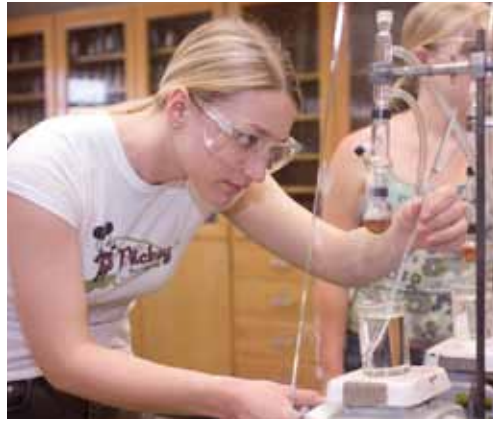# 7

Exploring an Accelerated Educational Future

Almost everywhere in the world, the advance in education continues. Depending on the region and country, the portions of population attending school, the numbers of students in school, and the average years of education—or, in some cases, all three of these measures—continue to grow rapidly. The normative scenario generally increases that rate of advance, relative to the base forecast of the path that countries already seem to be on, through the use of growth targets that our analysis suggests are simultaneously aggressive and reasonable. The purpose of this chapter and the next is to explore the possible consequences of pursuing those targets.

This chapter first addresses the enrollment implications of the normative scenario. How much faster might enrollment rates and student numbers grow in regions and countries with the assumptions of the scenario? What are the implications of such accelerated growth for the movement of the world to universal basic education and to higher participation in upper secondary and tertiary education?

The education transition obviously faces budgetary constraints, and the base case takes those into account. In the normative scenario, we removed the constraints in order to estimate the additional funds that would be needed relative to the base case. In some countries, those funds would be minimal because the base case already meets normative targets or the education systems below the tertiary level have already reached universal enrollment and benchmark spending levels. And in the case of countries that are spending above benchmark levels for per student costs in the base case, the normative scenario would result in lower total spending. However, for many countries, the normative scenario would require additional spending. The second set of questions in this chapter therefore addresses the budgetary implications of the normative scenario. How much increase in spending would be necessary to pursue the target growth patterns of the normative scenario? Might domestic

budgets fund such an increase? For the lowest-income countries, what is the magnitude of external assistance that might be desirable or even required?

Accelerating Education's Advance (If Budget Were No Constraint)

Chapter 6 provided both the foundations for the development of a normative scenario and the details of that scenario in terms of growth and parity in intake and transition rates and of survival rates. How different would the patterns of education's advance be for regions of the world (and specific countries) under the normative scenario, assuming for the moment that cost were no object?

Enrollment rates

Figure 7.1 shows the percentage point increases in enrollment rates that the normative scenario generates for each UNESCO region relative to the base case. There are some important global similarities across most or all of the regions and in the world totals.

Among the most clear-cut similarities is that over most of our time horizon, the greatest uncertainty concerning enrollment growth, and therefore also the greatest potential subject of debate in future global policy making, will likely be at the upper secondary level. Rates of enrollment at the lower secondary level vary less between the base case and the normative scenario, and rates of enrollment in primary education vary still less, reflecting the greater extent of progress already made in the education transition at these lower levels.

This rank ordering of education levels with respect to uncertainty is inversely related to the likely rank order of attention. The attention to completion of the transition to universal primary education reflects both its foundational character and the relative nearness of the goal. At the peak of difference between the normative scenario and the base case, efforts to speed progress might globally add just under 4 percentage points to primary net enrollment rates, although they could add nearly 15 percentage points to those in sub-Saharan Africa. Low levels of potential primary acceleration in most regions obviously reflect universality or nearing universality around the world.

Moving up the ladder of education levels, global rates at the lower secondary level might be as much as 6 percentage points higher in the normative scenario, and those at the upper secondary level could be 12 percentage points higher (about 14 percentage points higher in South and West Asia and 28 percentage points higher in sub-Saharan Africa). Gross lower secondary enrollment rates actually decline in Latin America and the Caribbean relative to the base case because the normative scenario decreases the overage portion of students (effectively increasing net enrollments).

Thinking forward to 2060, however, the potential policy leverage at the tertiary level may well be as great globally as that at the upper secondary level, and in the economically developed regions of the world, it is certainly greater than at other levels. Figure 7.1 does not show the considerable potential advance in tertiary education relative to the base case because of our decision not to set normative targets for growth at that level and only to pursue a modest narrowing of gender gaps relative to the base case. Tertiary enrollment increases in Figure 7.1 therefore reflect almost entirely the effect of higher GDP per capita in the normative scenario (related to an accelerated advance of education at lower levels) on tertiary intake rates. Volume 4 in the PPHP series will return to the broader potential for advance at the tertiary level.

In spite of global patterns of importance, regional variations across the normative scenario are clearly very great. The two regions that respond most overall to the normative scenario at all pretertiary levels are sub-Saharan Africa and South and West Asia. The Arab States and other regions also benefit considerably at the upper secondary level. The regions that respond the least are the higher-income ones.
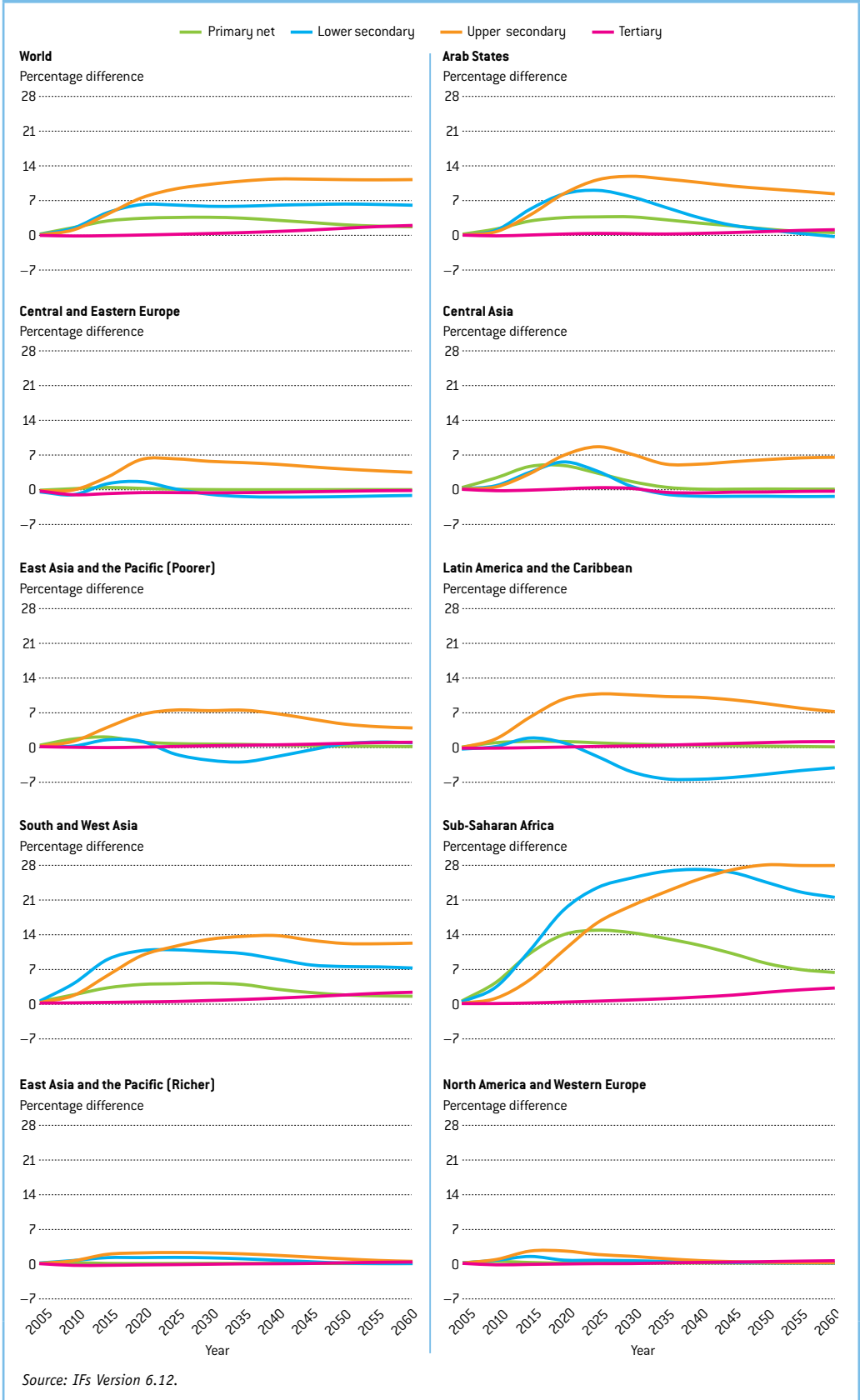
Enrollment numbers

Although enrollment rates have been the centerpiece of global goal-setting, school systems deal with students. For those school systems and the national governments that seek to expand them, the number of students is critical. We have seen repeatedly throughout this volume how important the demographic elements are in understanding the dynamics of education transitions.
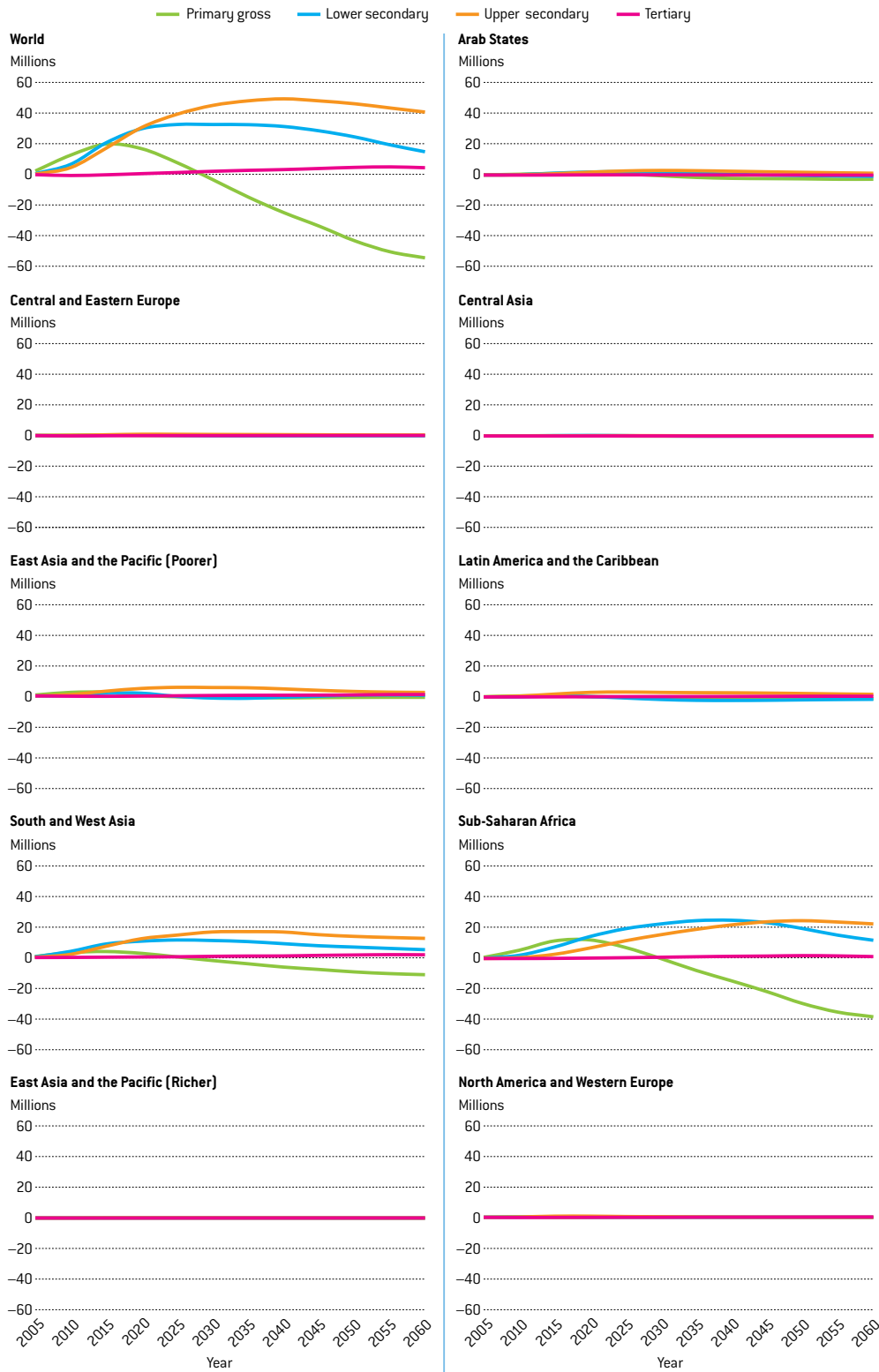
For the time horizon to 2060, the greatest uncertainty about enrollment growth will likely be at the upper secondary level.

Regional variations in the implications of the normative scenario are very great.

Figure 7.1 Enrollment rate differences: Normative scenario relative to base case

Legend: Primary net — Lower secondary — Upper secondary — Tertiary

World — Percentage difference

Arab States — Percentage difference

Central and Eastern Europe — Percentage difference

Central Asia — Percentage difference

East Asia and the Pacific (Poorer) — Percentage difference

Latin America and the Caribbean — Percentage difference

South and West Asia — Percentage difference

Sub-Saharan Africa — Percentage difference

East Asia and the Pacific (Richer) — Percentage difference

North America and Western Europe — Percentage difference

Source: IFs Version 6.12.

Figure 7.2 Student headcount differences (millions): Normative scenario relative to base case

Legend: Primary gross — Lower secondary — Upper secondary — Tertiary

World (Millions)

Arab States (Millions)

Central and Eastern Europe (Millions)

Central Asia (Millions)

East Asia and the Pacific (Poorer) (Millions)

Latin America and the Caribbean (Millions)

South and West Asia (Millions)

Sub-Saharan Africa (Millions)

East Asia and the Pacific (Richer) (Millions)

North America and Western Europe (Millions)

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Figure 7.2 turns from enrollment rates to student headcounts and shows the differences between the numbers in the normative scenario and base case forecasts. On a global basis, the normative scenario adds as many as 21 million more students in primary school, 33 million more at the lower secondary level, and 50 million at the upper secondary level. (The normative scenario does not explicitly accelerate enrollments at the tertiary level.)

The peak increments relative to the base case are staggered over time, as the incremental students of the normative scenario build at one level, approach universal enrollment, and push growth to higher levels of education. The years of greatest difference between the scenarios are 2016 (very near the MDG target date), 2029, and 2037 for primary, lower secondary, and upper secondary levels, respectively.

When we look at headcounts, however, the story is not a global one with regional variations but very much a regional one. Sub-Saharan Africa is the home of by far the largest number of additional student numbers in the normative scenario. Most of the rest are in South and West Asia, reinforcing this volume's heavy attention to these two regions.
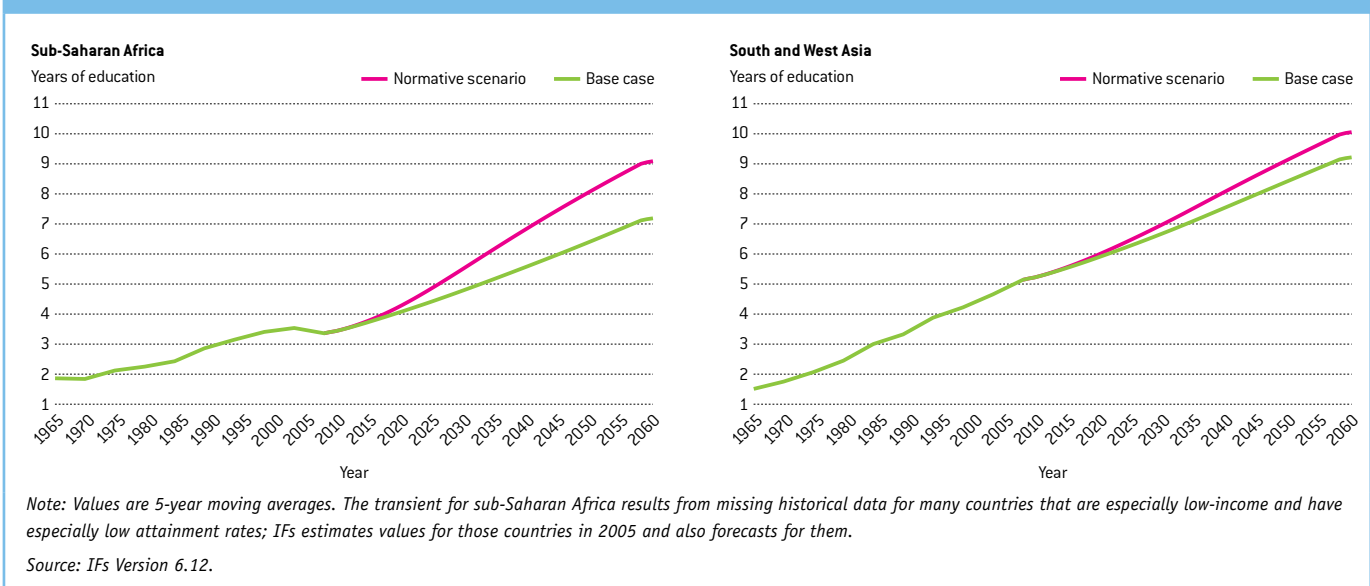
One interesting and important aspect of Figure 7.2 is the fact that in both sub-Saharan Africa and South and West Asia, the number of primary students in the normative scenario, although higher than in the base case for several years, eventually proves to be considerably smaller. By 2060, there are 40 million fewer primary students in sub-Saharan Africa and 12 million fewer in South and West Asia than in the base case. The explanation has two parts. First, Figure 7.2 shows primary gross enrollments and so includes overage students. In the normative scenario, higher net enrollment rates mean there are fewer overage students. Second and more important, the pushing up of education levels in sub-Saharan Africa and in South and West Asia brings down fertility rates in the IFs demographic model. The difference is not huge, but it is significant. By 2030, the total fertility rate in sub-Saharan Africa (where the trend in fertility is now clearly down) is 3.8 in the normative scenario, versus 4.1 in the base case. Clearly, long-term cost savings in the normative scenario from fewer students could potentially help pay for the additional costs of higher enrollments in the early years.

Education attainment

The differences in enrollment patterns between the base case and the normative scenario gradually manifest themselves as well in the education attainment levels of adults. Figure 7.3 shows the average years of education of adults fifteen and older in sub-Saharan Africa and South and West Asia. By 2060, the normative

Figure 7.3 Education attainment of adults age 15 and older in South and West Asia and in sub-Saharan Africa: Normative scenario relative to base case

Note: Values are 5-year moving averages. The transient for sub-Saharan Africa results from missing historical data for many countries that are especially low-income and have especially low attainment rates; IFs estimates values for those countries in 2005 and also forecasts for them.

Source: IFs Version 6.12.

scenario adds nearly 2 years of education to the base case value for sub-Saharan Africa and 0.7 years in South and West Asia. Other regions manifest smaller gains. Higher enrollments can only gradually reshape the education levels of the adult population, but in the long term, the effect is extremely significant.

Sub-Saharan Africa: Exploring the normative scenario

We have already noted that sub-Saharan Africa is the region for which the normative scenario makes by far the most difference in enrollment rates, student numbers, and adult attainment levels. Figure 7.4 shows the resultant pattern for primary net enrollment rates and for gross enrollment rates at the secondary and tertiary levels. In the normative scenario, sub-Saharan Africa surpasses 90 percent primary net enrollment in 2021 and 97 percent in 2034 (versus 2047 and beyond 2060 in the base case). Thus, even the extra impetus of the normative scenario does not allow achievement of the 2015 MDG for UPE.

In the normative scenario, sub-Saharan Africa reaches 90 percent lower secondary gross enrollment in 2041 and 97 percent in 2056 (versus reaching only 77 percent in 2060 in the base case). Consequently, the normative scenario suggests the possibility of universal basic education for the continent before our 2060 horizon. Global targets for enrollment at the upper secondary level do not exist, but in the normative scenario, the continent reaches 80 percent upper secondary gross enrollment in 2059. Tertiary enrollment builds to 28 percent in 2060, also a remarkable advance on the 5 percent level of 2005, bringing the region to about the level of Latin America and the Caribbean in 2005.

The difference between the pattern of the normative scenario and that of the base case is quite striking. Table 7.1 compares the two scenarios directly. Although differences at the primary level are considerable, it is those at both the lower and upper secondary levels that prove most significant. The normative scenario greatly accelerates the movement to nearing universal basic education (90 percent).[1] Moreover, the normative scenario brings upper secondary enrollment of sub-Saharan Africa to the levels of current upper middle-income countries by 2060

(the GDP per capita at PPP of upper middle-income countries is now very nearly $9,000, and sub-Saharan Africa would achieve the same upper secondary rate at about $7,100 in the normative scenario).

The group of sub-Saharan African countries that currently have low primary enrollment rates needs until beyond the 2060 forecast horizon to reach 90 percent primary net enrollment in the base case, but it is able to achieve it more than 35 years earlier in the normative scenario (see

● *Sub-Saharan Africa is the region for which the normative scenario makes by far the most difference.* ●

Figure 7.4 Enrollment rate forecasts for sub-Saharan Africa in the normative scenario

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.
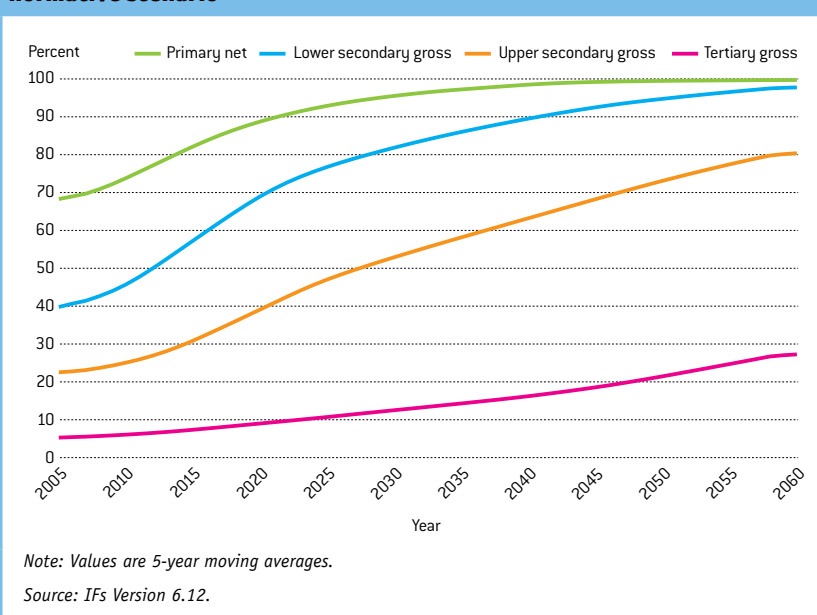
Table 7.1 Enrollment rates in sub-Saharan Africa: Normative scenario relative to base case

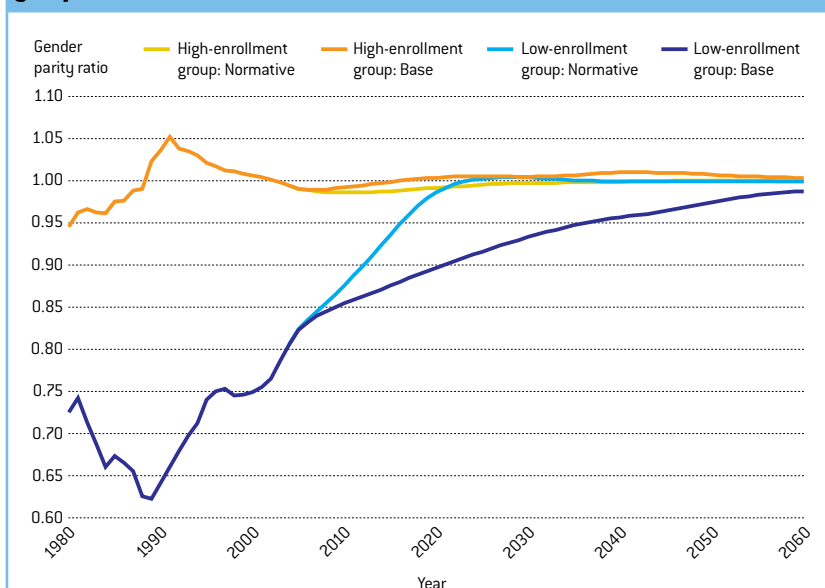|	Base case				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	67.7	72.2	81.4	89.3	93.8
Lower secondary gross	38.6	46.8	56.6	66.2	77.2
Upper secondary gross	22.3	26.0	33.2	41.3	53.5
Tertiary gross	4.9	7.0	11.6	16.7	24.7
	Normative scenario				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	67.7	82.3	95.7	99.4	99.9
Lower secondary gross	38.6	57.3	82.0	92.7	98.3
Upper secondary gross	22.3	30.5	52.9	68.3	81.3
Tertiary gross	4.9	7.1	12.3	18.4	27.9

Source: IFs Version 6.12.

Table 7.2 Enrollment rates in the low primary enrollment countries of sub-Saharan Africa: Normative scenario relative to base case

	Base case				
	2005	2015	2030	2045	2060
Primary net	48.3	54.2	67.4	80.2	87.9
Lower secondary gross	26.3	33.8	45.7	58.1	69.7
Upper secondary gross	13.7	16.1	21.6	29.5	40.6
Tertiary gross	2.2	3.7	6.5	9.4	17.5
	Normative scenario				
	2005	2015	2030	2045	2060
Primary net	48.3	68.4	94.3	98.8	99.8
Lower secondary gross	26.3	41.9	78.5	89.5	96.3
Upper secondary gross	13.7	19.3	43.2	60.3	74.7
Tertiary gross	2.2	3.9	7.2	11.3	21.8

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

Figure 7.5 Primary net gender parity ratio in high and low primary enrollment groups of sub-Saharan Africa: Normative scenario relative to base case

Note: Values are 5-year moving averages after removing 1991 for the low-enrollment group.

Source: IFs Version 6.12 using UIS data and IFs base case and normative scenario.

Table 7.2). Moreover, that group of countries can also reach 96 percent lower secondary gross enrollment levels by 2060, well above the expectation for the base case.

As a general rule, countries that are furthest from universal primary enrollment have the greatest gender imbalances. As a result, it is not surprising that sub-Saharan Africa, the region furthest from UPE, is also the furthest from

gender parity at the primary level. Interestingly given popular images, gender imbalances at all levels in the education systems of Arab countries are not as great as in Africa and Asia, and among all regions, imbalances of enrollment have been closing most rapidly in the Arab States (see, again, Chapter 3 and Figure 3.2).[2]

Figure 7.5 shows the primary net gender parity ratio for countries of sub-Saharan Africa in the base case and in the normative scenario, distinguishing high- and low-enrollment country sets. Consistent with the general rule, the low-enrollment countries are further from parity, with a primary gender parity ratio in 2005 of only 0.82, compared to 0.97 in the high-enrollment countries of the continent. In the base case, the low-enrollment countries reach parity (defined as a ratio between 0.97 and 1.03) only in 2048, consistent with the slowing, S-shaped pattern that occurs in so much end-stage enrollment change. The normative scenario pushes their movement to parity considerably more aggressively, achieving it in 2018.

Much of the uncertainty about education futures in Africa is tied to developments in several of the demographic giants of the continent: Nigeria, Ethiopia, and the Democratic Republic of Congo (DRC). In each of these countries, sociopolitical disruptions have frequently reversed earlier gains. In the case of the DRC, a nearly uninterrupted history since decolonization of internal conflict and extreme elite corruption has greatly retarded economic and sociopolitical advance.

The reality is, therefore, that forecasts of education's advance to midcentury for these countries are exceptionally uncertain even in the base case. Nonetheless, Table 7.3 presents forecasts of the DRC's education enrollment patterns for the base case and the normative scenario. They are dramatically different, exhibiting among the most extreme differences in the continent. The normative scenario presents the possibility of the DRC not only catching up with the rest of Africa but also substantially closing gaps with the rest of the world. The scenario clearly would have substantial economic costs relative to the base case, and subsequent discussion in this chapter will return to the issue of whether those costs might reasonably be paid. The normative scenario would also require, however,

a resolution of the cycles of conflict that continue to plague the country, and the path to accomplishing that is not at all clear. Achieving resolution or the failure to do so is not something we can forecast with any confidence. Unfortunately, even the base case for the DRC currently looks like a substantial challenge, and in the current political context the normative scenario appears to be wishful thinking.

Returning to the education attainment of adults, Figure 7.6 shows how different the futures of sub-Saharan Africa in general and the DRC in particular could be in the normative scenario relative to the base case. In the normative scenario, noncompletion of primary education and illiteracy would be disappearing by 2060 across the continent. Substantial numbers of additional adults would have completed secondary education. The potential differences between the two scenarios are, of course, even more striking in the DRC than in sub-Saharan Africa as a whole, simply because of the much weaker starting point—in 2005, more than half of all people fifteen to twenty-four years of age had no education or only an incomplete primary education, an ongoing legacy of the Belgian colonial era and the turmoil that followed it.

Figure 7.6 also suggests the manner in which the normative scenario begins slowly to interact with demographic change. The youngest cohorts finally begin to decrease in size for the DRC and the region as a whole after 2050 in the normative scenario, but they do so only after 2070 in the base case.

For those who wish to explore the prospects for other countries, the tables at the end of this volume provide base case forecasts of many education variables across 183 countries. Those forecasts include enrollment rates, gender parity ratios, literacy, and education attainment. Those who wish to explore the normative scenario in detail will find a parallel set of forecasts at www.ifs.du.edu.

South and West Asia: The normative scenario

The UNESCO region of South and West Asia contains the three large South Asian countries (India, Bangladesh, and Pakistan) in addition to Iran and smaller countries (Afghanistan, Bhutan, the Maldives, Nepal, and Sri Lanka).

Table 7.3 Enrollment rates in the Democratic Republic of Congo: Normative scenario relative to base case

	Base case				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	55.5	57.7	64.7	75.1	81.5
Lower secondary gross	29.8	35.3	43.7	51.9	65.4
Upper secondary gross	17.6	19.4	22.6	26.8	36.1
Tertiary gross	1.3	1.3	1.6	2.3	11.4
	Normative scenario				
	2005	**2015**	**2030**	**2045**	**2060**
Primary net	55.5	75.4	98.2	100.0	100.0
Lower secondary gross	29.8	43.2	80.2	90.9	97.3
Upper secondary gross	17.6	23.3	47.7	64.5	78.4
Tertiary gross	1.3	1.4	1.8	3.5	16.5

Source: IFs Version 6.12.

Figure 7.7 shows the potential growth of enrollment rates in the normative scenario. In that scenario, South and West Asia could reach universal primary net enrollment by 2028. The lower secondary gross enrollment rate was already at 66 percent in 2005 and climbing strongly, and it could reach 100 percent quite quickly thereafter (by about 2030).
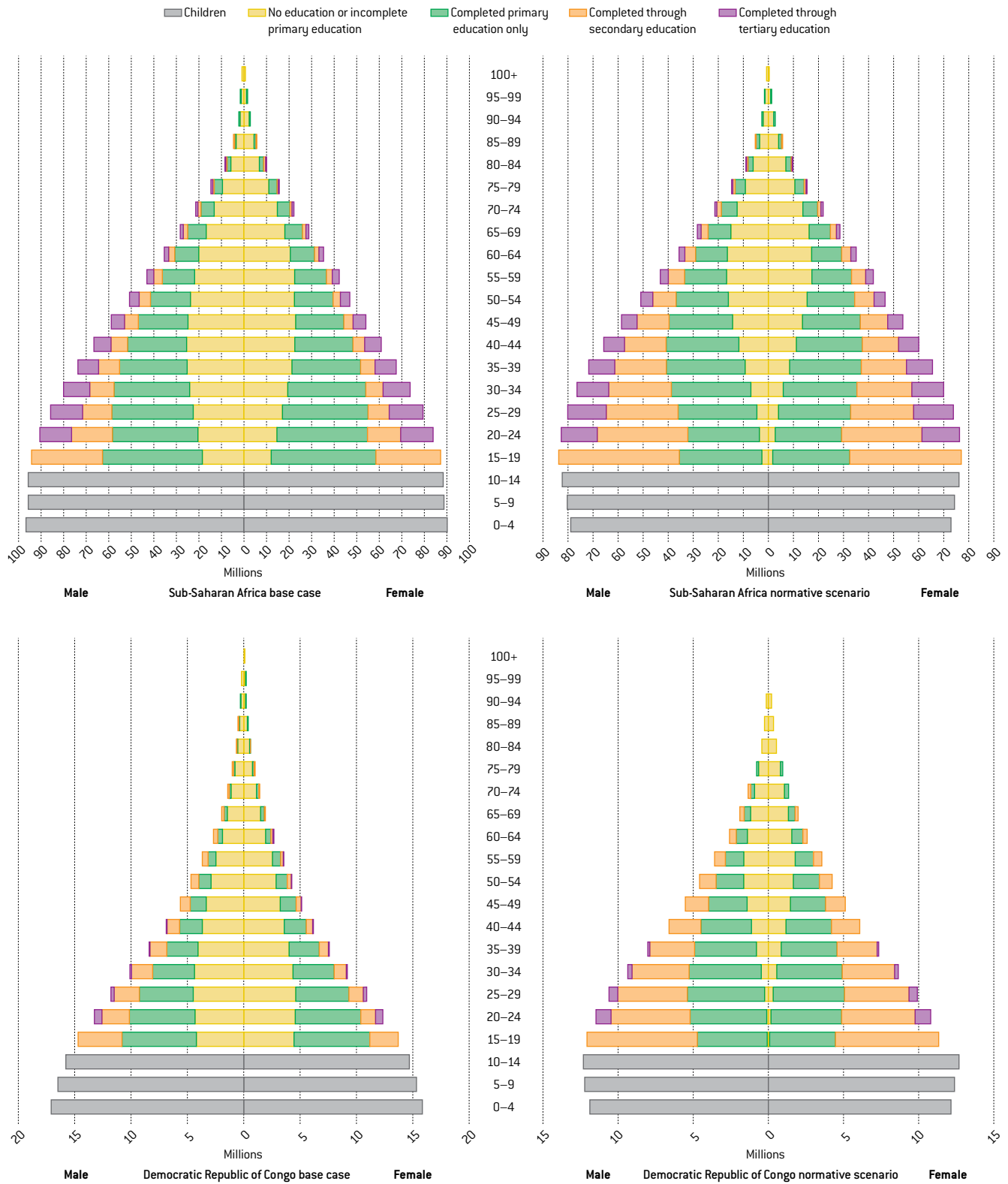
Were it possible to advance this rapidly toward basic education (and obviously, not all countries in the region are likely to do so even with extra attention to the sector), the frontiers of education in South and West Asia would already be in upper secondary and tertiary education by 2025. In fact, both of those levels advance substantially even in the IFs base case. The normative scenario hints at the possibility of nearing 90 percent upper secondary gross enrollment by 2055.

Yet the possibility held out in the normative scenario of great potential for secondary education in South and West Asia should not detract from our recognition that these countries are quite far from having achieved their agenda with respect to primary education. Given the path they currently are on, as represented in the base case, they would not in the aggregate reach universal primary education until 2039. The key element of their remaining agenda is the need to bring primary survival rates up substantially. Most of the South and West Asian countries, including all three of the South Asian giants, had primary

● The normative scenario also makes a substantial difference for South and West Asia. ●

Figure 7.6 Education attainment of adults 15 years of age and older in sub-Saharan Africa and the DRC in 2060: Normative scenario relative to base case forecasts

Legend:
- Children
- No education or incomplete primary education
- Completed primary education only
- Completed through secondary education
- Completed through tertiary education

Top left chart — Sub-Saharan Africa base case (Male / Female), Millions, x-axis 100–0–100, age groups 0–4 to 100+

Top right chart — Sub-Saharan Africa normative scenario (Male / Female), Millions, x-axis 90–0–90

Bottom left chart — Democratic Republic of Congo base case (Male / Female), Millions, x-axis 20–0–20

Bottom right chart — Democratic Republic of Congo normative scenario (Male / Female), Millions, x-axis 15–0–15

Source: IFs Version 6.12.

survival rates somewhat below 70 percent in 2005 (Bangladesh at 65 percent), at 70 percent (Pakistan), or only somewhat above 70 percent (India at 73 percent). Although that means they have reached levels where rates can increase quite rapidly, there is much distance yet to travel. Even in the normative scenario, with its aggressive assumption of 1.2 percent annual gains in survival rate, only India is likely to reach a 90 percent primary survival rate by 2020.
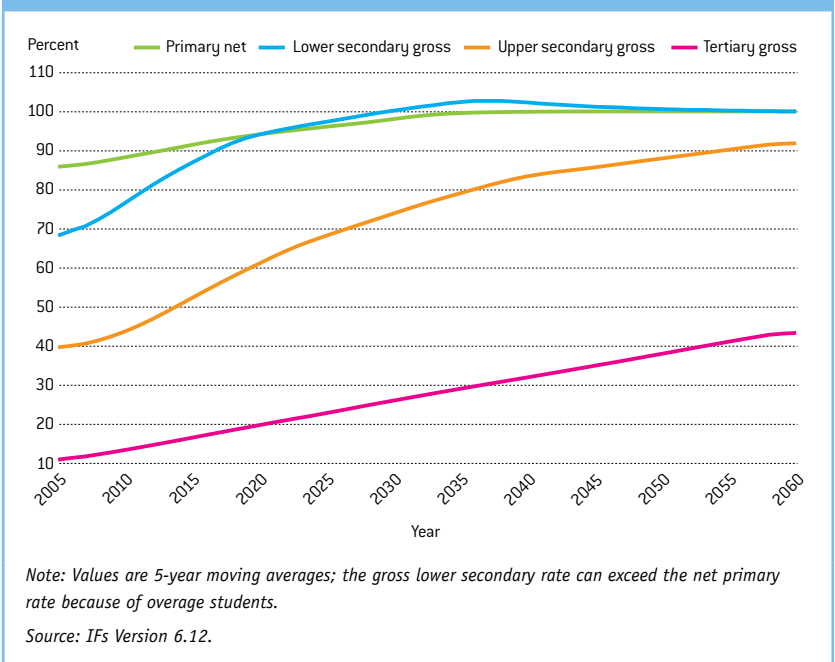
Iran stands out within this UNESCO region. It has reached about 90 percent primary survival, and it was already nearing universal primary enrollment in 2005. More generally, the regional totals conceal great differences across the big countries, as well as within the broader set. For instance, although the primary net enrollment rates in India and Bangladesh were both nearing 90 percent in 2005, enrollment rates in India at both the lower and upper secondary levels exceeded those of Bangladesh by about 10 percentage points. At the tertiary level, the difference between the two countries was about 5 percentage points.

Much more significantly, India and Pakistan displayed very different education participation patterns in 2005, and those differences are likely to persist for much of our forecast horizon. Figure 7.8 shows the extent to which Indian enrollment rates exceeded those of Pakistan at all levels. In 2005, primary net enrollment rates in India were about 20 percentage points higher, and lower secondary rates were more than 30 percentage points higher. Although these differences should disappear by about 2040 in the normative scenario, with both countries approaching universal basic education, the gap at the tertiary level would likely grow. (In the base case, the differences remain greater across the forecast horizon—even in 2060, the lower secondary enrollment rate in India could be 20 percentage points higher than in Pakistan.)
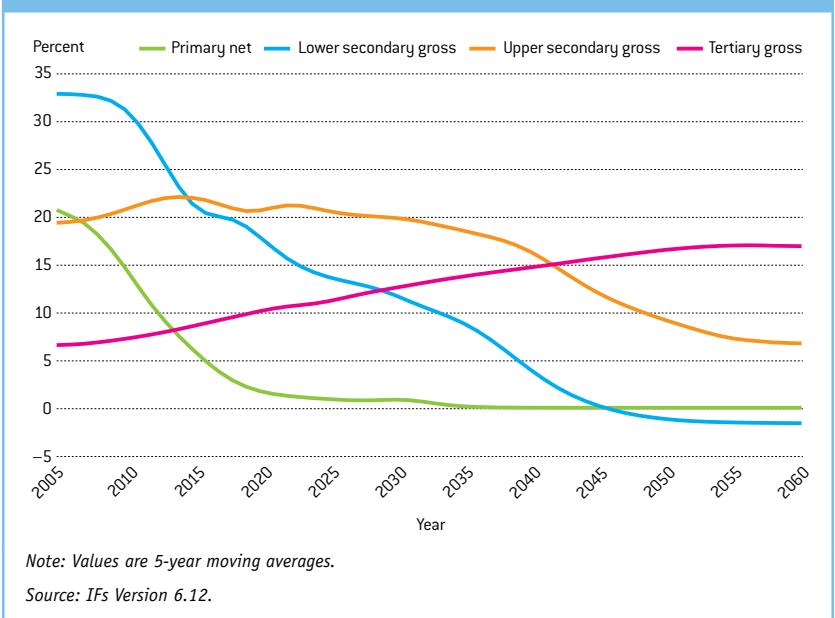
Middle-income countries: Latin America and the Caribbean

This volume has focused heavily on lower-income regions for reasons that Figures 7.1 and 7.2 made clear—the potential for acceleration of the education transition, both in terms of enrollment rates and absolute numbers of students, exists especially in those regions.

Figure 7.7 Enrollment rate forecasts for South and West Asia in the normative scenario

Note: Values are 5-year moving averages; the gross lower secondary rate can exceed the net primary rate because of overage students.

Source: IFs Version 6.12.

Figure 7.8 India's percentage point enrollment rate advantages over Pakistan in the forecasts of the normative scenario

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.

The middle-income countries of the world, essentially already at universal primary education and often at or near universal basic education, face a different set of issues.

The middle-income UNESCO region of Latin America and the Caribbean includes Mexico and all of Central America as well. Like the

developing portion of East Asia and the Pacific, the continent has all but reached universal primary enrollment, with the exception of sometimes large pockets of population, especially among indigenous peoples. Figure 7.9 shows the current status of enrollment rates at all levels in the region and the possibilities of the normative scenario. There are, however, huge inequalities across the region, as well as within countries. In contrast to Figure 7.9, we estimate the primary net enrollment rate to be only about 60 percent in Haiti, and the lower secondary gross enrollment rate was still less than 60 percent in Guatemala in 2005. At the other extreme, the upper secondary gross enrollment rate was already 95 percent in Brazil, and the tertiary gross enrollment rate was 65 percent in Argentina.

In spite of problematic exceptions, the Latin American and Caribbean region as a whole is quite well positioned with respect to basic education. The region's attention in the coming decades will be mostly on upper secondary and tertiary education, and the greatest uncertainty in forecasting is therefore also at those levels. Figure 7.10 shows the difference between the base case and the normative scenario forecasts with respect to the upper secondary gross enrollment rate. Although the movement in the normative scenario from about 75 percent in 2005 to 90 percent over the following twenty years would be aggressive, it is quite possible (the region as a whole moved from 63 to 73 percent in just the five years between 1999 and 2004). In fact, the base case upper secondary forecast of 79 percent in 2025 may appear too conservative— yet we should remember that it reflects both budgetary constraints and a slowing rise in demand as enrollment rates grow higher.

Brazil is the demographic giant of Latin America. With a population of nearly 200 million, it is almost twice the size of Mexico, which in turn is about twice the size of third-ranked Colombia. Brazil is also one of the Goldman-Sachs BRICs (Brazil, Russia, India, and China), the first tier of large emerging market economies. Thus, its education future is of considerable importance not just to the region but also with respect to the concept of the continuing global emergence of large, middle-income countries. Perhaps the two most interesting aspects of the forecasts for Brazil are (1) the starting conditions, with very high rates of education through the upper secondary level already in place, and (2) the movement before 2060 to about a 50 percent tertiary gross enrollment rate even in the base case. More generally, in 2060, the education profile of today's lower middle-income and upper

Figure 7.9 Enrollment rate forecasts for Latin America and the Caribbean in the normative scenario

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.
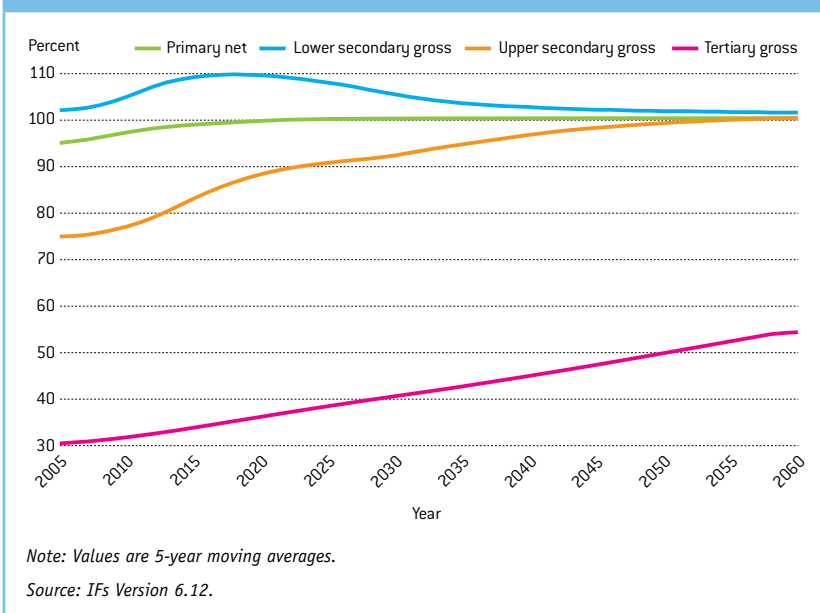
Figure 7.10 Upper secondary enrollment rates in Latin America and the Caribbean: Normative scenario relative to base case forecasts

Note: Values are 5-year moving averages.

Source: IFs Version 6.12.
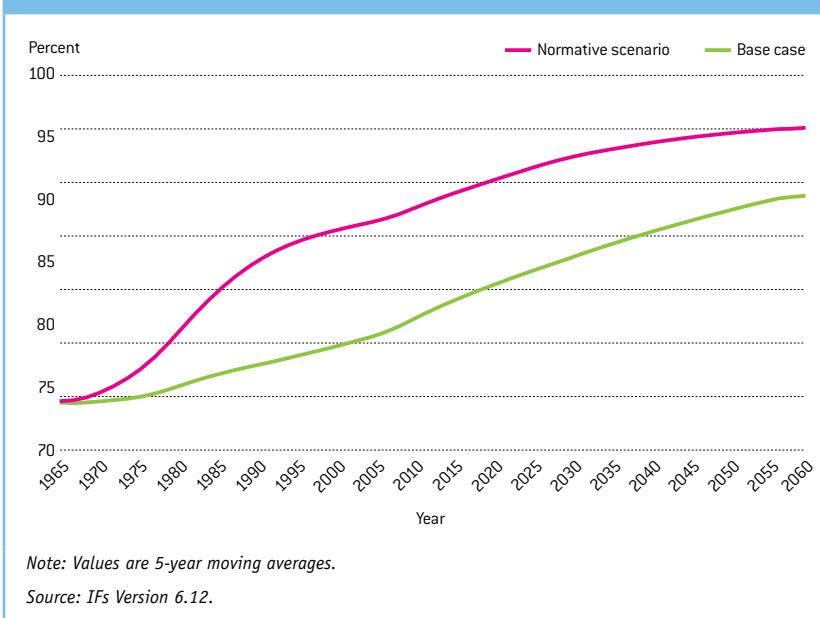
middle-income countries could look much like that of Southern Europe in 2005.

Implications for future education targets

One of the central (and often repeated) arguments of this volume is that when it comes to education targets, one size does not fit all. Most of the world will reach the level we call "nearing UPE" (defined as a 90 percent net enrollment rate) before 2015. But in the IFs base case, sub-Saharan Africa as a whole (weighting member countries by population) needs until 2047 to reach that goal, and both the Arab States and South and West Asia need until about 2019 (see Figure 7.11). The normative scenario shortens those horizons to 2021, 2014, and 2013, respectively.

Yet the global community generally understands the first MDG to mean 97 percent primary net enrollment, and it could take a long time to acquire those extra 7 percentage points. In the base case, sub-Saharan Africa does not reach that level until 2076, and the region as a whole needs until 2034 even in the normative scenario. The normative scenario would facilitate the goal being met by 2026 in the Arab States and 2028 in South and West Asia, but without such acceleration, these regions would not meet the goal until 2038 and 2039, respectively.

Figure 7.11 also explores when the UNESCO regions might reach a 90 percent lower secondary gross enrollment rate and an 80 percent upper secondary gross enrollment rate in the two scenarios, as well as looking out to 60 percent tertiary gross enrollment. (These values do not, of course, constitute global goals. Neither are we proposing that they should become goals, but we find them useful as analytical benchmarks.) At the lower secondary level, sub-Saharan Africa does not reach the 90 percent level until 2041 even in the normative scenario. In short, universal basic education is a long time in the future for the region. South and West Asia would reach it in 2017 in the normative scenario, shortening the horizon by fourteen years relative to the base case.

At the upper secondary level, the horizons extend still further, although all regions except sub-Saharan Africa and South and West Asia reach 80 percent by 2027 in the normative

scenario. South and West Asia reaches 80 percent in 2036, but even in the normative scenario, sub-Saharan Africa does not do so until 2059. The "benchmark" of 60 percent gross tertiary education, even though the rich countries of the world already have reached it, will likely elude all other regions except the transition region of Central and Eastern Europe through 2060, even in the normative scenario.

Despite the fact that they are not nearly as catchy or convenient as a goal of universality for all countries by a set year, target growth rates such as those of our normative scenario could serve the global community well as it begins to look beyond the current MDG set. How much pursuing growth targets might cost is the topic to which we next turn.

Paying for Education Acceleration: Costs and Possible Sources

We saw in Chapter 3 that education funding as a portion of GDP tends to be fairly consistent over time, seemingly somewhat independent of the financial needs inherent in underlying changing demographic patterns and of efforts to push education enrollment rates forward aggressively. But as a general rule also, public expenditure on education as a portion of GDP tends to be highest in high-income countries and lowest in low- and lower middle-income countries. It has been decreasing slowly in the former and increasing slowly in the latter.
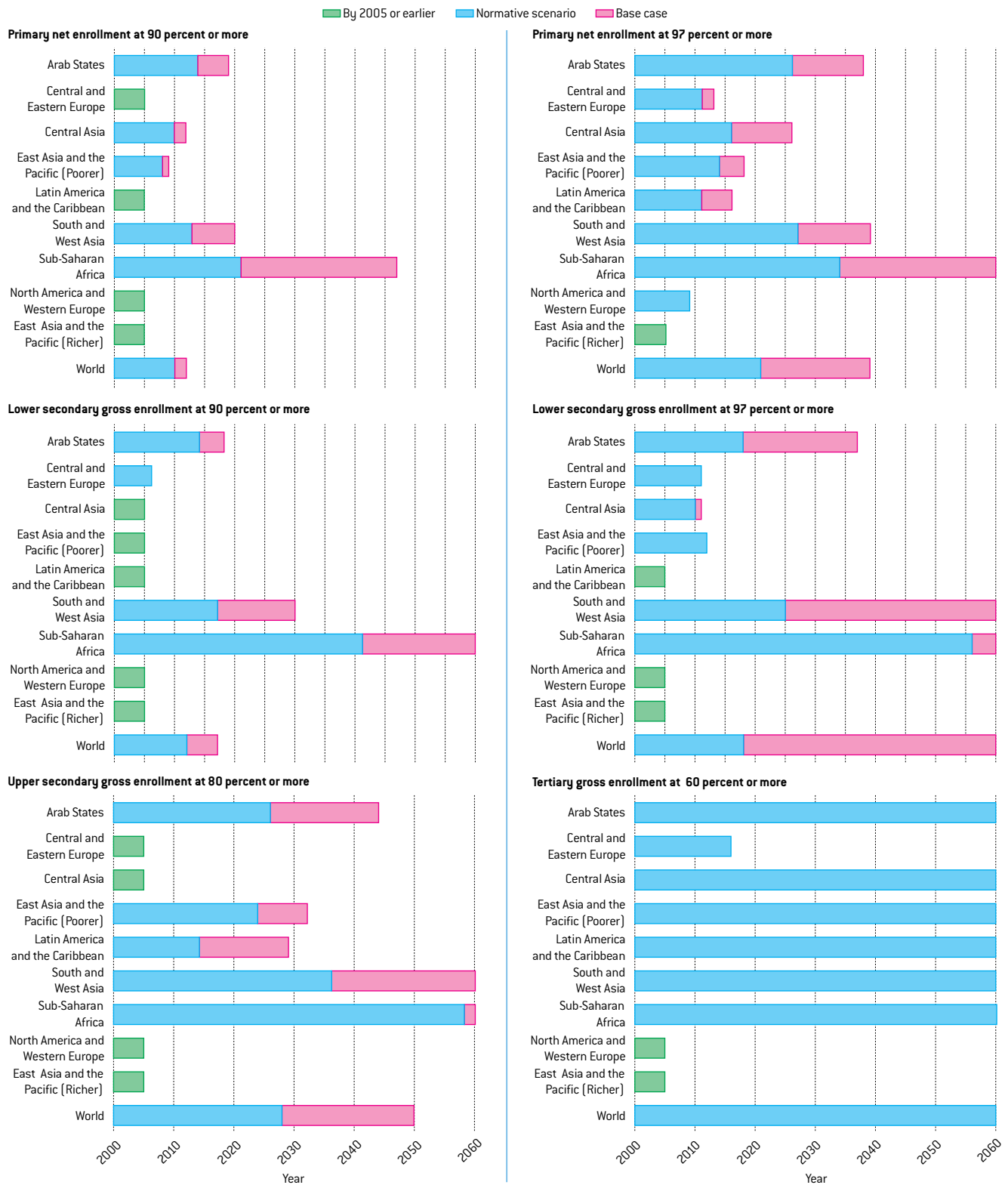
The base case of IFs generally reflects these patterns in its forecasts as well, responding to the changing broader context of education's advance. In particular, demographic pressures from young dependent populations are easing very considerably around most of the world, and by 2060, the world will likely approach zero population growth (the IFs forecasts show negative population growth by 2070 in both scenarios). At the same time, the pressure of older populations for both health care and pensions is increasing almost everywhere, and in the base case, those demands squeeze public budgets for education. Thus, there are both demand-side and supply-side forces that will work to reduce the share of GDP devoted to education somewhat over time. By the same token, however, the shift of societies to knowledge-based economies will put some upward pressure on that share.

Figure 7.11 Years when global regions attain various enrollment rates: Normative scenario relative to base case

Legend: ■ By 2005 or earlier ■ Normative scenario ■ Base case

Primary net enrollment at 90 percent or more

Primary net enrollment at 97 percent or more

Lower secondary gross enrollment at 90 percent or more

Lower secondary gross enrollment at 97 percent or more

Upper secondary gross enrollment at 80 percent or more

Tertiary gross enrollment at 60 percent or more

Regions (all panels): Arab States; Central and Eastern Europe; Central Asia; East Asia and the Pacific (Poorer); Latin America and the Caribbean; South and West Asia; Sub-Saharan Africa; North America and Western Europe; East Asia and the Pacific (Richer); World

X-axis: Year — 2000, 2010, 2020, 2030, 2040, 2050, 2060

Note: Values of 2005 are 2005 or earlier; values of 2060 are 2060 or later; in cases where a benchmark is reached at a future time and only a blue line is shown, both the normative scenario and the base case are forecast to reach the benchmark within a year of each other.

Source: IFs Version 6.12.

We built the normative scenario on top of this base case. Financially, the questions of interest to us are how big the incremental costs of the normative scenario might be and how societies and the global community might pay those costs.

What the normative scenario would cost

The financial constraints that countries face interact with other forces to shape the forecasts of the base case. To assess its incremental costs, our analysis removed the budgetary constraint from government spending in the normative scenario. This allows us to see the difference between the desired spending of the normative scenario and the forecast spending of our exploratory base case. Figure 7.12 compares the costs of the base case and the normative scenario as a portion of the GDP for the world and each UNESCO region, and it suggests several conclusions.

First, the incremental costs appear challenging for some regions in some time periods—but not generally overwhelming. The average additional spending needs for regions tend to be 0.5 to 1.2 percent of GDP. We have tried to make the normative scenario reasonable and sustainable. Nonetheless, as we shall see, such financial costs would not be easy for some countries to bear. Moreover, the calculated increments in a number of cases can be significantly higher—for example, for the DRC, they reach 3.3 percent of GDP, and for Angola (which is well behind education enrollment norms because of long civil conflict), they exceed 4 percent.

Second, there is frequently an incremental "cost bubble" in the middle of our forecast horizon. The upward curve of that phenomenon is tied most fundamentally to acceleration in the increase of enrollment rates in the normative scenario. It also in part reflects the specification in the normative scenario that per student spending adjusts to benchmark levels over twenty years; for some countries and regions, this results in increased spending per student and hence also a substantial rise of total expenditures during the early period (although for other countries, per student spending decreases to the benchmark levels). Over time, however, other factors relieve the upward spending pressure of the normative

scenario. One is the ongoing unwinding of demographic pressures in the first half of this century. Also, of course, enrollment rates move toward universality in the base case as well, so that by 2060, enrollments in the normative scenario are not always much or any higher than in the base case.

Third, the largest normative scenario bubbles in spending expressed as a percentage of GDP appear in Central Asia, Latin America and the Caribbean, South and West Asia, and sub-Saharan Africa. The difference for sub-Saharan Africa between education spending as a percentage of GDP in the normative scenario and the base case peaks at about 0.8 percent; the difference for South and West Asia peaks at 0.9 percent. The dubious distinction of having the highest peak incremental need belongs to Central Asia at 1.2 percent of GDP, partly because the collapse of spending rates since the demise of communism has led to expenditures that fall significantly below benchmark-based needs.

It is contrary to the expectations of many, perhaps, that the peak cost difference for sub-Saharan Africa is not the largest across regions in the normative scenario. Sub-Saharan Africa's spending per student is now often above benchmark levels, and in the normative scenario, it benefits from some decreases. The spending gap of sub-Saharan Africa is nonetheless the most persistent, remaining above 0.5 percent across the entire forecast horizon. These different incremental patterns across regions and over time reflect varying reasons for the spending gaps. For instance, enrollment rates in sub-Saharan Africa are currently often quite far from saturation levels, making the increments of the normative scenario more persistent.
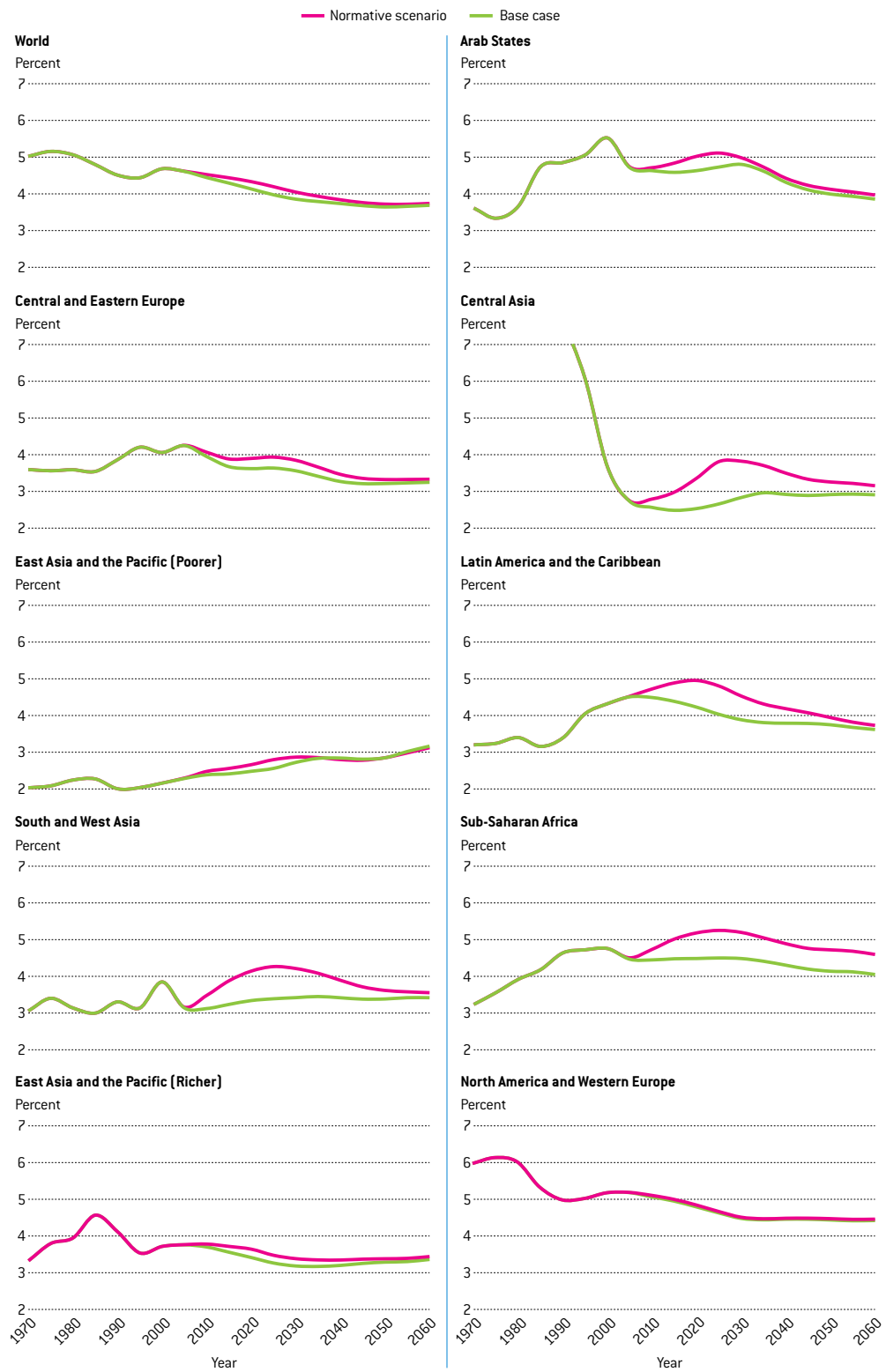
In absolute terms (rather than as a portion of GDP), the largest incremental spending needs of the normative scenario are in Latin America and the Caribbean in the early years of the forecast and in South and West Asia over time.[3] As is common in looking at cost or revenue streams spread over time, Figure 7.13 displays the annual increments with a 3 percent annual discount rate for future years (showing only the five regions with significant absolute increments relative to spending in the base case).[4] The region of East Asia and the Pacific (Poorer) also needs very substantial incremental funds early in the forecast, but the incremental

What are the incremental costs of the normative scenario, and how might they be paid?

Although there are exceptions, the incremental costs of the normative scenario appear challenging but not overwhelming.

There is frequently an incremental "cost bubble" in the middle of the forecast horizon.

Figure 7.12 Education costs as percent of GDP: Normative scenario relative to base case

Legend: Normative scenario — Base case

World — Percent

Arab States — Percent

Central and Eastern Europe — Percent

Central Asia — Percent

East Asia and the Pacific (Poorer) — Percent

Latin America and the Caribbean — Percent

South and West Asia — Percent

Sub-Saharan Africa — Percent

East Asia and the Pacific (Richer) — Percent

North America and Western Europe — Percent

Note: Used 5-year moving averages. Removed 2000–2004 data from East Asia and the Pacific (Poorer) because of China's nonreporting; data for Central Asia are missing for much of the historical period.

Source: IFs Version 6.12 using UIS and WDI data and IFs base case and normative scenario.

need disappears (and even turns slightly negative) later in the forecast horizon because the normative scenario brings down tertiary spending per student relative to the base case. Although incremental financial needs for sub-Saharan Africa continue to grow over time, the absolute values are not that high in early years, a topic to which we will return.

Over time and even with discounting, the cumulative incremental sums (see Table 7.4) are substantial. Through 2030, the world would spend an additional $1.5 trillion to meet the target intake/transition and survival growth rates of the normative scenario. Part of such incremental funding needs would be easy to meet because the normative scenario produces somewhat higher economic growth. Globally, if the same percentage of GDP were devoted to public education spending in the normative scenario as in the base case, $55 billion of that $1.5 trillion incremental need would be "automatically" covered. By 2060, the continued higher economic growth of the normative scenario would similarly cover more than one-fifth of the cumulative increment, or $760 billion of $3,300 billion. The portions of help from faster growth in sub-Saharan Africa are very similar. The difficulty for policy making, of course, is the substantial lag between the incremental expenditures and the greater resources from higher growth, an issue that will be addressed in Chapter 8.

It has been relatively common to calculate the additional resources required to meet specific education goals over the now especially short horizon of the MDGs. For instance, a broad purpose of the Bruns, Mingat, and Rakotomalala (2003) study was to estimate the financing gap between the cost of efficiently educating students at the target levels they explored for 2015 (95 percent primary completion) and the reasonable mobilization of domestic spending, given the benchmarks they established. Scaling up their analysis for rehabilitation of inadequate facilities, system expansion for new students, and extension of the analysis to all low-income and middle-income countries, they found that the annual average incremental cost between 2000 and 2015 of achieving the second MDG would be $33 billion to $38 billion, with the need for $5 billion to $7 billion from external resources after mobilizing domestic resources and improving

Figure 7.13 Incremental costs in $ (billions): Normative scenario relative to base case

Note: Values are 5-year moving averages with a 3 percent annual discount rate for future years.

Source: IFs Version 6.12.
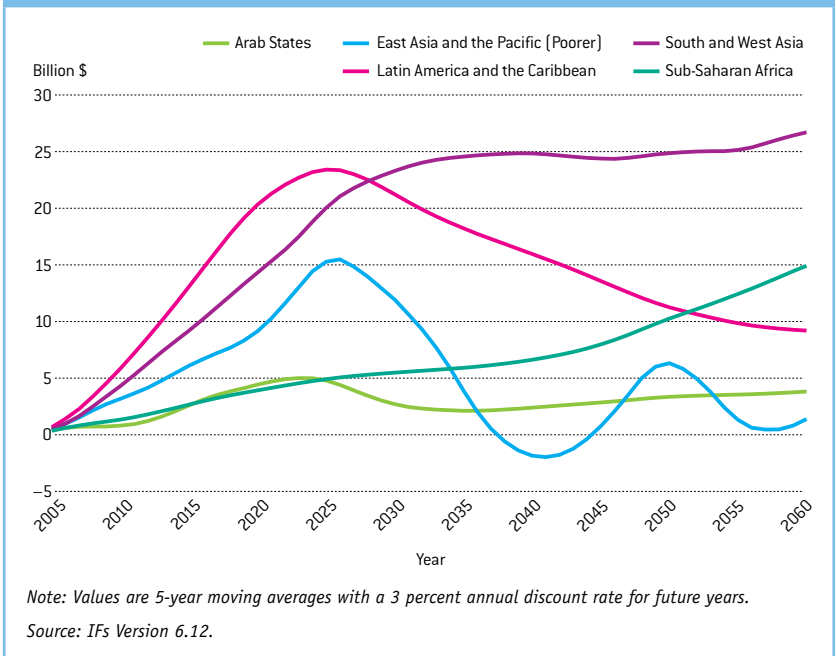
efficiency of resource use (Bruns, Mingat, and Rakotomalala 2003: 111, table 4.15).

There are many differences between our approach and that of Bruns, Mingat, and Rakotomalala, starting with the fact that our cost forecasts do not posit universal primary

Table 7.4 Cumulative incremental costs in $ (billions): Normative scenario relative to base case

	2030	2060
Arab States	77	143
Central and Eastern Europe	75	193
Central Asia	24	52
East Asia and the Pacific (Poorer)	250	−22
Latin America and the Caribbean	341	793
South and West Asia	298	1,042
Sub-Saharan Africa	87	341
East Asia and the Pacific (Richer)	168	361
North America and Western Europe	171	360
World	1,495	3,266

Note: Values reflect a 3 percent annual discount rate for future years.

Source: IFs Version 6.12.

education by 2015.[5] In addition, of course, our analysis of the normative scenario considers increments at secondary and tertiary levels, not just in primary education. Moreover, we calculate our incremental normative scenario resource needs relative to a base case in which spending has already increased with increases in GDP. Thus, our forecasts of incremental costs are not comparable to those of Bruns, Mingat, and Rakotomalala (2003) in either purposes or method. It is nonetheless interesting to consider the annual incremental costs of our normative scenario across all levels of education for the same set of low- and middle-income countries as in their study. For that country set, the total incremental costs between 2005 and 2015 of our normative scenario would be $219 billion (without discounting), or an average of $21 billion per year in constant 2000 dollars.

Such a calculation of totals over time and of annual averages is, however, very deceptive because the time profile is critical. The incremental costs per year of the normative scenario begin near zero and climb for many years. By 2015, incremental costs for the same subset of countries reach $45 billion annually and continue to climb, hitting $150 billion in 2030. In considering the funding of such incremental needs, it is critical to analyze them dynamically, taking into account the growth prospects of the underlying economies—which also differ in the normative scenario—and the prospects for mobilizing domestic or international resources on behalf of education.

Domestic sources

Although several of the UNESCO regions would need to mobilize additional resources to meet the target paths of the normative scenario (see, again, Figure 7.13), we return our focus to sub-Saharan Africa and South and West Asia, the regions to which we have devoted the most attention throughout this volume. Further exploration of the normative scenario must concentrate on two questions. First, can incremental resources be mobilized, especially in the countries of these regions? And second, does mobilizing them have value (and not just monetary return) that rather definitively outweighs the costs of doing so? The remainder of this chapter explores the first question, and Chapter 8 will address the second.

Calls for greater education funding abound in rich and poor countries alike. The UN Millennium Project (2005), under the leadership of Jeffrey Sachs, issued one of the strongest calls in recent years. As that study emphasized, it makes great sense to look for needed additional funding first from domestic sources. One of the key arguments for more public spending on education is that the spending generates, at least in part, socially beneficial externalities (positive impacts on others beyond those receiving more education), as well as private goods for those receiving the education. Some portion of broader social benefits (such as the creation of new knowledge flowing from tertiary education) are true public goods (goods such as knowledge, to which access is not easily restricted and from which individuals can benefit without diminishing benefits to others). Typically, societies do not recognize the full value of externalities, and when those are positive, they tend to underprovide such goods (Weimer and Vining 2004).

The Commission on Macroeconomics and Health (CMH), also directed by Jeffrey Sachs, built a normative scenario analysis around increased spending on health (CMH 2001: 60), somewhat similar to our education normative scenario, and it is instructive to compare and contrast our approach and conclusions with those of the commission. In their analysis, the authors (CMH 2001: 163) posited that low-income countries needed to increase spending on health by 2.7 percent of GNP within six years (by 2007) and 3.3 percent within fourteen years (by 2015). They also explored efficiency savings and concluded that those were unlikely to be more than 20 percent of current spending.

The study concluded that low-income countries should increase health spending by $40 billion in 2007 and $66 billion in 2015, needing $20.5 and $28.4 billion from external donors to do so, or about 0.1 percent of donor GNP (CMH 2001: 163 and 166). Africa was identified as having the largest need for external help.

The commission extended the analysis to benefits as well as costs. The authors concluded that a highly conservative estimate of the economic return in 2020 from the scaling up of health spending would be $180 billion, or about 10 percent of GDP (CMH 2001: 108). In short,

● *The funding of the incremental costs needs to be analyzed dynamically, taking into account the growth prospects of the underlying economies.* ●

the incremental investment would more than pay for itself in a quite short period of time.

In contrast to the normative scenario of the CMH and to other analysts' estimations of funds needed to achieve universal primary education by 2015, our normative scenario is less a "big push" than a "steady slog." That is, we see acceleration of the advance in education as a process that requires growing incremental investments over a long period of time, allowing a buildup of enrollment rates and student headcounts across many levels of education at reasonable and sustainable rates. A steady slog has many benefits, including enabling institutions to grow steadily and to absorb expansion and the fact that with more time, countries are better able to ramp up incremental spending from domestic resources. Further, in the normative scenario, the growth of the GDP in response to education's advance increases the domestic resource base, and this growth of GDP has two benefits. The first is that for the world as a whole and for most regions, including South and West Asia and sub-Saharan Africa, it would cover about 25 percent of the incremental costs without requiring any increase in the proportion of GDP spent on education. Second, although shifting 1 to 2 percent of GDP into any social use over five to fifteen years in the face of many competing demands (as in the CMH scenario) would be exceptionally difficult, a movement of 0.5 to 1.0 percent over twenty to thirty years from a faster-growing economy may be more feasible.

The resulting incremental costs of our normative education scenario are therefore less than those of the normative scenario of the CMH in the early years. Specifically, for the World Bank's set of low-income countries, the incremental funds required in 2015 would be $14 billion—compared to the $66 billion estimated incremental health expenditures posited in the CMH study for 2015—and they would grow to $52 billion in 2030.[6] In the later years, larger economies and government revenues (bolstered in the normative scenario by greater productivity tied to the growth of education) would increasingly cover this incremental expenditure (Chapter 8 explores this issue).

We noted earlier that incremental peak-year spending needs on a regional basis in the normative scenario relative to the base case run

between 0.5 and 1.2 percent of GDP, reaching about 0.8 to 0.9 percent in sub-Saharan Africa and in South and West Asia. These are levels of GDP per capita devoted to education beyond the levels of the base case. The logic of the Commission on Macroeconomics and Health would suggest that these regions in aggregate (although not, of course, every country in them) could bear the entire cost of such increments, especially with the considerably longer ramp-up period indicated by our analysis than in the shorter-term analysis of the CMH. The problem with such logic is that these countries face competing needs, not limited just to health and education but including much more, such as infrastructure, energy, and the environment.

In addition, low-income and Least Developed Countries (LDCs) face special problems with respect to revenue mobilization. Low-income countries mobilize only about 12 percent of GDP for all government consumption (military, health, education, and other), compared to about 18 percent in high-income countries. Even that level of resource mobilization in low-income countries is currently supported by foreign aid equivalent to about 5.5 percent of their GDP and to about 6.0 percent of the GDP in sub-Saharan Africa. Many low-income countries have very weak domestic taxing and revenue-raising capability.

International transfers

The purpose of this volume is neither to become very specific with respect to where funds for the normative scenario might be obtained nor to plead for an international commitment of assistance. Instead, the objective is to map the general character and expense of an accelerated advance of global education and to explore the implications of its pursuit. Nonetheless, we want to identify the general magnitude of incremental expenditures in the normative scenario that might not be possible to meet from domestic resources.

The United Nations defines its category of LDCs with an eye to those suffering from long-term handicaps to growth and therefore having the most limited ability to undertake new initiatives without external assistance. Those countries are, by definition, the least able to close the gap between current patterns of spending on education and the estimated

The "steady slog" of the normative education scenario begins fairly soon to pay for itself.

Low-income and Least Developed Countries face special problems with respect to revenue mobilization.

We estimate the external assistance that might be required to advance education more aggressively in the Least Developed Countries.

The broader argument for an increased commitment to education rests on the potential benefits of accelerating education's advance.

expense of the normative scenario. Most of the countries are in sub-Saharan Africa. Afghanistan, Bangladesh, Bhutan, Cambodia, Haiti, Kiribati, Laos, Mauritania, Myanmar, Nepal, Samoa, the Solomon Islands, Timor-Leste, Tuvalu, Vanuatu, and Yemen supplement the thirty-three countries from that region. Three criteria collectively keep countries on the list: GDP per capita below $900; human resource weakness such as inadequate nutritional levels or low life expectancy; and economic vulnerability, such as instability of agricultural production.

Table 7.5 shows the education spending of the least-developed country set in the base case and in the normative scenario. The gap is a very crude estimate of demand for funds in the normative scenario that cannot be met from domestic resources because many of the LDCs could realistically direct very little additional GDP to education (it would also, of course, be difficult for some other low- and lower middle-income countries to divert resources of the magnitude suggested in the normative scenario). The estimate of need for LDCs is fairly low by the standards of international assistance efforts and pledges. Total official foreign assistance is now about $60 billion annually, and in the base case, assuming constant rates of giving as portions of donor GDP, it would rise to $207 billion in

2060. For some additional context, at their meeting at Gleneagles, Scotland, in 2005, leaders of the G-8 agreed to basically double annual assistance flows, increasing aid to developing countries as a whole by $50 billion per year in 2010, including increased flows to Africa of at least $25 billion (the commitments also included debt relief for the Least Developed Countries and other supportive actions).[7] It appears nearly certain that the G-8 will fall decidedly short of that pledge, but the annual funds of the pledge would obviously have more than covered the unmet need that Table 7.5 identifies through 2045. Foreign assistance given by all OECD countries constitutes only a bit more than 0.2 percent of their GDP. An increase to somewhat more than 0.3 percent would nearly fill the gap identified in Table 7.5 for the entire horizon of the normative scenario.

Again, it is important to emphasize that this study is not balancing the needs in education against those in health, in infrastructure, or elsewhere in low-income countries. Thus, this analysis does not support making an argument for such an increase in external assistance focused solely on education; rather, it estimates the amount that might be required in order to advance education more aggressively.

The broader argument for either an increase in domestic commitment to education or external help with increasing expenditures rests, of course, on the potential benefits of accelerating education's advance. Those benefits could be economic or noneconomic, and they could accrue only to the target countries or to the broader international community. For instance, an enhanced domestic stability of low-income countries and a lower spillover of threats to the international community could potentially constitute a partially noneconomic benefit for the global community from the normative scenario. It is to a broad consideration of such benefits that we will turn in Chapter 8.

Conclusion

Education's advance is already remarkably rapid around the world. It might be that the current emphasis placed on increasing participation in education (the pace of which is now much greater in low-income countries than it was in high-income countries at similar levels

Table 7.5 Education spending in the Least Developed Countries: Normative scenario relative to base case

| Year | Education spending (billion 2000 dollars) | | | |
	Base case	Normative scenario	Absolute gap	Percent of GDP gap
2005	8.1	8.1	0.0	0.0
2010	10.8	12.5	1.7	0.5
2015	14.4	18.9	4.5	1.0
2020	19.6	28.0	8.4	1.3
2025	27.1	40.5	13.4	1.6
2030	37.3	56.0	18.7	1.6
2035	50.7	75.1	24.4	1.5
2040	68.5	98.8	30.3	1.3
2045	93.7	132.2	38.5	1.1
2050	131.6	184.6	53.0	1.0
2055	188.5	261.9	73.4	0.9
2060	265.3	366.5	101.2	0.8

Source: IFs Version 6.12.

of income) is very adequate. Perhaps global attention should simply focus on tracking and recognizing—on welcoming and even celebrating—such an advance. Yet a large community of analysts and advocates clearly believe that more rapid advance in education carries many personal and social rewards. The statement of global goals for universal primary completion and gender parity at all levels of education repeatedly demonstrates that belief.

This chapter has considered a normative scenario for education's advance globally, with special attention to low-income countries, that is simultaneously aggressive and solidly within the range of historical experience for well-performing countries. Such a future would cut about one generation off the period that the peoples in sub-Saharan Africa and also South and West Asia are otherwise likely to need in order to move to universal basic education and to high levels of upper secondary education (as well as accelerate such progressions across much of the rest of the developing world).

Achieving such an acceleration in educational advance would, however, be expensive, at its peak costing 0.5 to 1.1 percent of regional GDP for low- and middle-income UNESCO regions. Domestic resources could almost certainly support much or most of the acceleration in many countries, but the bubblelike patterns of needed funding, tied to the passing of demographic bubbles through the system as well as to increases in rates of enrollment and to bringing spending levels to benchmarks, suggest a pace of ramping up that would also require significant external help, especially in the LDCs.

Chapter 2 emphasized that those who support an acceleration of education's advance do so not only because of the economic returns that accrue to individuals and societies from it but also because of the capabilities it builds for the living of richer, freer, and more satisfying lives. The next chapter explores both types of returns.

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1 A lower secondary gross enrollment rate of 100 percent often does not, of course, mean universal education at that level because large numbers of above-age entering and repeating students may be included in the enrolled student population.

2 However, the much greater enrollment of boys in religious schools complicates the assessment of gender balance in Arab States, as enrollments in a religious school are included in UIS statistics only when the school provides a full state-certified curriculum.

3 All discussions of absolute costs and benefits in this chapter and in Chapter 8 use constant 2000 dollars.

4 Discount rates are roughly linked to economic growth and therefore to real returns to investment. Because the economic growth rates of these regions have exceeded global averages in recent years, even a discount rate of 5 percent might be reasonable.

5 Recall that Bruns, Mingat, and Rakotomalala were estimating costs that would be required if UPE were to be attained by 2015.

6 In 2007, the World Bank moved India from its low-income category, where it was at the time of the CMH study, to its lower middle-income category. For this comparative analysis, we added it back into the low-income group.

7 For further context, UNESCO (2007a: 42) reported that the actual level of support via foreign assistance for education by the OECD and other international organizations doubled from $1.3 billion to $3.3 billion (in constant 2004 currency) between 1999 and 2004.