

**MONEY COUNTS:  
PROJECTING EDUCATION EXPENDITURES IN LATIN  
AMERICA AND THE CARIBBEAN TO THE YEAR 2015**

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**By Laurence Wolff and Martin Gurría**



UNESCO Institute for Statistics, Montreal, 2005

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## 1. Introduction

This paper projects educational expenditures, both public and private, in 19 countries in Latin America and the Caribbean, to the year 2015, for pre-primary, primary, secondary and tertiary education. Through these projections we examine the financial feasibility of reaching critical education goals for increased access and quality at all levels of education. The paper estimates feasibility on the basis of the percentage of expected GDP which would have to be expended to meet these goals.<sup>1</sup>

Projecting just about anything is a risky business. As many commentators have put it: “Projections are very difficult because they are about the future” and “If economists could reliably predict the future, they would all be multi-millionaires.” While it is a truism that the best estimate of the future is what has happened in the past, we often do not know as much as we think we do about the past, which can suffer from a “fog” of conflicting numbers and statistics.

Yet, while projecting anything is hazardous business, it can also be rewarding. The exercise of projecting education expenditures in Latin America to the year 2015 can help policy-makers to understand the implications as well as the feasibility of current priorities, policies and programmes. It can help policy-makers to realise how complicated the process of achieving their goals is and can also provide them with financial options, some of them overlooked, to achieving such goals. It can guide policy-makers in education, who are often condemned to work on a short-term and crisis framework, as well as finance policy-makers, who also spend too much time trying to balance this year’s budget rather than planning for the long-term future. By focusing on the long term, education leaders can begin to ask the right questions about relative and absolute costs, the effectiveness of expenditures, and the feasibility of implementing policies.

Of course, money is not the only thing that matters in education. There is evidence that the amount of money spent on education does not necessarily translate into increased learning. For example in the most recent international studies of learning, several countries, including Korea and Hungary, do far better in levels of learning of fifteen-year-olds than would be expected given their per student expenditures on education, while the United States, Germany and several Latin American countries do worse (OECD/UNESCO-UIS, 2003). But education expenditures usually account for 20% of government budgets in Latin America, and an increasing amount is expended by the private sector. Political leaders, government finance officials, the private sector, and the informed public want to know whether they are investing enough money in education, whether they are investing it efficiently, and what should be done in the future.

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<sup>1</sup> A number of other studies have been undertaken to examine financial feasibility of growth and quality improvement in education. See for example Bruns et al, 2003; Bruneforth et al, 2004; and UNESCO/ECLAC, 2004.

It should be understood that projecting educational expenditures for 19 countries has its limitations. In the first place the projections depend mainly on data provided by countries to UNESCO. When definitions change, as they recently have (e.g. the number of years of secondary education), the data can often vary significantly from one year to another. Secondly setting regional targets to be met by all countries, as has been done at regional summits as well as in this paper, overlooks the wide income and development disparities of countries in the region. A more subtle approach would be to set “intermediate” goals for the poorer countries. Based on the data provided here, such intermediate goals can in fact be developed. Finally, setting goals on the basis of enrolment ratios is a poor substitute for what is really important for education and development—levels of educational attainment and of learning achievement of the work force of a country. Increasingly data are available on levels of learning achievement (e.g. the UNESCO OREALC study of 4<sup>th</sup> grade achievement in 12 countries) and on educational attainment of the adult population (see *CEPAL statistical yearbook*). But ministries of education operate on the basis of enrolments, and current available data do not permit good estimates of the costs of reaching these more fundamental goals.

The next section in this paper presents the basic data and projections as well as the assumptions underlying the projections. The final section examines how to ensure that increased spending is effective, especially in terms of increased learning and school retention. An annex discusses the sources as well as technical issues which must be dealt with in an exercise of this sort.



## 2. The Results: Education Expenditures in the Years 2000 and 2015

### GDP and population growth in 2000 and 2015

The exercise begins with the current and projected population and GDP per capita of the 19 countries studied. As can be seen in **Table 1**, total country population in the 19 countries ranged in 2000 from over 170 million in Brazil to less than 3 million in Jamaica. More importantly, it can be seen that most countries in the region will experience very moderate population growth through the year 2015. The majority will grow at less than 1.5% per annum. The countries in the southern most part of the region will grow most slowly. Only Guatemala, Nicaragua and Paraguay will grow at more than 2% per year.

**Table 1. Population and economic growth, 2000 and 2015**

Countries	Total Population (thousands)		Annual Population Growth Rate 2000-2015	GDP Per Capita Current US\$ (in PPPs)		Expected Annual Growth in GDP per Capita to 2015	Expected Annual Growth in GDP to 2015
	2000	2015		2000	2015		
Argentina	39,300	45,350	1.0%	12,377	17,926	2.5%	3.5%
Bolivia	8,330	11,220	1.7%	2,424	3,360	2.2%	3.9%
Brazil	170,690	202,450	1.1%	7,625	11,708	2.9%	4.0%
Chile	15,210	17,910	1.1%	9,417	16,959	4.0%	5.1%
Colombia	42,320	53,180	1.4%	6,248	8,788	2.3%	3.7%
Costa Rica	4,020	5,230	1.6%	8,650	12,166	2.3%	3.9%
Dominican Rep.	8,400	10,440	1.3%	6,033	10,865	4.0%	5.3%
Ecuador	12,650	15,940	1.3%	3,203	3,946	1.4%	2.7%
El Salvador	6,280	7,980	1.3%	4,497	6,805	2.8%	4.1%
Guatemala	11,390	16,380	2.3%	3,821	4,707	1.4%	3.7%
Honduras	6,490	9,040	2.0%	2,453	3,301	2.0%	4.0%
Jamaica	2,580	2,960	1.0%	3,639	4,004	0.7%	1.7%
Mexico	98,880	119,180	1.2%	9,023	14,684	3.3%	4.5%
Nicaragua	5,070	7,220	2.1%	2,366	3,092	1.8%	3.9%
Panama	2,860	3,450	1.7%	6,000	9,079	2.8%	4.5%
Paraguay	5,500	7,770	2.2%	4,426	4,699	0.4%	2.6%
Peru	25,940	31,970	1.4%	4,799	7,810	3.3%	4.7%
Uruguay	3,340	3,680	0.6%	9,035	11,982	1.9%	2.5%
Venezuela, RB	24,170	30,880	2.0%	5,794	6,060	0.0%	2.0%
<b>Latin America and the Caribbean</b>	493,400	602,230	1.5%	5,885	8,523	2.2%	3.7%
<b>OECD country mean</b>	n.a.	n.a.	0.5%	27,821	37,443	2.0%	2.5%
<b>High Income Countries</b>	n.a.	n.a.	0.3%	27,480	38,087	2.7%	3.0%

Sources: Population: CELADE; GDP: World Bank, 2003a.

Note: Economies are grouped according to 2000 GNI (formerly referred to as GNP) per capita, calculated using the World Bank Atlas method. The groups are: low income, \$765 or less; lower middle income, \$766-\$3,035; upper middle income, \$3,036-\$9,385; and high income, \$9,386 or more. Because of rounding, sums for all tables may not add up.

GDP per capita ranges significantly from one country to another. In the year 2000 Argentina had the highest GDP per capita of the region (US\$ 12,377 based on purchasing power parities)<sup>2</sup>, with Brazil, Chile, Costa Rica, Mexico, and Uruguay above US\$ 7,000 per capita. The poorest countries (less than US\$ 3,000) were Bolivia, Honduras and Nicaragua. It should be noted that some Latin American countries have a higher GDP per capita than recent European Union entrants, such as Poland (2000: US\$ 9,021); yet by and large they lag far behind countries as diverse as the United States (\$36,300), Japan and even Portugal (US\$ 17,290) (World Bank, 2003a).

Table 1 also shows World Bank estimates for GDP growth in the nineteen countries. These estimates were prepared by Bank economists on the basis of recent trends and best guesses about the opportunities for these countries. As with any economic projection, they must be taken with a great deal of circumspection.

Estimated annual GDP growth through 2015, according to the World Bank, would range from a high of 5.1% per year for Chile to 1.7% for Jamaica, with an average of 3.9% for the region as a whole. These growth rates are significantly lower than those estimated by the World Bank for Asia. On this basis the per capita income in the region would increase to an average of US\$ 8,523. It would be over US\$ 11,000 in six countries but would remain at less than US\$ 5,000 in another seven countries. The gap with OECD countries would decline slightly but the gap with East Asia would grow.

### **School-age populations in 2000 and 2015**

The school-age population is defined here as children and youths aged 6-17. Over the period 2000-2015, the school-age population in the 19 countries will grow on average by 8.7% (see **Table 2 and Figure 1**). Growth will be less than 5% in nine countries and will actually decline in Brazil, Chile, Jamaica, Mexico, Panama and Venezuela. The only countries with more than 20% growth of their school-age population will be Bolivia, Guatemala, Nicaragua and Paraguay -- among the poorest countries in region. With these exceptions the region will have a "window of opportunity" through the year 2020, during which time the percentage of the population in the work force will increase and the number of dependent persons, those who are very young and those who are very old, will decrease.

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<sup>2</sup> This may not be the case now because of the economic crisis of 2001.

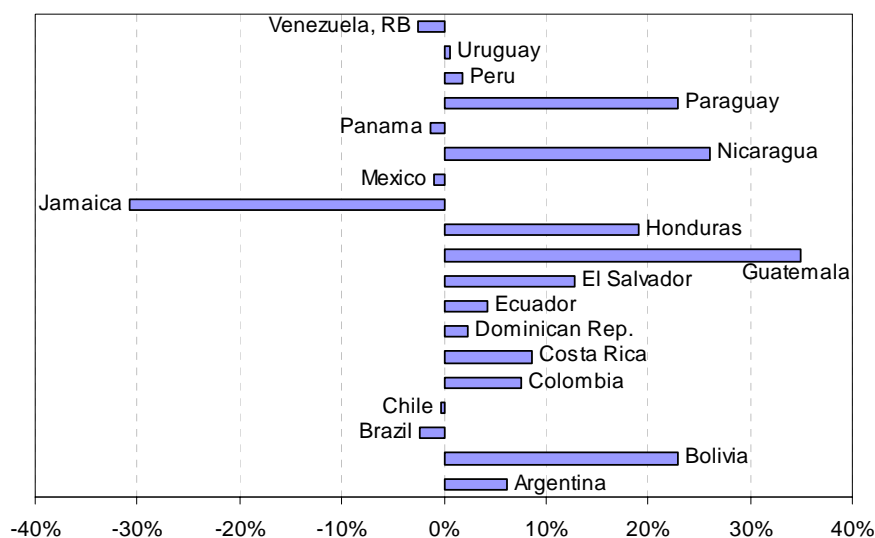
**Table 2. School-age population (ages 6 to 17) in 2000 and 2015**

Countries	School-age Population (thousands)		Percentage Change
	2000	2015	
Argentina	8,040	8,540	6.2%
Bolivia	2,390	2,930	22.9%
Brazil	36,340	35,510	-2.3%
Chile	3,380	3,370	-0.2%
Colombia	10,610	11,420	7.6%
Costa Rica	940	1,020	8.6%
Dominican Rep.	2,240	2,290	2.3%
Ecuador	3,330	3,470	4.4%
El Salvador	1,670	1,890	12.7%
Guatemala	3,570	4,820	35.0%
Honduras	1,980	2,360	19.1%
Jamaica	870	610	-30.7%
Mexico	25,500	25,270	-0.9%
Nicaragua	1,580	1,990	26.0%
Panama	700	690	-1.3%
Paraguay	1,620	1,990	22.9%
Peru	6,340	6,450	1.8%
Uruguay	640	640	0.8%
Venezuela, RB	6,400	6,210	-2.5%
<b>Latin America &amp; the Caribbean</b>	<b>111,750</b>	<b>121,470</b>	<b>8.7%</b>

Sources: CELADE.

Note: Brazil, Costa Rica and Peru up to age 16, since they have an 11 year primary and secondary system.

**Figure 1. Growth of school-age population (ages 6-17), 2000-2015**



Sources: See Table 2.

## Enrolments and percentage of school-age population enrolled, 2000 and 2015

### Enrolments in 2000

In the year 2000 gross primary school enrolment ratios (e.g. total enrolment as a percentage of the school-age populations) averaged 109% (see **Table 3**). The ratios vary from a high of 120% in Argentina to 94% in Colombia. Enrolment ratios are higher than 100% because of late entrants, repetition, and children returning to school after dropping out. Primary repetition rates are estimated at 16% (Wolff et al, 2002) and completion rates at 84%, depending on the source (ibid).<sup>3</sup>

**Table 3. Numbers of students and gross enrolment ratios, 2000**

Countries	Pre-primary		Primary		Secondary		Tertiary	
	Total (thousands)	As a % of 4 to 5-year-olds	Total (thousands)	As a % of 6 to 11-year-olds	Total (thousands)	As a % of 12 to 17-year-olds	Total (thousands)	As a % of 20 to 24-year-olds
<b>Argentina</b>	835	60	4,898	120	3,846	97	1,601	48
<b>Bolivia</b>	217	46	1,492	116	879	80	279	36
<b>Brazil</b>	4,008	63	21,225	111	18,609	108	2,781	17
<b>Chile</b>	451	77	1,799	103	1,383	85	452	38
<b>Colombia</b>	710	37	5,221	94	3,552	70	934	24
<b>Costa Rica</b>	150	87	551	107	255	60	62	17
<b>Dominican Rep.</b>	141	38	1,386	124	660	59	176	23
<b>Ecuador</b>	399	69	1,955	115	929	57	218	18
<b>El Salvador</b>	136	44	940	107	431	54	118	18
<b>Guatemala</b>	359	51	1,909	100	612	37	90	8
<b>Honduras</b>	81	21	1,095	103	295	32	91	15
<b>Jamaica</b>	97	88	328	100	454	83	43	17
<b>Mexico</b>	3,396	76	14,793	113	9,317	75	2,048	21
<b>Nicaragua</b>	83	27	838	100	400	54	57	12
<b>Panama</b>	57	47	400	112	234	69	89	35
<b>Paraguay</b>	249	83	950	111	461	60	83	17
<b>Peru</b>	726	59	4,350	122	2,375	86	848	34
<b>Uruguay</b>	70	63	361	109	304	98	98	36
<b>Venezuela, RB</b>	534	48	3,347	102	1,824	59	681	30
<b>Latin America &amp; the Caribbean</b>	12,699	54	67,838	109	46,820	72	10,749	24
<b>OECD country mean</b>	n.a.	70	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
<b>High-income countries</b>	n.a.	79	n.a.	102	n.a.	106	n.a.	62

Sources: UNESCO Institute for Statistics, 2003; World Bank, 2003a; OECD 2003.

Notes: i) Gross enrolment ratios. Brazil, Costa Rica and Peru have five-year secondary education systems so the ratio is with the age group 12-16. ii) n.a. = not available. iii) To have data for the greatest number of countries, we drew upon several sources, and therefore enrolment figures and enrolment ratios are not compatible with any single source. See the Annex for further details.

<sup>3</sup> Other sources vary by around 5%.

Secondary gross enrolment ratios (grades 7-12) are reported at 72% of the appropriate age group for the region as a whole. Gross secondary enrolment ratios range from over 95% in Argentina, Brazil and Uruguay to lows of 32% in Honduras and 37% in Guatemala. These figures mask high enrolment ratios in “lower” secondary education (grades 7-9) and much lower enrolment ratios in “upper” secondary education (grades 10-12), as well as significant and often under-reported repetition ratios. For example, in Brazil repeaters account for 18% of total secondary enrolment (Herran and Rodriguez, 2002).

On average in the region enrolment in tertiary education is equivalent to 24% of 20 to 24-year-olds. Enrolment ratios range from a high of 48% for Argentina to a low of 8% in Guatemala. These gross enrolment ratios mask potentially high levels of repetition as well as large numbers of part-time students. Finally, 54% of children (defined as those aged 4-5) were enrolled in pre-primary schooling, ranging from less than 30% in Honduras and Nicaragua to over 80% in Costa Rica, Jamaica and Paraguay.

Private education accounts for 31%, 13%, 28% and 37% of enrolments at the pre-primary, primary, secondary and tertiary levels (see **Table 4**). There is wide variation among countries and levels, especially in tertiary education, where private enrolment ranges from 6% to 71%. Compared with most regions of the world, private education accounts for a relatively high proportion of total enrolment. Some countries in the Far East (e.g. Indonesia, Japan, Korea, Philippines) enrol higher proportions of tertiary education students in private education.

**Table 4. Percent enrolled in private education, latest available year**

Countries	Pre-primary (1996)	Primary (1996)	Secondary (1996)	Tertiary (1994)
Argentina	29	20	28	21
Bolivia	10	10	31	8
Brazil	22	8	16	58
Chile	51	10	10	54
Colombia	51	19	39	64
Costa Rica	10	5	11	24
Dominican Rep.	41	16	33	71
Ecuador	38	23	26	23
El Salvador	25	13	61	69
Guatemala	32	13	48	29
Honduras	21	5	31	12
Jamaica	84	5	31	34
Mexico	8	6	11	25
Nicaragua	22	16	32	34
Panama	26	10	13	8
Paraguay	28	14	16	47
Peru	22	12	16	36
Uruguay	26	16	16	6
Venezuela, RB	19	18	29	35
Latin America & the Caribbean	31	13	28	37
OECD country mean	18	7	7	22

Sources: UNESCO Statistical Yearbook 1999; Data for higher education are from IDB 1997; More recent data were not available at the time of writing this paper.

Notes: Years of data differ for the following countries: Bolivia: primary 1990, secondary 2000; Chile: primary and secondary 2000; Colombia: secondary 1990; Ecuador: primary and secondary 2000; El Salvador: secondary 1990; Guatemala: primary secondary, 2000; Panama: secondary 1990; Venezuela: secondary 1990; Chile provides public support to many private schools. It is estimated that only 10% of primary and secondary schools in Chile are private and do not receive public financing. (Vargas and Peirano, 2004).

### *Expected enrolment ratios by 2015*

Desirable enrolment ratios by level are based on goals agreed upon by political leaders in the region, continuation of past trends and comparative data on other regions. On this basis the expected gross enrolment ratios are 80%, 100%, 85% and 40% of the school-age populations in pre-primary, primary, secondary and tertiary education.

In this exercise the expected gross primary enrolment ratio for 2015 is 100%, compared to the current gross enrolment ratio of 109%. A related objective of all countries is that of universal primary *completion*. If repetition continues at the same rate as in the past, then gross enrolment ratios would likely continue at 109% or even higher. Because it measures both education system coverage and student attainment, the primary completion rate (and proxies which seek to estimate completion) is a more comprehensive indicator of human capital formation and school system quality and efficiency than either gross or net enrolment ratios. It is also the most direct measure of national progress towards the Millennium Development Goal of universal primary completion. Even better would be a combination of completion rates and learning achievement. It should be noted that if all children enrol on time in the first year of primary education and then complete their schooling without repeating, that "gross" and "net" enrolment ratios would be the same.

The expected gross secondary enrolment ratio 2015 (grades 7-12) is 85%, a significant increase from the ratio in 2000 of 72%. This compares with the goal enunciated by the 1998 Summit of the Americas for 2010 of a 75% gross enrolment ratio, a figure which has likely already been achieved. A continuation of the current enrolment growth trends would easily lead to an 85% or higher enrolment ratio by 2015. Of course this ratio could also mask repetition rates as well as differences between lower secondary education (where enrolment ratios are probably already at 100%) and upper secondary education. Also primary completion rates would need to increase to at least 90% for secondary enrolments to continue to grow. Except in the poorer countries, such as Guatemala, which has a lower secondary gross enrolment ratio of only 47% (Ministry of Education of Guatemala, 2003), the greatest enrolment and completion challenge will be in upper secondary education.

Tertiary education includes post-secondary institutions which offer certificates, "diplomas" and "associate degrees," after one, two or three years of schooling; colleges and universities offering bachelors degrees; and institutions offering masters, doctoral, and other graduate programmes. One study estimates that the region's

current gross enrolment ratio of 24% is 10% below that of countries at comparable per capita GDP levels (de Ferranti et al, 2003). Brazil and Mexico have particularly low tertiary education enrolment ratios compared to their competitors. Two studies suggest that the premium for tertiary education graduates in the region (e.g. the rate of return) is increasing significantly (de Ferranti et al, 2003 and IDB, 2003). Over the fifteen-year time span of the projection, other countries will continue to expand their tertiary education enrolments. Based on the recent rapid growth of secondary education, a combination of social and economic demand, and to keep pace with competitors, it is appropriate to expect that, over the fifteen-year period from 2000 to 2015, gross enrolment ratios would increase significantly. In this exercise the ratio is estimated at 40% for 2015. This would still leave the region far behind the current OECD ratio of 60%. It would still mean that less than half of secondary school graduates would attend tertiary education institutions.

Based on anecdotal information, tertiary institutions appear to be increasingly serving working adults who are seeking to upgrade their skills and knowledge, often on a part-time basis, as well as students who remain enrolled for many years. For example in Bolivia the high gross enrolment ratio (37%) is reported to be a result of students remaining enrolled for many years beyond the normal length of their course of study (Contreras and Simon, 2003).

For pre-primary, there has been rapid expansion over the past few years. Continuing this expansion could lead to enrolment ratios equivalent to 80% of the 4 to 5-year-old population, compared with the current 54%. Early childhood education plays a crucially important role in ensuring the future success of students' academic careers and in building a strong foundation for lifelong learning. This expectation is also in keeping with OECD, Eastern European and rapidly growing Asian countries, many of which have near universal pre-primary enrolments, as well as the statements of regional education leaders on the importance of pre-primary schooling (OECD, 2003). Finally this is a reachable ratio since the absolute numbers of pre-primary age children will decline over the next 15 years.

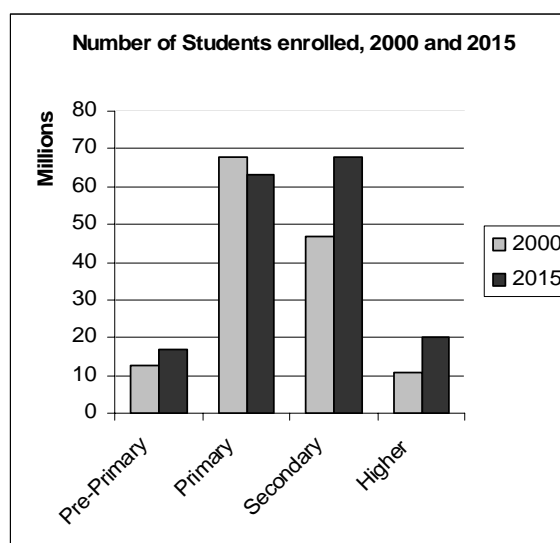
As can be seen in **Table 5** and **Figure 2**, for primary education 100% enrolment ratios would mean that the number of students in primary education in nearly every country would be stagnant or decrease significantly by the year 2015. Overall the number of students would decline from 67.8 million in 2000 to 63.2 million in 2015. The decline would be over 10% in the cases of Argentina, Brazil, Mexico and Peru. The exceptions would be Guatemala, Nicaragua and Paraguay, where enrolments would increase by 20%. If repetition continued at a rate of 10%, then enrolments would increase modestly to around 69 million. Of course it is hoped by all political leaders that the region would get close to a 100% completion rate with little or no dropout.

**Table 5. Enrolment projections by level, 2015**

	Pre-primary (80% of 4 to 5-year-olds) (thousands)	Primary (100% of 6 to 11-year-olds) (thousands)	Secondary (85% of 12 to 17-year-olds) (thousands)	Tertiary (40% of 20 to 24-year-olds) (thousands)
Countries	Target = 80%	Target = 100%	Target = 85%	Target = 40%
<b>Argentina</b>	1,139	4,293	4,993	1,373
<b>Bolivia</b>	409	1,500	1,686	430
<b>Brazil</b>	5,255	19,525	18,810	6,378
<b>Chile</b>	453	1,677	1,994	578
<b>Colombia</b>	1,537	5,725	6,698	1,865
<b>Costa Rica</b>	154	566	536	174
<b>Dominican Rep.</b>	315	1,174	1,313	351
<b>Ecuador</b>	459	1,740	2,041	566
<b>El Salvador</b>	250	945	1,110	288
<b>Guatemala</b>	669	2,425	2,816	645
<b>Honduras</b>	323	1,198	1,372	360
<b>Jamaica</b>	80	301	358	105
<b>Mexico</b>	3,320	12,537	14,980	4,080
<b>Nicaragua</b>	274	1,017	1,142	286
<b>Panama</b>	91	344	405	115
<b>Paraguay</b>	292	1,042	1,120	289
<b>Peru</b>	937	3,505	3,468	1,176
<b>Uruguay</b>	88	334	365	109
<b>Venezuela, RB</b>	914	3,411	3,297	1,091
<b>Latin America &amp; the Caribbean</b>	16,960	63,258	68,504	20,257

Sources: CELADE; UNESCO Institute for Statistics database; authors' calculations.

**Figure 2. Enrolment growth, Latin America and the Caribbean, 2000-2015**



Sources: See Tables 3 and 5.



To reach 85% gross enrolment in secondary education, enrolments in the region would have to increase from 46.8 million to 68.5 million. All of the poorer countries would have to make major efforts at quantitative expansion, with Ecuador, El Salvador, Guatemala and Honduras having the furthest to go. In contrast Argentina, Bolivia, Brazil, Chile, Jamaica, Peru and Uruguay would not need to increase total enrolment at all or only by a small percentage. It should be noted that Brazil, Costa Rica and Peru have five-year secondary school systems. If they were to extend schooling by one year, as is being discussed in several of these countries, then the number of students would increase by up to 20%. Of course, more important than enrolment increases would be reduced repetition and increased completion rates.

Increasing tertiary education enrolments to 40% would mean that the number of students would increase from 10.7 million to 20.3 million. Enrolments in Brazil would increase by over 3.5 million and in Mexico by 2 million. Some of the smaller, poorer countries would have to quadruple enrolments, which would be very unlikely. In contrast Argentina, Bolivia, Chile, Panama and Uruguay already enrol about 35% of the tertiary education cohort.

In spite of the reduced number of school-age children, achieving 80% enrolment in pre-primary schooling would require, for most countries, major expansion of places. In the region as a whole enrolments would increase from 12.7 to 16.9 million. Countries such as Bolivia, Dominican Republic, Honduras and Nicaragua would have to double pre-primary enrolment. Brazil would have to enrol 1.2 million more children in pre-primary than the 4.0 million that it enrolls now. Chile, Costa Rica, Jamaica and Paraguay are already close to or exceed an 80% enrolment ratio.

Primary repetition rates range from 5% to 25%, with the highest percentage in Brazil and Guatemala (UNESCO-UIS/OECD, 2003). There is also a long history in the region of under-reporting repetition. While there is almost no information, anecdotal evidence is that there are large numbers of part-time, repeating, and returning tertiary education students. If repetition continues at 10% or more at all levels throughout the region, and probably higher in primary education, then gross enrolment ratios would likely be at least 110% in primary education and could also be higher at other levels of education.

### **Unit costs of education, 2000 and 2015**

#### *Unit costs, 2000*

Expenditures per student for the year 2000 (see **Table 6**) vary enormously from country to country, in terms of US dollars, using purchasing power parity exchange rates. For example in primary education, while the regional average is US\$ 784, Argentina, Chile and Costa Rica spend over \$1,500 per student, but Ecuador, Guatemala and Nicaragua spend less than US\$ 300. There are similar huge differences in secondary education, ranging from less than US\$ 300 in Bolivia and Nicaragua to over US\$ 1,700 in Argentina and Chile. Tertiary education unit costs

vary from under US\$ 600 in Dominican Republic and El Salvador to over US\$ 6,000 in Brazil, Chile, Colombia, and Jamaica. In comparison OECD countries invest over five times more per student in primary and secondary education and 3.5 times more in tertiary education. While GDP per capita among countries varies by a factor of two to three, unit costs in education vary by a factor of six to ten.

**Table 6. Cost per student, 2000, US\$ (PPP) and as % of GDP per capita**

Countries	Costs per student							
	Pre-primary US \$	% GDP per capita	Primary US \$	% GDP per capita	Secondary US \$	% GDP per capita	Tertiary US \$	% GDP per capita
Argentina	1,653	13	1,533	12	2,286	18	5,382	43
Bolivia	135	6	300	12	247	10	1,495	62
Brazil	1,243	16	886	12	836	11	11,946	157
Chile	1,563	17	1,720	18	1,799	19	6,528	69
Colombia	n.a.	n.a.	1,263	20	1,516	24	6,782	109
Costa Rica	1,019	12	1,570	18	1,898	22	5,402	62
Dominican Rep.	n.a.	n.a.	284	5	284	5	560	9
Ecuador	n.a.	n.a.	137	4	286	9	1,101	34
El Salvador	245	5	300	7	300	7	469	10
Guatemala	n.a.	n.a.	252	7	462	12	1,173	31
Honduras	n.a.	n.a.	322	13	417	17	1,456	59
Jamaica	386	11	902	25	1,409	39	6,039	166
Mexico	1,385	15	1,291	14	1,615	18	4,688	52
Nicaragua	n.a.	n.a.	227	10	152	6	4,698	199
Panama	n.a.	n.a.	994	17	1,499	25	2,863	48
Paraguay	n.a.	n.a.	947	21	1,414	32	4,484	101
Peru	442	9	471	10	553	12	1,379	29
Uruguay	1,039	11	1,011	11	1,219	13	2,057	23
Venezuela, RB	n.a.	n.a.	486	8	765	13	n.a.	n.a.
Latin America (simple mean)	911		784	13	998	17	3,605	66
OECD country mean	4,477	18	4,470	21	5,501	26	11,109	44

Sources: UNESCO Institute for Statistics (2003), UNESCO-UIS/OECD WEI (2003), UNESCO/OREALC (2002).

Notes: Years other than 2000 are as follows: Nicaragua (1996), Bolivia (1998), Costa Rica, Guatemala, Jamaica (pre-primary), Panama (1999). See Annex for a more detailed discussion of sources.

*Alternatives for unit costs, 2015*

Unit costs are projected to 2015 on the basis of two options (**Table 7** and **Figure 3**). The first is that over the next 15 years unit costs in education would grow at the same rate as GDP per capita growth. Put another way, teacher salaries, which account for most of unit costs, would keep pace with the rest of the labour market and the relative monetary prestige of the teaching profession in society would not change. Recent studies suggest that, while there are significant variations by country, overall teachers salaries in the region are neither too high nor too low compared with similar occupations (Piras and Savedoff, 1999 and Liang, 1999).

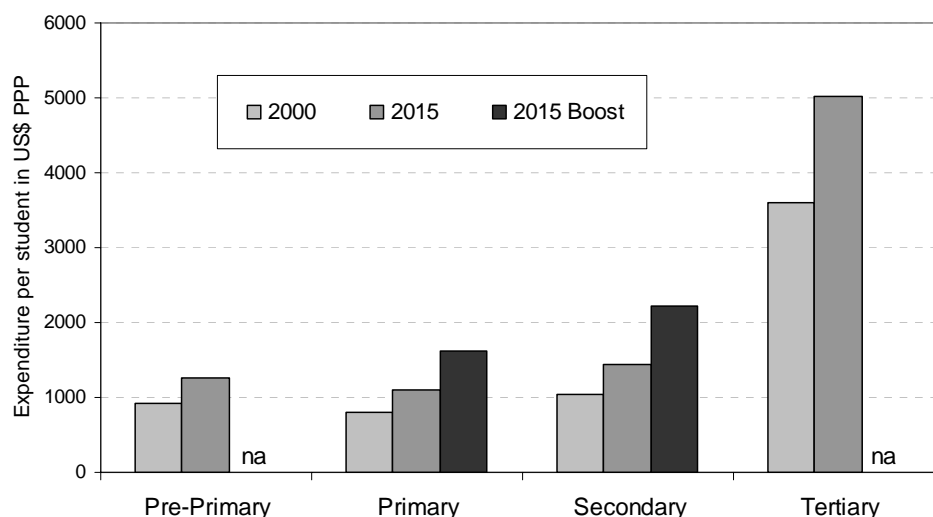
With a unit cost increase that keeps pace with GDP per capita growth, expenditures per student would increase modestly for the region as a whole, to US\$ 1,398; US\$ 1,137; US\$ 1,424; and US\$ 5,451 for pre-primary, primary, secondary, and tertiary education respectively.

**Table 7. Projected cost per student, 2015 (US\$ PPP)**

Countries	Costs in US\$ PPP Based on Keeping Pace with GDP per Capita Growth				Based on "Quality Boost" to 19% of GDP per capita for primary and 26% for secondary	
	Pre-primary	Primary	Secondary	Tertiary	Primary	Secondary
Argentina	2,394	2,220	3,311	7,795	3,259	4,460
Bolivia	195	434	358	2,072	707	968
Brazil	1,909	1,360	1,284	18,342	2,609	3,570
Chile	2,815	3,098	3,240	11,757	2,517	3,444
Colombia	n.a.	1,776	2,132	9,539	1,670	2,285
Costa Rica	1,500	2,311	2,794	7,598	2,960	4,050
Dominican Rep.	n.a.	512	512	1,008	1,412	1,932
Ecuador	n.a.	168	353	1,356	921	1,260
El Salvador	392	454	480	709	1,053	1,440
Guatemala	n.a.	310	569	1,445	977	1,337
Honduras	n.a.	433	561	1,960	517	708
Jamaica	429	1,001	1,564	6,705	1,125	1,540
Mexico	2,254	2,101	2,628	7,629	2,240	3,066
Nicaragua	n.a.	297	199	6,139	680	931
Panama	n.a.	1,504	2,268	4,332	1,210	1,656
Paraguay	n.a.	1,005	1,501	4,761	1,369	1,873
Peru	719	767	900	2,244	1,209	1,655
Uruguay	1,378	1,341	1,617	2,728	1,712	2,342
Venezuela, RB	n.a.	485	763	n.a.	1,482	2,027
Latin America and the Caribbean	1,398	1137	1424	5451	1,559	2,134
OECD county mean	6,025	6,016	7,404	14,951	6,016	7,404

Sources: OECD (2003), UNESCO Institute for Statistics (2003) and authors' estimates.

**Figure 3. Unit costs, Latin America and the Caribbean, 2000-2015**



Sources: See Table 7.

Yet simply keeping pace with GDP per capita growth may not be enough. Latin American countries participating in international tests score  $\frac{1}{2}$  to  $1\frac{1}{2}$  standard deviations below OECD countries on standardised tests, including PISA (Progress in Student Assessment), TIMSS (Third International Math and Science Study), PIRLS (Progress in Reading Literacy Study) and IALS (International Adult Literacy Study). At the primary level (grades 3-4) based on the TIMSS (in which Mexico, Colombia and Chile participated), half a deviation is the approximate equivalent to the increase of learning achievement between grade 3 and grade 4. Between grades 7 and 8 the difference is around one-third of a standard deviation. This suggests that what children know in the Latin America and Caribbean region is at least one full grade below what children know in OECD or newly industrialised Asian countries. From this point of view meeting targets like 100% completion of grade 6 would not be adequate for the region, since children completing 6<sup>th</sup> grade would know only as much as 4<sup>th</sup> or 5<sup>th</sup> graders; similarly at the end of grade 12 children probably would know no more than 10<sup>th</sup> or 11<sup>th</sup> graders, unless quality were improved. While there is little information on comparative learning in tertiary education, Brazil's tests of achievement in tertiary education identify many institutions which are not meeting expected standards and the scores of tertiary education graduates in Chile on the IALS test are significantly lower than those of other participating countries. In short, to reach *learning achievement* goals at the primary level all students would need to complete seven or eight years of education, and at the secondary level, 12 or 13 years of education. This could further increase costs by 10 or even 20%.

An alternative would be to invest more in quality improvement. OECD countries spend over US\$ 4,100 per primary student, compared to a range of US\$ 140 to US\$ 1,700 in Latin America. Perhaps more importantly, with just a few exceptions, the region does not appear to be making an adequate "relative" effort compared to

GDP per capita. Primary unit costs in the region as a whole average only 13% of GDP per capita compared to 21% in OECD. Only Colombia, Jamaica and Paraguay approach the “effort” of OECD countries. Secondary unit costs in the region are equivalent to 17% of GDP per capita, compared to 26% in OECD. Pre-primary costs are 8% compared to 18% in OECD countries. In contrast, the effort the region as a whole makes in tertiary education (66%) is higher than that of OECD countries (44%).

On this basis a second projection —the “quality boost” scenario— increases the “effort” of Latin American countries, in terms of GDP per capita to the percentage of per capita GDP of the OECD countries (21% in primary education and 26% in secondary education).<sup>4</sup> Unfortunately, spending more money on education does not guarantee higher quality. Chapter 3 discusses the ways additional funds could most effectively be utilised to increase quality. Nonetheless, to increase the region’s “effort” to the OECD level, on average unit costs would have to increase dramatically to US\$ 1,559 in primary education and US\$ 2,134 in secondary education.

In 2000, the only countries which met the “quality boost” level for primary education were Jamaica and Paraguay. The only countries at the criterion in secondary education were Jamaica and Paraguay.<sup>5</sup> Aside from these countries, most countries would require major increases in per student expenditures to achieve this target. Countries that would need to more than double their per student expenditures in primary and secondary education include Bolivia, Brazil, Dominican Republic, El Salvador, Guatemala, Nicaragua and Venezuela. Despite the boost, the three poorest countries —Bolivia, Honduras and Nicaragua— would still be spending less than US\$ 1,000 per year per student in primary and secondary education.

## Expenditures on public education institutions, 2000 and 2015

### *Public expenditures, 2000*

Estimating public education expenditure as a percentage of GDP measures the effort that a country is making to shape its nation’s social capital. Of course, GDP per capita is of fundamental importance for financing education, since poorer countries have fewer resources than richer countries to invest in the sector. In the year 2000 (see **Table 8**), public expenditures on educational institutions in the region (not including administration and transfers to households and to private institutions) averaged 3.9% of GDP.<sup>6</sup> Costa Rica, Jamaica, Panama and Paraguay spent over 5%, while the Dominican Republic, El Salvador, Ecuador, and Guatemala spent less than 2%. This level of public expenditures is a result of a combination of enrolment ratios, unit costs,

<sup>4</sup> Because of lack of data for eight countries, we do not include a “quality boost” for pre-primary education.

<sup>5</sup> But note that there is no evidence that these countries have high achievement in education.

<sup>6</sup> These data differ in some cases from those provided by UNESCO Institute for Statistics because of differences in year and source of data and because they do not include transfers to households or to private institutions.

and percentage of students in private institutions. Private expenditures on education increase the figure of 4% by 0.8% of GDP (see below).

**Table 8. Public expenditures on public institutions as % of GDP, 2000**

Countries	Pre-primary	Primary	Secondary	Tertiary	Total
	2000	2000	2000	2000	2000
Argentina	0.21	1.31	1.38	1.49	4.4
Bolivia	0.13	2.00	0.74	1.90	4.8
Brazil	0.30	1.33	1.01	1.07	3.7
Chile	0.24	1.94	1.56	0.95	4.7
Colombia	n.a.	2.02	1.24	0.86	4.1
Costa Rica	0.42	2.50	1.31	0.77	5.0
Dominican Rep.	n.a.	0.64	0.25	0.06	1.0
Ecuador	n.a.	0.51	0.49	0.46	1.5
El Salvador	0.09	0.87	0.18	0.06	1.2
Guatemala	n.a.	0.96	0.34	0.17	1.5
Honduras	n.a.	2.12	0.74	0.74	3.6
Jamaica	0.07	3.04	4.03	1.54	9.7
Mexico	0.49	2.03	1.51	0.81	4.8
Nicaragua	n.a.	1.33	0.34	1.48	3.2
Panama	n.a.	2.09	1.78	1.37	5.2
Paraguay	n.a.	3.18	2.25	0.81	6.2
Peru	0.20	1.46	0.90	0.61	3.2
Uruguay	0.18	1.02	1.03	0.63	2.9
Venezuela, RB	n.a.	0.95	0.71	n.a.	n.a.
Latin America and the Caribbean	0.23	1.65	1.15	0.79	3.9
Total OECD	0.4	3.5		1.2	5.2

Sources: OECD (2003), UNESCO Institute for Statistics (2003).

Notes: For Chile, private primary and secondary schools receiving government support are considered as public schools.

Average expenditure in the region on primary education in 2000 in terms of GDP was 1.7% with Costa Rica, Jamaica and Paraguay expending more than 2.5%, and Dominican Republic, Ecuador, El Salvador and Guatemala spending less than 1%. Expenditures on secondary education for the region were equivalent to 1.1% of GDP, but the range among countries was even greater, with Jamaica spending over 4% and the Dominican Republic, El Salvador, Ecuador and Guatemala spending less than 0.5%. Public expenditures on tertiary education averaged around 0.8%, with the highest countries (Argentina, Bolivia, Jamaica and Nicaragua) above 1.4% and the lowest (Dominican Republic and El Salvador) below 0.1%. The differences in secondary and tertiary education are a result not only of different enrolment ratios and unit costs, but also of varying percentages of enrolments in private institutions.

Finally the ten countries in the region with available data on average spent 0.23% of GDP on pre-primary schooling. Costa Rica and Mexico did best, spending over 0.4%, with a spending effort similar to that of OECD countries.

*Public expenditures, 2015*

For 2015 the “base” projection for public expenditures as a ratio of GDP for 2015 is based on the following assumptions:

- Gross enrolment by level would increase to 80%, 100%, 85%, and 40% of the school-age populations in pre-primary, primary, secondary and tertiary education;
- The school-age population would grow as estimated by CELADE;
- The percentage enrolled in private education would remain the same as in the year 2000 and public funds would not go to private schools;
- Unit costs at all levels would grow at the same percentage as the increase of per capita income; and
- Per capita income would grow on the basis of World Bank economic projections and CELADE population projections.

In the “quality boost” projection, unit costs would increase to 19% of GDP per capita for primary education and 25% of GDP per capita for secondary education. In the “repetition projection”, all enrolments and total costs would increase by 10% to account for continuation of high repetition.

Under the “base projection”, e.g. without a “quality boost” (see **Table 9**), there are major enrolment increases at all levels except primary education, and total public expenditures on education as a percentage of GDP would increase from around 3.9% in 2000 to around 4.8% in 2015. The range would be from a high of over 8.5% in Jamaica and Paraguay, to less than 1.5% in Dominican Republic and El Salvador. Expenditures on primary education would go down compared to other levels of education. Tertiary education expenditures would increase very significantly, and would account for 35% of expenditures compared around 19% in 2000. Secondary education expenditure would also increase from 27% of over 35% to total expenditures.

The “quality boost” scenario states that more expenditures per student are needed to improve the quality of primary and secondary education. When this is done the region as whole increases its expenditures on public education institutions in the year 2015 from 4.8% to 6.2% of GDP. Tertiary education takes a significantly lower portion of public funds (26% rather than 35%), and primary and secondary education increase their proportion.

**Table 9. Projected public expenditures on public institutions as % of GDP, 2015**

Countries	Expenditures as % of GDP based on expected enrolment growth and unit cost increases					Expenditures assuming 10% repetition	Expenditures assuming "quality boost": 19% of GDP per capita for primary and 26% for secondary		
	Pre-primary	Primary	Secondary	Tertiary	Total		Primary	Secondary	Total
Argentina	0.25	0.99	1.55	1.10	3.9	4.3	1.5	2.2	5.1
Bolivia	0.20	1.64	1.11	2.29	5.3	5.8	2.4	2.8	7.7
Brazil	0.33	1.05	0.87	2.10	4.3	4.8	1.7	2.1	6.2
Chile	0.21	1.55	1.92	1.03	4.7	5.2	1.6	2.6	5.5
Colombia	n.a.	1.81	1.91	1.41	5.1	5.6	1.7	2.0	5.2
Costa Rica	0.35	2.12	2.28	1.72	6.5	7.1	2.1	2.6	6.8
Dominican Rep.	n.a.	0.46	0.41	0.09	1.0	1.1	1.9	2.3	4.2
Ecuador	n.a.	0.37	0.89	0.98	2.2	2.5	1.7	2.6	5.2
El Salvador	0.14	0.72	0.40	0.12	1.4	1.5	2.1	1.5	3.8
Guatemala	n.a.	0.88	1.12	0.88	2.9	3.2	2.5	2.4	5.8
Honduras	n.a.	1.73	2.57	2.19	5.8	6.4	2.5	3.0	8.6
Jamaica	0.05	2.40	4.57	3.90	9.3	10.2	1.8	3.0	8.8
Mexico	0.40	1.45	2.05	1.36	5.3	5.8	1.9	3.0	6.6
Nicaragua	n.a.	1.19	0.72	5.44	7.4	8.1	2.4	2.9	10.7
Panama	n.a.	1.40	2.41	1.38	5.2	5.7	1.6	2.5	5.5
Paraguay	n.a.	2.52	3.95	2.04	8.5	9.4	2.2	3.3	7.5
Peru	0.21	0.96	1.07	0.69	2.9	3.2	1.9	2.4	5.2
Uruguay	0.21	0.86	0.96	0.64	2.8	3.1	1.5	1.9	4.2
Venezuela, RB	n.a.	0.75	0.84	n.a.	1.7	1.8	1.7	1.7	3.4
Latin America & the Caribbean	0.24	1.3	1.66	1.62	4.8	5.1	1.9	2.5	6.2

Sources: OECD (2003), UNESCO Institute for Statistics (2003) and authors' estimates.

### Expenditures on private education, 2000 and 2015

It is difficult to estimate expenditures on private education since unit costs are usually not available. In the absence of systematic data, in this exercise it is assumed that unit costs in private education are the same as those in public education. On this basis in the year 2000 the total expenditures on private education in the region accounted for 0.95% of GDP (see **Table 10**). These figures ranged from 0.2% to 3.4%. Projecting to the year 2015, and, again in the absence of data on trends, assuming that unit costs of private education increase at the same rate as those of public education, and also that the percentage of enrolments in private education remains fixed, then private expenditures on education increase to 1.6% of GDP in the "base" scenario. The total of public and private expenditures on educational institutions would reach 6.4% (see **Figure 4**). These estimates must be considered illustrative only. More detailed data are needed to estimate the unit costs of private institutions. Furthermore there are cases where governments subsidise private education (e.g. *Fe y Alegría* schools—Catholic schools in several countries which serve poor communities and are publicly subsidised--student loans for private tertiary



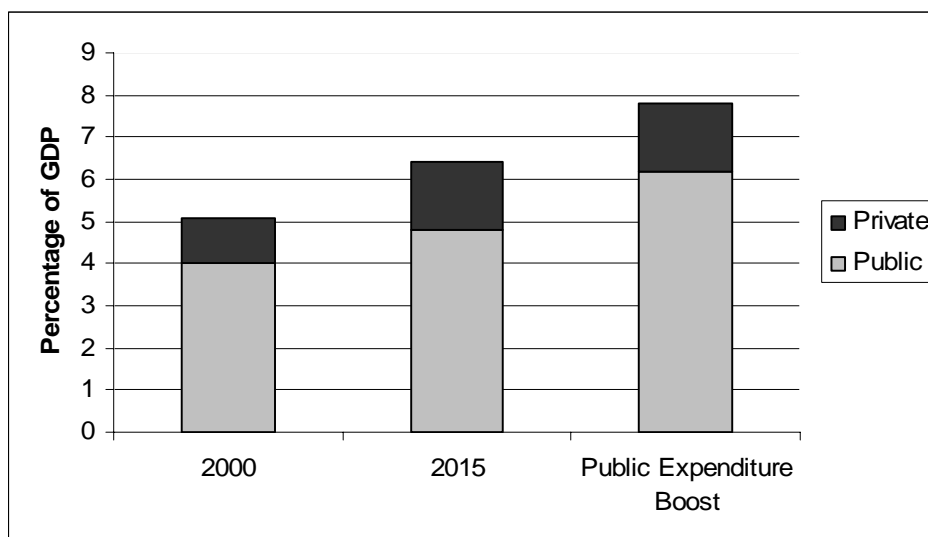
education and “vouchers” and direct subsidies for private schools in countries such as Chile and Argentina).

**Table 10. Expenditures on private education institutions as % of GDP, 2000 and 2015**

Countries	Private educational expenditure in education, as % of GDP									
	Pre-Primary		Primary		Secondary		Tertiary		Total	
	2000	2015	2000	2015	2000	2015	2000	2015	2000	2015
Argentina	0.09	0.10	0.33	0.26	0.54	0.51	0.39	0.29	1.35	1.16
Bolivia	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Brazil	0.08	0.09	0.11	0.06	0.19	0.14	1.48	2.90	1.87	3.19
Chile	0.25	0.22	0.22	0.10	0.17	0.18	1.11	1.21	1.75	1.71
Colombia	n.a.	n.a.	0.47	0.36	0.79	1.04	1.53	2.50	2.80	3.90
Costa Rica	0.05	0.04	0.13	0.09	0.16	0.24	0.24	0.54	0.58	0.91
Dominican Rep.	n.a.	n.a.	0.12	0.05	0.12	0.20	0.14	0.23	0.38	0.48
Ecuador	n.a.	n.a.	0.15	0.55	0.17	0.31	0.14	0.29	0.45	0.78
El Salvador	0.03	0.05	0.13	0.07	0.28	0.54	0.14	0.27	0.57	0.93
Guatemala	n.a.	n.a.	0.14	0.19	0.31	0.87	0.07	0.36	0.52	1.42
Honduras	n.a.	n.a.	0.12	0.10	0.04	0.13	0.10	0.30	0.27	0.52
Jamaica	0.37	0.24	0.16	0.17	0.11	0.11	0.80	2.01	1.44	2.53
Mexico	0.04	0.03	0.13	0.07	0.19	0.22	0.27	0.45	0.63	0.78
Nicaragua	n.a.	n.a.	0.25	0.12	0.16	0.29	0.76	2.80	1.18	3.21
Panama	n.a.	n.a.	0.23	0.16	0.27	0.31	0.12	0.12	0.62	0.58
Paraguay	n.a.	n.a.	0.52	0.58	0.43	0.64	0.72	1.81	1.67	3.02
Peru	0.06	0.06	0.20	0.09	0.17	0.17	0.34	0.39	0.77	0.72
Uruguay	0.06	0.07	0.19	0.15	0.20	0.18	0.04	0.04	0.49	0.45
Venezuela, RB	n.a.	n.a.	0.21	0.25	0.29	0.35	n.a.	n.a.	0.50	0.59
Latin America & the Caribbean	0.11	0.10	0.21	0.16	0.26	0.41	0.48	0.93	1.06	1.61

Notes: Assumes unit costs of private education are the same as that of public education (see Table 6), with the exception of private tertiary education in Brazil, where unit costs are estimated at \$ 2,000. For the year 2015, assumes that the percentage of enrolment in private education remains constant (see Table 5) and that unit costs increase under the “base” scenario (see Table 7).

**Figure 4. Public and private expenditures in Latin America and the Caribbean as % of GDP, 2000-2015**



Sources: See Tables 9 and 10.

### 3. Meeting the Challenges of Education Financing

#### Financial impact of expected enrolment growth and quality improvement

The region faces two financial challenges. One is to pay for expected enrolment growth, especially in tertiary education, but for some countries, also in secondary education. The second is to spend more money per student on primary and secondary education in a way that helps to increase learning.

Can governments afford the projected enrolment growth to the year 2015? The short answer for most countries appears to be: “Probably.” The total public expenditure on the various educational levels in 15 countries would be less than 6% of GDP. But this figure does not account for public administration and training, which would add a significant amount to costs, especially since the demands of “life-long learning” are increasing. To a great extent the demographic transition gives countries the opportunity to invest more, in terms of per capita expenditures, in education, if they so desire. On the basis of the projections, only Costa Rica, Jamaica, Nicaragua and Paraguay would have to spend more than 6% of GDP on formal education. The main reason these four countries would need to spend more is that their current unit costs, are relatively high, especially in tertiary education, and they have a relatively small private sector.

If governments decide to invest more in the quality of primary and secondary education (e.g. the “quality boost” scenario), then there would be significant increases in expenditures in education as a percentage of GDP for most, but not all, of Latin American countries. The increase is relatively low in Chile, Colombia and Jamaica, which already are making a big effort in primary and secondary education in terms of unit costs as a percentage of GDP per capita. The biggest change occurs in several of the poorer countries which currently spend very little per student in absolute as well as comparative terms, including especially the Dominican Republic, El Salvador, Guatemala, Nicaragua and Peru. To achieve a more adequate level of funding, these countries would have to increase public expenditures to over 8% of GDP. Nicaragua would have to spend an impossibly high 10.7% of GDP to cover quality improvement as well as continue its relatively high costs in tertiary education. These increases would especially be difficult in some of the poorer countries where a relatively small percentage of the GDP is collected as taxes. It is likely that these countries will have to devise intermediate targets for education financing.

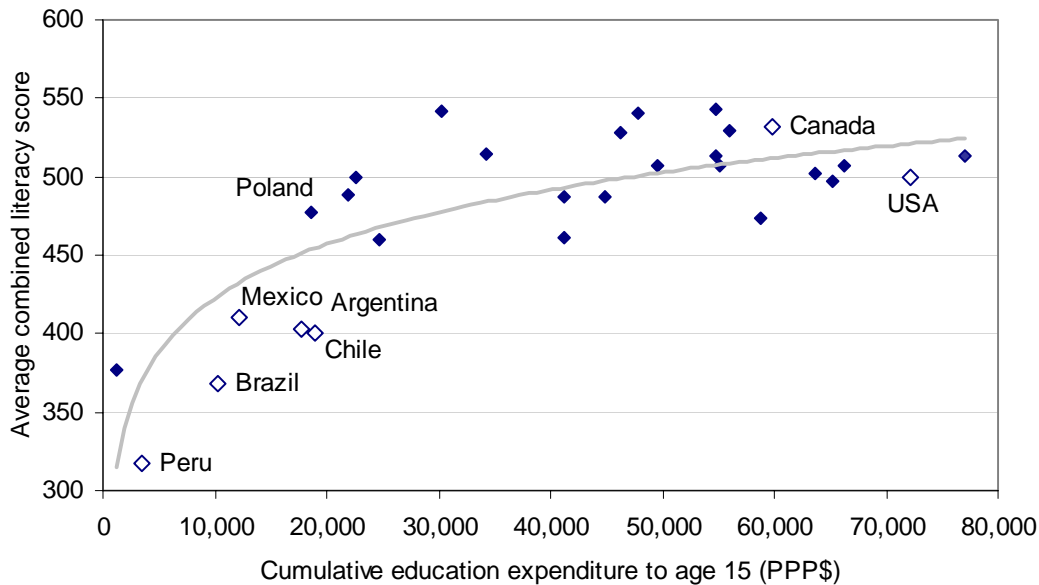
### **Strategies for encouraging more effective use of funds**

To ensure that governments invest wisely in education, it is important to design policies which encourage more effective use of public funds. In particular actions must be taken which are more likely to impact directly on the learning process. The nature and extent of these policies is, of course, country specific. Yet some generalisations can be made for the region as a whole.

#### *Focusing on increased learning*

The target of increasing per student expenditures in primary and secondary education assumes that more money can lead to higher quality. But such a positive impact is not inevitable. Comparing countries around the world, there is a strong fit between levels of education in the labour force and GDP per capita. But there is a less of a fit between expenditures on education on learning as measured by international tests. Looking at the PISA results (see **Figure 5**) some countries score higher on literacy of fifteen-year-olds, such as Hungary and Korea, than would be expected given their GDP per capita, while others score lower than would be expected, such as the United States, Germany and all of the participating Latin American countries (OECD/UNESCO-UIS, 2003). Also the countries in the region which spend the most per student compared to per capita income (Jamaica and Paraguay) do not seem to have the highest levels of learning in the region.

**Figure 5. PISA combined literacy performance and cumulative education expenditure to age 15, 2000/2001**



Source: OECD/UNESCO-UIS, 2003.

It is therefore very important that money is spent wisely. In considering any additional expenditures on education, decision-makers need to consider the potential cost effectiveness of every policy. In fact probably the most important means of helping to ensure that more money will increase quality is simply to change attitudes by all stakeholders--from the Ministers of Education and Finance to teachers, parents and businessmen--about the purpose of education funding at all levels of education. All stakeholders need to be asking the same question: Is society getting the greatest return for its investment?

In some cases a small investment of money can have a big impact. For example a recent study (Scheifelbein and Wolff, 2000) identified 40 possible inventions in primary education and estimated their cost effectiveness in terms of increased scores on a standardised test. Some low-cost/high-impact interventions include: ensuring that the school year is completed; encouraging the best teachers to work in first grade; and reducing teacher turnover within schools. In addition, reducing repetition lowers the costs per graduate, opens up additional classroom space (UNESCO, 2003), and, by lowering the age of students, reduces the opportunity cost of remaining in school.

It is also important to recognise the complexity of the definition of learning. While many commentators now think of quality as related to effectively developing communications and mathematics skills, schools need to provide other competencies. For example information technology literacy is increasingly critical for regional productivity. If this issue is not dealt effectively it will hamper the productivity of the region as a whole. Yet without a comprehensive strategy, financing of technology in schools can end up as an expensive intervention with inadequate payoffs. Purchase

of large numbers of computers and setting up Internet connections for schools must be accompanied by clear defined goals and an implementation strategy which includes adequate funding for training, especially of new teachers, as well as software provision and maintenance.

### *Increasing teacher effectiveness*

If authorities wish to increase teachers' salaries, they may get some initial benefits through reduced loss of time due to strikes. But the impact of such increases on teaching quality will be long term, since it will take time to attract a higher level of those entering the teaching profession. Also without better training, higher salaries will not improve the quality of current teachers. Finally salary increases must be linked with better performance and accountability, starting with easily measured actions, such as absenteeism and continuing to more sophisticated measures of "value added," as well as coherent learning standards and cultural changes which make the school into a "learning environment" for teachers.

There are other financial investments besides salaries which could help to attract future good teachers. One approach would be to screen potential new teachers for their interest and commitment, test them on their basic knowledge, and then provide scholarships for the duration of their time in teacher training institutions, as has been done in Uruguay (Pearlman et al, 2004). Scholarships or loans to teacher training students could require that new teachers spend a specified number of years teaching in public schools so as to repay society for its investment.

### *Managing class size*

Class size is also as important as teacher salaries in determining costs. With the demographic transition, enrolments in primary education will not increase; yet there may be many newly trained teachers seeking jobs in primary schools. The result could be a reduction in student/teacher ratios. Based on research, rather than wholesale reduction of class size, an effective approach would be to selectively lower class sizes, especially for disadvantaged children, in primary grades 1 to 3, encourage the best teachers to migrate to these grades and implement training programmes to change classroom pedagogy (Ehrenberg et al, 2001). At the secondary level decision-makers need to examine carefully the relationships between the number of hours in the school week and the number of hours that teachers work. Again, rather than wholesale salary increases, authorities could design incentives to encourage teachers to stay in one school and work full time and could pay for preparation hours in the school. The objective would be to create a stronger commitment on the part of teachers to their institutional environment as well as to their own students.

### *Targeting the neediest*

Targeting educational expenditures towards the neediest could also have a strong impact on learning, through closing the gap between socio-economic groups. There already are a number of such programmes which have been shown to have an

impact. Chile has a 10-year-old programme to identify and strengthen its poorest performing schools (the P-900 schools programme). Mexico also has a long-running programme (CONAFE) directed to “at-risk” students, especially indigenous populations in its southern states. Countries with large indigenous populations, such as Guatemala and Peru, have initiated a wide variety of bilingual and other targeted programmes. Columbia’s “escuela nueva” programme, directed at poor rural areas, is being replicated in several countries in Central America. Mexico’s *Telesecundaria*, a 40-year-old television-based programme providing lower secondary education in rural areas, has been shown to increase retention and learning and is being replicated in several Central American countries. Brazil’s accelerated schools programme targets children who have repeated for two or more years and places them in classes with specially trained teachers and materials. Since 1996, Uruguay has implemented a comprehensive primary school improvement programme, especially targeted to “at-risk” students, which included increased resources, intensive teacher training and upgrading, and feedback of testing results to teachers. The programme showed learning improvements of 3<sup>rd</sup> graders, especially among the targeted groups. In 1997, the Brazilian federal government changed its system of financial support to states so as to equalise expenditures per student, with the result that increased funds went to the impoverished states in the Northeast.

Conditional cash transfers are a new way of targeting towards needy populations and overcoming the poverty element of dropout. Argentina, Brazil, Colombia, El Salvador, Mexico and Nicaragua, among others, have programmes that aim to help poor students remain in school by providing cash or in-kind payments to parents who keep their children in school (i.e. “demand-side” or conditional cash transfer programmes). A book on the subject analyses in detail several of these programmes (Morley and Coady, 2003). According to this book, these programmes appear to improve school retention, but scores on tests of achievement have not gone up. For example, Mexico’s *Progresa* programme has increased entry rates to lower secondary schools in rural areas by nearly 20%, as a result of which educational attainment is estimated to have increased by about two-thirds of a year. (Schultz, 2000). These programmes range in cost from US\$ 5 per student in Nicaragua to US\$ 40 per month in Argentina. In some cases 15% of the education budget is going to these transfer programmes. There is a risk of pressure to expand subsidies to the middle class, as was the case in Venezuela over a decade ago. A study of Argentina (Herran and van Uythem, 2001) showed that youths who returned to secondary school because of monetary incentives were unprepared for the academic challenges and, without additional learning support, quickly became discipline problems. In short, these demand-based programmes may be helpful but require careful calibration of target groups and a deeper understanding of the educational environment to be cost effective.

*Investing in statistics, testing and research*

Judicious investments in education statistics, good tests and their dissemination, and applied research are also fundamental if more money is to increase learning. To begin with, it is difficult to get basic data on education financing. It is impossible, for example, to break down the components of costs by level (e.g. salaries, overhead, materials, etc.). Little or no information is available on private education costs. Estimates of costs per graduate are unsound and information on employment and income of school leavers is rare.

There are huge lacunae in our knowledge of “what works”. Basic measures of quality and equity are often missing or out of date, as well as information on teachers, what they are paid, whether they teach and what they teach, background training, and how many days of class were actually received/given in a given year. There are few measurements of “process” variables (i.e. what actually happens in the classroom) that intermediate between physical and financial inputs and the learning process and include the time actually spent teaching, the teaching strategies used and the utilisation of educational materials. Data are lacking to match the skills demanded in the workplace with the products of the school system. Research underway in all these areas can help to deepen our understanding of the extent to which a wide variety of interventions have an impact on the learning process.

After years of concern with the inadequacy of statistical systems, a number of countries, among them Brazil, Chile and El Salvador, have been making significant progress in their statistics, including publishing reader-friendly reports, useful Web sites, quick feedback to teachers and school directors, and in some cases, detailed school-level information available to the public. In addition, Argentina, Brazil, Chile, Mexico, Paraguay, Peru and Uruguay participated in the UNESCO/OECD World Education Indicators (WEI) statistics programme, and Mexico is leading an effort, based on the regional Summit of the Americas, to improve monitoring of educational outcomes.

Finally the region has also progressed in developing educational assessments which can measure whether educational investments result in increased learning, but much more is needed in terms of both technical quality of assessments and the adequate dissemination of results. Under the leadership of UNESCO, the region implemented a test of primary learning achievement given in 12 countries, with very provocative results (Cassasus et al, 1998).

### *Improving financial management*

A wide variety of management actions can be taken to help to ensure that funds are adequately utilised for educational purposes. For a simple example, many countries still have a practice of paying teachers' salaries to government officials who may have no teaching duties.

At the pre-primary level, there are many opportunities for government to contract with NGOs to provide services, usually at lower cost to government than full public provision, because of a combination of lower overhead and benefits, lower salaries and cost recovery. At the primary and secondary levels, while the overwhelming numbers of schools are expected to remain fully public, there are opportunities for utilising private schools to provide education at a lower cost and sometimes better results than public institutions (Wolff, Gonzalez and Navarro, 2002). But utilising private institutions requires, paradoxically, a state with strong oversight capacity to set rules which encourage private behaviours which serve public goals.

In the past, some multilateral organizations have argued that public funding in Latin America should be "shifted" from higher to lower levels of education. Given the expected high demand for tertiary education, decreased primary school enrolment and the fact that the private sector already accounts for 37% of tertiary education enrolment, this possibility has become increasingly less likely. Nonetheless, given this expected growth, countries in the region will have to find ways of economising public expenditures on tertiary education through a combination of increased private education, cost recovery in public education and reduced per student expenditures in some cases.

In any event, governments will need to encourage the continuation and likely significant expansion of private sector involvement in tertiary education. They may also need to expand student loan programmes, which are a particularly cost-effective means of encouraging the growth and quality of private tertiary education institutions (Tellez and Rodriguez, 2004). Countries with small private tertiary education sectors, such as Honduras, Jamaica and Nicaragua, especially will have to take action since their current cost structures and public/private ratios seem to make it impossible for the public sector to finance significant tertiary education expansion.

It will be equally important to implement policies at the higher education level which induce more effective use of funds in public institutions. These could include, for example, financing institutions on the basis of outputs (students completing their course) rather than inputs (numbers of teachers); differential financing depending on the extent to which institutions have a research and/or teaching function; encouraging institutions to seek alternative sources of financing from the private sector as well as through cost recovery; strengthening peer review of performance; and publishing of information on the quality of institutions.



### **Education financing and economic growth**

The prospects for financing enrolment growth and quality improvement depend heavily on economic growth. What would happen if economic growth were lower than expected? In the first place increased funding of education to improve quality would be much more difficult since it would take too much of GDP. Teachers' salaries, as well as everyone else's income, would not increase as much as many would hope. Teachers would be more likely to be frustrated and therefore less likely to increase their effort. The trade-off between more income and prestige and more commitment, responsibility and accountability would be more difficult. Without strong economic growth, it would be difficult to meet one of the objectives of many political and social leaders in the region—to reduce economic inequities and to increase educational opportunities. If unemployment of more highly educated students increases, then students in tertiary education institutions could become an increased source of political instability. Therefore educators must hope for increased economic growth, which could lead to a "virtuous cycle" of labour market demands for higher quality of human resources, and better education resulting in a more talented labour force which then aids and abets economic growth.

#### 4. Annex: Assumptions Underlying the Estimates and Projections

In this section we explain to the reader the assumptions underlying the base data as well as the projections, and also refer to a number of technical issues.

In this exercise, we do not take into account expenditures on administration, non-formal education, adult education, vocational training outside the formal education system, industrial and government in-service training, training undertaken in other government ministries in areas such as agriculture, health, etc., and private for-profit training courses (e.g. computers, beauty and barbers, accounting, etc.). While there is little information on them, it is likely that these other types of education and training account for a large percentage of expenditures in the sector, most of it private. One estimate is that, in Brazil, expenditures on these activities could account for over one-third of total expenditures on education and training.

For purposes of this exercise, we assume that public funds are expended only on public institutions. We do not estimate public funds which go to private households (i.e. in the form of scholarships) or directly to private institutions. In fact the region has a wide range of such programmes, through student loan schemes, direct subsidy and tuition vouchers, but there is no systematic information available. Furthermore we do not estimate "private" expenditures on public education, such as school fees and costs of uniforms and textbooks. A more complete study would take all of these parameters into account.

*The population and number of school-age children* in the year 2000 are available from CELADE (*Centro Latinoamericano y Caribeño de Demografía*) ([www.eclac.org/celade](http://www.eclac.org/celade)). These numbers are consistent with those used by the UNDP, WHO and the World Bank. *The number of children in school, percentage of children in public and private institutions, and unit costs in purchasing power parity (PPP) US dollars*, are all available from the UNESCO Institute for Statistics ([www.uis.unesco.org](http://www.uis.unesco.org)). The authors used the data which were available as of October 2003. A recent revision of UNESCO data has resulted in minor changes in these statistics.<sup>7</sup> The definition of levels of education follows the ISCED classification of UNESCO (UNESCO, 1997). Private school enrolments have recently not been reported and we have to rely on data from 1996 and 1994. GDP per capita in 2000 can be found from World Bank statistics.

The *school-age population*, as well as overall population, is projected to the year 2015 using CELADE estimates which are also available on-line. The population projections are reasonably accurate, since children born in the year 2000 are the fifteen-year-olds of 2015, and fertility and mortality rates change only gradually.

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<sup>7</sup> The exception is Brazil, where the gross primary enrolment ratio is now reported at over 150%. The authors have used a figure of 111%.

*Economic growth* is based on World Bank estimates of 3.9% for the region as a whole, but varying from country to country (World Bank, 2003b). These estimates are lower than those for East Asia and the Pacific, which are expected to grow at a rate of 6.2% per year. They assume an end of the recent downturn and a return to historical growth patterns in the region. These projections were made by country economists on the basis of historical trends and their best guesses of the direction of the economies in their countries, as part of determining the extent to which poverty could be reduced around the world. As with any economic projection they should not be given excessive credence.

As described in the text, expected *enrolment ratios* in 2015 by level are based on a combination of goals agreed upon by political leaders in the region, comparative data, and continuation of recent trends. Of course there is no sanctity or certainty in any of these estimates. Unit costs are projected on two bases: (a) to keep pace with GDP per capita growth); and (b) to increase in primary and secondary education so that they are “equivalent” to the relative effort of OECD countries. The result is an estimate of how much government, as well as society as a whole, would be spending on education by the year 2015 compared to their GDP.

For *primary education*, every country in the region is now reporting data to UNESCO on the basis that primary education is six years in length, with the exception of Colombia, which is reporting a five-year primary school system.<sup>8</sup> But several Latin American countries report expenditures on the basis of expenditures in basic education, usually the first eight or nine years, and secondary education, usually three or four years in length; this difference in financial reporting may sometimes lead to discrepancies in primary and secondary cost estimates. In every country in Latin America the official age of entry is six, with the exceptions of Brazil and Guatemala, where age seven is the age of entry. Some countries (Honduras and Costa Rica) have six years six months as the age of entry. In this exercise, we base Honduras and Costa Rica numbers on entry at age six. UNESCO reports data on absolute numbers enrolled as well as on a “net” and “gross” basis. Net enrolment is the ratio of the number of children in the official age group who are in school divided by the overall number of children of that age. Gross enrolment divides the total number of children in school of any age by the number of children in the appropriate age group. Gross enrolment therefore includes children out of the official age group. Because of repetition as well as late entry, the gross enrolment ratio is often over 100%. In the region as a whole the primary gross enrolment ratio in 2000 was 109%. The region is characterised by late entry into school and high percentages of repetition (UNESCO, 2003). In addition reported repetition may be a significant under-estimate of the real repetition rate (Wolff et al, 2002).

For *secondary education* most Latin America and Caribbean countries report their data to UNESCO on the basis of a six-year secondary system. The exceptions are Brazil, Costa Rica and Peru, which report five-year secondary systems. Many

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<sup>8</sup> Brazil has an 8/3 system (eight years of “basic” education and three years of secondary education) but in 2003 reported its data on the basis of a 6/5 system.

secondary school students in the region are 18 years and older, a result of repetition and late enrolment as well as the fact that some youths leave the labour market to return to secondary school. Many students of secondary school age are still attending primary education. This means that there is a huge difference between net and gross enrolment ratios. There has been a rapid increase in gross secondary enrolment ratios, going from 55% in 1995 to 72% (64% net) in 2000. In particular Brazil's gross enrolment ratios went from 45% in 1995 to over 100% in 2000. While there has undoubtedly been progress in enrolling more students, much of the apparent improvement is due to the changes in reporting definitions with regard to the length of secondary education, as in the case of Brazil.

For *tertiary education*, in accordance with UNESCO statistics, we use a five-year age group. For simplicity in our calculations, we always use the 20-24 age group. We define tertiary education to include all post-secondary institutions, including those which offer "diplomas" and "associate degrees" after two or three years of schooling, as well as bachelors, masters and doctoral degrees and certificates. The current reported gross enrolment ratio in the region is 24%. Ideally tertiary education enrolment estimates should be based on "full-time equivalent" (FTE) students. In Latin America data are rarely collected on this basis and therefore many part-time students are counted.

For *pre-primary*, we use the 4 to 5-year age group. The definitions of pre-school range used by each country range widely by age. Using the 4 to 5-year age group, the current regional enrolment ratio is 54%. At the time of this exercise, we had unit cost data on 11 countries in our sample of 19.

For the *private sector*, we assume that the percentage enrolled in private schools in 2015 remains at the same percentage of total enrolment as in 2000 (13% primary, 28% secondary, 37% tertiary, 31% pre-primary). We assume that costs in the private sector are the same as in public sector and that, with the exception of Chile, no public funds go to the private sector. As noted in the text, some studies have suggested that unit costs of private education may be somewhat lower than in public education (Wolff, Gonzalez and Navarro, 2002). Also there are cases where government subsidises private education (e.g. *Fe y Alegría* schools—Catholic schools in several countries which serve poor communities and are publicly subsidised), student loans for private tertiary education and "vouchers" and direct subsidies for private schools in countries such as Chile and Argentina.

The percentage of tertiary education enrolment covered by the private sector is 37%, but varying greatly by country is higher than most other regions, except a few East Asian countries such as Indonesia, Japan and Korea. In the absence of regional data, except for Brazil, we assume that unit costs in public and private tertiary education are the same. In Brazil public education costs are estimated at US\$ 14,000 per student and private at around US\$ 2,000 (Holm-Nielson et al, 2001). In other countries in the region there is anecdotal evidence that private education is more costly than public education.

## 5. Sources of Data

To have data for the most number of countries, we drew upon several sources, and therefore, the basic tables on enrolment and enrolment ratios are not compatible with any single source. Additionally, we used data available to us in October 2003, and since that time, the UIS may have updated some figures. We recommend that those wishing to undertake an exercise similar to this one use the most recent figures made available by the UIS on their website ([www.uis.unesco.org](http://www.uis.unesco.org)).

For primary education, actual enrolments from UIS statistics published on its website in 2003 and in the *Global Education Digest 2003* were used. To ensure that our own database was internally consistent, we then calculated enrolment ratios using CELADE population data for the relevant age group. For pre-primary and secondary education, enrolment figures were not available to us so we used enrolment ratios as provided in the UIS on-line database. We then calculated enrolments based on CELADE data for the relevant population group. For higher education, for most countries we had actual higher education enrolments which can now be found in the *Global Education Digest 2003*. We then calculated enrolment ratios from CELADE data. However at the time we made our calculations, enrolment data were missing for the Dominican Republic, Ecuador, Guatemala and Peru. For these countries we used the most recent enrolment ratios which could be found in the UIS database. Higher education data for Peru and Panama are for 1999.

For unit costs, we started with the data on unit costs in US\$PPP provided by *Education at a Glance, 2003*. This OECD/UNESCO publication includes data for Argentina, Brazil, Chile, Jamaica, Mexico, Paraguay, Peru and Uruguay. For Ecuador, El Salvador, Guatemala and Honduras, tertiary education costs in US\$ were obtained by starting with UIS data on unit costs as a percentage of GDP per capita; similarly for secondary education in Guatemala, Honduras and Nicaragua.

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