



Global Development Network 1999 - 2009

GDN Working Paper Series

GDN Education Issues Paper

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Working Paper No. 10

September 2009

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This Working Paper has been prepared within the GDN's Global Research Project *Varieties of Governance: Effective Public Service Delivery*. The project is currently supported by the International Development Research Centre (IDRC), Canada; and The World Bank, United States of America. The views expressed in this publication are those of the author(s) alone.

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Abstract

This paper reviews governance and institutional challenges facing educational systems in developing countries. We outline a framework for education service delivery and offer a comprehensive review of policies and programs to address the twin goals of decreasing barriers to attending school and reducing stark quality deficits with respect to developed countries. We review experimental and quasi-experimental evidence on student and teacher incentives, decentralization and local school control. More conclusive evidence on the quality improvement measures that succeed in different institutional and resource contexts is needed. To this end, the paper concludes with key research issues for future research.

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I. Introduction

This paper reviews governance and institutional challenges facing educational systems in developing countries. In middle-income and poor countries alike, educational opportunities elude many children, especially those from poor and disadvantaged children, in large part due to economic, social and institutional reasons. Children in developing countries have access to schools of much lower average quality than do their peers in developed nations. The cognitive skills that students in developing country elementary and secondary schools can demonstrate in international assessments are substantially lower than those of peers in high income nations. These skills are important because ample research has shown their strong impact in an individual's capacity to access good jobs, earn decent wages, and they are related to various human development outcomes, including better parenting and health outcomes.

In addition, there is substantial inequality in access to quality schooling in many developing countries (as well as in some developed nations, including the United States). Parents in low-income households tend to be less educated than parents in higher-income households and thus less capable of guiding and supporting their children's learning at home. Their teachers tend to be less qualified; their schools tend to be less-well equipped – particularly in countries with decentralized education finance; and their home and community environment is likely to provide fewer resources and stimuli for learning. And children from poor households often have to divide their time between school and work, leaving less time for homework and sometimes causing them to miss school during periods of peak labor need such as planting and harvest. Each market or policy dysfunction is often a failure to reach poor children.

The structure of the paper is as follows. We motivate the discussion with a brief review of the development of educational systems and human capital-based research on the value of investing in education. Next, we offer a framework for education public service delivery. Then, we review the growing body of evidence from developing countries on what works in K-12 education in the context of specific institutional challenges facing governments: agency problems, coordination tensions, imperfect information, and incentives related to the twin challenges of educational access and quality. We conclude with suggestions for further research and country case studies, as well as a review of empirical strategies that may be used in the case studies.

II. Evolution of Education Systems

In just 60 years, universal access to primary education has matured into a primary political and economic goal. The goal of achieving universal access to primary education was first agreed to by the international community in the 1948 Universal Declaration of Human Rights.¹ Reasserted in the Jomtien and Dakar Declarations, this right has since been incorporated into most national

¹ The right was subsequently established as binding international law in the 1966 International Covenant on Economic, Social and Cultural Rights and the 1989 UN Convention on the Rights of the Child.

constitutions. Most international agreements focus on the right to free and compulsory education.² The United Nations considers education a prerequisite for exercising other civil, political, economic, and social rights, viewing it as “the primary vehicle by which economically and socially marginalized adults and children can lift themselves out of poverty and obtain the means to participate fully in their communities” (UNESCO and UN Committee on Economic, Social and Cultural Rights 1999) (Article 13).

Most recently, the goal of achieving universal primary completion by 2015 in all countries of the world was agreed in the United Nations’ Millennium Development Goals. At present, the majority of countries mandate compulsory education for at least 5 years (see Table 1).

**Table 1: Duration of Compulsory Schooling
by Region, 2007 (in years)**

Region	Minimum Duration	Mean Duration
Arab States	6	9.1
Central & Eastern Europe	8	9.1
Central Asia & Caucasus	8	9.7
East Asia & Pacific	5	9.2
Latin America & Caribbean	6	9.8
North America & Western Europe	9	10.4
South & West Asia	5	7.2
Sub-Saharan Africa	4	7.4

Source: UNESCO Institute for Statistics database:

<http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=163>

In addition, the definition of basic education varies across countries, with some countries including only primary education while others extending it to secondary education. Table 2 summarizes the national definitions of basic education in developing countries.

² The Convention on the Rights of the Child goes beyond this guarantee to describe the purpose of education, which includes “the development of the child’s personality, talents and mental and physical abilities to their fullest potential” (Article 29).

Table 2: National Definitions of Basic Education

Basic education definitions (number of countries)	Countries
Primary education only [8]	Cape Verde, Ethiopia, Guinea-Bissau, Haiti, Maldives, Mozambique, Nicaragua, Portugal
Primary education plus at least one year of pre-primary education [17]	Albania, Bhutan, Botswana, Brazil, Burkina Faso, Burundi, Cameroon, Democratic Republic of the Congo, Djibouti, Ecuador, Guinea, Macao (China), Mexico, the Niger, Panama, Tunisia, Zimbabwe
Primary education plus lower secondary and at least one year of upper secondary education [7]	Argentina, Brazil, Republic of Korea, Oman, Philippines, Slovenia, Saint Lucia
Primary education plus some pre-primary and lower secondary and some upper secondary education [5]	China, Kenya, Myanmar, Peru, Thailand
Primary and lower secondary education [76]	Remaining countries which use the term basic education

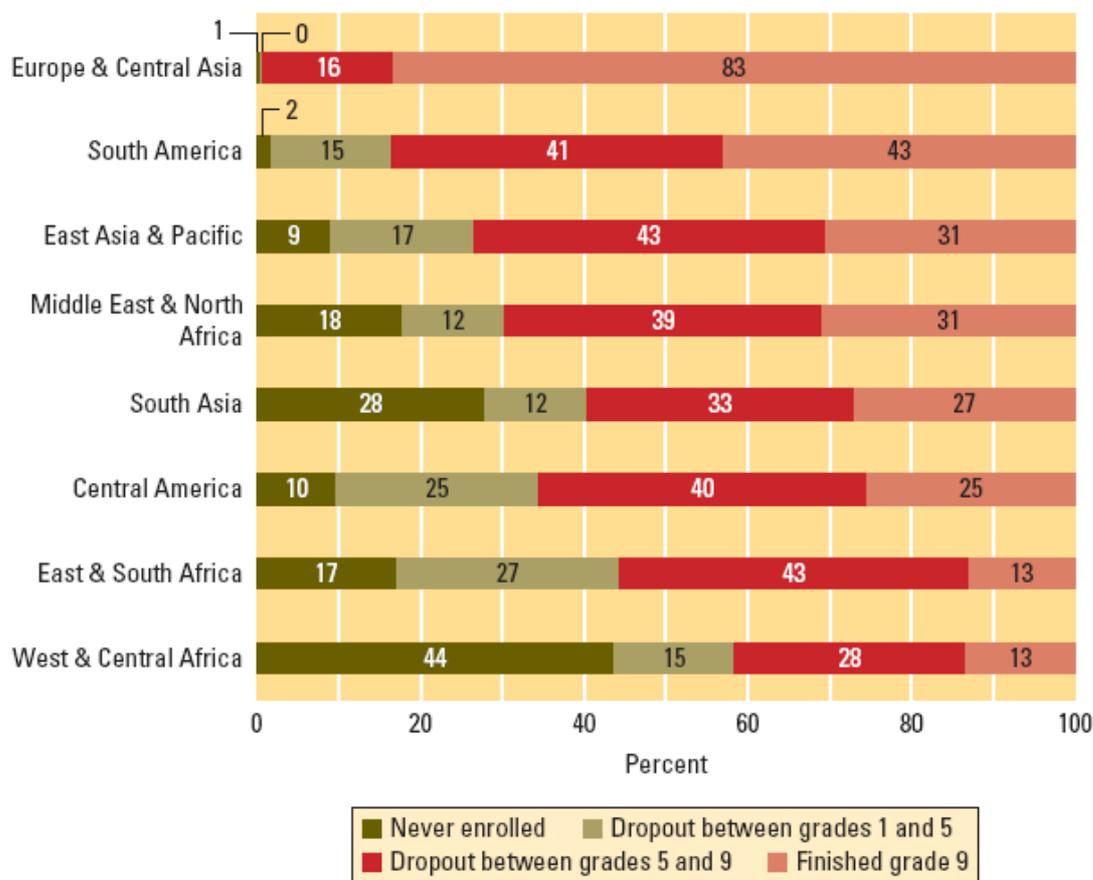
Source: Table 1.5, *EFA Global Monitoring Report, 2008*, UNESCO, Oxford University Press, 2008.

Globally, the primary school completion rate rose between 2000 and 2005 from 78 percent to 83 percent and the pace of progress in many countries has accelerated. Gains are especially strong in North Africa, SSA, and SAR. But 38 percent of developing countries are unlikely to reach 100 percent primary completion by 2015 and another 22 percent of countries which lack adequate data to track progress are also likely to be off-track. The groups facing the biggest obstacles to completing primary school are those that are ‘doubly disadvantaged’: girls from ethnic, religious, or caste minorities—amounting to three quarters of the 55 million girls who remain out of school.³

In addition, problems remain in access and retention of children in schools in a majority of developing countries. For example, in Sub-Saharan Africa, some children never enroll in primary schools. In Latin America and some South and East Asian countries, children who enroll in first grade do not complete primary education, or drop out in secondary school. As shown in Figure 1, most children in West and Central Africa either do not start school at all (44%), or drop out before completing primary school (15%). Children in East and South Africa are more likely to start school, but those that do so are also more likely to drop out before completing the primary cycle. In order to be effective, interventions to raise school attendance in basic education need to address these different forms of absence from school, and their specific causes.

³ World Bank and International Monetary Fund, *Global Monitoring Report 2007*.

Figure 1: Patterns of School Attendance and Drop-Out by Region



Source: Reproduced from Figure 7 in Eric A. Hanushek and Ludger Wößmann, *Education Quality and Economic Growth*, The World Bank, 2007, based on data provided in Lant Pritchett, "Access to Education," in *Global Crises, Global Solutions*, edited by Björn Lomborg. Cambridge: Cambridge University Press, 2004.

Large gaps in basic education coverage remain and will require sizeable investment to overcome.⁴ Table 3 and Table 4 show total primary-school enrollments and estimated out-of-school children by region and gender for the 1998/99 and 2004/05 school years.⁵ Global primary enrollments increased by 41.5 million between 1999 and 2005, and out-of-school children of primary-school age declined by almost 25 million -- a very significant accomplishment. However, there are still about 75 million children of primary-school age who are not enrolled in school. Almost all of these children (95.4 %) live in developing countries; 56.8% are girls. Moreover, among the children who are enrolled in school, a substantial number do not actually attend school. Based on household survey data, UNICEF estimates that there are 93 million children of primary-school age who are not attending school.⁶

⁴ These are elaborated in *EFA Global Monitoring Report, 2008*, UNESCO, Oxford University Press, 2008.

⁵ These figures are derived from country data in the UNESCO Institute for Statistics database, adjusted for differences in duration of primary schooling.

⁶ (http://www.unicef.org/progressforchildren/2007n6/index_41796.htm). This figure refers to the 2005/2006 school year.

Table 3: Change in Global Primary-School Coverage by Region, 1999–2005

	1999			2004/2005		
	Enrollment (millions)	Net Enrollment Ratio	Children not in School (millions)	Enrollment (millions)	Net Enrollment Ratio	Children not in School (millions)
Sub-Saharan Africa	81.6	0.56	45.0	116.1	0.70	35.1
Arab States	35.4	0.78	8.0	40.1	0.84	5.7
Central Asia	6.9	0.87	0.5	6.0	0.89	0.4
East Asia and Pacific	218.0	0.96	5.1	192.7	0.93	9.6
South and West Asia	157.5	0.76	35.0	192.0	0.86	18.2
Latin America & Caribbean	70.2	0.96	3.5	68.6	0.92	2.6
North America & Western Europe	52.9	0.97	1.4	51.4	0.95	2.0
Central & Eastern Europe	26.1	0.91	2.0	21.8	0.92	1.6
Total	648.6		100.5	688.7		75.2

Source: UNESCO Institute for Statistics database

Table 4: Estimated Number of Out-of-School Children of Primary-School Age by Region, 1999 and 2005

	1999			2005		
	Total (000)	% by region	% female	Total (000)	% by region	% female
World	96 459	100.0	58.7	72 124	100.0	56.8
Developing countries	92 534	95.9	59.1	68 825	95.4	57.3
Developed countries	1 886	2.0	49.0	2 270	3.1	44.7
Countries in transition	2 039	2.1	51.0	1 029	1.4	49.4
Sub-Saharan Africa	42 423	44.0	53.2	32 774	45.4	54.3
Arab States	7 720	8.0	59.4	6 122	8.5	59.7
Central Asia	490	0.5	52.0	381	0.5	51.7
East Asia and the Pacific	6 824	7.1	50.5	9 524	13.2	52.0
East Asia	6 377	6.6	50.5	9 189	12.7	51.9
Pacific	447	0.5	49.9	335	0.5	55.5
South and West Asia	31 434	32.6	69.0	17 092	23.7	66.3
Latin America and the Caribbean	3 595	3.7	54.3	2 433	3.4	49.0
Caribbean	435	0.5	51.5	449	0.6	52.8
Latin America	3 160	3.3	54.7	1 983	2.7	48.1
North America and Western Europe	1 465	1.5	49.1	1 898	2.6	44.6
Central and Eastern Europe	2 508	2.6	56.7	1 901	2.6	53.1

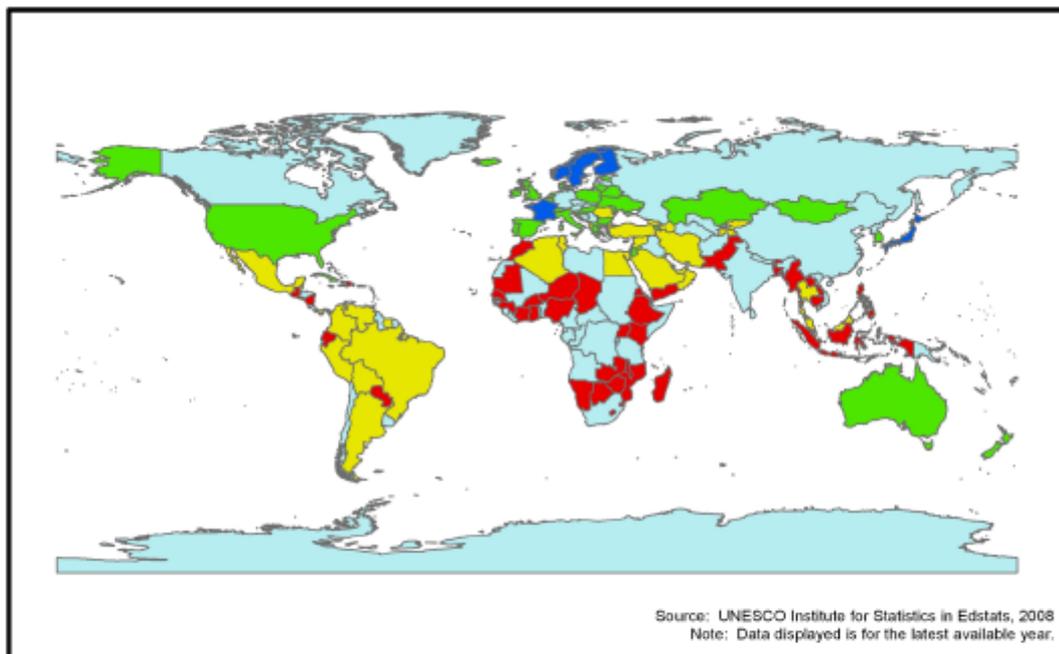
Source: Table 2.7, *EFA Global Monitoring Report, 2008*, UNESCO, Oxford University Press, 2008.

Sub-Saharan Africa and South and West Asia made the most progress in primary-school coverage between 1999 and 2005, with net enrollment ratios increasing by 13 percentage points and 9

percentage points, respectively. Sub-Saharan Africa has by far the highest proportion and number of out-of-school children: thirty-percent of primary-school-age children are not enrolled in school. Despite the remarkable progress in enrollment coverage, the number of out-of-school children declined less than in South and West Asia because of sub-Saharan Africa's higher rate of population growth.

Secondary education coverage is also a concern. Most countries define basic education and compulsory education to include the lower secondary education cycle (**Table 2**). While data on net enrollment rates in secondary education is not available for all developing countries, Figure 2 shows that secondary net enrollment rates in the developing world are substantially lower than in developed countries.

Figure 2: Secondary Net Enrollment Rates (%)



A special issue of concern is the extent to which access and quality of education differs for disadvantaged populations. Most developing countries struggle to reach and educate the 'last 10%' (Bruns, Mingat, & Rakotomalala, 2003). The very poor, children with disabilities, ethnic minorities and other disadvantaged children are often not in school. A recent review of studies of girls' absences from school found that nearly three fourths of 7-to-12-year-old girls who are not in school belong to socially excluded groups, such as the Roma in Eastern Europe, hill tribes in Laos, indigenous peoples in Latin America, and lowest caste groups in India and Nepal (Lewis &

Lockheed, 2006).⁷ Existing strategies to increase enrollment and learning are often not appropriate for traditionally excluded groups. For instance, the barriers to quality may sound the same but in practice are quite different; the barriers for indigenous students are not simply lack of textbooks, but lack of textbooks in the local language, or a teacher trained in bilingual education in the appropriate languages.

Table 5: Estimated Number of Girls Not Attending School, Total and Excluded Groups, by Region (in millions)

Region	Girls not Attending School	Girls from Excluded Groups Not Attending School	Main Excluded Groups
Sub-Saharan Africa	23.8	17.9	members of non-dominant tribes
South Asia	23.6	15.8	rural people in Afghanistan, scheduled castes and tribes in India, lower castes in Nepal, rural tribes in Pakistan
Middle East and North Africa	5.1	1.7	Berbers, rural populations
East Asia and Pacific	4.9	4.4	Hill tribes, Muslim minorities, ethnic minorities
Eastern Europe, and former Soviet Union	1.6	1.4	Roma, rural populations in Turkey
Latin America and Caribbean	1.5	1.5	Indigenous and Afro-Latino populations
Total	60.4	42.6	

Source: Table 1.2, Maureen Lewis and Marlaine Lockheed, op. cit., 2006

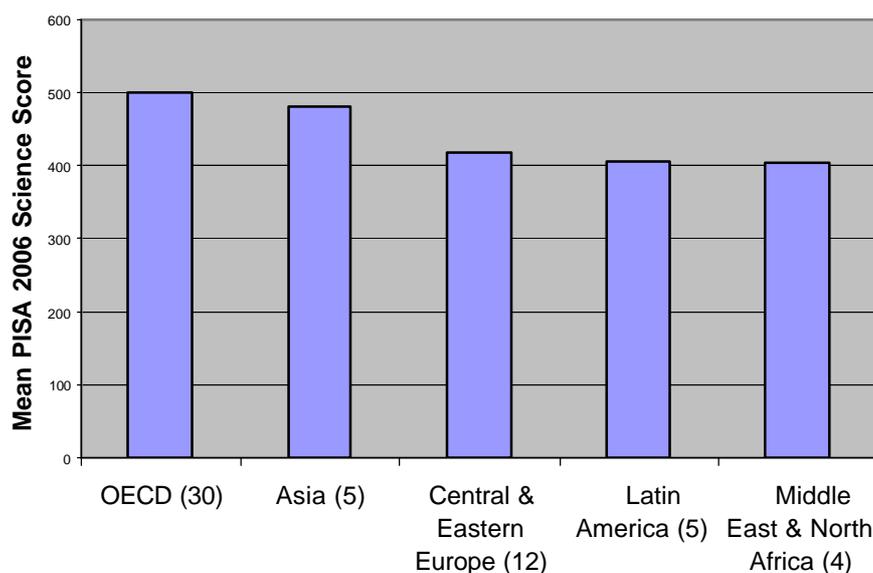
The MDG focus on gender parity led initially to efforts to include girls in school. But some countries may reach parity because poor or disadvantaged boys are not attending school (W. Africa, Middle East). Dropout of boys has become a pressing concern in countries with high unemployment/poor job prospects. In the face of such gaps in coverage, some researchers question whether the EFA and MDG goals are realistic for resource-constrained countries, whether they are wholly inadequate given the individual and national demand for education and whether a single set of goals are the right framework at all. For example, one scholar (Clemens, 2004) argues that while Africa will not be able to reach the MDGs, it has made significant progress in expanding access and ensuring primary school completion. Sperling (2009) puts forth that a main contribution of MDGs has been to eliminate inertia and advocates for an EFA/FTI 'global compact.' In contrast, Pritchett (Pritchett, 2004) argues that low schooling results from inefficient organization and production of schooling and that it is important to move focus away from inputs to performance.

While these agreements have led countries to increase their focus on ensuring that all children have access to primary education, the quality of schooling as reflected by international assessments of

student learning suggests that the quality of education has received less attention. While increasing access to education remains important, the quality of outcomes is critical.

International student assessment is the preferred instrument for documenting cross-country differences in student learning achievement. The most inclusive source of internationally comparable data on what students learn is the Programme for International Student Assessment (PISA).⁸ This study was carried out most recently in 2006 by the OECD for a sample of 15-year-olds in 30 OECD countries and 27 other countries. The 2006 survey focused on applied science competencies. As shown in Figure 3, there is considerable dispersion in learning achievement by region, with the lowest mean science scores in the Middle East and North Africa, followed closely by Latin America and Central and Eastern Europe (CEE) and the former Soviet Union (FSU) – all of them far below the thirty countries of the OECD. The average for the five non-OECD Asian countries is far from representative of the overall situation in Asian education. It comprises three small participants with high achievement (Hong Kong China, Chinese Taipei, and Macao China) and two larger participants with low achievement (Thailand and Indonesia). No sub-Saharan African country participated.

**Figure 3: Mean Student Performance in Science by Region, 2006
(for Countries Participating in PISA International Student Assessment, 2006)**



Source: Figure 2.11c, *PISA 2006, Science Competencies for Tomorrow's World, Volume 1: Analysis*, Paris, OECD 2007. Number of participating countries per region is presented in parentheses.

Another disturbing finding from PISA is that the countries with the lowest mean scores tend to have the greatest between-school variance in scores⁹ – implying greater inequality across schools and neighborhoods such that students from the most poorly endowed schools consistently perform well below the country average. Balancing quality and access is proving difficult for many developing

⁸ Note that PISA was repeated in 2003 with a change in focus to performance in mathematics (OECD 2004). The Czech Republic, Latvia, Poland, Serbia, and the Slovak Republic participated.

⁹ Page 170, OECD, *ibid.*

countries, which grapple with stretched education budgets, insufficient or ill-prepared teaching forces, and decentralized education systems that may apply priorities differently.

III. The Value of Investing in Education

Education is an investment for both individuals and society, providing long-term benefits such as increased earnings and economic growth in exchange for short-term outlays of time and money. The investment nature of education was recognized by the economist Adam Smith over two hundred years ago. An extensive body of research has been carried out since then – most of it during the past fifty years – to examine the benefits of education for individuals and society. This research has documented that education provides a number of benefits for individuals, including higher lifetime earnings, better health status, and improved capacity to recognize and take advantage of opportunities for self-improvement (UNESCO, 2008). Private rates of return to education compare the benefits that accrue to individuals as a result of education with the costs of education that are paid by individuals, and provide a succinct indication of whether the long-term benefits are worth the short-term costs in terms of time and money.

Education also provides important benefits for society, including collective or external effects on technology development, productivity of other workers, and improved social cohesion. Social rates of return compare the total benefits and costs of investments, consisting of the sum of individual benefits and costs (as measured by private rates of return) and external benefits and costs. Net external benefits of an investment, then, can be derived as the difference between net social benefits and net private benefits. Together, private and social rates of return help answer the question of whether the publicly-borne cost of education is more than offset by the collective benefits of education in the form of improved economic growth, better health status, better informed communities, etc. Combined with information on the tax structure, they can also help determine whether an education investment will generate enough tax revenues in the future to repay the initial cost of the investment.

Most research on the private rate-of-return to education analyzes how the earnings of current workers differ by educational attainment (years of schooling) and work experience, and uses these differences to project the future earnings of students once they have completed their education. These studies generally find that the private rate of return to an additional year of schooling ranges from 5 percent to 15 percent.¹⁰ Two consistent patterns are observed in the findings of these studies: (a) private returns to education are generally highest for primary education and somewhat lower for secondary and higher education; and (b) private returns to secondary and higher education tend to be higher in low-income countries (where skills are scarce) than in higher-income countries (where skills are more abundant) (Psacharopoulos & Patrinos, 2004). These patterns are summarized in Table 6 and Table 7.

¹⁰ Reviews of this extensive literature are provided in Psacharopoulos, G. and H. A. Patrinos (2007) and (Psacharopoulos & Patrinos, 1994)

**Table 6: Private Returns to Investment in Education
by Level of Education and Region**
(regional averages for latest available year, in %)

	Primary	Secondary	Higher
Asia*	20.0	15.8	18.2
Europe, Middle East, North Africa*	13.8	13.6	18.8
Latin America and Caribbean	26.6	17.0	19.5
OECD	13.4	11.3	11.6
Sub-Saharan Africa	37.6	24.6	27.8
All regions	26.6	17.0	19.0

*non-OECD. Source: Table 1, Psacharopoulos and Patrinos, 2004, op. cit.

**Table 7: Average Private Returns to Education
by Level of Education and Per-Capita Income**
(averages for latest available year, in %)

	Primary	Secondary	Higher
High Income (> \$9,265)	25.6	12.2	12.4
Middle (\$755 to \$9,265)	27.4	18.0	19.3
Low income (< \$755)	25.8	19.9	26.0
All countries	26.6	17.0	19.0

Source: Table 2, Psacharopoulos and Patrinos, 2004, op. cit.

Returns to schooling tend to decline somewhat over time as coverage increases. A recent review of these studies finds that average private rates of return declined by 0.6 percentage points over the past twelve years.¹¹ Despite this modest decline, the high average private returns to primary education shown in Table 6 and Table 7 indicate that education still provides a very respectable return on individual investments in most countries. Moreover, the private returns to education in some countries rose despite the overall decline in average returns. In the Czech Republic, for example, the private rate of return to an additional year of schooling rose from 3 percent in 1970 to 9 percent in 1997.¹² These country-specific differences and the differences by level of education are relevant to individual decisions about acquiring further education.

Including public as well as private costs, social rates of return are lower than the corresponding private rates of return -- on average, one-third lower than the corresponding private rates of return (see Table 8).

¹¹ Psacharopoulos and Patrinos, 2004, op. cit.

¹² Psacharopoulos and Patrinos, 2007, op. cit.

**Table 8: Social Returns to Investment in Education
by Level of Education and Region**

(regional averages for latest available year, in %, narrow definition, based on private earnings and public + private costs)

	Primary	Secondary	Higher
Asia*	16.2	11.1	11.0
Europe, Middle East, North Africa*	15.6	9.7	9.9
Latin America and Caribbean	17.4	12.9	12.3
OECD	8.5	9.4	8.5
Sub-Saharan Africa	25.4	18.4	11.3
All Regions	18.9	13.1	10.8

* non-OECD. Source: Table 1, Psacharopoulos and Patrinos, 2004, op. cit.

Education interventions can also have important benefits for redistribution of income. The private benefit of education in raising the income of the poor is captured in private rates of return, but there are also social benefits associated with reduced poverty and a less unequal distribution of income. In principle, the redistributive benefits of alternative public investments can be assessed through use of “shadow prices” or adjustment weights.¹³ In practice, this approach has rarely been applied because the setting of redistributive objectives for public expenditures is, by nature, a political choice.

In a majority of countries, overall public expenditures on education disproportionately benefit higher-income households, while expenditures on primary education disproportionately benefit lower-income households (this reflects the fact that unit costs of higher education are higher than for primary and secondary education and that a greater proportion of secondary graduates from upper-income households pursue higher education than from lower-income households). Table 9 shows that in every case, expenditures on primary education are more pro-poor than overall education expenditures. Simply investing in basic education can help meet the goals of countries that want to improve well-being for the poorest households.

¹³ I. M. D. Little and James A. Mirlees, *Manual of Industrial Project Analysis in Developing Countries, Volume II: Social Cost-Benefit Analysis*, OECD, 1969; and Lyn Squire. and Herman G. van der Tak, *Economic Analysis of Projects*. World Bank and Johns Hopkins University Press, Washington, DC, 1975.

Table 9: Distribution of Benefits of Education Expenditures by Income Quintiles of Beneficiaries

Country	All education		Primary level only	
	Poorest quintile	Richest quintile	Poorest quintile	Richest quintile
Armenia 1996	7	29	27	12
Azerbaijan 2001	18	22	19	19
Bangladesh 2000	12	32	22	14
Brazil 1997 (NE&SE)	18	25	26	7
Cambodia 1996/97	15	29	21	17
Colombia 1992	23	14	39	4
Costa Rica 2001	21	20	28	9
Cote d'Ivoire 1995	13	35	19	14
Ecuador 1998	12	25	24	11
FYR Macedonia 1996	9	40	18	22
Ghana 1992	16	21	22	14
Guinea 1994	5	44	11	21
Guyana 1993	15	32		
Indonesia 1999	15	29	25	13
Jamaica 1998	22	15	25	12
Kazakhstan 1996	8	26		
Kenya 1992	17	21	22	15
Kosovo 2000	9	40	18	22
Kyrgyz Rep 1993	14	27		
Lao PDR 1993	12	34		
Madagascar 1993/94	8	41	17	14
Malawi 1995	16	25	20	16
Mauritania 1995/96			11	19
Mexico 1996	19	21	30	10
Morocco 1998/99	12	24	17	18
Nepal 1996	11	46		
Nicaragua 1998	11	35	23	10
Pakistan 1991	14	29		
Panama 1997	12	21	34	4
Peru 1994	15	22	26	16
Romania 1994	22	17	21	10
South Africa 1994	14	35	19	28
Tanzania 1993/94	14	37	19	18
Uganda 1992/93	13	32	19	18
Vietnam 1998	18	21	26	13
Yemen 1998	19	22	21	18

Deon Filmer, "The Incidence of Public Expenditures on Health and Education." Background Note for World Development Report 2004," World Bank, May, 2003.

IV. Institutional Arrangements in Education

Developing country governments vary in their institutional arrangements for financing, providing, and ensuring the quality of education services. These variations in part respond to various kinds of market failures, tensions in education delivery, and the poor alignment of incentives and interests between key stakeholders. This section discusses some of these issues and situates evidence from program and policy evaluations.

A. Agency

Although education is not a public good in the classic sense of being non-rival and non-excludable¹⁴, education is largely publicly provided and basically treated as a public good. Countries have opted (in policy if not in practice) for compulsory education and universal primary education coverage. Such policies and public provision suggests state financing. In effect, public schooling functions as a sort of price-setting scheme: government sets the price not only by subsidizing the direct cost of schooling but also by serving as the majority provider of schooling.

The above set-up, and the negative externalities associated with it, presents several agency-related challenges. The first is that the state has few or no market 'demand' or willingness-to-pay signals from families. The decoupling of financing (or taxation) from service provision represents a serious hurdle that is unlikely to be surmounted in the absence of institutional structures such as defined property rights and the low feasibility and political support for taxing the poor for a perceived public good. However, informal tax systems may emerge to address resource gaps and the failure of the state to provide public services, especially in remote areas.

This represents a second challenge. Local leaders may collect extra-governmental informal taxes in terms of cash and in-kind labor. Such taxes may be redistributive, in that they may allow families who can't afford formal fees to pay into the public goods they consume; but such informal taxation is ultimately regressive (Olken & Singhal, 2008). Policymakers are often unaware of the structure of informal tax systems in local areas, and thus may not capture the true extent of public goods consumption to gauge demand. Also, ignoring this informal taxation process may underestimate the level of decentralization.

The third agency problem relates to asymmetric information and the tension between government goals and the realities of implementing policy or standards. Pritchett and Woolcock (Pritchett & Woolcock, 2004), in their oft-cited article on institutional approaches to governance in developing countries, note that public services such as education tend to require high transactions (T), high discretion (D) or both (TD). Yet transaction- and discretion-intensive sectors such as education pose the greatest principal-agent problems. For example, countries may have a single curriculum, and create an accompanying teacher induction and certification process for consistency (TD). The certification requires trained staff to monitor a number of small transactions (T). But in practice, individual teachers practice their own brand of pedagogy and discipline in the classroom (D), far away from bureaucrats.

Such widespread idiosyncrasy is an ingredient both for practical success and policy failure. Parents surely want teachers to respond to their children's changing needs, and resource constraints require adaptive and creative teachers (e.g. the iconic picture of a rural developing-country teacher holding class under a tree). But if teachers are the primary distribution channel for a particular policy or program, then their discretion disrupts the policy dissemination. A technocrat may consider that disruption a policy failure, while education providers may evaluate and reward teachers whose discretion enhances the day-to-day effectiveness and school operation. The challenge for

¹⁴ Increasing class size could be seen as reducing the consumption of others' learning, and the uneven availability of schools in developing countries suggests that schools can be excludable.

policymakers operates at two levels: what arrangement permits regional/national governments to bear enough of the costs of these transactions so that citizens are willing to support education, without government staff – from bureaucrats to teachers – misusing their discretion such that citizens don't trust the education sector. These dilemmas suggest a need for relaying information about government processes directly to the public (education consumers).

More generally, because of agency problems and the difficulty of aligning incentives of teachers and principals with those of policymakers, we see efforts to increase local control and information flows. It may be easier to align incentives between schools and their respective communities. Such efforts include increasing parent and community oversight through participation in local school councils, or devolving management of school or district finances to the community. The distribution of funds and local access to decision-making and spending can increase agency of local education officials and some parents. Increased monitoring and evaluation, and accompanying information dissemination, can also provide parents with information to lobby for change. Offering vouchers to families not only increases parents' agency, but also provides a financial incentive for schools to improve performance to attract students.

Despite such efforts to align interests of parents and schools, there is often incomplete decentralization--a fourth challenge. Teacher unions often resist different standards across districts or regions, and central governments are reluctant to have unequal implementation of broad civic goals. Thus, districts may have limited jurisdiction, financial control, or both. Responsibility without authority often means multiple principals pushing for policy change, creating a host of new agency problems.

Finally, another level of agency problems arises from donor country investments and policy mandates. If education becomes a global public good in the context of interconnected labor markets and inter-dependent economies, then donors may see themselves as stakeholders in developing countries and invest accordingly. However, donor policies about developing country resource allocation may tie the hands of local education officials and limit their response to local needs, such as hiring new teachers. Donor involvement can also create the perception of multiple principals, such that communities may organize simply to receive donor funds rather than to support program or policy innovations per se (Watkins and Swidler, 2008).

B. Coordination tensions to effective education delivery

Some of these agency issues stem from larger obstacles such as policymakers not resolving tensions and tradeoffs, and market failures associated with failed public service delivery frameworks. We discuss three major coordination tensions facing policymakers. First is the tension between improving efficiency versus redistribution for poverty alleviation. Second, we describe the tension between vertical and horizontal integration. Third, there is a salient tension between public and private provision of education services.

1) Efficiency vs. Redistribution

The increase in the use of cash transfers in many countries in the past decade¹⁵ emerged as part of a larger policy debate about whether to focus on the poor with specific subsidies and behavioral obligations, or to provide broad-based social insurance in the form of subsidized health care and pensions so that families do not sacrifice education for other needs. A recent review suggests that conditional cash transfers "allow national governments to forge a direct relationship with poor families, seeking to foster co-responsibility by requiring families to assume responsibility for schooling" (Rawlings & Rubio, 2005). They promote agency while also enlisting citizens in large-scale reform.

In short, transfers have multiple goals:

- Short-term:
 - Redistribution: Reduce poverty through pro-poor redistribution and subsidies (conditional transfers operate as selection mechanism)¹⁶
 - Efficiency: Address market failures and externalities by inducing behavior change (conditionality of transfers operates as incentive, and the subsidy improves efficiency of government funds)¹⁷
- Long-term:
 - Reduce opportunity costs of education and increase demand for education (transfers cover the difference between parental and children's rate of return)¹⁸
 - Operate as price-setting institutions (transfers operate as a price effect on the condition of schooling)¹⁹

If efficiency is the only goal, governments often become risk-averse and adopt incremental changes rather than comprehensive efforts to lift the poor into the middle class (Besley & Coate, 1991). Yet de Janvry et al. (Janvry, Finan, Sadoulet, & Vakis., 2006) find that conditional cash transfers can act as a broader safety net by protecting school enrollment of poor children even during economic shocks.

Even when policymakers have settled on one of the above goals, implementation of a transfer program raises several dilemmas. Efficiency, which underlies the goals of many demand-side programs, is related to the question of targeting. There are at least three possible ways in which transfers (or any assistance program) can result in inefficiencies. First, transfers may pay people to do what they already would have done. Second, transfers may target goals or stimulate behavior that is divorced from the intended outcomes. For instance, programs targeting initial enrollment rather

¹⁵ Throughout Latin America, governments and researchers have introduced conditional cash transfer programs to great success, on average. Programs include Oportunidades in Mexico, Red de Protección Social in Nicaragua, PRAF in Honduras, PATH in Jamaica, SUF in Chile. Governments provide grants to families contingent on meeting schooling requirements, such as enrollment, attendance, grade completion, and even learning achievement

¹⁶ de Janvry et al., 2006

¹⁷ Das, Do and Ozler, 2004

¹⁸ Kochar 2000

¹⁹ de Janvry et al., 2006

than completion may see little to no return on investment if students drop out. Finally, transfer amounts may be either too large or small to induce the conditional action. Thus, the change-inducing amount of the transfer will depend on whether the program is targeting the poorest (Das, Do, & Ozler, 2004).

2) Vertical or Horizontal integration

Objectives of efficiency or redistribution are not always coordinated across public services, so that even if education programs try to promote equality (such as universal access or price supports), programs in other areas may be promoting efficiency. Thus, policymakers in some countries are opting for coordination with other sectors. Cross-sectoral efforts are a form of horizontal, integrated management and can join poverty alleviation and efficiency goals. For instance, provision of free school meals in over 4,000 schools in eleven countries in sub-Saharan Africa and Latin America African increased average school attendance by more than 10 %.²⁰ Similarly, provision of water and sanitation facilities in schools and perimeter walls to ensure security and privacy can help raise attendance – particularly for girls.²¹ In effect, a school may not be complete without access to water as well.

Without proper management, cross-sectoral efforts may result in multiple principals, overlapping tasks, and poor regulation. In addition, teachers may resent having to fulfill even more responsibilities without additional resources (i.e. taking time out of class to feed children, but still being evaluated against the same learning standards without additional hours in the day to teach). Poor cooperation can undermine any intended synergies. Teacher unions also may resist having teachers take on more responsibilities without additional pay.

3) Public vs. Private Provision

A third tension is the level of central control in education delivery versus local partnerships or complete private provision. Although private schooling and NGO contracting has increased in recent years in parts of Central America, Pakistan and India, it still faces resistance. Teacher unions do not want to lose employment opportunities. In addition, efficiency gains don't necessarily accrue to the whole system or to the taxpayer, so it's not clear whether private providers reduce the price of schooling and thus the need for state subsidies or whether private provision simply means more profits for the provider alone. Finally, private provision, as a way to fill gaps in public service delivery, is probably most needed in rural areas. Yet the low economies of scale in remote areas make it inherently unattractive for a private provider other than the local community. A study in Pakistan (Alderman, Kim, & Orazem, 2003) suggests that returns to scale are important for private schools to survive.²²

²⁰ World Food Programme, "Information Note on School Feeding", 16 May, 2002.
www.wfp.org/eb/docs/2002/wfp009165~1.pdf

²¹ Lack of school toilets in primary schools is one of the factors responsible for non-attendance of girls in Malawi, and Nepal. (<http://www.dfid.gov.uk/casestudies/files/africa/malawi-girls-urinals.asp>, and http://www.ngoforum.net/index.php?option=com_content&task=view&id=80&Itemid=6)

²² Alderman et al. find that private schools succeeded in urban areas but failed to address the undersupply problem in rural areas.

should move away from a focus on inputs and instead measure broader performance. (Hanushek, 2003) suggests that increased investments have not yielded sufficient results to merit further spending. The input-output focus may have persisted because it is easier to implement and thus create a perception of short-term success despite little improvement in quality. Input orientations also can lead to micro-managing by donors, or to programs that are not nearly comprehensive enough.

Consider the opportunity of the Millennium Development Goals (MDGs), which provide agreed objectives for education. These are meant to be the basis for developing consistent strategies which unite education policy, domestic budget planning, and foreign assistance and make full use of the lessons of global experience about which interventions are most likely to achieve those objectives. But donor assistance for education often falls short of this ideal, partly because planning and preparation of assistance programs lack two important features: i) discipline to work backward from explicit objectives and target interventions to specific groups, based on international evidence about the interventions that are most likely to achieve those objectives; and, ii) inclusion of all actors necessary for interventions to be sustainable – including the authorities who are responsible for recurrent budget support²³ and representatives of interest groups involved in intended changes in behavior.

In addition, donors and developing countries still disagree over funding the MDGs, in part due to donors' orientation toward 'costing' needs while countries try to respond systemically to demand. Institutional challenges related to input-orientations include:

- Inter-temporal cost balance - Developing countries need to invest in primary school enrollment today to meet school completion goals in 2015. Most countries need additional funds in order to make these investments, but are not able -- politically or structurally -- to collect sufficient taxes from their citizens.²⁴
- Informational asymmetry - Many countries report their fiscal plans and obligations to donors, but donors do not offer comparable reports or make equivalent commitments to developing countries.
- Differing country capacities - All developing countries are expected to reach the goals at the same time, yet they are starting from different levels (Clemens 2004). Countries with the most children out of school often have the least governance capacity, yet they are expected to make the most change.

Such process failures associated with the MDGs may themselves be the result of an input-output focus or may produce programs that don't consider management and performance issues sufficiently. Pritchett (2004), in his paper on the education MDGs for the Copenhagen Consensus²⁵, suggests a performance orientation may point to different institutional arrangements. A focus on performance

²³ The central criticism of the International Advisory Panel for the IEG Primary Education Review was that the Review gave too little attention to the need for the Bank to work more closely with governments and the IMF to ensure that education strategies are consistent with medium-to-long-term fiscal capacity. (Page 104, Independent Evaluation Group, op. cit.)

²⁴ EFA *Global Monitoring Report 2008*.

²⁵ The Copenhagen Consensus is an international effort to set priorities related to achieving the Millennium Development Goals.

creates two important shifts in what policymakers and researchers do. First, although programs in 1990s and early 2000s may have been designed to choose between different institutional arrangements, today's research centers on how to *improve existing arrangements*. Programs and policy often rely heavily on processes, management and governance. Therefore, it's important for research teams in countries to evaluate process and governance. A focus on process elicits data from intermediate outcomes, not just outputs. This approach makes interventions less about denial of treatment/program, more about *quality* of treatment. Second, by assessing and experimenting with targeting, scaling up effective pilots, and varying program components, researchers and policymakers can understand what makes existing programs work, rather than making black-and-white decisions about whether programs do and do not work.

D. Increasing Access and Affordability

Families face four types of costs when deciding to send their children to school: (i) direct fees, often in the form of tuition; (ii) indirect fees, including parent-teacher association fees and supplemental teacher salary payments; (iii) indirect costs, which include transportation, school uniforms, textbooks and materials; and (iv) opportunity costs that include foregone earnings as well as the monetary value of time associated with children helping with chores and sibling care.

A recent survey of 79 developing countries²⁶ found that school attendance in basic education almost always entails mandatory payments of various kinds. Only two countries in the survey (Algeria and Uruguay) did not impose fees of any kind. Most countries charged several kinds of direct and indirect fees – including formal tuition fees (31 countries), textbook charges (37 countries), and mandatory school uniforms (40 countries). Charges for PTA or community contributions were the most prevalent type of fee.²⁷ Not surprisingly, school charges account for the largest share of household expenditures in poor households,²⁸ and have the greatest effect on limiting school attendance for children from poor households²⁹ and for girls.³⁰ In a UNICEF survey of households in several East Asia and Pacific countries, 81% of households with out-of-school children reported that school costs were responsible for their not being in school.³¹

The deterrent effects of school-related costs are also apparent in data on school attendance differences by household income. Figure 4 shows average primary-school attendance rates for developing countries by household income quintile.³² Average school attendance among the lowest income quintile is more than 20 percentage points lower than for the highest income quintile.

²⁶ (Kattan & Burnett, 2004)

²⁷ Kattan and Burnett, op. cit., page 10.

²⁸ (Bray, 1996)

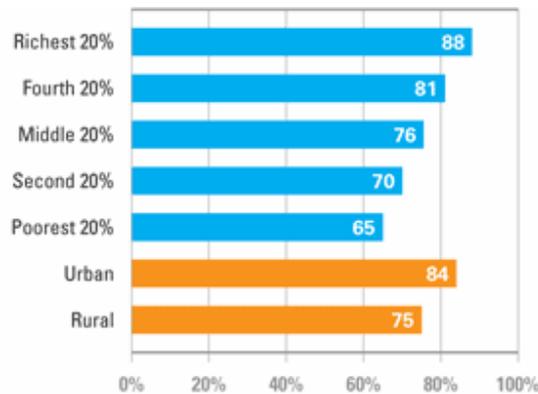
²⁹ Paul Gertler and Paul Glewwe, “The Willingness to Pay for Education in Developing Countries: Evidence from Rural Peru”, Living Standards Measurement Study, Working Paper No. 54, 1989.

³⁰ Elizabeth M. King and Andrew D. Mason, *Engendering Development*, The World Bank and Oxford University Press, 2001.

³¹ Chapter 2, UNICEF, *The State of the World's Children, 2004: Girls, Education, and Development*, 2003.

³² http://www.unicef.org/progressforchildren/2007n6/index_41796.htm

Figure 4: Primary-School Attendance Rates by Household Income Quintile, Developing Countries, 2000-2006 (in %)



Source: http://www.unicef.org/progressforchildren/2007n6/index_41796.htm

The number of children of primary-school age that are not in school because of income-related or demand-side constraints has been conservatively estimated at over 14 million worldwide.³³ Thus, many researchers suggest that efforts to alleviate these costs of school attendance--and directly tackle income-related constraints--might improve equality of opportunity in education.

Policymakers respond to these constraints in a number of ways, and we group the myriad designs into two broad categories. First, they can reduce the direct and indirect costs that families bear by changing the price of schooling. Second, they can improve access and quality of schooling, to change the cost-benefit assessment.

a) Efforts to reduce the price of schooling

i) Transfers

Perhaps the most studied transfer program is Progresa (now Oportunidades), a conditional transfer program in Mexico aimed at improving health and education for poor families.³⁴ Girls' enrollments improved, especially for entering secondary school. The most significant increase (15 percent) was for girls completing grade six (Morley & Coady, 2003). Another study found that the program reduced dropout rates as well as timely progression through grades, an outcome that many policy experiments may ignore (Behrman, Sengupta, & Todd, 2005). Schultz (Schultz, 2004) also finds that inequality in school enrollment declined within localities that received the transfer compared to inequality within control group villages -- an impressive finding suggesting some positive spillover benefits.

³³ (Orazem, Glewwe, & Patrinos, 2007) This estimate is conservative because it is limited to children who start school but drop out before completing grade five. In doing so, it ignores children who are deterred by the cost of schooling from ever starting school.

³⁴ Initially, the program randomly selected rural villages to participate in the program. Since 2001, the program has operated nationwide, using a proxy means-testing to determine eligibility instead of random assignment. The rural round of the program increased average school enrollment by 3.4 percent for all students in grades 1-8.

In Bangladesh, the Female Stipend Program³⁵ improved girls' enrollment and grade completion, and was perceived to delay rural female marriage until adulthood. An additional year of receiving the stipend was associated with an 8% increase in girls' enrollment, on average (Khandkher, Pitt, & Fuwa, 2003). Some of this gain may reflect that richer families tend to send their girls to secondary school. Thus, Das, Do and Ozler note that the enrollment boost is not the efficiency gain; instead the efficiency gain is the extent to which the stipend addresses the loss in enrollment due to different rates of return between parents and children.

A second generation of conditional cash transfer programs addresses more of the performance and process concerns discussed earlier, comparing different forms of an intervention rather than comparing an intervention to the status quo. In Bogota, Colombia, three variants of CCTs were offered to secondary school students.³⁶ On average, the *combined* incentives increase attendance, pass rates, enrollment, graduation rates, and advancement to university enrollment (Barrera-Osorio, Bertrand, Linden, & Perez-Calle, 2008). Because the savings treatment is just a shift in the timing of the payment, it is associated with improved advancement through grades and increases student enrollment in secondary or tertiary.

ii) Free schooling

Several Sub-Saharan African countries recently eliminated school fees³⁷, winning popular acclaim. The reforms responded to criticism by Oxfam³⁸ as well as local civil society groups that collecting fees excluded poor children, effectively reserving schools for the wealthy. Although tuition-free schooling is another form of price reduction, poor families face indirect and opportunity costs that may still be too high to permit school completion.

Given that free schooling does not target only the poor, impose conditionality or obligations on the user, or follow other aspects of an efficient direct transfer discussed above, why should free schooling work in Africa? As a policy reform, free schooling is advantageous because it creates a price effect as other transfers do, but with additional benefits. First, the large-scale application of a national policy demonstrates an immediate general equilibrium effect, often unknown when transfer programs are piloted at a smaller scale. Second, it dismantles a price-setting system in a way that increases access rather than inflating prices. This leads to another benefit, which is the absence of certain cross-price reductions such as depressed commodity prices that would hurt the subsistence of the poor. Also, such a policy should not create a welfare dependency *per se*. Curiously, these policies did not immediately meet resistance from local teachers' unions, although the surge of students has increased class size substantially.

³⁵ The program randomized the availability of stipends by school. The stipend was not means-tested, but instead given directly to girls who attended at least 75% of classes in secondary school. The program avoided the problems of fungibility by transferring the stipend directly to the girls' bank accounts, thus lowering the price of schooling for them rather than adjusting overall household income.

³⁶ Variants included: i) a basic CCT treatment based on school attendance, ii) a savings treatment that postpones a bulk of the cash transfer due to good attendance to just before children have to reenroll, and iii) a treatment where some of the transfers are conditional on students' graduation and tertiary enrollment rather than attendance.

³⁷ By year of announcement: Malawi (1994), Uganda (1996), Lesotho (1999), Tanzania (2001) and Kenya (2002), Democratic Republic of Congo and Mozambique (2003).

³⁸ See (Oxfam, 2001)

Uganda began its free-schooling policy in 1996, and thus has the most data for evaluation. Two papers directly examine the effect of increased enrollment on student outcomes. One study finds that Uganda's fee elimination policy increased enrollment, and reduced gender and income inequalities in enrollment (Deininger, 2003). But it reduced student *achievement*, primarily due to intense classroom overcrowding from increased enrollees. Another study looks at the effect of fee elimination on completion in Uganda, and find that the policy reduced delayed enrollments and increased grade completion rates up to the fifth grade, especially for girls in poor households (Nishimura, Yamano, & Sasaoka, 2005). They are not able to find positive achievement effects, either, citing high repetition and unequal quality as consistent barriers.³⁹

A nationwide fee reduction is likely inefficient, as it pays (or subsidizes) rich families for something they would have done anyway: send their children to school. To address the questions of efficiency and willingness to pay, a means-tested fee reduction was implemented in Bogota in 2004⁴⁰. Since schools cannot charge tuition fees for basic education in Bogota, the subsidy reduced indirect costs for primary grades and tuition costs for high school grades. A study shows that enrollment is sensitive to the size of the fee reduction (Barrera-Osorio, Linden, & Urquiola, 2007). Fee decreases boost enrollment in primary grades for the poorest households and increase enrollment in secondary school for the near-poorest households. Overall, the effects are larger for at-risk students.

A recent venture in Kenya also examined the role of *indirect* costs. A NGO in Western Kenya randomly distributed school uniforms to orphans already sponsored through the organization in 2002. Providing a school uniform reduces school absenteeism by 7 percentage points and almost double for poorer students who didn't own a uniform before (Evans, Kremer, & Ngatia, 2008). Current evaluations are investigating the effects of uniforms on test scores as well. It also reduced dropouts and attracted many students to transfer to those schools from other, non-program schools.

Another model of fee elimination was also piloted in western Kenya in 2001. A NGO offered two years' worth of school fees to girls scoring in the top 15% of the district on a year-end exam. These subsidies were offered in a random group of schools in each of two districts -- before the government had eliminated school fees nationally. Girls in the receiving schools increased test scores significantly (Kremer, Miguel, & Thornton, 2007). This increase had positive spillover effects as well, increasing scores of previously low-scoring girls who were unlikely to win the award and even of *boys*.

iii) School choice

The case of school vouchers is somewhat analogous to universal free schooling, but often explicitly intended to improve student performance and school outcomes. In facilitating school choice, vouchers essentially create a re-sorting of students, which may change average student

³⁹ It's important to note these papers do not explore the role of teacher quality as a likely pathway for reducing average student achievement. The policy change was clearly designed to affect school enrollment outcomes, but was not necessarily the mechanism for the change in *achievement* that both authors report.

⁴⁰ The size of the reduction depended on the household's income and asset wealth. The difference between poor households that received the subsidy and those that did not was as-if random; such discontinuity designs allow for a causal estimate using .

outcomes on an individual and classroom basis. For instance, if fee elimination encourages students who want to learn at any price to interact with students who want to learn only at zero or reduced cost, overall learning may increase and social welfare rises. If the interaction between different students manifests as a peer effect that drives an increase in test scores, then vouchers would seem most effective when targeted to a few or implemented on a small scale. This interaction is most likely to occur in urban areas where schools may attract students with more income heterogeneity.

Such was the case in Colombia, where the PACES vouchers were randomized to secondary school students from poor neighborhoods. Vouchers increased their likelihood of school completion and slightly boosted test scores (J. Angrist, Bettinger, Bloom, King, & Kremer, 2002). However, if the number of “poor” students who cannot pay is greater than those who can pay, the scales may tip: payers then re-sort by leaving for other, non-voucher schools. The tipping point is presumably some function of perceived school quality.

In Chile, unrestricted vouchers offered in 1981 did indeed lead to increased sorting, as higher achieving students left the public schools. Private school enrollments increased by 20 percentage points, and even more in wealthier communities (Hsieh & Urquiola, 2006). This case is notable in that the introduction of vouchers initiated a nationwide transition from a centralized school system to one of open choice, and appears to have responded to pent-up demand.⁴¹

Choice does not exist simply as a counterpoint to public schools, however. One quasi-experimental study suggests that a pre-existing girl’s secondary school increases the probability of a private school existing in the village by 35 percentage points-- a so-called “inter-generational externality of public schools on the existence of private schools.”(Andrabi, Das, & Khwaja, 2005) This is partly because Parent Education Committees formed the proposal for private schools, which initially would receive public subsidy -- but the subsidy was contingent on increased enrollment. In effect, pent-up demand for schooling and parents’ ability to pay can influence urban schools’ survival.

b) Public investment to address access and quality of schooling

i) Improving access through increased school supply

The demand interventions discussed heretofore do not replace the need for an adequate and continuing supply of schools. To what extent is poor school availability a constraint? In many of the poorest countries, access to basic education is constrained by inadequate classroom capacity, implying major needs for investments to build and equip new classrooms. This is true in much of sub-Saharan Africa and other regions where the school network does not cover all parts of the country. In such cases, school construction programs can bring

⁴¹ However, test scores did not rise any faster in communities with more private school response; in fact, grade repetition increased in these areas, even when controlling for pre-existing trends using a difference-in-difference and instrumental variables estimates. The authors suggest that parents may choose schools for familiar peer groups, but this does not necessarily boost productivity. Ultimately, such a system simply stratifies schools by social class. McEwan, Urquiola, and Vegas (2008) confirm this finding, and note that it’s difficult to adjust test scores for social class. In addition, test scores contain so much volatility that they can bias evaluations. Thus, they suggest that reducing stratification might actually “improve the ability of the system to evaluate school performance” (p. 26). In short, voucher programs need to be pursued with caution and attention toward unintended consequences.

about major improvements in education coverage. For example, with Indonesia's Sekolah Dasar INPRES presidential priority program for primary school construction in the 1970s built nearly 60,000 schools in just a few years. However, the government did not just supply a building; it made sure schools had enough trained teachers, books, and learning materials. A study found that each new school increased the average attendance by 0.24 to 0.38 school years for the first generation of children to enter school (Duflo, 2001).

Investment in additional school capacity is also necessary when schools are available but not in sufficient quantity to serve the school-age population, leading to overcrowding and impaired teaching effectiveness. When multiple-shift operation of schools reduces instructional time significantly, expanding school capacity can lead to improved learning outcomes by allowing more instructional time and more time on task for students.⁴²

But building more schools is not always the solution for incomplete basic education coverage. Where schools are already available, closer proximity of schools tends to have only a small effect on improved school attendance,⁴³ other constraints are usually responsible for children not attending school. A 2004 survey of households in East Asia and the Pacific found that only 4 % of households with out-of-school children reported that they were not attending school because no school was available.⁴⁴ Most were not attending school because of income-related constraints. Responses from Demographic and Health surveys in sub-Saharan Africa, Central Asia and Europe, and South and East Asia indicate an even smaller role for non-availability of schools (Table 15, below) in explaining non-attendance.

Responding to local constraints is more likely to involve new approaches to education delivery than it is to involve new school construction. For example, a pilot program in Burkina Faso which offered the first three grades of education in village satellite schools in existing facilities with mother-tongue instruction led to a large improvement in attendance and learning achievement,⁴⁵ and a program of support to multi-grade teachers in Colombia's *Escuela Nueva* program achieved similar improvements in attendance and learning achievement in the early primary grades.⁴⁶

⁴² Helen Abadzi, *Efficient Learning for the Poor: Insights from the Frontier of Cognitive Neuroscience*, The World Bank, 2006; and J. A. Stallings, "How Instructional Processes Relate to Child Outcomes in a National Study of Follow-Through", *Journal of Teacher Education*, Vol. 27, No. 1, 1976.

⁴³ Deon Filmer, "If You Build It, Will They Come? School Availability and School Enrollment in 21 Poor Countries", *Journal of Development Studies*, Vol. 43, No. 5, July, 2007; and Lant Pritchett, "Towards a New Consensus for Addressing the Global Challenge of the Lack of Education", Center for Global Development, Working Paper No. 43, June, 2004.

⁴⁴ Chapter 2, UNICEF, *The State of the World's Children, 2004: Girls, Education, and Development*, 2003.

⁴⁵ Annex A, UNICEF, *The State of the World's Children, 2004: Girls, Education, and Development*, 2003. UNICEF, *State of the World's Children, 2004*. (<http://www.unicef.org/sowc04/files/AnnexA.pdf>)

⁴⁶ Patrick J. McEwan, "The Effectiveness of Multigrade Schools in Colombia", *International Journal of Educational Development*, Vol. 18, No. 6, November, 1998; and George Psacharopoulos, Carlos Rojas, and Eduardo Velez, "Achievement Evaluation of Colombia's *Escuela Nueva*: Is Multigrade the Answer?", *Comparative Education Review*, Vol. 37, No. 3, 1993.

ii) Reducing class size

Small class size is sometimes considered a feature of existing school supply. There is great debate about the ideal class size for improving learning. One of the confounding factors is that students who were previously hard to retain in primary school may now be in classes with more traditional students, potentially upsetting others' learning (Lazear, 2001). Such unintended consequences of new investments in enrollment may mask class size effects (Joshua Angrist & Lavy, 1999). Also find that class size correlates with enrollment and achievement;⁴⁷ reducing class size increases test scores for students in fourth and fifth grades. Because teacher allocation rules underlie these results, it's not surprising there is a large return to reducing class size. To address the possibility that families may be taking advantage of teacher assignments and their sorting between schools may explain results for small class size, consider the results from a South Africa study. The authors (Case & Deaton, 1999) use apartheid as an instrumental variable to rule out switching between schools, because Blacks had limited options for relocation. Reducing the average Black class size would increase average educational attainment by half a year.

E. Education quality and incentives

Ensuring access to quality education for all children depends on recruiting skilled and motivated teachers and administrators and ensuring that they are in all schools, including in underserved rural areas. A growing body of evidence indicates that teachers play a key role in what, how, and how much students learn,⁴⁸ especially among disadvantaged students.⁴⁹ However, it is less clear what exact characteristics of teachers lead to better student learning outcomes. Research has been unable to establish a relationship between easily measurable teacher characteristics, such as years of education and experience, and teacher performance as measured by student learning outcomes. Thus, devising effective policies to improve teaching quality remains a challenge.

Two broad types of teacher policies are (i) teacher training and professional development and (ii) incentives to attract and reward effective teaching. Often as a response to demands to raise teacher quality, governments invest in teacher training and professional development. These programs are usually well received by teachers unions, who in many countries are powerful organizations. In addition, teacher salary scales often recognize and reward teachers for participating in professional development programs. While evidence on the impact of teacher training programs on student learning outcomes is scarce, quasi-experimental evidence from Israel suggests that teacher training can result in improvements in their students' test scores (J. D. Angrist & Lavy, 2001).

Research also indicates that the supply of teachers responds to salaries, working conditions, and opportunity costs, as well as the relative characteristics of the teacher and non-teacher labor market, including entry requirements. For example, in the United States, where there is growing concern about the declining quality of teachers, recent research shows that the increase in labor market

⁴⁷ They apply a regression discontinuity technique to observe learning among students who were essentially randomly assigned to a small or large class.

⁴⁸ See, for example, Hanushek and others 2005; Park and Hannum 2001; Rivkin, Hanushek, and Kain 1998; Rockoff 2004; Sanders and Rivers 1996; Wright, Horn, and Sanders 1997.

⁴⁹ For example, Lai, Sadoulet and DeJanvry, 2006 analyze teacher effects in China, and find that they are twice as large on students in the 25th percentile as those at the median, and not significant on students in the 75th percentile.

opportunities for women led to a decrease in the pool of qualified applicants for teaching positions. At the same time, research suggests that teacher salary scales in the United States are so compressed that the best teachers are likely to leave the profession for higher-salaried jobs in other occupations.

Unions

The role of unions may help explain the development of teacher policies and labor markets in developing countries. In countries such as Mexico and Korea, teacher unions were initially seen as state or party allies rather than teacher representatives, thus complicating evaluation of the role of teachers in the political economy of education. A pivotal paper (G. G. Kingdon & Muzammil, 2001) notes that teachers in the Indian state of Uttar Pradesh populate the state legislature and that the Indian state relies on teachers unions for explicitly political tasks such as elections and the decennial census. In 1990-91, they were influential in increasing the budget for education while other expenses declined.

Several descriptive and narrative studies discuss how unions overcome collective action problems. In response to states' current preference for incentive policies, Crouch (2005) notes that in Chile, union members didn't accept individual performance incentives until base salaries increased. A review of teacher unions in South Africa notes that the politics of teacher unions followed the arc of racial politics (Govender, 2004). During apartheid, education policy responded to the preferences of white teachers. Post-apartheid legislation effectively required racial unity, and in turn improved teachers' bargaining rights. South Africa's efforts to decentralize education prompted teacher unions to restructure along provincial lines as well. Finally, today the main teacher unions are intricately involved in national HIV/AIDS prevention policies and in reframing curriculum accordingly.

The effect of unions on student achievement eludes most research. This relationship could be either negative or positive, depending on whether the objective functions of the teachers who join operate within a rent-seeking or agency framework. Most countries have little union competition, making it difficult to observe within-country variation in union effects across school districts. In Argentina, they are organized at the provincial level and agreements bind for non-member teachers as well. One study in Argentina looks at inputs and processes, as well as union and province characteristics, and find that students perform better when their teacher expresses higher job satisfaction and where there are more class days, which may be associated with a less contentious union arrangement (Murillo, Tommasi, Ronconi, & Sanguinetti, 2002). Areas with more dense but fragmented union membership have more strikes (fewer class days). In Mexico, using state-level information, Alvarez, Garcia and Patrinos (2007) show that the use of state assessments lead to improvements in learning outcomes. They also show that teacher unions' strength through appointments of specific teachers to specific schools and relations with state governments is important. Relations between states and teacher unions with less conflict are important determinants of learning, and benefit lower-achieving students more. Meanwhile, (G. Kingdon & Teal, 2008) use data from private secondary schools in India and find that union membership may increase teacher pay, but it *decreases* student achievement.⁵⁰ In effect, the kind of political market surrounding unions affects student performance more than the existence (or not) of unions.

In response to concerns about teacher effort and quality, recent research indicates that teacher incentives can affect teaching quality. A recent review of teacher incentives in developing countries

⁵⁰ They estimate a within-student across-subject achievement production function, since they do not have longitudinal data.

(Glewwe, Holla, & Kremer, 2008) categorizes teacher incentives in terms of: (i) school environment incentives (policies that improve working conditions so that teachers are more motivated to come to work); (ii) input-based teacher incentives (monitoring and rewarding teachers based on inputs, such as teacher attendance); (iii) output-based incentives (monitoring and rewarding teachers based on student test scores); and (iv) changing the lines of authority (giving parents or schools the ability to hire and dismiss teachers).

- i. *School environment incentives.* Working conditions appear to motivate teachers to come to school. These working conditions not only refer to school infrastructure and materials, but also to the characteristics of the students in classrooms. Glewwe, Holla and Kremer (2008) report that absence is negatively correlated with an index that measures school infrastructure (toilets, covered classrooms, non-dirt floors, electricity, and a school library). Similarly, their review concludes that recent experimental research in Kenya suggests that teacher effort is greater when their students are better prepared and motivated to learn. Providing additional textbooks can also improve the learning of the top two quintiles of students (presumably, those whose background allowed them to benefit from books that were too hard for other students), as a recent experiment in Kenya found. Part of the effect appears to be mediated by teachers: textbook provision increased their presence in the classroom and caused them to use the books more frequently in class (Glewwe, Kremer, & Moulin, 2007). Even when poor conditions do not directly hamper the teacher's effectiveness, they are likely to reduce motivation and make it harder to recruit teachers, particularly to serve in poorer areas.
- ii. *Input-based incentives.* Research suggests that teacher attendance affects education quality directly. Das and others (2007) conducted surprise visits to the same schools over the course of one year in Zambia, and measured teacher absenteeism and students' learning gains. They found that teacher absence has a surprisingly large effect on student learning: each additional 5 percent increase in teacher absence reduces learning by 4 to 8 percent of a year's learning for the typical student. The study controlled for many other observable inputs into student learning, such as classroom equipment and even family-provided inputs, making it more likely that this effect really is due to absent teachers and not to differences in some other input that is correlated with teacher absence.

(Chaudhury, Hammer, Kremer, Muralidharan, & Rogers, 2006) measured teacher attendance in six countries through direct observation of teachers during surprise visits to primary schools in 2002-03. They used the same methodology across six countries on three continents, in each case in a random nationally representative sample of primary schools, which made cross-country comparisons possible.

Table 11: Absence rates of primary-school teachers

	<i>Absence rate (%)</i>
Bangladesh	16
Ecuador	14
India	25
Indonesia	19
Peru	11
Uganda	27
<i>Unweighted average</i>	19

Source: Chaudhury and others 2006

More recently, a handful of World Bank studies have used the direct-observation methodology to measure teacher absence at the lower secondary level. National average absence rates in these countries have been somewhat lower than in the case of the primary schools shown above, at 8 percent in Lao PDR and 16 percent in Cambodia. In Mongolia, a mixed sample of schools covering different ages, from Grades 1 through 10, recorded average absence rates of 16 percent in rural areas but only 5 percent in urban areas.

Some countries are experimenting with programs to raise teacher attendance. (Duflo, Hanna, & Ryan, 2007) conducted an experimental study in India to evaluate how teacher absence affects student learning gains. The experiment involved providing attendance-based bonuses for teachers at NGO schools in rural Rajasthan, by using cameras to monitor attendance and then verifying the results with random spot checks. Compared with the teachers in the schools that had been randomly assigned as controls, teachers eligible for the bonuses had much lower absence rates – only 21 percent, compared with 42 percent for the control teachers. Perhaps surprisingly, student learning increased substantially as well in the experimental schools, by 0.17 standard deviations. The authors estimate that reducing absence by 10 percentage points would increase child test scores by 0.10 standard deviations. Because schools had been randomly assigned to experimental and control groups, their study confirms that the estimated impact is purely due to a teacher effect: all other inputs were, on average, the same across the two groups.

- iii. *Output-based teacher incentives.* Several studies have evaluated the impact of rewarding teachers for improvements in their students' learning. For example, an evaluation of a randomized teacher incentives program in Kenya which provided financial rewards to teachers based on their students' test scores found that teachers increased their effort to raise student test scores by offering more test-preparation sessions. Similarly, an evaluation of a performance-based pay bonus for teachers in Israel concluded that the incentive led to increases in student achievement, primarily through changes in teaching methods, after-school teaching, and teachers' increased responsiveness to students' needs. Ongoing experimental research in India analyzed the impact of the introduction of bonus pay for teachers based on student performance in tests in government schools in Andhra Pradesh (Muralidharan & Sundararaman, 2008). Students in the schools that were subjected to the bonus pay program performed significantly better than students in control schools by 0.28 and 0.16 standard deviations in math and language tests, respectively.

- iv. *Changing the lines of authority.* A number of efforts to raise teacher performance include changing the lines of authority to increase teacher accountability by providing more information to parents and communities and giving them increased authority over teacher hiring, monitoring, and firing. These policies are a response to failures in central government management of teachers. Glewwe, Holla, and Kremer (2008) summarize evidence on a number of programs that (i) provided school performance information to parents and communities and (ii) gave teacher hiring authority to communities. They interpret the evidence as suggesting that giving communities information about the state of schools, without facilitating the use of that information, may not be very useful. In contrast, when communities can make decision (for example, around hiring teachers), then the information provided on education service delivery is useful to improve quality. Indeed, recent experiments in India (Banerjee, Cole, Duflo, & Linden, 2005) and Muralidharan and Sundararaman (2008) and Kenya (Duflo, Dupas, & Kremer, 2007) indicate that when communities can contract and monitor teachers directly, teachers are less absent and their students have higher test scores.

F. Information asymmetries and decision-making authority

Perhaps one of the most substantial reform efforts in the past decade -- initiated both by donors and developing countries themselves -- has been decentralization of school management and resource allocation. Decentralization may devolve either authority or finances, or both. Such arrangements are an outgrowth of a broader push for democratic governance, and respond in part to excessive centralization and related rent-seeking and corruption (Bardhan & Mookerjee, 2006; Besley & Coate, 2003). We discuss the many forms of decentralization in this section. The mixed evidence reflects the difficulty in aligning incentives between delegates and principals.

A growing body of research has used international assessments to explore cross-country differences in the allocation of decision-making power, the existence of national assessments, curriculum determination policies, private/public distributions of enrollments (and funding for private schools), teacher unions' influence, teacher incentive and ability or tracking practices. Cross-country comparisons have suggested that centralized examinations and centralized control of curricular and budgetary affairs have a positive relationship with student test scores. At the same time, research suggests that devolution of authority to schools over process and personnel decisions, enabling individual teachers to select teaching methods, encouraging parental involvement, and ensuring that intermediate levels (versus central level) of administration have authority over education also have positive effects on student achievement. Overall, institutional features, rather than available resources (consistent with the studies previously mentioned) help explain cross-country differences in students' educational performance (Woessmann, 2003).

Cross-country evidence shows that greater school autonomy over personnel management and process decisions (hiring of teachers, textbook choice, budget allocations within schools) appear to be related to higher student performance. Meanwhile, centralized decision-making in discretion-heavy areas with large scope for opportunistic behavior, e.g. formulating overall school budgets, is associated with higher student performance (Fuchs & Wößmann, 2007).

Within-country evidence follows similar lines, indicating that the impacts of decentralization may vary according to which actors or institutions have control over which types of decisions. In a study of three education reforms in Brazil, the authors suggest that two of these—increased financial autonomy for schools and the creation of school councils—had a significant, but not overwhelming impact on a number of intermediate quality indicators such as failure rates and age-grade distortion (de Barros & Mendonfa, 1998). Meanwhile, the third intervention—local control of selection of school principals had an impact, albeit very small, only on student achievement. King and Ozler In a study of Nicaragua’s autonomous school reform, authors suggest that greater school autonomy over teacher staffing and the monitoring and evaluation of teachers appear to be more effective in raising student performance (King & Ozler, 2000). Finally, a rich cross-sectional study finds that autonomy of primary schools in Argentina is associated with higher student performance (Filmer & Eskeland, 2002). Most recently, an evaluation of the Fe y Alegría schools in Venezuela shows that Fe y Alegría students perform slightly but significantly better on both the verbal and math portions of the Prueba de Aptitud Académica (PAA). The authors attribute these results to characteristics of Fe y Alegría’s management system which is decentralized, allowing principals authority over budgets and the hiring and firing of teachers (Allcott and Ortega 2006). Because all these reforms were not implemented experimentally, however, these results have to be interpreted with caution.

Despite the benefits it may offer, decentralization can also lead to increased inequality within countries. Decentralization policies have at times been problematic. A recent analysis of the impact of education decentralization on student outcomes in Argentina found that while decentralization had, on average, a positive and significant impact on student performance, it could also lead to increased inequality in student outcomes, especially in areas that were disadvantaged before the decentralization reform (Galiani, Gertler, & Schargrotsky, 2008). Brazil is historically one of the most decentralized countries in the region, with state and municipal governments managing education systems for many decades. This high degree of decentralization resulted in enormous inequality in the resources available for education systems in states and municipalities across Brazil. In 1998, the federal government of Brazil tried to remedy these inequities through FUNDEF, a mandated education finance equalization reform that introduced a per-pupil spending floor across states and equal per pupil spending in primary education within states.

Quasi-experimental studies from Central America show some positive evidence of the impact of school-based management on student learning. School-based management is one form of decentralization that has become increasingly popular in the Central American countries. While local control over resources may improve efficiency, a key question is the extent to which school-based or community-based management can improve student test scores, or other intermediate quality indicators such as repetition, drop-out, or completion rates. Recent evidence tells us that the context, design, and implementation of reforms can affect their success.

El Salvador, Honduras, Nicaragua and Mexico have all instituted reforms that devolve some powers to the community or school levels. These reforms have wide-ranging goals derived from the idea that schools will meet the needs of students and communities better if they respond to and are accountable directly to local stakeholders. Education goals frequently include improved education quality, greater relevance, expanded access, and increased efficiency. Community- and school-based management has proven promising in many of these areas, yet the policy has also at times been problematic. Research indicates that school-based management policies, like other decentralization

policies, can increase educational inequality between communities of differing income levels and management capacities.

The EDUCO program (Programa de Educación de la Comunidad—Education with Community Participation Program) in El Salvador grew out of the country's civil war. Rural communities who found themselves cut off from services, established and run their own local schools. After the war, the government expanded the program, recognizing its success in effectively reaching areas it could not. Through the EDUCO program, the government provides block grants to community associations for managing schools. An early evaluation of EDUCO finds that even within the context of the program's rapid expansion after the war, student absences diminished due to a reduction in teacher absences. The authors speculate that this reduction in student and teacher absence might later contribute to improved achievement (Jimenez & Sawada, 1999). A more recent study shows their instincts were correct. After controlling for background factors (EDUCO students tend to be poorer than traditional students), the study found that EDUCO students performed better in Spanish than students at traditional schools (Sawada & Ragatz, 2005).

In contrast to the school-based management programs in El Salvador, Nicaragua's *Autonomía Escolar* (School Autonomy) reform was aimed at urban schools with higher-than-average resources. And unlike EDUCO, *Autonomía Escolar* focused on changing the status of preexisting schools: by 2002, 63 percent of Nicaraguan students attended autonomous schools. The Nicaraguan reform differs from EDUCO in another way as well. It seems not to have contributed to increased student learning, and by the sixth grade students in autonomous schools were performing worse than their peers in traditional schools (Parker, 2005).

What factors may explain these different results (see Table 12)? In the case of EDUCO, it is difficult to know which factors of the decentralization program may have contributed to improved student outcomes. Research results indicate that many administrative processes had not yet been devolved to the local level, even though school associations felt that they had greater influence in administering schools. Personnel hiring and firing decisions were under the control of local actors, however. This aspect of the program, if it contributed to EDUCO's success, would be consistent with findings using international comparisons that indicate that local control over teacher hiring and firing is related to higher student learning outcomes (Woessmann 2003; Fuchs and Woessmann 2004). The research also indicates that the EDUCO reform may have increased the motivation of teachers, as shown by a reduction in absenteeism and increased time dedicated to teaching and meeting with parents (Sawada and Ragatz 2005).

Meanwhile, what accounts for the disappointing results in Nicaragua? While in El Salvador much of the decision-making power went to the hands of local communities and school boards, in Nicaragua it was concentrated in the hands of the school principal. Furthermore, the autonomous school reform focuses more on the administrative decentralization of power and less on devolving curricular or pedagogical decisions (Vegas & Umansky, 2005). These are all possible reasons for the ineffectiveness of the *Autonomía Escolar* program. However, identifying the aspects of Nicaragua's autonomous schools that may contribute to or detract from student achievement is a subject for future research (Parker 2005).

Table 12: Differences in teacher characteristics between teachers in school-based management program and non-program schools in Central America

	Honduras	Nicaragua	El Salvador
Years of education	Less	No difference	More
Years of experience	Less	No difference	Less
Hours of work	More	--	More
Absences/school closings	Less	--	Less
Use of alternative teaching methods	Less	--	--
Salary	Less	--	Less
Bonus salary perceived	--	More	--

Sources: (Gropello & Marshall, 2005), Parker (2005), Sawada and Ragatz (2005)

Recent evidence from Mexico suggests that parental participation in education management can be both effective and cost efficient. In 1992, the Mexican government introduced a process of decentralization of educational services from the federal to the state level. As part of these reforms, in 1996 it introduced the AGEs program (Apoyo a la Gestión Escolar—Support to School Management), which consisted of providing monetary support and training to Parent Associations (Asociaciones de Padres de Familia or APFs). The associations can spend money from AGEs on small school infrastructure improvement projects. In spite of its limited size, the program represents a significant advance for the Mexican education system, where parent associations have tended to play a minor role in school decision-making. A recent impact evaluation found a positive effect of the AGEs program on intermediate quality indicators, such as repetition and dropout rates, in rural primary schools, even when controlling for other compensatory programs⁵¹ that were introduced simultaneously (Gertler, Rubio-Codina, & Patrinos, 2006).

It is unclear exactly how the AGEs program improves schooling outcomes. It appears that the institutionalization of parental participation has given parents a strong voice in the school community, as well as official channels to communicate with teachers and administrators. This formal participation of parents improves relations between schools and parents and the overall

⁵¹ Conditional cash transfer programs were in place at the time.

school climate. The program may reduce teacher absenteeism as well; however, this data is not available (Gertler, Patrinos and Rubio-Codina, 2006).

The Learning Guarantee Program, an experiment in the Indian state of Karnataka, built on the above findings. The program goal was to push for engagement between parents and schools; it offered parents detailed information about school resources and offered cash incentives directly to schools to improve learning outcomes (Barnhardt, Karlan, & Khemani). The authors note that the design of incentive matters: programs that reward schools based on their absolute level of performance, rather than their improvement, are less likely to retain poorer-performing schools. Thus, policymakers need to consider the distributional impacts of various autonomy and incentive arrangements.

Some studies note that decentralization can often have unintended consequences. A Public Expenditure Tracking Survey found that only one-fourth of grant funds reached schools in Uganda (Reinikka & Svensson, 2004). Others note that decentralization often prompts a state reaction to re-centralize, which results in a larger government than before (Gershberg & Winkler, 2004). They also point out that decentralization can simply mean duplication if reform doesn't include a clear legal framework that identifies who has responsibility for finances and services. In addition, unclear legal status can reduce legitimacy. In sub-Saharan Africa, decentralization has taken the form of community schools, which have a poor perception due in part to their lack of regulation.

Implications for donor assistance: *Does money matter for education?*

Observational, descriptive studies show a negative association between income and learning achievement. International comparisons of spending levels and learning outcomes confirm that the simple act of spending more money on education does not assure higher learning outcomes.⁵² This does not mean that more money is irrelevant to education quality and learning achievement. What it does mean is that money must be spent intelligently if it is to raise learning achievement: it must address the binding constraints to higher learning achievement and it must do so in a cost-effective manner. It also suggests – though it does not confirm – that there may be an expenditure threshold beyond which additional expenditures, even intelligent expenditures, no longer lead to further improvements in learning.

Three related findings of global research on resources and learning also have important implications for donor assistance.

1. Improved *distribution* of education resources within countries can lead to significant improvements in learning outcomes. The FUNDEF national finance equalization program in Brazil provides a good example. The program pools state and municipal revenues for primary education and redistributes them on a uniform per-student basis. It also provides federal top-up grants for the poorest states. This redistribution program led to a marked

⁵² Hanushek, E. A. (2003). "The Failure of Input-based Schooling Policies." The Economic Journal 113(485): F64-F98.

improvement in teacher qualifications and teaching conditions in poor districts, with improved attendance and reduced drop-outs.⁵³

2. Incentives for efficient and effective use of resources have a much more pervasive effect on learning outcomes than resources *per se*.⁵⁴ Three institutional factors have been found to be particularly important in determining learning outcomes: a) choice and competition, b) decentralization and autonomy of schools, and c) accountability for outcomes.⁵⁵
3. Countries that invest very little on education achieve very low results in terms of learning achievement.⁵⁶ For these countries, education expenditures *do* matter – particularly, when they are spent on factors or systems found to lead to improved learning outcomes.

V. Suggestions for Future Research

Based on the issues identified in this paper, some key research questions that could be addressed through country case studies include:⁵⁷

- i. To what extent do existing processes for teacher recruitment, training, compensation and oversight create incentives for teacher and teaching quality? How and why? To what extent are teachers accountable to school heads, parents and communities, line bureaucracies, unions, political parties? Through which channels and with what effects?
- ii. To what extent are school heads and teachers accountable to parents and communities, line bureaucracies, unions, political parties? Through which channels and with what effects?
- iii. To what extent do processes in place to allocate financial and human resources to schools create incentives for school quality? How and why? Are there major differences in allocation of financial and human resources to urban and rural schools? Why? What are their effects on access and learning? Are there special programs for schools and teachers serving poor neighborhoods and villages and ethnic minorities and/or cash transfers or vouchers for poor parents? What are their effects on access and learning? Why?
- iv. To what extent do school and teacher quality vary according to whether schools are public, private or managed by community organizations and/or NGO's? Whether they are nationally, regionally or locally controlled? Whether there is parental or community participation in school boards? How and why?
- v. To what extent do the processes in place to measure student and teacher performance (e.g., learning tests for students, state exams for teachers, performance of students from different schools in accessing and advancing to tertiary education, labor observatories)

⁵³ Nora Gordon and Emiliana Vegas, "Education Finance Equalization, Spending, Teacher Quality, and Student Outcomes", in *Incentives to Improve Teaching*, The World Bank, Washington, D.C., 2005.

⁵⁴ Eric A. Hanushek and Ludger Wößmann, *Education Quality and Economic Growth*, The World Bank, 2007; and Ludger Wößmann, "Schooling Resources, Educational Institutions, and Student Performance: The International Evidence", December, 2000, Kiel Working Paper No. 983, Kiel Institute of World Economics.

⁵⁵ Hanushek and Wößmann, *op. cit.*, 2007.

⁵⁷ These questions were agreed to as priorities in the GDN conference in February 2009, and are laid out in the Call for Proposals.

- influence school choice, school quality and teacher quality? How and why? Are citizens informed about education policy decisions and their effects on sector performance? Through which actors (government agencies, political parties, civil society organizations, opinion makers) and channels? What is the effect of such information flows?
- vi. Is low demand for education a problem in some areas, income groups and ethnic minorities? If so, is it a product of their expectation that quality is poor, because they place a low value on the service -e.g., girls' education in some cultural and socioeconomic settings- or does it reflect income and credit constraints –faced with high direct or opportunity costs-? How does the effective demand of citizens affect institutional sectoral design and the way in which sectoral institutions perform?
 - vii. Do political parties and teacher unions interfere in teacher recruitment, allocation to schools, professional development and career advancement? Do they interfere in the implementation of particular programs (e.g. information systems, special programs for schools in poor regions or neighborhoods, cash transfers and vouchers for poor parents)? Do they promote or block particular reform initiatives? Through which channels and with what effects?

Empirical Strategies for Identifying the Impact of Education Policies and Programs

Researchers in developing countries can make important contributions to the literature via: (i) descriptive studies, particularly those that use national longitudinal data on students, teachers, and/or schools, to explore trends in education and relationships between inputs, processes, outputs, and outcomes; (ii) comparative studies, which use cross-nationally comparable datasets, such as regional data PASEC, SACMEQ, and OREALC data; and (iii) impact evaluation studies of education policies and programs.

Descriptive studies and sub-national variation

Existing studies try to assess within-country variation in education outcomes by examining administrative data linking students to teachers, and by looking at parental choice and outcomes among different institutional arrangements. Researchers may want to consult U.S. studies that have used state data matching student outcomes to their assigned teacher's characteristics. Rockoff (2004) uses rich longitudinal data that matches student test scores to teachers in order to separate variation in teacher quality from variation in student ability. A popular paper also uses matched panel data to demonstrate that a change in teacher quality within a school or district can improve student outcomes (Rivkin, Hanushek, & Kain, 2005). Developing countries that have recently expanded use of exit or grade-completion exams may find changes in long-term trends of grade repetition or school completion.

Decentralization is another example where within-country variation is just as useful to examine as between-country differences. Given that local control over school management and finances varies based on local preferences, legal arrangements, and enforcement mechanisms, there is an endogenous response. But compiling data and describing these differences goes a long way toward understanding how best to obtain causal estimates. One study looks at different decentralization features for eight Latin American countries. The authors account for these endogenous differences across countries and find that parental participation influences fourth-grade performance (Gunnarsson, Orazem, Sanchez, & Verdisco, 2004). One study suggests that researchers can take

advantage of changes over time: consider how changes in institutions occur at different times across regions of a country and compare outcomes across time and region (Pande & Udry, 2005).

In the absence of such detailed data, researchers may want to examine performance within their respective countries by sub-national geography, gender, ethnic and religious groups. In addition, looking at the different *distribution* of inputs and processes--such as teacher education, school supplies, curricular approaches and parental participation-- across different sub-national groups can highlight important inequalities. Such descriptive work can surface important hypothesis for further evaluation.

Possible study types

1) Descriptive, hypothesis-generating research about under-studied issues in education delivery.

For instance, case studies about the role and influence of teacher unions, donor institutions and private providers may increase understanding about the dynamic effects of tensions between these key actors. Another area is the transition to secondary school. As the cohort of primary school graduates swells, we need to understand more about how both poor families and secondary school administrators are negotiating these new educational pathways. These are examples for which qualitative and mixed-methods research can highlight nuances that quantitative analysis alone cannot.

2) Institutional or policy variations within countries.

In countries with a high degree of decentralization, such as India, Indonesia or Brazil, how does performance of the same program vary? What can these variations tell us about governance and local structural factors that ensure success? Differences between regions of the same country may also point to the role of local law, culture or industry to help us understand what aspects of local context matter. Consider states within Brazil that have different transfer arrangements, or a city such as Bogota, where different forms of schooling can be compared. also consider comparing how institutional variations -- such as private schools, school nutrition programs, etc. -- have expanded in different degree and form in different regions of a country.

3) Map of data type to methodology.

Because the method of study is implicit in many findings, it may be useful to disentangle what we know from how we know it. A useful starting point is to identify the kinds of data available at different levels of government, at different levels of schooling, in different regions, etc. Can administrative data about each school in a district be linked with household data about families whose children attend those schools? Can administrative data about water delivery be linked with data about school attendance? With such information, one can create richer datasets, and match those to possible research methods and study designs.

4) Quality of information

What are the right indicators of success, and how do those indicators affect the incentives of key actors, such as teachers and administrators? State-created standards, such as teacher exams and certification, seem like useful indicators of teacher quality to the extent there is

variation in the teacher pool. But if teachers do not want to lose opportunities for employment, they may game the system in order to earn a certificate or a high exam score, thus diluting the value of the information. In addition, if teachers are concerned about limited opportunities for professional advancement and career mobility, but the indicators capture the interests of parents or donors, it is not surprising if such indicators do not spur the expected change. Similarly, school autonomy programs may have high participation, but may be unevenly distributed between rich and poor communities or may yield uneven learning improvement.

Thus, it may be useful to consider what constitutes program success? What indicators best reflect stated policy goals? Proposing a more refined set of indicators of performance and distributional goals may be necessary to improve future research.

Impact evaluation studies:

Before pursuing new country studies to evaluate the impact of education policies and programs, including those mentioned above, researchers should consider some important methodological issues. First is selection bias. Education outcomes are often related to factors such as income, wealth and family education levels. A family's choice about how much they are willing to invest in education for their child is rarely separate from their other life choices – such as where they live – or from their endowment, such as the kind of land, wealth or family educational history they inherited. A related issue is omitted variable bias. It is often impossible for researchers to collect data on all the factors that influence the outcomes of interest.

To surmount these issues, researchers⁵⁸ have introduced randomized trials of educational interventions. In order to evaluate the impact of any intervention, researchers would want to have an experiment that would create the situation whereby researchers may observe *the exact same person, at the same time*, affected and unaffected by the intervention. This would mean that the only difference between the two situations would be the presence or not of the intervention, and so any differences in the individual's characteristics between the two situations could be interpreted as the impact or causal effect of the intervention. Since it is rare to observe this in reality, then there are two main ways to evaluate the impact of policies and programs: (1) randomized or natural experiments and (2) econometric, or quasi-experimental, methods that solve the identification problem.

Randomized experiments constitute the “gold standard” for estimating the causal impact of an intervention. In randomized experiments, a random sample of the population of interest is drawn and then members of that analysis sample are randomly assigned to treatment group status or control group status. The key advantage of randomized experiments is that the random selection of the sample, and then the random assignment into treatment and control groups, may guarantee that the treatment and control groups will have the same distribution of observable and unobservable characteristics before the intervention occurs and will be representative of the population. In other words, you can expect the pre-intervention treatment and control groups to be, on average, equivalent. Of course, this equivalence assumption can and should be verified once the samples are selected. Once the equivalence in the means of observable characteristics is established, any differences in the post-intervention outcomes of the treatment and control groups can be attributed

⁵⁸ See, for example: www.povertyactionlab.org.

to the intervention. The outcomes of both groups can be observed and compared after the intervention has been in place for a while, and the difference between these outcomes can be interpreted in a straightforward manner as the average effect of the intervention.

A well-designed randomized trial requires two things: (i) randomly choosing an analysis sample from the population of interest, *and* (ii) randomly assigning members of the analysis sample to the treatment and control groups. Most large-scale programs are not introduced as randomized trials.

Even if randomization were possible, a number of issues might threaten the validity of this technique to identify the counterfactual. Randomized trials and other experimental techniques must pay careful attention to selection issues. Participants may crossover between treatment and control groups, drop out of assigned groups, or not comply in other ways. These contamination and attrition issues may be easy to miss with poorly monitored administrative data. As a result, evaluations of educational interventions may suffer from over- or under-estimates. The main threats to the validity of random assignment studies are: (i) contamination effects, which occur when members of the treatment group interact with members of the control group, spilling over the effects of the intervention, and (ii) selective attrition, which occurs when members of the treatment and/ or control groups drop out from the experiment in a way that no longer maintains the equivalent distribution of observable and unobservable characteristics across the two groups (which means the treatment and control groups are no longer comparable). These issues can be monitored throughout the experiment and, therefore, randomization remains the “gold standard” for impact evaluation. Moreover, alternative strategies to identify the counterfactual present additional threats that further put into question the validity of causal effects inferred through those strategies.

In addition, there are several natural experiments that could be used to obtain information on the impact of different policies. Several researchers have taken advantage of such situations. Perhaps one of the most notable is the extensive research on school vouchers in Colombia. The program administrators used a lottery to allocate the vouchers due to over-subscription of the program. Researchers were able to use the resulting randomization to gain significant knowledge about how the program works (Angrist et al 2002). There are also examples, including the expansion of compulsory schooling laws, which create treatment groups and can be used as an instrument (see, for example, (Oreopoulos, 2007); (Patrinos & Sakellariou, 2005)).

Econometric or quasi-experimental techniques can be used to obtain credible impact evaluation of program effects, which can be the result of a discontinuous change in a policy, such as the introduction of a new policy or program (for example, a compensatory education program to schools serving disadvantaged students). The type of technique that is applied will depend on the characteristics of the intervention, the definition of the target group, the rule or process for determining participation in the treatment, and the characteristics of available data. Regression discontinuity analysis has increasingly been viewed by most experts as the second best alternative to randomized experiments, mainly because, under certain assumption, it provides a statistically unbiased estimate of an intervention’s causal effects.⁵⁹

⁵⁹ Shadish, W., T. D. Cook and D. T. Campbell. 2002. *Experimental and quasi-experimental designs for generalized causal inference*. Boston, New York: Houghton Mifflin. Chapter 7: Regression discontinuity designs.

How does **regression discontinuity (RD)** work?⁶⁰ RD takes advantage of the fact that participation in a program, policy or intervention is based on an observable and continuous variable, which we will call the assignment variable: participants with values of the assignment variable above a certain threshold are assigned to the treatment group, and those with values of the assignment variable below the threshold are assigned to the control group. Because the treatment and control groups are not assigned randomly, we cannot expect the observables and unobservable characteristics of both groups to be comparable. However, close to the threshold, we can expect the members who are just below the threshold (control group) to be essentially similar to the members who are just above the threshold (treatment group) in everything except for whether they receive the treatment or not. *If we assume that the observations just on either side of the threshold are equal in all dimensions except for their treatment status*, then when we compare the post-intervention outcomes of both groups we can attribute any differences in these outcomes to the intervention. Examples of assignment variables may include an individual's date of birth, a municipality's poverty rate, the number of school years completed by the head of a household, etc.

More generally, economists use other quasi-experimental techniques, such as instrumental variables estimation and propensity score matching techniques to construct comparison groups in non-experimental settings. Such research designs can approximate causal estimates of the effects of programs, but because they rely on observable variables, can be subject to biases due to unobservables.

In all impact evaluations, it is important to consider heterogeneous responses.⁶¹ Although we may find an average effect of an intervention, it is likely that groups with certain characteristics (women, older students, minorities) may respond at a different rate or in a different way to an intervention than other groups. These differences may provide important policy guidance, especially for local administrators.

A final issue is scope. In order to get a causal estimate, sometimes the nature of the phenomenon studied is too small to inform policymakers decisions about prioritization or resource allocation. However, cross-national or studies that examine education systems as a whole often leave policymakers with as many questions as answers. As a result, it is important to consider what the country study will be able to address.

⁶⁰ Additional explanations of regression discontinuity analysis include, in increasing order of complexity:

- (i) The Urban Institute, <http://www.urban.org/toolkit/data-methods/regression.cfm>
- (ii) The New Palgrave Dictionary of Economics Online, http://www.dictionaryofeconomics.com/article?id=pde2008_R000243
- (iii) Van der Klaauw, W. 2002. Estimating the effect of financial aid offers on college enrollment: A regression-discontinuity approach. *International Economic Review* 43, No. 4.

⁶¹ For more, see Handbook of Econometrics 2007.

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