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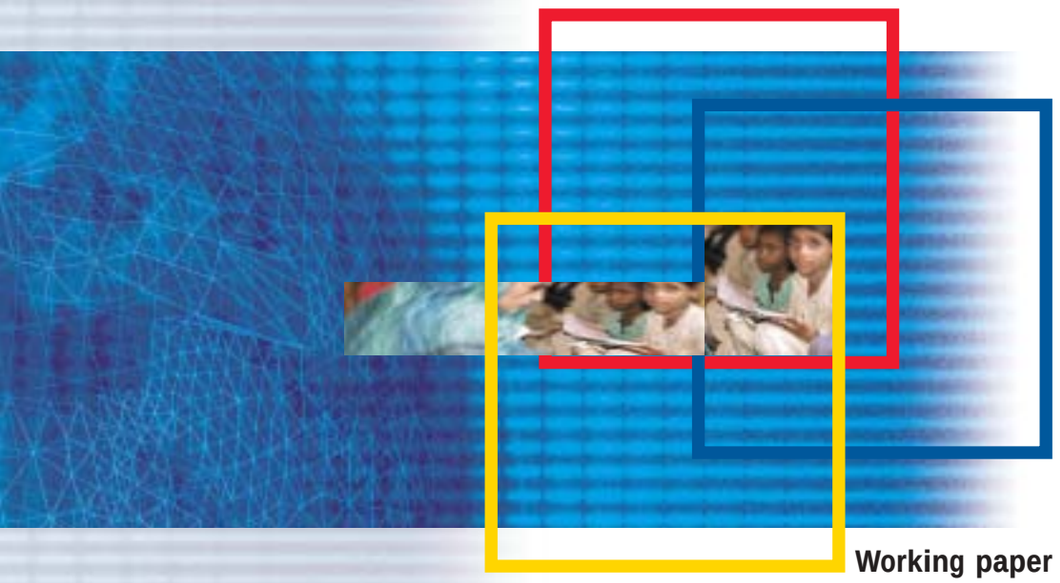

Working paper

Costs and benefits of education to replace child labour

Peter Matz

International Programme on the Elimination of Child Labour (IPEC)

ILO/IPEC Working Paper

Costs and benefits of education to replace child labour

Research paper in conjunction with the ILO-IPEC Study on the Costs and Benefits of the Elimination of Child Labour.

by

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International Labour Office
International Programme on the Elimination of Child Labour

October 2002

ISBN 92-2-113624-8

First published 2003

Funding for this report was provided by the United States Department of Labor

Printed in Switzerland SIT

The views and interpretations in this report are those of the author and do not necessarily reflect those of the ILO.

The author would like to thank the following individuals for their advice and support: Mathieu Brossard, Peter Buckland, Enrique Delamonica, Peter Dorman, Sarah Gormly, Lena Lavinas, Oliver Matz, Geir Myrstad and William Ratteree.

Contents

1. Introduction 1

2. School attendance and child labour 2

   2.1. Does schooling displace child labour? 2

   2.2. The "school versus work" decision of the household 3

   2.3. Education as a mitigating factor 4

3. Costs 4

   3.1. The supply of primary education 5

      3.1.1 Recurrent expenditure 5

      3.1.2 Quality improvement 6

      3.1.3 Capital spending 11

      3.1.4 Summing up 12

   3.2. The supply of secondary education 12

   3.3. The demand for education: Income transfer programmes 14

   3.4. Disparities 16

   3.5. Total costs 17

4. Benefits 18

   4.1. Micro-level benefits 18

   4.2. Macro-level benefits 20

   4.3. Monetizing the benefits 21

5. Conclusion 22

Annex: Tables 25

Bibliography 61

1. Introduction

There is today a vastly increased commitment of governments and the social partners to take comprehensive action against child labour. Against this background, work on the economic implications of action against child labour is of urgent importance. Although many studies have examined the measures necessary to combat child labour, no comprehensive research has yet been carried out analysing the economic costs and benefits of the effective elimination of child labour. In particular, there is yet little information on the resources required for such an undertaking and how to allocate those resources.

This working paper is a component of an ILO-IPEC project to calculate the economic costs and benefits of the elimination of child labour. An earlier version of this paper was used as a guideline document by researchers in the eight countries where field research was carried out. The findings presented in this paper complement their findings as an input for the final project report (forthcoming).[1]

Universal education up to the minimum age for admission to employment is one of the key measures to eliminate child labour. It is an important means of protecting children who are especially vulnerable to child labour exploitation because of poverty, or other difficult socio-economic conditions. Children who have access to education learn skills and have better chances of finding suitable employment when they get older. They become aware of their rights and are less vulnerable to accepting hazardous and exploitative work (Haspels et al. 1999).

It may also be assumed that education to replace child labour makes economic sense, as many long-term macro-economic benefits can be associated. Yet, it is initially a costly endeavour, encompassing both demand and supply side. Since costs are borne up front and benefits accrue over time, the provision of universal education to replace child labour can be thought of as an investment, and this working paper is designed to provide an approximation of its rate of return.

In estimating the costs of supplying schooling to all children, we consider recurrent costs, the cost of quality improvements, and capital improvements.[2] On the demand side, we estimate the cost to households of sending children to school and calculate the amount of income that if transferred to the household, would allow them to send children to school. In estimating the benefits of universal schooling, we consider the increase of GDP associated with the additional years of average schooling of the population.

This working paper does not enter into the debate whether and how the cost of quality improvements could be offset by efficiency savings and cost-shifting measures.[3] While this discussion is beyond the scope of this paper, it must be acknowledged that education is

[1] Some sections of this paper focus on different aspects and apply slightly different methodologies than the country studies. For example, this paper relies heavily on UNESCO data, whereas the country studies used to a large extent national household surveys and other data sources. Another example is the calculation of the benefits of education (chapter 4.3); the country studies used Mincerian coefficients rather than the formula proposed in this paper.

[2] It should be noted that capital expenditures differ from recurrent costs, even though both are calculated on an annual basis in this paper. In the long run (i.e. once universal education has been achieved), the marginal capital costs would be much lower, while the recurrent costs would remain constant at the level of 2015.

[3] See, for example, Mehrotra/Vandemoortele 1997.

interlinked with other aspects of society, and the cost of education depends on the effectiveness of governance, the extent of social problems that impede schooling, and other factors. We take as a baseline the world as it is, and we estimate what it would cost to reach certain education objectives holding constant the other factors that affect it.

The working paper is organized in the following way: After examining the hypothesized link between schooling and child labour (section 2), the paper provides a net economic analysis of the costs (section 3) and benefits (section 4) associated with universal primary education and secondary education up to the minimum age for work. At the end, the main findings are summarized and the need for further research is identified (section 5).

2. School attendance and child labour

Child labour cannot be approached separately from the issue of education. It would be difficult to effectively combat child labour without the support of an open, competent and attractive school system. Hence, the ILO's Minimum Age Convention, 1973 (No.138) explicitly links the minimum age for admission to employment and work with the age of completion of compulsory schooling. It should not be less than 15, or 14 in the case of countries "whose economy and educational facilities are insufficiently developed" (art. 2).

2.1. Does schooling displace child labour?

While education is widely acknowledged to be both intrinsically important and to deliver many benefits, it is also the most compelling potential alternative to full-time work and should therefore be regarded as a powerful tool for removing children from work. Hence, this paper is based on the hypothesis that schooling of acceptable quality displaces child labour.

To be sure, the relationship between school attendance and child labour is complex. In reality, schooling and child labour are not always mutually exclusive, and there are many children who attend school and work (in fact, some may work in order to go to school), and some who neither work nor go to school.

Nonetheless, child labour and school attendance are linked, even though existing empirical evidence regarding the scope of this linkage is, so far, rather sparse. For example, studies of Tanzanian plantations found that the children working were those who had dropped out of school (ILO-IPEC 2001). In Ghana, a working child experiences on average only 50-60 per cent of the schooling of the non-working child (Ray 2000). Studies in Latin America also reveal a high degree of exclusion between school and work. In Peru, 67 per cent of working children are outside of formal education. In Brazil, the level of formal education is lower, the higher the rate of labour activity (Salazar/Glasinovich 1996).

Whereas the above examples indicate that child labour has the potential to displace schooling, there is reason to believe that the reverse causal relationship also exists. For example, in Turkey, school attendance seems to be the major deterrent of market work. When children enrolled at school are considered, only 4 per cent were found to be employed. While 22.7 per cent were found to be engaged in some sort of domestic work, 73.3 per cent are found not to be involved in any kind of activity (they are assumed to be enjoying 'pure' leisure). When children who are not enrolled at school are considered, a totally different picture emerges: 39.2 per cent of children are found to be employed

(market work), 32 per cent involved in domestic work and only 28.8 per cent enjoying pure leisure (ILO-IPEC 1994).

Generally speaking, regular school attendance makes bonded labour and many other forms of exploitation of children virtually impossible. It also rules out the employment of children in hazardous industries and occupations that require presence at the work site for a full shift.

2.2. The "school versus work" decision of the household

The decision to enrol a child in school is the result of a household's evaluation of the costs and benefits associated with schooling. The expected returns to education are therefore an important factor. For example, the reduction of child labour in Vietnam between 1992 and 1998 can be attributed in part to the increase in returns to education that occurred over the period considered (Cigno/Rosati 2001). However, the household's decision will also depend on the beliefs about the profitability of schooling relative to other activities, its ability to afford schooling, and its tastes.

Thus, there are several reasons why a household may decide to have a child work rather than sending it to school. In the first place, the true benefits of schooling may often not be known to families, and even if they are, assessment of their value, for comparison with private costs, is not an easy task.

Moreover, there is a positive association between child labour hours and household poverty. According to the "luxury axiom" (Basu and Van 1998), parents send their children to work only if the income from non-child labour falls to very low levels. Ray (2001) found evidence for this hypothesis for boys in Pakistan.

The pull away from schooling and towards work in poor households is compounded by a Principal-Agent[4] interaction problem linked to the costs and benefits of education. The benefits of going to school are mainly long-term, and will flow mainly to the child, rather than the parent. On the other hand, the costs have to be borne by the parent, and those costs have to be borne in the short run.

High costs of schooling can serve to push children into the labour market to enable them to afford school. Given the deficiencies in the public education system in Ecuador, one in ten working children studies in a private school (Brown et al. 2001). High cost can also pull children away from school as they cannot afford it, as was found to be the case in Ghana (Canagarajah/Coulombe 1997).

Lamentably, there is a lack of credit markets for education in developing countries[5] to alleviate this problem (Psacharopoulos 1997, Al-Samarrai 2000). A comparative study of child labour and schooling in Africa found that one way to reduce child labour and increase incentives to keep the children in the educational system is to improve the access

[4] In the Principal-Agent situation, the principal wants to induce the agent to take some action that is costly to the agent. In the "school versus work" context, the child wants the parent to invest in the child's education, and this is costly to the parent.

[5] Even though it may be argued that there is also a lack of credit markets for education in developed countries, these countries often have remedial government programs to address the shortcomings of the private market.

to credit (Canagarajah/Nielsen 1999). Instead, we propose income transfer programmes in order to stimulate demand (section 3.3.)

While many studies argue that social as well as private returns to education are higher for females, in reality parents may perceive these returns as low due to such factors as limited employment opportunities, low wages for females, early marriage, and the dowry system, as a recent study in Andhra Pradesh, India, asserts (Ota 2001). However, the findings of this study suggest also that children's motivation to be educated does make a difference and that economic incentives are not the only reason that parents provide their children with education.

2.3. Education as a mitigating factor

Adult literacy can be useful in reducing child labour indirectly. In Ghana, fathers with relatively high levels of education have a significant negative influence on the likelihood of the child working (Canagarajah/Coulombe 1997). The positive role that increasing adult education can play in influencing child labour and child schooling was also confirmed in Pakistan and Peru (Ray 2001), and in India and Vietnam (Rosati/Tzannatos 2000).

It should be noted that commonly cited "demand-side" obstacles to school attendance can often be overcome by the supply of good quality and free education in the neighbourhood (Swaminathan/Rawal 1999). One of the main reasons for the prevalence of high child labour participation rates and low school enrolment rates in Ghana is the perceived low quality of schooling, and its apparent lack of relevance to the child's needs as viewed by the parents (Ray 2000). Likewise, in his analysis of child labour and child schooling in Peru and Pakistan, Ray (2001) concludes that good schools can do a lot in reducing child labour in South Asia and in breaking the strong link that exists between poverty and child labour hours.

3. Costs

In order to arrive at estimates of the cost of providing universal primary and lower secondary education to all children aged 6 to 14, we need to determine the current number of in-school versus out-of-school children. The best measure would be the attendance rate. Unfortunately, it is only measured in a few countries. Therefore, the net enrolment ratio (NER) appears to be the second-best indicator. It measures the proportion of children of school age (in this case, ages 6-14) who are enrolled in the grades corresponding to this age cohort.

In line with the timeframe of the overall IPEC study of the costs and benefits of eliminating child labour,[6] we will estimate the minimum global cost of reaching NER 100 on the primary level by 2015,[7] and on the lower secondary level by 2020. It is assumed that these targets will be reached by increasing the annual spending on education by a

[6] In the Methodological Framework of the study, the progressive elimination of child labour is modelled as a series of waves, each of which is assumed to last five years. The transferral of working children of primary school age should take place during waves one to three (2001 to 2015), and the transferral of working children of lower secondary school age during waves two to four (2006 to 2020).

[7] This goal is in line with the Dakar Framework of Action adopted at the World Education Forum 2000. However, the 2001 Monitoring Report on Education for All warns that 32 countries are at grave risk of failing to enrol all children in primary school by 2015 (UNESCO 2001).

country-specific amount. This implies, of course, that demographic changes will have to be taken into account.

The additional cost of supplying quality schooling to all children will be estimated by adding, on a country-by-country basis, the necessary recurrent expenditure (including quality improvements) and capital expenditure required to put all out-of-school children aged 6-14 into primary and lower secondary schools.

While these figures represent the supply side of education, it will also be necessary to take the demand side into consideration. School attendance may be too expensive for low-income households due to its direct costs, such as for books and uniforms, and/or the opportunity costs associated with the foregone benefits of child labour. Consequently, some form of monetary transfers to low-income households may be necessary to defray the direct and indirect costs of education, which will be estimated and added to the total. [8]

Therefore, the objective of this section is to estimate the costs of providing universal education in the following way:

Total additional costs (3.5.) = additional expenditure on the supply of primary education (3.1.) + additional expenditure on the supply of lower secondary education (3.2.) + additional expenditure on demand-side financing (3.3.)

3.1. The supply of primary education

The required additional expenditure to ensure the supply of primary schooling of acceptable quality has three subcomponents, which will be calculated in the following:

(1) recurrent expenditure to achieve NER 100;

(2) expenditure on quality;

(3) capital expenditure.

3.1.1 Recurrent expenditure

The additional recurrent costs of providing universal primary education to accommodate all children in schools by 2015 can be calculated by estimating the yearly intake of additional pupils between 2001 and 2015, multiplied with the unit costs (i.e. current spending on education per capita) of one year of education. This scenario assumes that expenditures per pupil will remain constant from now until 2015. The country-by-country results are given in table 1. [9] Added up, they amount to an additional expenditure per year between 2001 and 2015 of:

(a) $14.03 billion

[8] Strictly speaking, these transfer expenses are not social costs in conventional economic theory. Therefore, they are distinct from the other costs considered in this paper, which are real resource costs.

[9] It should be noted that the approach taken is at best approximate at the level of individual countries. For instance, Saudi Arabia accounts for $3.67 billion additional required spending due to a high average expenditure coupled with a steep increase in pupils. This figure is higher than the expenditure for Latin America and South Asia combined, which is clearly not very realistic.

Of this sum, over 40 per cent ($5.87 billion) would have to be spent in North Africa and the Middle East. In sub-Saharan Africa, where the growth of pupil numbers will be even larger than in North Africa and the Middle East, spending would have to be increased by an annual average of $2.71 billion, i.e. by more than 90 per cent between today and 2015, in order to meet demand. Latin America would require an annual increase in spending of $2 billion (almost half of this amount in Brazil), East Asia and the Pacific $1.27 billion, South Asia $1.65 billion, and Eastern Europe and Central Asia $0.1 billion, respectively (Brossard/Gacougnolle 2001).

However, there are several limitations to this procedure of estimation. First, there may be *economies of scale* involved, i.e. the (average) unit costs may decrease when the (absolute) number of school children increases.[10] Conversely, the unit costs may also increase, because educating marginalized children is likely to be more costly than educating those who are already in school. For lack of reliable data, it will be assumed that these two tendencies level out (Delamonica et al. 2001).

Second, and more important, the unit costs will increase if we want to improve the *quality of education*, which is reportedly poor in many countries. Third, the costs of preventing a deterioration of the education system due to shocks, especially *HIV/AIDS* in sub-Saharan Africa, need to be included in the calculation. Fourth, *capital expenditure* required to accommodate the additional number of pupils must be added to the costs. These objections make it necessary to refine the above calculation, which will be attempted in the following.

3.1.2 Quality improvement

Surveys have shown that the current quality of education is not sufficient in many countries where child labour is prevalent. Children will not be attracted to or retained in the education system unless they receive schooling of acceptable quality.[11] Consequently, the cost of reaching universal primary education cannot be disassociated from the cost of improving quality. Moreover, only schooling of satisfactory value will produce the benefits discussed in section 4, such as increased productivity, improved health, and lower infant mortality, among others.

How can the quality of education be captured? UNICEF states: “Whether schooling is of high quality will be measured by the readiness of the child to succeed; the content in certain areas such as literacy, numeracy, life skills and peace education; the level of teacher preparation and the nature of the teaching-learning itself; whether the learning environment is child-centred, gender-sensitive and community-based; and whether students attain nationally defined competencies in literacy, numeracy and life skills.” (UNICEF 2000b)

Assessing national education systems on a country-by-country basis in this light is clearly beyond the scope of this paper. Rather, we assume that quality education needs to fulfil two purposes: it needs to be attractive enough to secure NER 100, and it needs to be able to generate the benefits discussed in section 4.

[10] It may be for this reason that unit costs of primary education as a proportion of GNP per capita are higher in sub-Saharan Africa than in Asia, as there is a wider coverage in the latter region.

[11] In fact, poor schooling may even encourage work, as Heady (2000) shows. In Ghana, children did not want to return to school because they had had a bad experience there, and their parents were inclined to get them to work rather than let them remain idle.

In order to measure such quality education, two alternative ways of estimating the costs of upgrading recurrent expenditure will be proposed. [12] The first one is looking at the required key inputs, which is a relatively complex but rather reliable method. The second approach is focusing on the outcome; it needs only one indicator, which makes the calculation easier but tends to oversimplify the results. [13]

(a) Inputs

Possible quality-enhancing interventions include (among others):

- reducing pupil-teacher ratios;
- improving teacher training;
- employing more female teachers to increase girls' enrolment;
- providing more teaching materials and textbooks;
- increasing teachers' real wages to boost morale;
- introducing more participatory school management;
- adjusting the school calendar to local circumstances;
- adapting the curriculum to local needs; and
- providing instruction in local languages.

The most critical variables appear to be the qualification, experience, and educational level of teachers, and the availability of textbooks (Colclough/Lewin 1993). However, the "quantification" of quality aspects of education is extremely difficult, and there is no agreement on the "right mix" of inputs. Unlike in the case of an industry's production function, the inputs to the schooling process are much less homogeneous (teachers, goals, pupils), and the characteristics of the outputs (more schooled pupils) cannot be unambiguously compared with earlier inputs for value-added purposes (Colclough 1998). Nevertheless, it is important to find a way to adjust the unit costs to incorporate the cost of quality education. [14]

Brossard/Cacougnolle (2001, forthcoming) suggest a decrease in pupil/teacher ratio by 10 per cent as a crude measure of improvement in education. However, this approach

[12] Another possible "shortcut" would be to base calculations on a recommended proportion of GNP to be spent on education. For example, Colclough and Al-Samarrai (2000) find that an "affordable" allocation of public expenditure on primary schooling would be around 3% of GNP.

[13] Clearly, there is need for improved data gathering on the quality of education. The OECD's Programme for International Student Assessment (PISA), which collected information on the achievements of 15-year olds in 32 countries in its 2000 survey, may have set an important precedent to be followed on a global scale (Schleicher and Tamassia 2002).

[14] The adjustment applies also to current expenditure, because the quality of education has to be improved for all pupils, including those who are already enrolled.

may overestimate the significance of pupil/teacher ratios for improving quality.[15] Instead, it appears that expenditures on textbooks and teacher training are more likely to affect student outcomes significantly than expenditures for reducing class size. For example, a study in Kenya found that expenditures for textbooks and uniforms reduced dropout rates, even though class size increased (Betts 1999).

A different approach by Delamonica et al. (2001) is based on the experience of developed countries that at least 15 per cent of recurrent expenditure should be available for non-wage inputs. We are adopting this approach, considering also the pupil-teacher ratio as a necessary, albeit not sufficient element of improving the quality of education.

Non-wage recurrent expenditure

Material school inputs are related to achievement in developing countries (Fuller 1987), but in a 1999 international assessment, over 80 per cent of students in several countries reported "a lot of problems" with the availability of learning materials (OECD/UNESCO 2001). At least until minimum thresholds have been exceeded, additional learning materials are a priority for improving school quality (Colclough/Lewin 1993, Wolff et al. 1994). One way to calculate the costs of improving quality, then, would be based on the recommended minimum expenditure for certain non-salary items. For example, in sub-Saharan Africa, the latter is suggested to be $5 per pupil per year, comprising $1.50 on textbooks, $1.50 on writing materials, and $2 on teacher training (Colclough/Lewin 1993). However, it appears difficult, on the whole, to derive global extrapolations from this figure or come up with similar estimates for other quality-enhancing measures (Fuller 1987).

Instead, using data from developed countries that suggests that at least 15 per cent should be available for non-wage inputs, the unit costs are adjusted according to the current gap for this indicator (table 2). While the 15 per cent rule of thumb may appear as an overestimate compared to the current low share of non-wage expenditure in developing countries, this figure is meant to cover a wide range of quality issues, including the costs of teacher training, which is often not included in primary education statistics. The relatively high percentage seems justified also by the fact that the lower the per capita income of a country is, the greater are the effects of school and teacher quality on student achievement (Colclough/Lewin 1993).

Table 2 shows that an additional $7.44 billion would be required globally for non-wage inputs to ensure quality education. A large part of this sum ($3.34 billion) would have to be spent annually in the Middle East and North Africa.[16] The remaining additional expenditure would be distributed rather evenly among the other regions of the world: Latin America and the Caribbean $1.51 billion (over half of which is attributed to Argentina), sub-Saharan Africa $0.98 billion, East Asia and the Pacific $0.93 billion, and South Asia $0.67 billion.

However, two notes of caution are in order. First, many countries, among them some of the most populous ones, did not report the percentage of total personnel expenses relative to current expenditure. Consequently, the required annual additional expenditure

[15] For example, the fact that pupil teacher ratios in Africa declined during the 1980s was not symptomatic of an improvement in quality, but merely indicated the pressure felt by governments to maintain teacher employment at a time of declining opportunities in the rest of the economy (Mehrotra 1998).

[16] As in table 1, the result for Saudi Arabia is extremely high (due to the same reasons as described before).

for these countries is estimated on the basis of a regional average and may thus be flawed, in one direction or the other. Second, even though some countries report a low ratio of personnel expenses, this does not necessarily mean that they spend a lot on material inputs, as "other expenditure" is often spent on welfare services or scholarships or is not further specified in country reports. Therefore, the figures for the required additional expenditure in the right column of table 2 might be underestimates, as can be seen most clearly in the case of Eastern Europe and Central Asia where the figure amounts to less than $14,000.

Pupil-teacher ratio

Efficient pupil-teacher ratios depend much on teacher qualifications, teacher skills, and teacher experience, and as in the case of other issues of education quality, it is difficult to assess the effectiveness of different policy options (OECD/UNESCO 2001). Nonetheless, pupil-teacher ratios of 40 seem to be reasonable for most developing countries (Mehrotra/Vandemoortele 1997). Stating this, it is assumed that countries will be able to relocate teachers in a way that decreases the overcrowding of some schools (e.g. in low-income urban areas) by increasing the class size in others (e.g. affluent urban areas). [17] Hence, we will list the countries that need to make investments to decrease the pupil-teacher ratio to a level of 40, based on the latest available data for pupil-teacher ratios and on the predicted size of the school-age population in 2015 (table 3).

The total of $557 million incurred in 17 countries in sub-Saharan Africa and six countries in South Asia is an estimate of the average annual investment required for decreasing, if need be, the pupil-teacher ratio to 40. In essence, this should be done by hiring more teachers. [18]

The impact of HIV/AIDS

In many sub-Saharan African countries, HIV/AIDS is taking a massive toll on education systems, which cannot be ignored. In the most heavily affected countries, the costs of preventing a deterioration of quality, particularly due to teachers' illness and death will be substantial. The gravity of the situation will be illustrated by a few examples.

Recent data from Botswana documents a mortality rate of 12.1 per cent for males and 7.6 per cent for females among permanent primary teaching staff between May 1999 and April 2000 (UNICEF, Draft 2001). In Cote d'Ivoire, on average, five primary school teachers die on each school day due to AIDS. While teachers are supposed to teach 28 weeks per school year, those who are living with HIV/AIDS teach only during 4 weeks. In Zimbabwe, 1,403 teachers died in 1999. Zambia lost 1,331 teachers in 1998, due to a mortality rate among teachers that is 70 per cent higher than for the general adult population (World Bank 2000).

In the education system in Mozambique, the AIDS epidemic is projected to result in the loss of some 17 per cent of its personnel over the period 2000-2010. Across all levels,

[17] In order words, we assume that pupil-teacher ratios, which are a mathematical abstraction, reflect the actual class size in all schools in a given country. However, in reality this is often not the case, and many ministries and teacher employers may find it extremely difficult to relocate teachers to disadvantaged schools, especially in rural areas.

[18] Pupil-teacher ratios can also be brought down by increasing the workload of teachers or by lowering the time of classroom instruction for students. These strategies will not be considered, as they are likely to have a negative impact on quality. In countries with gender enrolment gaps (see section 3.4.), there should be preference toward hiring more female teachers, as there is a correlation between the amount of female teachers and girls' enrolment (UNICEF 2000a*;* Watkins 2000).

some 9,200 teachers will die and an estimated 123 senior managers, planners and administrators will be lost. Additional costs are expected to exceed $110 million, representing an additional annual cost of 6.9 per cent just due to HIV/AIDS (UNDP 2000). In Swaziland, the theoretical cost of hiring and training teachers to replace those lost to AIDS is estimated to reach $233 million by 2016 – an unsupportable cost that exceeds the total 1998-99 government budget for all goods and services (UNAIDS 2000).

Overall, the World Bank (2002) estimates that HIV/AIDS will add between $450 million and $550 million per year to the cost of achieving Education for All in 33 African countries studied. In this paper, we adopt the minimum figure, i.e. $450 million.

(b) Outcomes

Alternatively, one can try to assess the quality of education based on the "output". The World Education Forum in Dakar defined the goal of quality education as "tapping each person's talents and potential (…) so that they can improve their lives and transform their societies" (UNESCO 2000b). Such an accomplishment would be inadequately measured by basic literacy and numeracy, because these indicators are, in isolation, insufficient foundations for further learning, which requires the ability to apply basic skills to new and more complex problems (Lockheed et al. 1991). While test scores related to cognitive skills might be considered a better indicator reflecting attainment, global data measuring such skills is not available.

Data are more readily available for the "coefficient of efficiency", a synthetic indicator measuring the internal efficiency of an education system, reflecting the combined impact on efficiency of repetition and dropout.[19] Table 4 presents this coefficient. Since the quality of schooling affects the length of time necessary to acquire a desired amount of human capital and thus makes an impact on the overall cost of schooling, we assume that wastage is to some extent linked to the poor quality of education. This relationship is confirmed by several country studies.[20] Consequently, the coefficient of efficiency will be translated into a factor to be multiplied with the recurrent expenditure on primary education.

The global result of this calculation is an annual additional investment of $16.57 billion, which is twice the previous estimate for quality improvement based on non-personnel spending.

On the one hand, besides the convenient global availability of data, the advantage of this approach is that it avoids flawed decisions about the right mix of inputs. In assigning a recommended increase in spending to improve quality, it is assumed that decisions about

[19] The coefficient of efficiency refers to the ideal number of pupil-years required to produce graduates from a given cohort (in the absence of repetition and dropout) as a percentage of the actual number of pupil-years spent to produce the same number of graduates (World Bank 2001). The ideal value is 100%, corresponding to a situation in which all pupils complete the school cycle, neither repeating grades nor dropping out.

[20] For example, in Brazil, shortcomings within the school system and complaints about its quality and accessibility are among the reasons most mentioned for dropping out (Rizzini et al. in Salazar 1998). Likewise, in Colombia, the poor quality and often irrelevant curricula compel students to abandon their studies and enter prematurely into the working world (Turbay and Acuna in Salazar 1998). In Mozambique, an education that separates the child from the language spoken in his family is said to be one of the main causes of repeating years and dropping out of school (Mozambique UNDP 2000). In India, the low quality of school infrastructure and poor learning environment affects school attendance and retention (Swaminathan/Rawal 1999).

the choice of quality-enhancing measures will be taken on either a national, district, or local level. [21]

On the other hand, there are three important downsides to this approach. First, it must be noted that the universal factor that translates the coefficient of efficiency into additional required expenditure is arbitrary and that it can be taken as reliable only in determining the relative, not the absolute amount that a given country should spend. Second, it cannot be excluded that in some countries, issues other than quality are the main causes of repetition and dropout. Third, data for countries that have introduced automatic promotion distorts the picture, as these countries are likely to have a higher indicator than other countries with a comparable level of quality.

Weighing the advantages and disadvantages of the "input" and the "outcomes" approach against each other, we opt for the former, keeping the latter in store as a possible alternative, should doubts about the quality or availability of data arise.

Therefore, we add the costs for non-wage inputs, additional teachers, and HIV/AIDS-related to arrive at the following sum of expenditure for quality:

(b) $7.44 billion + $0.56 billion + $0.45 billion = $8.45 billion

Thus, global quality improvement of education demands an additional annual investment of more than half the $14 billion initially determined as necessary to put all out-of school children worldwide into elementary schools.

There is evidence from many countries that both the quality and the quantity of education [22] are considerably affected by investment in facilities, which brings us to the issue of capital expenditure.

3.1.3 Capital spending

In countries where the gross enrolment ratio is above 100, it can be assumed that there is place enough in schools for achieving the goal of universal coverage. In some other countries, recent capital expenditure seems sufficient due to an expected decline in the number of births. The annual enrolment growth required to achieve GER of 100 by 2015 exceeds recent trends in 26 countries, listed in table 5a. Roughly 15 per cent of total education expenditure in these countries is devoted to capital investment. Using the country-by-country recurrent unit cost as a basis, Delamonica et al. (2001) estimate the required annual increase in capital expenditure for the different regions, shown in table 5b. The capital expenditure required per year is:

(c) $647 million

More than 90 per cent of this sum would have to be spent in sub-Saharan Africa.

[21] In any case, Hough's (1997) assumption that cost-shifting measures would lead to quality improvement as well as net savings does not seem very realistic.

[22] Research in Brazil indicated that allowing class size to "float upwards" and using the savings for additional classroom resources might improve students' rate of learning without increasing overall expenditure. A detailed statistical study of test scores in Ghana revealed that a number of school traits are strongly correlated with gains in math and reading scores. The provision of blackboards in classrooms and the repairs of leaky roofs, proved to be more relevant than average years of teacher experience or training and education (Betts 1999).

Two notes of caution need to be made at this point. First, even in countries where the national gross enrolment ratio is high, the regional distribution of facilities could be such that more buildings and classrooms will be needed (cf. section 2.4.: Disparities).

Second, research from India indicates that the physical presence or absence of schools in a village is not an overwhelming factor in determining enrolment rates. Schools may be "present" but dysfunctional, or they can be "socially unavailable", if parents don't feel comfortable sending their daughter to school due to a lack of appropriate facilities or female teachers, or for safety reasons (Filmer/Pritchett 1998a). For this reason, further research should identify the condition of facilities in a given country and estimate the investment needed to upgrade infrastructure. For the time being, we are assuming that urgently needed improvements can be covered by a portion of the additional expenditure on quality enhancement discussed above.

3.1.4 Summing up

We can now add the subtotals (a), (b), and (c) [23] to arrive at global estimates for the required additional annual expenditure related to the supply of primary education:

(d) $14.03 billion + $8.45 billion + $0.65 billion = $23.13 billion

Discounted to present value, [24] this figure becomes

(d') $16.08 billion

3.2. The supply of secondary education

While there are a number of reports dealing with the costs and benefits of achieving universal primary education, few studies have looked in detail at the lower secondary level. Apart from the significance of education at this level in the light of Convention No.138, there are also important externalities and feedback effects on primary education, associated with the expansion of lower secondary education.

First of all, increased primary education enhances the pool of "eligible" secondary pupils and is thereby likely to increase the demand for secondary education (Watkins 2000). Second, the supply of secondary education increases the demand for primary education, as it opens a wider range of educational perspectives. [25] Third, a full secondary education is of paramount importance as a principle source of teacher preparation, thus potentially increasing the supply of primary teachers.

Unfortunately, it is difficult to determine the NER of 12 to 14-year-olds. In some countries, this age cohort pertains to the lower secondary school cycle; in other countries, it does not correspond to a clearly defined school cycle. Enrolment data is often only available for secondary school as a whole, irrespective of age. We can construct the GER for the grades corresponding to ages up to 14. Assuming that the number of over-age

[23] See footnote 2.

[24] Discounted annual average = annual average * 15 * r /[$(1+r)^{15} - 1$], with r=5%. Discounting is necessary, in order to compare the costs with the benefits (see section 4.3.)

[25] Appleton et al. (1996) found that the additional benefit associated with the prospect of post-primary education doubled, or more than doubled, the conventionally estimated primary rate of return.

pupils in these grades roughly equals the number of over-age up to 14-year-olds in primary school, we use the GER as a proxy for the NER (table 6). From there, we calculate the costs of NER 100 of the grades pertain to ages up to 14, analogous to the primary level.

For some countries, this procedure will not be very realistic, due to the age structure of the school system. In Kenya, for example, the typical age entering secondary school is 14. In line with the aim of enrolling all children up to the age of 14, the consequence would be full enrolment in the first grade of secondary school, and current (low) enrolment in the remaining three grades. In other countries, such as Algeria, the lower secondary cycle ends when students reach the age of 15, which is in line with the method. We follow the established pattern for the sake of coherence, assuming that enrolment rates for ages 15 and above remain constant between now and 2020.

Part of the total figure should be the additional costs of bringing the pupil-teacher ratio at secondary level down to 30. Because in most countries, these teachers will continue to take care of upper grades, a lower threshold for this indicator at the *overall* secondary level than at the primary level has been selected, assuming that this will result in a pupil-teacher at the *lower* secondary level that is comparable to the one in primary education. Table 7 shows that only 13 countries, most of which in sub-Saharan Africa, report pupil-teacher ratios above 30. We do not attempt to calculate additional costs for this indicator, because we assume that these would be negligible on a global scale, and also because data on teacher salaries at this level is not readily available.

The fact that pupil-teacher ratios are often far below 30 indicates that there is room for lowering the unit costs by hiring less new teachers relative to the amount of new pupils. Notwithstanding, we abstain from making such recommendations, because we are not dealing with issues of cost-effectiveness.

Due to the lack of data, estimating the costs of improving quality on the lower secondary level is even more problematical than in the case of primary education. To be sure, demands on the quality of schooling are likely to be high, because the pull toward work can become stronger the older a pupil gets. For instance, skills training should be part of the curriculum in order to make school attractive for 12 to 14-year-olds. These and other factors make teacher training a particular challenge, which many countries seem currently unprepared to meet. For example, in Mozambique, only 25 per cent of teachers in the first cycle of secondary education are qualified to teach at this level (UNDP 2000). Nevertheless, the high unit costs relative to primary education (on average, 34 per cent of GNP per capita versus 9.4 per cent of GNP per capita, i.e. 3.6 times as much) indicate that increasing enrolment could be accompanied by diminished marginal costs. Therefore, we assume that on the whole, current unit costs do not have to be raised to allow for quality improvements.

Since gross enrolment rates are low in many developing countries, capital investment would have to be significant in order to reach NER 100. However, the information base is too weak to calculate the necessary additional capital expenditure. For the sake of simplicity, we assume that capital investment could be offset by the savings in unit costs.

Hence, the total annual additional costs to achieve global lower secondary education were calculated only on the basis of current unit costs and the differential between current enrolment and projected universal enrolment. The result is shown in table 6:

(e) $27.83 billion

This figure is more than the equivalent total for primary education. On a global scale, high unit costs and current low enrolment more than compensate the (on average) small age cohort pertaining to this level.

The region with the highest annual additional cost is Latin America and the Caribbean ($8.06 billion), followed by South Asia ($7.07 billion). In the Middle East and North Africa, the additional annual expenditure would amount to $6.75 billion. However, due to unknown unit costs, this figure excludes Iraq, where enrolment would nearly triple by 2015. The annual increase in sub-Saharan Africa, which has the highest average unit cost as a percentage of GDP, would have to spend an additional $3.79 billion.

Discounted to present value, [26] this figure becomes

(e') $19.35 billion.

3.3. The demand for education: Income transfer programmes

Increasing the supply of education is a necessary albeit not a sufficient condition for achieving universal education. Due to the costs to households (i.e. direct and opportunity costs), it is also necessary to affect the demand side of education. Indeed, the reduction of costs to parents seems to have been a major reason for the rapid expansion of primary enrolment in Sri Lanka, Korea, Malaysia, Botswana, Mauritius, Costa Rica, and Cuba (Mehrotra 1998). Therefore, it may be essential to target households whose income is below the poverty line by providing them with income transfer services.

To calculate the costs of equivalent programmes in other regions, the following indicators need to be taken into account, as a minimum requirement:

- Enrolment gap: Data on this indicator is readily available.
- Households below poverty line and number of children in them: We divide the amount of the population below the poverty line by the estimated average number of members per household, and multiply it by the estimated average number of school-age children per household.
- Direct costs to households: Even though some data on school fees and payments is available, it often understates the level of parental contribution. For example, in the United Republic of Tanzania, parents are expected to pay a primary education levy of just over $2. In reality, however, the overall parental contributions amount to $38 on average (Watkins 2000).
- Opportunity costs: This is a very important aspect to consider. However, it is often difficult to estimate the foregone income of a child, for example by determining the percentage of the minimum adult wage that the child could be expected to earn, inter alia because we cannot exclude the possibility that a child combines work and schooling, or because contract labour does not contribute to household income.
- Overhead costs: These should be estimated based on an assessment of the quality of administration and level of education of civil servants.

Drawing lessons from Brazil's Bolsa-Escola programme, the ILO-UNCTAD Advisory Group developed the Minimum Income For School Attendance (MISA) Initiative, a minimum income support scheme tied to school attendance. The cost of this scheme has been calculated for Africa. Programme MISA E is designed to increase the

[26] As above: Discounted annual average = annual average * 15 * r /[$(1+r)^{15} - 1$], with r=5%.

NER to a target minimum of 90 per cent.[27] In countries that have already exceeded this target, the goal is to close the gap between GER and NER. In order to reach these targets, 21.4 million pupils in Africa would be supplied with an average cash transfer of US$100 (compensating for both direct and opportunity costs). Table 8a shows that this would lead to a budget of US$2.135 billion per year.[28]

To this amount, the ILO-UNCTAD Advisory Group suggests that a 20 per cent overhead be added to the calculation. The percentage chosen is fairly high, due to the (on average) relatively low level of education of civil servants and the low fiscal capacity of municipalities in Africa.

Therefore, the overall costs of programme MISA E in Africa can be estimated at

(f) $2.14 billion + $0.43 billion = $2.57 billion

Using the same method for calculation outside of sub-Saharan Africa, we can extrapolate the costs for income transfer programmes on a global scale (table 8b). A more conservative estimate of 5 per cent was chosen for approximate overhead cost, which gives a total of

(g) $13.46 billion + $0.67 billion = $14.13 billion

As can be seen from table 8b, India and Brazil together account for over half of this total.

Since we would like to determine the additional costs of such income-transfer programmes, we would need to subtract the costs of ongoing programmes. However, we abstain from such an attempt, because information on such programmes is scarce on a global scale (cf. data on scholarships and welfare services given in the UNESCO Statistical Yearbook 1998). Therefore, we are left with a global total of annual spending for income transfer programmes of

(h) = (f) + (g) = $16.7 billion.

[27] A target smaller than 100% was chosen because there may remain some residual enrolment gap due to attrition and other factors not directly related to those addressed by the programme.

[28] This result is the sum of the direct costs and the opportunity costs, calculated country-by-country through the following formula:

Direct costs = (gross enrolment / GER * gap of NER to 90%) * GNP per capita * 0.22

Opportunity costs = (gross enrolment / GER * gap of NER to 90%) * minimum of GNP per capita or rural wage per worker * 0.35

Notes:

- The bracketed part of the equations gives the increased enrolment.
- The parameter for the direct costs is % of per capita income. Direct household costs are estimated to be around 22% of per capita income (ILO/UNCTAD 2001, p.22).
- The parameter for the opportunity costs is % of rural wage. Assuming that the average rural wage is approximately equal to per capita income, the opportunity costs of school attendance would vary between 25% to 50%, depending on the age of the child (ILO/UNCTAD 2001, p. 22).

Discounted to present value, [29] this figure becomes

(h') $11.61 billion.

3.4. Disparities

In this paper, we are using national aggregates to derive cost estimates. However, in some country cases, these mask several sets of disparities that have not been reflected sufficiently in the data used. Even though we do not attempt to adjust the above figures, field research should investigate rural/urban, gender, and regional disparities and break down the national figures accordingly. Depending on the characteristics of each country, this may have significant implications on cost estimates.

(a) Rural-urban disparities

There is a pronounced disparity in the provision of education in urban and rural areas. Limited educational opportunities in rural areas are caused by a combination of factors, including the administrative cost and difficulty of providing services to more remote areas with scattered populations, the unwillingness of teachers to live in isolated regions, expectations regarding returns to education, and demands for child labour. Public spending priorities that concentrate resources on urban areas add to the problem. For example (Watkins 2000):

- In Pakistan, 54 per cent of urban children aged 10-14 have completed school – twice the level for rural children in the same age group.
- Niger's capital, Niamey, has a net enrolment rate that exceeds 90 per cent, but the rate is less than 20 per cent in rural areas.
- In Morocco, 37 percentage points separates the urban school enrolment rate from the rural enrolment rate.
- Mali's national capital region of Bamako has a net enrolment rate above 80 per cent. Rural northern regions such as Kidal, Timbuktu, and Gao have enrolment rates below 20 per cent.

Schools in rural areas are often less accessible, less well equipped, and less able to provide an education of reasonable quality. In Zambia, for example, 50 per cent of the rural poor live more than 10 km from a school, compared with 10 per cent of urban poor households. Rural schools have fewer qualified teachers and lower completion rates. Likewise, urban schools in the United Republic of Tanzania have a larger proportion of qualified teachers, a more favourable pupil-teacher ratio and higher average achievement levels in the primary school leaving examination (Al-Samarrai 2000).

(b) Gender disparities

Cultural, social, and economic factors combines to place young girls at a serious disadvantage regarding their chances to receive several years of quality education. Hence (Watkins 2000):

- There are 42 million fewer girls in primary school than boys.

[29] As above: Discounted annual average = annual average * 15 * r /[$(1+r)^{15} - 1$], with r=5%.

- Gender gaps in enrolment have not narrowed significantly over recent years. In South Asia, the net enrolment rate for girls is 20 per cent lower than for boys; in sub-Saharan Africa and the Middle East, it is 10 per cent lower.

- An average six-year-old girl in Asia can expect to spend about six years in school – three years less than an average six-year-old boy.

- There are twelve countries in sub-Saharan Africa, where the gender gap in enrolment exceeds 20 per cent.

- Each year, one million more girls than boys leave school without having completed the full primary cycle.

In many countries, gender disparities interact strongly with inequalities linked to household wealth and rural-urban differences. For example, in Morocco, the gender differential is relatively small in urban areas, while it grows to almost 20 points in rural areas (Rosati 2001).

Gender discrepancies in school attendance are an important issue in designing demand-side interventions. Moreover, in some countries they can also affect the supply of education, for example, where boys and girls attend separate schools.

(c) Regional disparities

It must also be noted that country-level data tends to skew regional disparities within countries, which are often related to rural-urban disparities. For example (Watkins 2000):

- While Brazil is a middle-income country, the nine states of the northeast are among the poorest regions in the world. Over half the children in the rural northeast receive less than four years of schooling, and one quarter of the region's population has had no schooling.

- Despite the relatively high rates of net enrolment in the Philippines, only one in three children in Northern Mindanao complete primary school, compared with four out of five pupils in Central Luzon.

- Some of the developing world's widest educational disparities exist between Indian States. The attendance rate of children from the poorest 40 per cent of households in Uttar Pradesh is 48 per cent, around half of the rate achieved in Kerala.

3.5. Total costs

Notwithstanding the qualifications under 3.4., the additional costs for achieving universal primary and lower secondary education can be estimated by adding the discounted subtotals for the supply of primary education (3.1.), the supply of lower secondary education (3.2.) and the demand for schooling (3.3.):

(i) $23.13 billion + $27.83 billion + $16.7 billion = $67.66 billion

The discounted total cost amounts to

(i') $16.08 billion + $19.35 billion + $11.61 billion = $47.04 billion

4. Benefits

Education has emerged with the key role in the dissemination of new knowledge and of capacities to adapt as central to the process of economic growth (McMahon 1999). Returns to investment in education, especially at the primary level, are likely to exceed those to alternative forms of investment (Psacharopoulos 1999, Colclough/Lewin 1993). Even if we accept the proposition that many of the positive effects of education on an individual, such as greater opportunities for personal development, cannot be captured in economic terms, there are still multiple benefits on the micro- and macro-economic level, which accrue to education.

4.1. Micro-level benefits

Primary education has been shown to have a positive effect on the **agricultural output** of small farmers. Evidence from thirteen low-income countries suggests that each year of additional education raises farm output by 2 per cent (Foster and Rosenzweig 1995). In Uganda, four years of primary education were found to raise farm output by about 7 per cent, when other factors were accounted for (Appleton and Balihuta 1996).[30] Furthermore, schooling facilitates **entrepreneurship**. Evidence from Bolivia, Malaysia, Ghana, and Ivory Coast shows a correlation between firm size and the number of years of schooling of the owner. This relationship holds for both primary and secondary education (World Bank 1991). One study in India found that four years of basic education increased economic returns to innovation by about one third (World Bank 1997). Thus, the impact of education on production in both the rural and urban informal sectors appears to be significant.

Some of the **externalities** associated with increased education are very difficult to capture. For example, a better-educated farmer may provide his neighbour with a better example of the application of new technology and thereby provide a positive externality. In addition, a better-educated farmer may find it easier to learn from a neighbour, so the transmission of the externality may be facilitated (Stacey 1998).

Primary education also appears to improve **health**. The evidence shows that education increases people's ability to improve the nutritional content of diets, and initiate earlier and more effective diagnosis of illness. One study from Ghana shows that an increase in the education of the household head from none to complete primary schooling is associated with a reduction in the household's calorie gap by an amount equal to one-fifth of a typical adult's calorie requirement (Kyereme and Thorbecke 1991).

Moreover, **infant and child mortality** are lower the higher the mother's level of schooling. Comparative research in 33 countries during the 1980s found that each additional year of maternal education reduced childhood mortality by about 8 per cent (Caldwell 1986). According to data gathered from over 90 countries, a 10 percentage point increase in girls' primary enrolment can be expected to decrease infant mortality by 4.1 deaths per 1,000, and a similar. In Pakistan, for example, this would mean that an extra year of schooling for an additional 1,000 girls would ultimately prevent roughly 60 infant deaths (UNICEF 1999). Mortality rates for the children of Ghanaian mothers with some education are twice as high as for children born to mothers with no education (Government

[30] Moreover, there are external effects of education, according to this study. The average primary schooling of other farm workers in the area significantly raises own production: an extra year of schooling on average corresponds to a 4 per cent increase in output. However, secondary schooling, appears to have little or no overall effect on production.

of Ghana 1995). In Mozambique, mothers who completed grades 1-5 are almost twice as likely to vaccinate their children when compared to illiterate mothers (Assiate and Watt 1998).

Even though it is difficult to isolate the effects of education on health and child mortality from other factors such as level of income poverty, the effects of education appear to outweigh those associated with income. In Pakistan, the infant mortality rate is 34 per cent higher among the poorest 20 per cent of households than among the richest 20 per cent; but in households where the mother has had no education, the infant mortality rate is 60 per cent higher than in households where the mother has had some form of education (Government of Pakistan 1996).

Education is instrumental in achieving lower **birth rates**. In the worldwide data, fertility rates are significantly lower where female primary and secondary enrolment rates are higher, all with a lag of 20 years (McMahon 2001). Even though lower birth rates need not always be considered a benefit in every country, changes in fertility reflect an important change in the ability of women to exercise greater control over their lives. Better-educated women marry later and space births over longer periods, with benefits for maternal and child health.

While the above paragraphs illustrate that there are doubtlessly considerable economic benefits to education, the question remains how these can be monetized and weighed against the costs of education.

Psacharopoulos (1994) states that the average private rate of return on primary education in developing countries is 29 per cent, while the returns on secondary education are 18 per cent. The main problem with these estimates is that the majority of individuals in developing countries are not wage earners. For example, wage earners make up 15 per cent of the workforce in India, 19 per cent in Haiti, and 11 per cent in Togo (Chowdhury 1995). The largest component of the workforce in developing countries is engaged in self-employed farm work, and the remaining component of household income is self-employed, off-farm income.

Rate of return studies relate the benefits of education to its cost, usually with the goal of determining the profitability of investment. However, the decision to eliminate child labour has already been taken, and we want to analyse the costs and benefits in order to understand the economic consequences of this decision. Therefore, rates of return studies may be relevant to the extent that they reflect underlying benefits, but they are of limited use for the purpose of monetizing them, net of the costs of education.

Instead, the monetary benefits of one year of primary or lower secondary education should be estimated in isolation from its cost, as displayed in the following examples.

In Latin America, workers who have completed primary school will earn on average 50 per cent more in their first job than workers who have not attended school. In Brazil and Mexico, they earn twice as much (Inter-American Development Bank 1999). There is a positive correlation between income and education even in the informal sector, where school qualifications are of limited relevance. Evidence from Honduras, Guatemala, and El Salvador indicates that each additional year of education is linked to a 5-10 per cent increase in informal sector earnings. Returns to female education in the informal sector are even higher: more than twice the average returns for males, in the case of Thailand (Funkhouser 1996).

However, like rates of return studies, these figures are based on ex-post analyses, which may not be reliable for predicting future benefits, as the examples of declining primary returns in Costa Rica and South Africa illustrate (Moll 1996, Funkhouser 1998).

The marginal impact of increases in various levels of education appears to vary greatly according to the state of a country's development. A World Bank study in 1996 found that the level of higher education is most important in high-income countries, and primary education levels are a significant motor of growth in developing countries. This result confirms the possibility that over time, the expansion of any level of education may yield diminishing returns (OECD 1998).

Jolliffe (1998) argues that years of schooling fail to capture any effect that school quality may have on the creation of human capital. He proposes the use of test scores, which have shown to reflect the variation in school quality in Ghana, as a basis for measuring the returns to skills. Extending this argument, one can expect to see the benefits of education increase significantly due to the proposed improvements in the quality of education in a given country.

Because parental education is a strong determinant of children's school participation and eventual educational attainment (Birdsall 1985), the intergenerational education income effect should be measured, as well. In the United Republic of Tanzania, for example, a mother's education was found to be a very important determinant of primary school attendance in both urban and rural areas (Al-Samarrai and Reilly 2000). In Cameroon, one extra year of a mother's education raised a child's probability of enrolment by 6 percentage points (Filmer 1999).

4.2. Macro-level benefits

Much of the macroeconomic literature emphasizes the role of education in a country's per capita economic growth (Krueger and Mikael 2000). The evidence points to a positive association between economic growth and change in education: growth increases with more education, and declines with less. No country has achieved economic growth without first assuring the education of its population.

According to Lucas' (1998) production function, the output of a firm that is sold in the market, measured as GNP originating within this firm, is produced using knowledge, technology, and techniques that cannot be used unless the value of the employees' time is enhanced by formal education. Thus, human capital is an important causal factor contributing to output. This is consistent with research in the lower-income OECD countries, where per capita growth of GNP depends in part on human capital investment, particularly secondary education (McMahon 2001).

Based on a cross-section panel of 111 countries, Topel (1999) states that a one-year increase in average years of schooling of the labour force raises output per worker by 5 to 15 per cent. Hanushek/Kimko (2000) find that labour-force quality differences are important for growth, that these quality differences are related to schooling, and that quality has a causal impact on growth. Nevertheless, they conclude that the simple estimates of cross-country growth relationships appear to overstate the causal impact of quality, while the precise cause or magnitude of this overstatement is unclear.

A multi-country study based on the Solow growth model by Mankiw et al. (1992) indicates that an increase in the average years of education by one year raises GDP by 0.73 per cent, when other variables are controlled for.

Social capital is not only a critical input for education but also one of its valuable by-products. It is produced through education in three fundamental ways (World Bank website):

- Students practice social capital skills, such as participation and reciprocity

- Schools provide a forum for community activities
- Through civil education, students learn how to participate responsibly in their society.

Education contributes to broader awareness and understanding of the political process, and there are empirically significant effects from democratisation on political stability and investment rates that feedback on economic growth (McMahon 2001).

Feedback effects from non-market social outcomes (health, fertility reduction, democratization and human rights, inequality reduction, environmental impact, crime reduction) on economic growth are estimated to account for about 40 per cent of per capita economic growth in OECD countries. This estimate is similar to those for East Asia and Latin America. In Africa, with its high degree of political instability, the effect should be even higher (McMahon 2001).

However, schooling is a necessary but by no means a sufficient condition for growth. Education needs to be accompanied by macro-policies that encourage the productive use of educated labour (Psacharopoulos 1999).

4.3. Monetizing the benefits

The above discussion has demonstrated the difficulty of making globally and intertemporarily reliable assumptions about the monetary value of improved education. Consequently, any attempt to come up with a concrete figure will have to be treated with extreme caution.

The inputs necessary to estimate the macro-level benefits are more readily available on a global scale than the inputs required for a calculation of the micro-level benefits. Therefore, taking into account the research already cited, we assume that each additional year of schooling will increase GDP based on the following formula, adapted from Mankiw et al (1992):

Percentage increase in GDP = ln [((8 - (8 * per cent of school-age population that reaches grade 8))* (population ages 6-14)÷(total working age population))]* 0.73

We assume that from 2020 onwards, all children between the ages of 7 and 14 will attend school, i.e. the average years of schooling will be 8 years. Next, we subtract from 8 the current average years of schooling.[31] We estimate this number by multiplying the percentage of primary school intake (this indicator is readily available) times the percentage of primary school entrants reaching grade 8 (this indicator is estimated based on available grade 5 completion data[32]) times 8 (as the corresponding ideal years of schooling).

Then, we multiply the difference between the two averages times the population ages 6 to 14 divided by the total working age population. This ratio can be calculated by dividing the age-dependency ratio (available from the World Development Indicators 2000) by 2. Next, the log of the preceding variables is multiplied by 0.73, which gives the

[31] In both cases (current average years of schooling and average years of schooling) we disregard the ages 15 and above, assuming that enrolment remains constant. This is in line with our assumptions for the cost calculations.

[32] The formula applied to convert grade 5 completion data into grade 8 completion estimates is: $P_8 = 100 * (P_5 / 100)^{8/5}$

percentage increase in GDP. Multiplying the resulting factor on a country-by-country basis with GDP yields a global total of $22.1 trillion (table 9).

This figure applies to the first year when the entire workforce has profited from the described educational expansion, which would be approximately only in 2065. Assuming that the economy would start benefiting from the educational expansion in 2015 and that the benefits would increase gradually until 2065, we can thus estimate the global annual increase in GDP at $22.1 trillion / 50 = $442 billion.

Since we calculated the costs over a period of 15 years, we consider the corresponding benefits between 2015 and 2029, and discount these back to present value at a discount rate of 5 per cent: $442 billion/(1.05)^{15} + 442 billion/(1.05)^{16} + … + 442 billion/(1.05)^{29} = 2.3 trillion. Finally, we divide this figure by 15, which yields the discounted annual average increase in global GDP due to increased education:

(j) $2.3 trillion / 15 = $154 billion

This result is likely to be an underestimation, for three reasons.

(1) The formula adapted from Mankiw et al. is related to 12 to 17-year olds, i.e. secondary pupils. The returns to primary education could be even higher (Psacharopoulos 1994).

(2) Substantial investments in the quality of education have been proposed in the previous section of this study, which are not reflected in the formula.

(3) The yearly gains will not be equal, as the proportion of the population benefiting from increased education changes from year to year. We can assume that GDP growth will not be constant, but slow at first because only a few individuals in the workforce benefit. Later, the gains would increase as the percentage of the labour force with more education rises, and finally they would slow down again as the only change becomes the attrition of less educated workers leaving the labour force.

For these reasons, the above figure should be considered a conservative minimum estimate.

5. Conclusion

Financing education for all children up to age 14 by the year 2015 is a considerable challenge. According to the findings presented here, total additional annual costs would amount to $47 billion worldwide, discounted to present value. Of this figure, $16 billion would be needed to provide universal primary schooling, and over $19 billion to provide universal secondary education of at least minimum quality standards. In order to achieve universal school attendance, it was shown that supply-side policies need to be accompanied by demand-side investments of close to $12 billion.

However, several qualifications regarding these figures are in order:

- Some country figures, especially those relating to the supply of lower secondary education, could be severely inflated due to high current unit costs. Economies of scale may serve to lower the actual recurrent expenditure significantly.

- To date, information on lower secondary education is relatively sparse, compared to primary education. Research is needed to identify the supply- and demand-side measures necessary to achieve NER 100 at this level.

- As pointed out, net enrolment rates are only the second best indicator on the extent of schooling. They do not tell us whether children actually attend school or complete their schooling. Data on actual school attendance is weak and requires further research.

- Estimates of the capital expenditure required for accommodating all children aged 6 to 14 in schools are also clouded by uncertainty. This problem extends to an assessment of the investment needed to upgrade existing facilities to acceptable quality.

- Another important aspect related to the expansion of education, which has not been discussed at adequate length, is teacher training. It has significant implications on costs, and also, since it is a crucial component of quality education, on benefits. Unfortunately, it is difficult to keep track of the expenditure on teacher training, because this item is not recorded in a coherent fashion by countries across the globe. (For example, some countries list it under their tertiary education budgets.)

- The impact of disparities relating to gender, regions, and rural/urban areas on the costs and benefits of education has not been explored in sufficient depth. They require further country-specific research.

- Issues of cost-effectiveness have not been dealt with in this paper. While we assumed a "best practice" scenario throughout this analysis, in reality much could be gained by a reallocation of existing resources (Mehrotra/Vandemoortele 1997, Colclough/Lewin 1993). No policy recommendations, such as decentralization or community-based interventions, have been made in this paper.

On the other hand, it is clear that the benefits of universal education up to the age of 14 would outweigh the costs. Even under conservative assumptions, the benefits would amount to at least $154 billion annually when discounted back to present value, a figure more than triple the costs. However, it must be noted the calculation of the benefits of education is clout with extreme uncertainty. This is partly due to the fact that many (market and non-market) benefits cannot be reasonably monetized, and partly to the impossibility of making reliable predictions about returns to education in the not so near future.

One of the shortcomings of attempting to capture the benefits of education in the above manner is that it fails to capture the intrinsic value of education, which extends far beyond the monetizable aspects of schooling. Policymakers should bear this in mind, when comparing the costs and benefits of education.

In conclusion, the benefits of education are likely to outweigh the costs. And even though the link between school attendance and child labour is complex, universal primary and lower secondary education [33] is a central pillar in the struggle to abolish child labour.

[33] Throughout this analysis, "education" has been rather narrowly defined as formal schooling. To be sure, non-formal education and vocational training are also important means of imparting skills on children and young people and contributing to their personal development. In most countries, stronger linkages need to be created between the formal and non-formal education streams. In particular, innovative education methods, which have been tried out successfully on a small scale in experimental non-formal education, should be incorporated and expanded in the formal education system (Haspels/Jankanish 2000).

Annex: Tables

Table 1. Indicators for universal primary education by 2015

Country	NER primary school-age group (%)	Current expenditure per pupil (1997)(1995 US$)	Current expenditure per pupil (per cent of GNP per capita)	Enrolment 1997 (thousands)	UPE enrolment 2015 (thousands)	Average annual extra spending (millions of 1995 US$)
Sub-Saharan Africa						2,705.4
Angola	33.9	147	29.0	911	4 209	230.4
Benin	68.6	33	12.6	843	1 506	10.6
Botswana	81.0	278	8.0	322	387	4.6
Burkina Faso	33.7	45	19.7	778	3 474	61.2
Burundi	33.1	26	20.0	555	2 358	23.2
Cameroon	73.7	10	11.0	2 024	3 819	9.2
Cape Verde	100.0	202	9.0	92	109	3.5
Central African Republic	44.9	15	8.0	320	813	3.6
Chad	52.0	15	7.3	787	2 131	10.8
Comoros	60.2	46	9.0	79	156	1.7
Congo	94.9	42	14.8	497	793	6.5
Côte d'Ivoire	58.3	280	17.0	1 808	3 451	207.3
Democratic Rep. of the Congo	44.6	10	--	4 828	18 167	69.9
Djibouti	33.1	269	32.0	38	153	14.8
Equatorial Guinea	84.0	15	--	82	146	0.5
Eritrea	31.4	109	9.2	241	962	39.8
Ethiopia	35.5	21	31.6	5 093	14 767	85.6
Gabon	100.0	485	--	265	398	40.4
Gambia	64.9	56	15.9	135	277	3.9
Ghana	78.6	73	5.0	2 450	4 279	63.1
Guinea	42.0	35	8.0	675	1 837	20.0
Guinea-Bissau	54.6	34	--	120	279	2.7
Kenya	71.0	64	12.0	5 550	7 808	68.7
Lesotho	66.2	91	13.8	369	656	13.8
Liberia	15.3	109	--	123	1 499	58.4
Madagascar	61.6	10	4.0	1 890	3 764	11.0
Malawi	96.1	16	8.9	2 910	3 884	9.2
Mali	38.9	28	15.2	863	2 941	27.1
Mauritania	61.1	48	12.0	330	696	8.8
Mauritius	97.7	394	10.3	127	115	2.7
Mozambique	39.5	20	15.0	1 500	4 114	29.2
Namibia	94.0	458	20.9	381	492	40.3

Country	NER primary school-age group (%)	Current expenditure per pupil (1997)(1995 US$)	Current expenditure per pupil (per cent of GNP per capita)	Enrolment 1997 (thousands)	UPE enrolment 2015 (thousands)	Average annual extra spending (millions of 1995 US$)
Niger	24.7	57	29.3	482	2 963	69.4
Nigeria	40.5	39	--	13 500	45 343	593.1
Rwanda	64.5	68	16.0	1 000	2 272	51.4
Senegal	60.8	57	11.0	1 027	2 786	47.1
Sierra Leone	46.3	5	2.0	430	1 452	2.3
Somalia	7.9	109	--	183	4 213	198.6
South Africa	100.0	587	15.0	8 200	7 387	413.9
Sudan	45.4	12	5.0	3 050	7 870	28.3
Swaziland	78.3	117	7.0	206	307	5.7
Tanzania, United Rep. of	48.9	20	8.0	4 058	9 650	55.0
Togo	83.2	18	9.9	888	1 559	6.4
Uganda	87.5	25	7.8	5 304	7 958	26.1
Zambia	71.5	33	5.0	1 510	2 592	18.0
Zimbabwe	91.2	133	19.4	2 511	2 538	7.6
North Africa & Middle East						5,871.9
Algeria	95.4	126	--	4 730	5 244	40.0
Bahrain	99.2	923	8.0	74	60	4.8
Egypt	96.1	74	12.0	8 240	7 778	0.8
Iraq	76.9	723	14.0	2 934	5 166	798.6
Jordan	66.5	129	9.1	1 122	2 408	82.2
Kuwait	71.5	2 287	21.5	142	191	32.8
Lebanon	94.9	135	6.0	398	349	7.3
Libyan Arab Jamahiriya	100.0	723	--	1 550	1 757	58.2
Morocco	76.2	160	11.0	3 254	3 944	57.3
Oman	67.6	672	13.3	314	680	105.5
Qatar	90.7	723	--	60	73	3.7
Saudi Arabia	60.4	2 190	19.0	2 244	5 705	3671.7
Syrian Arab Republic	92.3	295	8.0	2 695	3 188	55.2
Tunisia	100.0	348	15.0	1 450	1 491	5.1
United Arab Emirates	80.8	1 544	--	263	292	7.9
Yemen	52.7	169	--	2 797	8 586	537.6
Latin America & Caribbean						2,001.0
Argentina	100.0	988	8.3	5 153	6 048	485.1
Bahamas	100.0	5 028	--	35	36	14.9
Barbados	100.0	1 060	20.0	27	22	0.0

Country	NER primary school-age group (%)	Current expenditure per pupil (1997)(1995 US$)	Current expenditure per pupil (per cent of GNP per capita)	Enrolment 1997 (thousands)	UPE enrolment 2015 (thousands)	Average annual extra spending (millions of 1995 US$)
Belize	100.0	321	11.0	56	55	0.8
Bolivia	100.0	101	10.0	1 637	2 023	24.8
Brazil	98.2	519	11.1	34 229	30 106	903.6
Chile	87.6	548	10.9	2 300	2 311	12.8
Colombia	91.1	180	9.0	5 152	5 226	23.1
Costa Rica	89.0	508	13.0	525	622	26.1
Cuba	100.0	336	16.6	1 081	809	21.4
Dominican Rep.	90.4	83	26.5	1 493	1 549	3.8
Ecuador	97.7	86	6.0	2 098	2 235	2.9
El Salvador	86.7	101	7.1	1 191	1 549	18.7
Guatemala	73.2	70	6.2	1 545	3 130	53.0
Guyana	100.0	94	10.0	104	91	1.0
Haiti	60.2	11	7.0	1 486	2 559	5.2
Honduras	83.7	61	10.0	1 030	1 329	13.8
Jamaica	93.3	267	13.7	322	295	0.6
Mexico	100.0	340	11.9	14 648	13 588	158.2
Netherlands Antilles	100.0	336	10.0	25	22	0.1
Nicaragua	81.1	53	14.5	827	1 222	11.5
Panama	93.1	295	9.0	372	371	1.9
Paraguay	94.0	211	10.9	906	1 090	13.5
Peru	92.2	183	4.5	4 163	4 558	79.0
Puerto Rico	100.0	336	--	630	622	1.7
Suriname	100.0	112	26.0	92	67	0.0
Trinidad and Tobago	91.5	440	10.5	180	147	0.0
Uruguay	95.1	432	8.0	350	373	5.8
Venezuela	83.6	231	2.1	4 296	5 205	117.7
East Asia & Pacific						1,273.8
Brunei Darussalam	90.9	1 381	--	44	41	3.5
Cambodia	100.0	14	--	2 012	2 071	0.4
China	100.0	35	6.8	140 272	108 087	18.3
China, Hong Kong SAR	92.3	1 822	6.0	467	425	0.9
Fiji	100.0	267	--	148	128	0.0
Indonesia	98.4	18	--	29 250	25 520	5.5
Korea, Republic of	94.9	2 892	17.9	3 794	3 821	241.0
Lao People's Democratic Republic	77.5	20	5.0	822	1 156	4.0

Country	NER primary school-age group (%)	Current expenditure per pupil (1997)(1995 US$)	Current expenditure per pupil (per cent of GNP per capita)	Enrolment 1997 (thousands)	UPE enrolment 2015 (thousands)	Average annual extra spending (millions of 1995 US$)
Macau	81.3	687	--	47	32	0.0
Malaysia	100.0	427	9.8	2 880	2 860	154.6
Mongolia	86.3	61	11.0	245	229	0.7
Myanmar	100.0	83	3.2	5 415	5 229	0.0
Papua New Guinea	79.4	863	--	530	874	154.0
Philippines	100.0	115	9.8	12 159	13 459	146.6
Samoa	97.0	137	9.0	36	40	0.3
Singapore	82.6	1 821	7.0	278	296	90.0
Solomon Islands	85.9	170	12.0	65	103	3.5
Thailand	78.0	499	12.2	5 928	7 145	449.0
Vanuatu, Republic of	91.7	355	14.0	29	37	1.5
Viet Nam	88.5	22	7.7	10 436	8 950	0.0
South Asia						1,653.5
Afghanistan	47.9	78	28.0	1 550	6 230	178.8
Bangladesh	71.8	10	5.0	13 156	17 038	14.5
Bhutan	13.5	41	30.0	68	627	11.2
India	77.5	38	9.2	108 782	115 640	1070.6
Iran	88.2	320	6.0	9 000	7 622	0.0
Maldives	94.3	143	--	50	61	0.8
Nepal	84.6	19	9.7	3 540	4 372	13.8
Pakistan	60.6	48	9.0	14 000	27 914	363.0
Sri Lanka	100.0	35	9.0	1 844	1 838	3.6
Eastern Europe and Central Asia						98.1
Albania	100.0	46	9.7	572	492	1.2
Armenia	92.7	137	3.0	263	202	0.0
Azerbaijan	100.0	82	20.6	711	489	0.0
Belarus	97.8	391	46.8	615	440	0.0
Bosnia and Herzegovina	76.2	391	--	160	181	2.8
Bulgaria	95.9	94	30.7	426	273	0.0
Croatia	100.0	1 579		206	161	0.0
Czech Republic	91.3	695	16.4	663	493	0.0
Estonia	100.0	511	10.0	128	69	2.3
Federal Republic of Yugoslavia	76.0	391	--	438	495	4.9
Georgia	95.5	391	14.0	293	259	0.0
Hungary	100.0	835	18.4	502	352	0.0
Kazakhstan	100.0	145	4.0	1 291	1 017	0.0

Country	NER primary school-age group (%)	Current expenditure per pupil (1997)(1995 US$)	Current expenditure per pupil (per cent of GNP per capita)	Enrolment 1997 (thousands)	UPE enrolment 2015 (thousands)	Average annual extra spending (millions of 1995 US$)
Kyrgyzstan	100.0	95	3.0	485	430	0.0
Latvia	96.2	231	9.0	147	81	0.0
Lithuania	100.0	191	9.0	221	134	0.0
Moldova	99.6	143	24.0	321	225	0.0
Poland	97.6	560	17.6	4 905	3 445	0.0
Romania	100.0	318	20.3	1 373	818	0.0
Russian Federation	100.0	214	9.0	8 150	5 473	0.0
Slovakia	100.0	945	22.3	325	238	0.0
Slovenia	100.0	1 904	20.1	96	65	0.0
Tajikistan	100.0	8	3.0	660	684	0.3
The Former Yugoslav Rep. of Macedonia	53.6	683	18.0	132	222	28.2
Turkmenistan	100.0	391	--	478	453	4.6
Ukraine	83.5	414	47.3	2 339	1 869	0.0
Uzbekistan	79.4	391	--	2 060	2 476	58.7
Other developing countries						429.9
Cyprus	83.2	1 858	12.0	65	65	1.5
Guam	55.0	401	--	16	30	4.1
Malta	99.9	887	9.0	35	33	0.2
Turkey	100.0	433	9.0	6 389	6 967	424.1
TOTAL						14,034

Source: Brossard and Gacougnolle, forthcoming. *Financing Primary Education for All: Yesterday, Today and Tomorrow*, UNESCO Institute for Statistics Draft 2001 (note: data is preliminary and subject to revision); Column 3: World Education Report 2000, World Development Indicators 2000.

Table 2. Non-wage expenditure – Primary Level

Region/Country	Total emoluments (as % of current expenditure on primary education)	Current expenditure per pupil	UPE enrolment 2015 (thousands)	UPE enrolment 2015 (thousands)	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Sub-Saharan Africa	Regional median: 91.5				984 056
Angola (1990)	87.36	147	4 209	618 723	17 179
Benin	91.5	33	1 506	49 698	3 800
Botswana (1991)	80.25	278	387	107 586	0 000
Burkina Faso	91.5	45	3 474	156 330	11 955
Burundi (1992)	99.64	26	2 358	61 308	10 559
Cameroon	91.5	10	3 819	38 190	2 920
Cape Verde	91.5	202	109	22 018	1 684
Central African Rep. (1991)	96.36	15	813	12 195	1 630
Chad (1996)	90.98	15	2 131	31 965	2 249
Comoros (1995)	99.27	46	156	7 176	1 205
Congo (1995)	98.29	42	793	33 306	5 207
Cote d'Ivoire (1996)	87.31	280	3 451	966 280	26 260
Djibouti (1991)	91.85	269	153	41 157	3 317
Equatorial Guinea	91.5	15	146	2 190	0 167
Eritrea (1994)	91.39	109	962	104 858	7 883
Ethiopia (1990)	98.16	21	14 767	310 107	48 012
Gabon (1992)	99.18	485	398	193 030	32 202
Gambia (1996)	70.65	56	277	15 512	0 000
Ghana (1990)	99.43	73	4 279	312 367	53 029
Guinea (1993)	68.54	35	1 837	64 295	0 000
Guinea-Bissau	91.5	34	279	9 486	0 725
Kenya	91.5	64	7 808	499 712	38 213
Lesotho (1994)	88.18	91	656	59 696	2 233
Liberia	91.5	109	1 499	163 391	12 495
Madagascar (1993)	87.02	10	3 764	37 640	0 895
Malawi	91.5	16	3 884	62 144	4 752
Mali (1995)	80.67	28	2 941	82 348	0 000
Mauritania (1996)	93.63	48	696	33 408	3 392
Mauritius (1990)	97.72	394	115	45 310	6 781
Mozambique (1990)	97.29	20	4 114	82 280	11 897
Namibia	91.5	458	492	225 336	17 232
Niger	91.5	57	2 963	168 891	12 915

Region/Country	Total emoluments (as % of current expenditure on primary education)	Current expenditure per pupil	UPE enrolment 2015 (thousands)	UPE enrolment 2015 (thousands)	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Nigeria	91.5	39	45 343	1 768 377	135 229
Rwanda	91.5	68	2 272	154 496	11 814
Senegal (1996)	90.41	57	2 786	158 802	10 107
Seychelles (1995)	81.94			0	0
Sierra Leone	91.5	5	1 452	7 260	0 555
Somalia	91.5	109	4 213	459 217	35 117
South Africa (1996)	91.89	587	7 387	4 336 169	351 485
Sudan (1996)	99.99	12	7 870	94 440	16 655
Swaziland (1995)	99.89	117	307	35 919	6 292
Tanzania, United. Rep. of	91.5	20	9 650	193 000	14 759
Togo (1996)	87.85	18	1 559	28 062	0 941
Uganda	91.5	25	7 958	198 950	15 214
Zambia	91.5	33	2 592	85 536	6 541
Zimbabwe (1995)	94.71	133	2 538	337 554	38 561
South Asia	Regional median: 93.5				667 978
Afghanistan	93.5	78	6 230	485 940	48 594
Bangladesh (1991)	98.86	10	17 038	170 380	27 782
Bhutan	93.5	41	627	25 707	2 571
India	93.5	38	115 640	4 394 320	439 432
Maldives	93.5	143	61	8 723	0 872
Nepal	93.5	19	4 372	83 068	8 307
Pakistan	93.5	48	27 914	1 339 872	133 987
Sri Lanka	93.5	35	1 838	64 330	6 433
East Asia & Pacific	Regional median: 93.5				932 315
Cambodia	93.5	14	2 071	28 994	2 899
China	93.5	35	108 087	3 783 045	378 305
China, Hong Kong SAR	93.5	1 822	425	774 350	77 435
Fiji	93.5	267	148	39 516	3 952
Indonesia (1995)	82.93	18	29 250	526 500	0
Lao People's Dem. Rep. (1996)	91.74	20	1 156	23 120	1 833
Malaysia (1994)	84.24	427	2 860	1 221 220	0
Mongolia	93.5	61	229	13 969	1 397
Myanmar (1994)	94.24	83	5 229	434 007	47 179
Papua New Guinea	93.5	863	874	754 262	75 426

Region/Country	Total emoluments (as % of current expenditure on primary education)	Current expenditure per pupil	UPE enrolment 2015 (thousands)	UPE enrolment 2015 (thousands)	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Philippines	93.5	115	13 459	1 547 785	154 779
Singapore	93.5	1 821	296	539 016	53 902
Solomon Islands (1991)	93.55	170	103	17 510	1 761
Thailand (1995)	87.7	499	7 145	3 565 355	113 252
Vanuatu, Rep of (1994)	88.27	355	37	13 135	0 505
Viet Nam	93.5	22	8 950	196 900	19 690
Middle East & North Africa	Regional median: 95				3 337 239
Algeria (1996)	96.03	126	5 244	660 744	85 741
Bahrain	95	923	60	55 380	6 515
Egypt (1996)	84.32	74	7 778	575 572	0
Iran, Islamic Rep. of (1996)	89.51	320	7 622	2 439 040	129 413
Iraq	95	723	723	522 729	61 498
Jordan (1996)	91.7	129	129	16 641	1 312
Kuwait	95	2 287	2 287	5 230 369	615 338
Lebanon	95	135	135	18 225	2 144
Libyan Arab Jamahiriya	95	723	723	522 729	61 498
Morocco (1996)	95	160	3 944	631 040	74 240
Oman (1996)	86.88	672	680	456 960	10 107
Palestine	95			0	0
Qatar	95	723	73	52 779	6 209
Saudi Arabia	95	2 190	5 705	12 493 950	1 469 876
Syrian Arab Rep. (1996)	95.59	295	3 188	940 460	117 170
Tunisia (1995)	96.81	348	1 491	518 868	72 092
Turkey (1995)	96.28	433	6 967	3 016 711	400 335
United Arab Emirates	95	1 544	292	450 848	53 041
Yemen	95	169	8 586	1 451 034	170 710
Latin America & Caribbean	Regional median: 91.5				1 506 445
Argentina (1996)	98.25	988	6 048	5 975 424	931 463
Belize (1996)	95.99	5 028	55	276 540	35 755
Bolivia (1996)	100	101	2 023	204 323	36 057
Brazil (1995)	83.67	519	30 106	15 625 014	0 000
Chile	91.5	548	2 311	1 266 428	96 844
Colombia (1996)	88.86	180	5 226	940 680	42 718
Costa Rica (1996)	92.02	508	622	315 976	26 096

Region/Country	Total emoluments (as % of current expenditure on primary education)	Current expenditure per pupil	UPE enrolment 2015 (thousands)	UPE enrolment 2015 (thousands)	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Cuba (1996)	68.83	336	809	271 824	0 000
Dominican Rep.	91.5	83	1 549	128 567	9 832
Ecuador	91.5	86	2 235	192 210	14 698
El Salvador	91.5	101	1 549	156 449	11 964
Guatemala (1995)	85.94	70	3 130	219 100	2 423
Guyana	91.5	94	91	8 554	0 654
Haiti (1990)	98.11	11	2 559	28 149	4 342
Honduras (1995)	99.32	61	1 329	81 069	13 658
Jamaica (1996)	95.68	267	295	78 765	9 897
Mexico (1995)	89.26	340	13 588	4 619 920	231 540
Nicaragua (1992)	91.11	53	1 222	64 766	4 656
Panama (1994)	97.63	295	371	109 445	16 262
Paraguay	91.5	211	1 090	229 990	17 587
Peru (1996)	70.62	183	4 558	834 114	0
Suriname (1993)	42.92	112	67	7 504	0
Trinidad and Tobago (1996)	81.63	440	147	64 680	0
Uruguay (1996)	72.52	432	373	161 136	0
Venezuela (1994)	47.08	231	5 205	1 202 355	0
Eastern Europe & Central Asia	Regional median: 75				13 787
Albania (1994)	82.03	46	492	22 632	0
Armenia	75	137	202	27 674	0
Azerbaijan (1996)	75	82	489	40 098	0
Belarus (1996)	46.63	391	440	172 040	0
Bulgaria (1996)	76.41	94	273	25 662	0
Croatia	75	1 579	161	254 219	0
Cyprus (1995)	87.59	1 858	65	120 770	3 680
Czech Republic (1996)	64.88	695	493	342 635	0
Estonia (1996)	75	511	69	35 259	0
Georgia (1994)	75	259	259	67 081	0
Hungary (1996)	73.55	835	352	293 920	0
Kazakhstan	75	145	1 017	147 465	0
Kyrgyzstan (1996)	75	95	430	40 850	0
Latvia (1996)	67.94	231	81	18 711	0
Lithuania (1996)	75	191	134	25 594	0

Region/Country	Total emoluments (as % of current expenditure on primary education)	Current expenditure per pupil	UPE enrolment 2015 (thousands)	UPE enrolment 2015 (thousands)	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Malta (1992)	94.25	887	33	29 271	3 185
Moldova	75	143	225	32 175	0
Poland	75	560	3 445	1 929 200	0
Romania	75	318	818	260 124	0
Russian Federation	75	214	5 473	1 171 222	0
Slovakia (1996)	59.94	945	238	224 910	0
Slovenia (1995)	79	1 904	65	123 760	0
Tajikistan (1996)	75	8	684	5 472	0
The Former Yugoslav Rep of Macedonia (1996)	88.88	683	222	151 626	6 921
Turkmenistan	75	391	453	177 123	0
Ukraine	75	414	1 869	773 766	0
Uzbekistan (1993)	75	391	2 476	968 116	0
Yugoslavia, Federal Rep. of (1996)	62.55			0 000	0
TOTAL					7 441 820

Source: UNESCO *Statistical Yearbook 1998*, own calculations.
Note: Where no data was available, the regional median was applied. Due to lack of statistics for South Asia, a common median was calculated for South Asia, East Asia and the Pacific.

Table 3. Countries with high pupil-teacher ratios (primary level)

Country	Year	P-T ratio	UPE enrolment in thousands	Required numbers of teachers in 2015 (With current P-T ratio)	(With P-T ratio = 40)	Delta	Teacher salaries (US$)	Additional annual resources needed
Sub-Saharan Africa								
Benin	1996/97	56	1 506	26 893	37 650	10 757	2 366	13 574 080
Burkina Faso	1995/96	50	3 474	69 480	86 850	17 370	2 730	25 290 720
Burundi	1995/96	50	2 358	47 160	58 950	11 790	1 826	11 481 888
Cameroon	1996/97	49	3 819	77 939	95 475	17 536	3 480	32 547 233
Central African Rep.	1990/91	77	813	10 558	20 325	9 767	4 320	22 502 151
Chad	1996/97	67	2 131	31 806	53 275	21 469	1 218	13 946 282
Congo	1996	70	793	11 329	19 825	8 496	4 020	18 216 343
Congo, Dem. Rep. of	1996	45	18 167	403 711	454 175	50 464	600	16 148 444
Gabon	1995/96	51	398	7 804	9 950	2 146	19 800	22 662 588
Guinea	1997/98	49	1 837	37 490	45 925	8 435	1 300	5 848 408
Lesotho	1996	47	656	13 957	16 400	2 443	2 392	3 116 047
Malawi	1995/96	59	3 884	65 831	97 100	31 269	558	9 305 801
Mauritania	1996/97	50	696	13 920	17 400	3 480	4 150	7 702 400
Mozambique	1995	58	4 114	70 931	102 850	31 919	1 380	23 492 359
Rwanda	1991/92	58	2 272	39 172	56 800	17 628	5 723	53 804 094
Senegal	1997/98	56	2 786	49 750	69 650	19 900	3 060	32 476 800
Togo	1996/97	46	1 559	33 891	38 975	5 084	2 320	6 290 226
South Asia								
Afghanistan	1994	58	6 230	107 414	155 750	48 336	236	6 083 917
Bangladesh	1990	63	17 038	270 444	425 950	155 506	981	81 360 507
India	1975/76	42	115 640	2753 333	2891 000	137 667	1 125	82 600 000
Pakistan	1991/92	45	27 914	620 311	697 850	77 539	1 175	48 591 037
Cambodia	1997/98	46	2 071	45 022	51 775	6 753	236	850 010
Myanmar	1994/95	46	5 229	113 674	130 725	17 051	2 067	18 797 118
							Total:	556 688 452

Source: Mehrotra/Buckland 1998 (calculations based on UNESCO *Statistical Yearbook 1996*); own calculations.

Table 4. Coefficient of efficiency

Country/Region	Ideal years to graduate as % of actual years	Proposed factor for additional effort Upper factor limit: 0.4 Acceleration factor: 3	Current recurrent expenditure	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Sub-Saharan Africa				
Angola	51.6	0.326274181	618 723	201 873
Benin	49.8	0.331196672	49 698	16 460
Botswana	90.7	0.117298866	107 586	12 620
Burkina Faso	67.7	0.268129903	156 330	41 917
Burundi	69.3	0.260666539	61 308	15 981
Cameroon	63.7	0.285293676	38 190	10 895
Central African Rep.	20	0.383627646	12 195	4 678
Chad	43.2	0.347133128	31 965	11 096
Congo, Rep.	34.2	0.36435477	33 306	12 135
Cote d'Ivoire	59	0.302997796	966 280	292 781
Eritrea	66.5	0.273496973	1 048 858	286 859
Ethiopia	74.8	0.232098492	310 107	71 975
Gabon	46.5	0.339559005	193 030	65 545
Gambia	74.3	0.234894713	15 512	3 644
Ghana	87.5	0.144999116	312 367	45 293
Guinea	53.1	0.321964102	64 295	20 701
Lesotho	53.6	0.320483767	59 696	19 132
Madagascar	25.9	0.376601319	163 391	61 533
Malawi	43.9	0.345588551	37 640	13 008
Mali	66.4	0.273935569	62 144	17 023
Mauritania	61	0.295768051	82 348	24 356
Mauritius	98.3	0.039803359	45 310	1 803
Mozambique	38.1	0.357458688	82 280	29 412
Namibia	65.5	0.277824275	225 336	62 604
Niger	65.1	0.279519172	168 891	47 208
Nigeria	65.1	0.279519172	1 768 377	494 295
Rwanda	46.9	0.338588927	154 496	52 311
Senegal	80	0.200390173	158 802	31 822

Country/Region	Ideal years to graduate as % of actual years	Proposed factor for additional effort Upper factor limit: 0.4 Acceleration factor: 3	Current recurrent expenditure	Estimated required annual additional expenditure for quality improvement (in 1000 $)
South Africa	75.1	0.230400515	4 336 169	999 056
Sudan	68.4	0.264908716	94 440	25 018
Tanzania, United Rep. of	85.5	0.161008961	193 000	31 075
Togo	44.9	0.343324978	28 062	9 634
Zambia	86.1	0.156306459	85 536	13 370
Zimbabwe	86.1	0.156306459	337 554	52 762
South Asia				
Bangladesh	75.7	0.226958371	170 380	38 669
India	66.6	0.27305706	4 394 320	1 199 900
Nepal	40.5	0.352796003	83 000	29 282
Pakistan	68.3	0.265373037	1 340 000	355 600
Sri Lanka	90.4	0.12001019	64 000	7 681
East Asia & Pacific				
Cambodia	39.5	0.354779664	29 000	10 289
China	94.2	0.083796068	3 780 000	316 749
Indonesia	88.3	0.138321326	527 000	72 895
Lao People's Dem. Rep.	51.5	0.326554682	23 000	7 511
Malaysia	98.2	0.040941985	1 220 000	49 949
Mongolia	94.5	0.080757346	14 000	1 131
Myanmar	58.1	0.306112321	434 000	132 853
Papua New Guinea	67.5	0.269037886	754 000	202 855
Philippines	76.1	0.224628945	1 548 000	347 726
Thailand	93.7	0.088800225	3 565 000	316 573
Viet Nam	79.6	0.203008726	197 000	39 993
Middle East & North Africa				
Algeria	84.1	0.171657816	660 000	113 294
Iran, Islamic Rep. of	92.1	0.104318312	2 439 000	254 432
Jordan	97.3	0.051037351	17 000	868
Kuwait	88.4	0.137475277	5 230 000	718 996
Lebanon	40	0.353795272	18 000	6 368
Libyan Arab Jamahiriya		0.4	523 000	209 200

Country/Region	Ideal years to graduate as % of actual years	Proposed factor for additional effort Upper factor limit: 0.4 Acceleration factor: 3	Current recurrent expenditure	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Morocco	65.5	0.277824275	631 000	175 307
Oman	87.1	0.148278389	457 000	67 763
Saudi Arabia	90	0.123587539	12 494 000	1 544 103
Syrian Arab Rep.	85.8	0.15866829	940 000	149 148
Tunisia	76.1	0.224628945	519 000	116 582
Turkey	92.5	0.10050834	3 020 000	303 535
United Arab Emirates	86.1	0.156306459	451 000	70 494
Yemen	70.8	0.253336681	1 450 000	367 338
Latin America & Caribbean				
Argentina	89	0.132345334	5 980 000	791 425
Bolivia	54.9	0.316529345	204 000	64 572
Brazil	78	0.213174294	15 600 000	3 325 519
Chile	91.7	0.108082838	1 270 000	137 265
Colombia	71.3	0.250819175	940 000	235 770
Costa Rica	83.6	0.175353881	316 000	55 412
Cuba	94.8	0.077691151	272 000	21 132
Ecuador	80.4	0.197740008	192 000	37 966
El Salvador	63.5	0.286098985	156 000	44 631
Guatemala	51.1	0.327668308	219 000	71 759
Haiti	47	0.338344583	28 000	9 474
Honduras	61.4	0.294269315	81 000	23 836
Jamaica	89.1	0.13148133	78 800	10 361
Mexico	93.8	0.087805389	4 620 000	405 661
Nicaragua	52.8	0.322841704	64 800	20 920
Paraguay	69.9	0.257774116	230 000	59 288
Peru	80.3	0.198405534	834 000	165 470
Trinidad and Tobago	93	0.095681129	7 500	718
Uruguay	88	0.140844297	160 000	22 535
Venezuela	59.9	0.299798034	1 200 000	359 758

Country/Region	Ideal years to graduate as % of actual years	Proposed factor for additional effort Upper factor limit: 0.4 Acceleration factor: 3	Current recurrent expenditure	Estimated required annual additional expenditure for quality improvement (in 1000 $)
Eastern Europe & Central Asia				
Albania	88.8	0.134065585	23 000	3 084
Armenia	99.8	0.022307642	28 000	625
Azerbaijan	98.1	0.0420772	40 000	1 683
Belarus	98.4	0.038661313	172 000	6 650
Bulgaria	89.6	0.127122216	26 000	3 305
Croatia	100	0.019914827	254 000	5 058
Czech Republic	98.2	0.040941985	343 000	14 043
Estonia	95.6	0.069378429	35 000	2 428
Georgia	98.6	0.036366915	67 000	2 437
Hungary	93.7	0.088800225	294 000	26 107
Kazakhstan	94.8	0.077691151	147 000	11 421
Kyrgyzstan	94.5	0.080757346	41 000	3 311
Latvia	96.1	0.06408075	19 000	1 218
Lithuania	98.1	0.0420772	26 000	1 094
Moldova	97.3	0.051037351	32 000	1 633
Poland	95.9	0.066209362	1 930 000	127 784
Romania	92.7	0.09858614	260 000	25 632
Russian Federation	97	0.054342353	1 171 000	63 635
Slovakia	96.6	0.058703007	225 000	13 208
Slovenia	98.9	0.032899404	124 000	4 080
The former Yugoslav Rep. of Macedonia	92.2	0.103370101	152 000	15 712
Ukraine	98.4	0.038661313	774 000	29 924
Uzbekistan	99.9	0.021113029	968 000	20 437
			Total:	16 574 939

Source: World Development Indicators 2001; own calculations.

Table 5a. Capital expenditure for countries with GER of less than 100 (as percentage of total primary expenditure, latest available year in the 1990s)

Region/Country	GER male	GER female	Capital expenditure (per cent)
Sub-Saharan Africa			
Burkina Faso	48	33	17
Burundi	68	55	14
Cameroon	88	74	9
Central African Republic	70	50	2
Chad	83	46	1
Congo	82	75	2
Congo, Dem. Rep. of	70	51	2
Ethiopia	52	31	32
Ghana	82	72	13
Guinea-Bissau	85	52	No data
Liberia	72	53	14
Niger	36	22	3
Nigeria	75	65	24
Rwanda	88	88	6
Senegal	73	58	2
Sierra Leone	59	41	4.5
Somalia	18	9	26
South Asia			
Afghanistan	53	5	7
Bhutan	82	62	2
East Asia & Pacific			
Papua New Guinea	42	66	No data
Middle East & North Africa			
Djibouti	45	33	0
Iraq	110	95	1
Sudan	48	43	No data
Syrian Arab Republic	98	93	15
Yemen	89	45	10
Latin America & Caribbean			
Saint Kitts and Nevis	101	94	3

Source: Delamonica et al., 2001.

Table 5b. Additional capital spending required for reaching universal primary education by 2015 (by region, $ 1998)

Region	Observed capital expenditure as per cent of total spending	Capital expenditure required per year to reach GER 100 by 2015 (as per cent in total spending in 2000)	Capital expenditure required by year to reach GER 100 by 2015 ($ million)
Sub-Saharan Africa (16 countries)	17	57	601
South Asia (2 countries)	8	11	11
Middle-East and North Africa (4 countries)	8	19	35
Total (22 countries)	15	48	647

Source: Delamonica et al. 2001.

Table 6. Lower secondary education

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Sub-Saharan Africa			Regional median: 32					3792 121 435
Angola	181 000	3 262 000	32	220	70.4	12 742 400	0.212607804	68 013 308
Benin	112 000	795 000	23	380	87.4	9 788 800	0.139575946	28 512 172
Botswana	75 600	81 600	46	3 240	1 490.4	112 674 240	0.005104516	116 790 705
Burkina Faso	62 600	236 000	42	240	100.8	6 310 080	0.092502681	12 596 911
Burundi	27 300	580 000	143	120	171.6	4 684 680	0.225982741	27 979 517
Cameroon	315 000	1 585 000	32	580	185.6	58 464 000	0.113733409	138 166 379
Cape Verde	19 000	24 000	20	1 330	266.0	5 054 000	0.015696235	5 648 913
Central African Rep.	34 900	384 000	17	290	49.3	1 720 570	0.173366595	6 618 203
Chad	59 500	1 123 000	24	200	48.0	2 856 000	0.216347087	15 730 279
Comoros	8 900	57 000	42	350	147.0	1 308 300	0.13178949	3 576 765
Congo	126 000	430 000	8	670	53.6	6 753 600	0.085275154	12 738 685
Congo, Dem. Rep. of	1 196 300	7 975 000	32	100	32.0	38 281 600	0.1348177539	107 265 173
Cote d'Ivoire	361 000	1 653 000	41	710	291.1	105 087 100	0.106753855	234 871 268
Eritrea	64 100	455 000	10	200	20.0	1 282 000	0.139576692	3 734 148
Ethiopia	437 300	5 200 000	59	100	59.0	25 800 700	0.179455585	104 389 544
Gambia	13 500	85 000	38	330	125.4	1 692 900	0.130504626	4 580 221
Ghana	756 900	1 902 000	17	390	66.3	50 182 470	0.063354648	79 889 040
Guinea	34 610	614 000	32	510	163.2	5 648 352	0.211335518	29 828 224
Kenya	183 800	1 026 000	43	360	154.8	28 452 240	0.121467753	71 554 003

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Lesotho	40 200	100 000	54	550	297.0	11 939 400	0.062636991	18 903 207
Madagascar	262 400	2 628 000	28	250	70.0	18 368 000	0.166032804	66 489 672
Malawi	380 100	443 000	27	190	51.3	19 499 130	0.010261316	20 963 977
Mali	48 800	1 064 000	30	240	72.0	3 513 600	0.228102985	21 362 982
Mauritania	302 500	354 000	57	380	216.6	65 521 500	0.010536161	70 581 686
Mauritius	66 000	73 000	15	3 540	531.0	35 046 000	0.006742945	36 749 520
Mozambique	142 600	1 259 000	36	230	82.8	11 807 280	0.156273077	39 434 355
Namibia	30 300	59 000	36	1 890	680.4	20 616 120	0.045427593	28 657 296
Niger	478 500	1 181 000	74	190	140.6	67 277 100	0.062081548	106 066 406
Nigeria	2 784 700	13 538 000	32	310	99.2	276 242 240	0.111181681	639 630 168
Rwanda	28 900	293 000	54	250	135.0	3 901 500	0.166983329	14 234 355
Senegal	69 200	710 000	64	510	326.4	22 586 880	0.167912079	83 042 316
Sierra Leone	72 500	615 000	10	130	13.0	942 500	0.153194265	3 069 088
South Africa	1 762 200	1 796 000	22	3 160	695.2	1225 081 440	0.001267399	1236 010 024
Sudan	136 400	994 000	4	330	13.2	1 800 480	0.141575924	5 330 624
Swaziland	29 100	51 000	22	1 350	297.0	8 642 700	0.038114234	11 376 852
Tanzania, United Rep. of	56 400	1 316 000	130	240	312.0	17 596 800	0.233668433	112 123 318
Togo	82 900	535 000	26	320	83.2	6 897 280	0.132365468	18 944 881
Uganda	162 500	2 501 000	32	320	102.4	16 640 000	0.199915569	79 854 511
Zambia	79 300	427 000	11	320	35.2	2 791 360	0.1187773	6 869 461

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Zimbabwe	417 500	868 000	32	520	166.4	69 472 000	005000383	99 943 279
South Asia			Regional median: 17					7067 011 046
Bangladesh	2 622 900	16 080 000	16	370	59.2	155 275 680	0.128496684	413 323 412
India	51 882 400	88 775 000	18	450	81.0	4202 474 400	0.036457205	5464 490 225
Maldives	24 400	49 000	17	1 200	204.0	4 977 600	0.047579723	7 031 567
Nepal	969 000	3 177 000	13	220	28.6	27 713 400	0.082379511	51 103 969
Pakistan	4 402 000	26 017 000	21	470	98.7	434 477 400	0.125746171	1131 061 873
Sri Lanka	1 716 000	1 621 000	17	820	139.4	239 210 400	- 0.003789652	0
East Asia & Pacific			Regional median: 13					1919 330 481
Brunei Darussalam	17 600	18 000	13	24 620	3 200.6	56 330 560	0.001499313	56 925 618
Cambodia	250 800	1 431 000	13	260	33.8	8 477 040	0.123106154	21 602 364
China	61 741 700	54 470 000	12	780	93.6	5779 023 120	- 0.008319167	0
China, Hong Kong SAR	265 300	229 000	13	23 520	3 057.6	811 181 280	- 0.00976133	0
Fiji	23 000	50 000	24	2 310	554.4	12 751 200	0.053132005	18 781 900
French Polynesia	15 800	20 000	13	16 930	2 200.9	34 774 220	0.015838949	38 907 379
Indonesia	6 356 400	8 064 000	13	580	75.4	479 272 560	0.015989657	536 818 026
Kiribati	2 200	9 000	36	910	327.6	720 720	0.098469464	1 508 204
Lao People's Dem. Rep.	159 500	720 000	14	280	39.2	6 252 400	0.105702065	13 857 566
Macau	10 700	12 000	13	14 200	1 846.0	19 752 200	0.0076773485	20 849 283
Malaysia	1 280 300	1 501 000	17		0	0	0.010658881	0

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Mongolia	103 600	156 000	46	350	161.0	16 679 600	0.027663637	20 330 901
New Caledonia	18 400	18 400	13	15 160	1 970.8	36 262 720	0.	36 262 729
Papua New Guinea	41 600	316 000	13	800	104.0	4 326 400	0.144738397	13 144 450
Philippines	2 693 500	3 819 000	9	1 020	91.8	247 263 300	0.023549488	292 492 988
Samoa	7 200	8 400	15		0	0	0.010329699	0
Singapore	145 500	128 000	12	29 610	3 553.2	516 990 600	- 0.008506667	0
Thailand	3 155 000	3 162 000	11	1 960	215.6	680 218 000	0.00014776	680 922 016
Tonga	8 000	13 000	8		0	0	0.032896703	0
Vanuatu	3 000	20 000	49		0	0	0.134820701	0
Viet Nam	4 129 000	6 168 000	9	370	33.3	137 495 700	0.027117114	166 927 057
Middle East & North Africa			Regional median: 18					6748 258 972
Algeria	1 859 000	2 011 000	23	1 550	356.5	662 733 500	0.005253311	687 667 946
Bahrain	36 600	31 000	19		0	0	- 0.011009681	0
Egypt	5 650 500	5 970 000	18	1 400	252.0	1423 926 000	0.003673591	1461 131 817
Iran, Islamic Rep. of	6 433 800	6 234 000	8	1 760	140.8	905 879 040	- 0.002100934	0
Iraq	847 200	2 485 000	17		0	0	0.074375336	0
Kuwait	160 000	252 000	6	3 700	222.0	35 520 000	0.0307469	44 284 140
Lebanon	257 700	267 000	18		0	0	0.002366298	0
Morocco	633 000	1 426 000	44	1 200	528.0	334 224 000	0.055636475	501 714 031
Oman	85 500	343 000	21	4 940	1 037.4	88 697 700	0.09738495	183 522 014

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Qatar	20 300	32 000	18	15 570	2 802.6	56 892 780	0.03080598	70 961 157
Saudi Arabia	957 000	2 463 000	18	6 900	1 242.0	1188 594 000	0.065050413	1916 925 583
Syrian Arab Rep.	766 100	1 622 000	17	970	164.9	126 329 890	0.051278282	183 492 770
Tunisia	324 300	563 000	21	2 100	441.0	143 016 300	0.037458571	187 347 776
Turkey	3 761 100	4 929 000	9	2 900	261.0	981 647 100	0.018191802	1117 066 928
United Arab Emirates	108 500	140 000	18	17 870	3 216.6	349 001 100	0.017138016	394 144 810
Latin America & Caribbean			Regional median: 12					8060 415 763
Argentina	1 404 600	1 428 000	15	7 600	1 140.0	1601 244 000	0.001102093	1613 656 234
Bahamas	20 000	23 000	12	11 700	1 404.0	28 080 000	0.009361006	29 996 778
Belize	4 700	10 000	25	2 730	682.5	3 207 750	0.051623162	4 671 353
Bolivia	74 500	250 000	14	1 010	141.4	10 534 300	0.084057327	19 681 568
Chile	236 600	280 000	12	4 740	568.8	134 578 080	0.01129118	145 753 415
Colombia	2 299 300	3 775 000	12	2 250	270.0	620 811 000	0.033605364	790 427 387
Costa Rica	135 500	285 000	25	2 740	685.0	92 817 500	0.050816873	134 348 421
Dominican Rep.	86 900	192 000	5	1 910	95.5	8 298 950	0.054270603	12 329 634
Ecuador	430 000	869 000	17	1 310	222.7	95 761 000	0..048021249	135 725 056
Guatemala	210 000	813 000	5	1 660	83.0	17 430 000	0.094438637	35 330 878
Guyana	45 000	131 000	12	760	91.2	4 104 000	0.073834251	7 081 808
Haiti	120 100	712 000	10	460	46.0	5 524 600	0.125975997	14 408 777
Honduras	91 200	388 000	20	760	152.0	13 862 400	0.101342653	29 677 270

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Jamaica	161 300	150 000	23	2 330	535.9	86 440 670	- 0.004830342	0
Mexico	5 543 100	6 170 000	18	4 400	792.0	4390 135 200	0.007168567	4617 424 827
Nicaragua	93 500	339 000	8	430	34.4	3 216 400	0.08966384	6 279 157
Panama	119 500	169 000	12	3 070	368.4	44 023 800	0.02337489	52 010 548
Paraguay	190 900	530 000	12	1 580	189.6	36 194 640	0.070445751	60 844 322
Peru	1 319 600	1 693 000	7	2 390	167.3	220 769 080	0.016750302	248 631 616
Trinidad and Tobago	57 200	55 000	16	4 750	760.0	43 472 000	- 0.002611299	0
Uruguay	150 900	165 000	11	5 900	649.0	97 934 100	0.005972975	102 136 712
Eastern Europe & Central Asia			Regional median: 22					239 456 700
Albania	30 100	50 000	20	870	174.0	5 237 400	0.034412041	6 708 117
Armenia	283 900	143 000	11	490	53.9	15 302 210	- 0.044689151	0
Azerbaijan	657 900	492 000	18	550	99.0	65 132 100	- 0.019185191	0
Belarus	884 600	466 000	30	2 630	789.0	697 949 400	- 0.041829935	0
Bulgaria	564 700	217 000	22	1 380	303.6	171 442 920	- 0.061769681	0
Croatia	159 600	208 000	22	4 580	1 007.6	160 812 960	0.017814647	182 500 908
Czech Republic	1 059 700	426 000	22	5 060	1 113.2	1179 658 040	- 0.058944774	0
Estonia	44 900	21 000	42	3 480	1 461.6	65 625 840	- 0.04399153	0
Georgia	355 200	222 000	23	620	142.6	50 651 520	- 0.030847766	0
Hungary	867 500	406 000	18	4 650	837.0	726 097 500	- 0.049357769	0
Kazakhstan	1 236 100	935 000	24	1 230	295.2	364 896 720	- 0.018439213	0

Country/Region	Current number of pupils in corresponding grades (gross enrolment)	Total number of students up to age 14 to be enrolled in secondary school	Unit cost (as percentage of GNP per capita)	GNP per capita	Unit cost (in $)	Current expenditure (in $)	Multiplying factor to account for increase in enrolment	Additional annual expenditure
Kyrgyzstan	362 000	377 000	30	300	90.0	32 580 000	0.002710398	33 205 453
Latvia	155 600	74 000	37	2 470	913.9	142 202 840	- 0.048340746	0
Lithuania	217 900	118 000	26	2 620	681.2	148 433 480	- 0.040065387	0
Malta	33 200	18 000	16	9 210	1 473.6	48 923 520	- 0.03990285	0
Moldova	314 100	179 000	53	370	196.1	61 595 010	- 0.036794384	0
Romania	1 106 000	870 000	9	1 520	136.8	151 300 800	- 0.015873465	0
Russian Federation	11 824 300	6 139 000	22	2 270	499.4	5905 055 420	- 0.042758586	0
Slovakia	595 600	272 000	10	3 590	359.0	213 820 400	- 0.050909526	0
Slovenia	170 800	61 000	24	9 890	2 373.6	405 410 880	- 0.06633847	0
Tajikistan	488 600	491 000	12	290	34.8	17 003 280	0.000326718	17 042 222
Ukraine	2 322 200	1 468 000	22	750	165.0	383 163 000	- 0.030111606	0
Uzbekistan	2 988 000	2 591 000	22	720	158.4	473 299 200	- 0.009459004	0
Total								27826 594 398

Sources: United Nations World Population Prospects (2000 Revision); World Education Report 2000; World Development Indicators 2001; UNESCO *Statistical Yearbook 1998*; Lewin (1996), own calculations.
Notes: Countries in which primary education extends up to age 14 are not included in this table. The unit costs in $ are partly taken from Lewin (1996). The rest are own calculations based on the unit costs as a percentage per capita, as provided by the World Education Report 2000 and the World Development Indicators 2001. Where data on neither indicator was available, the regional median average for the unit costs as a percentage per capita was inferred.

Table 7. Pupil-teacher ratios (secondary level)

Region/Country	Pupil-teacher ratio (latest year available)
Sub-Saharan Africa	
Cameroon	31
Central African Republic	38
Chad	37
Congo	33
Cote d'Ivoire	31
Eritrea	45
Ethiopia	35
Mozambique	38
Togo	34
South Asia	
India	33
East Asia & Pacific	
Philippines	32
Middle East & North Africa	
Islamic Republic of Iran	32
Latin America & Caribbean	
Nicaragua	39

Source: World Education Report 2000, World Development Indicators 2001.

Table 8a. The cost of MISA E Programme in sub-Saharan Africa

	Net enrolment ratio (%)	Increased enrolment (number)	Total school cost (million US$)
Angola	35	609 326	62.5
Benin	68	209 047	46.4
Burkina Faso	32	1 016 443	105.2
Burundi	36	548 623	37.7
Central African Republic	46	210 867	40.3
Chad	48	439 972	49.6
Congo, Dem. Rep. of	58	2 407 780	157.6
Eritrea	29	271 944	32.1
Ethiopia	35	5 957 383	367.1
Guinea	46	618 504	123.1
Lesotho	69	108 140	24.5
Madagascar	61	650 787	68.4
Malawi	89	21 386	1.6
Mali	38	827 800	103.6
Mauritania	57	309 504	60.5
Mozambique	40	1 179 523	97.6
Niger	24	1 056 608	105.5
Senegal	60	439 136	85.6
Tanzania, United Republic of	48	2 578 363	254.3
Togo	82	124 733	24.1
Uganda	52	1 534 130	246.1
Zambia	72	304 655	41.9
Average	52	21 424 654	2 135

Source: ILO/UNCTAD Advisory Group 2001.

Table 8b. MISA E outside sub-Saharan Africa

	Primary school						MISA Program			
	GNP per capita (US$ 1995)		Gross (1) enrolment (number)	Enrolment ratio (% of relevant age group)			Increased enrolment (number)	Direct (1) (million US$)	School cost Opportunity (2) (million US$)	Total (million US$)
				GER (2)	NER (3)	Gap of NER				
	1998	Year	Pupils	1996	1996	to 90%		22%	35%	
South Asia										
Bangladesh	361.35	1990	11 940 000	72	64	26	4 311 667	343	545.31	888.07
India	440.63	1994	109 040 000	100	77	18	19 627 200	1 903	3 026.92	4 929.55
Maldives	1 049.00	1993	48 321	128	93	2	755	0	0.28	0.45
Nepal	221.90	1992	3 034 700	113	78	17	456 548	22	35.46	57.75
Pakistan	488.55	1989	8 614 900	61	*61*	29	4 095 608	440	700.32	1 140.52
										7 016.34
East Asia & Pacific										
Cambodia	273.10	1997	2 011 800	110	98	0	0	0	0.00	0.00
China	711.08	1996	136 150 000	123	100	0	0	0	0.00	0.00
Indonesia	896.26	1996	29 236 000	113	95	0	0	0	0.00	0.00
Lao People's Dem. Rep.	419.95	1996	786 340	112	72	23	161 481	15	23.73	38.65
Mongolia	405.05	1996	234 190	88	81	9	23 951	2	3.40	5.53
Papua New Guinea	995.85	1995	516 800	80	73	17	109 820	24	38.28	62.34
Philippines	1 145.00	1996	11 903 000	114	100	0	0	0	0.00	0.00
Thailand	2 578.60	1996	5 909 600	87	88	2	135 853	77	122.61	199.68
Viet Nam	324.79	1987	8 666 300	113	100	0	0	0	0.00	0.00
										306.20

	Primary school						MISA Program			
	GNP per capita (US$ 1995)		Gross (1) enrolment (number)	Enrolment ratio (% of relevant age group)			Increased enrolment (number)	Direct (1) (million US$)	School cost Opportunity (2) (million US$)	Total (million US$)
				GER (2)	NER (3)	Gap of NER				
	1998	Year	Pupils	1996	1996	to 90%		22%	35%	
Middle East & North Africa										
Algeria	1 475.00	1996	4 674 900	107	94	1	43 691	14	22.56	36.73
Egypt	1 162.50	1996	8 243 100	101	93	2	163 230	42	66.41	108.16
Iran, Islamic Republic of	1 281.60	1995	9 238 400	98	90	8	754 155	213	338.28	550.92
Jordan	1 462.20	1995	1 074 900	93	*86*	7	80 906	26	41.41	67.43
Lebanon	2 975.90	1996	382 310	111	76	19	65 440	43	68.16	111.00
Morocco	1 338.80	1996	3 160 900	86	74	16	588 074	173	275.56	448.77
Syrian Arab Rep.	1 011.60	1996	2 690 200	101	91	4	106 543	24	37.72	61.43
Tunisia	2 185.40	1996	1 450 900	118	98	0	0	0	0.00	0.00
Turkey	3 268.70	1994	6 466 600	107	99	0	0	0	0.00	0.00
										1 384.45
Latin America & Caribbean										
Belize	2 606.90	1994	51 377	121	100	0	0	0	0.00	0.00
Bolivia	937.03	1990	1 278 800	95	91	4	53 844	11	17.66	28.76
Brazil	4 452.70	1994	31 220 000	125	90	5	1 248 800	1 223	1 946.19	3 169.50
Colombia	2 344.20	1996	4 916 900	113	85	10	435 124	224	357.01	581.41
Dominican Rep.	1 697.20	1997	1 492 600	94	91	3	47 636	18	28.30	46.08
Ecuador	1 524.40	1996	1 888 200	127	100	0	0	0	0.00	0.00
El Salvador	1 704.20	1997	1 191 100	97	89	8	98 235	37	58.59	95.42
Guatemala	1 519.40	1997	1 544 700	88	72	18	315 961	106	168.03	273.64

	Primary school						MISA Program			
	GNP per capita (US$ 1995)		Gross (1) enrolment (number)	Enrolment ratio (% of relevant age group)			Increased enrolment (number)	Direct (1) (million US$)	School cost Opportunity (2) (million US$)	Total (million US$)
				GER (2)	NER (3)	Gap of NER				
	1998	Year	Pupils	1996	1996	to 90%		22%	35%	
Guyana	760.60	1996	102 000	96	87	9	9 563	2	2.55	4.15
Haiti	368.75	1990	555 430	48	22	68	786 859	64	101.55	165.39
Honduras	693.19	1994	1 008 200	111	88	7	63 580	10	15.43	25.12
Mexico	4 312.40	1996	14 651 000	114	100	0	0	0	0.00	0.00
Nicaragua	401.05	1997	777 920	102	78	17	129 653	11	18.20	29.64
Paraguay	1 788.90	1997	905 810	111	91	4	32 642	13	20.44	33.28
Peru	2 481.70	1995	4 131 100	123	91	4	134 345	73	116.69	190.04
										4 642.44
Eastern Europe & Central Asia										
Albania	811.88	1995	558 100	107	100	0	0	0	0.00	0.00
Armenia	861.03	1996	256 480	87	87	3	9 434	2	2.84	4.63
Azerbaijan	429.98	1996	719 010	106	86	9	60 370	6	9.09	14.80
Kazakhstan	1 266.00	1996	1 342 000	98	90	8	112 290	31	49.76	81.03
Kyrgyzstan	839.15	1995	473 080	104	95	0	0	0	0.00	0.00
Moldova	628.51	1996	320 730	97	90	7	21 823	3	4.80	7.82
Tajikistan	362.49	1996	638 670	95	91	4	24 202	2	3.07	5.00
Uzbekistan	1 002.40	1994	1 905 700	78	91	0	0	0	0.00	0.00
										113.28
									Total:	13 462.70

Source: The State of the World's Children 2001.
Note: This table includes countries with an under-five mortality rate of 30 or above.

Table 9. Benefits

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated per-centage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
South Asia							
Bangladesh	171 020 000 000	65	70	56.5	38	140.8	240 837 151 760
India	2 034 600 000 000	68	52	35.1	32	146.0	2 970 416 168 990
Maldives	1 072 100 000	65	98	96.8	45	127.5	1 366 859 355
Nepal	26 442 000 000	54	44	26.9	41	147.3	38 954 137 710
Pakistan	225 640 000 000	61	50	33.0	42	145.4	327 975 138 758
Sri Lanka	55 939 000 000	95	97	95.2	26	132.2	73 962 581 915
East Asia & Pacific							
Brunei Darussalam	5 278 700 000	65	95	92.1	29	137.9	7 278 041 482
Cambodia	14 453 000 000	63	45	27.9	40	146.5	21 171 229 726
China	3 846 200 000 000	100	91	86.0	24	134.9	5 189 478 173 020
Fiji	3 344 500 000	65	92	87.5	29	138.6	4 636 792 552
Indonesia	540 020 000 000	49	85	77.1	28	143.6	775 669 426 937
Lao People's Dem. Rep.	8 624 400 000	54	57	40.7	49	143.5	12 374 742 591
Malaysia	180 490 000 000	97	99	98.4	32	125.2	225 958 203 421
Mongolia	3 981 800 000	81	87	80.0	33	134.2	5 344 744 733
Papua New Guinea	10 859 000 000	65	60	44.2	36	143.8	15 619 227 815
Philippines	267 270 000 000	53	69	55.2	35	143.9	384 625 862 367
Samoa	647 960 000	65	84	75.7	36	137.6	891 435 284
Singapore	76 588 000 000	65	100	100.0	20	141.6	108 473 959 874

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated percentage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
Thailand	333 880 000 000	37	97	95.2	23	145.6	486 225 586 125
Viet Nam	333 880 000 000	95	78	67.2	33	134.5	449 169 374 953
Middle East & North Africa							
Algeria	143 390 000 000	81	95	92.1	35	129.7	185 982 265 466
Bahrain	8 430 200 000	81	99	98.4	26	134.8	11 367 791 505
Egypt	186 690 000 000	87	92	87.5	34	129.9	242 568 745 503
Iran, Islamic Republic of	317 220 000 000	96	95	92.1	35	124.8	395 769 131 849
Jordan	15 274 000 000	63	98	96.8	38	132.6	20 245 710 468
Kuwait	31 441 000 000	63	97	95.2	30	137.3	43 172 085 360
Lebanon	18 216 000 000	81	91	86.0	31	134.0	24 416 995 137
Morocco	91 795 000 000	53	75	63.1	30	144.1	132 258 178 437
Oman	10 531 000 000	75	95	92.1	43	126.1	13 275 888 599
Qatar	9 512 700 000	81	88	81.5	20	141.5	13 456 874 152
Saudi Arabia	210 670 000 000	81	96	93.7	39	126.2	265 835 111 915
Syrian Arab Rep.	44 176 000 000	90	92	87.5	42	122.5	54 105 991 188
Tunisia	50 448 000 000	86	92	87.5	30	133.1	67 155 796 015
Turkey	407 790 000 000	81	99	98.4	27	134.1	546 880 462 048
United Arab Emirates	48 266 000 000	97	95	92.1	22	135.8	65 555 187 454
Yemen	11 940 000 000	67	74	61.8	5	150.3	17 942 575 099
Latin America & Caribbean							
Argentina	434 030 000 000	75	94	90.6	30	135.2	586 647 589 889
Bahamas	4 296 500 000	75	78	67.2	27	141.1	6 063 290 570

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated per-centage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
Belize	1 088 900 000	75	72	59.1	40	137.5	1 497 749 816
Bolivia	18 040 000 000	58	47	29.9	39	146.7	26 463 039 213
Brazil	1 097 700 000 000	75	71	57.8	27	142.7	1 566 529 982 871
Chile	130 240 000 000	75	99	98.4	28	134.9	175 694 275 836
Colombia	245 050 000 000	75	59	43.0	31	144.1	353 146 228 837
Costa Rica	21 109 000 000	75	89	83.0	31	136.2	28 739 937 261
Dominican Rep.	37 949 000 000	75	58	41.8	31	144.3	54 771 906 285
Ecuador	36 567 000 000	85	72	59.1	32	139.0	50 828 641 910
El Salvador	24 451 000 000	52	77	65.8	35	142.5	34 838 760 791
Guatemala	37 852 000 000	75	51	34.0	44	143.1	54 165 502 459
Guyana	2 889 700 000	75	91	86.0	27	137.8	3 982 942 860
Haiti	10 578 000 000	43	41	24.0	41	148.6	15 723 287 499
Honduras	14 976 000 000	46	58	41.8	42	145.6	21 812 196 395
Jamaica	8 729 800 000	75	96	93.7	31	133.9	11 686 339 277
Mexico	738 390 000 000	93	85	77.1	31	133.4	985 360 469 238
Nicaragua	10 271 000 000	75	51	34.0	42	143.5	14 740 627 202
Panama	14 509 000 000	77	82	72.8	30	138.4	20 074 524 175
Paraguay	22 377 000 000	71	71	57.8	39	139.1	31 118 464 727
Peru	106 190 000 000	93	87	80.0	32	131.9	140 109 351 604
Trinidad and Tobago	9 619 200 000	75	96	93.7	25	137.7	13 245 543 064
Uruguay	28 361 000 000	54	98	96.8	30	139.3	39 519 611 849
Venezuela	135 000 000 000	62	89	83.0	32	138.7	187 199 201 025

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated percentage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
Eastern Europe & Central Asia							
Albania	9 363 900 000	89	82	72.8	29	136.6	12 791 746 190
Armenia	7 864 500 000	89	96	93.7	26	134.0	10 535 544 521
Azerbaijan	17 202 000 000	82	98	96.8	29	132.7	22 826 574 101
Belarus	64 665 000 000	89	96	93.7	24	135.5	87 621 803 596
Bulgaria	39 707 000 000	89	91	86.0	24	137.0	54 392 139 567
Croatia	30 378 000 000	98	98	96.8	23	133.8	40 653 955 159
Czech Republic	127 270 000 000	89	100	100.0	22	135.9	172 949 749 383
Estonia	11 137 000 000	89	96	93.7	24	135.5	15 090 760 483
Georgia	18 245 000 000	94	98	96.8	26	132.1	24 099 580 240
Hungary	103 490 000 000	89	98	96.8	23	135.7	140 409 870 761
Kazakstan	68 275 000 000	98	92	87.5	27	132.6	90 513 687 352
Kyrgyzstan	10 886 000 000	97	89	83.0	35	127.6	13 894 977 276
Latvia	14 029 000 000	82	96	93.7	24	136.9	19 208 986 884
Lithuania	23 832 000 000	89	98	96.8	25	134.1	31 956 013 513
Malta	8 786 400 000	89	100	100.0	24	134.3	11 796 452 266
Moldova	8 366 400 000	89	93	89.0	26	135.0	11 291 058 087
Poland	294 610 000 000	89	98	96.8	24	134.9	397 387 810 100
Romania	127 080 000 000	84	96	93.7	23	137.2	174 385 056 655
Russian Federation	947 680 000 000	89	96	93.7	23	136.3	1 291 290 334 405
Slovakia	52 285 000 000	89	97	95.2	24	135.2	70 686 805 290
Slovenia	28 329 000 000	89	98	96.8	21	137.2	38 875 101 995

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated per-centage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
Tajikistan	6 365 300 000	89	96	93.7	41	121.3	7 718 824 972
The former Yugoslav Rep. of Macedonia	8 549 700 000	76	95	92.1	25	137.8	11 777 508 412
Turkmenistan	11 878 000 000	89	96	93.7	36	125.7	14 936 249 162
Ukraine	160 650 000 000	89	98	96.8	24	134.9	216 694 449 247
Uzbekistan	49 374 000 000	89	96	93.7	38	124.0	61 217 266 748
Sub-Saharan Africa							
Angola	21 859 000 000	32	34	17.8	50	149.7	32 720 797 732
Benin	5 158 600 000	43	64	49.0	49	143.9	7 420 664 511
Botswana	9 531 200 000	63	86	78.6	41	135.2	12 890 275 195
Burkina Faso	9 333 200 000	14	68	54.0	50	149.0	13 905 425 673
Burundi	3 730 200 000	31	74	61.8	47	144.9	5 405 610 223
Cameroon	8 701 200 000	32	51	34.0	45	148.1	12 889 018 754
Central African Republic	3 890 100 000	22	24	10.2	43	151.1	5 877 624 048
Chad	6 237 100 000	32	59	43.0	56	145.9	9 102 865 251
Congo, Dem. Rep. of	39 650 000 000	22	64	49.0	50	147.8	58 585 837 061
Congo, Rep.	2 768 100 000	32	55	38.4	48	147.4	4 079 035 806
Eritrea	3 231 000 000	21	71	57.8	45	147.7	4 772 123 596
Ethiopia	35 150 000 000	32	51	34.0	48	147.9	51 979 065 731
Gambia	415 700 000	37	74	61.8	41	144.6	601 172 220
Ghana	7 500 800 000	32	80	70.0	44	144.2	10 818 212 747
Guinea	12 623 000 000	18	78	67.2	46	147.6	18 634 097 172
Kenya	11 579 000 000	32	68	54.0	45	145.9	16 893 213 795

Region/Country	GDP (current international $) 1998	Current intake into grade 1	Percentage of prim. School entrants reaching grade 5	Estimated per-centage of primary entrants reaching grade 8	Age-dependency ratio * 0.5 (%)	Increase in GDP (%)	Increase in GDP (current int. $'98)
Lesotho	3 346 600 000	32	68	54.0	40	146.6	4 905 290 625
Madagascar	11 029 000 000	32	40	23.1	47	149.2	16 457 456 579
Malawi	5 512 300 000	73	34	17.8	48	147.1	8 108 513 362
Mali	7 218 700 000	24	84	75.7	51	144.7	10 445 847 729
Mauritania	3 952 900 000	30	66	51.4	44	146.7	5 797 581 566
Mozambique	13 261 000 000	20	46	28.9	47	149.8	19 863 778 742
Niger	7 497 200 000	19	66	51.4	52	148.0	11 095 245 060
Nigeria	96 028 000 000	32	80	70.0	44	144.2	138 498 737 952
Rwanda	2 023 900 000	32	60	44.2	44	147.1	2 977 418 006
Senegal	11 809 000 000	23	82	72.8	45	146.1	17 250 701 891
South Africa	351 420 000 000	30	65	50.2	31	148.3	521 188 830 976
Sudan	10 366 000 000	43	76	64.5	37	143.9	14 916 683 481
Tanzania, United Republic of	15 426 000 000	14	81	71.4	47	148.3	22 874 820 109
Togo	6 117 100 000	32	60	44.2	48	146.7	8 972 046 453
Uganda	22 446 000 000	92	55	38.4	52	137.0	30 744 791 709
Zambia	6 953 900 000	43	84	75.7	46	140.0	9 733 061 538
Zimbabwe	31 201 000 000	39	73	60.4	40	144.6	45 107 293 303
							22 064 892 539 177

Source: Own calculations, based on Mankiw/Romer/Weil, 1992.
Note: Where data on current intake into grade 1 was not available, the regional median was used. Where GDP data was not available, the country was excluded from the table.

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