Getting a Feel for the Market: The Use of Privatized School Management in Philadelphia

VAUGHAN BYRNES
Johns Hopkins University

This study evaluates the impact of the privatization of education services in the Philadelphia School District, using an interrupted time series design. The sample observes 88 middle-grades schools, beginning with the 1996–97 school year, and finds that, by 2006, four years postintervention, the achievement growth rate of schools run by educational management organizations (EMOs) had fallen significantly below the growth rate of district-run schools in both reading and mathematics, whereas, in 2002, immediately prior to privatization, those schools later run by EMOs had achieved growth rates significantly higher than the rest of the district in reading and statistically equivalent in mathematics.

Over the past decade, the plights facing the U.S. public education system have drawn much attention and have been widely documented. This attention has focused predominantly on the growing dropout crisis in U.S. high schools (Balfanz and Legters 2001, 2004; MacIver et al. 2003; Swanson 2004), the widening achievement gap within U.S. public schools between minority and low-income students and their more advantaged counterparts (Braswell et al. 2001; O’Sullivan et al. 2003; U.S. Department of Education 2003), and the international disparity in achievement results between the United States and some other developed nations, particularly in the middle grades (Beaton et al. 1996; Schmidt et al. 1999). As these problems have been brought further into the spotlight, the pressure to fix them has continued to mount. Yet, despite wide-ranging efforts and significant financial investment, the problems persist, and as the pressure continues to build, the type of reforms being brought into consideration have grown bolder, encompassing not only ideas for adjusting the current system but also proposals for changing the very nature of the system itself. One such fundamental reform is the idea of privatizing the public education system.

While attempts at privatization are relatively new and few in practice, they
The Impacts of School Privatization in Philadelphia

have drawn a disproportionate amount of publicity, as they represent a striking challenge to the traditional role of government as the monopoly provider of free public education to those who cannot afford alternatives. Privatization proponents have theorized that the bureaucratization of the education system is at the heart of its failure and a main cause of the poor performance in many public school districts and that privatization would provide more efficient administration and use of resources, as well as greater innovation and improvement in the provision of services arrived at through competition in an open market (Chubb and Moe 1990; Peterson 1999). Although new and controversial as a reform in education, the underlying theories, in fact, stem from the very fundamentals of traditional capitalist economic doctrine, going back to the core of Adam Smith and The Wealth of Nations (1776/2000). The basic ideas of removing government interference in the field of education and allowing the natural free market forces such as competition to provide the public consumer with the best possible education services are in a sense traditionally American, finding support from the preeminent American economist of the twentieth century, Milton Friedman (1995). However, the idea of privatizing the public education system has proven quite controversial to many in what has been a traditionally liberal arena.

Philadelphia as a National Proving Ground

The controversial aspect of privatization has thus meant limited opportunities to put its theories into practice. However, with a struggling urban public school system under a conservative state government, Philadelphia made for an ideal site to introduce privatization on a larger scale.

The Philadelphia City School District, serving over 200,000 students, is one of the largest urban school districts in the United States. Poor academic performance, combined with the city’s dependence on the state for assistance in paying off the school system’s debts, laid the groundwork for a 2001 state takeover of the school system. Tension between the city district and the state
Byrnes

had grown in the late 1990s under Superintendent David Hornbeck (Maranto 2005). By 1998, the state had set the stage for future takeover when Republican Governor Tom Ridge, supported by a Republican-controlled state legislature, passed Act 46, permitting the state takeover of any school district in financial and/or academic distress. This legislation was furthered in 2000, with Act 16, putting Philadelphia and 10 other school districts on notice that they would be taken over by the state within three years should they fail to improve the academic standing of their students. Shortly thereafter, Superintendent Hornbeck announced his resignation. In 2001, Governor Ridge hired Edison Schools, the nation’s largest for-profit educational management organization (EMO) to review the district’s operations and present a proposal for restructuring Philadelphia’s educational services. Later in that same year, Mark Schweiker, who replaced Ridge as governor in Pennsylvania, announced a plan for a state takeover of the Philadelphia City School District, based largely on the Edison proposal and calling for the privatization of many of the districts schools, along with many of the services traditionally provided by the school district.

The controversial nature of privatizing the schools led to strong reactions from the public, however, including student, teacher, and community groups. Their reaction gave the city’s Democratic mayor, John Street, the political leverage to negotiate a better deal with the state, but, in the end, the deal was one that would still see the privatization of many of the district’s schools. In 2002, the Philadelphia School Board was replaced by the School Reform Commission (SRC) with a five-member board; three members were appointed by the governor and two by the mayor, assuring that the SRC would favor the state’s policies. The SRC then assigned 45 of the district’s lowest-achieving schools to the management of education management organizations (EMOs). This number was substantially lower than in the original proposal and, similarly, the scope of privatization was also limited. Unlike in the more commonly conceived voucher system, parents were not given the freedom to choose their children’s schools, and the EMO-run schools continued to draw their student populations from local neighborhoods. Still, the intervention in Philadelphia represented the largest single experiment in the privatization of public schools in the United States, and EMOs were given control over the hiring of administrative staff and classroom curriculum and pedagogy.

The SRC went even one step further beyond a simple experiment in privatization and introduced not one but several external service providers to create a competitive market environment. Edison received most (20) of the 45 schools, while two other for-profit EMOs, Victory and Chancellor Beacon, received five schools each. Two nonprofit EMOs, Foundations and Universal, received five and two schools, respectively, and, finally, two local universities, Temple and the University of Pennsylvania, were given the management of five and three schools, respectively. A further 16 schools, originally designated
The Impacts of School Privatization in Philadelphia

for new management, were allowed to continue with their ongoing reform efforts as they had shown substantial improvement in the years leading up to the state takeover. Four more schools were designated to become charter schools that would have freedom from some of the regulations that apply to the district’s other schools.

Those schools left under the care of the district did not stay with the status quo. Paul Vallas, the ex-CEO of the Chicago public schools, was hired as the new superintendent of the Philadelphia School District. Vallas immediately introduced a wide array of reforms district-wide, including a mandated core curriculum in mathematics, reading, and English language arts, with coherence across grade levels; pacing guides; benchmark assessments administered every six weeks; district and regional coaches for teachers; professional development for teachers; the addition of content leaders for each major subject at each school; improved hiring practices for the district to recruit better candidates; the closing of some middle schools and the conversion of many K–4, K–5, and K–6 schools into K–8 schools; and the adoption of a zero-tolerance disciplinary policy by the district. Thus, even while the SRC was bringing in several new management organizations to experiment in privatization, the district itself was also undergoing a substantial change in direction and implementing its own brand of reforms. These reforms included assigning 21 of the lowest-achieving schools to be managed by the district’s own Office of Restructured Schools (ORS). By the start of the 2002–3 school year, the educational landscape in Philadelphia was unlike any other in the country.

Research on Privatized Service Providers

The large-scale experiment in Philadelphia represents an important opportunity to research and evaluate the effectiveness of privatization in education. The need to do so is made even more important by the lack of conclusive research presented on the matter to date despite its high publicity level. While conservative proponents of the policy have founded their arguments on the strong rhetoric of classical economic theory, they have offered little in the way of empirical evidence to ground and support their theories (CER 2007; Finn 1991; Hill 1997a, 1997b, 1997c, 1998; Peterson 2007). This lack of scientific evidence is due in large part to few opportunities, with there being just over 400 privately managed schools across the country at the time of privatization in Philadelphia (GAO 2003).

Where empirical studies have been done on different privatization models, the research has been quite mixed, with positive results for privatization in some cases and negative results in others (Ascher 1996; Edwards 1997; GAO 1996, 2003; MacIver and Stringfield 2000; Peeler and Parham 1994; Williams
Byrnes

and Leak 1995). John Chubb (chief education officer of Edison, Inc.) and Terry Moe’s 1990 study is often considered a hallmark case linking higher student achievement to lower levels of bureaucratic organization, but the study’s methods and validity have been brought into question (Sukstorf et al. 1993). Similar to past research on privatization in general, the early studies on Philadelphia data have also been mixed, with studies by Johns Hopkins University (MacIver and MacIver 2006) and the RAND Corporation and Research for Action (Gill et al. 2007) both finding EMO schools to have achieved less than the other district schools but not significantly so in statistical terms, while Peterson and Chingos (2007) found statistically positive results among for-profit EMOs when compared to the rest of the school district but no differences among nonprofit EMOs.

Sample and Method

In this article, we use an interrupted time series design (Shadish et al. 2002) to analyze the effectiveness of the various education service providers in Philadelphia. This quasi-experimental design allows us to determine the effect of each management organization in two different ways. First, we are able to analyze each management type on its own by comparing the achievement performance of their schools both before and after assignment to their new management group. Second, we can then compare the trends of each management type, private versus public, against those of the other, to gauge the differential effects of one manager versus another.

The grant funding this study focused research on the 88 middle-grades schools in Philadelphia (most of these middle and elementary middle schools had a 6–8 or K–8 grade configuration). This meant that we were unable to include elementary schools, which account for nearly half of the EMO-managed schools and most of the ORS schools. However, the sample remains large enough to provide reliable estimates from which we can draw conclusions about the effects of the various managers in general, and it does include the entire population of middle schools, which were the focus of the funded study. We focus on the academic achievement of students and schools in the eighth-grade year at the end of the middle grades. The middle grades are where the achievement gap between disadvantaged minority students and their U.S. and international counterparts is at its widest (Beaton et al. 1996; Schmidt et al. 1999) and also where practitioners can start to identify the students who will later dropout and fail to graduate from high school (Balfanz et al. 2007). Data were not available for charter schools, eliminating that one management group from our analyses. Our analysis includes data taken from a 10-year time period, from the 1996–97 school year to the 2005–6 school year. This gives our models six years of trend
The Impacts of School Privatization in Philadelphia

line prior to the state takeover of Philadelphia and four time points observed after.

With 10 years of data surrounding the point of intervention, we are able to rule out several of the most likely threats to validity involved in a time series analysis. These include delays in the emergence of reform effects, which typically take from three to five years to realize at a decent level of implementation (Borman et al. 2003); initial effects caused by the publicity generated from the state takeover and privatization; or any short-lived effects due to the initial excitement of introducing a new reform in general. In addition, the comparison among multiple groups allows us to rule out history or testing as threats to internal validity, and the use of several pretest measures and multiple control variables highly correlated to the outcome help to rule out the threat of any differences between the groups as a cause for selection bias in the results. This last point is of particular relevance given that the EMO groups were given the lowest-achieving schools to reform. Analysis of the control measures also found that any changes in the student population over the 10-year period were consistent across both the district and EMO schools, further reducing the threat of selection bias.

Our control measures include variables for the percentage of minority students at a school, the percentage of students eligible for the Federal Free/Reduced Lunch Program (FRL), and whether a school was a K–8 or middle school. The outcome in our models was a school’s mean scale score on the Pennsylvania System of School Assessment (PSSA) exam, and separate models were run for both mathematics and reading. Table 1 shows the descriptive statistics for our sample of schools just prior to the state takeover in school year 2002–3.

We used two-level multilevel models (Bryk and Raudenbush 2002; Snijders and Bosker 1999) to measure schools’ growth curves over this 10-year period, where schools were the level-2 unit and their achievement growth was modeled over time at level 1. Our variables measuring schools’ demographic compositions were also measured at each time point and modeled at level 1 in order to control for changes in school characteristics over time. The use of multilevel modeling is ideal for samples such as ours where the data are clustered, as it explicitly accounts for the interdependence of observations taken over time from within the same schools. Such autocorrelation violates the statistical assumptions of traditional regression modeling and is common to time series designs.

Analysis

Figures 1–6 graphically present the results of our multilevel models (a sample of the full model estimates are presented in app. A). Figures 1 and 2 compare the growth rates of those schools that remained under the district’s manage-
TABLE 1

**Sample Descriptives**

<table>
<thead>
<tr>
<th></th>
<th>District</th>
<th>ORS</th>
<th>Edison</th>
<th>Other</th>
<th>EMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>61</td>
<td>5</td>
<td>13</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Spring 2002, mean eighth-grade math PSSA score</td>
<td>1,213</td>
<td>1,106</td>
<td>1,121</td>
<td>1,103</td>
<td></td>
</tr>
<tr>
<td>Spring 2002, mean eighth-grade reading PSSA score</td>
<td>1,197</td>
<td>1,074</td>
<td>1,084</td>
<td>1,076</td>
<td></td>
</tr>
<tr>
<td>Mean student attendance (%)</td>
<td>90.8</td>
<td>87.0</td>
<td>85.8</td>
<td>84.9</td>
<td></td>
</tr>
<tr>
<td>Teacher absentee rate (%)</td>
<td>6.1</td>
<td>6.5</td>
<td>6.1</td>
<td>7.1</td>
<td></td>
</tr>
<tr>
<td>Average grade size</td>
<td>129</td>
<td>216</td>
<td>172</td>
<td>188</td>
<td></td>
</tr>
<tr>
<td>Student/teacher ratio (%)</td>
<td>20.5</td>
<td>16.9</td>
<td>17.8</td>
<td>18.0</td>
<td></td>
</tr>
<tr>
<td>FRL-eligible students (%)</td>
<td>64.9</td>
<td>91.7</td>
<td>94.0</td>
<td>90.6</td>
<td></td>
</tr>
<tr>
<td>Minority students (%)</td>
<td>66.7</td>
<td>99.4</td>
<td>95.3</td>
<td>95.1</td>
<td></td>
</tr>
<tr>
<td>Average no. of suspensions</td>
<td>126</td>
<td>241</td>
<td>244</td>
<td>214</td>
<td></td>
</tr>
<tr>
<td>Student mobility rate during 2001–2 school year (%)</td>
<td>30.3</td>
<td>44.2</td>
<td>46.8</td>
<td>38.7</td>
<td></td>
</tr>
</tbody>
</table>

**Note.**—ORS = Office of Restructured Schools; EMO = education management organizations; PSSA = Pennsylvania System of School Assessment exam; FRL = federal free/reduced lunch program.

The individual points in the figures represent a management group’s mean achievement scores across time, as per the results of our multilevel models, which controlled for schools’ grade structures and population demographics, as well as for measurement error, and the unique variation associated with each individual school. Asterisks above an EMO point estimate represent a statistically significant difference from the district according to the results of our models, using a 95% confidence interval with a two-tailed test. In the first baseline year of 1996–97, this means that the schools later run by EMOs started at significantly different levels of achievement than did the schools later run by the district. In later years, this means a significant interaction between EMO status and the slope of the model, or that EMO-run schools experienced significantly different achievement growth rates than did the district-run schools. Along with the point estimates, trend lines have been su-
perimposed for each management group to highlight their growth trends both before the state intervention and after, as per the interrupted time series design. By comparing the trend lines of a single group before the intervention to after, we can see if its growth rates rose, decreased, or remained the same after the new management group was introduced. Thus, scores from the spring of 2002 represent the final point of growth prior to state intervention; conversely, this is the initial starting point from which growth is measured for the posttakeover time period and the onset of new management. By comparing the trend lines of one management group to another, we can also evaluate the relative effects of one versus another. The slopes for each trend line are marked in the figures.

From figures 1 and 2, we first see that, prior to state takeover, all schools on average were making achievement gains from 1997 to 2002. We also see that all schools, district-run and EMO-run alike, improved even more rapidly after 2002. However, when we start to compare the relative differences between EMO-run and district-run schools after the takeover, we start to see two diverging patterns. The figures show that, prior to the state intervention, the “struggling schools” (originally designated for outside management) were actually gaining on the higher-performing district schools. This is evident from the higher slopes of their trend lines, which up until 2002 show that the achievement levels of the low-performing schools were actually converging with those of the higher schools. The higher growth rate of the targeted schools compared to the rest of the district reached statistical significance in reading by 2002, just prior to the state takeover, though not in mathematics, which, while nominally higher, were not statistically distinguishable. After the state
Byrnes

Fig. 2.—PSSA growth trends, reading: district versus EMO before and after 2002 state turnover
takeover and the introduction of several new EMO groups, we see the opposite trend. The growth rates of the targeted schools fall below those of the district schools, reversing the pretakeover pattern. After 2002, the trend lines of the EMO-managed schools begin to diverge from those of the district managed schools, and by 2006, four years postintervention, their growth rates are significantly lower than those of the district-run schools in both reading and math.

When looking more specifically at individual management groups in figures 3 and 4, we see little difference between Edison and the other EMOs. The ORS trajectories, meanwhile, more closely resembled the higher gains of other district-managed schools, though their trajectories were not statistically distinguishable from those of other EMOs; given that this estimate is based upon a sample of only five schools, it should not be considered to be conclusive. The patterns are similar in figures 5 and 6, which compare the EMOs along profit versus nonprofit lines. Both for-profits and nonprofits grew at lower rates than did other district-managed schools, a result that differs from the Peterson and Chingos study (2007), which found a positive effect of for-profit EMOs on achievement growth rates. While their study and ours are similar in methodological approach, as both attempt to compare each management group’s pre-intervention growth to their post-intervention growth and then the differences between the two, our study makes use of five years of growth prior to intervention as a baseline for comparison, whereas theirs compares the four years of postintervention growth to only one year of pretreatment growth, the school year 2001–2. Using only one year of pretreatment growth for comparison leaves the causal inferences they draw open to several threats to validity, such as regression...
Fig. 3.—PSSA growth trends, mathematics: by specific management before and after 2002 state turnover.

Fig. 4.—PSSA growth trends, reading: by specific management before and after 2002 state turnover.
Fig. 5.—PSSA growth trends, mathematics: profit versus nonprofit before and after 2002 state turnover.

Fig. 6.—PSSA growth trends, reading: profit versus nonprofit before and after 2002 state turnover.
The Impacts of School Privatization in Philadelphia

to the mean or selection maturation (Shadish et al. 2002). This is especially so
given the particularities of the 2001–2 school year in the Philadelphia School
District, as the state takeover of the school board occurred in the middle of the
school year, in January of 2002. Further, the effects of this historical event would
not have been equal across all schools in the district but rather would have been
greater for those schools facing outside management, as they were already aware
of their possible fates prior to spring testing, meaning that principals already
knew that they would likely be replaced and that many of the teachers who
later transferred to other schools not on the takeover list would have already
begun that process and filed their transfer papers. Thus, given the social and
political upheaval surrounding the district at the time and those EMO schools
in particular, the year of growth from 2001 to 2002 represents a particularly
unreliable year from which to estimate preintervention trends. Our study, which
included five years of growth prior to intervention, provides both a more reliable
measure of preintervention trends from which to compare and results that are
less vulnerable to threats of internal validity.

Discussion

That our main results echo those of other early studies on privatization in
Philadelphia (Gill et al. 2007; MacIver and MacIver 2006) lends support both
through replication and by triangulation of methodologies. Responses to these
results from supporters of privatization have relied upon the fact that the
EMO schools were given management of many of the lowest-achieving schools
in the district. However, that is not likely to bias results in this study given
the statistical control of several pretest measures (six time points), as well as
the control for several other measures of student demographics and school
structure. Furthermore, in our sample of middle-grades schools, five of the
worst schools in terms of absolute levels of achievement prior to state inter-
vention were those under ORS management, which began with achievement
levels as low as those of the EMO schools and with equally disadvantaged
student bodies (table 1). That the ORS schools may have been the highest-
performers of all groups postintervention further takes away the argument
that the relative effectiveness of the district versus EMO management was
due to pretreatment differences in achievement levels and student demograph-
ics. Given that the models also incorporate data up to four years past the date
of intervention, it is also unlikely that the lack of positive results for EMO is
due to early implementation problems or that it is too early to detect any
treatment effects (Borman et al. 2003).

Some EMO officials have argued that the district-wide gains have been a
product of the competitive market introduced by the state takeover, thus mak-
ing the introduction of EMOs a success, even if they themselves did not outperform the district schools, as their competition may have been the impetus for the district’s reforms and improved achievement levels (Viadero 2006). A competing theory is that the achievement gains seen district-wide are a result of the increased pressure upon school and district administrators from new national accountability measures imposed under No Child Left Behind (NCLB), which led them to implement their centralized and systemic curricular and staff development reforms (MacIver and MacIver 2006). As both NCLB and the privatization of the school district were introduced at roughly the same, it is empirically very difficult to separate the effects of the two and determine which one was more likely the cause of the district’s gains.

There is one point, however, that gives us reason to doubt the competition theory, the lack of competitive environment at all that seems to have existed between the district and the EMOs. That many of the EMOs were sharing in the district’s reforms suggests this (MacIver and MacIver 2006), and studies based upon interviews and other qualitative methods have further described the relationships between the district and the EMOs as better characterized by cooperation than by competition (Christman et al. 2006). The district and EMO schools were also not competing for students given that the 2002 changes did not include parental choice of schooling, which is usually considered an essential element of school competition. Again, because of their coinciding introductions, it is difficult to assert whether the district-wide gains were due to the introduction of private service providers or due to the introduction of federal accountability measures; there is some evidence that suggests the latter theory over the former. The lack of a competitive environment between the district and EMOs casts doubt on the notion that the introduction of varied service providers spurred the positive results that were seen in the district after 2002. Rather, it seems more likely that the large gains seen by the district were in response to the increased pressures under NCLB, and the centralized reforms it adopted in response, such as a coherent core curriculum, providing coaches and content leaders in the major subjects, improved hiring practices, and the restructuring of the some schools with the worst track records. As many of the EMOs made use of the district’s curriculum and its benchmark tests and professional development, as well as experiencing the district’s parallel K–8 conversions, they would also have benefited from the district’s reforms, though to a lesser degree, making the effect citywide.

One area this study could not address was the issue of the funding provided to the various management groups. As one of the main arguments for the privatization of school districts is that the bureaucratization of public administration causes great inefficiencies, it is very important to then evaluate the academic performances of the management groups in the context of their relative funding levels. If the EMO results came at higher costs but were no
better than those of the publicly run school district, then this would be considered as evidence against the theory that the publicly run administrations are less efficient. A similar situation exists in Baltimore, where Edison has run three schools and the high cost of its contracts has brought into question the cost effectiveness of privatization as a use of state funds (Abell Foundation 2005). In the case of Philadelphia, it is known that, through funding agreements between the city and state, the EMOs received marginally increased per pupil funds than did the district schools (Christman et al. 2006). Edison schools received the most extra funding, $881 per pupil above the regular district schools in the first year after takeover and $750 in years 2 and 3. Victory received $857 and $750, respectively; Foundations, $667 and $750; Universal $656 and $650; and Chancellor Beacon $650 and $100. The two universities, Temple and University of Pennsylvania, received $450 in extra funding per pupil per year. Within the district itself, ORS schools and the 16 schools removed from the takeover list received an additional $550 and $450 per pupil above other district schools. However, it is also known that EMO schools had less-experienced teachers and thus received fewer resources in terms of teacher salaries. However, given the lack of data on teacher salaries and without knowing how teacher salaries differed across schools, there is no way to know whether the total per pupil funding was greater or less in district schools or EMO schools. There are also several other streams of funding for which we do not have data, including outside grants from charities, foundations, and federal sources. Further, as this study in particular was based on a 10-year time span, the above-mentioned financial data would have had to have been available for that entire time period. Therefore, the financial context of the school privatization is an issue that we were unable to examine here, but it is an important detail of the story that bears further examination in future work if possible.

Another area that this study could not address was the performance of charter schools as an education service provider and school management choice. Charter schools are proving to be a popular choice as an alternative to failing urban public school systems (Hess et al. 2001). However, the research on charter schools has similarly produced limited evidence as to their educational advantages (Hess and Moranto 2000; Miron and Nelson 2002; Murphy and Shiffman 2002; Wells et al. 1998; Zimmer et al. 2008), and, given their growing popularity as a reform, more research on their efficacy is certainly required.
Appendix

Model Estimates for Figure 1—PSSA Mathematics

Summary of the Model Specified (in Equation Format)

Level-1 Model:

\[ Y = B_0 + B_1 \times \text{LOWINC} + B_2 \times \text{MINORITY} + B_3 \times \text{COHORT2} \]
\[ + B_4 \times \text{COHORT3} + B_5 \times \text{COHORT4} + B_6 \times \text{COHORT5} \]
\[ + B_7 \times \text{COHORT6} + B_8 \times \text{COHORT7} + B_9 \times \text{COHORT8} \]
\[ + B_{10} \times \text{COHORT9} + B_{11} \times \text{COHORT10} + \text{R}. \]

Level-2 Model:

\[ B_0 = G_{00} + G_{01} \times \text{ALLEMO} + G_{02} \times \text{K3} + U_0 \]
\[ B_{11} = G_{10} \]
\[ B_{2} = G_{20} \]
\[ B_{3} = G_{30} + G_{31} \times \text{ALLEMO} + G_{32} \times \text{K3} \]
\[ B_{4} = G_{40} + G_{41} \times \text{ALLEMO} + G_{42} \times \text{K3} \]
\[ B_{5} = G_{50} + G_{51} \times \text{ALLEMO} + G_{52} \times \text{K3} \]
\[ B_{6} = G_{60} + G_{61} \times \text{ALLEMO} + G_{62} \times \text{K3} \]
\[ B_{7} = G_{70} + G_{71} \times \text{ALLEMO} + G_{72} \times \text{K3} \]
\[ B_{8} = G_{80} + G_{81} \times \text{ALLEMO} + G_{82} \times \text{K3} \]
\[ B_{9} = G_{90} + G_{91} \times \text{ALLEMO} + G_{92} \times \text{K3} \]
\[ B_{10} = G_{100} + G_{101} \times \text{ALLEMO} + G_{102} \times \text{K3} \]
\[ B_{11} = G_{110} + G_{111} \times \text{ALLEMO} + G_{112} \times \text{K3}. \]
### TABLE A1

Final Estimation of Fixed Effects (with Robust Standard Errors)

<table>
<thead>
<tr>
<th>Fixed Effect</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept for baseline achievement of Cohort 1, B0:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G00</td>
<td>1.12411</td>
<td>10.91</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G01</td>
<td>−52.21</td>
<td>13.95</td>
<td>.001***</td>
</tr>
<tr>
<td>K–8 school, G02</td>
<td>37.59</td>
<td>14.88</td>
<td>.014*</td>
</tr>
<tr>
<td>Slope for % of FRL-eligible students, B1:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G10</td>
<td>−.87</td>
<td>.21</td>
<td>.000***</td>
</tr>
<tr>
<td>Slope for % of minority students, B2:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G20</td>
<td>−1.07</td>
<td>.26</td>
<td>.000***</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 2, B3:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G30</td>
<td>8.90</td>
<td>4.34</td>
<td>.040*</td>
</tr>
<tr>
<td>EMO school, G31</td>
<td>−16.71</td>
<td>6.72</td>
<td>.013*</td>
</tr>
<tr>
<td>K–8 school, G32</td>
<td>−11.73</td>
<td>7.85</td>
<td>.135</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 3, B4:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G40</td>
<td>25.98</td>
<td>4.54</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G41</td>
<td>1.28</td>
<td>7.06</td>
<td>.057</td>
</tr>
<tr>
<td>K–8 school, G42</td>
<td>−6.35</td>
<td>8.57</td>
<td>.459</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 4, B5:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G50</td>
<td>21.06</td>
<td>5.64</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G51</td>
<td>2.27</td>
<td>8.57</td>
<td>.792</td>
</tr>
<tr>
<td>K–8 school, G52</td>
<td>−19.85</td>
<td>9.33</td>
<td>.057*</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 5, B6:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G60</td>
<td>42.24</td>
<td>6.73</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G61</td>
<td>2.63</td>
<td>10.37</td>
<td>.799</td>
</tr>
<tr>
<td>K–8 school, G62</td>
<td>−21.46</td>
<td>10.61</td>
<td>.043*</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 6, B7:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G70</td>
<td>59.02</td>
<td>7.67</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G71</td>
<td>16.88</td>
<td>10.98</td>
<td>.124</td>
</tr>
<tr>
<td>K–8 school, G72</td>
<td>−22.57</td>
<td>11.88</td>
<td>.057</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 7, B8:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G80</td>
<td>69.59</td>
<td>7.86</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G81</td>
<td>−8.79</td>
<td>10.74</td>
<td>.413</td>
</tr>
<tr>
<td>K–8 school, G82</td>
<td>−20.31</td>
<td>10.60</td>
<td>.055</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 8, B9:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G90</td>
<td>122.44</td>
<td>9.45</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G91</td>
<td>11.08</td>
<td>14.32</td>
<td>.446</td>
</tr>
<tr>
<td>K–8 school, G92</td>
<td>1.34</td>
<td>13.34</td>
<td>.920</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 9, B10:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G100</td>
<td>149.20</td>
<td>12.40</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G101</td>
<td>−13.50</td>
<td>17.23</td>
<td>.434</td>
</tr>
<tr>
<td>K–8 school, G102</td>
<td>−10.08</td>
<td>15.44</td>
<td>.514</td>
</tr>
<tr>
<td>Slope for achievement of Cohort 10, B11:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept, G110</td>
<td>150.92</td>
<td>11.60</td>
<td>.000***</td>
</tr>
<tr>
<td>EMO school, G111</td>
<td>−31.63</td>
<td>15.82</td>
<td>.045*</td>
</tr>
<tr>
<td>K–8 school, G112</td>
<td>−17.31</td>
<td>15.94</td>
<td>.278</td>
</tr>
</tbody>
</table>

**Note.**—EMO = education management organization; FRL = federal free/reduced lunch program.

* Statistically significant at the 10% level.

*** Statistically significant at the 1% level.
Note

The research reported here was supported by the Research on Learning and Education (ROLE) Program at the National Science Foundation (grant 0411796); by a CSR Quality Initiative grant from the Institute of Education Sciences, U.S. Department of Education; and by an Interagency Education Research Initiative grant (r305w020003).

References


Beaton, Albert E., Ina V. S. Mullis, Michael O. Martin, Eugenio J. Gonzalez, Dana L. Kelly, and Teresa A. Smith. 1996. “Mathematics Achievement in the Middle School Years.” TIMSS Study Center, Boston.


The Impacts of School Privatization in Philadelphia


Finn, Chester E. 1991. We Must Take Charge: Our Schools and Our Future. New York: Free Press.


Byrnes


