

$f(x) = x - 1 + g(x)$
 $y) f =]2; +\infty[$
 5) limites aux bornes.
 $x + 2 > 0$
 $x > -2$
 $\lim_{x \rightarrow +\infty} f(x) = \lim_{x \rightarrow +\infty} x - 1 + \ln \frac{x-2}{x+2} = +\infty$
 $\lim_{x \rightarrow -2^+} f(x) = \lim_{x \rightarrow -2^+} x - 1 + \ln \frac{x-2}{x+2} = +\infty$
 do $(\mathcal{D}) : x = 2$ est asym
 le $a(\mathcal{D})$
 $f(x) = \frac{x}{x-4}$

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C H A P T E R 3

Post-primary levels and enrolment dynamics¹

Focussing on Universal Primary Education has partly overshadowed structured thinking on secondary education; now, seven years on from Dakar 2000, due to the significant progress in primary completion registered by the African countries, there is a question mark on the future of these children, and interrogations, as to the relevance for them to continue on in large numbers into general and technical secondary education. What is the current situation of post-primary education? Are growth dynamics in secondary enrolments cause for concern? This chapter intends to address these issues by putting the accent on the wide diversity of situations throughout the continent; it therefore promotes sector-wide policies in line with national contexts.

1 NB: only countries, for which data is available, subsequent to the 2003/04 school year, are taken into account in this chapter. Angola, Gabon, Guinea-Bissau, Equatorial Guinea, Liberia, Libya, Democratic Republic of Congo, Seychelles, Somalia and Zimbabwe are therefore excluded from most analysis.

Chapter 2 illustrated the undeniable progress made by Africa in terms of primary enrolment, even though some doubts may subsist regarding the capacity of a still significant number of countries to achieve primary education completion for all by 2015. The progress made is therefore very encouraging, but these dynamics do give rise to questions as to what will become of the pupils completing primary education today, questions which may have been overshadowed by the priority granted to UPE (a priority which is obviously necessary and which must continue in those countries still far from the goal).

It is therefore very necessary to give consideration to post-primary education and, firstly, to look into the current development of these levels of education and their dynamics. What type of education is provided to children completing primary education today and what proportion of children continue their schooling? What is the level of development of post-primary education? Do the fast development of primary education and the progress made in primary completion generate every increasing flow of pupils entering secondary education? Is the impression of a sudden massive arrival of pupils in secondary education founded?

The first section of this chapter will outline the situation of post-primary education, looking at coverage, flows and internal effectiveness of the different levels without neglecting the issue of gender disparities or teaching conditions. The second section will analyze post-primary dynamics by giving consideration essentially to general secondary education, in order to discover if there is growing pressure to enter this sub-sector and to what extent this results from the expansion of primary education.

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1. Current status: many different situations throughout the continent

1.1 Post-primary coverage

Post-primary education refers to three types and levels of education; these are general secondary, technical and vocational education and training (TVET), and tertiary education. This section will examine schooling at each of these levels, data permitting.

1.1.1 General secondary: situations ranging from very marginal access to almost universal access

Institutional aspects

Each country has its own education system organization. In the previous chapter, among the differences already noted in primary education, there was duration. General secondary education is often longer than primary education and broken down into two levels, lower and upper secondary, resulting in an even greater number of configurations.

With the exception of Ethiopia, Kenya and Malawi², to be handled separately (see box 3.1), general secondary education consists in two levels everywhere, each level varying in duration from 2 to 4 years. Table 3.1 provides a distribution of the different countries according to the duration of each secondary level.

Table 3.1: Breakdown of countries as to the duration of each level of general secondary education

		Duration of lower secondary		
		2 years	3 years	4 years
Duration of upper secondary	2 years		Botswana, Lesotho, Mozambique, Namibia, Swaziland	Uganda, U.R. of Tanzania
	3 years	South Africa, Sao Tome and Principe, Sudan, Zambia	Algeria, Egypt, Gambia, Ghana, Mali, Morocco, Nigeria, Sierra Leone	Benin, Burkina Faso, Burundi, Cameroon, Comoros, Congo, Côte d'Ivoire, Djibouti, Guinea, Madagascar, Mauritania, Niger, CAR, Senegal, Chad, Togo
	4 years	Cape Verde	Eritrea, Mauritius, Tunisia	

Source: Authors' calculations based on UIS data

Enrolments

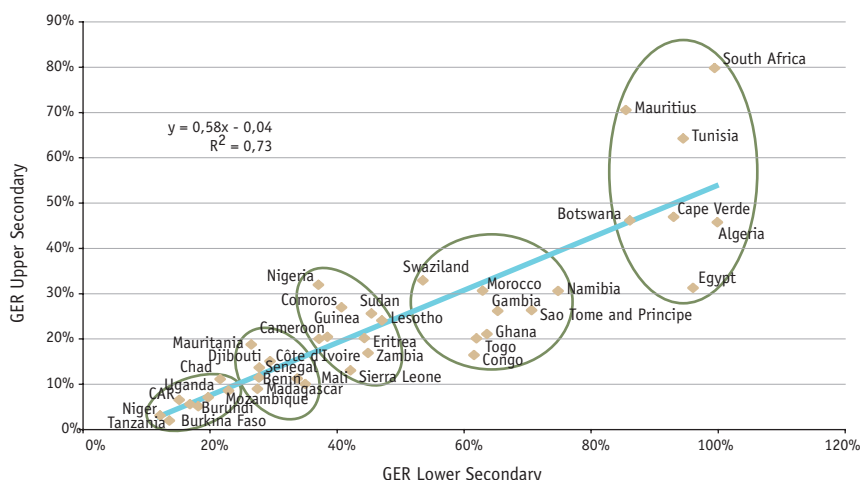
In 2005 in Africa, one out of two children on average³ has access to lower secondary education and more than one out of three completed that level, whilst one out of four children reaches upper secondary education. The average gross enrolment rate (GER) in Africa is 49% for lower secondary and 24% for upper secondary, with access rates of 48% and 24% respectively and completion rates of 37% and 17% respectively.

² Ethiopia, Kenya and Malawi have specific structures, which do not allow comparing them with other countries. Indeed, in these three countries, primary education lasts eight years and is followed by secondary education lasting four years (2+2 for Malawi). While the last years of primary education can be put in the same category as lower secondary education curricula-wise, the fact that the eight years are incorporated in one course of education and so in a single school produces very different transition mechanisms and makes comparison delicate.

³ Country averages.

This situation conceals huge disparities: graph 3.1 shows the cloud of points for 39 countries according to the GER in the two levels of general secondary education. The correlation between the developments of the two levels is obvious, with consistently less coverage in upper secondary than in lower secondary.

Graph 3.1: GER in the two levels of secondary education in 2004/05 (or closest year)



Source: Authors' calculations based on sectoral analysis and UIS data

According to the levels of GER, five more or less homogeneous groups can be differentiated:

- Group 1: very low development of secondary education (Burkina Faso, Burundi, Mozambique, Niger, Uganda, CAR, Tanzania and Chad)

All these countries are characterized by the low development of their secondary education: on average, one in five children have access to this level of education and under one in 20 complete upper secondary education. The GERs are very low, between 12% and 25% for lower secondary and 2% and 11% for upper secondary : they result from particularly low access rates and very low survival rates (under 50%), with the exception of Mozambique and Uganda.

	Lower Sec.	Upper Sec.
GER	18%	6%
Access	20%	6%
Completion	10%	4%

- Group 2: low development of secondary education (Benin, Côte d'Ivoire, Djibouti, Madagascar, Mali, Mauritania and Senegal)

The second group is made up of countries with a low development of secondary education but with access and survival rates 10 points higher than group 1 in lower secondary education and twice as high in upper secondary. One child in every three has access to lower secondary education and survival is better overall than in group 1 (two-thirds of pupils entering lower secondary education complete that level).

	Lower Sec.	Upper Sec.
GER	30%	13%
Access	31%	12%
Completion	20%	10%

- Group 3: moderate development of secondary education (Cameroon, Comoros, Eritrea, Guinea, Lesotho, Nigeria, Sierra Leone, Sudan and Zambia)

The third group includes countries where secondary education has already taken on a certain importance, with average access and completion rates 10 points higher than the previous category. In all cases, access rates to lower secondary are around 40%, but development of upper secondary varies considerably, with GERs between 13% for Sierra Leone and 32% for Nigeria.

	Lower Sec.	Upper Sec.
GER	42%	22%
Access	43%	22%
Completion	33%	19%

- Group 4: fairly well developed secondary education, especially lower secondary (Congo, Gambia, Ghana, Morocco, Namibia, Sao Tome and Principe, Swaziland and Togo)

This group comprises countries where over one child out of two has access to secondary education. When compared to lower secondary, upper secondary is little developed in that group, with the exception of Swaziland : GERs and access rates for upper secondary are very close to those in the previous group, while values for lower secondary are considerably higher.

	Lower Sec.	Upper Sec.
GER	64%	26%
Access	63%	26%
Completion	46%	19%

- Group 5: highly developed secondary education (South Africa, Algeria, Botswana, Cape Verde, Egypt, Mauritius and Tunisia)

The last group is clearly apart from the other countries, with a GER close to 100% in lower secondary. However, there are major disparities in the development of upper secondary, with, on one hand, a high development of this level of education in South Africa, Tunisia and Mauritius, and, on the other hand, four countries where upper secondary GERs and access rates are under 50%.

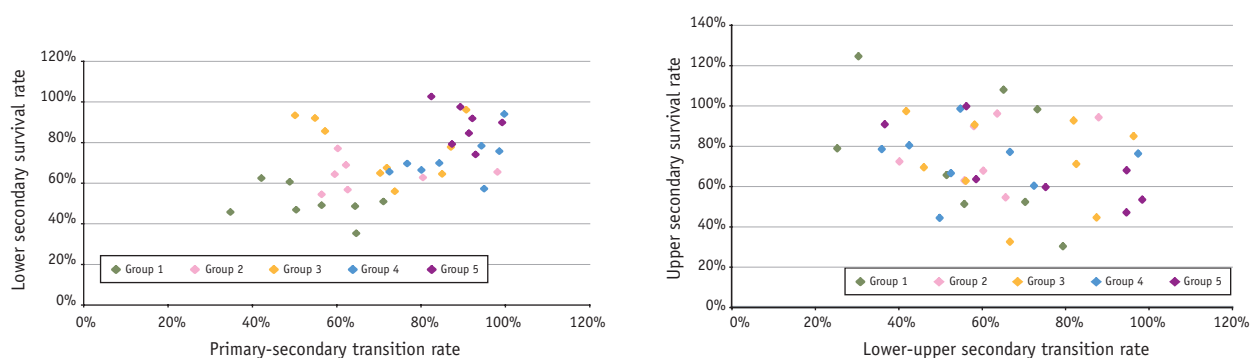
	Lower Sec.	Upper Sec.
GER	94%	55%
Access	88%	57%
Completion	78%	37%

Pupil flows

The previous classification, while giving a good indication of disparities in terms of GER and access to secondary education, does not give any information on flow indicators and regulation, whether deliberate or not. In fact, no significant correlation is observed either between flow indicators (transition between levels and survival within levels) and stock indicators or between flow indicators themselves. In Zambia, for example, transition between primary education and lower secondary education is low (one in two children completing primary education move on to secondary education) while survival within the level is very high, since virtually all children reaching lower secondary education complete it: this is a typical case of deliberate regulation. On the opposite, in Swaziland, transition between primary and secondary education is universal while survival in secondary education is low (one child in two entering lower secondary education completes that level). In the same way, high transition or survival rates do not necessarily go along with high access rates.

Graphs 3.2 and 3.3 indicate transition rates and survival rates for each level of secondary education in 2005, and the group to which the country belongs.

Graph 3.2 and 3.3: Transition and survival rates in lower and upper general secondary education in 2004/05 (or closest year)



Source: Authors' calculations based on sector analysis and UIS data

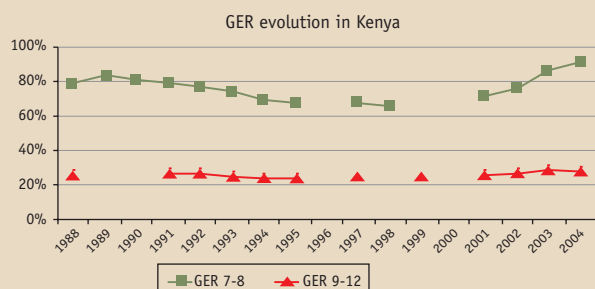
While some coherence can be seen between the two flow indicators (transition rate and survival rate) and the level of development for lower secondary education (countries in the same group are represented by points more or less close together on graph 3.2), this is not the case for upper secondary. As a result, the typology established, although informing on the different levels of development of the system, masks the extreme variability of transition and survival rates, especially in upper general secondary education.



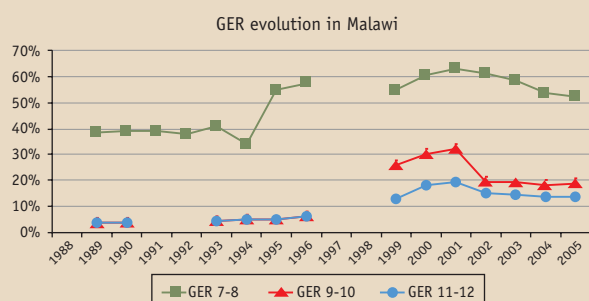
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Box 3.1: Cases of Ethiopia, Kenya and Malawi

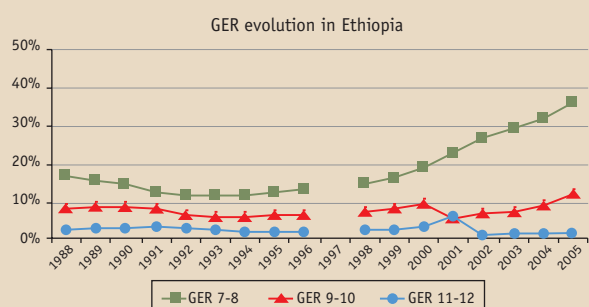
In Ethiopia, Kenya and Malawi, primary education lasts eight years and leads on to a four-year course of secondary education. With regard to curricula and in order to comply with international standards, these eight years are often divided up into 6+2 years, the last two years corresponding to lower secondary. Here, we shall therefore look at schooling in the last two years of primary education and in secondary education. In addition, unlike Kenya, secondary education in Ethiopia and Malawi is subdivided into two levels each lasting two years. Finally, Malawi introduced free primary education in 1994, which directly resulted in a sudden rise in pupil numbers and of enrolment rates is therefore very different in each of the three countries.



In Kenya, the GER in the two last years of primary education declined and then stagnated for the whole 1990 decade, before distinctly rising to reach 90%. As for general secondary education, while there has been a slight increase in the number of pupils since 2000, the GER has stagnated around 28%: since 1988, it remains between 25% and 28%.



The introduction of free primary education in Malawi, in 1994, resulted in a massive pupil influx and a sudden rise in GER in the last two years of primary education; this had repercussions on GER in lower secondary education three years later; the early 2000's marked a general drop in GERs. The question is to know whether this downward trend will be confirmed in the coming years or if it is just the consequence of the sudden increases noted in the mid 1990's.



As for Ethiopia, a regular increase in enrolment rates is observed in the last two years of primary education, but also stagnation, even a fall, in these rates in the four years of secondary education, levelling off at 15% and 2%: the increase in primary enrolment has therefore not resulted in acceleration in access to secondary education.

Finally, the development of primary schooling has been very different in each of these three countries but they all show a relative stagnation of schooling in secondary education.

Source: Authors' calculations based on UIS and national data

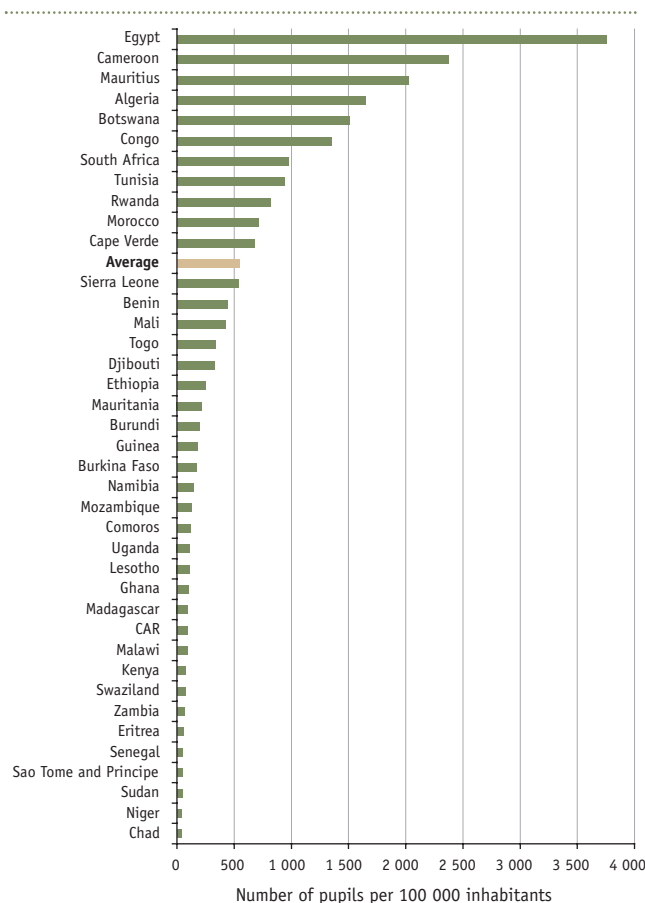
Repetition, practised in very different ways

The issue of repetition is often raised at primary school level. The different studies made on this subject show that it curbs UPE by encouraging dropping out. Repetition is both costly and very much contested in terms of educational effectiveness. It has been analyzed much less in secondary education although the stakes are just as important. Therefore, in order to report on the internal effectiveness of African countries in post-primary education, an evaluation of the scope of repetition in secondary education seems appropriate.

Repetition practices in secondary education vary greatly: in 2004/05, the percentage of repeaters extended, in lower secondary education, from under 1% (Botswana) to over 34% (Sao Tome and Principe), and in upper secondary education from under 1% (Namibia, Tanzania and Botswana) to 31% (Sao Tome and Principe).

Generally speaking, several countries (Algeria, Benin, Burkina Faso, Burundi, Cameroon, Cape Verde, CAR, Congo and Chad) still had a high percentage of repeaters in 2004/05 (over 20%), reducing their capacity to receive a higher number of pupils. Indeed, with a given budget constraint, repeaters fill places at the expense of new entrants, entailing a reallocation of expenditure in order to face up to classroom over-enrolment and needs in material, human and financial resources.

Graph 3.4: TVET coverage in 2004/05 (or closest year)



1.1.2 Technical and vocational education and training (TVET): very different policy choices

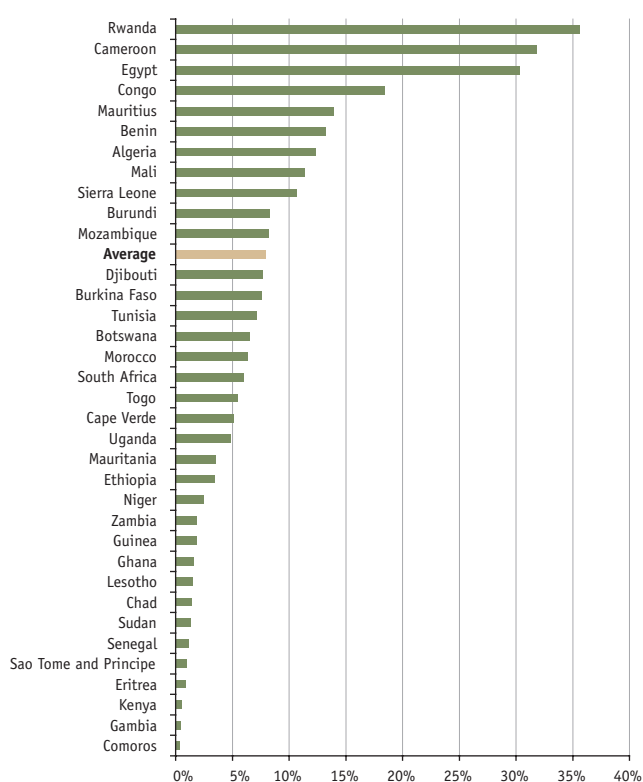
However, at continent level, taking the weighted average per the countries' demographic weight, coverage rises to 871 pupils per 100 000 inhabitants. The difference here reveals the variety of situations observed between countries where recent data is available. Some countries have less than 100 pupils in TVET for 100 000 inhabitants (Chad, Niger, Sudan, Sao Tome and Principe, Senegal and Eritrea) while others have over 1 000 pupils (Congo, Botswana, Algeria, Mauritius, Cameroon and Egypt).

Source: Authors' calculations based on sector analysis and UIS data

TVET coverage results from a policy choice to give more or less importance to this secondary education sub-sector; it is therefore important to complete the earlier description by examining the share represented by TVET at secondary level for each country. The country average is 8% but at the level of the continent, 14% of pupils enrolled in secondary education are in technical and vocational sections. The share of technical and vocational pupils varies widely, reflecting very different priorities granted to this type of education: while not exceeding 2% in ten countries (Comoros, Sao Tome and Principe, Kenya, Eritrea, Sudan, Senegal, Ghana, Guinea, Zambia and Namibia), it is over 30% in Egypt, Cameroon and Rwanda, where it reaches 36%.

Graph 3.5 shows, for countries where information is available, the variety of situations observed as to the share of TVET pupils in secondary education in 2004/05.

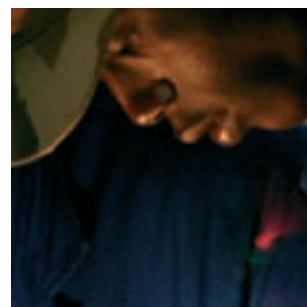
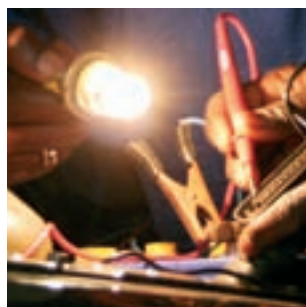
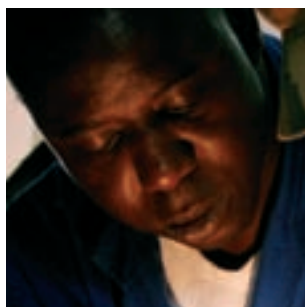
Graph 3.5: Share of TVET pupils in secondary education for 2004/05 (or closest year)



There is no clear relationship between the development of general secondary education and the share of technical and vocational secondary education. Some countries may have a fairly high (Ghana) or high (Egypt) general secondary GER and a low (Ghana) or high (Egypt) share of TVET; on the contrary, some countries where general secondary education is not very well developed may have a high (Benin) or low (Senegal) share of TVET. This highlights the independence of these two sub-sectors, which can occupy very different places in the elaboration of sectoral strategies depending upon the country.

Data available for TVET does not allow refining the analysis in this sub-sector, in particular for the issues of repetition and transition.

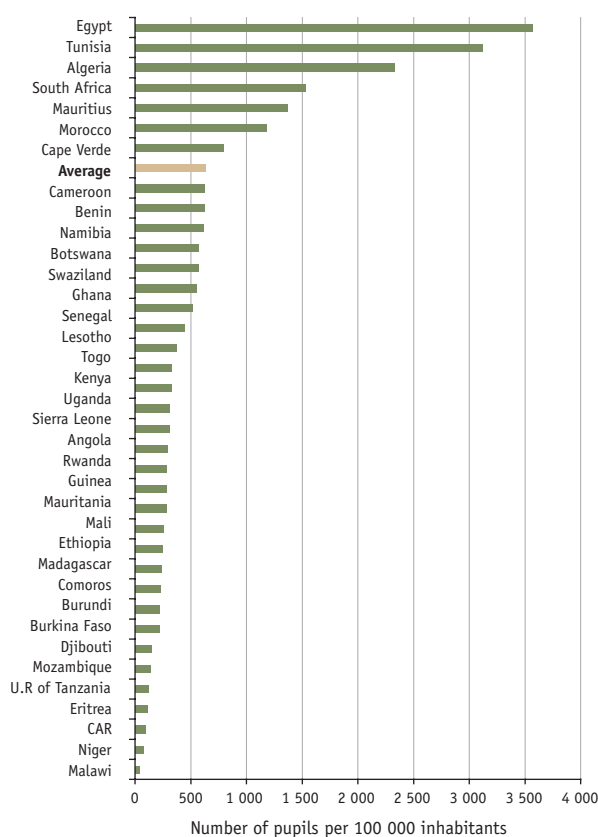
Source: Authors' calculations based on sector analysis and UIS data



1.1.3 Tertiary education

As for TVET, tertiary education coverage is evaluated in numbers of students per 100 000 inhabitants. Students are calculated at 985 per 100 000 African inhabitants; but if North Africa, where tertiary education is much more widely developed than on the rest of the continent, is excluded from that calculation, then the average for sub-Saharan Africa registers at 400 students per 100 000 inhabitants, and there again the averages hide a wide variety of situations depending upon the country. Out of the 37 countries where recent data is available (2004/05 or closest year), 23 count under 500 students per 100 000 inhabitants, 8 countries have between 500 and 1 000 students per 100 000 inhabitants and 6 countries over 1 000. In most African countries, there is therefore little development of tertiary education.

Graph 3.6: Tertiary education coverage in 2004/05 (or closest year)



Source: Authors' calculations based on sector analysis and UIS data

This last observation does not mean that tertiary education is insufficiently developed, but simply that in Africa, there are relatively few students; the relevance of more extensive tertiary education will be examined further in chapter 7.

The lack of finer data does not enable more detailed information on these observations, concerning, for example, subjects studied (science, arts) or type of institution (school, university). This is unfortunate as one of the characteristics of tertiary education, as opposed to primary education, and to a lesser extent general secondary, is that it is protean: tertiary education covers many different situations which cannot be apprehended by a simple quantitative description.



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Thus in 2004/05, there was a large variety of situations concerning the development of post-primary education whether in general secondary, TVET or tertiary education and it is impossible to generalize on these levels of education in Africa. The following section strives to analyze gender disparities in these levels of education.

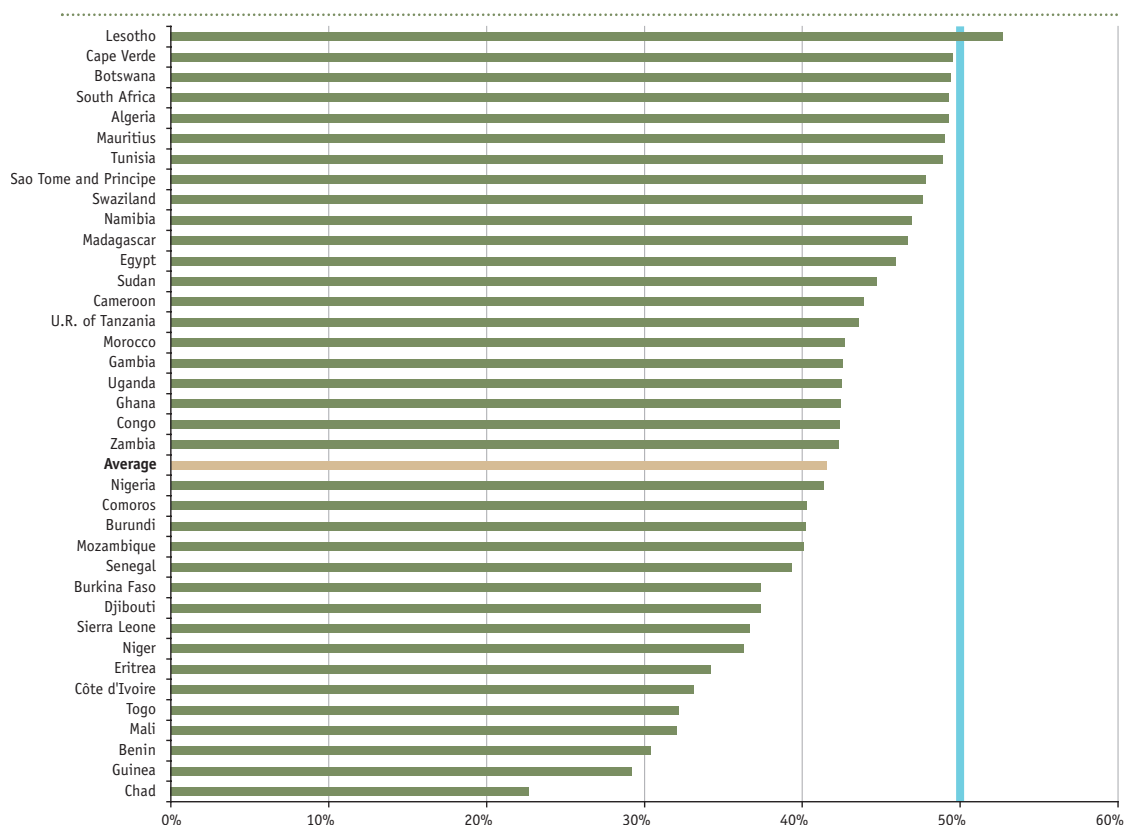
1.2 Gender disparities are still significant

Generally speaking, in the same way as there are still well-known disparities between girls and boys in primary education, girls are in the minority in post-primary education.

All over Africa, girls represent less than half (45% on average) of the pupils in general secondary education. There again, there are profound differences: the share of girls in general secondary education extends from 24% in Chad to over 55% in Lesotho.

Graph 3.7 illustrates this diversity. In five countries, there are twice as few girls as boys whereas in nine countries there are more girls than boys.

Graph 3.7: Share of girls in general secondary education in 2004/05 (or closest year)



Source: Authors' calculations based on sector analysis and UIS data

It is important to underline that, while there is some relationship between the scope of the disparities and the development of secondary education, the correlation is far from perfect. In countries where general secondary education is highly developed, no disparity to the disadvantage of girls is noted, on the contrary: for eight countries with a GER in secondary education of over 60%, the share of girls is equal to or over 50%. In countries where secondary education is less extensively developed, a great variety of situations exists. The most striking example is no doubt that of Madagascar and Chad: while they have very similar secondary GERs (18% and 20% respectively), the share of girls is 50% in Madagascar compared to 24% in Chad.

In TVET, the share of girls is slightly lower and equal to 42%. It should be borne in mind that the share of girls in this level of education will very much depend on the courses of study on offer. Some courses of study may be designed more for females and others more for males: the diversity of what is on offer may thus explain to some extent why situations are extremely varied. In some countries, there are five to ten times fewer girls than boys (Comoros and Zambia) and in others there are just as many, even more (Burkina Faso, Lesotho and Ghana). Even so, it should be highlighted that girls are less numerous than boys in the great majority of countries.

In tertiary education, girls represent 40% (simple average) to 44% (weighted average) of the total number of students. For this level of education, the situation is more or less the same as it is for general education, although much more accentuated. Countries with few girls in tertiary education are the ones with an imbalance already in secondary education (Chad and Eritrea), just as parity is maintained in countries having achieved it in secondary education. Out of 31 countries where gender data is available for tertiary education, 12 countries show twice as few female students as male students, while seven countries show more.

In general, gender inequalities are more pronounced the higher the level of education, since they are accentuated between the two secondary levels (45% to 42% simple average), then between secondary and tertiary education (42% to 40% simple average). On the opposite, although gender inequalities in secondary education are high in many African countries, analysis of the evolution in these disparities since 2000 can lead to relative optimism. On simple average, the share of girls in general secondary education has risen from 42.5% to 44% and in almost all countries, the share of girls has stagnated or slightly increased, with the notable exception of Eritrea (and some countries where the share of girls was and remains higher than 50%).



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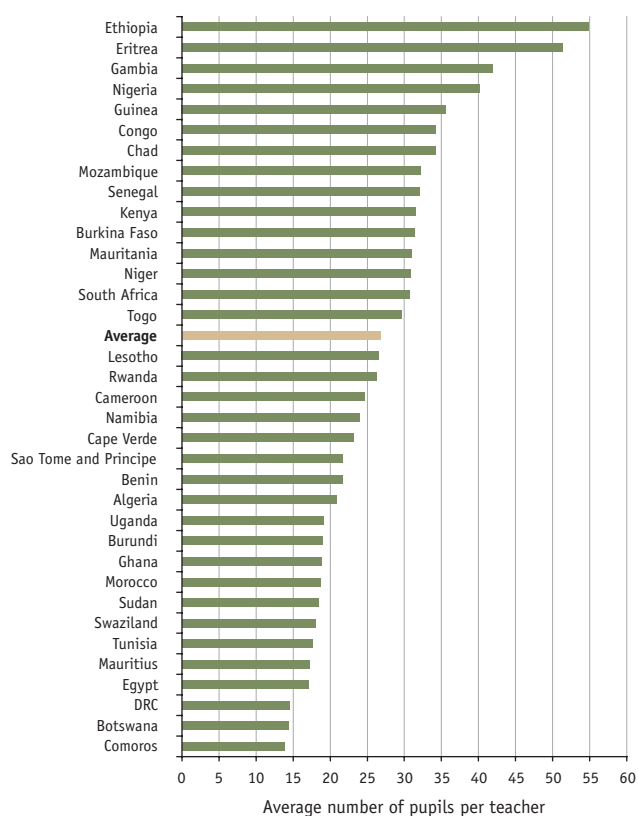
1.3 Pupil-teacher ratios

This section will look at pupil-teacher ratios for 2004/05 in secondary education (general and technical)⁴ and in tertiary education, in order to understand what the countries' policies are in terms of allocation of human resources.

Pupil-teacher ratio is to be understood as the number of pupils per teacher. Contrary to primary education where this indicator is interpreted without ambiguity, since each pupil has only one teacher, there will be question of more reserve here. Indeed, the indicator that could inform directly on teaching conditions in post-primary education would be the ratio of pupils per group of teachers; however, this indicator is only available for a limited number of African countries. This said, the pupil-teacher ratio does provide useful information on teaching conditions in post-primary education, particularly as it shows how the countries have managed the increase in post-primary pupil numbers at human resources level.

Graph 3.8 indicates the pupil-teacher ratios in secondary education.

Graph 3.8: Pupil-teacher ratio in secondary education (general and TVET) in 2004/05 (or closest year)



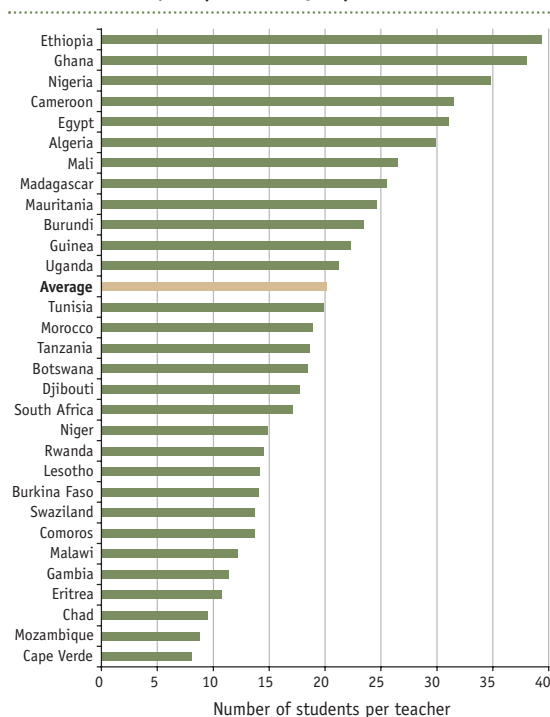
Graph 3.8 shows the huge difference in pupil-teacher policies in secondary education in Africa. Thus, countries like Comoros and Botswana have less than 15 pupils per teacher while Eritrea and Ethiopia have over 50. The average for the countries, taken as a whole, is around 27 pupils per teacher.

Source: Authors' calculations based on sector analysis and UIS data

⁴ Data available does not make it possible to separate general secondary from TVET.

Graph 3.9 indicates the student-teacher ratios in tertiary education in 2004/05 for several African countries

Graph 3.9: Student-teacher ratio in tertiary education in 2004/05 (or closest year)



Significant differences can also be seen in student-teacher ratios in tertiary education: thus, Cape Verde, Mozambique and Chad have student-teacher ratios lower than 10 whilst Egypt, Cameroon, Nigeria, Ghana and Ethiopia have ratios of over 30. The average for the countries presented, as a whole, is around 20 students per teacher.

Source: Authors' calculations based on sector analysis and UIS data

Analysis of post-primary education in 2004/05 (or closest year) shows that there are strong differences on the African continent, both in terms of coverage, and also in terms of educational policy choices illustrated by the share of TVET in secondary education as a whole and the pupil-teacher ratios in the different types and levels of education. The following section will deal with growth dynamics for the post-primary levels, placing the accent on the evolution of general secondary education to see if increased pressure has been noted at the entrance to secondary education as a result of UPE.



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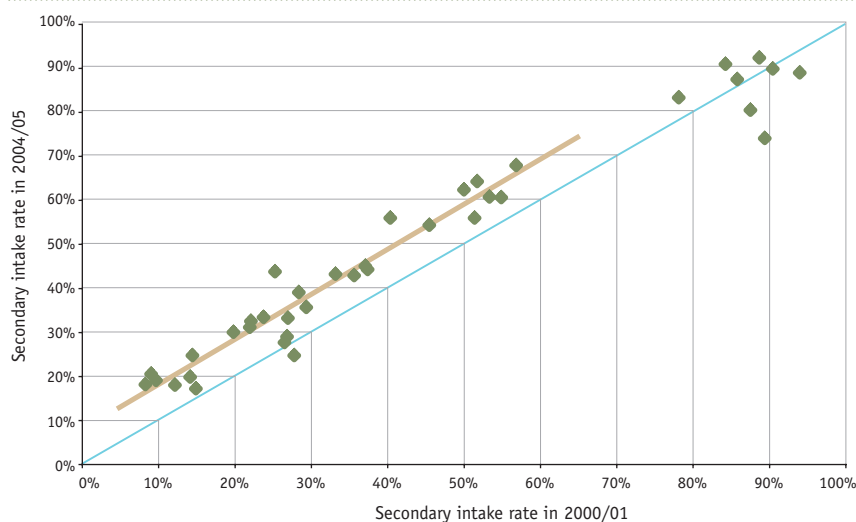
2. Enrolment dynamics at work⁵

2.1 How has post-primary education developed since 2000?

2.1.1 General secondary education

In 2000, GERs⁶ in lower and upper general secondary education were 43% and 20%: four years after, these rates have risen to 49% and 24% respectively. It is interesting to note that the increase in lower secondary arises from a large increase in access, in almost all countries, except for those with an already high access rate (South Africa, Namibia, Mauritius and Uganda). Graph 3.10 indicates access rates in 2000/01 and 2004/05 for lower secondary education.

Graph 3.10: Access rates in 2000/01 and 2004/05 to lower secondary education (or closest years)



Source: Authors' calculations based on sector analysis and UIS data

It clearly appears on the graph that if the eight countries⁷ with a high access rate in 2000/01 (over 70%) are excluded, then the access rate to lower secondary education has increased by around 10% for the countries as a whole, whatever the starting point. This represents a rapid increase, perhaps voluntary perhaps not, and which can therefore give rise to questioning: the rest of this chapter will try to reveal whether this increase has been more rapid since 2000.

5 Nigeria is not taken into account in this section, as data for around 2000 is not available.

6 Average per country.

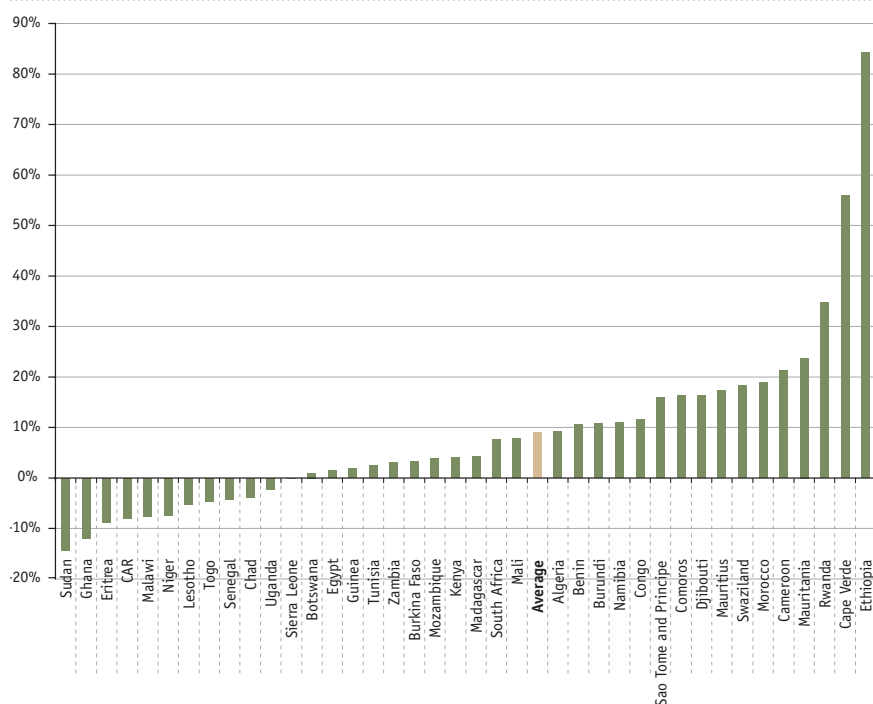
7 Algeria, Botswana, Cape Verde, Egypt, Mauritius, Namibia and South Africa.

2.1.2 Technical and vocational education and training

TVET coverage has increased in Africa: the average for the countries as a whole⁸ rose from 402 to 549 pupils per 100 000 inhabitants between 2000/01 and 2004/05, i.e. an increase of 27% on the period and an average annual increase of 9%.

Unlike general secondary education, where there is an almost general increase, the development of TVET varies greatly from one country to another as shown in graph 3.11, revealing a great diversity in policy choices for this sub-sector between 2000/01 and 2004/05. While coverage has fallen in some countries (e.g. Ghana), it has progressed considerably in other countries where average annual rates of increase in coverage have exceeded 20%: this is the case for Cameroon (21%), Mauritania (24%), Rwanda (35%), Cape Verde (56%) and Ethiopia (84%).

Graph 3.11: Average annual rate of increase in TVET coverage between 2000/01 and 2004/05 (or closest years)



Source: Authors' calculations based on sector analysis and UIS data

2.1.3 Tertiary education

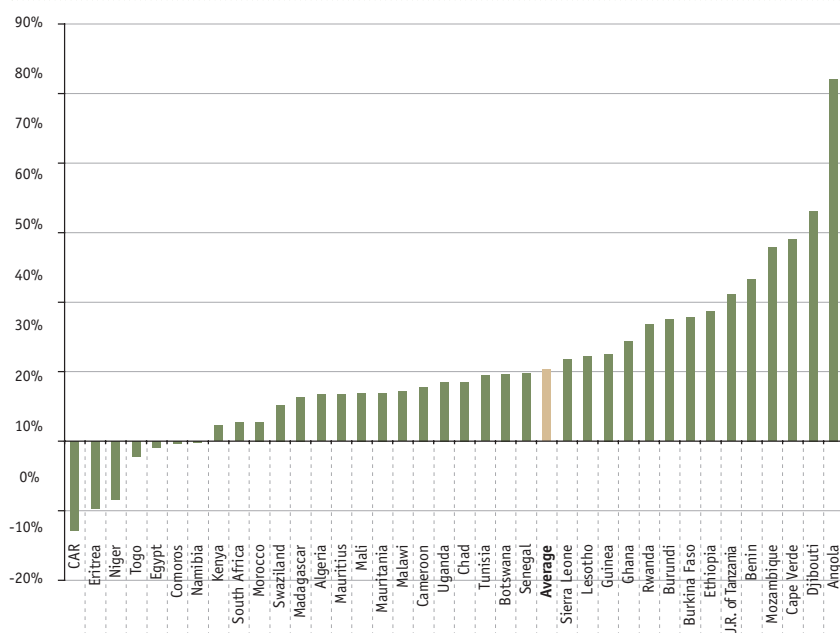
In recent years, tertiary education in Africa has been characterized by a strong expansion: with the average number of students⁹ per 100 000 inhabitants rising from 496 in 2000/01 to 630 in 2004/05, i.e. an average annual increase in tertiary education coverage of 10.3% on the period.

Dynamics in tertiary education vary significantly depending upon the country: there has been, on one hand, a considerable increase in coverage in some countries, particularly in Tanzania, Benin, Mozambique, Cape Verde, Djibouti or Angola and, on the other hand, a decrease in the coverage of others such as CAR, Eritrea, Niger and Togo (cf. graph 3.12).

⁸ Data available for 39 countries represented in graph 3.11.

⁹ Average on the 37 countries represented in graph 3.12.

Graph 3.12: Average annual rate of increase in tertiary education coverage between 2000/01 and 2004/05 (or closest years)



Source: Authors' calculations based on sector analysis and UIS data

2.1.4 Evolution in post-primary pupil-teacher ratios

In terms of unit expenditure in the education sector, the pupil-teacher variable is known to be an adjustment parameter insofar as teacher salaries remain relatively stable. In general, pupil-teacher ratios in secondary and tertiary education deteriorated between 2000/01 and 2004/05: in this respect, there has been an increase in pupil/student numbers in secondary and tertiary education but this has not been accompanied by an adjustment in teacher numbers. For example, in Ethiopia, the GER rose from 21% in 2000/01 to 31.3% in 2004/05 for secondary education and the pupil-teacher ratio increased from 44 to 55 pupils per teacher. For tertiary education, there is the case of Ghana where coverage increased from 323 to 552 students per 100 000 inhabitants between 2000/01 and 2004/05 along with a student teacher ratio which increased from 18 to 39 students per teacher.

However, some exceptions do exist like Burkina Faso where coverage in tertiary education rose from 133 students per 100 000 inhabitants in 2000/01 to 218 students in 2004/05 while improving its student-teacher ratio, which went from 19 to 14 students per teacher.

2.2 Has focalisation on UPE goals mechanically increased the pressure of demand on general secondary education?

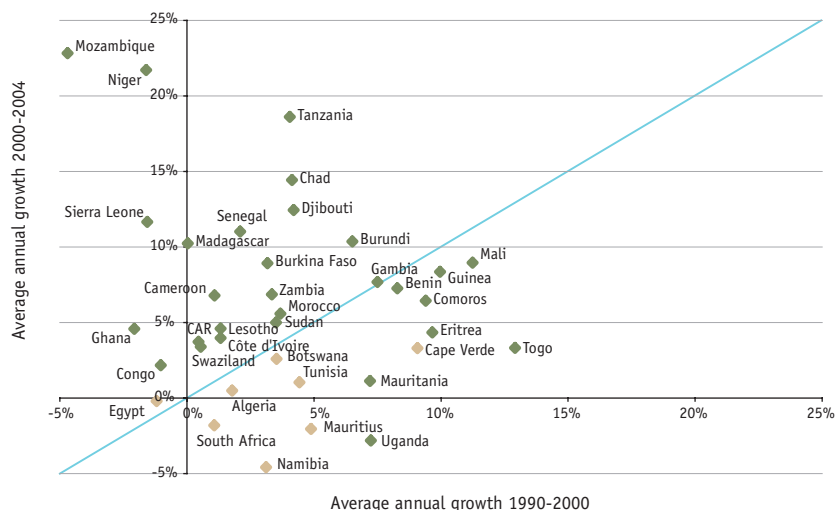
With priority on primary completion goals since 1990 and above all 2000, issues related to secondary education have often been left in the background: the future of pupils after primary completion is an issue, and it should be seen if there is growing pressure on access to secondary education due to efforts related to UPE. In other words, we wonder if those pupils whom we have striven to lead to the last year of primary education constitute a breeding ground for an every-growing demand for general secondary education.

2.2.1 Past trends and recent trends: comparison of growth rates

In order to compare the growth rates between 1990 and 2000 and between 2000 and 2004¹⁰, we have taken the average annual rates of increase which show the average increase in the indicator each year.

Graph 3.13 indicates these average annual growth rates for access to lower secondary education for the two periods. The first bisector represents all the points for which these growth rates are identical in the first and second periods: the points above this line represent countries for which the access rate has increased more rapidly between 2000 and 2004 than between 1990 and 2000; inversely, the points below the line represent countries where the access rate has grown less rapidly in the second period.

Graph 3.13: Average annual rate of increase in access to general secondary education between 1990 and 2000 and between 2000 and 2004



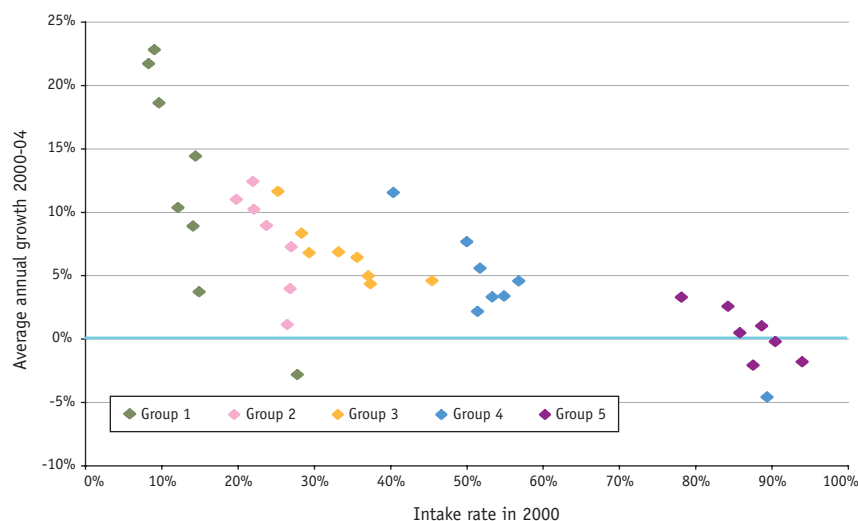
¹⁰ These periods correspond to 1990/91-2000/01 and 2000/01-2004/05 school years.

Source: Authors' calculations based on sector analysis and UIS data

No global acceleration of the growth in access rates to secondary education is noted when initially reading the graph. However, if we set aside the eight countries with an access to secondary education of over 60% in 2000, and consequently limited possibilities of growth in secondary education (Cape Verde, Botswana, Algeria, Mauritius, Tunisia, Namibia, Egypt and South Africa), it is noticed that for many countries, access to secondary education has increased on average more rapidly between 2000 and 2004 than between 1990 and 2000.

In addition, it must be highlighted that among the 22 countries with acceleration in their growth rate, 9 show average annual growth rates of over 10%, which seems very high, especially with regard to the level of development of secondary education in these countries: the cases of Niger, Mozambique, Chad and Tanzania are typical in this respect. These countries were in the first group in the previous section, i.e. they have particularly low levels of development in secondary education, and show very high rates of growth, over 20% per year on average for Niger and Mozambique. There is clearly an issue as to the sustainability of such a pace of expansion for these countries.

Graph 3.14: Access rate to general secondary education in 2000 and average annual growth rate in access between 2000 and 2004



Source: Authors' calculations based on sector analysis and UIS data

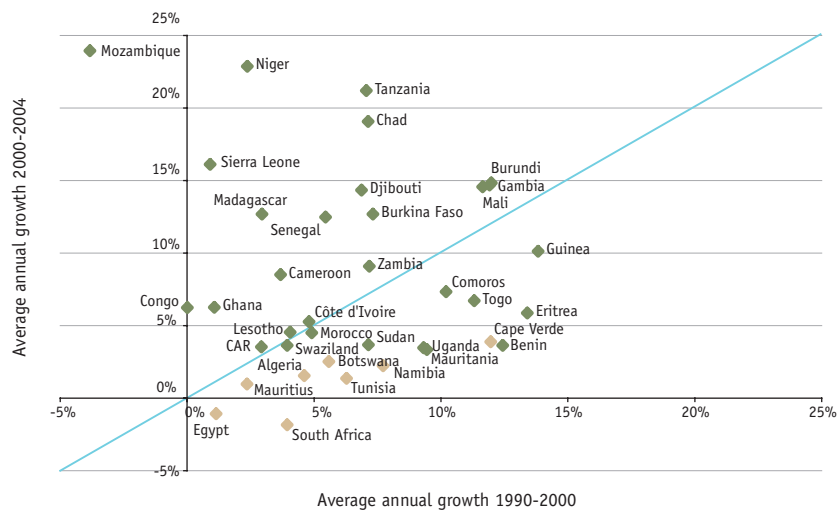
Graph 3.14 illustrates this issue well: it represents the access rate to secondary education in 2000 and the average annual growth rate between 2000 and 2004 for each country differentiating the group the country belonged to in 2004 (defined in 1.1.2 second paragraph). It is clear that the highest growth rates are to be seen amongst countries with the lowest access rates.



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Very much the same observations are made when looking at growth in pupil totals (see graph 3.15): for countries where access to secondary education was already high, the growth rates are low and often lower than those observed over the 1990-2000 period. For the others, 10 countries show a decrease in the rate of growth in pupil numbers compared to 20 countries where this has increased over the 2000-2004 period. There are even 13 countries with average annual growth rates in pupil numbers of over 10% between 2000 and 2004, and even over 20% for Mozambique, Niger and Tanzania.

Graph 3.15: Average annual rate of increase in pupil numbers in the first grade of general secondary education between 1990 and 2000 and between 2000 and 2004



Source: Authors' calculations based on sector analysis and UIS data

All in all, if only those countries with access of below 60% in 2000 are taken into account, then two-thirds have registered acceleration in growth rates in terms of pupil numbers or of access to secondary education: this is particularly marked for Chad, Niger, Mozambique and United Republic of Tanzania. For around ten countries with access of under 60% in 2000, there has been a slow down in growth rates which remain high in spite of everything. The following section attempts to differentiate the different paces of growth by studying the mechanical effects involved in the growth in pupil numbers and in access rates.

2.2.2 Breakdown: where does the growth observed in access to lower secondary education come from?

Before gaining access to secondary education, a pupil must have entered primary school, completed his/her primary schooling and moved from primary to secondary education: access to secondary education therefore results from three factors, i.e. access to primary, survival in primary and transition between primary and secondary education. Here, we shall attempt to provide the breakdown of growth in access rates to secondary education as the sum of the evolution of these three components.

The following box indicates the method used to arrive at such a breakdown.

Box 3.2: Breakdown by log-linearization of the growth observed in access to lower secondary education

When taking into consideration the access rates and completion rates of the different levels of education (primary, lower secondary and upper secondary), the following relationships can be established:

The access and completion rates are noted AR and CR respectively, indexed by the different levels, and the apparent survival and transition rates SR and TR respectively.

$$CR_{prim}^t = AR_{prim}^t \times SR_{prim}^t$$

$$AR_{LS}^t = CR_{prim}^t \times TR_{prim-LS}^t = AR_{prim}^t \times SR_{prim}^t \times TR_{prim-LS}^t$$

$$CR_{LS}^t = AR_{LS}^t \times SR_{LS}^t = CR_{prim}^t \times TR_{prim-LS}^t \times SR_{LS}^t$$

To express the growth rates between two instants t_1 and t_2 , this will be noted as follows:

$$\frac{AR_{cycle}^{t_2}}{AR_{cycle}^{t_1}} = ar^{t_1-t_2}_{cycle}$$

$$\frac{CR_{cycle}^{t_2}}{CR_{cycle}^{t_1}} = cr^{t_1-t_2}_{cycle}$$

$$\frac{SR_{cycle}^{t_2}}{SR_{cycle}^{t_1}} = sr^{t_1-t_2}_{cycle}$$

$$\frac{TR_{cycle}^{t_2}}{TR_{cycle}^{t_1}} = tr^{t_1-t_2}_{cycle}$$

Consequently, growth in lower secondary access or completion can be broken down in terms corresponding to the growth in primary access, primary survival, transition between primary and secondary and survival in secondary education.

Using the logarithmic function enables breakdown of growth of the interest indicator as a sum of growth of other related indicators.

If we are trying to break down the growth in lower secondary access rates between 2000 and 2004,

i.e. we wish to express $\frac{AR_{LS}^{2004}}{AR_{LS}^{2000}} = ar^{00-04}_{LS}$

This gives:

$$ar^{00-04}_{LS} = \frac{AR_{LS}^{2004}}{AR_{LS}^{2000}} = \frac{AR_{prim}^{2004} \times SR_{prim}^{2004} \times TR_{prim-LS}^{2004}}{AR_{prim}^{2000} \times SR_{prim}^{2000} \times TR_{prim-LS}^{2000}} = ar^{00-04}_{prim} \times sr^{00-04}_{prim} \times tr^{00-04}_{prim-LS}$$

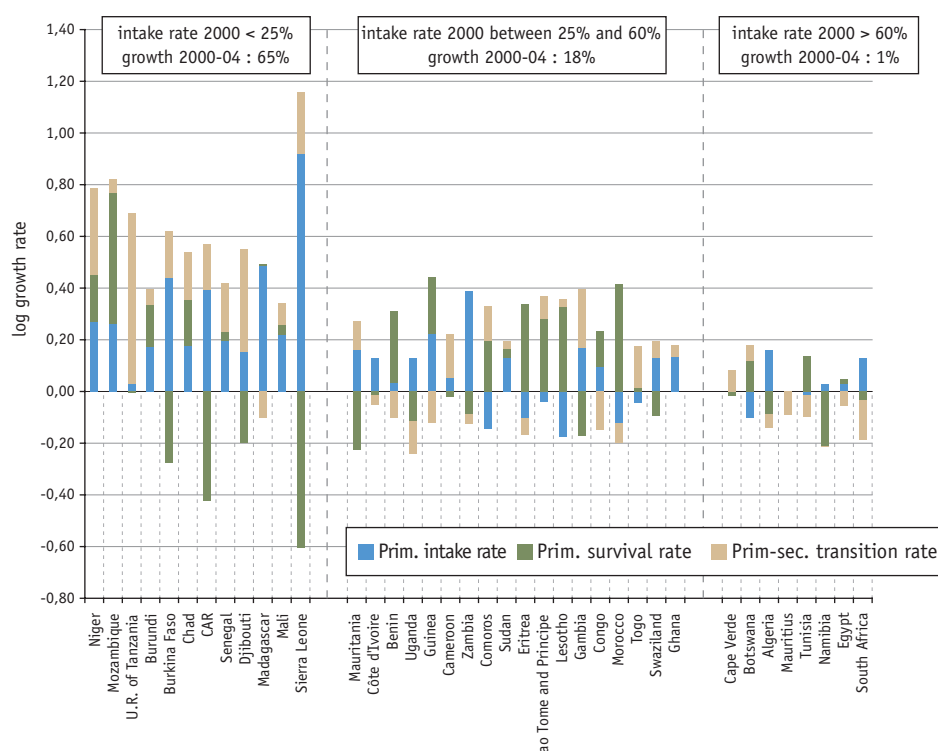
And log-linearization gives:

$$\ln ar^{00-04}_{LS} = \ln ar^{00-04}_{prim} + \ln sr^{00-04}_{prim} + \ln tr^{00-04}_{prim-LS}$$

Thus, the increase observed in secondary access can be considered as the sum of the evolutions in primary access, apparent primary survival and apparent transition between the last grade of primary and the first grade of secondary education.

The evolution observed in secondary access can therefore be considered as the sum of three elements: evolution in primary access, evolution in apparent survival in primary education and evolution of the transition between primary and secondary education. It is difficult to see a trend from these elements common for the countries as a whole; this seems normal in view of the extensive variety of situations highlighted throughout the chapter. On the opposite, if the countries are classified according to access level in 2000, we can distinguish schematically three different groups.

Graph 3.16: Breakdown of the improvement in access to lower secondary education between 2000 and 2004



Source: Authors' calculations based on sector analysis and UIS data

Amongst the countries with an access rate of under 25% in 2000, the rise in access can generally be explained by the combined rise in primary access, primary survival and transition. For most countries, the important rise in primary access is combined with a rise in survival, except for four countries (Burkina Faso, Djibouti and CAR and Sierra Leone which are both post-conflict countries) where survival in primary education has decreased quite significantly and therefore weighs negatively on the evolution of the access rate to secondary education. In the same way, the rise in access to secondary education can be partially explained everywhere by a significant rise in transition (with the exception of Madagascar). Finally, the rise in access to primary education contributes in all cases mechanically to the rise in access to secondary education.

In the countries where access to secondary education was between 25% and 60% in 2000, transition can be seen to have changed little, either upward or downward, and the rise in access to primary education, far from being general, does not contribute very much, on the one hand, to the increase in access to secondary education except in Zambia. On the other hand, the improvement in survival contributes significantly to the evolution in access to secondary education for Benin, Guinea, Comoros, Eritrea, Sao Tome and Principe, Lesotho, Congo and Morocco. It can also be noted that, unlike the countries analyzed above, there is

not an accumulation in most cases (14 countries out of 18) of a rise in primary access and survival: if access increases, survival decreases or vice versa.

For countries where access was over 60% in 2000, it was seen earlier that this had changed little since 2000. This could be explained either by much contrasted developments in primary access, survival and transition or by a stagnation of these three indicators. The latter clearly appears to be the case, since for all these countries where there were already high access rates to secondary education, there has been little progression either upward or downward.

In the end, what do these breakdowns show? Once again, the variety of situations makes it impossible to outline country profile types. However, a number of elements do emerge. Firstly, the highest increases in secondary access are noted in the 12 countries with a low rate of access in 2000, and which had therefore plenty of leeway for making rapid progress; it is also in those countries where the primary access rates have progressed the most since 2000. It is important to underline the fact that in these countries, the rise in access to primary education has not been compensated for by a drop in survival or transition, quite the contrary: all the rates combine and therefore there is an absence of flow regulation. The situation is very different for the other countries where the access rate to secondary education was already a little higher in 2000 : for countries in the second group, it can be noted that the survival rate observed is a determining factor, even if it sometimes moves upward and sometimes downward, and does not enable a specific trend to be defined. In the great majority of cases, it compensates for the rise (or fall) in access to primary education, whilst there is little evolution in transition between primary and secondary education. Finally, for the last group, all the indicators seem to have been stabilized since there are very few variations in the different elements. Without over interpreting the results, the following assumption can be put forward: in cases of low development of secondary education, expansion is rapid and can result in a combined improvement in primary access and survival, and in transition between primary and secondary education. The growth that ensues is much more regulated; and finally, once a certain level has been reached, this results in a stabilization of the indicators.



4. Conclusion

This chapter has shown, throughout, the extent of the diversity in post-primary education in Africa today and the dynamics which surround it. Countries with very marginal access to secondary education, and even more so to tertiary education, go side by side with countries where secondary access is virtually universal, even if in general, these levels are undergoing expansion, whether for general secondary education, technical and vocational education or tertiary education. The extent of this diversity does not make it possible to draw conclusions or make general recommendations; however, it is now possible to answer a number of questions raised at the start of the chapter. For countries with low secondary access, an acceleration of growth rates can generally be noted, both in terms of pupil numbers and access, with average annual growth rates of over 10%. For the other countries, most advanced ones, there does not appear to have been any significant increase in pressure since 2000.

Two points must therefore be highlighted: first of all, there are a number of countries where the strong rise in growth rates observed can give rise to questioning and concern for the future, even more so as these are countries with currently low intake capacity and for which the question of sustainability and the relevance of such a pace must be addressed. Secondly, growth dynamics were already at work and fairly prolonged during the 1990 decade and there are ever-increasing flows of pupils arriving at secondary level. A number of issues emerge from these observations and will be tackled in the following chapters. The continual growth in secondary pupil numbers raises the question as to physical, economic and financial sustainability, especially for some countries. In other words, to what extent can the rates of growth observed today be maintained in the coming years?

In addition, promoting UPE has greatly overshadowed secondary education and it is important to give consideration to the future of pupils completing primary education and to the systems the most adapted to the environment in each country. If this general observation seems to be shared by all today, the great variety of situations observed militates in favour of individual consideration being given to each country, as to the form and content of post-primary education. In this respect, technical and vocational education and training, which has been the subject of renewed interest for the last one or two years, will not be in itself a solution, without in-depth appropriate consideration being given to adapt it to the economic context. Data is lacking at this level as for tertiary education, while these are the two most protean types of education: the wide range of courses of study and special fields enables a high adaptability of these levels of education, which is far from being taken advantage of at the present time, but which also requires much finer analysis than made possible by the current data situation.



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