

Short Report prepared for the Copenhagen Consensus 2008

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February 20, 2007

This paper reviews the stylized facts regarding the distribution of human capital investments and the returns to those investments in developing countries. It then examines recent evidence regarding which policies can induce increased human capital investments in the most efficient manner, using estimated benefits and costs as a guide. Demand-side interventions are argued to improve literacy in the most cost-effective manner.

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I thank Jean Fares, Deon Filmer, Sarojini Hirshberg, Manny Jimenez, Elizabeth King, Claudio Montenegro, Harry Patrinos, Annette Richter, and T. Paul Schultz for their advice on topics, content and relevant literature as I prepared background materials for this paper. Shiva Sikdar provided able research assistance. Opinions expressed are my own and not necessarily those of my colleagues or of the World Bank.

Alternative Strategies to Combat Illiteracy

I. Benefits

Few empirical relationships have been more frequently investigated than that between years of schooling and earnings. Literally hundreds of studies using alternative data sets from developing and developed countries, spanning many decades, and employing alternative specifications to correct for various potential sources of bias, have derived amazingly consistent estimated private returns per year of schooling.¹ Average returns are almost universally positive and at or above market returns to other investments. Using harmonized household data sets from 48 developing countries, Fares, Montenegro and Orazem (2007) found that returns for women average 9.6% compared to 7.1% for men, and 8.1% for urban residents compared to 7.5% for rural residents. There may be external benefits from schooling beyond those that go to the individual. These social benefits include improved governance due to an educated electorate, improved climate for growth due to agglomerations of skilled individuals, reduced fertility behavior, and improved household health.²

The finding of positive returns to schooling across a wide array of countries at all stages of development suggest that education offers consistent returns in almost all economic settings. Nevertheless, a year of schooling will be even more productive in some environments than others. As argued by Schultz (1975), human capital is most valuable in markets experiencing technological, production or price shocks that require adaptation, whether by moving to industries or areas with the strongest labor demand, adopting or developing new technologies, or switching occupations to fulfill market needs.³ Good adaptive decisions require a reward, and so human capital will be most valuable when social or governmental institutions place few restrictions on mobility or trade, when wages and prices are flexible, and when property rights are enforced.⁴ An example of the role of freer markets in enhancing human capital productivity is the rapid increase in returns to schooling observed in virtually all formerly planned economies as they transitioned toward market systems (Fleisher et al, 2005).

While years of schooling are consistently associated with higher earnings, time in school is only productive if it enhances cognitive skills. Investments of time and money in a child's schooling that fails to produce basic cognitive skills such as literacy are almost surely wasted. Studies that include both years of schooling and measures of cognitive skills find that it is the latter and not the former that drive earnings (Glewwe, 2002). Hanushek and Kimko (2000) found that it is average cognitive attainment and not average years of schooling that drives economic growth.

¹ Psacharopoulos and Patrinos (2004) present the most recent review of findings from developing countries. Card(1999) contains an excellent review of the various estimation methods and biases associated with analysis of the returns to schooling.

² Pritchett (2004) questioned the importance of these externalities because of the unstable relationship between growth in measures of aggregate human capital and aggregate output, but there is strong microeconomic evidence that human capital improves household health, lowers fertility, lowers the crime rate, and improves labor mobility, all of which have external as well as individual benefits. Angrist et al (2002) and Schultz(2004) both found that increased schooling from randomly assigned vouchers and conditional cash transfers led to reduced fertility behavior, although the evidence was somewhat weaker in the latter case.

³ Consistent with that presumption, Fafschamps and Quisumbing (1999) and Godoy, Karlan, Rabindran and Huanca (2005) find that returns to schooling are apparent in off-farm work but not on traditional farms. On the other hand, in agricultural environments with technological change, it is the most educated that adopt first (Huffman and Orazem, 2006) and in India, returns to schooling were highest in areas where Green Revolution technologies were most complementary with local agriculture (Foster and Rosenzweig, 1996).

⁴ Acemoglu, Robinson, and Johnson (2001), Acemoglu, Johnson, and Robinson (2002) have examined the role of institutions that constrain or enhance mobility in retarding or fostering economic growth.

Nevertheless, as shown in Figure 1, the probability of attaining self-reported literacy rises with years of schooling, although there is considerable variation in the pattern across countries. Children who complete the primary cycle, about six years of schooling, are almost certain to attain literacy in most countries. While one could argue that these children could have attained literacy without schooling, the Figure shows that relatively few literate individuals never attended school. This presumption that schooling is needed for literacy underlies the Millennium Development Goal of attaining universal primary education (UPE) by 2015.

The World Bank estimates that meeting this goal will require an additional investment of \$11-28 billion. Even this high cost may be understated because the children who are currently not in school are disproportionately located in areas that are expensive to reach with schooling services or in households that are less keen to send children to school. Making efficient progress toward the goal requires identifying which illiterate populations can be served most economically.

Many countries have placed an emphasis on raising enrollment rates for girls, and these efforts have succeeded in shrinking the gender enrollment gap over the past 20 years. Across 69 developing countries, the enrollment gap between boys and girls under age 12 exceeds 10 percentage points in only 3 countries. Larger gaps are observed at the secondary schooling level. In contrast, the enrollment gap between urban and rural children under age 12 exceeds 10 percentage points in over half the countries. Filmer and Pritchett (1999) develop estimates of child grade attainment by household wealth status. In almost all countries, the gaps occur even at grade 1, and in all countries, the gaps are larger at higher grade levels. Therefore, the most underserved populations are the poor and children residing in rural areas.⁵

As shown in table 1, some of these children never attend school and others drop out before completing the primary cycle. It is the latter group that would be the most cost effective population to target first in moving toward UPE and universal literacy. Much more expensive would be getting children who have never attended school to complete the primary cycle.

II. Supply-side interventions

Supply-side policies aim to improve the quantity or quality of schooling offered. These policies include direct provision of newly constructed schools or of school supplies by the central government, improving the quality of existing schools, or improving the management of existing schools. but they can also involve the decentralization of school control to local authorities who are believed to be able to allocate resources more efficiently to meet school needs.⁶

While high quality, well-managed schools would enhance schooling outcomes, there are several reasons why investments in additional schools or improved school materials may fail the cost-effectiveness criteria.

1) If you build it, they may not come.

Building and staffing more schools requires that most expenses are incurred before we find out if parents will send their children to the school. In addition, some of the enrollment at the new schools will be from children already in school who switch to the new school.⁷ Duflo's (2001) analysis of Indonesia's massive public works project that doubled the number of primary schools in a six year period suggests that halving the average distance to school raised years of

⁵ Orazem (2006) presents the relative enrollment rates for boys girls, urban and rural children, and poor children which are summarized in the text.

⁶ Glewwe and Kremer (2006) and Duryea, King and Orazem (2006), and Orazem(2006) provide much more detailed discussion of these and other interventions and related evaluation issues.

⁷ See Jimenez and Sawada (2001).

schooling by about 1.5%.⁸ Filmer's (2004) analysis of the relationship between distance and enrollments across 21 developing countries generally found very small marginal effects of lowering distance. This does not imply that school provision is unimportant—only that the existing supply is already located in the most dense child populations. New schools will be disproportionately located in relatively remote places where there are relatively few children and relatively high costs.

2) Quality matters, but we don't know how to foster quality

It is undoubtedly true that higher quality schools enhance human capital production and raise school demand. However, research has failed to identify how to foster improved quality. For example, Rivkin, Hanushek, and Kain (2005) found that good teachers systematically produce better academic outcomes than do bad teachers. Unfortunately, good teachers and bad teachers look very much alike statistically—they have the same education levels, similar demographics, receive the same in-service training and are compensated similarly. In other words, teacher quality matters, but we don't know what matters for teacher quality. As teachers represent 74% of recurring school expenditures in developing countries (Bruns et al, 2003), it would seem that any policy aimed at improving school quality would have to confront teacher quality. The lack of agreement about how to foster teacher quality thwarts any general prescription regarding likely cost-effective avenues for improvement.

3) Are better managed schools better or are better schools better managed?

The World Bank and other international agencies have made decentralization of school management a central theme of new efforts to improve the efficiency of public service delivery in developing countries (Bardhan, 2005). The clear attraction of the strategy is that it offers the potential of improving school outcomes without spending more on the schools—we simply “spend smarter and not harder” to modify the common aphorism. The available evidence, even that often used by proponents of decentralization, is really too uncertain to engender a high degree of confidence that local management can work in all settings. Studies by Jimenez and Sawada (1999) of the EDUCO schools in El Salvador and by King and Ozler (2001) of the autonomous schools in Nicaragua found that schools that exercised more local autonomy experienced gains in student attendance or test scores compared to other schools. However, participating schools are not randomly drawn-- local authorities had to self-select into the programs and would be dropped if they did not fulfill their obligations. It is likely that the schools opting to accept local responsibility differ in ways that could vary school outcomes compared to communities that did not elect to participate in the program. In other words, a finding that autonomous schools outperform schools that do not behave autonomously does not imply that the nonautonomous schools would have better outcomes if they too behaved autonomously.⁹

4) Returns to increased school supply come at a long lag

⁸ Because average distance was cut in half, Duflo's estimates suggest a 3% increase in years of schooling from the doubling of schools. Pitt et al (1993) estimate that the program raised enrollments by 2.5%, very similar to Duflo's estimates of the impact on years of schooling.

⁹ Reinnika and Svensson(2003) found that a decentralization program in Uganda dramatically increased the proportion of funds that ended up reaching the schools from 20% in 1995 to 80% in 2001. Pressure to spend more on schools may have been due to publication of the amount of the transfers, making it moiré difficult to withhold money from the schools, but it may have also come from better central monitoring of the accounts. Whether the resources were then allocated better or whether the schools improved is not clear, but it does suggest that aspects of decentralization can be mandated. Gunnarsson et al (2007) show that most of the variation in the practice of local school autonomy occurs within and not between countries, suggesting that national policies to foster decentralized decisionmaking may be ineffective.

Supply-side interventions generally require the allocation of funds upfront with the hoped for child or parental response only becoming apparent later. Once built, there is no economic return to a new school unless children attend, but it may be five years before children attain permanent literacy. It may take some time for parents to react to school quality improvements. Similarly, it may take some time for teachers and students to respond to better local school management. The combination of upfront costs, uncertain response, and delayed benefits place supply-side interventions at a cost-benefit disadvantage compared to the demand side alternatives we examine next.

III. Demand-side interventions

Demand-side policies have several distinct advantages over the supply-side efforts to improve literacy. Demand-side stimulus can be targeted to the particular population currently not in school, whereas supply side interventions will typically result in some redistribution of children already in school to the new schools. Demand-side interventions can also be made contingent on the child being in school, meaning that payment only occurs if the program is working. Finally, demand-side interventions can immediately influence behavior and so they have an advantage relative to the more heavily discounted benefits of supply-side interventions.

There are three types of interventions that I will review, interventions in child health or nutrition that attempt to improve the child's physical or mental ability to learn; efforts to lower the cost of public or private schooling that enhance the household's ability to pay for schooling; and income transfers to the households made conditional on the child's enrollment that enhance the household's ability to afford schooling while lowering the opportunity cost of child time in school. These demand-side strategies work best where there is existing excess capacity of available schools so that more children can be added at low marginal cost.

a: Health and schooling

Numerous mechanisms to influence child health have been introduced through schools including the administration of nutrition supplements, school lunch plans, immunization programs, and health instructions. These programs have been installed from preschool through the schooling cycle, although the most rigorously evaluated have been the ones targeted at younger children.

There is substantial evidence that malnutrition early in life affects both cognitive and physical development that may be only partially reversible by better nutrition later in life. For example, Glewwe, Jacoby and King (2000) found that controlling for other household background measures, children who were malnourished early in life start school later and complete fewer years of schooling. Alderman, Hoddinott and Kinsey (2003) report similar findings for children who were malnourished because of exposure to civil war and drought in Zimbabwe. Evaluations of efforts to provide nutritional supplements to at-risk preschool children have shown permanent improvements in physical stature and cognitive development, both of which can raise life-time earnings.

Behrman, Cheng, and Todd (2004) conducted an experimental evaluation of the *Proyecto Integral de Desarrollo Infantil* (PIDI) program in Bolivia. This program provides support for daycare, nutritional inputs, and preschool activities for low-income children aged 6-72 months. For children exposed to the program for periods exceeding one year, the authors report permanent gains in cognitive development and fine motor skills that they translate to projected life time earnings growth with benefit cost ratios ranging between 1.7-3.7. Grantham-McGregor et al. (1991) report comparable findings for a similar program aimed at stunted infants in Jamaica, as do Armezin et al. (2005) for low-income rural households in the Philippines. . Vermeersch and Kremer found that providing free breakfast to preschoolers raised attendance by

30% in Kenya but did not raise average measured skills. An analysis of a program that combined deworming medication with an iron supplement for preschoolers in India also raised attendance and physical stature.

Nutritional programs can also have benefits at older ages. McGuire (1996) reported that giving iron supplements to secondary children aged (13-15) in a low income country can raise cognitive abilities by 5-25% or the equivalent of .05 years of schooling. Knowles and Behrman (2005) estimate that because the cost of the supplement is so small and administration inexpensive, it costs about \$11 per added child-year of schooling and even these modest gains in schooling have substantial returns of 32 times the costs.

In a widely publicized study, Miguel and Kremer (2004) examined the impact of a program which administered deworming medicine to school children in Kenya. The treated children increased their attendance by 0.15 years per pupil, or an implied cost of \$3.50 per child-year of schooling.

One reason these health interventions can be viewed as particularly cost-effective in raising schooling investments is that the schooling is a collateral benefit. The main aim for the programs is to improve child health which has a value in itself, raising the benefits side of the equation. On the cost side, expenses are only incurred if the children participate and so there is much less potential for wasted investments than is the case for supply-side interventions.

Can these studies be generalized to other developing country settings? Demographic and Health Survey data suggest that health reasons are less often cited as a reason for children not being in school than are child work inside or outside the home, poverty, or the child's lack of interest in school (Table 2). Health is cited more often in Africa and in urban areas of Latin America, but is less often cited elsewhere. Nevertheless, in areas where malnutrition or worm infestations are more common, these interventions offer an inexpensive way to raise attendance, physical and mental capacity, and perhaps length of time in school, all of which would increase the probability that the children attain permanent literacy.

b: Lowering schooling costs

In many countries, parents face significant school costs for their children, ranging from uniforms and school supplies to tuition, fees and after-school tutorials. These expenses can represent a significant share of household income for poor families. Several countries have cut or eliminated the school fees charged by government schools, including Ghana, Kenya, Tanzania, and Uganda. In Tanzania, enrollments rose by 1.2 million children. A program that cut household costs of uniforms and school materials in Kenya increased years of schooling completed by 15% (Kremer, Moulin and Namunyu, 2003). An evaluation by Deininger (2001) of the Uganda case found that elimination of primary fees lowered average costs by 60% and increased enrollments by 60% with the largest gains in rural areas. Increased schooling demand led to considerable crowding as school supplies did not keep up. Pupil teacher ratios rose from 38 to 65.

In many developing countries, students are expected to get tutoring after school with the tutoring often provided by the same teacher they have in class. Poor children cannot afford these services and may fall behind their peers. A program in India hired local women with high school degrees to provide remedial tutoring to grade 3 and 4 children who had fallen behind in school (Banerjee et al, 2003). At a cost of \$5 per child, the program raised the likelihood of a child performing at first grade math level by 11.9 percentage points and at second grade language levels by 9.9 percentage points. By the end of the two year program, children were performing on average .28 standard deviations higher on the test scores, roughly equivalent to having attained one additional year of schooling. The reason the program is so inexpensive is that they

hired less qualified tutors at the market rate rather than mandating teaching certifications and paying the government rate for teachers.

The availability of less expensive teaching and infrastructure inputs is a major reason to consider private rather than government school options to serve expanding school demand. A program in Balochistan province in Pakistan attempted to spur both school demand for girls and to provide an incentive for private school entry by providing scholarships to girls. Randomly selected neighborhoods were given the option of packaging up to 100 girls' scholarships of 100 rupees per month (equivalent to \$3) to try to induce a school operator to open a school in the area. In urban areas, even this modest subsidy was sufficient to get schools to open (Kim, Alderman and Orazem, 1999) and enrollments for both girls and boys rose relative to enrollments in control neighborhoods. The schools were opened at one-quarter of the cost of a public school. A similar program in rural areas enabled schools to open, but the communities were too poor and the number of girls too few to allow the schools to become self-sustaining (Alderman, Kim and Orazem, 2001). This raises an important lesson for the likely success of private school options to raise enrollments—invariably they will be most successful in areas that would have been able to support private schools in the absence of a subsidy, in other words, places with the greatest elasticity of supply for private schools.

James (1993) reported that private schools are an even more important component of school supply in developing than in developed countries. Often private schools will have excess capacity as measured by the relative numbers of students per teacher in comparison to government schools. If excess private school capacity exists, vouchers are an excellent mechanism by which governments can expand access less expensively than building additional government schools. One example of this strategy was the Colombia PACES program that provided subsidies to municipalities to provide secondary school vouchers to poor children. There was ample evidence that the existing government school supply was insufficient to meet demand, and that private schools could add additional students without requiring additional teachers or classrooms (King, Orazem and Wohlgemuth, 1999). Angrist et al (2002, 2006) demonstrated that children who were randomly sorted into the program were 10% more likely to complete the 8th grade and also scored .2 standard deviations higher on standardized tests, equivalent to adding an additional year of school. For those in doubt of external benefits from education, it is interesting that voucher recipients also were less likely to marry young or cohabit and were less likely to engage in child labor. A follow-up analysis confirmed that educational gains were permanent and not transitory. The voucher cost \$228 per recipient including the opportunity cost of the children (Knowles and Behrman, 2005), which is swamped by the lifetime value of the induced additional years of schooling and cognitive attainment.

Programs to reduce the costs of schooling to parents can have dramatic and quick impacts on children's achievement and years of schooling completed. Additionally, they can take advantage of existing underutilized private school and teaching capacity at a fraction of the cost of building and staffing new schools. Additionally, they have the advantage of only using resources if the children use the services.

c: Conditional cash transfers

Latin American countries have moved rapidly to the use of conditional cash transfers to induce parents to send their children to school. These programs transfer income to a household in exchange for the household sending their children to school. Many of these programs include other components, typically adding nutritional supplements and mandating health clinic visits for children and health training for mothers, so the programs are not just aimed at education. Programs have been implemented and evaluated in Argentina, Bangladesh, Brazil, Colombia,

Costa Rica, Honduras, Jamaica, Mexico, Nicaragua and Turkey and other programs have been or are being established in Chile, Ecuador, Peru and other countries.

These programs will be most effective in environments in which schooling demand is highly income and child wage elastic and where large numbers of children are not in school. These circumstances naturally fit poor households, neighborhoods and communities and these programs have in fact been aimed at the lowest income strata of society. While they have been tried in urban areas, most notably the *bolsa escola* programs in Brazil, there are significant advantages to using geographic targeting which is easier in less densely populated areas. In urban areas, it can be costly for authorities to try to establish which households qualify on the basis of income and which don't, and such efforts lead to moral hazard problems in which households may take on activities that lower their earned income but increase their chance of getting the government transfer.

Additionally, these programs will be most successful when they are aimed at populations not currently in school. In Brazil, where individual municipalities established their own programs until they were centralized more recently under the federal *bolsa familias*, some programs targeted children who were sufficiently young that the vast majority were already in school. As an example, in Mexico, conditional transfers had almost no impact on primary enrollments because the children were already in school (Schultz, 2004) while in Nicaragua, enrollment rose by 23 percentage points (Maluccio, 2006). As a rule, the largest effects from conditional transfers have been in rural areas, consistent with the presumption of higher income elasticities and opportunity cost elasticities in rural areas.

IV. Benefit-Cost Summary

My task in this exercise is to identify the low-lying fruit of educational expansion—what programs will raise returns most per dollar expended. These estimates must be taken with a considerable grain of salt—the returns will depend on the degree of economic freedom and growth in the economy and will depend on whether the program can be successfully targeted to those populations that will respond most elastically to the intervention. As a general rule, these populations will be drawn disproportionately from the poor and rural areas at the primary level. At the secondary level, urban populations may be targeted as well. In designing these programs, efforts to supplement existing supply by working outside the government school system are generally less expensive and subject to fewer regulatory constraints. Such private sector educational programs will be most effective in urban areas where the elasticity of educational supply is greatest. Health programs offer opportunities for collateral educational benefits while improving child welfare. The enrollments of poor and rural children, populations that have higher income and child wage elasticities, will also be particularly sensitive to conditional cash transfers.

My review of returns to literacy and to years of schooling demonstrated considerable consistency across countries, genders, and urban and rural markets in the estimated returns to schooling. In the estimates I report, I will assume that the return to schooling is an increase of 8% per year of schooling completed over an estimated average earning for labor in the country. Modest variation in the returns to schooling will not be sufficient to reverse the conclusions regarding whether the interventions are expected to pay for themselves.

I assume a 45 year work career in my estimates. In my projection of lifetime earnings, I am implicitly assuming that the value of time outside the market rises in value at the same rate as the value of time in the labor market. This assumption is particularly suspect in the cases where women are not commonly found in the labor market as in the Pakistan example. On the other hand, I do not make any adjustments for possible external benefits of women's education which

would create a bias in the other direction, and I should further note that the literature has not demonstrated that returns to girls' schooling are substantially lower than are returns to boys' schooling.

I provide summary information on benefit-costs ratios for many of the programs mentioned above. Some of these are compiled personally while others take ratios developed by the authors of those studies. It is important to emphasize that some programs may have very high ratios and yet be only applicable to certain areas and not others. For example, the voucher program that appears to have been successful in urban areas of Colombia could not be implemented in rural areas without preexisting private schools.

Finally, these estimates concentrate on the narrow returns to a year of schooling. This can be misleading in either direction. The reported benefit cost ratios will be biased downward if increased years of schooling reduced fertility behavior of young women, as was found in Colombia and (less definitively) in Mexico. Incorporating the benefits of delayed fertility increases the benefit cost ratios substantially, from 3.3 to 25.6 in the case of the Colombia PACES program (Knowles and Behrman, 2005). On the other hand, it is possible that increased time in school will not have the same impact on lifetime earnings if the schools are of atypically poor quality. For example, the results of cognitive tests of the Kenya experiments found that even though students spent more time in school, their performance on cognitive exams did not improve significantly. The increased enrollments in Uganda apparently were only modestly accommodated by increased school materials and so school quality suffered for all children. That raises concerns that these programs did not permanently increase the children's lifetime human capital stock. My view is that the tie between years of schooling and lifetime earnings is sufficiently strong that the benefits will yet become apparent as these children age, even if they do not show immediately. It should be emphasized that in most of the cases summarized in Table 3, improved cognitive ability did accompany the increased time in school when both were measured.

Estimated benefit-cost ratios for discount rates 3% and 5% are reported in Table 3. I use the 5% discount rate because it was the rate most commonly used in the cited literature. I report the estimates of other authors when I assess that they are more carefully done than anything I could do from reading the paper.

It is immediately clear that these benefit cost ratios are large and some extremely large. The largest returns are for very low cost interventions in areas with very clearly targeted beneficiaries such as the 92% with worm infestation in Kenya or the poor children who lacked tutors in India. The very high benefit-cost ratios are attributable both to the selection of very low cost interventions and to the siting of these interventions in settings where they would be disproportionately successful. In contrast, more broadly distributed interventions such as the conditional cash transfer programs are less selective in terms of the places where the intervention is tried and the benefits are more modest as a result.

The largest benefit-cost ratios are interventions early in the child's life because the interventions are less costly and the opportunity costs are less. However, relatively modest costs resulted in sizable returns in the Colombia PACES program and in the iron supplement aimed at secondary students. Both did not involve building more schools or adding capacity, a key to keeping cost low relative to benefits.

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Table 1: Reasons for not attaining Universal Primary Education

Region	Percent Never Enrolled	Percent Not Completing Grade 5
West, Central Africa	43.7	58.4
East, South Africa	17.1	44.3
South Asia	27.9	40.3
Central America	9.7	34.4
MENA	17.8	30.2
East Asia	9.1	26.5
South America	1.9	16.6
Europe, Central Asia	0.5	0.8
Source: Pritchett, 2004		

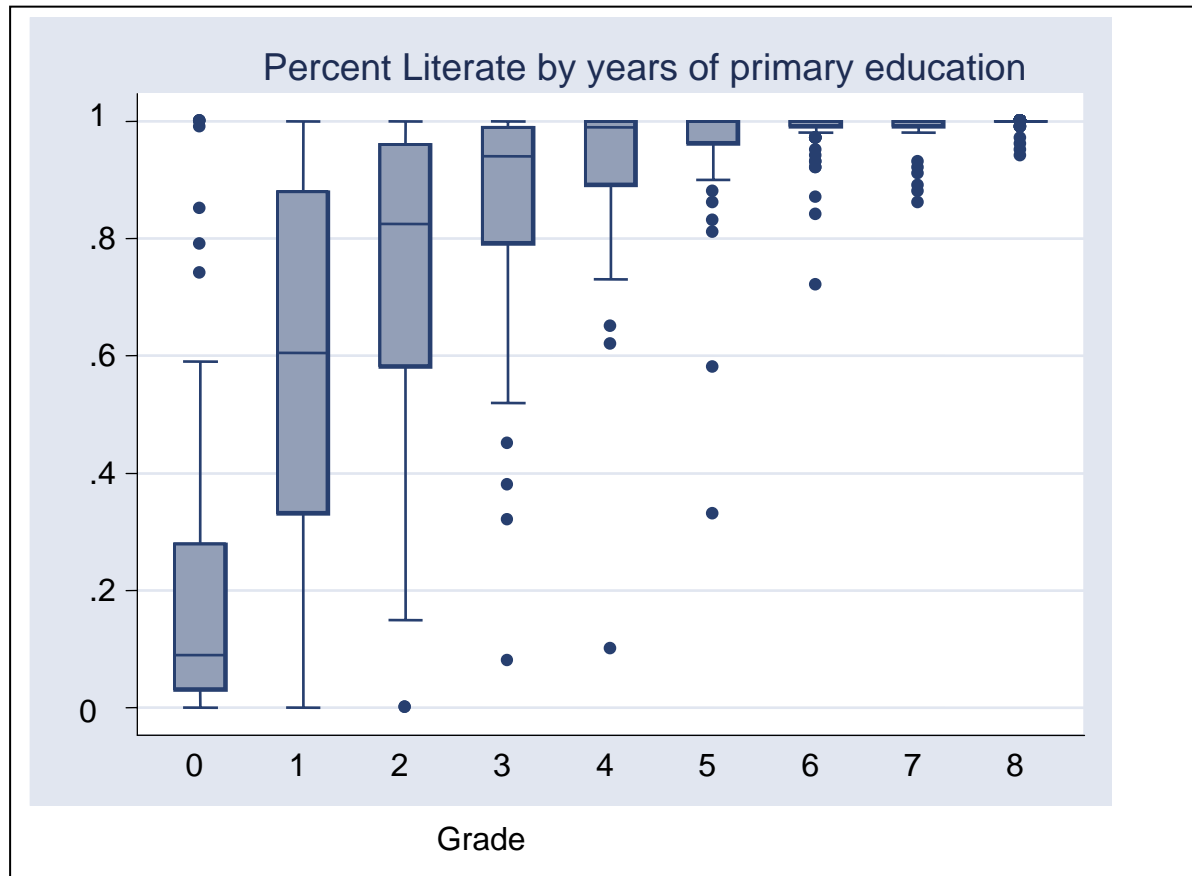
Table 2: Reasons for Not Attending School in Urban and Rural Populations, by World Region

	All World Regions		Sub-Saharan Africa		North Africa & Middle East		Central Asia & Europe		South & East Asia		Latin America & Caribbean	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Work outside the home	7.4	4.2	3.3	1.8	0.7	0.7	9.3	7.8	8.7	4.4	18.3	10.0
Housework	7.3	11.5	5.3	7.9	5.6	9.9	6.3	9.3	10.7	19.7	11.7	17.9
Inadequate school supply	1.9	4.9	1.8	3.2	2.0	6.2	1.3	3.0	1.7	2.7	2.6	10.8
Poverty	18.2	18.1	24.1	23.9	4.6	3.4	1.3	0.8	24.2	26.3	11.9	11.3
Lack of interest	47.3	44.0	45.2	42.7	76.6	69.4	65.0	58.2	49.3	41.7	34.0	33.5
Health reasons	6.3	5.0	7.9	7.6	1.2	0.5	0.7	0.4	1.5	0.9	9.4	4.2
Others	11.5	12.3	12.4	12.9	9.3	9.9	16.0	20.5	4.0	4.3	12.1	12.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source- Computations provided the author by Elizabeth King based on data from Demographic and Health Surveys, various year

Table 3: Overview Table of Benefit-Cost ratios from various efforts to reduce illiteracy						
	Low Discount (3%)			High Discount (5%)		
	Benefit	Cost	BCR	Benefit	Cost	BCR
Health and Nutrition Programs						
Bolivia PIDI: preschool and nutrition ^a	\$5,107	\$1,394	3.66	\$3,230	\$1,301	2.48
Kenya: deworming ^b	2977!	3.5!	850	2188!	3.5!	625
Kenya: preschool and nutrition ^c	2977!	\$29.13	102	2188!	\$28.6!	76.5
Iron supplements to secondary schoolers ^d	\$474!	\$10.49!	45.2	\$330	\$10.29!	32.1
Scholarship/Voucher Programs						
Colombia: PACES secondary school urban voucher ^d	\$4,287	\$971	4.41	\$3,152	\$953	3.31
Pakistan urban girls' scholarship ^e	\$7,011!	225!	31	\$4,866!	\$223!	21.8
	\$7,011!	\$452!	15.5	\$4,866!	\$448!	10.9
Pakistan rural girls' scholarship ^e	\$5842!	253!	23	\$4055!	\$250!	16
	\$5842!	\$758!	7.7	\$4055!	\$751!	5.4
India <i>balsakhis</i> tutorial program ^f	\$8173!	\$9.85!	830	\$6,008	\$9.76!	616
Uganda tuition waiver ^g	\$3678!	\$140!	26.3	\$2,703!	\$140!	19.3
Conditional Cash Transfers						
Mexico Progressa ^h	\$16086!	\$2585!	6.2	\$11,163!	\$2535!	4.4
Nicaragua: RED ⁱ	\$6,003	\$509!	11.8	\$4,412	\$509!	8.67
	\$6,003	\$1574!	3.80	\$4,412	\$1574!	2.80
^a Behrman, Cheng and Todd(2004)#						
^b Miguel and Kremer (2004)*						
^c Vermeersch and Kremer (2005)*						
^d Knowles and Behrman(2005)#						
^e Alderman, Kim and Orazem (2003)						
^f Banerjee, Cole, Duflo and Linden (2003)						
^g Deininger (2003)**						
^h Schultz(2004)						
ⁱ Maluccio (2006)						
#Benefit cost ratio computed in the cited paper.						
*Cost per year of schooling reported in M.I.T. Abdul Latif Jameel Poverty Action Lab. (2005)						
!Per year of schooling induced						
**Assumes that the government expands school space to accommodate additional students at the average cost per primary student						

Figure 1: Distribution of self-reported literacy by grade attainment for youth aged 15-24, various countries



Source: Authors compilation of summary data from 73 household surveys spanning 57 developing countries provided by Claudio Montenegro of the World Bank