Vouchers for Basic Education in Developing Economies: An Accountability Perspective

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Advocates argue that voucher programs can correct the incentive problems of education systems in developing economies. An accountability perspective, based on a principal-agent framework, was developed to clarify the arguments for and against education vouchers. An assessment of findings on voucher programs in industrial countries and a review of voucher or quasi-voucher experiences in Bangladesh, Chile, Colombia, Côte d’Ivoire, and the Czech Republic support the usefulness of the analytic framework. The assessment concludes that the policy relevance of voucher programs for developing economies remains uncertain. Major voucher initiatives have been attempted only in countries with a well-developed institutional infrastructure. Some studies find favorable benefits for at least some population groups, but others find limited effects and evidence of increasing social stratification in schools. Whether vouchers lead to better outcomes or greater stratification appears related to specific contexts, institutional variables, and program designs.

Education systems in developing economies face enormous problems. In many of the poorest countries, there are large gaps in affordable access and staggering differences in attainment between children from poorer and richer households. Even in many middle-income countries that have achieved nearly universal coverage in primary and secondary education, the quality of instruction and learning is low, particularly for poor people. Government spending is often inadequate and inefficiently and inequitably allocated across education inputs and levels of education. Even where education systems are adequately funded, they can be indifferent to families’ concerns because they are controlled by inattentive officials or by particular social classes and interest groups. In these settings, high rates of teacher absenteeism and
low enrollment rates for girls are symptomatic of systems with inadequately aligned incentives.

What kind of an education system is best able to address these problems? In the broadest terms, there are two archetypes for education systems. In the public archetype, the government finances education and manages all aspects of schooling, including hiring teachers and constructing schools. The public archetype is useful for building a system from the ground up and for ensuring uniformity among schools, but it is typically less effective at motivating teachers and schools to respond to families’ concerns. In the private archetype, schools are privately owned, and families pay the entire cost of tuition. The private archetype gives parents choices among schools, and schools have a strong financial motivation to keep their clients happy. But families unable to pay for a private school lose out. Using the vocabulary of the World Bank’s (2003) World Development Report 2004: Making Services Work for Poor People, the public archetype entails the long route of accountability in which students’ interests are secured when citizens’ voice influences the compacts that policymakers establish with providers, and the private archetype entails the short route of accountability in which the client power of family preferences influences provider organizations and frontline professionals.

Analysts and reformers have argued that a combination of the two archetypes—public financing with private provision—is the best way to combine universal access with systemic responsiveness. Parents receive vouchers that can be redeemed at qualifying private schools, or private schools are reimbursed by the state based on their enrollment rates. Thus parents choose the schools their children attend, and schools are financed based on the number of students they attract and are allowed substantial management autonomy to make themselves more attractive. Critics worry that a decline in financing for public schools will eventually destroy the system of public education, resulting in difficult-to-measure but real consequences for social cohesion, and that voucher programs will exacerbate rather than lessen what are already significant inequalities in access to good education.

Despite the popularity (and notoriety) of voucher proposals, there is little empirical evidence on their effects, especially in developing economies. Programs that subsidize education are not uncommon in developing areas, particularly those that aim to allay the direct and indirect costs of schooling for girls, low-income groups, and ethnic minorities. Generally speaking, the objective is to increase the likelihood that children in particular groups enroll in and complete school. Voucher programs, on the other hand, generally aim to increase the quality of education among students who are already enrolled by expanding the range of choices.

Using a principal-agent framework, this article examines the available studies on the impact of voucher programs and draws inferences about what might be expected from voucher programs in developing economies, what kinds of voucher programs might be most useful, and what elements of the institutional infrastructure will be
important for their implementation. The analysis compares the theoretical predictions to the evidence on the operation and impact of voucher plans in industrialized countries and then reviews five voucher and quasi-voucher experiments in developing and transition economies. It draws inferences about the ways in which education vouchers might be useful in low- and middle-income countries.

Vouchers and the Principal-Agent Problem

In the public archetype, a centralized education department designs a national curriculum, finances education out of general revenues, and pays capital and operating costs directly. It also makes all managerial and staffing decisions; negotiates teacher salaries directly with national unions; remunerates and promotes teachers on the basis of negotiated, experience-related criteria; employs evaluations as indicators of need and not performance; and assigns students to schools. Critics contend that the system results in overstaffing, too many unmotivated teachers, unnecessarily high taxes, school administrators indifferent to families, and passive parents with no option but to enroll their children in schools with which they are dissatisfied.

These critics advocate voucher systems that depart from the public archetype in three key aspects. First, students are not assigned to a public school based on residence but depending on the details of the program’s design, have choices among a variety of other public or private schools. Although elements of choice and competition also exist in public systems—parents choose a school by choosing a residence, and private school options usually exist—vouchers significantly augment them.

Second, schools have strong incentives to expand student enrollments because a significant part of school financing is proportional to the number of students enrolled in a given school. The idea is to shift schools’ primary accountability for performance from the education department, which is politically compromised in its efforts to enforce quality standards, to parents and students, who are the best judges of the education they want for their children. In theory, these incentives will lead the better schools to take steps to improve quality, enhance efficiency, and develop innovative approaches to learning. Poorly performing schools will not attract students and will either close or be forced to find a market niche. Some schools might then satisfy demands that the bureaucratically constrained archetypal system cannot meet, such as specializing in computers, the arts, specific languages, certain ethnic traditions or religions, or learning methods for socially disadvantaged students.

This aspect of voucher systems focuses not on the simple existence of subsidies to private schools but on the degree to which payments vary with enrollment. In several European countries, for instance, political resolutions of historical religious struggles entail notions of equal treatment of different denominations, and the state reimburses sectarian schools for some portion of their costs. Most of these are not
really voucher systems because the reimbursements are not proportional to enrollment, are proportional to enrollment but relatively small in magnitude, or are adjusted irregularly, with the result that schools do not have strong incentives to expand enrollments.2

Third, voucher systems require schools to have enough managerial control to respond to parental demand. To be responsive to demand, schools need substantial control over staffing and personnel decisions, budget, and instructional methods. At least limited control over capital expansion, calendar, and curriculum also provide schools with needed flexibility. Voucher programs and proposals differ significantly in the extent of control granted to local schools, leading to large variations in expected outcomes. How much leeway schools have in selecting students or charging additional fees on top of the per student allocation, for example, is likely to result in substantial differences in how much socioeconomic sorting a voucher system will exhibit.

Such sorting is one of the principal concerns of voucher opponents. They argue that if vouchers are available to all students, children from advantaged backgrounds (greater income, education, and access to information) would have a significant edge in enrolling in better-performing schools. As more advantaged students choose these schools, performance would continue to improve, leaving students from disadvantaged backgrounds behind in increasingly less attractive education settings. These dynamics would accelerate not only if students chose schools but if schools were allowed to choose students, either openly or indirectly. New schools would be reluctant to serve disadvantaged students because the costs of educating them would be relatively high. Opponents of vouchers also argue that for a variety of social and political reasons, voucher programs might not function as supporters imagine: Politicians might be reluctant to let public schools close, parents might not value or discern differences in educational quality, and professional norms might impede competitive practices among schools.

How can one assess the relevance of the voucher debate for developing economies, where educational institutions are more varied and resource constraints more severe than in industrial countries? Setting aside, at least provisionally, the assumptions that are difficult to prove or disprove generally—parents know their children’s best interests, parents are in a better position to observe school effort than administrative officials, and schools respond to financial incentives just as most other organizations do—how well voucher programs can be expected to function depends on key parameters of the institutions and resources in a given developing area.

To identify these parameters, it is useful to cast the voucher reform as a payment mechanism in a principal-agent relationship: The state is a principal that pays schools, its agents, for providing educational services that further its objectives. Consistent with the voucher idea, agents are assumed to have sufficient management autonomy to deliver the objectives. Clients are free to choose from among the
agents. The state rewards schools in a linear compensation contract: Payments are proportional to the number of students they enroll. As a result, the compensation scheme employs intense incentives.\(^3\) The state’s education objectives are, stated loosely, the same for most governments in the contemporary world: to impart literacy, numeracy, a stock of cultural and scientific knowledge, and cognitive skills; to transmit social norms and world views; and to provide educational opportunities that structure life chances based on local interpretations of freedom, equality, and nondiscrimination. In a voucher system, the state usually continues to rely on a national curriculum, the broader institutional landscape, and civil rights laws to guide schools toward those objectives, but it uses student enrollment as the exclusive indicator of the effort a given school has exerted to achieve them.\(^4\)

The principal-agent literature is now fairly advanced, and its findings can be applied directly to the architecture of voucher programs in education (Milgrom and Roberts 1992). The findings can be used to assess key institutional parameters that are likely to affect voucher systems, particularly as they might function in developing economies (table 1).

**Table 1.** The Expected Effect of Key Social and Institutional Parameters on Voucher Programs

<table>
<thead>
<tr>
<th>Social or institutional characteristic</th>
<th>Expected effect on voucher programs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents use student body composition as a proxy for school quality</td>
<td>Increases socioeconomic or racial sorting</td>
</tr>
<tr>
<td>Enrollment is weakly correlated with school effort</td>
<td>Weakens productivity effect</td>
</tr>
<tr>
<td>Teachers and school owners are poorer and more risk averse</td>
<td>Reduces welfare gains</td>
</tr>
<tr>
<td>Determinants of school quality or enrollment are exogenous to the school</td>
<td>Weakens productivity effect</td>
</tr>
<tr>
<td>Professional norms are weak</td>
<td>Discourages curricular innovation</td>
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<tr>
<td>Monitoring of reported attendance is ineffective</td>
<td>Weakens productivity effect</td>
</tr>
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Source: Authors’ compilation.

Bias and Noise in the Estimate of Effort

Theory indicates that compensation with intense incentives should be based only on performance measures that are strongly correlated with the agent’s effort.\(^5\) It is reasonable to ask, then, how well enrollment estimates a school’s effort at achieving the state’s objectives. Parents probably observe aspects of school effort that ministry officials might overlook, such as the attentiveness of staff, the dedication of teachers, and help in securing placement in higher level schools. But parents’ assessments might also have systematic biases, such as the tendency to conflate the composition of a school’s student body, particularly along socioeconomic and racial dimensions,
with the quality of the education offered, and to conflate the quality of education offered with the effort a school exerts.\textsuperscript{6}

Because family background, not school performance, usually explains most of the variance in student performance, such a confusion would bias the state’s indicator of school effort. That bias would also create a powerful incentive for schools to attract a student body that parents would find desirable. The preconditions for significant socioeconomic or racial segregation would be in place. If the potential for such bias is substantial, it will make sense for the compensation formula to include additional variables that correct for the effect of student body composition on demand for a school and on the learning outcomes for which the school is responsible.

Moreover, enrollments can also be a noisy estimate of effort. Remoteness or transportation costs, changes in the birth rate, migration, returns to education in the economy, and (arguably) cultural expectations about who should be in school are all exogenous determinants of enrollment that are uncorrelated with school effort. In developing economies these exogenous determinants of enrollments could weaken the desired effect of voucher programs on school productivity. Weights for these factors would not be hard to devise, and they would not require frequent adjustment because these exogenous factors change slowly, and changes are generally predictable.

\textbf{Risk-Averse Agents}

The less comfortable an agent is with risk, the higher the welfare cost the agent bears from intense incentives.\textsuperscript{7} In voucher programs, schools that suffer enrollment declines receive lower revenues, with commensurate impact on the salaries and professional reputations of staff. The poorer the country, the more likely it is that teachers are poor and risk-averse, and the higher the welfare cost of voucher programs to them and their families. A related problem is the transaction costs of transferring ownership of the facility, or the opportunity cost of letting it sit idle, which carries higher welfare costs in countries where capital is in short supply.

\textbf{The Productivity of More Effort}

Intense incentives are worthwhile only if increments of additional effort produce better performance. Intense incentives for schools to increase enrollment, although they might elicit greater effort at first, might not improve academic outcomes if, for example, the quality of teacher training is inadequate nationwide, textbooks are routinely stolen, it is difficult to recruit teachers to certain areas, teacher time is siphoned off for political purposes, population density is too low, cultural norms limit girls’ attendance, or students are malnourished.

There might also be circumstances in which the marginal effect of school effort is powerful, at least over a certain range of effort, as when modest numbers of public
school students are given vouchers to attend private schools, which often have the capacity to accommodate small numbers of new students with just a little more effort. In that program design (vouchers are awarded to some but not all students), an issue emerges about whether the voucher scheme includes intense incentives for the public schools the students have left and what effects incremental effort on the part of these schools might have on school quality and on the willingness of the students to stay. In other words, it is important to distinguish a partial equilibrium effect (the incremental gain in learning for students who use vouchers) from the general equilibrium effect (which sums the effect for students who use vouchers and the effect on students left behind in public schools). 8

Relative Compensation among Activities

If a compensation scheme with intense incentives rewards certain activities at lower rates, the agent will not perform them. In voucher programs schools are not rewarded for stressing norms or principles of fairness with which many parents might disagree. So if the rules governing, say, equal treatment or ethnic pluralism are not well enforced, the payment scheme will not give schools a reason to pursue those objectives. Of course, the same can be true of compensation schemes without intense incentives, such as those based on subjective evaluation. It can be argued that because processes are difficult to observe, they should not be included in the compensation scheme. 9

A related phenomenon is that voucher programs might not stimulate innovation in instruction and curricula, as proponents hope, and might even dampen it, because parents in many contexts are conservative about teaching methods, the selection criteria of higher-level schools and universities remain traditional, and the formula for compensation does not pay schools for innovation or professional development.

The Value of Monitoring

With intense incentives it pays to monitor the agent’s performance carefully (Milgrom and Roberts 1992). In a voucher program, a school will be rewarded if it can exaggerate enrollment rates and get away with it. It will also be rewarded if it successfully lowers standards for expelling students or if it raises the average grades students can expect to receive, enticing more students to choose the school. Without reliable inspectors and a strong current of professionalism among educators, education departments in developing economies will be hard pressed to monitor how schools behave in response to intense incentives, which in turn will lower the usefulness of the incentives.
Voucher Programs in Industrialized Countries

Although the framework described here comes directly from theory, empirical work on voucher programs in industrial countries supports its usefulness. In applying the framework, it should be emphasized again that voucher programs take a variety of forms, depending on such things as rules on student eligibility, student admissions, information dissemination, fiscal and pedagogical accountability, the mean and the distribution of the voucher value, and school-level management autonomy. All these influence the expected impact of a given program on academic achievement, equity, innovation, and the state’s other educational objectives. Impact evaluations of voucher programs remain sparse. Even so, experiences can be analyzed to determine how key institutional and social variables influence program effects.

**United States**

If enrollments are a biased or noisy indicator of school effort, the expected impact of voucher programs on school effort is likely to be weak, with little final impact on outcomes. In the United States, studies of the academic effect of voucher programs in small, privately funded efforts in New York City; Washington, D.C.; Dayton, Ohio; and Charlotte, North Carolina, and targeted, publicly financed programs in Milwaukee, Wisconsin; Cleveland, Ohio; and Florida have found limited or mixed results, consistent with that expectation.10

In New York a private foundation offered scholarships of up to $1,400 to elementary school students enrolled in low-quality public schools. Some 20,000 students applied for the scholarships, and 1,300 were selected through a lottery. Using the lottery as an instrumental variable for private school attendance, Myers and others (2000) compared average reading and math test scores of students who enrolled in private schools with a comparable group of students who did not, and found no statistically significant difference after the second year of the program. Mayer and others (2002) also found no statistically significant difference overall after the third year. But both studies found significant and positive differences for African Americans enrolled in the scholarship program, though not for other racial and ethnic groups. Working with the same data, Krueger and Zhu (2002) argue that the positive effect for African Americans disappears if students with missing baseline data are included and that the effect is sensitive to the definition of race that is used.

Studies of the experiments in Dayton and Washington, D.C., also found no differences in achievement between voucher and control group students overall but some possible benefit for African American students (Howell and others 2000; Howell and Peterson 2002). Evaluation of the publicly financed voucher program in Milwaukee has generated considerable controversy, even though it involved only 341 students in 7 nonsectarian schools. Witte (2000) found no consistent difference in achievement...
scores among voucher program participants and public school students, but Greene and others (1997, 1998) reanalyzed the data, comparing results with those for a group of voucher applicants who could not find space in a participating school. They found that participating students did better after four years of enrollment. Rouse (1998) used the same data and found that voucher students did better in math but not in reading and that the math advantage increased over time.

Studies of the effects of these voucher programs on public schools and on the students who remain in the public system have been hard to conduct because the numbers of students involved have been so small. In Florida’s voucher program students in schools deemed to have “failed” two years in a row are given the option of using vouchers in private schools. One study of the program found that all 78 failing schools improved to avoid the voucher threat and argues that this is evidence that voucher programs have positive effects for participants and nonparticipants alike (Greene 2001). But it is unclear whether the improvements in those schools can be attributed to vouchers per se or to the social and political pressure following a failing grade.

**New Zealand**

More direct evidence on bias in the estimate of school effort comes from New Zealand. In the late 1980s and early 1990s successive liberal and conservative governments established a “quasi-voucher” system in basic education (Wylie 1998). Control over teacher hiring, operating budgets, selection of academic missions, student fees, and local fundraising was transferred to self-governing school boards composed of the principal, one teacher, and elected parents. Residency rules were loosened so that parents could choose any school for their children. The system did not establish intense incentives based on enrollment, but schools started to compete for students anyway because they received more operating funds as enrollment increased, salary scales and prestige for principals were linked to school size, and schools gaining students were widely perceived to be successful, which motivated school boards to expand enrollments.

Studies of parental choice in New Zealand (controlling for census-based predicted enrollments and nonmandatory certificate exam scores in secondary schools) found that schools serving largely disadvantaged groups experienced declining enrollment and rising shares of minority students (Fiske and Ladd 2000, 2003). Schools serving advantaged populations were more likely to experience rising enrollment and steady or falling shares of minority students. It appeared that white students were either fleeing schools with large minority populations or pursuing schools with advantaged students. Additional research suggested that minority students were less likely to consider high-status schools as an option and less likely to attend a nonlocal school (Smithfield Project 1995).
Although parents’ decisions to flee schools with high minority populations might be individually rational, such actions are also consistent with the notion that in some contexts enrollment rates are biased estimates of school quality. There is also evidence of noise in the correlation between enrollment and quality: when one secondary school suffered a number of suicides, enrollment declined dramatically even though it was far from clear that the school atmosphere was causally associated with the suicides (Fiske and Ladd 2000). Schools also used a variety of clever but legal techniques to recruit more advantaged populations. In 1997 these enrollment schemes were used by more than 50 percent of schools in Auckland and Christchurch and 24 percent in Wellington (Fiske and Ladd 2000). The apparent increase in socioeconomic polarization in New Zealand was probably also related to the fact that schools were able to set the level of student fees, as well as the fact that less advantaged parents had a harder time accessing information about the better schools and traveling to them.

**Sweden**

Though systematic studies are not available, similar accounts have surfaced about the voucher program in Sweden. From the early 1990s onward, Sweden transferred control and management of schools to municipalities, which began to finance education based on their own revenues and block transfers from the central government. Municipalities now grant privately managed “independent” schools, some of which had been receiving state assistance, per pupil subsidies equal to the per pupil financing granted to public schools.

The enrollment share of independent schools increased from 1 percent in 1991 to 4 percent in 2002. Parents with children in independent schools appear to be better educated than parents of children in public schools, and they seem to be making choices that avoid schools with large shares of non-Nordic immigrants (Daun 2003). In one large municipality, some schools with large losses in enrollment were unable to attract better teachers, but others were able to establish new market profiles (Daun 2003).

**United Kingdom**

Evidence on systematic bias in the estimate of effort is mixed in the United Kingdom, and evidence on the outcomes of the voucher program is unclear. A series of laws beginning in 1980 created a quasi-market in government-financed basic education (LeGrand 1991; Walford 1997, 2003). The 1988 Education Reform Act transferred control of budgets and personnel hiring to state-maintained schools, linked school funding to age-weighted enrollment figures, allowed parents to send children to any school with available space, and required schools to follow the national curriculum.
In 1993 schools were allowed to select up to 10 percent of their students on the basis of specific abilities, and existing private schools or independent sponsors were permitted to establish grant-maintained schools. Seven new schools were formed from 1993 to 1997, and seven more have been established under the Labour government, which has retained the voucherlike system.

A series of case studies has argued that the choice system has increased socioeconomic segregation among schools, as students sorted based partly on the socioeconomic mix in schools and as schools started to select students (Ball and Vincent 1998; Gerwitz and others 1995). But statistical analyses of segregation by class have been inconclusive (Gibson and Asthana 2000; Gorard and Fitz 2000; Levacic and Woods 1999), partly because in the previous system, which assigned students to schools based on residence, “selection by mortgage” had already created substantial sorting.

Achievement scores of students in the system increased during the 1990s, and some studies argue that competition among schools, as measured by private sector enrollment share, number of schools, or a Herfindahl index, is associated with higher test scores (Bradley and Taylor 2002; Millington and Bradley 1998), but other studies find mixed results. One study used interviews with headmasters to try to establish a link between structural competition in a market, measured by the number of firms (or, in this case, schools) or a Herfindahl index, and competitive behavior and found that the relationship is looser than believed because of such attenuating factors as product differentiation (type of education offered) and amount of space available (Levacic 2001). It also found that the impact of competition on performance is sensitive to the measure of competition used. In the early 1990s, the government introduced nationwide testing and required publication of test results and school inspections—a system of “naming and shaming.” It is possible that the accountability system, rather than competition for students, motivated school effort.

**Incentive Problems**

Some European countries with voucher systems, recognizing the incentive that flat per pupil payments create for schools to select relatively advantaged students and for parents to choose those “successful” schools, transfer additional resources to schools based on the composition of the student body. Holland pays 1.9 times the standard voucher value for each minority student and 1.25 times the value for an economically disadvantaged student (Patrinos 2002a). Sweden also transfers additional resources based on numbers of minority students and students with learning disabilities.

In almost all countries, constellations of teachers, local politicians, and voters have successfully resisted efforts to close schools, even schools with low enrollments and declining quality. That is suggestive of the risk aversion (and the political power) of the actors in the education sector, including teachers. Experiences in
industrial countries also suggest that voucher programs can result in less attention to noncompensated school activities, such as curricular innovation.

Consistent with the predictions, case studies have found that pedagogy in England and Wales has become more uniform as schools have come to be ranked on the same hierarchical academic scale. Schools have seemingly expended less effort on pedagogical innovation because they were not rewarded for it and may even have been punished for it because parents tend to be pedagogically conservative (Walford 2003). Fiske and Ladd (2000) also report that some teachers felt that collegiality had declined in New Zealand schools and that parents, regardless of socioeconomic status, rated the quality of schools similarly, resulting in a consistent focus on traditional academics in most schools and little curricular innovation.

Both findings are consistent with the notion that when certain activities—in this case professional relations among teachers and pedagogical innovation—are rewarded at lower rates, they will receive less attention. In the United States voucher schools were less likely to have students with disabilities than the public school population (Myers and others 2000), probably because voucher schools were not compensated for taking on students with disabilities.

Voucher Programs in Developing and Transition Countries

Although there have been experiments with demand-side financing in a large number of developing and transition countries (Patrinos 2002b), true voucher programs are rarer. The reforms in Chile and Colombia are probably the only genuine examples. Bangladesh, Côte d’Ivoire, and the Czech Republic have had some quasi-voucher initiatives, which help illustrate the variety of contexts in which voucher programs might be implemented and the results they might achieve.

Chile

Starting in 1980, Chile transferred management of public primary and secondary schools to municipalities, abolished pay scales and civil servant protections for teachers, started to finance municipal and nonfee-charging private schools at equal rates tied strictly to attendance, and encouraged parents to choose schools based on performance. The democratic government that assumed power in 1989 reestablished salary scales and employment protection for teachers, but otherwise maintained Chile’s voucher system. It is probably the closest national-level approximation of a voucher system among developing economies (Gauri 1998).

The Chilean voucher system led to a dramatic increase in students enrolled in private voucher schools, from 15 percent of total enrollment at the beginning of the 1980s to 33 percent in 1996, almost entirely at the expense of municipal schools.
Although many teachers shifted to the private subsidized sector, almost no municipal schools closed. There is evidence that the private subsidized schools perform better, based on test scores, than municipal schools (Aedo and Larrañaga 1994; Rodríguez 1988), but this private advantage disappears or turns negative when student-level socioeconomic data are included as controls (McEwan 2001; Mizala and Romaguera 1998). McEwan and Carnoy (2000) find that Catholic schools perform better than municipal and nonreligious private voucher schools, but they spend more per student than the other groups of schools.

A study that attempted to measure the effects of private school competition on municipal schools found that communities with higher concentrations of private school enrollment had modestly higher positive test scores in the national capital (a net 0.2 standard deviation gain over 15 years) but small negative effects in the rest of the country (McEwan and Carnoy 1999). Another study found that communities with higher private enrollment shares saw public school performance fall from 1982 to 1988 (though the point estimate was significant only at the 10 percent level; Hsieh and Urquiola 2002). The study concludes that even if a voucher system creates incentive effects that lead to improvements in municipal schools, the fact that the better students migrate from municipal to private schools could lead to an overall decline in municipal school performance.

That study also argues that although small numbers of public students might benefit from vouchers to attend private schools, when a voucher system induces large number of students to move to private schools the overall impact can be assessed only by taking the sum of the (assumedly positive) effects for the migrating students, the (assumedly positive) effect of competition on public schools, and the (assumedly negative) effect of the loss to public school students of their most talented peers. It finds no change in national aggregate indicators of achievement, including Chile’s ranking in international test scores and the achievement gap between subsidized and nonsubsidized elite schools. There is also evidence that both municipal and private schools in Chile took active measures to select more advantaged students during this period (Gauri 1998; Espínola 1995).

Chile’s experience with vouchers, consistent with the predictions mentioned previously, suggests that when enrollments are the indicator for school effort, schools take steps to make themselves more attractive to parents by enrolling a more advantaged clientele. New Zealand’s experience shows that such sorting effects can be problematic when the supply of schools is fixed. Chile’s experience illustrates that sorting can also occur when there is a strong supply response. In Chile the effects of intense incentives based on enrollment were modest in the national capital and zero or negative elsewhere. That is also consistent with the expectation that when school effort is not directly related to productivity, intense incentives do not lead to better performance. That no municipal schools were closed is consistent with the fact that intense incentives can carry costs for risk-averse agents, who will fight efforts to
relocate or close schools. Finally, Chile’s voucher formula included adjustments for rural schools, in recognition of the need to include covariates of enrollment in intense incentives.

**Colombia**

Starting in 1992, Colombia offered vouchers to entering sixth-grade students residing in low-income neighborhoods who had previously attended a public school. The vouchers, renewable through the end of secondary school, were cofinanced by the central government and participating municipalities. Where local demand exceeded the municipal allotment, vouchers were assigned by lottery. The program was designed to help poor students make the transition to secondary school in areas where public schools were filled to capacity. Financing to public schools was not reduced when they lost students to the program.

The value of the voucher was initially high enough to pay for tuition at low-cost private schools, but it was not indexed to inflation. By 1998 participating students were typically making out-of-pocket payments equal to the voucher value to cover tuition costs. Most elite private schools in Colombia elected not to accept the vouchers. The program provided vouchers to 125,000 students, or about 1 percent of national secondary enrollment, before it was discontinued in 1997 (Angrist and others 2001; Calderón 1996; King and others 1997, 1998; Montenegro 1995).

A quasi-experimental study compared educational and other outcomes among samples of students who won and lost the voucher lottery (Angrist and others 2001). Lottery winners had lower grade repetition rates than losers but were not more likely to be enrolled in school. A sample of lottery winners also scored 0.2 standard deviations higher on standardized tests, controlling for age, gender, parents’ schooling, and residence, and almost 0.3 standard deviations higher in a two-stage least squares regression that took into account private school scholarships obtained by lottery losers and scholarships not used by lottery winners. The effects were slightly larger and estimated more precisely for girls than for boys. Lottery winners spent US$52 more on school fees than losers, gave up $41 in reduced earnings because they remained in school longer, and received scholarships that were $74 higher, for a net household contribution of $19. The public spent an extra $24 for each voucher student, net of reduced public school costs.

A complete analysis of the net impact of the program in Colombia would estimate not only the direct gains for students who used vouchers but also the program’s effect on public school students who lost classmates to the voucher program and the effect on the new classmates of lottery winners. Short of research of that scope, however, Angrist and others (2001) at least make plausible the argument that in certain circumstances the marginal impact of incremental private school effort can be substantial. That is consistent with the predictions mentioned already, though it should
be noted that programs like Colombia’s do not create intense incentives for schools but instead exploit incentives in existing private schools. The findings from the Colombia program are also consistent with the predictions that the marginal impact of school effort will be lower in rural settings (most participating schools were in the large urban areas) and that schools behave as if families use the socioeconomic composition of their student body as an indicator of quality (most elite schools in Colombia refused to accept the vouchers).

**Bangladesh**

Community-managed, not-for-profit schools enrolled 80–95 percent of secondary school students in Bangladesh in 2001, depending on how religious schools (madrassas) are classified. The government subsidized 80 percent of the base teacher salaries at these nongovernment schools, accounting for 79 percent of total government expenditures at the secondary level in 1997. Because the schools were supposed to follow state criteria on number and recruitment of students, the subsidies functioned as a sort of voucher: When schools attracted enough students to warrant hiring another teacher, the government subsidized that increase in enrollments by paying for most of the additional teacher’s salary. In private secondary schools student fees for admission, tuition, books, uniforms, stationery, sports, after-hours tutoring, and other activities constituted an average of half to two-thirds of private school revenues. Demand for secondary education was strong enough, and entry requirements in the sector liberal enough, that overall enrollments doubled from 1990 to 1997, when they reached 7 million students.

But the norms for the transfer of the subsidies were weakly enforced. One survey found that in 1998 only 29 percent of principals reported a visit by an inspector in the recent past (World Bank 2000). As a result, schools applied for and received subsidies without complying with enrollment and other norms, and the quasi-voucher system did not necessarily create intense incentives to expand school enrollments. The private fees, however, did serve that function.

By all accounts, the quality of secondary education in Bangladesh was inadequate despite high per pupil expenditures by international standards. The private schools did not train their teachers or develop new teaching methods, instead relying on the traditional pedagogy of memorization. Textbooks were often unavailable, and charges of cheating, by both students and schools, were not uncommon. The principal purpose of secondary education was to screen and winnow university applicants on the basis of the all-important examinations. Promotion rates were as low as 75 percent between grades, 15 percent of students who enrolled in the first year of secondary school completed a secondary degree, and 6 percent went on to a university.

The Bangladeshi experience with a quasi-voucher system is consistent with several theoretical predictions. Intense incentives can fail to achieve objectives without...
a functioning monitoring system. School effort will not be related to academic outcomes if exogenous factors, such as textbook shortages and examination pressures, limit returns to effort. Risk-averse actors will lobby to reduce the risk to which voucher programs expose schools. External pressures, such as university exams, will limit curricular innovation and teacher training (World Bank 2000).

**Côte d’Ivoire**

Côte d’Ivoire subsidizes private primary schools at rates that are negotiated with umbrella groups for religious (Catholic and Protestant) and secular schools, that vary with school location and tuition charges, and that are loosely tied to the number of students enrolled. These subsidies ranged from $40 to $66 per pupil in 1999. At the secondary school level reimbursements to private schools even more closely resembled a voucher system. In 1999 the government reimbursed private secondary schools $200–$233 per year for each “state-sponsored” student. These voucher values were above market tuition rates at some private schools, but about one-tenth the fees at the top ones.

Qualifying for sponsorship was not transparent, but it was tied to test scores, which had been the subject of corruption controversies in previous years. Generally, private schools had small permanent teaching staffs and hired public sector teachers on a contractual basis or used “rental” teachers from the government. Private enrollments were 13 percent of the national total at the primary level and 36 percent at the general secondary level. Some 42 percent of private students at the primary and secondary levels received either direct or indirect state support. The per capita private education subsidy was significantly higher for families in the top income quintile than for families in the lower quintiles, but the same was true for public education, which favored urban areas.

Outcomes studies of education subsidies in Côte d’Ivoire are not available. One analysis compared the results of a standardized test administered to five Francophone Sub-Saharan countries (Michaelowa 2001). It noted that although primary education expenditure as a share of gross domestic product (GDP) was 50 percent more in Côte d’Ivoire than in Cameroon and three times more than in Madagascar, and its per capita GDP was higher than that of both countries, test scores among fifth graders in Côte d’Ivoire were lower. Enrollment rates in Côte d’Ivoire were 54 percent, lower than in Cameroon but higher than in Madagascar. In some regions of Côte d’Ivoire first-grade enrollment rates for girls were as low as 12 percent.

Explanations for the inefficiency in expenditures included the short academic year (at 820 hours, one of the shortest in the world); double-shift classes for some students, which further reduced the hours of schooling; fees and other obstacles to textbook access that resulted in pupil:textbook ratios of 5:1 in urban areas and 10:1 in
rural areas; high teacher salaries (an average of nine times gross national product per capita); and small class sizes, which were the lowest among the five comparator nations (LaRocque 1999; World Bank 1998).

Although detailed analyses of the voucher program in Côte d’Ivoire are not available, the case illustrates that even if schools are given intense incentives, external constraints on performance, such as the labor market for teachers, national rules regarding the school year, and expectations regarding girls’ education, can diminish the returns to school effort. In the circumstances, compensation based on enrollment will be weakly productive in raising achievement.

**Czech Republic**

Private schools were legalized in the Czech Republic in 1990. At the same time, state-run schools were given authority over enrollment and curricula. Although private schools at first received “equal treatment” with respect to public financing, in 1995 their public funding was lowered to 60–90 percent of the funding for state schools. Following complaints about the arbitrariness of the state’s funding decisions, a new formula in 1999 directed that private schools should receive funding based on a set of defined quality measures.

In that scheme state-run schools received separate recurrent budget allocations, determined on a per student, voucherlike basis. The recurrent component had two parts: a base support level, which varied by type of school (on average 50 percent of the per student payment to state schools), and a quality-based payment, with a maximum total set at 90 percent of the state sector per student subsidy. The average private school received just under 80 percent of the per student allocation that public schools received. Private secondary schools could charge tuition, which in 1998 averaged 55–65 percent of the per student allocation going to public secondary schools. Although the enrollment share remained tiny for private primary schools, the secondary school share went from 0.1 percent in 1990 to 9.8 percent in 1999 (Filer and Munich 2003; World Bank 2001).

Assessments of the voucherlike system of education financing in the Czech Republic remain provisional. One study found that parents with higher earnings and more education were more likely to choose a private school for their children, but many private schools found their market niche by enrolling students who did not gain admission to the most desirable, oversubscribed public secondary schools. There is little published data on the criteria private schools use to select students or on whether enrollments were functioning as a useful estimate of school effort. Provisional evidence suggested that areas with relatively weak public schools were more likely to have private schools established (Filer and Munich 2003).
Conclusion

Voucher programs are a potential solution to the problem that governments face in motivating schools, as their agents, to put forth effort. Making school payments proportional to enrollment creates intense incentives to satisfy parents. Enrollment is a useful measure of school effort. But because parents frequently conflate student body composition with learning opportunities, voucher programs can create a strong incentive for schools to select advantaged students. Findings in Chile and New Zealand are consistent with this concern. Where administratively feasible, it makes sense to set the voucher value for disadvantaged students at higher levels, as Holland does. Where that is not feasible, which is likely in most developing economies, eligibility for voucher programs might be restricted to the poor.

Intense incentives are worthwhile only if more school effort produces better results. For small voucher programs that send modest numbers of students to urban private schools with surplus capacity, as in Colombia’s experiment, that might well be true, at least for participating students. (Evidence on aggregate results is still unavailable.) In programs with wide eligibility, the ability of schools to improve learning among large numbers of students is likely to be limited in many developing areas by factors beyond the schools’ control, such as the number of qualified teachers, the availability of textbooks, and pedagogical traditions.

Voucher programs that do not reward innovation may reduce diversity and innovation in teaching if parents are pedagogically conservative. Voucher programs in Bangladesh, Chile, Côte d’Ivoire, New Zealand, and the United Kingdom did not promote pedagogical innovation. Case studies suggest that pedagogy might even have become more uniform in those countries than before the programs. If implementing voucher programs, governments will need to continue to finance and support teacher training and professional development in private schools.

Teachers, school owners, and parents in developing economies are often risk-averse. As a result, strict voucher programs in which poorly performing schools are closed and teachers are laid off carry higher welfare costs and might encounter strong political resistance.

Finally, voucher programs reward schools that can get away with exaggerating enrollment rates or loosening education standards. So the effect of intense incentives to expand enrollments will be distorted unless the government establishes a functioning monitoring system, which can be expensive.

The usefulness of voucher programs for developing economies remains uncertain. Major voucher initiatives have only been attempted in two countries with relatively well-developed institutional infrastructures, Chile and Colombia. Some studies have found favorable benefits for at least some population groups, but others have found limited effects and evidence of increasing social stratification in schools. Whether
vouchers lead to better outcomes or greater stratification appears related to specific contexts, institutional variables, and program design.

Notes

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1. Patrinos (2002b) reviews the evidence on subsidies to increase education demand in developing economies, including, for example, Bolsa Escola in Brazil, Progressa in Mexico, Food for Education in Bangladesh, and a community grants program in Pakistan.

2. It is possible that schools will exhibit competitive behavior even in the absence of explicit, intense incentives. In some cases, rivalry for professional status can lead to a “culture of competition,” as in the New Zealand system.

3. Formally, incentives in a voucher system are modeled as \( r = \alpha + \beta(e + x + \gamma y) \), where \( r \) represents total payments to the school, \( \alpha \) is a base payment for capital costs or in-kind inputs, \( e \) is school effort as measured by the number of students enrolled, \( x \) is noise in the measurement of enrollments, \( y \) is a set of factors that varies with enrollment, and \( \gamma \) is a parameter that varies from 0 to 1. The higher the voucher value, \( \beta \), the more “intense” the incentives the school faces (Milgrom and Roberts 1992).

4. Another approach would model parents as principals, either alongside or instead of the state as a principal, with the school remaining the agent. But that approach, although useful as an exercise, would have limited value for policy. The analytic virtue of the principal-agent framework is that it identifies important contractual parameters of the voucher scheme in the hope that they might be modified to improve social outcomes. If parents are not concerned with broad social outcomes, or if they cannot shape the parameters of contracts with schools—there are reasons to believe that both are true—an approach that makes them principals has limited value for policymaking. The state might design a voucher program in which schools are paid not only for each student enrolled but an additional amount for students from minorities or from disadvantaged backgrounds, or less if an inflow of immigrants raises average enrollment rates and lowers marginal costs for all schools in a neighborhood, or it may link payments to a weighted average of enrollments and test scores. But parents are concerned primarily with the education of their own children and are not likely to pay less if the school fails to fulfill a social objective. Moreover, because schooling, for economies of scale and social and historical reasons, is provided collectively, parents would have to negotiate the terms of the contract with schools among themselves first, resulting in a difficult collective action problem. As a result, they would be hard pressed to design and modify key parameters of contracts with schools. The framework adopted here focuses on, to the use the language of World Bank (2003), the policymaker–provider link, and it assumes that the policymakers follow through on their commitment to reward schools on the basis of parental choices. In other words, it does not address issues related to interest group influence, which of course do not disappear in a voucher system.

5. The use of a poor measure of effort and the exclusion of observable, exogenous correlates from the contract both raise the expected variance with which effort will be measured. The higher the variance, the higher the implicit costs of contracting (Holmstrom 1979).

6. This bias on the part of parents is rational if enrolling a child in a school with advantaged peers helps the child learn—if there are peer effects—or if enrolling in such a school is construed as a sign of high achievement by employers and higher level schools—if there are signaling effects.
7. With a risk-neutral principal and a risk-averse agent, a fee schedule in which the agent bears all the risk is never pareto optimal (Shavell 1979), but a small degree of risk aversion in a linear compensation contract will permit a solution close to the first best (Holmstrom and Milgrom 1987).

8. For a formal presentation of this point, see Hsieh and Urquiola (2002).

9. Holmstrom and Milgrom (1987) argue that if two of an agent’s activities can be separately observed, the weight to attach to each in the optimal compensation scheme depends not only on the costs and benefits of the activities but on their variances. The higher the variance, the lower is the weight attached to the activity.

10. For a summary of research findings on vouchers in the United States, as well as on charter schools, see Gill and others (2001). That volume argues that differences in academic achievement between conventional public and charter schools in Arizona, Michigan, and Texas are relatively small and mixed in direction, though that might be a consequence of the relative youth of charter schools. Hoxby (2001) argues that areas with greater competition from charter schools exhibit higher achievement. Other reviews include Ladd (2002) and Neal (2002).

References


