	–5	14.2	.38	1.53	1.26
Delaware	19	3	16.0	.47	.13	.32
District of Columbia	17	2	16.4	6.06	.18	.22
Florida	12	7	18.8	3.02	5.37	3.52
Georgia	7	6	17.4	3.33	1.87	2.46
Hawaii	18	—	20.7	4.89	.41	.42
Idaho	3	0	19.1	1.86	.46	.45
Illinois	15	–6	16.1	–2.08	5.58	4.87
Indiana	9	0	17.6	.89	2.30	2.61
Iowa	9	–1	15.2	–1.74	1.64	1.37
Kansas	8	0	13.7	–1.28	.93	1.00
Kentucky	10	1	18.6	2.29	.82	1.55
Louisiana	18	3	16.2	–1.71	1.52	1.76
Maine	7	–11	17.5	6.90	.66	.52
Maryland	13	–4	16.2	2.16	2.09	1.94
Massachusetts	12	–13	14.1	.86	1.90	2.59
Michigan	10	–5	20.3	1.02	3.30	4.79
Minnesota	11	–4	16.0	–.98	2.39	2.04
Mississippi	10	7	17.3	1.87	1.36	1.11
Missouri	13	0	15.9	–.68	1.75	2.08
Montana	5	–5	15.0	.88	.29	.37
Nebraska	12	1	15.7	.19	.61	.69

(Appendix continued on next page)

(Appendix continued)

State	Private School Sector (Percent)		Student/ Teacher Ratio, Public Schools, 1980	Student/ Teacher Ratio Gap, 1980 ^a	Sample Representativeness	
	1980	Change 1950–1980			High School and Beyond ^b	Department of Education ^c
Nevada	4	0	19.7	.73	.46	.37
New Hampshire	11	–16	19.0	5.98	.09	.42
New Jersey	16	–4	14.9	–1.65	2.88	3.20
New Mexico	6	–4	18.3	3.70	1.43	.64
New York	17	–3	16.3	.16	7.20	7.76
North Carolina	5	4	18.8	5.29	1.96	2.58
North Dakota	8	–1	15.2	–.74	.19	.30
Ohio	12	–2	18.0	.14	4.54	4.84
Oklahoma	3	0	16.1	2.57	1.95	1.34
Oregon	6	–1	18.5	3.55	.87	1.09
Pennsylvania	18	–1	15.8	–2.04	5.12	5.09
Rhode Island	17	–14	14.9	–.97	.50	.40
South Carolina	7	6	18.0	3.81	1.74	1.45
South Dakota	8	–1	15.1	2.76	.41	.33
Tennessee	8	5	19.6	5.30	2.31	1.89
Texas	5	0	16.4	2.00	7.43	6.39
Utah	2	0	23.5	6.97	.79	.70
Vermont	7	–13	14.0	3.42	.15	.22
Virginia	7	4	16.3	3.31	1.56	2.31
Washington	7	0	19.8	3.66	1.56	1.82
West Virginia	3	1	16.8	.74	1.36	.85
Wisconsin	16	–6	14.9	–1.66	2.62	2.27
Wyoming	3	0	14.4	2.52	.15	.21

^a Public sector ratio minus private sector ratio.^b Percent distribution of public school student respondents in the High School and Beyond Sample.^c Percent distribution of 1980 public school secondary students in reports issued by the U.S. Department of Education.

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