Section Two:
Case Studies in Market Education

Analyzing School Choice Reforms That Use America's Traditional Forms of Parental Choice

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The majority of the states in the United States are currently considering, or have recently passed reforms, that increase the ease with which parents may choose schools for their children.[1] At first view these reforms seem to take elementary and secondary education into wholly unknown territory. Yet this view neglects the fact that choices made by American parents have traditionally been an important force in determining the education their children receive. Parents' ability to choose among fiscally independent public school districts (through residential decisions) and to choose private schools (by paying tuition) are such an established feature of American education that they are almost taken for granted. Yet through these choices American parents exercise more control over their children's schooling than do many of their European counterparts.[2] However, American parents are not all equally able to exercise choice. High-income parents routinely exercise more choice than low-income parents because high-income parents have more school districts and private schools within their choice set. Moreover, there is significant variation in the degree of choice across different areas of the

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country. Some metropolitan areas, for instance, have many independent school districts and/or a number of private schools.[3] Other metropolitan areas are completely monopolized by one school district or have almost no private schooling.

In this chapter I attempt to answer three related questions. First and foremost, what general facts can we learn by examining the traditional forms of school choice in the United States? In particular we need to understand the relationships between school choice and student achievement, student segregation (along lines of ability, income, and taste for education as well as race and ethnicity),[4] school efficiency, teachers' salaries and teacher unionism, and the degree to which parents are involved in and influence their children's schools. Second, how do the general facts that we garner from traditional school choice carry over to analyses of reforms such as charter schools, vouchers for private schools, and open enrolment programs? Third, what information do we still need if we are to accurately predict the effects of reforms? And what empirical strategies might we use to get such information? For evidence I draw upon previous empirical work included in several studies.[5] Although I briefly sketch the empirical strategy of each study, I do not attempt to present the results or methodology in detail. Rather, my goal in this chapter is to summarize the results and discuss their implications for school choice reforms.

How Analysis of Traditional Choice Informs the Debate over School Reform

Analysis of school choice reforms should begin with the two basic, traditional forms of school choice in the United States, choice among public school districts and choice between public and private schools. These two traditional forms of choice already give some parents a substantial degree of choice, and the effects of their choices are useful for predicting the effects of reforms. Moreover, empirical evidence on how traditional choice affects students is the *only* way we can learn about the general equilibrium and long-term effects of school choice. For instance, there are a few recent or ongoing studies (including one I am conducting) that evaluate charter and voucher schools using randomized "treatment" and "control" groups of students. The studies by Greene, Peterson, and Du and Greene, Howell, and Peterson are excellent examples.[6] Studies like these can inform us about the effects of voucher or charter

schools on the students who actually use the schools. Unfortunately, such studies can tell us nothing about the effects that a widespread voucher or charter school policy would have on who attends public schools or how public schools respond to competition. Analysis of the two traditional forms of choice does inform us about these crucial issues. Furthermore, school choice reforms are always layered on top of traditional choice, and households will make different traditional choices as reforms are added.

Traditional Choice Among Public School Districts: Background and Predictions

In this section I describe choice among public school districts. Later I briefly discuss *intra*district choice, a scheme that has only some of the characteristics of choice among districts. A household chooses among public school districts by choosing a residence. The degree to which households can exercise this form of choice depends heavily on the number, size, and residence patterns of the school districts in the area centered around the jobs of the adults in these households. There are some metropolitan areas in the United States that have many small school districts with reasonably comparable characteristics. Boston, for instance, has seventy school districts within a thirty-minute commute of the downtown area and many more within a forty-five-minute commute. Miami, on the other hand, has only one school district (Dade County) that covers the entire metropolitan area. People with jobs in rural areas typically have only one district or a few school districts among which to choose.

Choice among public school districts—as a form of choice—has several important properties. The first is that districts that are good, efficient providers of schooling tend to be rewarded with larger budgets. This fiscal reward process works because conventional American school finance makes each district's budget depend somewhat on local property taxes, which in turn depend on house prices within the district, which in turn depend on how marginal home buyers value the local schools. Rewards for good, efficient provision of schooling can be obtained so long as districts have a significant amount of fiscal autonomy (especially over marginal revenues and expenditures).[7] The fiscal reward process tends to be sustainable over the long term because it depends on decentralized choices. This is in contrast to centralized reward

systems—for example, financial or other "merit" awards for successful school districts that are distributed by the state. These tend to be unsustainable because states cannot, after the fact, credibly adhere to processes that reduce (in relative terms) the amount of money going to failing school districts.[8]

The second important property of traditional choice among public school districts is that parents who prefer different amounts of school spending and different types of schools sort themselves into different districts. As a result, each district is more homogeneous than the metropolitan area is in general, and the residents of each district tend to vote for taxes and support schools that approximately fulfil their spending and curricular desires. This means that districts offer differentiated schooling that follows local parents' preferences to a certain degree. In consequence, choice among public school districts creates residential patterns that mirror households' desired levels of school spending. This is in contrast to residential patterns that purely reflect households' incomes or housing desires. Of course desired school spending depends partly on income, but it also depends on how much a household prefers to spend money on schooling relative to other goods or investments. Low-income or minority households are the most likely to be prevented from making reasonably optimal investments in their children's schooling, because their ability to choose residences in more than one district may be severely constrained by their budgets or discrimination.

Another consequence of choice among public school districts is that parents' preferences have some sway over what local schools do. Any given school district's budget is, for instance, allocated more according to parents' preferences (than, say, according to the preferences of school staff members or the state department of education) when parents have more choice among districts. This is simply because, when parents have more choices, school budgets are more elastic with respect to parents' preferences, and therefore policy is more responsive to their preferences.

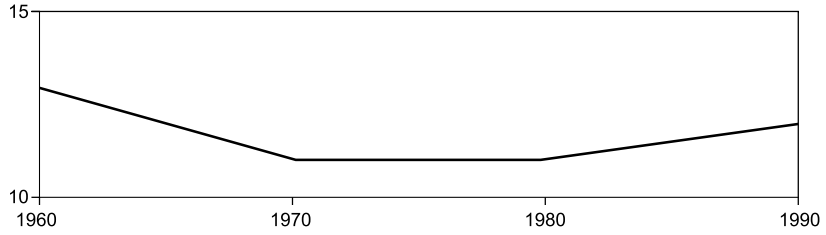
Evidence of what happens when an area has more choice among public school districts is useful mainly for analyzing charter school reforms and open enrolment reforms. A charter school is a school that receives a charter to educate public school students, receives a "tuition" payment (from public revenues) for each pupil it enrols, and admits students non-selectively or at random. Although charter schools are "public" schools, they are supposed to have a high degree of administrative autonomy and as much fiscal autonomy as a stable tuition

payment per pupil can give them.[9] Opening a charter school thus has some, but not all, of the features of creating an additional public school district to compete with the initial district.

An open enrolment program allows students to attend schools in districts outside their districts of residence. Whether an open enrolment program closely resembles an expansion of choice among public school districts depends largely on the financial transfers that accompany transferring students. If an open enrolment program has financial transfers that closely simulate the fiscal pressures of choice among public school districts, the program is a means of intensifying traditional choice among public school districts by reducing mobility costs and allowing many more households to be on the margin between districts. Most actual open enrolment programs, however, do not have financial arrangements that simulate the fiscal pressures of choice among districts. The financial transfer is usually small compared to the receiving district's own average expenditure per pupil. A financial transfer that is only a small fraction of a district's per-pupil expenditure guarantees that the movement of students from one district to another must remain tiny relative to the size of the receiving district—even in the long run. A somewhat perverse financial arrangement that sometimes occurs in an open enrolment plan is that the money that accompanies the transferring student comes wholly or partly from the state rather than from the sending district.

In summary, studying traditional choice among public school districts is helpful for analyzing charter school and open enrolment reforms. All three types of choice give us a general sense of on what bases parents choose among schools, how public schools differentiate themselves given that they are all subject to public scrutiny and public constraints, whether public providers react to competition for students by improving their programs, how the degree of choice among public providers affects parents' willingness to pay for private school alternatives, and how students self-segregate among schools when they can choose but receiving schools cannot discriminate among them.[10] Traditional choice among public school districts is less helpful for understanding charter school and open enrolment reforms to the extent that (1) the financial arrangements of the reforms have quite different properties than traditional choice, and (2) charter schools and open enrolment programs depend on the sufferance or cooperation of local school districts, making them less sustainable than traditional choice.

Figure 1 **Percentage of K–12 Students Enrolled in Private Schools, 1960-90**



Source: Author's calculation based on data from the US Census of Population 1960, 1970, 1980, 1990.

Choice Between Public and Private Schools: Background and Predictions

The second way in which parents have traditionally been able to exercise choice in the United States is by enrolling their children in private schools. Private school tuition in America is not subsidized by public monies (as it is in some European countries), so parents can afford private schools only if they can pay tuition and also pay taxes to support local public schools.[11] Partly as a result, private schools tend to enrol fewer than 15 percent of American elementary and secondary students. This percentage reached a peak of just under 15 percent in the early 1960s, declined to 10 percent by 1980, and has since rebounded to 12 percent. Figure 1 depicts the percentage of K-12 students enrolled in private schools between 1960 and 1990.

There is tremendous variation in the schooling offered and the tuition charged by private schools in the United States. Approximately 90 percent of private school students attend schools that are affiliated with religious groups, but these include a variety of Christian and non-Christian groups and have tuitions that range from token amounts ("$100 or what parents can pay") to over $10,000. The remaining 10 percent of private school students attend schools with no religious affiliation; these include many of the independent college preparatory schools that charge tuitions of $5,000 or more. More than 65 percent of American private school students attend schools affiliated with the Catholic Church; these vary from modest parochial schools with token tuitions to elite college preparatory schools that compete with the independents for students. The modal private school student in the United

States attends a Catholic school that is parochial or diocesan and charges a tuition of about $1,000 (for elementary school) or $2,200 (for secondary school).

A key feature of American private schools is that they typically subsidize tuition with monies from donations or (less often) income from endowments. The share of schooling costs that is covered by subsidies is larger in schools that serve low-income students, but even relatively expensive private schools charge subsidized tuitions. For instance, Catholic elementary schools, on average, cover 50 percent of their costs with donations from local households, donations channelled through the local diocese, and teachers' and parents' contributed services and goods. (Teachers who are members of religious orders also implicitly subsidize the schools because their salaries are minimal.) Catholic secondary schools are less subsidized: On average, tuition payments to Catholic secondary schools cover about 75 percent of the actual costs of schooling. Even the most expensive religiously affiliated private schools in the United States—those affiliated with the Friends (Quakers)—charge tuitions that average only 80 percent of their costs.[12] Note that schools that serve low-income households and charge highly subsidized tuitions are frequently oversubscribed and must ration school places through waiting lists. Some cities and areas of the United States have significantly larger shares of students in private schools than others. Metropolitan areas, for instance, range from highs of 33 percent of students in private schools to lows of approximately 0 percent of students in private schools. This variation is created by historical accident, the donations available for subsidizing private schools in an area, and the quality of public schools. I return to these sources of variation a bit later.

Choice between private and public schools has several important properties. First, private schools that efficiently offer high-quality education tend to be rewarded by gaining more applicants. At the very least, the larger applicant pool allows a private school to be more selective. More often, a larger applicant pool allows a private school to expand. Symmetrically, public schools that do not offer quality education efficiently are likely to lose students to private schools. The students who are drawn away are, for any given public school, those with the greatest taste for the type of education offered by private schools. A second property of choice between private and public schools is that private schools are likely to have an ambiguous impact on the finances of local public schools. On one hand, an increased supply of private schools tends to

draw into the private school sector parents who, had their children remained in public schools, might have supported generous public school spending. This phenomenon tends to decrease voter support for public school spending. On the other hand, an increased supply of private schools draws into the private school sector students who would otherwise have had to be educated at public expense. This phenomenon tends to increase public school spending *per pupil*.

Increased private school availability should change patterns of residential segregation because private school parents who would want to live in districts with expensive public schools if private schools did not exist will be willing to live in less expensive districts. Such changes in residential segregation, however, are limited by the fact that private school parents prefer to live with neighbours who have similar professions, educations, and preferences for other local public goods. For instance, private school parents are unlikely to live with low-income neighbours just to avoid paying taxes to support moderately expensive public schools. Finally, private schools put mild pressure on public schools to pay the same input costs that private schools pay. In particular, private schools are less likely to be unionized and to accept supply contracts for political reasons. If they do not pay union wage premiums and pay competitive prices for supplies, their lower costs indirectly put a little pressure on public schools to be cost efficient. The pressure is small, though, because the fact that private school parents continue to pay taxes to support public schools drives a considerable price wedge between private and public schools with comparable costs.

Evidence of the effects of traditional private school choice is most useful for predicting the effects of vouchers. Some properties of vouchers would be quite similar to those of traditional private school choice: Successful private schools would be rewarded with larger pools of applicants, and the least efficient public schools would most likely lose students. The fiscal impact vouchers would have on public schools is ambiguous, but possibly less positive than the fiscal impact of private school competition on public schools. The difference is that vouchers typically would be funded with monies from the local public schools. Some students who would attend private schools even in the absence of a voucher program would use vouchers: This would have a negative impact on per-pupil spending in the sending districts. However, this effect would be offset by the positive impact on per-pupil spending that would occur whenever a student used a voucher who would have, in the absence of a voucher program, attended the public schools. This

positive impact would occur because all voucher amounts proposed thus far have been significantly smaller than per-pupil spending in the sending public school districts. Some of the indirect fiscal impacts of vouchers on per-pupil public school spending would be positive as well. For instance, some parents with a taste for quality education would be likely to remain in districts that they would abandon for suburban districts if vouchers were not available. Keeping parents like these has a positive effect on a district's property prices, and therefore on the tax base that supports public schools.

Interactions between the Two Traditional Forms of School Choice

We expect that the two traditional forms of school choice will substitute for one another to some degree. Parents who are able to choose districts that offer schooling and per-pupil costs closer to their desires will have less incentive to send their children to private schools. Of course, public and private school choice are unlikely to be complete substitutes for one another, because the two sectors function under somewhat different constraints. For instance, parents with strong preferences for religious education cannot satisfy these in the public sector; parents with strong preferences for public schooling cannot satisfy these in private schools.

Similarly, we expect some interaction among the reforms. Availability of charter schools is likely to reduce the use of private school vouchers or open enrolment programs. Logically, the more one reform offers a needed type of choice, the less the alternative reforms will be desired or used. For instance, the less autonomy charter schools have, the more parents will want to use private school vouchers. Also, areas that already have substantial amounts of choice among public school districts or choice of private schools are unlikely to make heavy use of charter school programs or open enrolment programs (unless the latter have perverse fiscal arrangements). Besides, areas with substantial amounts of choice among public school districts are less likely to make heavy use of vouchers. The same cannot be said of areas that already have substantial amounts of choice of private schools. Since vouchers would give an opportunity to transfer to parents already using private schools, vouchers would be highly utilized in areas with high private school shares. The means testing in most proposed voucher programs will attempt to reduce transfers by parents already using private schools.

Table 1 Degree of Choice among Public School Districts of Illustrative Metropolitan Areas

Metropolitan areas with the most choice among public school districts		Metropolitan areas with the least choice among public school districts	
Metropolitan area	Herfindahl index[a]	Metropolitan area	Herfindahl index[a]
Albany, N.Y.	0.0333	Honolulu, Hawaii[b]	1
Bergen-Passaic, N.J.	0.0346	Miami, Fla.	1
Boston, Mass.	0.0352	Las Vegas, N.V.	1
Middlesex-Somerset-Hunterdon, N.J.	0.0366	Fort Lauderdale, Fla.	1
Pittsburgh, Pa.	0.0368	Daytona Beach, Fla.	1
Riverside-San Bernardino, Calif.[c]	0.0370	Fort Myers, Fla.	1
Monmouth-Ocean, N.J.	0.0377	Albuquerque, N.M.	1
Minneapolis, Minn.	0.0416	Hagerstown, Md.	1
Atlantic City, N.J.	0.0490	Jacksonville, N.C.	1
San Francisco, Calif.[c]	0.0531	Sarasota, Fla.	1
Binghamton, N.Y.	0.0563	Odessa, Tex.	1
York, Pa.	0.0568	Cheyenne, Wyo.	1
Scranton, Pa.	0.0572	Lakeland/Winter Haven, Fla.	1
Johnstown, Pa.	0.0573	Reno, N.V.	1
San Jose, Calif.	0.0576	Boca Raton, Fla.	1
Dayton, Ohio	0.0578	Wilmington, N.C.	1
Allentown, Pa.	0.0598	Ocala, Fla.	1
Anaheim-Santa Ana, Calif.[c]	0.0616	Melbourne/Palm Bay, Fla.	1
Seattle, Wash.	0.0631	Lompoc, Calif.[c]	1
Rochester, N.Y.	0.0638	Panama City, Fla.	1
Phoenix, Ark.	0.0642	Bradenton, Fla.	1

Source: Author's calculation based on U.S. Department of Education, National Center for Education Statistics, *School District Data Book,* 1990.

a An alternative measure of choice among school districts is the raw number of districts in a metropolitan area. However, this measure favors larger metropolitan areas for any degree of choice. The metropolitan areas with the largest numbers of districts are Greater New York City, 286; Chicago, Ill., 209; Philadelphia, Pa., 166; Detroit, Mich., 117; Boston, Mass., 114; Bergen-Passaic, N.J., 94; Los Angeles, Calif., 82; Monmouth-Ocean, N.J., 78; Pittsburgh, Pa., 74; Minneapolis, Minn., 68; Middlesex-Somerset-Hunterdon, N.J., 68; Tulsa, Okla., 65; Portland, Ore., 62; Oklahoma City, Okla., 59; Dallas, Tex., 59; Phoenix, Ariz., 56; Cincinnati, Ohio, 56; Riverside-San Bernardino, Calif., 55; Cleveland, Ohio, 54; Albany, N.Y., 54; and St. Louis, Mo., 53.

Another measure of choice among school districts is the number of districts per 10,000 school-age persons. This measure favors metropolitan areas that have large land areas for their populations. The metropolitan areas with the largest numbers of districts per 10,000 school-age persons are Bismark, N.D., 11.76; Redding, Calif., 10.02; Burlington, Vt., 9.40; Dover, N.H., 9.08; Glens Falls, N.Y., 8.84; Enid, Okla., 8.16; Atlantic City, N.J., 8.14; Great Falls, Mont., 7.98; Salem, Ore., 7.70; Billings, Mont., 7.63; Pittsfield, Mass., 7.60; Texarkana, Ark., 7.48; Denison-Sherman, Tex., 7.29; Peoria-Pekin, Ill., 7.24; Tulare, Calif., 6.84; Yuba City, Calif., 6.62; and Grand Forks, N.D., 6.56.

b Hawaii is one school district fiscally, so the school district is larger than the metropolitan area of Honolulu. Obviously there is no school district in the state of Hawaii.

c California has school districts that have almost no fiscal independence, so it is also virtually one fiscal school district. Therefore, it is somewhat deceptive to describe metropolitan areas such as Riverside-San Bernardino, San Francisco, San Jose, and Anaheim-Santa Ana as having significant choice among school districts.

Evidence on the Effects of Competition among Public School Districts

To determine the effects of competition among public schools, we might compare metropolitan areas that have had long-term differences in parents' ease of choice among districts.[13] Ease of choice depends both on the number of districts in the area and on the evenness with which enrolment is spread over those districts. Choice is easier in a metropolitan area where parents choose among twenty districts of equal size than in an area where three quarters of enrolment falls into one of twenty districts, which in turn is easier than in an area with only one school district. A Herfindahl index based on districts' enrolment shares is a good measure of the ease of choice because it incorporates both these facts—the number of districts and the evenness of districts' enrolment shares.[14] Table 1 shows how much metropolitan areas differ in the degree of choice available among public school districts. The differences are largely a result of historical accident and geography. However, we might worry that districts' enrolments can reflect their success: A highly successful and efficient district might attract a disproportionate share of its metropolitan area's enrolment. It might even attract smaller districts to consolidate with it. These phenomena would tend to make simple comparisons of metropolitan areas with public school enrolments concentrated in a few districts versus metropolitan areas with enrolments spread evenly over many districts biased against finding positive effects of competition among districts.

Formally, the observed degree of choice available among public school districts is possibly related to the school quality experienced by the typical student. To obtain unbiased estimates we need to identify geographic or historical factors that increase a metropolitan area's tendency to have many small independent school districts. We need instrumental variables related to the demand for independent school districts, but unrelated to contemporary public school quality. I use the fact that metropolitan areas with more streams had more natural barriers and boundaries that, because they increased students' travel time to school, caused the initial school district lines to be drawn up so there were smaller districts.[15] This estimation strategy allows me to control for a wide range of background variables that might also influence schools or students. For instance, I control for the effect of household income, parents' educational attainment, family size, family composition (single-parent households), race, region, metropolitan area size, and the local population's income, racial composition, poverty, educational attainment, and urbanness. Because I have good measures of self-segregation

Table 2 Effects of Competition among Public School Districts[a]

Variable	Effect
Effect on per-pupil spending	17 percent decrease
Effect on student achievement as measured by test scores	3 percentile point improvement
Effect on student achievement as measured by wages	4 percent increase
Effect on student achievement as measured by educational attainment	0.4 additional years of education
Effect on parents' involvement in students' school careers	30 percent increase in probability that parents visit school annually

Sources: Caroline Hoxby, "Does Competition among Public Schools Benefit Students and Taxpayers?" 1997 revision of Working Paper 1979, Cambridge, Mass.: National Bureau of Economic Research (NBER), 1994; and Caroline Hoxby (1998) "When Parents Can Choose, What Do They Choose? The Effects of School Choice on Curriculum and Atmosphere," in Susan Mayer and Paul E. Peterson, eds., *When Schools Make a Difference,* forthcoming.

a Consider an increase of one standard deviation in the number of school districts in a metropolitan area or a decrease of one standard deviation in the concentration of enrolment among school districts in a metropolitan area. Note that smaller effects are found for metropolitan areas in which school districts do not have financial autonomy (most revenue is state determined).

by school and school district (for racial, ethnic, and income segregation), I can differentiate the effects of choice on self-segregation from the effects on student achievement and school efficiency.[16]

My best estimates of the effects of competition among public school districts, displayed in Table 2, are gauged in terms of an increase in the Herfindahl index of one standard deviation. This corresponds to a substantial increase in the degree of choice among districts; for instance, it is the difference between having 3 and 13 equal-sized districts or the difference between having 4 and a very large number (100, say) equal-sized districts. An increase of one standard deviation in the degree of choice among districts causes a small (and statistically significant) improvement in student achievement.[17] Students' reading and math scores improve by about 2 percentile points, for instance. However, an increase of one standard deviation in choice among districts causes a large improvement in schools' efficiency. This is because the small improvement in student achievement takes place even though schools lower

their per-pupil costs by 17 percent when they face an increase in choice of a standard deviation. What is striking is the opposite sign of these effects: An increase in choice improves student achievement even while accomplishing substantial cost savings. The implications for schools' productivity (the ratio of student achievement to dollars spent) are powerful.

What about the effects of competition among districts on the segregation of students? These turn out to be insignificant for a reason that may not occur to us at first glance. The degree of racial, ethnic, and income segregation that a student experiences is related to the degree of choice among *schools* in a metropolitan area, not to the degree of choice among *districts*. (In fact, the point estimates have the wrong sign for the latter relationship.) In other words, students are just as segregated in schools in metropolitan areas that have few districts as they are in metropolitan areas that have many districts. Households sort themselves into neighbourhoods inside districts; neighbourhoods and schools are small enough relative to districts that district boundaries have little effect on segregation. This result demonstrates how important it is to compare realistic alternatives. The realistic alternative to a metropolitan area with a high degree of choice among districts is not a metropolitan area in which all schools are perfectly desegregated and every student is exposed to similar peers. The realistic alternative is a metropolitan area with a low degree of choice among districts and a substantial degree of segregation among schools.

Choice among public school districts has several other effects worth noting. First, choice among districts and choice between public and private schools are substitutes for one another. An increase of a standard deviation in the degree of choice among districts lowers the share of children who attend private schools by about 1 percentage point (on a base of about 12 percentage points, recall). When parents have more choice within the public sector, they are more likely to be satisfied by their public options and are less likely to choose private options.

A second effect is that when parents have more choice among districts they tend to be more involved in their children's schooling.[18] For instance, an increase of one standard deviation in the degree of choice causes one out of every three parents to visit the school in the course of a year and causes school administrators to say that parents have a more significant influence on school policy.[19] Furthermore, parents appear to induce schools to actually pursue the policies that parents, on average, say in surveys that they want to be pursued: more challenging curricula,

stricter academic requirements, and more structured and discipline-oriented environments. For instance, a standard deviation in the degree of choice in a metropolitan area raises the probability by 8 percent that a school's regular mathematics sequence ends in a twelfth-grade course that contains at least some calculus.[20]

Finally, the beneficial effects of choice among districts on schools' productivity depend on districts' having a significant degree of fiscal independence. In states such as California where districts depend almost entirely on state per-student allocations for their budgets, the positive effects of choice on student achievement and cost savings are reduced by more than half. This is probably because successful schools are not rewarded through the property tax or budget process for improving achievement or reducing costs. This result has implications for analyses of reforms, which do not always give participating schools sufficient fiscal independence to allow them to benefit financially from their own success.

Evidence of the Effects of Private School Competition

To determine the effects of private school competition on public schools and public school students, we might compare areas with and without substantial private school enrolment.[21] Table 3 shows the US metropolitan areas with the highest and lowest percentages of students enrolled in private schools. There is substantial variation in private school attendance, even within states. However, low-quality public schools raise the demand for private schools as substitutes for public schools. Therefore, simple comparisons among metropolitan areas would confound the effect of greater private school competitiveness with the increased demand for private schools where public schools are poor in quality. Formally, private school enrolment is likely to be endogenous to (partly caused by) public school quality, and this endogeneity would lead simple estimates to be biased toward finding negative effects of private school competition on public schools.

To obtain unbiased estimates, we need to identify factors that increase the supply of private schools in an area and that are unrelated to public school quality. Formally, we need instrumental variables that shift the supply of private schools and are unrelated to the demand for private schools that is generated by low-quality public schools. I use the fact that a denomination's private schools have more resources with which to provide tuition subsidies in areas that are densely populated

Table 3 Percentages of Students in Private Schools in Illustrative Metropolitan Areas

Metropolitan areas with the highest percentages of students in private school		Metropolitan areas with the lowest percentages of students in private school	
Metropolitan area	Percentage of students in private schools	Metropolitan area	Percentage of students in private schools
Dubuque, Iowa	33.95	Edinburg-McAllen-Mission-Pharr, Tex.	3.38
New Orleans, La.	28.50	Las Cruces, N.M.	4.37
Honolulu, Hawaii	27.55	Brownsville, Tex.	4.56
Philadelphia, Pa.	26.74	Lawton, Okla.	4.59
St. Louis, Mo.	25.67	Texarkana, Ark.	4.62
Jersey City, N.J.	24.67	Peterville, Calif.	4.88
Stamford, Conn.	24.20	Orem-Provo, Utah	4.90
San Francisco, Calif.	23.81	Killeen-Temple, Tex.	5.00
New York, N.Y.	23.24	San Angelo, Tex.	5.02
Cleveland, Ohio	22.43	Hickory, N.C.	5.05
Trenton, N.J.	22.32	Pine Bluff, Ark.	5.14
Wilmington, Del.	22.23	Casper, Wyo.	5.14
Bergen-Passaic, N.J.	21.97	Odessa, Tex.	5.22
Erie, Pa.	21.95	Pueblo, Colo.	5.26
Cincinatti, Ohio	21.67	Fresno, Calif.	5.27
Milwaukee, Wisc.	21.18	Fayetteville, N.C.	5.82
Baton Rouge, La.	20.96	Sherman-Denison, Tex.	5.88
Chicago, Ill.	20.58	Merced, Calif.	5.89
Green Bay, Wisc.	20.55	Yuba City, Calif.	5.91
Salem-Gloucester, Mass.	19.89		

Sources: Hoxby, "Does Competition among Public Schools Benefit Students and Taxpayers?"; and Hoxby "When Parents Can Choose, What Do They Choose?

by that denomination. Since religious composition of an area is largely a matter of historical accident, it is not likely to have an independent effect on public school quality. Areas with higher Catholic population shares, for instance, have larger shares of teaching services donated by members of religious orders (worth 30 to 35 percent of costs) and provide larger shares of Catholic school income through offerings (25 to 50 percent of costs). Therefore, denominations' population shares fulfil the conditions for a good instrument: They are positively correlated with the supply of private schools, but are likely to be uncorrelated with the part of the demand for private schools that is generated by

public school quality. Catholic population shares provide the best instrumental variables not only because school subsidies are a relatively high-priority use of Catholic Church funds, but also because Roman Catholicism is spread across the entire United States (it is not all concentrated in one state or one region) and is associated with many ethnic groups (unlike some other denominations, which are associated with only one or two ethnic groups).

Note that this estimation strategy allows me to control for a variety of background factors that might be correlated both with the demand for private schools and with public school quality (or public school students' performance). For instance, I control for the effect of a household's belonging to a denomination. If being Catholic, say, affects a household's demand for public school spending or the achievement of its children, this effect is controlled for (and not confounded with the effect of more or less private school competition). I also control for the effect of certain ethnic group concentrations in an area, for the effect of racial and ethnic homogeneity in an area, for the effect of religious homogeneity in an area, and for the effect of religiosity of an area. Numerous other background factors are controlled for: family income, the share of households in poverty, parents' educational attainment, family size, family composition (single-parent households), urbanness, population density, and region of the country.[22]

Table 4 Effects of Competition for Public Schools from Private Schools[a]

Variable	Effect
Effect on public schools' per-pupil spending	Approximately 0
Effect on achievement of public school students as measured by test scores	8 percentile point improvement
Effect on achievement of public school students as measured by wages	12 percent increase
Effect on achievement of public school students as measured by educational attainment	12 percent increase in the probability of college graduation

Source: Caroline Hoxby, "Do Private Schools Provide Competition for Public Schools?" Working Paper 4978, NBER, 1994.

a Consider an increase in exogenous tuition subsidies of $1,000 or an increase in exogenous private school enrolment of 10 percent.

My best estimates of the effect of more competition from private schools, shown in Table 4, suggest that if private schools in an area receive sufficient resources to subsidize each student's tuition by $1,000, the achievement of *public* school students rises. This is true whether the measure of achievement is test scores, ultimate educational attainment, or wages. The effect on mathematics and reading scores is an improvement of 8 percentile points. The effect on educational attainment is an 8 percent increase in the probability of graduating from high school and a 12 percent increase in the probability of getting a baccalaureate degree. The effect on wages (for those who work, later in life at ages 29 to 37) is a 12 percent increase.

Interestingly enough, the estimates indicate that competition from private schools does not have a significant effect on public school spending per pupil. This is probably because the two forces described earlier offset one another. On the one hand, an increased supply of private schools tends to draw into the private school sector parents who, had their children remained in public schools, might have supported generous public school spending. This phenomenon tends to decrease voter support for public school spending. On the other hand, an increased supply of private schools draws students into the private school sector who would otherwise have had to be educated at public expense. This phenomenon tends to increase public school spending *per pupil*.

What about the effects of private school competition on the self-segregation of students among schools? I will not dwell on these estimates because their ability to predict the effects of private school voucher programs is limited. This is because the estimates are based on private schools that have religious affiliations, mainly Catholic schools. In contrast, proposed voucher programs often exclude private schools with religious affiliations and always constrain private schools that accept vouchers to either accept all voucher applicants or accept some random sample of them.

The one thing about the estimates that is noteworthy because it has general applicability is that all the self-segregation effects are very small. This is for two reasons. First, public schools are already quite segregated along lines of race, ethnicity, parents' income, and students' performance. When people attempt to imagine the effect of increasing private school availability, they sometimes conjure up a notional public school that is perfectly desegregated. Possibly the effects of private school competition on such a notional public school would be dramatic. However, even if we could estimate such effects, they would be irrelevant,

since actual public schools do not correspond closely to this ideal. The actual self-segregation effects of traditional private school competition are small simply because a large increase in self-segregation cannot be obtained by sorting out an already segregated public school. The second reason that self-segregation effects are small is that an increase in private school competition typically allows self-segregation in public schools to increase slightly while self-segregation in private schools decreases slightly. These effects tend to offset one another.

My best estimates suggest that, if private schools in an area receive enough resources to subsidize tuition by $1,000, segregation along lines of race, ethnicity, income, and students' performance decreases at private schools by small but statistically significant amounts and changes at public schools by amounts that have positive point estimates, but are statistically not different from zero.[23]

Finally, note that both private school competition and competition among public schools tend to hold down input costs. Specifically, both types of competition constrain the salary increases that teachers' unions gain for their members (the union wage premium of 12 percent is reduced by about one-third for a standard deviation increase in competition among districts and by about one-half for a $1,000 subsidy for private schools).[24] This result parallels a standard result from private industry: Increased competition in the market for a product (in this case, the market offering schooling to students) tends to decrease the wage premiums earned by unionized workers and other inputs that are supplied by suppliers with market power.

Intradistrict Choice Programs

Intradistrict choice has been used by a number of large school districts for some time. The least dramatic forms of intradistrict choice are magnet or alternative schools to which students typically apply based on their preference for alternative curricula or schooling environments. In the more dramatic forms of intradistrict choice (Manhattan's District 4 or Cambridge, Massachusetts), every student must actively express a preference for a school. Intradistrict choice shares some features of the two traditional forms of school choice discussed above. In particular, the fact that parents and students make an active choice is likely to make them more committed and involved in schooling. However, intradistrict choice programs rarely give schools a degree of fiscal or curricular autonomy similar to that they enjoy in independent school

districts or private schools. It is important to recognize that a district that gives fiscal or curricular autonomy to a school in a given year has not given the school long-term autonomy unless the district can bind itself not to revoke that autonomy. Such binding often proves to be politically impossible. For instance, intradistrict choice programs sometimes exhibit long-term fiscal incentives that are perverse because the district cannot, after the fact, resist taking money from successful schools and giving it to unsuccessful schools. The gathering of evidence on intradistrict choice is in an exploratory phase. My own work demonstrates only that simple estimates (comparing districts that have intradistrict choice to districts that do not) are badly biased.[25] The bias is caused by the fact that districts do not randomly enact intradistrict choice programs. Such programs are usually associated with the hiring of superintendents who are given a free hand to "turn around" districts that have recently experienced sharp decreases in student achievement. It is difficult to create a control group of schools that form a good comparison for this type of school. Even before-and-after studies do not enable us to disentangle the effects of intradistrict choice from the effects of getting a new superintendent who is paid more and given greater latitude than previous administrators.[26]

Lessons for Reform and What We Still Need to Know

The evidence on the effects of traditional school choice teaches us several lessons that are helpful for analyzing reforms. They are as follows. First, public schools can and do react to competition by improving the schooling they offer and by reducing costs. They are not passive organizations that allow their students and budgets to be withdrawn without responding. Realistic increases in the competition they face produce significant improvements in students' test scores, educational attainment, and wages. Second, public schools' responses do not depend just on whether they lose students; their responses also depend on the fiscal rewards and penalties attached to gaining or losing students. When competition has little fiscal implication, a public school is less likely to react. When cost competition is weakened by a large price wedge (such as that between public and private schools), public schools reduce costs less than they do when cost competition is on a more level playing field (like that between two similar public school districts).

Third, the segregation effects of increasing school choice via reforms are likely to be small because schools in the United States (not

merely districts) are already quite segregated. To accurately predict the effects of reforms on segregation, one must consider a realistic alternative, not an idealized public school with perfect desegregation. Fourth, parents who have greater choice are more involved in their children's schooling. Parents' influence on school policy, which is greater when choice is greater, will reflect, on average, their stated preferences for tougher curricula and stricter school atmospheres. Note, however, that greater choice is also likely to make schools more diverse through parents' influence because like-minded parents will be better able to group together in sending their children to the same schools. (I have no evidence on this last point.) Finally, different types of school choice substitute for one another to a limited degree.

Given these lessons, what other pieces of information do we need in order to analyze school choice reforms? Three information deficiencies stand out. Since we know that the fiscal impact of choice is an important determinant of its effects on schools, the financial arrangements of charter school programs, open enrolment programs, and voucher programs will be key determinants of such effects. These financial arrangements often receive little thought, and they are chosen more for convenience and political reasons than because they generate good financial incentives. States that want to avoid perverse financial incentives should consider financial arrangements that purposely mimic the fiscal impacts of the two traditional forms of school choice. In order to estimate the effects of more dramatic fiscal incentives, we will need to observe actual choice reforms made under a variety of financial arrangements.

The second information deficiency pertains to the long-term sustainability of reforms. All three of the reforms discussed create schools or programs that have less long-term autonomy than the schools that compete in the two traditional forms of school choice. Public school districts have indefinite lifetimes and will not have difficulty raising tax revenues as long as parents want to send their children to the schools. Private schools have similarly indefinite lifetimes and can raise tuition revenues as long as they attract parents. Although some charter school laws are written to give a high degree of fiscal autonomy to charter schools, all charter schools must get their charters renewed by the state (at least) and depend on other organizations to decide their per-pupil payments. It remains to be seen whether charters and per-pupil payments are politically maintainable when and if charter schools become successful competitors for the revenues and students of public school

districts. Most open enrolment programs have even less inherent political sustainability.

These programs, at least as written thus far, require the ongoing cooperation of local public school districts (the receiving districts almost always must voluntarily cooperate, though involuntary cooperation is sometimes exacted from the sending districts). The voucher programs passed thus far depend on the sufferance of the sending districts, but some proposed programs have made the vouchers less dependent on those districts. Careful analyses of district-level and state-level politics will be necessary for predicting the long-term sustainability of all three reforms.

Finally, traditional school choice gives us only limited information about the supply response we can expect from private schools under a voucher program or from charter schools. Supply responses are estimated in the analyses of choice among public schools and choice between public and private schools. (For instance, giving private schools additional resources that are equivalent to a $1,000 tuition subsidy creates a 4.1 percent increase in Catholic school enrolment—on a base of about 10 percent.) However, proposed charter school programs and voucher programs sometimes take us beyond the range where extrapolation from traditional school choice results is reasonable. Making a voucher of $3,500 available to all poor students, for instance, would produce a long-term supply response that would be difficult to predict, since the availability and long-term horizon would exceed those of current voucher programs (like Milwaukee's) and the voucher amount would exceed that of most current private school subsidies.

Notes

1 For useful surveys of the reforms, see A. Tucker and W. Lauber, *School Choice Programs: What's Happening in the States* (Washington, D.C.: Heritage Foundation Press, 1995).

2 Americans are more residentially mobile than Europeans, but the typical European family can also effectively choose a school for early grades by choosing a residence. The most important reasons that Americans have more choice are the fiscal independence and autonomous curricular control that typical American school districts enjoy. Much of the fiscal independence of American school districts has been eroded since 1950. In 1950 the median America school district raised almost 70 percent of its revenue from a local tax base. By 1990 the median raised only 35 percent of its revenue from local sources. Also note that Europeans may find it easier to make informed school choices because all students take certain national examinations and schools' scores are publicized.

American students take a wide variety of standardized tests (if any); there is heavy self-selection of the Scholastic Aptitude Test (SAT) and American College Test (ACT) tests; and letter grading standards differ substantially among schools. For discussion of the effect of external examinations on the incentives that schools face, see John Bishop, "Signalling, Incentives, and School Organization," Working Paper 94-25, Cornell University, 1994.

3 These points are elaborated later with references to Tables 1 and 3.

4 The word *segregation* is often exclusively associated with racial segregation. I describe segregation along a number of lines, such as ability and income. Segregation can also be described as *student sorting,* a term that encompasses a variety of phenomena such as "cream skimming" or "cherry picking."

5 Caroline Hoxby, "Does Competition among Public Schools Benefit Students and Taxpayers?" 1997 revision of Working Paper 1979, Cambridge, Mass.: National Bureau of Economic Research (NBER), 1994; Caroline Hoxby, "Do Private Schools Provide Competition for Public Schools?" Working Paper 4978, NBER, 1994; Caroline Hoxby, "The Effects of Private School Vouchers on Schools and Students," in Helen F. Ladd, ed., *Holding Schools Accountable*: *Performance-Based Reform in Education* (Brookings, 1996), pp. 177-208; Caroline Hoxby, "How Teachers Unions Affect Education Production" *Quarterly Journal of Economics* CXI, no. 3, (1996), pp. 671-718; Caroline Hoxby, "Are Efficiency and Equity in School Finance Substitutes or Complements?" *Journal of Economic Perspectives* 10, no. 4, (1996), pp. 51-72; Caroline Hoxby "When Parents Can Choose, What Do They Choose?" in Susan Mayer and Paul E. Peterson, eds., *When Schools Make a Difference,* forthcoming. Copies of unpublished papers can be obtained from my Web site (through www.harvard.edu) or by sending me mail or electronic mail.

6 See chapter 13 (Jay P. Greene, Paul E. Peterson and Jiangtao Du, "School Choice in Milwaukee: A Randomized Experiment" pp. 335-356) and chapter 14 (Jay P. Greene, William G. Howell, and Paul E. Peterson "Lessons from the Cleveland School Choice Program" pp. 357-392) in Paul E. Peterson and Bryan C. Hassel Editors. 1998. *Learning from School Choice*. Washington D.C.: Brookings Institution Press.

7 Note that the fiscal reward process works through the residential decisions of marginal home buyers. If marginal home buyers choose to locate in other districts because district X is a poor or inefficient provider of schooling, all house prices in district X fall in consequence. There is no need for all households to relocate for all houses' prices to affect the districts' fiscal rewards.

8 See Charles T. Clotfelter and Helen F. Ladd, "Recognizing and Rewarding Success in Public Schools," in Ladd, ed., *Holding Schools Accountable*, pp. 23-64.

9 In practice, however, states' charter school laws vary greatly in the degree of administrative and fiscal autonomy that they give to charter schools. Arizona, for instance, probably has the most autonomous charter schools. They report directly to a state board (not the local districts that might suffer from their success), they are allowed to expand to meet demand, and they earn increasing credibility with (and decreasing scrutiny from) the state board if they perform well. In other states charter schools may have little administrative autonomy because they are automatically subject to all clauses of the local teachers' union collective bargaining agreement. In some states charter schools have little fiscal

autonomy because their tuition payments depend directly on the per-pupil spending of the local school districts (so that a successful charter school in a failing district is automatically penalized when homeowners dislike the local public schools). The least fiscally autonomous charter schools are those that must annually renegotiate their tuition payments with their local districts.

10 Public schools must admit all students in their attendance areas. Charter schools and open enrolment schools must admit a random sample from the group of eligible students who are interested in attending.

11 There are and have been some public subsidies for private school expenses, including small tuition tax deductions and credits. Minnesota currently has a tax credit for non-tuition private schooling expenses. Some states also require local public districts to provide certain textbooks and bus transportation to private school students.

12 Although tuition understates the true costs of private schooling, private schooling does cost significantly less than public schooling on average. Over the entire period from 1976 to the present, per-pupil costs in private schools have always been between 50 and 60 percent of contemporary per-pupil costs in public schools.

13 For this section, see Hoxby, "Does Competition among Public Schools Benefit Students and Taxpayers?" (1997 rev.).

14 The notes to Table 1 show two alternative measures of choice among public school districts and explain why the alternative measures are less useful than Herfindahl indexes. A Herfindahl index based on enrolment shares is as follows. Suppose a metropolitan area has J school districts, which we index by $j = 1, \ldots, J$. . Suppose each school district has a share, s_j, of total metropolitan area enrolment. Then the Herfindahl index is

$$\sum_{j=1}^{J} s_j^2$$

When there is no choice in a metropolitan area because there is only one public school district, the index is equal to 1. As more districts are added and as enrolment is spread more evenly over those districts, the index gets closer to 0.

15 This typically took place about the time of Anglo-American settlement, which varies with the area of the country. Many of the original petitions for district boundaries cite streams as a reason for not extending the district lines further. Streams are by far the most common natural boundaries for school districts. Note, however, that many of the streams that are preserved in boundaries are small and have never had industrial importance. Today many of the boundary streams are of negligible importance in travel.

16 The estimation equations can be summarized as follows. The main equation is of the form

$$y_{ik} = \alpha H_k + X_{ik}\beta + X_k\delta + \varepsilon_k + \varepsilon_{ik},$$

where y is an outcome such as a student's test score or a school's per-pupil spending, i indexes students or schools (depending on the outcome), k indexes the metropolitan area, H is the Herfindahl index that measures the degree of

choice among public school districts, X_{ik} is a vector of background variables that describe the student or school (for instance, the race and gender of the student or the homogeneity of household incomes of students who attend the school), and X_k is a vector of background variables that describe the metropolitan area (for instance, its racial composition and size). The two-tiered error structure adjusts the standard errors for the fact that the degree of choice varies only at the level of the metropolitan area.

There is also an implied first-stage equation that estimates the effect of streams on the concentration of public school districts in the metropolitan area. This equation is

$$H_k = S_k\gamma + X_{ik}\kappa + X_k\lambda + \upsilon_{ik},$$

where H_k, X_{ik}, and X_k are as above (except that X_{ik} is effectively averaged for the area) and S_k is a vector of variables that measure the prevalence of large and small streams in the metropolitan area. I multiply the Herfindahl index by –1 so that it is a measure of choice rather than a measure of concentration (the lack of choice).

17 I use the term *statistically significant* to refer to estimates that are statistically significantly different from zero using an asymptotic 5 percent level.

18 For this paragraph, see Hoxby, "When Parents Can Choose."

19 Specifically, the measure of parental influence over school policy rises by two-thirds of a standard deviation.

20 Interestingly, an increase in the degree of choice encourages grade inflation, which I measure by comparing students' course grades to their performance on national standardized exams in the same subjects. This suggests that although parents want their children to be exposed to harder "real" curricula, parents are loath to set higher nominal standards for their children—perhaps because local grade deflation might be misinterpreted by colleges in the admissions process.

21 For this section, see Hoxby, "Do Private Schools Provide Competition for Public Schools?" and Hoxby, "The Effects of Private School Vouchers."

22 The estimation equations can be summarized as follows. The main equation is of the form

$$y_{ik} = \mu V_k + X_{ik}\nu + X_k\pi + \iota_k + \iota_{ik}$$

where y is an outcome such as a student's wage or a school's per-pupil spending, i indexes students or schools (depending on the outcome), k indexes the area (metropolitan areas and counties, depending on their urbanness), V is the average tuition subsidy offered by private schools in area k, X_{kik} is a vector of background variables that describe the student or school (for instance, the student's own religion or the racial homogeneity of the school), and X_k is a vector of background variables that describe the area (for instance, its income composition or religiosity). The two-tiered error structure adjusts the standard errors for the fact that average tuition subsidies vary only at the level of the area.

There is also an implied first-stage equation that estimates the effect of denominations' population shares on the tuition subsidies private schools offer. This equation is

$$V_k = D_k\rho + \bar{X}_{ik}\theta + X_k\tau + \omega_{ik},$$

where V_k, X_{ik}, and X_k are as above (except that X_{ik} is effectively averaged for the area) and D_k is a vector of population shares of denominations $m = 1, \ldots, M$ in area k.

23 Income segregation is measured using students' eligibility for free lunches.

24 Hoxby, "How Teachers' Unions Affect Education Production."

25 Hoxby, "When Parents Can Choose."

26 In addition, before and after studies suffer from bias produced by a phenomenon sometimes called Ashenfelter's dip. The bias results from the fact that treatment (intra-district choice) is assigned to school districts that have recently experienced a negative departure from their own history. Since districts typically display mean reversion (return to their historic paths) anyway, simple before and after studies exaggerate the effect of intradistrict choice programs.