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Chapter III

The demographic dividend: an opportunity to improve coverage and progression rates in secondary education

Introduction

The pace of demographic change has quickened in the last few years in Latin America, and the most recent data suggest that even the countries furthest behind in this regard have entered the moderate stage of the demographic transition.[1] Consequently, all the countries of the region are witnessing huge changes in the age structure of their populations that consist, in most cases, of a significant decrease in the weight of the child population and an increase in the weight of the adult and elderly population.

These changes in the age structure mark the onset of a period in which the proportion of people in the potentially productive age bracket grows steadily relative to the number of people of potentially inactive ages and in which dependency ratios therefore decline to minimum levels before rising again as a result of the increase in the proportion of older persons. This period, which is known as the demographic "dividend" or "bonus" or the "demographic window of opportunity", creates a situation that is particularly conducive for development as it increases the possibility of saving and investing in economic growth. Nearly all the countries of Latin America currently find themselves in this favourable period

of transition. Owing to the unevenness of demographic change, however, this window of opportunity is beginning to close for some countries whereas in others it has just begun to open up.

In most countries, the demographic changes under way have had a positive impact on the education sector. The primary education segment has benefited directly from the relative and absolute decline of the younger population.[2] In conjunction with the efforts countries have made to meet the education targets of the Millennium Development Goals, this demographic change has resulted in most of the region's countries being close to attaining universal coverage for primary education,[3] although important challenges remain both in terms of progression and quality.[4]

In the coming decades, not only will demand for primary education continue to decline, but so will demand for secondary education, relatively at first, but

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[1]   A classification of the countries of Latin America according to the stage of demographic transition they have reached, as determined by their fertility and life-expectancy rates, is presented in the next section.

[2]   The number of primary-school students in the region will fall from 67.8 million 2000 to 63.2 million in 2015 (Wolf and Gurria, 2005).

[3]   According to UNESCO statistics, only Colombia, Dominican Republic, Nicaragua and Paraguay had net primary-education enrolment rates of less than 90% in 2000-2004 (See UNESCO, 2007).

[4]   In El Salvador, Guatemala and Honduras, the proportion of children that have completed the final grade of primary school is barely over 60%, and in Nicaragua, practically half the children in the country do not finish primary school.

subsequently in absolute terms. During this period, governments will have the opportunity to pursue ambitious goals for increasing coverage and quality in secondary education as a strategy for taking better advantage of the demographic dividend.

As ECLAC has stated on numerous occasions, as soon as the region has recorded major advances in terms of primary-education coverage, efforts to increase the coverage and quality of secondary education will need to be stepped up. Only through a quality secondary education will young people be able to access more productive jobs and obtain incomes that will keep them above the poverty line (ECLAC, 1998). This is the way to obtain significant improvements in terms of equity and social cohesion and to avoid the pitfalls of the intergenerational reproduction of poverty.

The demographic dividend opens up an opportunity for moving towards universal coverage for secondary education in conjunction with on-time progression. If the education system and spending on education as a percentage of GDP expand at historical rates, spending per student will rise and the ratio of students to infrastructure and teachers will drop.

In addition to generating more opportunities for the young people of today, investing in education and health and in the creation of productive jobs during the period corresponding to the demographic dividend constitutes a unique opportunity to prepare for the future. This is because the fruits of such investments are essential for achieving the savings and productive leaps forward needed for dealing with the exponential increase in costs which will accompany society's inexorable ageing.[5] Production capacities need to be improved to increase formal employment and social security contributions, enhance the conditions of the active population and prepare for when the opportunity posed by the demographic dividend runs out.

This document examines how the changes in the age structure of the population associated with the demographic transition under way in Latin America can help to significantly expand secondary-education coverage and to raise spending per student to the levels seen in developed countries.

The first part of this chapter presents a general overview of the region's demographic context together with past and future trends in the secondary-school-age population. A summary is given of the main demographic trends observed in Latin America since 1950 and the medium- and long-term trends expected in the future. In addition to examining the demographic transition in the region as a whole, the unevenness of the changes across the region is taken into account by applying ECLAC typology that classifies countries according to different stages of the transition. The effects of the transition on the age structure of the population are measured using dependency ratios, which serve as a means of assessing the relationship between the demographic context and other aspects of socio-economic development. The values of these ratios are used to determine the demographic dividend in each of the region's countries. It should be noted that these dividends vary considerably in terms of duration.

The end of the first part focuses more on the implications of the demographic trends for the education sector, presents the general trends in the secondary-school-age population and analyses the evolution of that population throughout the demographic dividend period.

The second part of the chapter examines the efforts that governments must make on the economic front to achieve the coverage and quality targets set for secondary education and the role that demography plays in the process.

First, a comparative analysis of enrolment rates, spending per student and total spending on education as a percentage of GDP is performed using data for around 2005 obtained from the United Nations Educational, Scientific and Cultural Organization (UNESCO) on 14 Latin American countries and for 17 countries of the Organisation for Economic Co-Operation and Development (OECD), which are used as the comparison group.

Then the financial costs of attaining the following three goals in secondary education are calculated for each country and Latin America as a whole in around 2005: (i) 75% net enrolment for secondary education, as agreed by the countries of Latin America at the 1998 Summit of the Americas[6]; (ii) universal secondary school coverage; and (iii) OECD levels of net secondary school enrolment and spending per student.[7]

Finally, the population projections made by the Latin American and Caribbean Demographic Centre (CELADE)-Population Division of ECLAC are used to predict the impact of the changes in the age structure of the population on countries' capacity to reach three different targets for secondary education during the demographic dividend period.

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5   A recent simulation performed by Lee and Mason (2008) shows that the rise in productivity generated by better education will be enough to cover the additional costs of an ageing population.

6   The target of universal secondary education, the usefulness and feasibility of which is still debatable, has not yet been adopted by the countries of Latin America and is considered in this document for the purpose of analysing the repercussions of demographic changes on more ambitious coverage targets.

7   Although coverage in OECD is on average less than universal, this combined target of high coverage and high spending per student is more demanding in terms of resources.

A. The secondary-school-age population and the demographic context

Latin America us currently going through a stage of profound demographic change, which is referred to as the demographic transition. During this period, particularly favourable conditions for development arise, inasmuch as the proportion of people in the potentially productive age bracket grows steadily relative to the number of people of potentially inactive ages. This stage is known as the "demographic bonus" or "demographic dividend" in reference to the opportunities that it offers for boosting per capita GDP and thus raising the population's living standards. The duration and intensity of the demographic dividend varies across the region, but in all the countries of Latin America in the coming decades, not only will demand for primary education continue to decline, but so will demand for secondary education, relatively at first, but subsequently in absolute terms, which opens up the possibility of taking advantage of the dividend by investing in education. In addition to generating more opportunities for young people, the demographic dividend constitutes a unique opportunity to prepare for the challenges that the ageing of society will pose.

1. Demographic transition, changes in the dependency ratio and the demographic dividend

(a) Demographic transition

Like other developing regions, Latin America is going through a stage of profound demographic changes known as the demographic transition. This is a relatively long process that starts with high mortality and fertility rates and ends with much lower ones. Population growth is slight at both ends of the process, but tends to increase as the process unfolds and mortality rates decline and then decrease again when fertility rates come down. In Latin America, the fact that the onsets of the decline of the mortality and fertility rates did not coincide produced a relatively short period of rapid population growth in the middle of the twentieth century that substantially altered the age structure of the population.[8]

During the initial stage of demographic transition —during which mortality, especially among children, falls, but fertility remains high— the region's population remained

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[8] Although at the regional level and in the more populated countries, international migration does not have a large impact on the age structure of the population, its effect in smaller countries and countries with high migration rates, such as Nicaragua and Uruguay, can be significant. Given its generally selective nature migration alters not only the size, but also the age structure, the gender composition and other socio-economic and demographic features of both origin and destination populations.

very young and even became somewhat younger as a result of the growing proportion of children.[9] Beginning in the mid-1960s, the continuing fall in fertility and a sustained rise in life expectancy led to the start of a gradual ageing of the population as the larger generations progressed through the life cycle.[10]

Table III.1 summarizes the demographic changes that have occurred and are projected to occur in Latin America. Since 1950, the average number of children per Latin American woman has dropped from 5.9 to 2.4, the number of children who die before their first birthday has dropped from 128 to 22 per 1,000 births, the average life expectancy of the population has risen from 52 to 73

years, and average annual population growth has fallen from 2.8% to 1.3%. In the same period, the proportion of children under 15 has dropped from 40% to 30%, while the population of people aged 60 or more has risen from 6% to 9%. In 2050, life expectancy is projected to be 80 years, as infant mortality falls to 8 deaths per 1,000 births, average annual population growth shrinks to 0.2%, and the average number of children drops to 1.9 (below the replacement rate).[11] According to these projected changes, in 2050, the proportion of children under 15 will have almost halved (from 30% to 18%) and the proportion of elderly will have almost tripled (from 9% to 24%), and by the middle of this century, one in four Latin Americans will be an older person.

Table III.1
LATIN AMERICA: DEMOGRAPHIC CHANGE INDICATORS, 1950-2050

Indicators	1950-1955	1975-1980	2005-2010	2025-2030	2045-2050
Global fertility rate (children per woman)	5.9	4.5	2.4	2.0	1.9
Life expectancy at birth (in years)	51.8	63.4	73.4	77.1	79.6
Infant mortality rate (per 1 000 births)	127.7	69.7	21.7	12.0	7.9
Annual population growth rate (percentages)	2.8	2.3	1.3	0.7	0.2
Age structure (percentages)	1950	1975	2005	2025	2050
0 to 14 years	40	41	30	23	18
15 to 59 years	54	52	61	62	58
60 years or more	6	6	9	14	24
Total	100	100	100	100	100

Source: Latin American and Caribbean Demographic Centre (CELADE) - Population Division of ECLAC, population estimates and projections, 2007.

Regional averages, however, conceal major differences at the country level in terms of the pace and intensity of demographic change. With a view to analysing this variation and obtaining a comprehensive view of the changes under way in the region, ECLAC (2008) classified the countries of Latin America into four different stages of demographic transition according to life expectancy and fertility rates: very advanced, advanced, full and moderate.

Only Cuba is in the very advanced stage of transition. The total fertility rate reached replacement level much earlier in Cuba than in the rest of the region (between the late 1970s and early 1980s).

The countries in the advanced stage of transition fall into three subgroups. The first consists of Argentina and Uruguay, whose fertility and mortality rates both declined early on (in the first half of the twentieth century) and were already posting fertility rates of about three children per woman from 1950 onward. A second case apart is Chile, which despite having a fertility rate similar to that of Cuba in the period 1950-1955, has not seen fertility decline as sharply as in Cuba since then. Chile is nonetheless the second country in the region where fertility has fallen below the replacement level for its population. All three countries (Argentina, Uruguay and Chile) have population growth rates of less than 1%. The third subgroup within advanced transition countries is constituted by Brazil, Colombia, Costa Rica and Mexico. Unlike other countries at an advanced stage of transition, although these countries still had total fertility rates of

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9   Between 1950 and 1965, infant mortality in Latin America fell from an average of 128 to 92 deaths of children aged under one year per 1,000 births, while the overall fertility rate remained at close to six children per woman. In the same period, the proportion of children under 15 in the total population rose from 40% to 43%.

10 The largest generations are those born during the initial period of demographic transition when infant mortality falls and fertility rates remain high.

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11 The replacement rate is considered to be 2.1 children per woman.

between six and eight children per woman in the period 1960-1965, fertility had halved (and sometimes dropped even further than that) by the late 1980s to early 1990s. The natural rate of population increase in this subgroup is therefore between 1.3% and 1.4%.[12]

Two groups of countries are in the full transition stage. On the one hand, there are those where fertility had already declined considerably by the early 1980s (Bolivarian Republic of Venezuela, Dominican Republic, Ecuador, El Salvador, Panama and Peru). On the other, there are those where the most significant drops in fertility were recorded more recently (Honduras, Nicaragua and Paraguay). Fertility rates in both of these groups have now levelled out at the regional average rate, although the natural population growth rates vary within them, ranging from 1.5% in Peru to 2.3% in Honduras.

The countries in the moderate transition stage are Bolivia, Guatemala and Haiti. Fertility has dropped in all three countries but remains far above the regional average. The decline has been particularly slow in Guatemala, which now has the highest fertility rate in the region (4.2 children per woman) as well as the highest rate of population growth (2.8%). Haiti and Bolivia, meanwhile, have the highest levels of mortality in the region, with life expectancy levels (60 and 66 years, respectively) well below the regional average (73 years).

Despite the differences in the region, in general, Latin America can be said to have undergone a rapid process of demographic transition compared with that experienced by industrialized countries (ECLAC/CELADE/IDB, 1996). Whereas the demographic transition lasted over a century in developed countries, similar changes are occurring much faster in Latin America, mainly because the means of controlling fertility and reducing mortality were already available. In a period of approximately 30 years, between 1960 and 1990, Latin America went from having among the highest reproductive indices in the world to levels below the international average. In other words, changes in the age structure of the population, especially ageing, are occurring more quickly in Latin America than they did in the industrialized countries, which points to the need to develop situation-specific measures to tackle the challenges and take advantage of the opportunities raised by the demographic change process.[13]

(b) Changes in the dependency ratio

Since people's economic behaviour depends on the stage they have reached in the life cycle, changes in the age structure tend to have a major impact on economic development. The existence of a high proportion of dependent persons (children and older persons) in the population usually constrains economic growth as a significant portion of resources have to be allocated to attending their needs. In contrast, having a large proportion of working-age people can boost economic growth, as incomes increase and the accumulation of capital accelerates thanks to the larger proportion of people working and the lower level of spending on dependent persons.

In this regard, by relating the numbers of people in potentially inactive age groups (under 15 years and over 59 years) to the population in potentially active age groups (15-59 years), the dependency ratio constitutes a valuable indicator of the potential effects of demographic changes on socio-economic development.[14]

The average dependency ratio in Latin America increased between 1950 and the 1960s owing to a relative increase in the child population and then began to decline steadily with the drop in fertility rates. This decline is expected to continue until around 2020 when the growing proportion of elderly people will cause the dependency ratio to increase again. Although Latin American countries in general formally coincide with this model, in terms of time, there are huge variations from one country to another (see table III.2). This is clearly shown by a comparison of the situation of three countries in different stages of demographic transition (Cuba, in the very advanced stage; Mexico, in the advanced stage; and Guatemala, in the moderate stage).

In Cuba, the period in which the dependency ratio declines is much shorter than in other countries, and, after stabilizing at relatively low levels for a long period of time, the dependency ratio is expected to rise again much more quickly. In Mexico, the dependency ratio

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[12] The natural growth rate does not take migration flows into account. In several countries of Latin America, the total growth rate is below the natural one due to large negative migratory flows.

[13] The population generally keeps ageing in the industrialized countries owing to very low fertility rates and the increase in longevity. In 2050, for example, 42% of the population of Japan is expected to be 60 years old or older.

[14] To calculate the dependency ratio, many studies consider the economically active population to be those aged between 15 and 64. However, it is important to be aware of the limitations of stating dependency ratios in terms of age ranges. First, in most populations people do not automatically cease to be economically active at the age of 60. Second, not everyone aged 15 to 59 is economically active, especially among the female population (and despite the increasing participation of women in the labour market). Similarly, as training for entering work becomes longer, a growing number of adolescents and young adults spend longer in education and outside the labour market (thereby extending the period of dependence far beyond the age of 15). These observations suggest that trends in dependency ratios considered in this section offer only an indication of the economic impact of changes in the main age groups of the population.

was extremely high at the beginning of the period due to high child dependency rates and then started a steep downward trend that is expected to last until the middle of the 2020s. In Guatemala, the decline of the dependency ratio has been far more gradual because fertility rates have remained relatively high. The dependency ratio is therefore projected to continue to

decline until the middle of this century. The child dependency ratio (the number of children to the number of people in the potentially active age bracket) is projected to converge in Latin America, while the dependency ratio of the elderly (the number of elderly persons to the number of people in the potentially active age bracket) is projected to diverge.

Table III.2
LATIN AMERICA: ASPECTS OF DEPENDENCY RATIO TRENDS [a]

| Countries | Reduction period of dependency ratio | | | | | | Period for which dependency ratio remains below two dependents per three people in the economically active age group | | |
	Maximum value (MAV)	Year of maximum value	Minimum value (MIV)	Year of minimum value	Duration (years)	Intensity (%)	Start year	Final year	Duration (years)
Latin America	97	1965	60	2019	54	38	2001	2041	40
Argentina	78	1989	63	2032	43	19	2007	2039	32
Bolivia	95	1974	57	2041	67	40	2019	2062	43
Brazil	97	1964	58	2007	43	41	1995	2040	45
Chile	92	1966	54	2011	45	41	1983	2026	43
Colombia	109	1965	56	2017	52	49	1998	2042	44
Costa Rica	115	1965	53	2014	49	54	1999	2041	42
Cuba	91	1974	53	1991	17	42	1983	2024	41
Ecuador	105	1965	61	2025	60	43	2008	2048	40
El Salvador	104	1968	57	2028	60	45	2011	2052	41
Guatemala	103	1988	55	2050	62	46	2029	2069	40
Haiti	92	1970	57	2039	69	38	2018	2060	42
Honduras	111	1972	56	2040	68	50	2019	2059	40
Mexico	110	1966	57	2022	56	48	2002	2036	34
Nicaragua	114	1965	59	2035	70	48	2013	2052	39
Panama	102	1968	61	2020	52	40	1999	2036	37
Paraguay	113	1962	58	2038	76	48	2015	2055	40
Peru	99	1967	59	2017	50	41	2005	2049	44
Dominican Republic	114	1965	63	2027	62	44	2010	2048	38
Uruguay [b]	74	1989	67	2016	27	9	-	-	
Venezuela (Bol. Rep. of)	104	1966	61	2020	54	41	2002	2048	46

Source: Latin American and Caribbean Demographic Centre (CELADE) - Population Division of ECLAC, population estimates and projections, 2007.
[a] Number of people aged less than 15 years and aged 60 or over per 100 persons aged 15 to 59. years.
[b] After reaching its maximum value, the dependency ratio in Uruguay will remain at or above two dependants per three economically active people.

Figure III.1 shows how the dependency ratio will vary over the next few decades in selected Latin American countries according to the demographic transition stage that they have reached. The year 2008 is taken as the base year (equal to 100) for comparing projections up to 2050. The figure shows a clear downward trend in the dependency ratio in the countries furthest behind in the transition process, such as Bolivia and Guatemala, and a strong upward trend in the case of the countries that are in the later stages of transition, such as Chile and Cuba. Meanwhile, in countries such as Brazil and Mexico, which are in the intermediate stages of demographic transition, the dependency ratio is growing in line with the average for

Latin America, in other words, far more slowly than in the countries in the later stages of transition.[15] A comparison of the extreme cases of Cuba and Guatemala provides a clear picture of the diversity of demographic situations in the region: in Cuba, the dependency ratio is expected to practically double by 2050, while in Guatemala, it is expected to be nearly halved.

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[15] Brazil and Mexico are classified in a less advanced subgroup than Chile within the advanced stage of demographic transition due to the significantly higher overall fertility rates they had at the start of the transition process in comparison with Chile.

Figure III.1
LATIN AMERICA (SELECTED COUNTRIES): FUTURE TRENDS IN THE TOTAL DEPENDENCY RATIO, 2008-2050 [a]
(2008 = 100)
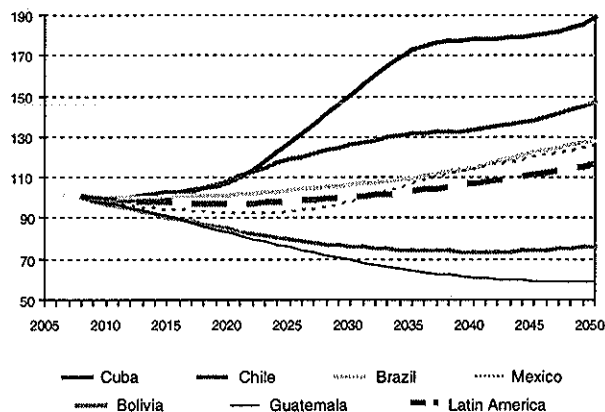
Source: Latin American and Caribbean Demographic Centre (CELADE) - Population Division of ECLAC, population estimates and projections, 2007.
[a] Number of persons aged under 15 and 60 or over per 100 persons aged between 15 and 59 years.

(c) The demographic dividend

During demographic transition, there is a period when the dependency ratio drops substantially as the weight of the potentially productive age group grows and the relative weight of the potentially inactive age group diminishes. In that period, the situation is particularly favourable for development as there are more possibilities for savings and investment in economic growth, while there is also reduced pressure on primary-education spending. Various terms have been coined to describe this period, including "demographic dividend", "demographic bonus" or "demographic window of opportunity", which refers to the possibility of increasing rates of economic growth per capita and hence the levels of well-being of the population during this period.

The benefits associated with this period do not accrue automatically. They are subject to the adoption of macroeconomic policies that encourage productive investment, increase employment opportunities and promote a stable social and economic environment conducive to sustained development (Bloom, Canning y Sevilla, 2003; Adioetomo et al., 2005; Wong and Carvalho, 2006). In particular, they require major investments in human capital, above all in the education of young people, to increase their productivity.

The recent history of countries in South-East Asia shows that the combination of a large pool of young workers with highly developed job skills and a relatively small contingent of dependent older people creates a situation that is highly favourable for economic growth. The increase in productivity seen in these countries stems largely from

the considerable investments made in educating young people during the period of the demographic dividend (UNFPA, 1998; Mason, 2002).

There is no exact measurement of the beginning and end points of the demographic dividend, and its definition in terms of the dependency ratio tends to vary. In this study, the period corresponding to the demographic dividend has been subdivided into three phases. In the first of these phases, the dependency ratio declines but is still fairly high (above two thirds, in other words, two dependents for every three persons in economically active age groups). In the second, the dependency ratio falls below two thirds and continues to decrease. In the third and final phase, the dependency ratio begins to rise as the proportion of older people increases, but is still below two thirds.

While the countries of the region show little difference as regards the onset of the demographic dividend (in nearly every country, the dependency ratio began to come down towards the middle of the 1960s), the extent and duration of its different phases vary significantly (see figure III.2). Generally speaking, the countries which are most ahead in the demographic transition have a shorter dividend period left than countries that are further behind in the process. In Chile and Cuba, for example, the dividend is expected to end some time in the first quarter of this century. In Brazil and Costa Rica, it will last until the beginning of the 2040s, while in Ecuador and Peru it is expected to end around 2050. In seven countries, the dividend should last beyond the middle of the century (to 2062 in Bolivia and 2069 in Guatemala, for example).

Figure III.2
LATIN AMERICA: DURATION AND STRUCTURE OF THE DEMOGRAPHIC DIVIDEND [a]
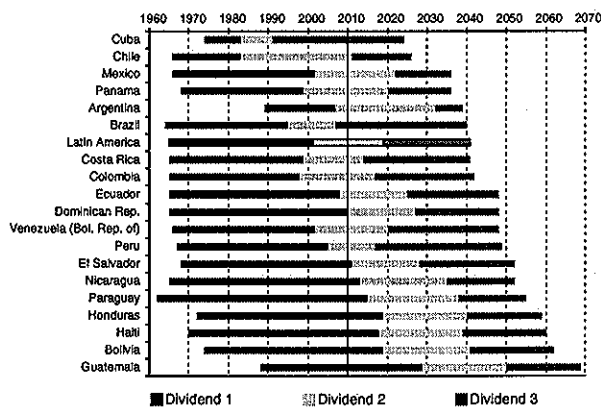
Source: Latin American and Caribbean Demographic Centre (CELADE) - Population Division of ECLAC, population estimates and projections, 2007.
[a] Dividend 1: period in which the dependency ratio declines but is above two thirds, i.e. two dependents for every three people in economically active age groups; Dividend 2: period in which the dependency ratio falls below two thirds and continues to decrease; Dividend 3: period in which the dependency ratio rises, but is still below two thirds. Uruguay is not included in the figure because the dependency ratio in this country, having reached its maximum value, will not drop below two dependents per three people in economically active age groups.

On average, the Latin American population is currently in the second —the most favourable— stage of demographic transition, in which the dependency ratio tends to be relatively low and is still falling. This stage began at the beginning of the twenty-first century and is expected to last until the end of the next decade when the third stage will begin and last until the beginning of the 2040s. Only two countries are in the third phase of the demographic dividend: Cuba since the beginning of the 1990s, and Brazil since 2007. Chile is expected to enter this final phase very shortly (2011), and eight other countries are already in the second phase: Argentina, Bolivarian Republic of Venezuela, Colombia, Costa Rica, Ecuador, Mexico, Panama and Peru. The eight remaining countries are still in the first phase (see figure III.2).[16]

(d) Taking advantage of the opportunity the dividend offers for preparing for the future

All the countries of Latin America without exception are, thanks in part to the demographic dividend, currently in a period that is particularly conducive to economic development. In some countries, this period has already entered, or is about to enter, into the final phase, while in others it is only just beginning and should last for the next five or six decades. The advantage of having a favourable ratio between the economically active population and the number of dependent people will disappear, sooner for

some than for others, as the proportion of elderly people steadily increases.

At the end of this phase, there will be a period of rapid population ageing that will pose new challenges to society and require the implementation of public policies and programmes in various areas, including the provision of long-term health care and the financing of pensions for a progressively ageing population.

Population ageing will occur in each of the countries of Latin America and will invert the dependency ratio as the number of older dependents steadily increases in relation to the number of young people and working-age adults. If this phase is reached in unfavourable economic conditions, with no economic growth or accumulated savings, the burden placed by the dependent elderly population on the active population will require huge transfers of resources from the latter to the former, which might not only create intergenerational conflict, but also generate solvency problems that could jeopardize the financing of key systems, such as health and social security.

Taking advantage of the demographic dividend by investing in education and creating productive jobs not only generates more opportunities for the young people of today. The fruits of such investments are essential for achieving the savings and productive leaps forward needed for dealing with the exponential increase in costs which will accompany society's inexorable ageing. The demographic dividend period therefore also represents a unique opportunity to prepare for the future.

2.   Secondary education and the demographic dividend

Trends for the younger population and for the secondary-school age group in particular are directly linked to an important part of the demographic dividend that arises from changes in the proportional size of the different age groups in the population. The secondary-school age population generally increases considerably during the initial phase of the dividend, which leads to a series of demands on public policy, especially in terms of providing quality secondary education and creating enough jobs to

make good use of a growing supply of increasingly well-educated and well-trained workers.

As countries move through the period of the dividend, the secondary-school age group stabilizes and then begins to decrease, which provides a unique opportunity to extend coverage and improve the quality of schooling provided at the secondary level while demand for public spending from the older population is still relatively low.

The analysis presented below describes the general trends for the secondary-school age population and how they change according to the different phases of the dividend.

(a) General trends in the secondary-school age population

The weight and volume of the secondary-school age group in the population of Latin American countries vary according to the stage of demographic transition

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[16]   Uruguay is not included in the figure since it is not going through a demographic dividend period. While the dependency ratio in Latin America on average dropped 38% between its maximum and minimum level, the decline in the case of Uruguay was only 9%. Also, after attaining a maximum value significantly lower than the regional average, Uruguay's dependency ratio always remained above two dependents per three persons in the potentially-active age group (see table III.2). The heavy migration of members of the active age group could be one of the factors behind this situation.

reached. The relative size of this group usually shrinks at the beginning of the transition period when the number of children increases sharply. It later increases owing to the incorporation of cohorts born during low-fertility periods and then shrinks again as a result of the constant ageing of the population. In absolute terms, the volume of secondary-school age children usually increases steadily during the first stages of the transition up to a point of inflection after which the generations joining this group are smaller and smaller in comparison with previous years as a result of the decline in fertility rates.

The current secondary-school-age population (those aged between 12 and 17) in Latin America is 64 million, three times as large as in 1950.[17] The size of this group is expected to remain fairly stable over the next decade and a half and then decrease gradually. Projections place the secondary-school-age population at 57 million in 2050, which represents an approximate 10% drop from present levels (see table III.3). In relative terms, the proportion of people of secondary-school age in the population has fallen from 12.7% in 1950 to 11.3% today after reaching 14% in 1975. By 2050, this age group is expected to account for no more than 7.5% of the population.

Table III.3
LATIN AMERICA: VOLUME, RELATIVE PARTICIPATION AND PAST AND FUTURE VARIATION OF THE SECONDARY-SCHOOL-AGE POPULATION, 1950-2050

| Countries | Age group | Secondary-school-age population | | | | | | | | | | Variation between 1950 and 2008 (Percentages) | Variation between 2008 and 2050 (Percentages) |
| | | Volume (Thousands) | | | | | Relative participation (Percentages) | | | | | | |
		1950	1975	2008	2025	2050	1950	1975	2008	2025	2050		
Latin America	12-17	20 474	44 096	64 059	64 159	56 904	12.7	14.0	11.3	9.5	7.5	3.1	-11
Argentina	12-17	1 877	2 777	4 140	4 111	3 632	10.9	10.7	10.4	9.0	7.2	2.2	-12
Bolivia	12-17	355	638	1 335	1 531	1 414	13.1	13.4	13.3	11.5	8.4	3.8	6
Brazil	11-17	8 428	18 386	23 585	24 785	21 761	15.6	17.0	12.1	10.8	8.5	2.8	-8
Chile	12-17	710	1 512	1 754	1 506	1 369	11.7	14.5	10.5	7.9	6.8	2.5	-22
Colombia	11-16	1 638	3 941	5 478	5 014	4 531	13.0	15.6	11.7	9.0	7.3	3.3	-17
Costa Rica	12-16	94	273	430	402	358	9.7	13.3	9.5	7.2	5.8	4.6	-17
Cuba	12-17	739	1 208	921	647	535	12.5	12.8	8.2	5.8	5.4	1.2	-42
Ecuador	12-17	418	953	1 674	1 693	1 552	12.3	13.8	12.1	9.9	7.7	4.0	-7
El Salvador	13-18	254	567	877	952	914	13.0	13.8	12.1	10.4	8.2	3.5	4
Guatemala	13-17	352	690	1 597	2 174	2 225	11.2	11.1	11.7	10.9	8.0	4.5	39
Haiti	12-18	486	816	1 548	1 700	1 707	15.1	15.9	15.9	13.5	10.6	3.2	10
Honduras	13-18	188	427	1 027	1 134	1 029	12.7	13.7	14.0	11.6	8.3	5.5	0
Mexico	12-17	3 562	8 605	12 616	11 235	9 180	12.8	14.2	11.7	9.1	7.0	3.5	-27
Nicaragua	13-17	147	343	673	640	541	11.4	12.3	11.9	9.4	6.8	4.6	-20
Panama	12-17	103	239	375	408	386	12.0	13.9	11.0	9.7	7.8	3.6	3
Paraguay	12-17	204	411	817	881	843	13.9	14.7	13.1	10.9	8.4	4.0	3
Peru	12-16	847	1 787	2 903	2 764	2 488	11.1	11.8	10.3	8.2	6.4	3.4	-14
Dominican Rep.	12-17	341	784	1 199	1 253	1 114	14.4	15.2	12.3	10.7	8.3	3.5	-7
Uruguay	12-17	240	301	320	289	262	10.7	10.6	9.6	8.1	7.0	1.3	-18
Venezuela (Bol. Rep. of)	12-16	534	1 583	2 729	2 911	2 657	10.5	12.4	9.8	8.3	6.5	5.1	-3

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007.

Given the unevenness of demographic change in Latin America, its effects on the secondary-school-age population also tend to vary considerably from one country to another in the region. With notable variations and some exceptions, the secondary-school-age population has increased significantly in the last few decades in most of the region's countries. In some, such as Argentina, Brazil and Chile, this population group has doubled or almost tripled since the middle of the

last century (see table III.3). In others, such as Colombia, the Dominica Republic and Mexico, the increase has been between three- and four-fold. In Costa Rica, Guatemala and

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[17] The age range for secondary education varies slightly from one country to another in Latin America (see table III.3). For illustrative purposes, this study considers the regional average (12-17 years) as the most common range.

Nicaragua, it has expanded by a factor of four-to-five, and in the Bolivarian Republic of Venezuela and Honduras, the secondary-school-age population is more than five times larger than it was in 1950. By contrast, this population segment has increased by only 20% in Cuba and 30% in Uruguay. In Cuba, the number of secondary-school-age children has varied significantly over the period in question, however: having risen sharply in the mid-1970s and the early 1980s before declining after then.

Figures III.3 and III.4 show the future trends for the secondary-school-age population in absolute and relative terms, using a group of countries in different stages of demographic transition as an example. Both figures use 2008 as the base year for projections for the following years up to 2050. A clear distinction emerges between the countries at the opposite ends of demographic transition: in Bolivia and Guatemala, the countries furthest behind in the process, the secondary-school-age population will continue to increase for several decades, and the relative weight of this population segment will decrease more slowly than the regional average; while in Chile and Cuba, the countries in the most advanced stage of transition, the secondary-school-age population will continue its downward trend, and its relative weight will shrink faster than the regional average. In the countries in the intermediate stages of transition, the declines both in absolute and relative terms of the secondary-school-age population will be steeper in Mexico than in Brazil.

Figure III.3
LATIN AMERICA (SELECTED COUNTRIES) FUTURE TRENDS IN THE VOLUME OF THE SECONDARY-SCHOOL-AGE POPULATION, 2008-2050 [a]
(2008 = 100)
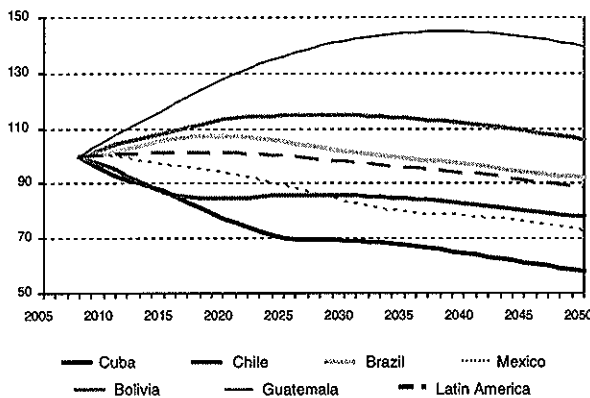
Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007.
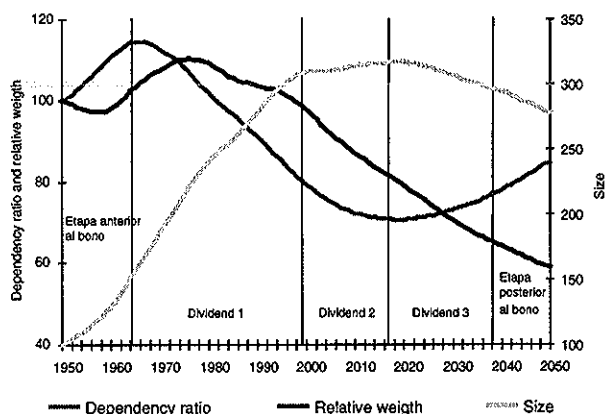[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America.

Figure III.4
LATIN AMERICA (SELECTED COUNTRIES): FUTURE TRENDS IN THE RELATIVE WEIGHT OF THE SECONDARY-SCHOOL-AGE POPULATION, 2008-2050 [a]
(2008 = 100)
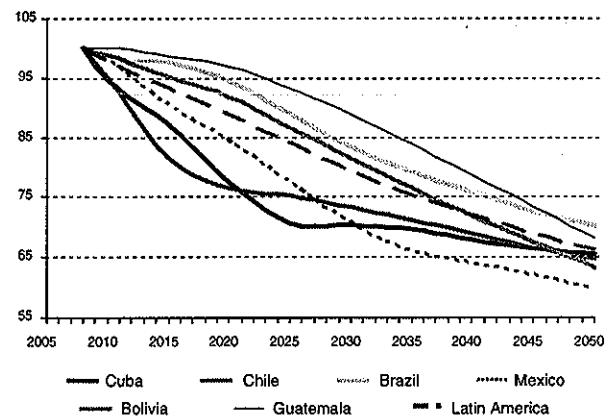
Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007.
[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America.

(b) Evolution of the secondary-school-age population over the course of the demographic dividend

There are three distinct phases in the demographic dividend. In the first of these phases (dividend 1), the dependency ratio is high but falling; in the second (dividend 2), the dependency ratio reaches more favourable levels and continues to fall, and in the third (dividend 3), the dependency ratio begins to rise again but remains at favourable levels.

Figures III.5 to III.8, which present the regional average as well as the situation in countries in different stages of demographic transition, show that although the duration and magnitude of the demographic dividend vary greatly from one Latin American country to another, trends for the secondary-school age group through the various phases of the demographic dividend tend to follow a similar pattern in all the countries. Both in Chile, the country furthest ahead in terms of demographic transition, and in Brazil, which is in an intermediate stage, and in Bolivia, which is the furthest behind in the process, the secondary-school age group increases notably in the initial phase of the dividend, while its relative weight in the population remains relatively stable, increasing slightly at first before starting to gradually decrease.
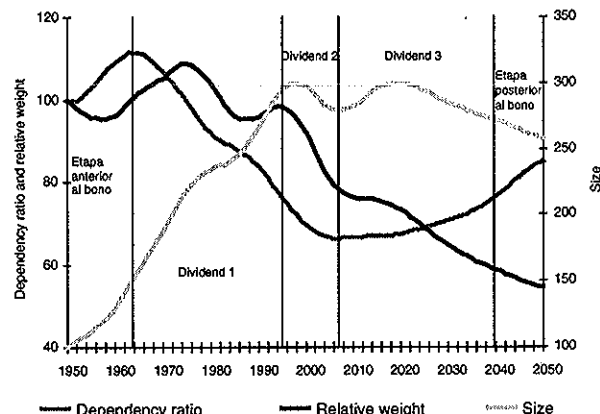
Figure III.5
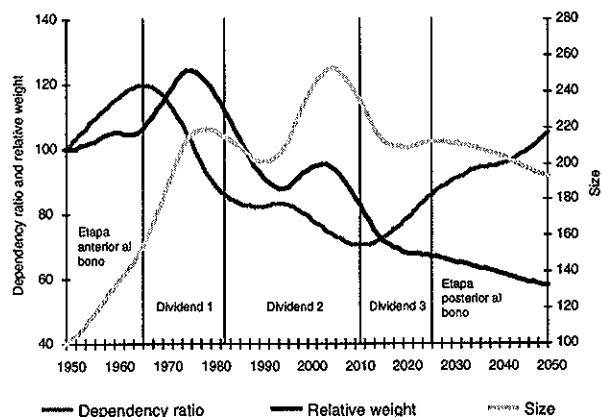**LATIN AMERICA: DEPENDENCY RATIO, SIZE AND RELATIVE WEIGHT OF THE SECONDARY-SCHOOL-AGE POPULATION IN THE VARIOUS PHASES OF THE DEMOGRAPHIC DIVIDEND [a]**
(1950 = 100)

Dependency ratio   Relative weight   Size

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007
[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America. Dividend 1: period in which the dependency ratio declines but is above two thirds, i.e. two dependents for every three people in economically active age groups; Dividend 2: period in which the dependency ratio falls below two thirds and continues to decrease; Dividend 3: period in which the dependency ratio rises, but is still below two thirds. Uruguay is not included in the figure because the dependency ratio in this country, having reached its maximum value, will not drop below two dependents per three people in economically active age groups.
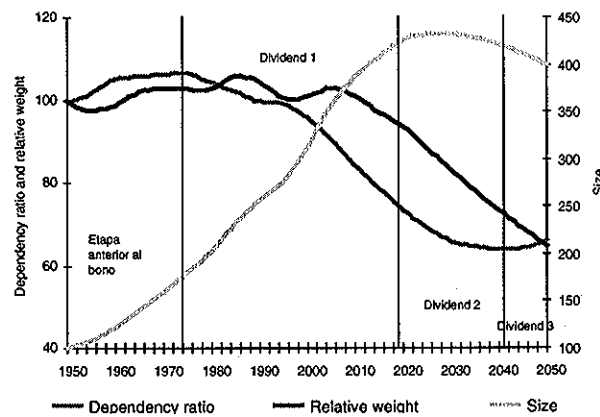
Figure III.7
BRAZIL: DEPENDENCY RATIO, SIZE AND RELATIVE WEIGHT OF THE SECONDARY-SCHOOL-AGE POPULATION IN THE VARIOUS PHASES OF THE DEMOGRAPHIC DIVIDEND [a]
(1950 = 100)

Dependency ratio   Relative weight   Size

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007
[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America. Dividend 1: period in which the dependency ratio declines but is above two thirds, i.e. two dependents for every three people in economically active age groups; Dividend 2: period in which the dependency ratio falls below two thirds and continues to decrease; Dividend 3: period in which the dependency ratio rises, but is still below two thirds. Uruguay is not included in the figure because the dependency ratio in this country, having reached its maximum value, will not drop below two dependents per three people in economically active age groups.

Figure III.6
CHILE: DEPENDENCY RATIO, SIZE AND RELATIVE WEIGHT OF THE SECONDARY-SCHOOL-AGE POPULATION IN THE VARIOUS PHASES OF THE DEMOGRAPHIC DIVIDEND [a]
(1950 = 100)

Dependency ratio   Relative weight   Size

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007
[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America. Dividend 1: period in which the dependency ratio declines but is above two thirds, i.e. two dependents for every three people in economically active age groups; Dividend 2: period in which the dependency ratio falls below two thirds and continues to decrease; Dividend 3: period in which the dependency ratio rises, but is still below two thirds. Uruguay is not included in the figure because the dependency ratio in this country, having reached its maximum value, will not drop below two dependents per three people in economically active age groups.

Figure III.8
BOLIVIA: DEPENDENCY RATIO, SIZE AND RELATIVE WEIGHT OF THE SECONDARY-SCHOOL-AGE POPULATION IN THE VARIOUS PHASES OF THE DEMOGRAPHIC DIVIDEND [a]
(1950 = 100)

Dependency ratio   Relative weight   Size

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007
[a] The age range for secondary education varies slightly across the region. The range 12 to 17 years was used as the average for Latin America. Dividend 1: period in which the dependency ratio declines but is above two thirds, i.e. two dependents for every three people in economically active age groups; Dividend 2: period in which the dependency ratio falls below two thirds and continues to decrease; Dividend 3: period in which the dependency ratio rises, but is still below two thirds. Uruguay is not included in the figure because the dependency ratio in this country, having reached its maximum value, will not drop below two dependents per three people in economically active age groups.

During the second and most favourable phase of the dividend, the relative weight of the secondary-school age group falls significantly, while the absolute weight remains more or less stable, with a slight tendency to decrease towards the end.18 In the third phase, when the dependency ratio rises again but the proportion of elderly people is still low, the secondary-school age group decreases both in relative and absolute terms.

Although the downward trend in the secondary-school-age population tends to continue beyond the period of thedividend in all countries, by this point the situation will be less propitious for investment in education because the process of population ageing will have increased demand for public spending in other areas, such as health care and pensions.

The next sections of this chapter examine the effort that the countries of Latin America will need to make from an economic perspective to attain the coverage targets set for secondary education as well as the role that demographics play in this process.

B. The impact of demographic changes on secondary education

In most of the region's countries, the demographic changes under way are already having a positive impact on education. Throughout the demographic dividend period, sizeable savings will be generated by the decline of the dependency ratio of the primary- and secondary-school age population. These savings will be sufficient to cover the cost of providing universal coverage for secondary education and will make a considerable contribution towards achieving more ambitious targets in terms of spending per student. These dividends are realized not in the present but in the course of the demographic transition until the end of each country's demographic dividend period. Therefore, countries must find ways to finance the resources needed today based on these future dividends.

1.   Education targets and current coverage rates in Latin America

At the second Summit of the Americas, held in Santiago in 1998, the countries of the region committed themselves to attaining two fundamental targets by 2010:[19]

(i) Ensuring, by the year 2010, universal access to quality primary education for all children and access to quality secondary education for at least 75 percent of young people, with increasing percentages of young people who complete secondary education; and

(ii) Providing the general population with opportunities for life-long learning.

According to the assessment performed by UNESCO in 2007, access to primary education is almost a universal phenomenon in all the countries of the region, with Brazil, Ecuador, Mexico and Panama being the most recent countries to achieve this target (UNESCO, 2007). Despite the undeniable progress made in this regard, several countries in Latin America still have to make additional efforts to achieve universal primary-education coverage. This is the case of Colombia, the Dominican Republic, Nicaragua and Paraguay, whose net primary-school enrolment rates are still below 90%.

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[18] In Chile, this relative weight oscillates signficantly, probably owing to past demographic events.

[19] Plan of Action signed by the Heads of State and Government participating in the Second Summit of the Americas, held in Santiago in 1998 (UNESCO, 2007).

Although net enrolment rates provide an indication of access to primary education, and in part to the education system as a whole, they do not reflect how students progress within, and complete, the respective education cycle. Primary-school enrolment may be high, but grade repetition, high dropout rates and low completion rates continue to be a problem. The percentage of children who repeat a grade at primary school is below 10% in the region as whole, but 13% in Guatemala and 20% in Brazil. The lowest completion rates for primary school are recorded in Ecuador (72.6%), El Salvador (66.4%), Guatemala (62.6%), Honduras (61.7%) and Nicaragua (50.2%) (UNESCO, 2007).

Under these circumstances, large numbers of children will not reach secondary school at the appropriate age, which, in turn, undermines efforts to improve net enrolment rates in secondary education. Providing universal access to primary education is only the first step. Considerable efforts are still required to ensure that children progress within, and complete, the primary school cycle. Only then will secondary-school coverage and completion rates significantly increase in the region.

Two aspects of the second target (life-long learning opportunities for all) need to be addressed: eliminating adult illiteracy so that people can keep learning; and improving pre-school education given its proven importance in ensuring that children perform better throughout the various education cycles and beyond.

As regards secondary education, of the countries for which information is available, only Argentina and Brazil have attained the 75% net enrolment target, while Bolivia and Peru are close to doing so. Secondary-school enrolment in Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala and Nicaragua is below 60%.[20] Although there is less data on secondary-school completion rates, with the exception of Argentina, Bolivia, Chile and Peru, only up to half of the young people enrolled in secondary school in the region complete the cycle.[21] A comparison of the percentage of the population aged between 20 and 24 years that has completed secondary school shows that Guatemala, Honduras and Nicaragua are the furthest behind in this respect as three quarters or more of this population group in these countries have not completed secondary school.

In the cases of both primary and secondary education, the countries whose systems lag most behind are also the least advanced in the demographic transition process. These are countries with younger populations which face greater potential demands at the levels of primary and

secondary education and which have had to cope with serious constraints associated with their demographic situations. Despite this, and as was explained at the beginning of this chapter, these countries have only recently entered into the first phase of the demographic dividend period. Accordingly, from this point on, they will be able to take full advantage of the opportunity to improve their education systems.

However, as pointed out earlier, the benefits to be derived from the demographic dividend do not accrue automatically, and governments will have to make considerable efforts to provide the resources needed to obtain them. The state of the education system in some of the countries that have already gone through a large part of their demographic dividend periods attest to the fact that achievements in education are not always proportional to improvements in demographic conditions. Demographic changes open up opportunities but, as several studies show, they are not the most determinant factor in bringing about improvements in the education system (UNESCO, 2007; IDB, 2000).[22]

While there are targets that remain to be attained at the primary level, the countries should seek to achieve those relating to the secondary level as soon as possible. From a demographic perspective, the fact that the secondary-school age group has greatly increased in numbers means that its many needs, among which education is of vital importance, must be analysed and attended to. From an economic and social perspective, quality secondary education is needed to ensure that young people have access to higher-productivity jobs and thus to incomes that will enable them to remain above the poverty line. According to ECLAC (2000d), in order to have some chance of obtaining an intermediate or high level of income, people need to have at least 12 years of schooling behind them. Deficient education systems condemn young people to unemployment or informal and low-income jobs and perpetuate the intergenerational transmission of poverty.[23]

The scenario analysis presented below considers only quantitative targets, in other words, minimum goals. The importance of the progress that still needs to be made in terms of the quality and equality throughout education

20 There is no information on net enrolment in Chile, Costa Rica, Cuba and Uruguay, which have possibly already reached the target.
21 No information is available on the current completion rate for secondary education in 10 of the region's countries.
22 The UNESCO report (2007) cites the case of Belize and Guatemala: 11% of the population in both countries is aged between 15 and 19; coverage rates are 72% and 34%, respectively. A study carried out by Behrman, Duryea and Szekely referred to in the IDB report (2000) notes that demographic factors had only a marginal influence on the educational progress made in the 1980s in Latin America.
23 It should be noted that higher levels of education among young people can lead to rising employment and huge expectations and this can lead to increasing unemployment. Education policies need to be implemented together with measures to guarantee the absorption of demand for more skilled jobs.

cycle should not be overlooked, however; governments will need to invest as much, if not more, in improving the quality and equality of the education system as they do in expanding education coverage, which will reduce the possibilities of transferring the primary education dividend to the secondary education sector.

2.   Countries' efforts to improve education

Public investment in education, as a percentage of GDP, constitutes an important measure of the efforts being made to improve education. This indicator varies considerably across the region, from 1.8% in the Dominican Republic to 6.4% of GDP in Bolivia in 2005. The countries that, in addition to Bolivia, are making the largest efforts in this regard are Brazil, Colombia, Costa Rica Mexico and Paraguay, which are all investing over 4% of GDP in education. At the other end of the spectrum, the Dominican Republic, El Salvador, Peru and Uruguay, are making the smallest investments in education, as measured by this indicator, inasmuch as they allocate less than 3% of GDP to education (UNESCO, 2007).

The countries in which public investment in education as a percentage of GDP has grown since 2000 are Bolivia, Chile, Colombia, Costa Rica, El Salvador, Mexico and Paraguay. Investment in education has remained practically stagnant in Cuba and Uruguay and has fallen in Ecuador, Nicaragua, Panama and Peru, most steeply in the case of Ecuador.

A comparison of investment in education (as a percentage of GDP) with the progress made in education coverage shows that the achievements reached in the coverage and completion of education cycles are not proportionate to the amount invested in education. In Colombia, for example, investment levels similar to those of Mexico (again as a percentage of GDP) have resulted in far less coverage at both primary- and secondary-education levels than in Mexico. As far as secondary school completion is concerned, however, the opposite occurs: 60% of the population aged between 20 and 24 have completed secondary school in Colombia compared with 40% in Mexico. This implies that the same level of spending on education as a percentage of GDP can achieve highly different results according to institutional factors and other factors affecting the effectiveness of the education system, such as the grade-repetition and dropout rate.

Spending per student is a more subtle measure of education policy efforts and reflects the resources available per enrolled student. This spending is determined by, among other elements, the costs of teachers and other staff, infrastructure costs and class sizes, three factors that are closely linked to the efficiency and effectiveness of the education system.

In 2005, public spending per secondary-school student as a percentage of per capita GDP varied considerably across the region, from 3.7% in Guatemala to 18.4% in Colombia (UNESCO, 2007). There seems to be no direct relationship between this spending and the progress made either: Argentina and Mexico, for example, which spend similar amounts per student in terms of percentages of per capita GDP, have achieved very different results in terms of secondary-school coverage and completion rates.

3.   The impact of demographic change on public investment in secondary education

(a) Trends in dependency ratios in secondary education

The weight of the secondary-school-age population increases slightly during the first phase of the demographic dividend and then declines gradually. In the second phase, the weight of this group falls sharply and in the third, it diminishes both in relative and absolute terms.

The secondary-education dependency ratio can be understood as a measure of the potential burden that the secondary-school-age population (as defined by each country) places on the potentially active population (people aged between 20 and 64 years) [24] and is measured as the ratio between the two. Although this dependency ratio will decrease in all the countries during the demographic dividend period, the magnitude of this decline will

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[24]   This age group is used to include the population most likely to participate in the production process and to exclude those who are still in the education system or retired.

depend on the stage of demographic transition reached, the pace of demographic change and the period in which the demographic dividend occurs in each country. The percentage drop in the dependency ratio between the present moment and the moment at which the dividend is projected to end[25] provides an approximation of the benefit or dividend that each country can derive for its secondary education sector from the demographic change process, in other words, an estimate of the secondary-education dividend.[26]

Table III.4 shows the total decrease of the dependency ratio in each country. On average the dependency ratio will fall approximately 35% between now and the end of the demographic dividend period. The countries furthest

behind in the demographic transition process, such as Guatemala, Nicaragua, Paraguay and Peru, will record a much larger drop (of about 50%) since their dividend period is just starting and they will experience a total reduction of the dependency ratio. Some countries in an intermediate transition stage will witness a decline of about 40% (Colombia, Costa Rica and Mexico) and those at more advanced stages will undergo a decrease of up to 30% (Argentina, Chile and Uruguay).[27] Some countries in the intermediate transition stage, such as Mexico and Panama, will experience smaller reductions owing, probably, to the fact that their demographic trends to date imply that their demographic transition will be faster in the future.

Table III.4
LATIN AMERICA: PERCENTAGE CHANGE IN THE SECONDARY-EDUCATION DEPENDENCY RATIO FROM 2005 TO THE END OF THE DEMOGRAPHIC DIVIDEND PERIOD

Countries	Secondary-education dependency ratio			Year in which the demographic dividend ends
	In 2005	In the year in which the demographic dividend ends	Percentage change	
Latin America	0.214	0.138	-35.4	2040
Argentina	0.194	0.133	-31.3	2039
Brazil	0.222	0.155	-30.0	2040
Chile	0.190	0.131	-30.7	2026
Colombia	0.220	0.131	-40.2	2042
Costa Rica	0.182	0.103	-43.5	2041
Cuba	0.142	0.093	-34.7	2024
El Salvador	0.239	0.142	-40.3	2048
Guatemala	0.278	0.132	-52.6	2050
Mexico	0.222	0.128	-42.2	2036
Nicaragua	0.258	0.115	-55.4	2050
Panama	0.208	0.151	-27.1	2036
Paraguay	0.278	0.141	-49.4	2050
Peru	0.203	0.109	-46.5	2049

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007.

(b) Demography and secondary education coverage: overcoming demographic constraints

The demographic transition process and its influence on the secondary-education dependency ratio are in full force in all the countries of Latin America. The

issue now is to what extent these changes are being converted into gains in terms of education coverage. As the secondary-education dependency ratio decreases, coverage can be expected to increase. The first question is whether the expected increases in coverage are actually happening. Figure III.9 shows the relationship between education coverage, measured as the net enrolment rate, and the secondary-education dependency ratio,

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[25] The duration or end of the demographic dividend period is determined by the definition given in the first section of this chapter, in other words, when the dependency ratio exceeds two thirds (see table III.2).

[26] The functioning of this dividend may be related to the reduction of the number of household dependents which makes it possible to increase household spending per child.

[27] As shown in the first section of this chapter, Argentina and Uruguay fall into the most advanced subgroup of countries in the advanced stage of demographic transition, while Chile is in the second subgroup, and Colombia, Costa Rica and Mexico in the third.

which reflects the demographic situation that affects secondary education.[28] The countries of OECD, which are representative of countries in very advanced stages of demographic transition, are included in the figure for reference.
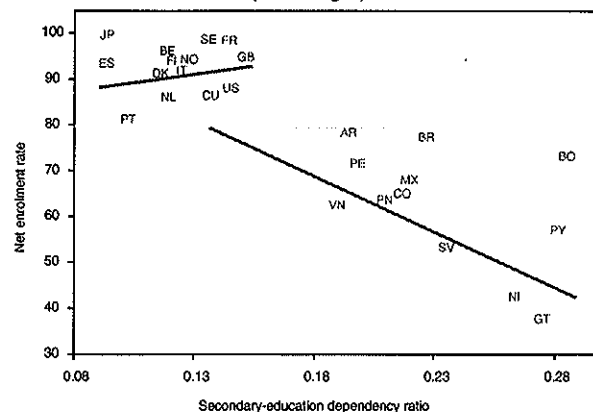
As the OECD countries are at much later stages of demographic transition, their secondary-education dependency ratios are much lower than those of any Latin American country (except Cuba). Despite the differences in dependency ratios, the differences in secondary-education coverage are smaller in relative terms, in other words, there is a weak relationship between secondary-education coverage and the demographic situation (correlation of +0.12). Moreover the relationship tends to be a positive one, which, to some extent, suggests that progress in education coverage in the developed countries depends less on demographics than on factors related to spending and education policy.

In Latin America, on the other hand, there is an inverse relationship between the coverage rates and dependency ratios for secondary education (a correlation of -0.65) which seems to indicate that the drop in the relative demand in the education sector has helped the countries in the more advanced stages of demographic transition, such as Argentina and Cuba, to increase education coverage, while higher dependency ratios are hampering coverage expansion efforts in countries further behind in the transition process, such as Guatemala, Nicaragua and Paraguay.[29]

In short, the difference between what is occurring in the developed countries and in Latin America as regards expanding secondary-education coverage is that policy decisions largely determine progress in the developed countries, while demographic constraints still influence the situation in Latin America.

Nevertheless, the relationship between these two variables and the results obtained by some Latin American countries suggest that demographic constraints are not so large as to be impossible to overcome with the implementation of appropriate policies. Two sets of countries in figure III.9 show this to be the case: Brazil and Colombia on the one hand, and Bolivia, Guatemala and Paraguay, on the other. The dependency ratio (in other words, the demographic restrictions) in each set is very similar, but the progress made in education is not.

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[28] The net enrolment rate in secondary education is not a totally accurate measure because it is affected by those who have fallen behind in the education system: children that fall into the secondary-school age group but are registered in primary school.

[29] This cannot be interpreted as a causal relationship because social and economic factors, as well as factors associated with the institutional educational arrangements beyond the scope of this analysis, are involved.

Figure III.9
NET ENROLMENT RATES AND DEPENDENCY RATIOS IN
SECONDARY EDUCATION [a]
(Percentages)

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.
[a] The secondary-education dependency ratio is the ratio between the secondary-school-age population and the potentially productive population (people aged between 20 and 64).

Brazil and Colombia, for example, are both countries in the intermediate stage of demographic transition, which, despite having similar dependency ratios of about 23%, have achieved very different coverage rates (78% in Brazil and 54% in Colombia). Bolivia, Guatemala and Paraguay are the countries furthest behind in demographic transition in the region and therefore all have very high dependency ratios (of about 30%). Despite these demographic restrictions, Bolivia has made notable progress and achieved a net secondary-education coverage of 74% that is far higher than coverage in Guatemala (less than 40%) and Paraguay (56%).

Although bringing about improvements in secondary education in Latin America depends more on demographic constraints than it does in developed countries, some countries in the region are overcoming these restrictions and achieving high coverage rates. This shows that when all of society is behind the effort, the educational level of the population can be improved.

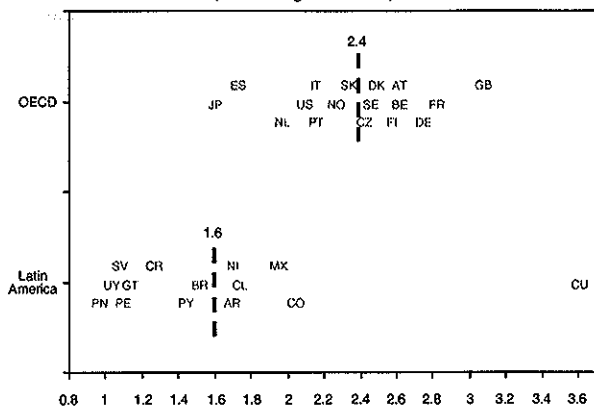(c) Social investment in secondary education

One way to gauge the effort a society is making to improve education is to measure education spending as a percentage of GDP (in other words, the proportion of the country's economic resources that is invested in education). The most notable case in Latin America is Bolivia, which has significantly boosted education spending as a percentage of GDP. Colombia, Costa Rica, Chile, El Salvador, Mexico and Paraguay have also made efforts in this regard in recent years. The question is to what extent this increased spending translates into significant improvements in terms of coverage. Figure III.10 presents education spending as

a percentage of GDP for the countries of Latin America and, as a point of comparison, the education spending levels of the OECD countries.

Figure III.10
SPENDING ON SECONDARY EDUCATION
(Percentages of GDP)

Source: UNESCO Institute for Statistics, Data Centre, 2008.

The levels of average spending on secondary education in Latin America and in the OECD countries are very different: 1.6% and 2.4% of GDP, respectively.[30] Several Latin American countries, however, are spending similar proportions of GDP on secondary education as OECD countries (Argentina, Chile, Colombia, Mexico and Nicaragua), which is highly noteworthy because, as figure III.9 shows, all the OECD countries have far higher secondary-education coverage rates. With the exception of Cuba, no country in Latin America has attained the levels of coverage found in OECD. This suggests that, with the same effort in terms of the size of their economies, the OECD countries achieve better results as far as expanding coverage is concerned than some Latin American countries.

The question is: why? What factors lie behind the differences in coverage achieved through similar levels of spending (when measured as a proportion of GDP)? Part of the difference must stem from demography given that dependency ratios are lower in the OECD countries. There must be other and possibly more influential factors, however, related to the institutional and organizational structure of the education system (number of students and teachers per class), as well as to dropout and grade repetition rates, teacher training processes, and individual and social characteristics, that can make access to education expensive and affect a country's results in education.

An attempt to gauge the efforts that the countries of Latin America will need to make to attain several different coverage targets for secondary education is presented in the next section. The various factors and demographic effects involved are taken into account using a methodology that breaks down spending into its various components.

Box III. 1
BREAKDOWN OF SPENDING ON SECONDARY EDUCATION

The effort made to finance secondary education can be measured by observing the size of spending on secondary education in relation to the size of the economy. The equation below presents the measure of spending on secondary education as a percentage of GDP as the product obtained by multiplying four factors.

$$G/Y = P_{12}^{17}/P_{20}^{64} * N * B/N * (G/E)/(Y/P_{20}^{64})$$

G = Spending on secondary education

Y = GDP

P_{12}^{17} = Official school-age population

P_{20}^{64} = Working-age population

N = Net enrolment rate

B = Gross enrolment rate

E = Number of students

The first factor, the secondary-education dependency ratio, measures the impact of the age structure of the population on spending. This is defined as the proportion of people officially of secondary-school age (generally those aged between 12 and 17 years) divided by the working-age population (those aged between 20 and 64 years). The decline of this demographic dependency ratio over time considerably loosens the constraints on education funding.

The second and third factors are associated with enrolment rates: the proportion of students attending school in relation to the population "at risk" (those officially of secondary-school age). For both theoretical and empirical reasons discussed below, gross enrolment is

considered to be the product of two factors: the net enrolment rate and the ratio between gross enrolment and net enrolment. The gross enrolment rate is the number of students enrolled in secondary school divided by the population "at risk". The net enrolment rate is the number of students enrolled in secondary school that are within the standard age range for enrolment, divided by the population "at risk". The net enrolment rate is usually used to measure progress in education coverage, with 100% representing universal access to secondary education. The coefficient between gross and net enrolment reflects the extent to which students outside the standard age range are enrolled in secondary education. This coefficient is higher than one and reflects the effects

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[30] A substantial portion of education spending goes towards paying wages. In 2005, for example, wages represented 76% of education costs of public institutions worldwide both for primary and secondary education (UNESCO DATA Center [online] www.uis.unesco.org). In more economically developed countries, other factors obviously also determine the general state of the education system.

Countries of Latin America were paired up with OECD countries that spend the same proportion of GDP on secondary education (Colombia with the United States, Argentina with Spain, and Nicaragua with Japan). Nicaragua spends a slightly higher percentage of GDP on secondary education than Japan, which means it invests proportionally more of the economic resources its society generates than does of Japan.[31]

An analysis of the first pair of countries (see table III.5) shows that the demographic dependency ratio of Colombia is significantly higher than that of the United States, but gross enrolment and spending per student are much higher in the United States. These two countries therefore make the same effort in terms of spending as a proportion of GDP but achieve very different results as far as coverage is concerned. In other words, the United States uses its low dependency ratio to step up both spending per student and coverage.

The same occurs in the case of Argentina and Spain (see table III.6). The dependency ratio of Argentina is twice that of Spain, and although Argentina is making the same effort in terms of investing in education, Spain is taking advantage of its lower dependency ratio to spend 50% more per student and achieve 40% more coverage than Argentina.

In the final pair of countries examined (see table III.7), it is interesting to note that Nicaragua is making a slightly larger effort than Japan in terms of education spending as a percentage of GDP, but Japan is investing the demographic dividend in spending-per-student levels that are 72% higher than in Nicaragua with 50% more coverage.

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31 Logically, in absolute terms, both spending and price levels are much higher in Japan than in Nicaragua, hence the use of a relative measure.

Table III.5
COLOMBIA AND THE UNITED STATES: BREAKDOWN OF SPENDING

	Colombia	United States	United States/ Colombia
Spending/GDP (percentages)	2.1	2.1	1.02
Dependency ratio (percentages)	0.22	0.15	0.68
Gross enrolment (percentages)	82	94	1.14
Spending per student (percentages of GDP)	12	15	1.32

Table III.6
ARGENTINA AND SPAIN BREAKDOWN OF SPENDING

	Argentina	Spain	Spain/ Argentina
Spending/GDP (percentages)	1.7	1.8	1.01
Dependency ratio (percentages)	0.20	0.09	0.48
Gross enrolment (percentages)	86	118	1.38
Spending per student (percentages of GDP)	10	16	1.52

Table III.7
NICARAGUA AND JAPAN: BREAKDOWN OF SPENDING

	Nicaragua	Japan	Japan/ Nicaragua
Spending/GDP (percentages)	1.7	1.6	0.95
Dependency ratio (percentages)	0.26	0.10	0.36
Gross enrolment (percentages)	66	102	1.53
Spending per student (percentages of GDP)	10	17	1.72

These differences in secondary-education coverage show that demographics constitute an important restriction in the countries of Latin America for making progress in this regard. It is also apparent that some countries can overcome this constraint by making spending-related efforts. Figures III.9 and III.10 show that Guatemala and Paraguay have similar demographic situations (dependency ratios of 28%), but that Paraguay has been making a larger effort to invest in education (by spending 1.5% of GDP on education compared with 1.2% in Guatemala) and has achieved more coverage (66% compared with 53% in Guatemala). Another example is provided by the comparison of Chile and Costa Rica, which also have similar demographic situations. In this case, Chile is the country that is achieving greater coverage by spending a larger proportion of GDP on education.

Figure III.11 shows the difference between the demographic situation and other education-spending-related factors in all the countries of Latin America and the OECD countries for which this information is available. Using a logarithmic scale, spending per potential student (the product of gross enrolment and spending per student) is cross-measured with the dependency ratio. The sloping lines on the figure represent the levels of spending on secondary education as a percentage of GDP (iso-spending lines).

There are clear differences between the situation in Latin America and the situation in OECD countries. The countries of Latin America are generally characterized by low levels of spending per potential student and high dependency ratios, while the OECD countries have high spending-per-potential-student levels and low dependency ratios. With the exception of Cuba, all the countries of Latin America currently spend between 1% and 2% of GDP on secondary education, while OECD countries spend between 2% and 3% of their GDP on secondary education.

The demographic situation is clearly an important factor in the differences observed between developed countries and Latin America as regard secondary-education coverage as this study has shown. The OECD countries seem to have taken advantage of their lower demographic dependency ratios to intensify spending on secondary education. Figure III.11 supports this notion. Moving from right to left represents the decline in the dependency ratios that Latin America could experience as the demographic transition process lowers those ratios to current OECD levels. The figure clearly shows, however, that even when that point has been reached, Latin America will not attain the same levels of secondary-education coverage as the OECD countries unless it steps up spending to between 3% and 4% of GDP. In other words, the demographic situation can be a constraint, but it is also an opportunity, and under no circumstances is it an excuse for not making the significant investments needed in education.

Figure III.11
SECONDARY-EDUCATION DEPENDENCY RATIO, SPENDING PER POTENTIAL STUDENT, AND ISO-SPENDING LINES [a]
(Percentages of GDP)
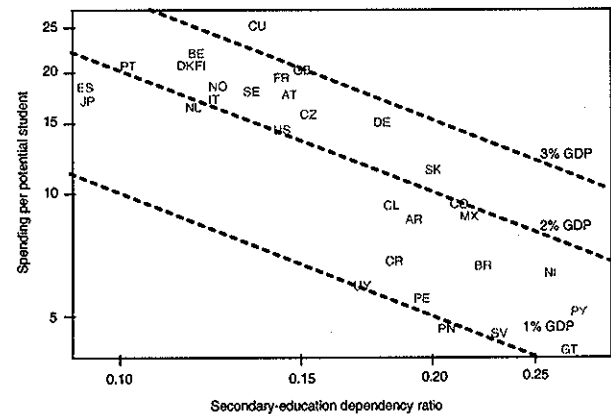
Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008

[a] Spending per potential student refers to spending per person of secondary-school age. The secondary-education dependency ratio is the coefficient between the secondary-school age population and the potentially productive population (people aged between 20 and 64 years).

4. More ambitious education targets

Given the current economic, social and demographic conditions in Latin America, the countries of the region should focus their efforts on achieving significant advances in secondary education since the demographic dividend offers an opportunity for governments to adopt increasingly ambitious targets for that level of education. The analysis presented below examines the possibility of attaining alternative goals in secondary education under different scenarios. It should be noted that these exercises are merely intended to provide some indication of the size of the effort required and should not be taken as recipes for action.

The first possible goal considered is the coverage target of 75% for secondary education by 2010 adopted by the countries of Latin America and the Caribbean at the second Summit of the Americas (UNESCO, 2007). The second possible goal is universal coverage for secondary education, which in many studies is considered essential

for attaining development goals.[32] The third possible goal pursues, to some extent, progress in both the coverage and quality of the education system and consists of achieving current OECD standards for secondary education, in other words, 93% coverage and spending per secondary-school student equivalent to 17% of GDP.

The feasibility of attaining certain goals for secondary education depends on the cost of reaching those goals. Data on three factors are needed to calculate these costs: the gross enrolment rate, the costs of education per student and the secondary-education dependency ratio. Given that the scenarios are framed in terms of net rates, an additional component that relates gross rates to net rates is required. The difference between gross and net rates of coverage provides a measurement of out-of-age enrolment that has occurred either because of grade repetition or for other reasons. A larger difference means that more students in the country are enrolled in courses that do not correspond to their age group.

Figure III.12 shows that in general there is a certain relationship between gross and net enrolment which suggests that, as coverage increases, the education system improves and out-of-age enrolment diminishes. The situation varies considerably, however, and even in the most developed countries there are high levels of out-of-age enrolment, which is one of the factors that raise education costs. For the purpose of projecting education costs in the analyses presented in this section, the average out-of-age enrolment rate of the OECD countries (16%) is used.
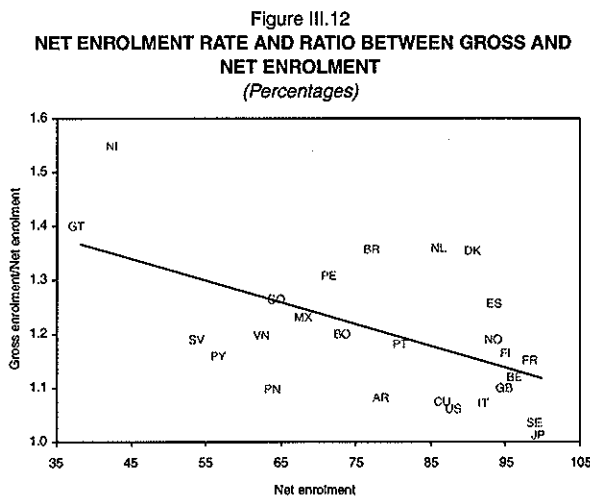
Figure III.12
NET ENROLMENT RATE AND RATIO BETWEEN GROSS AND
NET ENROLMENT
(Percentages)

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

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[32] The Universal Basic and Secondary Education Project of the American Academy of Arts and Sciences suggests the target of universal coverage for secondary education. The target proposed by ECLAC for the population aged between 20 and 24 to have an average of 12 years of education is equivalent to universal secondary education.

(a) The target set by the Summit of the Americas

The analysis here consists of attempting to determine the spending required to attain the goal set by the Summit of the Americas (75% coverage) starting from the situation in each country in around 2005. Figure III.13 shows that Costa Rica, Mexico, Panama and Peru are close to reaching this target at a minimum additional cost (in relative GDP terms). Colombia, Guatemala and Nicaragua will have to make a greater effort. It is interesting to note that Colombia, despite being at a more advanced stage of the demographic transition process, will have to make as much of an effort as Nicaragua. The five countries that have already reached the target, Argentina, Brazil, Chile, Cuba and Uruguay, are not included in the figure. In order to reach the Summit of the Americas target as of 2005, the region should have spent between an additional US$ 1.5 and 3.1 billion in current dollars, which is equivalent to an additional 0.1% of the region's total GDP. This is therefore a perfectly feasible goal.

Figure III.13
ADDITIONAL EFFORT REQUIRED TO ACHIEVE THE NET
ENROLMENT TARGET OF 75% SET BY THE SUMMIT OF
THE AMERICA, AROUND 2005[a]
(Percentages of GDP)

■ Out-of-age enrolment rate remains unchanged
▨ Out-of-age enrolment rate falls
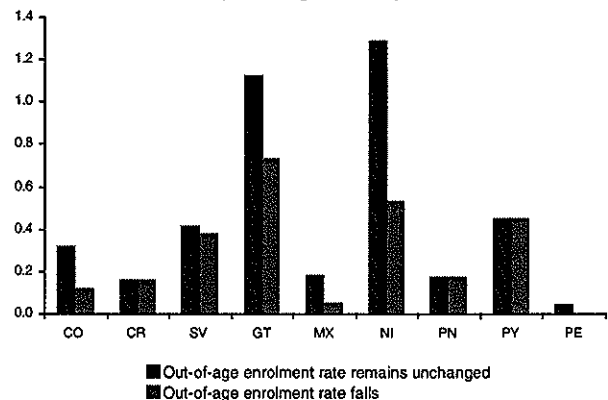
Source: Calculations by the Economic Commission for Latin America and the Caribbean (ECLAC).
[a] Argentina, Brazil, Chile, Cuba and Uruguay have already reached the target.

Two types of cost calculations are given to take into account the impact of out-of-age enrolment, which is one of the factors that significantly raises education costs but tends to diminish as coverage increases. The higher cost calculation assumes no changes in the percentage of out-of-age enrolment, and the lower cost calculation assumes that this percentage will fall to the 16% average of the OECD countries. In Nicaragua, for example, the difference between the two is large due to the high percentage of students enrolled in courses outside their age group (about 55%). In Brazil, out-of-age enrolment is 35% and will have to be halved if the country is to attain the Summit of Americas
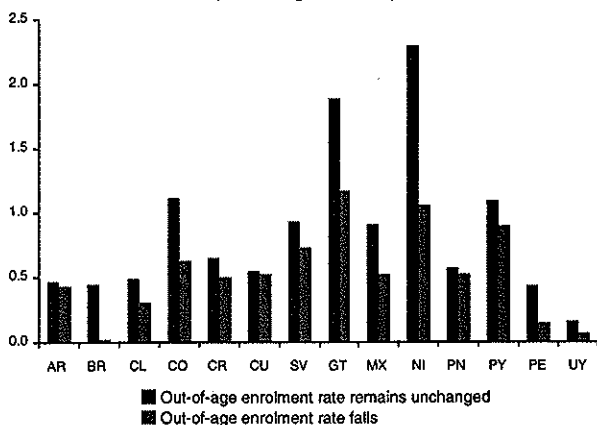
target for secondary education coverage. This will obviously require modifications to the education system. These cannot, however, be introduced overnight. They will need time to work as they will mean implementing policies to reduce out-of-age enrolment from primary school onward.

(b) Universal coverage

Figure III.14 shows that attaining universal coverage for secondary education implies greater costs but can feasibly be achieved by most of the countries by increasing spending on education by up to one half a percentage point of GDP. Although Colombia, Guatemala and Nicaragua will need to make a large effort to reach this target, the costs of doing so will diminish substantially to approximately one percentage point of GDP if out-of-age enrolment is reduced. Achieving universal coverage today would mean increasing spending by between US$ 8.8 billion and US$ 17.3 billion in current dollars on improving secondary education in the region, in other words an addition half a percentage point of GDP.[33]

Figure III.14
ADDITIONAL INVESTMENT REQUIRED TO ACHIEVE THE TARGET
OF UNIVERSAL SECONDARY EDUCATION, AROUND 2005
(Percentages of GDP)

■ Out-of-age enrolment rate remains unchanged
▨ Out-of-age enrolment rate falls

Source: Economic Commission for Latin America and the Caribbean (ECLAC).

(c) The OECD standard

This section aims to justify the pursuit of a more ambitious target for the region and to present the feasibility of doing so. Net coverage and cost per student are shown

in figure III.15, which is divided into four quadrants according to the average of both factors. The countries fall into one of two categories: the developed countries have a high coverage rate and high costs per student and are all in quadrant I; while the countries of Latin America are in quadrant III. Net enrolment rates vary considerably within the region but spending levels are similar.

Figure III.15
SPENDING PER STUDENT AND NET ENROLMENT [a]
(Percentages of GDP and percentages)
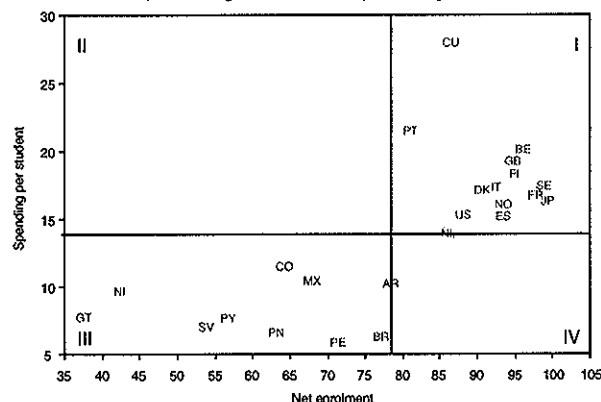
Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.
[a] Spending per student refers to spending per enrolled student in relation to average GDP per working-age adult.

Attaining the target of 75% net coverage for secondary education set at the Summit of the Americas or universal (100%) coverage would mean the countries making a horizontal shift into quadrant IV, in which no Latin American country currently stands, probably because this is not very feasible. To move towards the level of the developed countries, Latin America needs to invest not only in greater coverage but also in increasing spending per student, in other words, to move into quadrant I. A more realistic scenario for the changes needed in the region involves boosting both coverage and spending per student. The third target examined in this section is therefore to reach the average levels of coverage and spending recorded for OECD countries, in other words, 93% coverage and spending per student equivalent to 17% of GDP per working-age adult.

This target contemplates less-than-universal coverage but also requires an effort to bring spending per student up to the average OECD level. Figure III.16 shows that all countries, except Cuba, need to significantly increase spending on education as a percentage of GDP.[34]

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[33] This estimate is very similar to that of Binder (2006), who calculated the additional cost of achieving the target of universal secondary education for Latin America in around 2000 to be between US$ 4.1 billion and US$ 10.7 billion (in constant 2002 dollars), depending on grade repetition rates. Converting these figures to current dollars and adjusting the goal from 90% coverage to 100%, the estimated costs would be between US$ 6.2 billion and US$ 16.3 billion, which is fairly close to the projections presented here (between US$ 8.8 billion and US$ 17.3 billion).

[34] Cuba reports an exceptionally high level of spending per student in terms of per capita GDP, possibly on account of how teachers' wages and/or GDP are valued in that country.

Guatemala, Nicaragua and Paraguay need to make the largest efforts in this regard: Guatemala and Nicaragua need to raise spending by over four percentage points of GDP, and Paraguay by more than 3.5 percentage points of GDP.

Table III.16
ADDITIONAL INVESTMENT NEEDED TO ATTAIN THE AVERAGE OECD LEVEL OF COVERAGE AND SPENDING PER STUDENT, AROUND 2005
(Percentages of GDP)
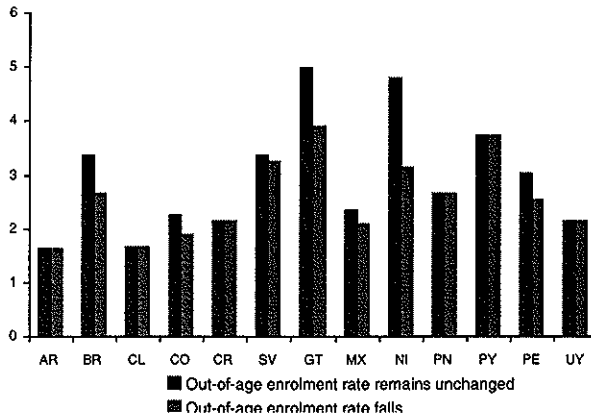
■ Out-of-age enrolment rate remains unchanged
▨ Out-of-age enrolment rate falls

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC

This would mean that the region's total spending level would have to be far more than doubled, with added expenditure of from US$ 56 billion to US$ 66 billion at current prices (4% of GDP).[11] It may seem surprising that Latin America would have to spend 4% of its GDP on secondary education to achieve OECD levels of coverage and of spending per student given that OECD countries currently spend about 2.6% of their GDP on education. The explanation lies in the favourable demographic structure existing in the OECD countries. As the demographic transition under way in Latin America moves ahead, the proportional burden of education spending will decrease, and this decrease is the effect of the demographic dividend.

(d) The impact of the demographic dividend

As shown above, upgrading the education systems in the region to meet the targets set for secondary education will represent major costs for the countries of Latin America, but these costs could fall as the dependency ratio declines in the years ahead. Countries can not, however, just wait until the dependency ratio falls and costs of achieving these education goals decreases as a result of inertia. For several reasons, efforts need to be made today, through loans or taxation, to ensure that the expected future dividend materializes. First, waiting

for effects of the demographic dividend will only make it possible to reach these goals in the long run. Second, if several generations are allowed to continue suffering from shortfalls in the secondary-education system, the necessary increases in productivity and savings, and hence the leap forward in development, will be much harder to attain. Third, the period in which the younger generations can produce the savings needed to address the growing demands of the older adult population is growing shorter by the day.

The percentage drop in the dependency ratio for secondary education represents the size of the sector's demographic dividend. This drop ranges from 25% to 55% in Latin America. Given that the dependency ratio is a factor in education spending as a percentage of GDP, this means that education spending will experience a reduction of the same proportions.

The case of Paraguay is analysed below to assess the contribution of the demographic dividend to the achievement of different education targets. Figure III.17 shows two costs projections for the secondary education system.[35] The dotted line represents the projected level of spending per student needed to uphold the current education system as the age structure of the population varies over time. This shows that costs are projected to fall by almost 50% over the period under consideration. The second projection (the unbroken line) supposes a system of universal coverage in which Paraguay would spend 2.4% of GDP (instead of the 1.5% it spends at present) and would maintain that level of spending regardless of the changes in the demographic situation. In this case, the costs also fall 50% over the period in question. The difference between the two projections (the area between the two curves in the figure) shows the additional spending that Paraguay will have to carry out in order to achieve and maintain universal coverage. The challenge for the country is to find a means to cover this increase in spending.

Figure III.18 presents the same information but with a third line that shows spending as a percentage of GDP if it remains at the same level as today even though the demographic situation changes. This implies a first-level effort that involves reinvesting the whole secondary education dividend in the system. This reinvestment of the dividend would cover a large portion of the additional costs required and, from 2032 onward (where the lines cross), there would be sufficient funds to cover the additional costs of providing universal coverage.
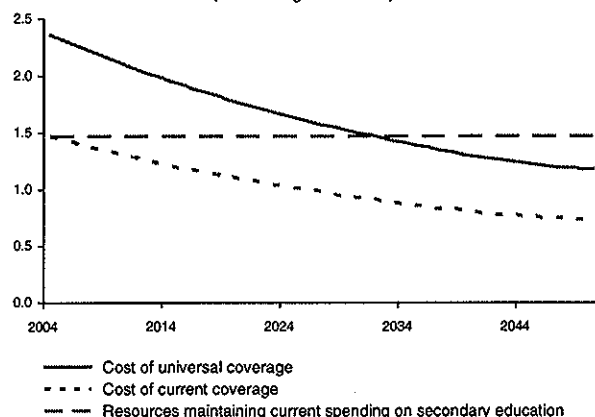
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[35] These projections suppose that GDP will grow at the same pace as the working-age population (using the Cobb-Douglas function). They do not take into account the impact of improvements in education on economic growth.

Figure III.17
PARAGUAY: UNIVERSAL COVERAGE, 2004-2050
(Percentages of GDP)
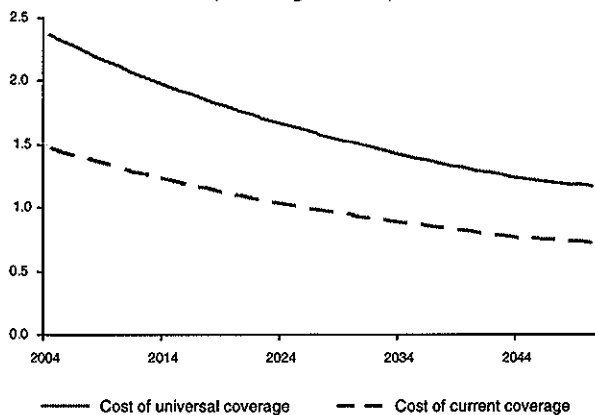
——— Cost of universal coverage   — — Cost of current coverage

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

Figure III.18
PARAGUAY: UNIVERSAL COVERAGE, 2004-2050
(Percentages of GDP)

——— Cost of universal coverage
- - - - Cost of current coverage
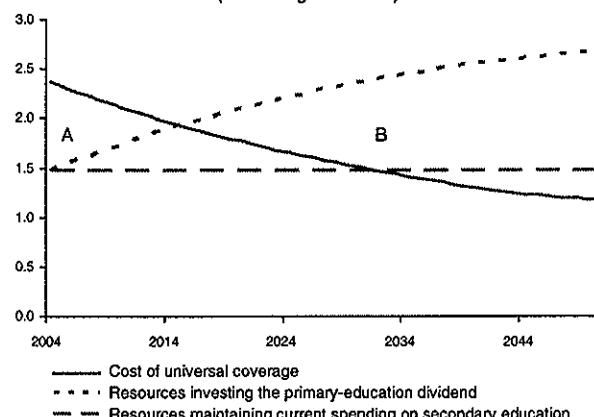—— —— Resources maintaining current spending on secondary education

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

As most countries have already attained coverage close to 100% in the case of primary education, they could also invest the primary-education dividend (derived from the decrease in the dependency ratio in the primary cycle) in improving the secondary education system.[36] This possibility is shown in figure III.19 which presents another projection of spending needs based on the use of both the primary- and the secondary-education dividends to improve the secondary education system.

In this case, Paraguay would have sufficient funds to achieve the universal coverage target as of 2015, the point at which the demand curve (universal coverage) intersects with the resources curve (the investment of the two dividends). To reach this point, Paraguay would have to reinvest all the balance of the secondary-education dividend obtained so far and all of the primary-education dividend. From 2015 onward, the total education dividend would not only be sufficient to finance completely the maintenance of universal coverage, it would also generate savings (area B) that could be used to improve the quality of education or invest in other sectors, such as the financing of the pension system.

Figure III.19
PARAGUAY: UNIVERSAL COVERAGE, 2004-2050
(Percentages of GDP)

——— Cost of universal coverage
· · · · Resources investing the primary-education dividend
—— —— Resources maintaining current spending on secondary education
Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008
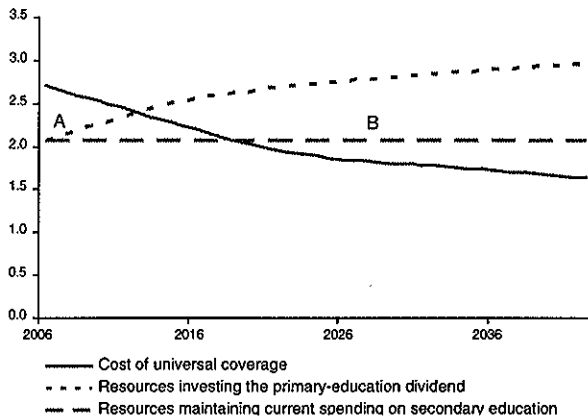
To strengthen the argument, the exercise was repeated using the data for Colombia, which is at a more advanced stage of demographic transition than Paraguay, has a higher level of coverage for secondary education and is therefore closer to attaining universal coverage. In the case of Colombia, investing the secondary-education dividend alone would mean reaching the universal coverage target in 2019. Investing the primary-as well as the secondary-education dividend would mean attaining the target in 2013 (see figure III.20).

The cases of Colombia and Paraguay are further compared with regard to the more ambitious target of attaining OECD levels of coverage and spending per student. Figure III.21 shows that if Paraguay maintains its spending on secondary education at current levels, there is no possibility of the country reaching the OECD target during the period under consideration. If it uses the entire secondary-education dividend and the entire primary-education dividend, however, Paraguay would attain the target in 2047 and would have accumulated 70% of the necessary additional resources in 2030. In other words, although the demographic dividend is not enough to cover all the additional costs in the short term, it can make a considerable contribution towards doing so. In the case of Colombia, if all the primary- and the secondary-education dividend are reinvested in secondary education, the target will be reached in 2026 (see figure III.22).

[36] The dependency ratio for primary education is the ratio between the population at the age to attend the primary cycle and the potentially productive population (aged between 20 and 64).
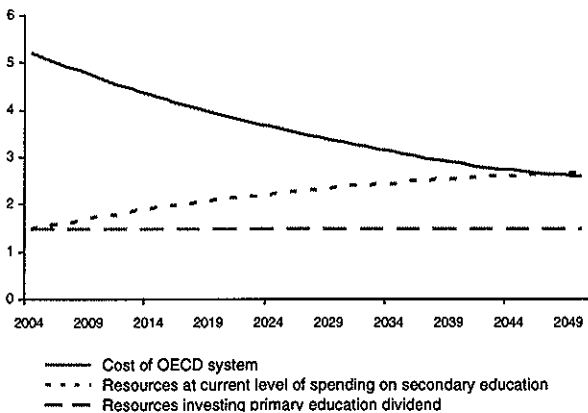
It can be concluded, therefore, that the demographic dividend can help countries in Latin America significantly to reach more ambitious goals in secondary education. One way to appreciate the magnitude of the costs involved and the resources the education dividend will generate in the decades ahead is to calculate their discounted present value today (the sum of future values discounted by the projected interest rate). Figure III.23 shows that for Latin America as a whole, the present value of the education dividend represents 0.8% of the present value of regional GDP and ranges between 0.3% and 1.7% across the region. Moreover, in all the countries of the region, the dividend is sufficient to cover the cost of achieving universal secondary education and would make a significant contribution towards attaining the average OECD level of coverage and spending-per-student.

Figure III.20
COLOMBIA: UNIVERSAL COVERAGE, 2006-2042
(Percentages of GDP)

——— Cost of universal coverage
- - - - Resources investing the primary-education dividend
—— —— Resources maintaining current spending on secondary education

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

Figure III.21
PARAGUAY: RESOURCES REQUIRED TO ATTAIN THE AVERAGE OECD LEVEL OF COVERAGE AND SPENDING PER STUDENT, 2004-2050
(Percentages of GDP)

——— Cost of OECD system
- - - - Resources at current level of spending on secondary education
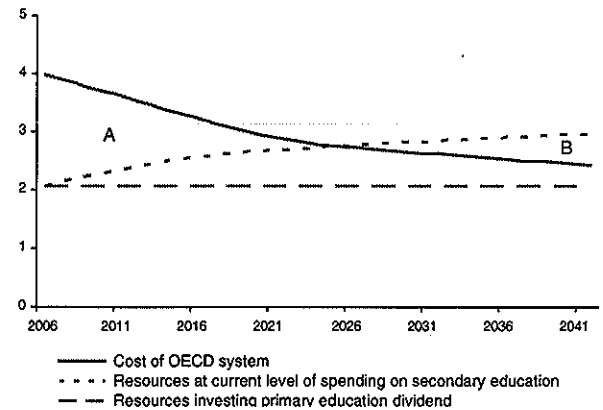—— —— Resources investing primary education dividend

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

Figure III.22
COLOMBIA: RESOURCES REQUIRED TO ATTAIN OECD LEVEL OF COVERAGE AND SPENDING PER STUDENT, 2006-2042
(Percentages of GDP)

——— Cost of OECD system
- - - - Resources at current level of spending on secondary education
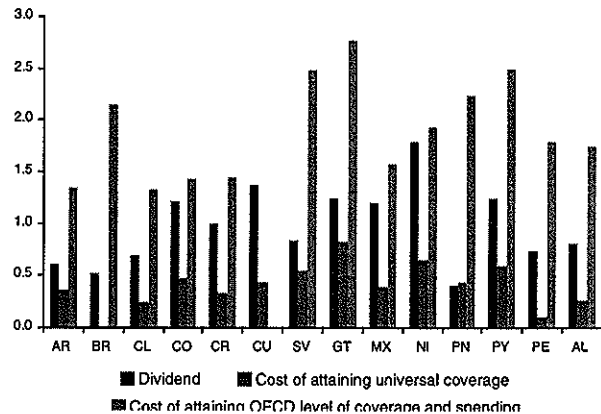—— —— Resources investing primary education dividend

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

Figure III.23
DISCOUNTED PRESENT VALUE OF THE PRIMARY- AND SECONDARY-EDUCATION DIVIDEND AND THE COST OF ATTAINING SELECTED TARGETS
(Percentages of GDP)

■ Dividend   ▨ Cost of attaining universal coverage
▨ Cost of attaining OECD level of coverage and spending

Source: Latin American and Caribbean Demographic Centre (CELADE) – Population Division of ECLAC, population estimates and projections, 2007, and UNESCO Institute for Statistics, Data Centre, 2008.

However, the resources freed up by the demographic dividend are not available to the countries at present, but as they are generated over the course of the whole demographic dividend period. As is apparent in figures III.19 and III.20, although there are sufficient resources in the period as a whole to guarantee universal coverage (by 2013 in Colombia and 2015 in Paraguay), there is a shortage of recourses at first (area A in the figures) that is then followed by a surplus (area B).

This raises the possibility of redistributing resources over time by borrowing to finance today's investments and then using the proceeds of the demographic dividend to repay that loan later on.

Although the demographic dividend will generate savings in the future, the countries should not wait for it to take effect and miss the opportunity for one or more generations to improve their level of education and consequently their possibilities of obtaining productive jobs as a means of remaining above the poverty line. Moreover, generations of people living close to or below the poverty line could hamper the demographic transition process and the dividend it generates.

Having a poorly educated population undermines countries' possibilities of competing in today's globalized economy and makes them less prepared to respond to the pension and other demands of an ageing population, which will undoubtedly hinder their development.

It has already been shown that some secondary-education targets can be reached with relatively little effort, that the savings generated by the dividend represent an opportunity for setting more ambitious goals and that the best course of action as far as furthering development is concerned is to try to attain these goals as soon as possible.

Conclusions

Under present demographic conditions, most of the region's countries are very close to reaching the 75% target set for secondary education coverage by the Summit of the Americas. The additional cost of reaching this target for the region as a whole is estimated at between US$ 1.5 billion and US$ 3 billion at current prices. Although attaining universal secondary education would require a greater effort, this goal is still feasible for the region at an additional cost of between US$ 8.8 billion and US$ 17.3 billion. Achieving the third target suggested in this chapter, which would mean bringing coverage and spending per student up to OECD levels, will be far more difficult for the countries of Latin America as they still face demographic constraints. The additional costs in this case would be between US$ 56 billion and US$ 66 billion in current dollars, which means that spending on secondary education would have to be raised to 4% of regional GDP, far above the average spending level (2.6% of GDP) of the developed countries, because high demographic dependency ratios still exist in the region.

The demographic context in Latin America is changing, however, and although the situation varies from country to country, in general they are going through a favourable demographic dividend period brought about by the huge changes under way in the age structure of their populations, which, as a result of the demographic transition process, is largely characterized by a significant reduction in the weight of the child population and an increase in the proportion of people in the potentially active age bracket. For the region as a whole, the demographic dividend, as defined in this study, will last until the beginning of the 2040s.[37] From then on, the proportion of older people will increase rapidly and the ageing of the population will intensify (ECLAC, 2008g).

As a result of these changes, the secondary-school-age population at first increases and then trends downwards. In relative terms, in Latin America, the weight of this age group has already dropped from 14% in 1974 to 11.3% today, and is projected to continue falling gradually to 7.5% in 2050. This decline represents a significant reduction in the dependency ratio between the secondary school-age population and the working-age population.

The reduction in the dependency ratios of the primary- and secondary school-age population over the course of the demographic dividend period will produce a sizeable dividend. Calculated as a discounted present value, this dividend currently represents as much as 1.7% of the countries' GDP and averages 0.8% of regional GDP. This dividend, which is sufficient to cover the cost of attaining the target of universal secondary education, could significantly contribute towards all the countries of Latin America achieving more ambitious goals, such as OECD levels of coverage and spending in secondary education.

In other words, to make greater progress in secondary education, the countries of the region should reinvest the whole secondary-education dividend as well as the primary-education dividend in the secondary education system. Given that these dividends are realized not in the present but in the course of the demographic transition and up to the end of the demographic dividend period, each country will need to find a way to finance now the resources they may be able to save in the future.

Countries need to start financing the upgrading of the education system today. If they wait for the education dividend to come into effect, improvements will only be obtained in the distant future, and countries will miss the opportunity for one or more generations to improve their level of education and, consequently, their possibilities of obtaining productive jobs and generating the savings needed to address the demands that will be generated by the forthcoming ageing of the population. In short, failing to improve the education of the next generations now will undermine the country's possibilities of harvesting the benefits derived from the demographic transition process.

[37] The definition of the demographic dividend period is given in the first part of this chapter.