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Impact of Choice and Competition on Student Achievement February 2013

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> *[School vouchers] would bring a healthy increase in the variety of educational institutions available and in competition among them. Private initiative and enterprise would quicken the pace of progress in this area as it has in so many others. Government would serve its proper function of improving the operation of the invisible hand without substituting the dead hand of bureaucracy.*
>
> *Milton Friedman (1955)*

When the University of Chicago economist Milton Friedman proposed school vouchers, he did not argue that students would learn more in one type of school or another but that the "pace of progress" would be greater if one had "a healthy increase" in the variety of schools and the competition among them. He envisioned a large government role in the financing of schools but left government's regulatory responsibilities unexplored. Whether competition between traditional public schools and publicly funded but privately managed schools would drive progress is a topic he never addressed. Although Friedman preferred minimal regulation but he admitted that a "paternalistic concern for children" might require some government oversight over the educational function. All things considered, his argument seems to place greater weight on the need for competition among schools than for independence from government supervision. A government cannot be expected to supply money to private institutions without establishing a mechanism that ensures the money is spent for intended purposes.

A good empirical test of Friedman's competitive theory requires an examination of the educational outcomes in systems of education that vary in the amount of choice and competition that has occurred. For that reason the best test of Friedman's theory comes from international studies of countries with varying amounts of choice. That information can be used to identify the long-term consequences of choice-based education. However, it is possible to obtain additional evidence by taking advantage of the variation within countries in the amount of choice and competition within the education sector. Unfortunately, very little of the research literature on school choice has looked at either sets of data but instead has veered off course by focusing most of its attention on the relative merits of public and private schools. In this paper we bring together the results from the limited number of studies that provide the best tests of the Friedman hypothesis. We find that in general a 30 percentage point increase in the percentage of students attending the non-governmental sector seems to lift student performance by about a year's worth of learning by the age of 15, or a one-month gain in learning annually.

The Shift from Competitive to Private School Effects

The shift away from a focus on the benefits of competition to a focus on the differences between public and private school happened almost inadvertently. When Friedman's University of Chicago colleague, sociologist James Coleman, suggested in the late 1970s that Catholic schools were more educationally effective than public schools, he did not draw upon Friedman's theory in his initial reports. Instead, he explained the Catholic school success by pointing to the close-knit adult community in which Catholic schools were embedded. Coleman said these community relationships provided "social capital" that facilitated the learning process. By supporting one another, teachers and parents were better able to keep the adolescent community focused on their educational responsibilities. To test this theory, Coleman and his colleagues

administered reading and math tests to a nationally representative sample of high school students who attended public and Catholic schools in the United States. A higher performance in the Catholic sector was identified even after adjustments had been made for a wide variety of family background characteristics, such as parental education, family income, books in the home, and the like.

Coleman's findings were treated as a test of Friedman's theory by supporters and critics alike. While the former treated them as proofs, the latter objected to Coleman's methodology. It was pointed out that Coleman had conducted an observational, not an experimental, study (a distinction elaborated below). The students in the Catholic and public schools were not equivalent, and the findings were not robust to alternative analytical models. Coleman defended himself by doing a second study that showed gains in tests scores were greater in Catholic schools, but neither side paid much attention to the fact that his studies offered no evidence whatsoever for the Friedman proposition that "healthy progress" was being made by schools in more competitive environments.

In 1990, Brookings political scientists John Chubb and Terry Moe continued to point the discussion away from a focus on competition by offering a political theory for the superiority of private schools relative to public ones. They argued that public schools were inherently inferior because they were subject to numerous rules and regulations imposed by interest groups and collective bargaining agreements. Administrators focused on bureaucratic compliance rather than educational effectiveness. Unimpeded by such rules, private schools could focus on their educational mission. To support their theory, Chubb and Moe did their own observational analysis of the data Coleman had collected, reaching conclusions not unlike those the Coleman team had originally reported. Once again, critics raised methodological objections, saying the

students in public and private schools differed from one another in ways not captured by conventional controls for family background characteristics. Little attention was paid to the fact that Friedman's key proposition was not being tested.

Since the Coleman and Chubb-Moe studies, most of the school choice research has continued to be directed at detecting—or not detecting—differences between the public and private sector, not identifying the effect of competition on the rate of educational progress. In an extensive review of studies of the comparative effects of public and private schools, economist Helen Ladd concludes, for example, that "contrary to the claims of its proponents, a large-scale universal voucher program would not generate substantial gains in overall student achievement and that it could well be detrimental to many disadvantaged students," though she qualifies that statement by saying "the case for a targeted, means-tested voucher program is stronger" because disadvantaged students seem to do better in the private sector. Similarly, a policy brief issued by the influential Program on International Student Assessment (PISA) for the Organization of Economic Co-operation and Development (OECD), the international agency that gathers data on student test performance throughout the world, finds no difference between private and public schools once family background characteristics and the degree of autonomy enjoyed by local schools is taken into account. On the basis of this finding PISA concludes that "there is no evidence to suggest that private schools help to raise the level of performance of the school system, as a whole."

Competition in other Industries

A glance at the way in which competitive markets work in other industries clarifies the inappropriateness of public-private sector comparisons for assessing the merits of choice-based

educational systems. Consider, for example, the advances made within the communications industry in the aftermath of the break-up of the AT&T monopoly in the United States. Competition among innovative entrepreneurs drove the shift from landlines to cell phones and the introduction of internet access, text messaging, conferencing, digital photography, visualization, aps, cloud-based data bases, and much more. No one thinks that the best test of competition theory in communications is a comparison of the relative effectiveness of iPhones with those that are Android based.

Competition has also driven rapid product improvement within the automobile industry. When U. S. automakers began to act like oligopolies, they were overwhelmed by competition from Japan, Germany, Korea and elsewhere. Cars today are quieter, faster, safer, more efficient, more comfortable, and more differentiated than they were in 1970 because international firms compete in product variety and design. No one would consider market theory debunked by a finding that the Ford Taurus is not much better than the General Motors Saturn or by data that show the Toyota Lexus is just as good as the Honda Acura. Indeed, the very similarity of automobiles sold at similar price points is taken as confirmation of the power of markets.

In education, too, one should expect that schools at similar price points will provide either highly differentiated or roughly equivalent educational experiences. Studies that examine differences in the effectiveness of public, private and charter sectors in education are unable to yield information relevant to the Friedman hypothesis.

Quasi-experimental Evidence

Quite apart from studying the wrong question, school choice research has too often relied upon observational data (such as both Coleman and Chubb-Moe used) rather than using

experimental or quasi-experimental research designs to estimate causal relations. Reliance upon observational evidence puts the analyst at risk of claiming a causal connection simply because two variables are correlated with one another. But the relationship between any two variables may exist because the second causes the first, the first causes the second, or some third set of variables is affecting the other two simultaneously. Consider, for example, a study that finds students performing less well in countries with more parental choice. The relationship between the two variables could be 1) choice and competition undermines some part of the educational system; 2) parents are seeking choice because schools are under-performing, or 3) slow rates of economic growth have both weakened school performance and generated demands for a choice-based system. Observational studies cannot choose among these three explanations.

We therefore concentrate our attention on studies that have a better chance of identifying causal relationships. Such studies find some external or exogenous factor that affects school choice without directly influencing school performance in any other way. Appropriate inclusion of this external factor in the analysis is expected to identify the true relationship between competitiveness and educational outcomes. In this essay we shall rely principally on studies that use quasi-experimental evidence to estimate competitive effects on achievement.

Competitive Effects: International Evidence

As mentioned above, the best test of the Friedman hypothesis is one that identifies the long-term consequences of choice and competition. Only with the passage of time do all the trappings and accouterments that eventually adhere to any organizational arrangement come together to form an institution that has an enduring impact. Fortunately, a recent study by Harvard University's Martin West and University of Munich scholar Ludger Woessmann

accomplishes that objective by estimating the competitive effects of the variation in school choice across nations.

The two scholars take make use PISA data on the performance of 15-year-old students in math, reading and science (much the same data PISA relied upon for its own conclusion that choice and competition do not enhanced student achievement). Using information on the 2003 performance of 220,000 students in 29 OECD countries, the analysis adjusts for a multitude of family background and school characteristics, including the amount of school expenditure per student.

The researchers assume that choice and competition is greater in those countries where a larger share of students attend private schools. In this respect, the variation among OECD countries is considerable. School choice can be extensive even in places where it is not explicitly recognized as such. Ontario, Canada has won plaudits for the strong performance of its students on international tests. In a study undertaken in August 2012, my colleagues and I found that students in Ontario gained 3.3 standard deviations (st. dev.) on international tests--compared to a gain of just 1.6 st. dev. for students in the United States, the median country among the 49 included in our study. Australia gained by one standard deviation annually, Canada as a whole gained, 1.1 st. dev., and Quebec declined by one st. dev.

In 2011 a former high-level provincial official was asked to explain the exceptional gains in Ontario at a conference held at Harvard University. The official pointed to government reforms that exerted tighter provincial controls over schools and excellent relations between government and the teacher unions. When asked about school choice, the official said that choice was not part of the Ontario educational system. She pointed out that Catholic schools

were fully funded by the government in order to comply with a clause in the Canadian constitution that was originally designed to protect the religious traditions of the country's French-speaking minority. But these Catholic schools, she explained, were subject to most of the provincial regulations that applied to district-operated schools.

The Canadian official was certainly correct to point out that Canada has neither a school voucher program, where any student can go to any school the family chooses, nor does it have privately managed, secular charter schools such as can be found in the United States, which are authorized by government and receive government funding but typically operate free of numerous government regulations and collective bargaining agreements.

It is nonetheless the case that Ontario parents do not have to pay tuition to have a choice between state and Catholic schools. While the number of students at Catholic schools is not officially reported, they constitute approximately a third of the population in Ontario. In addition approximately 10 percent of the students at Catholic schools come from another religious background. Catholic schools may not deny non-Catholics access to the school though they may ask them to participate in the school's religious ceremonies. School choice is further augmented by the presence of fee-based private schools, which serve approximately10 percent of the population. In short, Ontario provides a broader range of government-funded and fee-based school choice options than do most U. S school districts.

So it is in many other OECD countries where public schools, Catholic schools, and, in some cases, schools with other religious affiliations compete with one another for student enrollments. Government funds follow the students to the school of their choice. According to West and Woessmann,

> [the] private school share [of school enrollment at age 15] in Belgium, Ireland, and Korea is well above one-half [the total]. By contrast, the share of students attending privately operated schools in Greece, Iceland, Italy, New Zealand, Norway, Poland, Sweden, and Turkey is below 5 percent. Just over 6 percent of the American 15-year-olds sampled by PISA attended private schools, a figure that corresponds closely to official estimates of private enrollment at the secondary level from the U.S. Department of Education.

The percentage in all 29 countries they studied is shown in Table 1.

The research team tells us that some of the variation across countries is an accident of historical circumstances rather than a function of the contemporary quality of either public or private schools. In the late 19th Century the leadership of the Catholic Church in Rome called upon Catholics to create their own separate educational system in those countries where the state schools were not providing instruction in the Catholic faith. The success with which that was done varied considerably from one country to another. This variation in the historical situation becomes the external, exogenous factor that allows West and Woessmann to make causal estimates of the effect of competition on student performance.

The scholars find that the greater the historically-induced competition (that is, the larger the size of the private sector established more than a century ago), the higher the current performance of the educational system as a whole (public and private schools combined). Specifically, a 30 percentage point increase in the share of students attending the private sector increases by 27.3 percent of a st. dev., or more than a year's worth of learning by age 15. Effects in science and reading are about half that large but still amount to over half a year's worth of learning. The competition also lowers the cost of education. A 30 percentage point increase in the size of the private sector reduces costs by about 16 percent.

West and Woessmann say that "public school students profit nearly as much from increased private school competition as do a nation's students as a whole." In other words,

scores climb not because the students in private school do better than those in state-administered schools but because both private and public schools are better when both face healthy competition.

Competitive Effects within Single Countries

Although the international research we have just discussed is the most compelling of all the competitive effects studies, single-country studies provide a substantial amount of confirming evidence that choice-based systems lift student achievement.

Long-term effects within the United States

Even before the West-Woessmann research was undertaken, Stanford economist Caroline Hoxby had used a similar strategy to estimate the long-term consequences of school choice arrangements within the United States. She, too, uses the variation in choice created by the struggles between Catholics and Protestants in the 19th Century to estimate contemporary competitive effects. At that time, a large Protestant majority stoutly rejected Catholic pleas that their schools be placed on an equal footing. It was only by one vote that a constitutional amendment failed to pass the U. S. Senate that would have unconditionally prohibited aid to religious schools offered by Maine Senator James Blaine, a future Republican nominee for the presidency. But its language did become part and parcel of many state constitutions— "Baby Blaines" they are called. Such legislation has complicated the enactment of government-funded school choice interventions even after the Supreme Court upheld a voucher intervention in Cleveland, Ohio in 2002. As a result, the United States does not offer families a choice of free schooling in either a secular or religious setting to the same extent as is available in Canada, Australia and a majority of other advanced industrialized countries.

Two long-standing, though imperfect, school choice options are nonetheless available in the United States. First, about 11 percent of the school age population pays tuition and fees in order to attend a private school. Unfortunately, competition between a free system and a fee-based system produces odd results. Some of the fee-based schools offer an elite, private school experience to those of very high income—the "one percent," as it were. Approximately 10 to 15 percent of the private school population—or a little over one percent of all school-age children—attend Episcopalian, Quaker, or other high prestige private schools recognized for their success in preparing students for admission to high-prestige private universities.

The largest share of the private sector consists of Catholic schools created at the time the Blaine Amendment was under debate. (In recent years Protestant Evangelical schools (known as Christian schools) have grown rapidly, while the Catholic sector has eroded.) These schools compete with the public sector by offering instruction within a religious setting, not necessarily by setting higher quality educational services. They operate at about two-thirds the cost of public schools. Salaries for teachers are also about two-thirds of the level paid by public schools, which also offer more extensive health and pension benefits.

The second choice option is a function of the highly decentralized governing arrangements for education within the United States. In the early 20th Century, over one hundred thousand school districts paid for most educational costs out of the property taxes paid by district businesses and residents. Even today, there are 14,000 districts and nearly half the cost of education comes from local revenues. With local boards in charge of each district, the type and quality of schooling varies widely from one community to the next. In a society as mobile as the United States, this creates some competition among districts as the property values in a

community are affected by the quality of the schools. However, the higher quality educational services are limited to those who can afford the cost of property in these desirable communities.

Hoxby has estimated positive effects on achievement from both forms of competition. Using density of private schools (caused principally by the variation in the historical evolution of the Catholic sector across the United States), she finds that a 10 percentage point increase in the Catholic share of enrollment generates "an additional 0.9 years of educational attainment, 6 percent higher wages, and a 7 percentile increase" in test score performance. The last result implies about two-thirds of a year's worth of learning of a 30 percentage point change in the private-sector share, an impact similar to the one identified by West and Woessmann.

To identify inter-district competitive effects on school effectiveness, Hoxby exploits the fact that metropolitan areas within the United States vary in the number of school districts that operate independently within them. At one extreme Boston has over 300 self-contained school districts, while the Miami metropolitan area has only one (Dade County). She assumes that the number of rivers within a metropolitan area helps to determine the number of school districts (by affecting the ease of transportation and by creating local identities) and uses this information to obtain a quasi-experimental estimation. Using this technique she finds that test scores "rise by one quarter to one half of a standard deviation" by 12^{th} grade, if competition reaches its maximum rather than remaining at zero. While her methodological technique has provoked controversy, her results are not much different from those identified by West and Woessmann.

Although all of these studies are of great interest because they are able to estimate the long-term consequences of school choice, they nonetheless have their limitations. The first relies upon data from just 29 countries. And all of the studies assume that historical events do not

affect current student achievement except via the school choice arrangements they leave behind. However, it is possible that other historical factors coincident with the decision by Catholics to establish a distinct school system could be affecting contemporary educational performance. Further, metropolitan areas with more rivers may differ from other places in educationally relevant ways.

Shock Studies

For this reason it is useful to supplement this research with other quasi-experimental studies that have looked at the short-term consequences of an increase in competitiveness caused by an external shock that affects the degree of competition without directly affecting student achievement in another way. The use of shocks to estimate causal effects has become increasingly popular in recent years. Because shocks come as a surprise to participants, they cannot alter their behavior prior to the shock. As long as no other shock is happening at the same time, the change in the behavior at the time of the shock may be attributed to the surprising event that suddenly increased the competitiveness of the educational sector.

Florida vouchers. Martin West and I carried out the first school choice "shock" study. In 1998 the State of Florida had enacted a law that gave students a voucher that would allow them to attend another public or private school if their own school twice failed the state accountability standard. Initially, Florida judged "failure" by the level of student performance on the Florida state test, but in 2002 they also required districts to show gains in student achievement if they were to avoid being identified as "F" schools. This change in the rules came as a surprise to school officials, and, as a result, around 40 schools suddenly learned they had failed to meet the standard, placing them at jeopardy of losing their students to other public and

private schools the following year—unless they improved their performance. In other words, a public school could forestall the introduction of a competitor by lifting their test-score performance.

To estimate the effects of the potential increase in competition, we compared the performance of "F" schools with "D" schools that just barely avoided a similar designation. We found one-year gains in student achievement of about 4 percent of a st. dev. A subsequent study of this same event was carried out by Cecilia Rouse and her colleagues, who also found similar impacts of the Florida voucher shock. They also unearthed a number of changes in educational practices that may have contributed to these gains. Further, Patrick Wolf has identified another 20 studies, most of which use quasi-experimental research designs, all of which identified positive competitive effects on student achievement at U. S. public schools as the result of the introduction of school voucher and charter school programs. Wolf reports that the effects of these interventions are, on average, approximately one percentile points, or about one to two percent of a st. dev., annually.

Ontario tax credits and school openings. In 2001, Ontario, Canada had experienced a similar shock. In that year a conservative government surprised public schools by enacting (with hardly any warning) a tax credit of up to $3,500 for those who paid tuition so their children could attend one of Ontario's private schools. To estimate the effect of the tax credit Winnie Chan at the University of Toronto compares the change in student performance at provincial schools that occurred after the credit option became available. She looks at impacts in districts that varied in the percentage of students enrolled in private schools eligible for participation in the tax credit program. She finds that the introduction of the tax credit lifted performance by one-tenth of a st. dev. for every one percent increase in the size of the private sector enrollment in the district. The

findings imply an increase of 25 percent of a st. dev. if private sector share of the market were to increase by 25 percent. The tax credit was politically controversial, however, and the policy was reversed when political power in the province changed hands a few years later.

A second Ontario study by Berkeley economist David Card and his colleagues focused on the effects on provincial elementary schools of the increase in parental choice created by the opening of new Catholic schools in a community. They expected a greater impact of school openings in communities with a larger Catholic share of the population, because a larger share of students would be given an additional school choice. To estimate impacts they look at changes in test scores between third and sixth grade on a provincial test. Their estimate of effects is less than those estimated by Chan; they report that average test scores would rise by somewhere between 6 percent and 8 percent of a standard deviation if all families in the community had access to the Catholic school. Although the study is of interest, the opening of a new school is not an exogenous shock as a new school takes years to plan and build. Some of the impact of the increased choice could have been anticipated by parents and school administrators as the new school was being planned and built. That could account for the lower estimate of the impact of additional choice.

Florida tax credits. Florida increased the competitive context for public schools again in 2003 when it suddenly enacted a tax credit initiative. The Florida Tax Credit Scholarship program allows corporations to take a full tax credit for donations to scholarship foundations against their state income tax if they provide money to students from low-income families who wish to send their children to private schools. Over 15,000 scholarships were awarded in 2003, the year the program became operative. The number rose in subsequent years to a high of nearly 30,000 in 2010. Northwestern economist David Figlio estimated the difference in school

performance at public schools before and after the introduction of the tax credit program. He compared the changes in performance at public schools facing varying amounts of competition from the private sector. He used of indicators to measure variation in competition—distance from closest private school, density of private schools in the neighborhood, and the variety in the type of private schools located nearby. No matter what indicator he used, Figlio found that test score performance in public schools increases when they face more competition. The gains for reading and math, calculated together, are about as 3 percent of a standard deviation over the course of one year, an estimate roughly comparable to the effects observed by West and Woessmann.

Chile: A Voucher System at Scale

No national government has introduced a more comprehensive school voucher plan than the one introduced in Chile in 1981. By 2002 only 53 percent of students were attending municipal schools. While 9 percent of students were attending fee-based private schools that operated altogether independently from the government, the balance attended either a voucher school that was part of a larger network of schools (13 percent) or what may be called a stand-alone school or "Mom and Pop" school because it is not part of a larger network ((25 percent).

A wide variety of scholars have tried to test the effectiveness of the Chilean experiment by comparing student achievement in municipal and voucher schools. The range of estimates varies widely, depending on the exact research method that was used. In one of the best studies, a team of Chilean scholars headed by Gregory Elacqua reports that the stand-alone schools do not appear to be decidedly better than the municipal schools but they do find the schools that are part of larger institutional networks to be more effective. But these comparisons among schools

are, as we have argued above, an inappropriate way of identifying the effectiveness of the Chilean experiment.

The most significant finding from Chile is the country's rapid improvement on international tests since 1999. As part of an international study, my colleagues and I found that the average annual rate of gain on all international tests administered in Chile between 1999 and 2009 to be 4.4 standard deviations, the second highest observed among the 49 countries whose performances were observed over roughly the same time period. Gains in Latvia, the most rapidly improving country, were 4.7 percent of a standard deviation. Recall that by comparison Ontario gained 3.3 st. dev., the United States 1.6 st. dev., and Australia 1.0 st. dev. annually over this time period. The differences in these annual gains are non-trivial. Over the course of a decade, the annual gains in Chile accumulate to 44 percent of a st. dev., or nearly two full years of learning, as compared to just 10 percent of a st. dev. in Australia. When Elacqua spoke before an international conference held at Harvard University in July 2012, he attributed the Chilean gains to increased educational expenditures in recent years, increased regulation and supervision of voucher school operations, and a highly competitive school system which encouraged schools effective use of the incremental resources.

The Chilean experiment provides a real world example of a major transformation of an educational system that increased the amount of choice and competition by a very large margin. According to early observers, new schools induced to form by the voucher opportunity initially did not have the administrative and pedagogical capacities needed to make full and effective use of the resources made available. But by the beginning of the 21st Century the system had stabilized and the system was improving at a much faster pace than in most other countries. Admittedly, a single-country does not provide any more than anecdotal evidence that

competition can spur sustained achievement growth. But the size of the gain in Chile—about 4 percent of a standard deviation annually—is not much different from what one would expect, given estimations of competitive effects from quasi-experimental studies.

Conclusions

The impact of an increase in choice and competition is broadly similar across a wide variety of estimations carried out with alternative identification strategies. The effects seem to hover somewhere around 3 percent to 5 percent of a standard deviation annually, which cumulates to one to two years worth of learning by the time the student reaches the age of fifteen. While this should be taken as a ball park estimate, not a definitive prediction of the likely impact of any specific increment in choice and competition, the effects are large enough to give considerable credence to the Friedman hypothesis.

Critics of school choice have identified three ways in which parental choice might prove harmful to those attending government-operated schools: 1) It is culturally divisive, as parents seek instruction for the children at schools that share the family's cultural traditions; 2) It stratifies society by increasing the between-school variation in student performance; and 3) It drains resources from public schools, lowering the quality of educational provision;

The success with which many societies have had with publicly funded but dual secular and Catholic school systems casts doubt on claims on the first of these propositions. Further, studies of public and private schools within the United States show little difference in political tolerance and inclination to participate in public life between students who are attending the two sectors. While instances of cultural conflict in systems with school choice can undoubtedly be identified, a secular system of education in Yugoslavia did not prevent extreme cultural conflict

after the collapse of the Soviet empire. The unification of Germany in the 19th Century was undoubtedly facilitated by Bismarck's decision to allow Catholic schools to persist. The Canadian compromise protecting Catholic education within the framework of the Canadian constitution has proved remarkably durable.

Quasi-experimental evidence concerning the impact of school choice on social stratification is very limited. However, West and Woessmann find that the greater the competition between the public and private sector, the lower the connection between family background characteristics and student achievement. The converse is true for those countries, such as the United States, that expects family to choose their school by choosing the neighborhood in which they live. When school choice is tied to housing choice, it accentuates differential social access to higher quality schools.

As for the impact of competition on the overall performance of public schools operated by the government, the evidence is consistently positive. As both international comparisons and the studies of interventions within single countries discussed in this paper show, substantial gains in student performance within the public sector are observed when choice is introduced.

Table 1. Percentage of Students in Private Schools and Percentage of Private School Funding from Government Sources in Selected Members of the Organization for Economic Co-operation and Development

Name of Country	%Private School	% Funding from Government
Netherlands	77%	96%
Belgium	69	85
Ireland	61	45
Korea	56	55
Spain	38	67
Australia	38	NA
Japan	27	33
Denmark	22	76
Mexico	16	8
Luxembourg	14	89
Slovak Republic	12	94
Hungary	11	78
Austria	8	NA
Germany	8	78
Canada	7	54
Czech Republic	7	63
Finland	7	98
Portugal	6	64
Switzerland	6	22
United Kingdom	6	13
United States	6	2
Italy	5	14
New Zealand	5	15
Greece	4	0
Sweden	4	99
Turkey	3	0
Norway	1	89
Poland	1	35
Iceland	0	90

NA: Information is not available.

Source: West, M. R. and L. Woessmann (2010). "'Every Catholic in a Catholic School': Historical Resistance to State Schooling, Contemporary School Competition, and Student Achievement Across Countries." *The Economic Journal*, vol. 120, no. 546: F229-F255.