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Sustainable Educational Development in LICs, LMICs and UMICs

Dancing to an African Rhythm

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Sustainable Educational Development in LICs, LMICs and UMICs

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Introduction

This position paper provides a profile of educational development in Sub-Saharan Africa (SSA). It highlights differences between the Low Income countries (LICs), Low Middle Income Countries (LMICs), and Upper Middle Income Countries (UMICs). The characteristics of the different groups of countries are important to understand in profiling programmes of support that the AEF may develop.

Sub-Saharan Africa is unlike other regions of the developing world. Over 60% of its countries are Low Income Countries (LICs); 30% are Low-Middle-Income Countries (LMICs); and 10% are Upper-Middle-Income Countries (UMICs). More than 65% of out of school primary children are in LICs, and over 70% of the poorest Africans live in LICs. LICs are much poorer than LMICs with an average GDP per capita about one third the size of the average in LMICs. LICs need concessionary finance and grants to support development. LMICs and UMICs can make use of loans providing these do not generate unsustainable debt.

Differences in demography, costs, fiscal efficiency and political will create greatly varying problems of educational financing across SSA. The status of countries as LICs, LMICs and UMICs is critical for the patterns of educational financing that are needed to ensure rights to education are realised and that grants, loans and other instruments to invest in education are fit for purpose. Conventionally concessional development financing of grants and very low interest loans has only been available to LICs, and LMICs and UMICs have been expected to graduate to borrowing from the international capital markets.

Development agencies have positioned themselves in relation to the income levels of potential recipients of development assistance. Thus the Global Partnership for Education (GPE) has historically emphasised that it give grants not loans, and operates only in LICs, not LMICs and UMICs. In contrast the International Finance Facility for Education (IFFEd) intends to focus only on LMICs and to offer interest bearing loans at below market rates. Much bi-lateral aid is in the form of grants to LICs but some is directed at LMICs. Many bi-laterals have means to guarantee loans and extend credit to private sector companies exporting goods and services to countries judged to be at risk of non-accrual or default.

The core issue is how to finance educational development as a public good provided through education systems that are predominantly free at the point of use without unsustainable debt. More than half the population of school age children in LICs, and about a third in LMICs. are in households below the poverty line of USD1.90 a day. In LICs and LMICs most

households below the second quintile of income have little discretionary expenditure. Schools and higher education institutions for these households have to be funded from general taxation and other sources of public income. Charging fees increases the number below the poverty line. Borrowing money to pay recurrent costs can result in high rates of interest and poor value for money.

The proposed AEF should be able to contribute to developing methods of financing and educational delivery, and fiscal reforms, that allow sustainable financing from domestic resources complemented by balanced external assistance that diminishes over time. The most pressing needs for stable and affordable development finance are in the LICs which have the last ability to generate domestic resources. Most grant aid and highly concessional lending through IDA et al is focussed on LICs for the good reason that additional debt is unlikely to be sustainable.

An increasing number of LMICs can borrow on the international markets. Because of their level of national income they lose access to concessional funding from multinational sources and have to borrow at rates that reflect their indebtedness and credit ratings. This is what is supposed to happen as countries develop. Where markets fail the AEF could facilitate loan financing that was more attractive than pure commercial lending.

The AEF will need to set its own priorities and conditionality for loans and grants for LICs, LMICs and UMICs. These need to reflect different levels of educational development, value for money, cost benefit ratios, credit ratings, risks of non-accrual, and political will. The AEF seeks to be inclusive of all member States but will need to prioritise where it directs most resources.

Understanding Differences in Education Financing in LICs, LMICs and UMICs

The dimensions of educational financing problems differ greatly between countries in SSA and from countries in other regions of the world. Global diagnoses and prescriptions are blind to the specificities of African development histories and opportunities. Shortfalls in educational financing are 3% or more in some countries and non-existent in others. A map of recent developments is needed to give the flavour of some of the challenges

LICs in SSA have an average GDP per capita of about $690 (PPP 1,800), LMICs about $2,100 (PPP 4,900), and UMICs about $8,900 (PPP 19,300). LMICs are on average about three times richer than LICs on a per capita basis; UMICs are 12 times richer. The total GDP of all LICs is about $374 billion, the LMICs is $875 billion and the UMICs $422 billion totalling nearly $1.7 trillion.

Financially, Africa's wealth and the resources for education are concentrated in LMICs, and UMICs, and especially the largest and richest LMICs and UMICs. About 54% of Africans live in LICs but the LICs account for only 20% of the GDP of SSA. Only 40% live in LMICs and 6% in UMICs. If Africa is not to become more divided by wealth as it develops it is clear that more efforts are needed to accelerate development in the LICs by supporting environmentally sustainable economic growth.

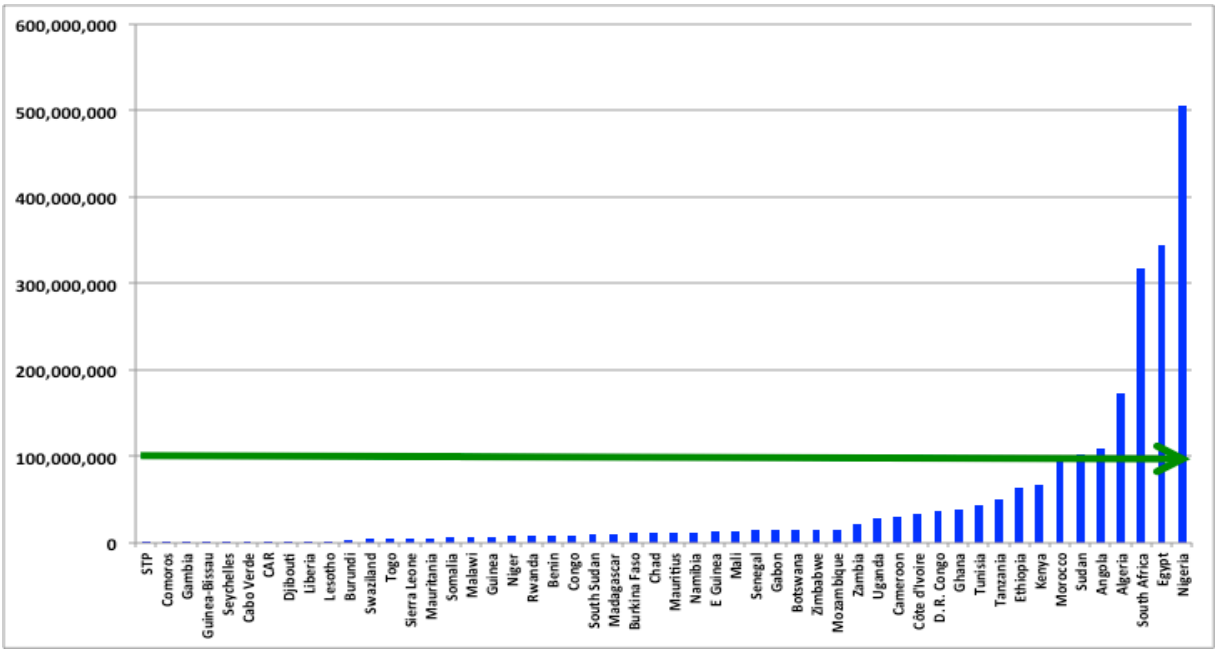
Table 1: GDP/Cap and Allocation to Education

GDP Per Capita	PPP per Capita	Population	Total GDP
$	$	Million	Billion

LICs	**690**	**1,800**	**571**	**374**
LMICs	**2,100**	**4,900**	**419**	**875**
UMICs	**8900**	**19300**	**66**	**422**

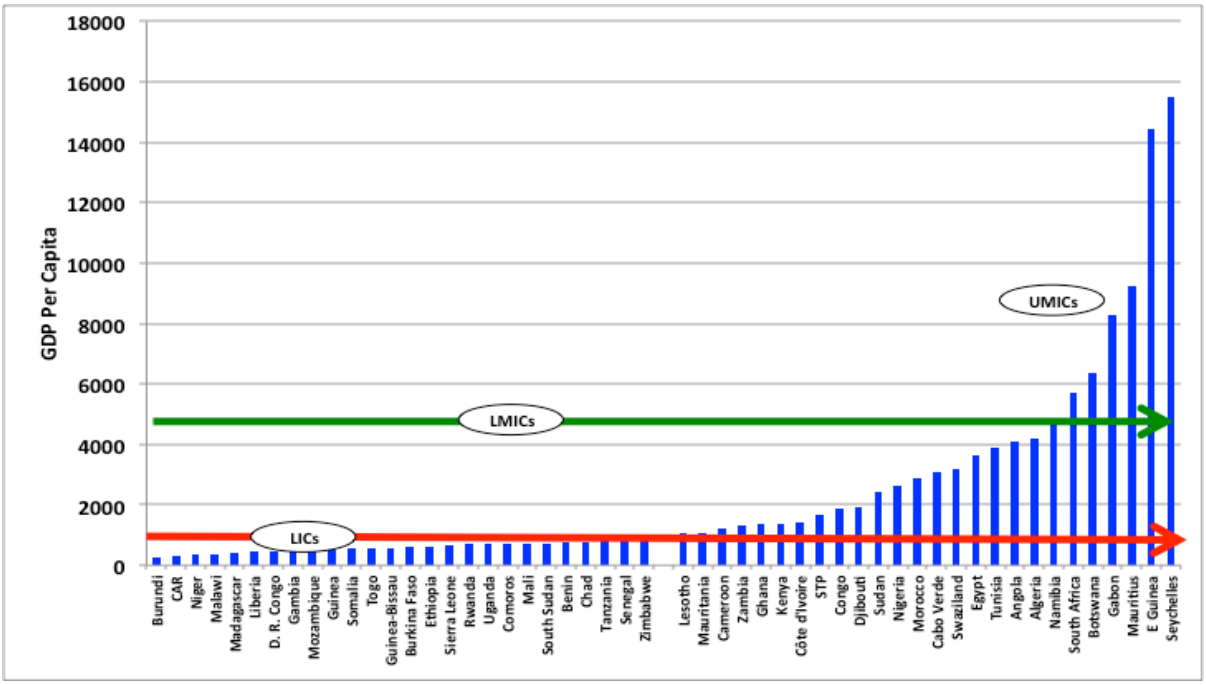
There are seven USD 100 billion economies that account for over 70% of the total of Africa's GDP. About 30% of this total GDP is located in North Africa. This is about 40% of the GDP of the LMICs. About 40% of GDP is located in just three countries in SSA – Nigeria, South Africa and Angola. The next ten economies are from USD 100 billion to USD 20 billion in size. They account for about 10% of Africa's GDP and 37 countries account for the remaining 20% (figure 1).

Figure 1: Total GDP by Country



Half of the countries in SSA Africa have incomes per capita of less than USD 1,000 (figure 2). A further 20 fall below USD 5,000. Fourteen are now Low-Middle-Income Countries. Most of the richest countries are small. All include significant middle classes with relatively high incomes. But even richer countries include poor inhabitants at the lower end of the income distribution.

Figure 2: GDP Per Capita Africa

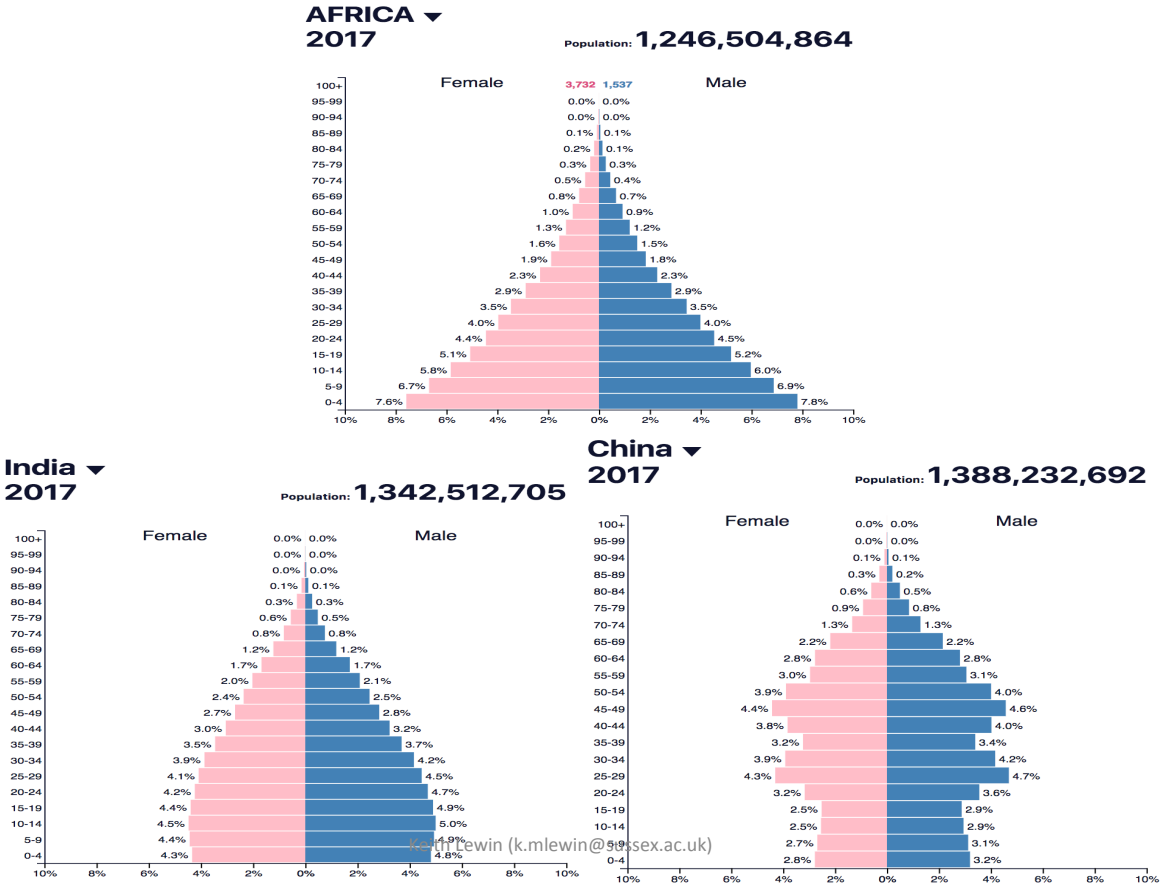


These economic realities are important for the AEF. It means that in terms of domestic resources in Africa, these are concentrated amongst the largest and richest economies. If the AEF is to be endogenously financed, it will need to gather most of its resources from where there is most capacity to finance Pan African initiatives that are African owned. If it is to target the poorest, then it will have to identify where they are living. LMICs and UMICs include many low income households that may not be materially different from those in the middle of the income distribution in LICs.

Demography

Africa is unlike most other parts of the world since its population is still growing rapidly. The average age of the African population is below 25 and in many countries below 20 years old. The comparison of population pyramids is striking. Most countries in sub-Saharan Africa follow the general pattern for the continent with far more people in the youngest age groups. There are some exceptions. South Africa is in transition as are some of the North African countries. By way of comparison, East Asia and Europe have falling populations of children. In China demographic transition has taken place and there are more workers than dependent children. India is changing rapidly and demographic transition has already occurred in the Southern States. Figure 4 illustrates the projected population and underscores the demographic transition.

Figure 3: Population Pyramids



Investment in Education

Government allocations to education average 3.7% of GDP in LICs, 4.6% in LMICs, and 5.5% in UMICs. Thus the relative effort in favour of education is 50% greater in UMICs than LICs. LMICs allocate 24% more to education as a percentage of GDP than do LICs. If this is the result of real constraints on capacity then LICs need more investment in their education systems. If it is the result of weak political will this needs to be addressed before offering concessional financing for education.

These proportions of GDP allocated to education include external assistance to education and general budget support. If aid was not included, the proportion of GDP allocated to education by LICs would fall to below 3%. Where the allocation is so low this should be a subject for enquiry for policy research the AEF could support. Using external assistance to reduce the shortfalls can only be a temporary expedient.

Total government spending for education as a proportion of all government spending in LICs is about 14.1% of, 16.7% for LMICs, and 19% for UMICs. Within this there is a tendency for LMICs to allocate more to secondary and a little less to tertiary as a percentage of their total commitment, and UMICs even more so. LICs need the most assistance in working out how to increase their educational investment effort.

UMICs spend more absolutely and relatively as a proportion of their national budgets. Thus richer countries in Africa do appear to prioritise education more than poorer ones. They also have fewer children per adult and thus can invest much more per child. However, there are large differences in the proportion invested between countries and this is significant in terms of indicating the level of political will to support educational development and extend its reach to the whole population.

Table 2: Percentage GDP and Percentage of the Public Budget on Education

	% GDP Education	% Budget Education
LICs	3.7	14.1
LMICs	4.6	16.7
UMICs	5.5	19.0

Financing education depends on how many students are enrolled. The population of the African LICs is about 570 million, the LMICs about 420 million, and UMICs 66 million. There are therefore 150 million more Africans in LICs than in LMICs. LICs have a younger population with 15.5% being of primary school age compared to 13% in LMICs and about 11% in UMICs. The 0-14 year old population is 44% of the total in LICs, 40% in LMICs and only 31% in UMICs indicating that UMICs are well into a period of demographic transition. Demographic transition has not occurred in most of the LICs and LMICs in SSA.

Child population growth rates are lower in the LMICs (1.4%) and UMICs (1.2%) than in the LICs (2.1%) especially in those with higher GDP per capita. The result of continued high child population growth is that demand for school places will continue to grow rapidly in LICs. Most of these new places needed are at secondary level and above where expansion is made up of population growth in addition to increased access to secondary schools. LICs have the biggest demand side problems and the lowest participation rates.

Out-of-school children are concentrated in LICs. UIS estimate of about 32 million primary age children out of school in Africa. This figure has a high margin of error arising from definitional problems and missing data sets. About 65% of Out of School primary age children recorded appear to be in LICs according to World Bank data. This is probably an under-estimate given that reporting is less comprehensive than in LMICs and UMICs.

Table 3: Population and Out of School Children

	Total Population	Population Growth	Child Population Growth	% Primary Age	Out of School Primary 000
LICs	570	2.7	2.1	15.5	65%
LMICs	420	1.8	1.4	13.2	33%
UMICs	66	1.5	1.2	11.0	2%

LICs, LMICs and UMICs cannot be distinguished by Gross Enrolment Rates (GERs) at primary level. These now average 106%, 100% and 102% respectively. Primary completion rates do differ and average 63% in LICs, 79% in LMICs and over 90% in UMICs indicating that just over half of children are completing primary school on-schedule successfully in

LICs though many may not be learning. At the same time 30% of students are over-age in LICs and 21% over-age in LMICs. Low completion rates are correlated with over age enrolment and progression (Lewin 2011). This core problem of over-age children is widespread and could be subject of interest for the AEF since it relates to subsequent access to TVET and exclusion from STEM opportunities.

GERs for the whole of secondary school average nearly 40% in LICs, 60% in LMICs, and 99% in UMICs. The NER is about 28 for LICs, 45% for LMICs and 84% for UMICs. GERs for Lower Secondary are 60% in LICs, 80% in LMICs and 99% in UMICs. The implication is no more than a quarter of children complete lower secondary in LICs on schedule with appropriate levels of learning achievement in LICs. In LMICs about a half now complete lower secondary. The largest gaps in school enrolment rates between rich and poor are in secondary in LICs. These gaps are much larger than those correlated with gender.

LICs have far fewer students at tertiary level with only 8% GER in LICs compared to 14% in LMICs and 22% in UMICs as illustrated in Table 4. TVET enrolment rates are difficult to compare across countries but are often a small proportion of those enrolled in the mainstream school system at a given level. The AEF should promote interventions that can raise low participation rates in STEM and TVET especially in LICs.

Table 4: Participation in Education

	GER Primary	NER Primary	Primary Completion	GER Secondary	NER Secondary	GER Tertiary
LICs	106	76	63	37	28	8
LMICs	100	80	79	58	45	14
UMICs	102	95	91	99	84	22

2.13 Cost per student is central to financial gaps. Cost per student can be varied unlike the proportion of school-age children in the age group is a short term constant. Surprisingly average costs per student as a percentage of GDP at primary are similar in LICs and LMICs and averages about 13% of GDP per capita as shown inn Table 5. LICS have relatively more expensive secondary school systems than LMICs in terms of cost per student as a percentage of GDP per capita. Tertiary education is much more expensive relative to GDP in LICs. As countries become richer they tend to reduce costs per student as a percentage of GDP at higher levels of education. This may be partly because some of the costs are being transferred to households and tertiary institutions are increasingly likely to charge user fees for services. Managing this process in ways that preserve equity needs evidence based policy that AEF could support.

It is much cheaper to finance school places in US dollar terms in LICs than in LMICs and UMICs. Simply put on average the same dollar would have more than three times the reach in a LIC as in an LMIC at primary level. But it would only have twice the reach at tertiary level because of the much higher relative costs in LICs than in UMICs. A dollar spent on primary education could finance ten times the number of places that it would at higher education level in LICs, and about six times in LMICs.

Table 5: Costs per Student

	Primary Student % GDP/cap	Secondary Student % GDP/cap	Tertiary Student %GDP/cap
LICs	13	24	142
LMICs	13	20	84
UMICs	13	18	26

Working age dependency rates – the proportion of children to working age adults - are nearly 90% in LICs but less than 60% in UMICs. This means that in LICs there are fewer taxpayers per learner and the task of publicly financing education is more difficult. The proportion of those who work in agriculture is over 65% in LICs but less than 30% in UMICs. LICs need more investment in knowledge and skills to climb the value added ladder. LMICs are transitioning into service sector economies with implications for the knowledge and skills that will be most useful.

Youth unemployment rates appear higher amongst UMIC and LMICs than in LICs. This is partly because in higher income countries unemployment begins to be defined in terms of lack of access to modern sector jobs rather than engagement in agricultural livelihoods. Managing the arithmetic of youth unemployment is critical to social stability and growth and analysis is needed to inform policy and investment to enhance social cohesion. The AEF can promote system reforms that match educational outputs to labour market evolution.

Table 6: Employment

	Working Age Dep	Agric Workforce	Unemployment Rate
LICs	88	66	5
LMICs	79	47	11
UMICs	58	27	17

It is clear that in SSA the majority of countries are LICs. This will remain true for the next decade especially if low-income thresholds are adjusted in line with inflation. Eventually real economic growth should result in most LICs becoming LMICs. This depends on LICs adopting strategies to accelerate development and avoiding high levels of debt than can slow growth.

The same amount of external finance can have far more impact in LICs than LMICs all things being equal because costs are much lower. LICs are more likely to need grants or highly concessional forms of financing. LMICs and UMICs can afford to borrow and repay. Some LMICs may need concessionary loans but others, especially the richer LMICs well above the income threshold for transition fro LICs to LMICs should graduate to loans that reflect their improved credit ratings as they become fiscal states.

Demand for Public Finance for Education

A simple algorithm provides an indication of the demand for finance for education (Lewin 2008). It can be used to calculate how much governments spend on their education systems and how much they would need to spend if they were to reach universal enrolment from pre-

school through primary to the end of secondary school, and achieve much higher rates of participation in tertiary institutions.

The resources needed in terms of a percentage of GDP per capita are determined by the desired level of enrolment, the proportion of children of school age, and the costs per student per year. Thus the aggregate recurrent costs of expanding schooling towards target levels of provision (e.g. Gross Enrolment Rate (GER)[1] =100%) can be calculated using the linear equation:

X = GER *A *C where:

X	=	Public expenditure on primary/secondary education as a percentage of GNP
GER	=	Gross Enrolment Ratio
A	=	The proportion of the population of primary/secondary school age
C	=	Public recurrent expenditure on primary/secondary schooling per student as a percentage of GNP per Capita

The assumption of the SDGs and many national education policies is that school GERs will reach universal levels by 2030 or soon after. This can be modelled by targeting GER 105% for all levels of education below tertiary level as the goal which needs to be financed. The first parameter that determines public expenditure – GER - is therefore known.

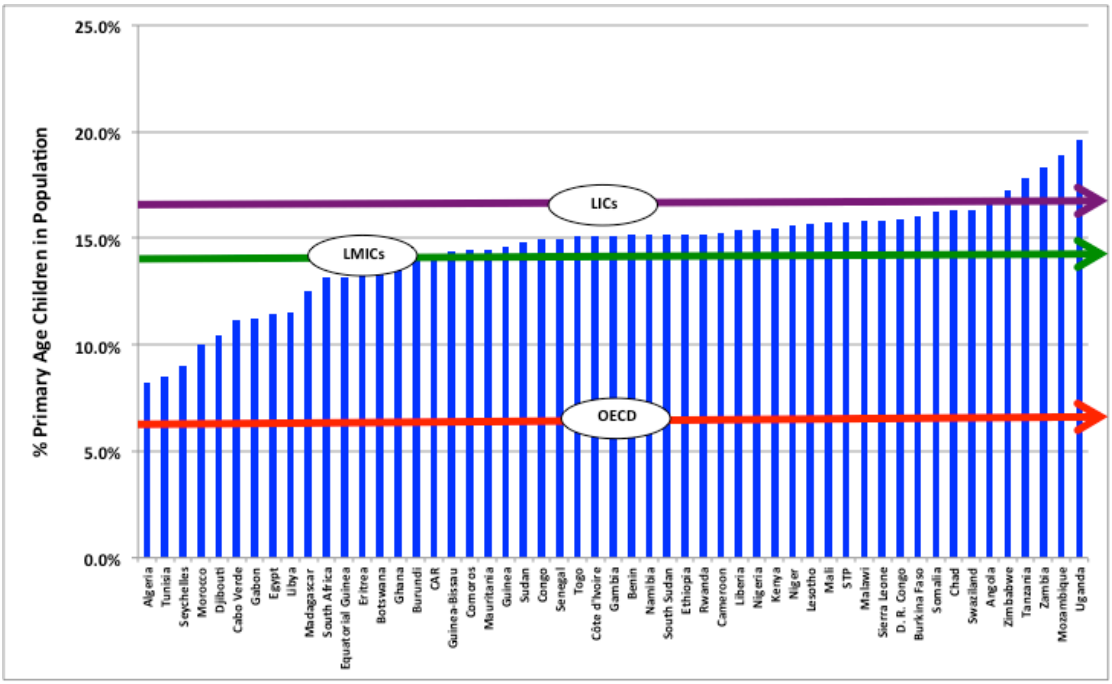
The second parameter is A, the proportion of children of primary school age. This varies from 14% to 20% for the LICs and averages 15.5%. The values of A in LMICs range from 7% to 18% with an average of 14%, with UMICs falling in the 5%-12% range. There is a significant trend for richer countries to have lower values. Where A is below 12% demographic transition to low growth is likely to be taking place. A large value for A makes it difficult to finance universal participation since there are relatively large numbers of children per working adult.

School Age Children

The proportion of school age children – A – is shown in Figure 3. Mauritius, Algeria, Tunisia and Seychelles have less than 10% of the population of primary school age. In contrast Uganda, Mozambique, Zambia, Tanzania and Zimbabwe have more than 15%. The OECD average is less than 6%. All other things equal, these countries need to spend a lower proportion of GDP to universalise enrolment.

Figure 4: Proportion of the Population of Primary School Age

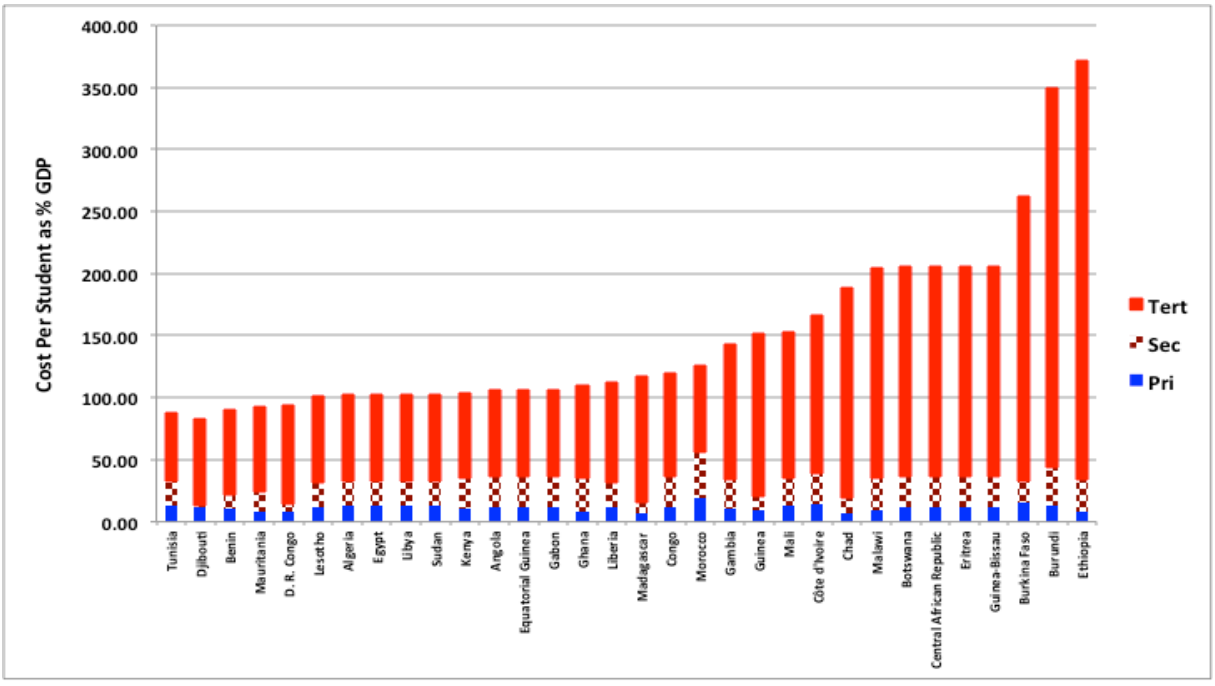
[1] GER = Gross Enrolment Rate. If NER is preferred then a range of assumptions need to be made explicit about entry ages, repetition, and overage enrolment.



Cost per Student

The third component of the estimation of gaps in financing at macro-level relates to costs per child or per student. Data on these costs is uneven and these kinds of costs can vary enormously between levels, institutions at the same level, and over time. The data available allow some national level estimates (Figure 5).

Figure 5: Cost per Student by Level



The costs per student are strikingly greater at tertiary level than at other levels. This means that as tertiary education expands, it will be a high priority to reduce the cost per student as a proportion of GDP. Otherwise tertiary costs will take up most of the education budget. Before this happens, it is likely that so much will be needed that different means of financing higher education will have to be found.

On average, the cost per student is about 13%, 21% and 107% of GDP per capita across African countries. The costs of higher education tend to be relatively greatest in the poorest countries. The average for LICs is about 140% of GDP per capita compared to about 85% of GDP in the LMICs. These costs translate in the LICs into an average of USD 180, 320 and 2,300 for primary respectively, secondary and tertiary education, and in the LMICs to USD 820, 1,240, and 4,200, respectively.

In Europe and North America, costs per student average 22%, 23% and 27% per student at primary, secondary and tertiary level respectively. This is a radically different pattern of investment with greater emphasis on investment at primary, less difference between primary and secondary, and tertiary costs constituting only a third more than school costs as a result of cost sharing and greater efficiency.

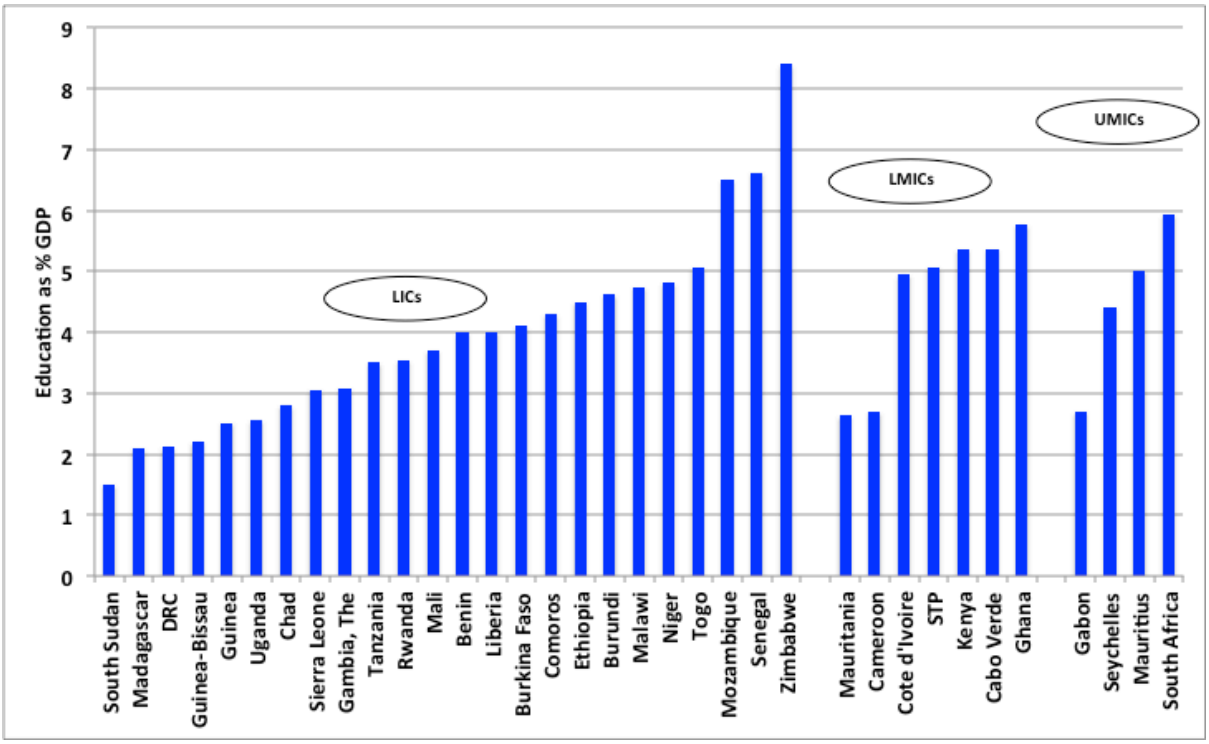
This profile of costs in LICs and LMICs will make expansion very difficult to finance in a sustainable way. Most of the resources for expansion will have to be publically financed and most educational provision will have to be fee free if the poorest are to participate. High subsidies to tertiary education will have to be managed such that they are affordable and directed towards those who cannot otherwise pay. Cost per student of TVET below higher education will have to be managed to be similar to those for general secondary schooling.

Contributions from fiscal reform and levies on employers could help reduce costs. So also could efficiency gains arising from more effective pedagogy and workplace based TVET. The AEF could support analytic studies to establish how accss can be extended at affordable costs. It could also identify how demand led approaches could reduce wastage and drop out before completion and entry to the labour market.

Public Commitment to Financing Education

African countries have different levels of commitment to financing education. This partly determines the size of the funding gaps that are generated by goal driven policy linked to the SDGs. Public expenditure on education as a percentage of GDP varies widely across the countries in the data set as figure 6 shows.

Figure 6: Proportion of GDP spent on Education



The lowest commitments appear to be in South Sudan, Madagascar, DRC, Guinea-Bissau, Guinea, Uganda, Chad, Sierra Leone, and the Gambia with under 3%. Mauritania, Cameroon, and Gabon are richer countries but also have low levels of investment in education below 3% of GDP. The greatest allocations are in Zimbabwe, Senegal, Mozambique, Togo, Niger and Kenya, Cape Verde, Ghana and South Africa[2].

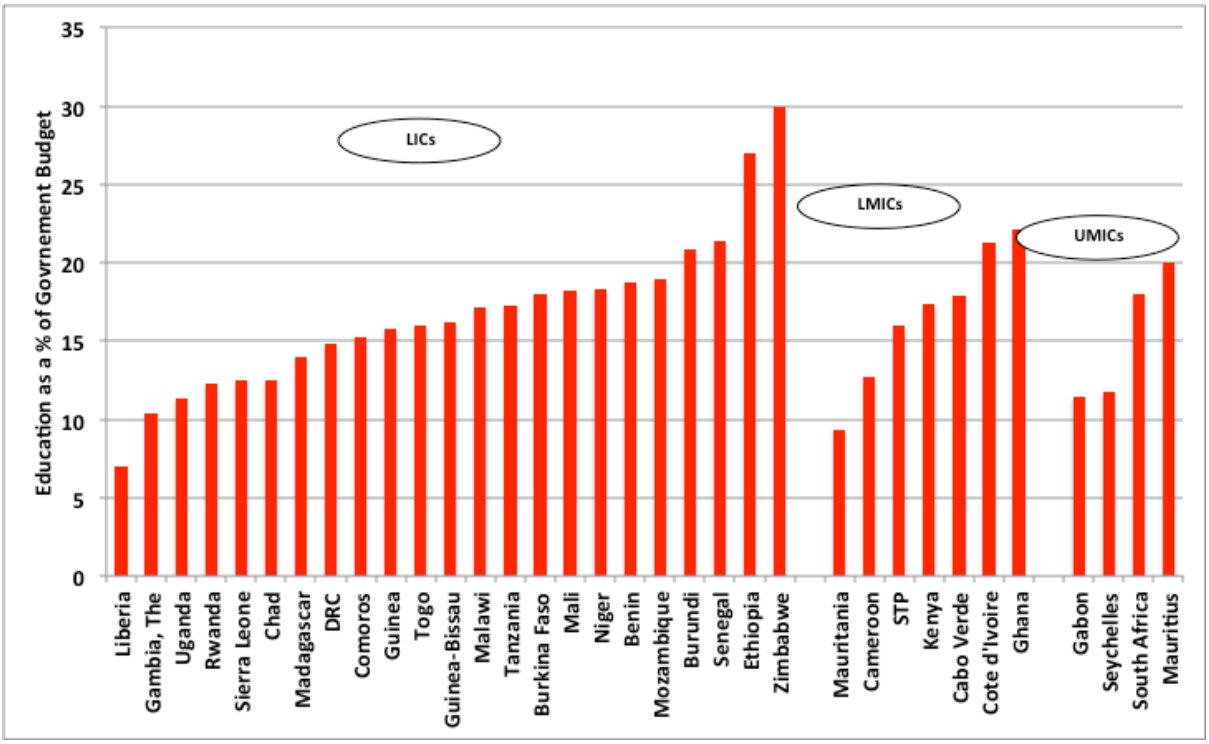
The overall allocation does not indicate which sub-sectors within education are most heavily financed. In many SSA countries higher education receives a disproportionate share of the total allocation as a result of high costs per student. A low allocation to education as a proportion of GDP indicates lack of political will. However a high allocation may not be balanced and equitable and may direct more public spending to the richest households.

The AEF will have to consider what approach it has to countries that allocate a low or high proportion of GDP to education. Where the allocation is small it may indicate a lack of political will which will not be resolved by external assistance as it may be the result of other constraints and priorities on the economy. If the amount allocated is high this may be an indicator that more assistance may not be wise especially if it is generates loans that lead to increased debt.

The level of commitment in relation to GDP must be seen as complemented by the proportion of government expenditure allocated to education. This varies across Africa as shown below in figure 7.

Figure 7: Proportion of Government Budget Allocated to Education

[2] Recent data is missing for some countries.

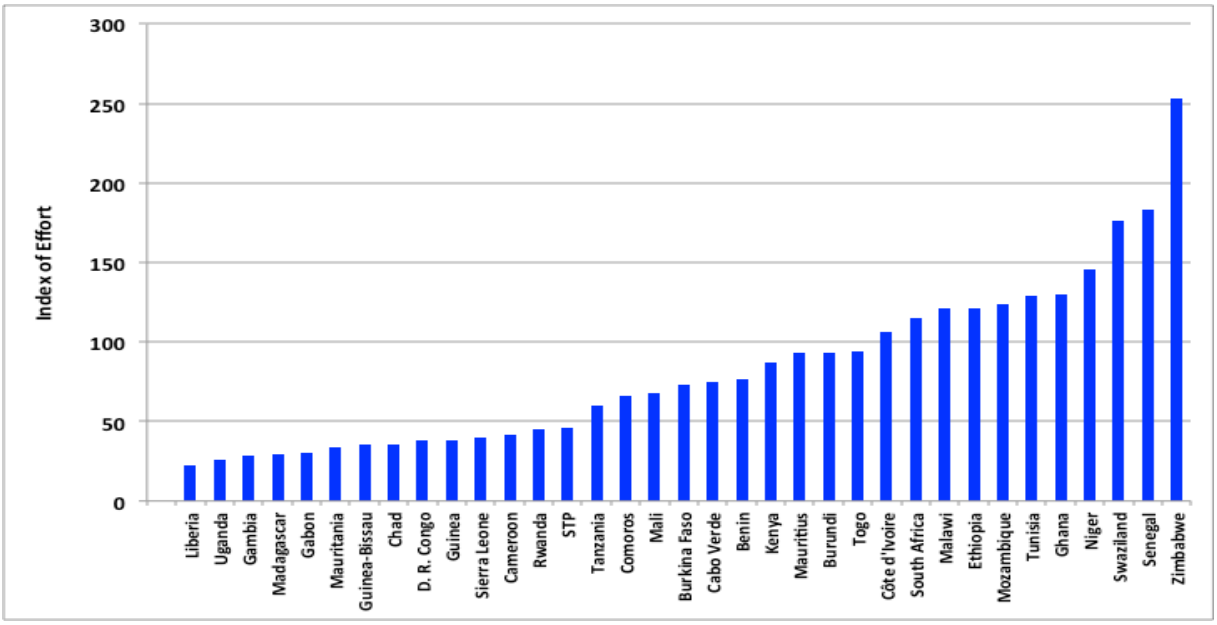


Liberia, the Gambia, Uganda, Rwanda, Sierra Leone and Chad and Madagascar are low spenders along with Mauritania, Cameroon and Gabon and Seychelles. The lowest spenders allocate less than 12% of the government budget to education. The highest spend over 20% but few countries reach these levels. Some of the countries that have low allocations receive a lot of external finance. So also do some countries with high allocations.

The AEF needs to take a view as to whether low allocations are the result of substitution. Governments may spend least on education where aid is most generous. In some cases where the allocation to education is high the reason is the large volume of aid which conceals a low level of domestic prioritisation. In the poorest LICs grants are more appropriate than loans since the capacity to repay is very limited.

If an *index of effort* is constructed by multiplying the percentage of GDP allocated to education by the proportion of the government budget allocated, the result is that there appear to be three groups of countries: those scoring below 50 on the index, those between 50 and 150, and those above 150. The average score for LICs is 67 and for LMICs 88, suggesting that as national income increases, more is allocated to education (Figure 8). There is a strong correlation between governments that make a high allocation of their government budget to education and those that allocate a high proportion of GDP.

Figure 8: Chart Index of Effort (% GDP to Education x % Budget)



Those countries with the lowest values of effort are not investing strongly in public education. For the AEF this may raise questions about whether more aid to education is justified if its purpose is to meet the needs of poor households for free education that government itself is unwilling or unable to provide. Countries in the midrange may or may not be heavily aided. Their challenge is likely to be how to provide recurrent finance from domestic revenue indefinitely into the future.

The AEF might consider how external assistance can contribute to increasing the proportion of countries that score highly on the Index of Effort. This may suggest that priority should be given to supporting the kinds of fiscal measures that could increase domestic financial effort without which educational finance will not be sustainable.

Financing Recurrent Expenditure

The gaps in funding necessary to achieve the goals set by governments and reflected in the Sustainable Development Goals can now be estimated. The countries are separated into the LICS and LMICs since the financial gaps are very different in these two sets of countries. This poses a challenge since the richer LMICs have much higher costs and bigger gaps in USD values but lower absolute levels of educational need. The same amount of funding will have a bigger impact on the poorer LICs than in the LMICs.

The key assumptions are that for LICs, the starting condition specifies GERs for primary, lower, upper secondary and tertiary percentages respectively as follows: 102%, 60%, 20% and 7% and for LMICs 103%, 85%, 50% and 20%. Costs per student in LICs are estimated at 12%, 20% and 30% of GDP per capita in LICs and 13%, 20% and 25% respectively in LMICs. With these levels of enrolments and costs which reflect SSA averages, LICs spend about 3.6% of GDP on education and LMICs spend 4.2%.

The model shows what would be necessary to achieve full enrolment i.e. GER 105% in primary and secondary in LICs and LMICs, GER 30% at tertiary in LICs and GER 50% in LMICs in Scenario 2 (Table 9). This can be achieved with a little over 6.6% of GDP in LICs and 6.1% in LMICs if cost-saving reforms reduce costs per student at lower and upper secondary and higher education. In this model, it would also be possible to increase costs per child at primary level from 12% to 14% of GDP per capita to improve quality. This scenario does not compute the costs of providing universal access to pre-school that would add between 0.5% of GDP to the total cost.

Table 7: Projections of Gaps in Financing Education in Africa

Scenario 1					**Scenario2**				
	GER	**Cost per Child USD**	**% GDP Needed**	**Total Billion USD**	**GER**	**Cost per Child USD**	**% GDP Needed**	**Total Billion USD**	**" Gap " Billion USD**
LICs									
Primary	102	12	1.9	9.7	105	14	2.2	11.1	1.4
Lower Secondary	60	20	0.8	4.3	105	20	1.4	7.2	2.9
Upper Secondary	20	30	0.4	1.8	105	30	1.8	9.2	7.4
Higher	7	170	0.5	2.4	30	100	1.2	6.2	3.7
Total			**3.6**	**18.3**			**6.6**	**33.7**	**15.4**
LMICs									
Primary	103	13	1.7	24.8	105	14	2.0	27.9	3.1
Lower Secondary	85	20	1.0	14.5	105	20	1.2	17.1	2.6
Upper Secondary	50	25	0.7	9.8	105	30	1.7	23.5	13.7
Higher	20	75	0.8	10.7	50	50	1.3	17.8	7.1
Total			**4.2**	**59.8**			**6.1**	**86.4**	**26.5**

The current estimated total public expenditure on education across the LICs is about USD 18 billion and for LMICs USD 60 Billion[3] representing 3.6% and 4.2% of GDP respectively[4]. This does not include current aid contributions which are accounted for in different ways in different countries. To reach or exceed 6% of GDP would cost at least another USD 15.5 Billion per year for the LICs and USD 26 Billion for the LMICs, or about five times more than all current aid to education in Africa from DAC countries. Most of the additional cost would be incurred in expanded participation in lower and upper secondary school, and at tertiary level. The additional costs would be much greater for the LMICs than the LICs because their systems are much more expensive. However they are more likely to be able to finance the additional costs if the political will exists.

[3] For the countries in the database which includes all DCPs on which there is equivalent data.
[4] These estimates differ from those of the International Commission of Financing Global Educational Opportunity (ICFGEO 2017). These calculations use more recent data and are only focused on Africa.

The analysis leads to the conclusion that the amounts needed are much larger than current or planned aid disbursements. They are also recurrent, and would have to be supported from domestic revenue sooner or later. If African countries did allocate 6% of GDP to education, they could go a long way towards financing universal access to schools. However, 48% of countries spend less than 4% of GDP on education and only 22% spend more than 6%. About 43% of countries allocate less than 15% of government budgets to education and 26% allocate more than 20%.

If the share of the government budget for education was not to exceed 20% of the total government spending the amount collected from domestic revenue would have to increase sharply from the current average of about 17% of GDP to over 25% to achieve spending on education over 6% of GDP. If countries did allocate 20% of the government budget to education, and only collected 17% of GDP in domestic revenue to fund government services, then only 3.4% of GDP would be allocated to education (20% of 17%). This is not nearly enough. Thus, achieving substantial increases in levels of domestic revenue needed to finance government spending on education requires very substantial fiscal reform and much more effective revenue collection, and could be a major focus of external assistance from educational development funds.

The financial gaps identified for LICs and LMICs are large and are predominantly recurrent rather than in development funding available for capital works, though clearly both are important. This means that whatever efforts are made to fill the gaps have to be sustained into the indefinite future. Most analysts recognise that the volume and the recurrent nature of demand for financing mean that the bulk of financing in all but the short term has to be supported by domestic revenue, especially where private expenditure by households is severely limited by 2 dollars a day poverty threshold.

Capital Expenditure

The estimate of gaps in finance does not include spending on capital works. Capital expenditure on education is needed to provide new capacity for expanded enrolments. The amounts needed have to be seen as an investment over a long time period unlike recurrent expenditure which is consumed every year. School buildings should last 50 years or more if well constructed so their cost should be amortised over this length of time, including an element for depreciation, maintenance and repair.

The capital costs of expansion to GER 105% for the school system have been modelled. Higher education expansion would be an additional cost that depends on the level of aspiration and the quality of facilities built. Pre-school education would also add to costs if it were to take place in purpose built facilities. It has been assumed that increases to high participation rates will be phased over the 15 year period. The student/classroom ratio is assumed to drop at primary, lower secondary and upper secondary from 40, 25, 15 to 30, 25, 20 respectively in LICs and LMICs.

On this basis a total of 9.2 million new classrooms will be needed in LICs in Africa and 8.6 million in LMICs (Table 10). Most of the new teachers will be at secondary level – 65% in LICs and 55% in LMICs. If the costs of classrooms are USD 10,000 per classroom at primary and USD15,000 at secondary then the total cost to meet demand until 2030 is about USD 73 billion in LICs and USD53 billion in LMICs. This assumes efficient use of space with high

occupancy rates. Under-utilisation of space or poor distribution in relation to demand would create additional demand. So would higher building costs in LMICs.

Table 8: Capital Spending

		Total Classrooms 2015	Total Classrooms 2030	Increase 2015-2030	Cost USD Billion
LICs					
	Primary	2,250,000	4,239,485	1,989,485	20
	Lower Secondary	972,000	2,289,322	1,317,322	20
	Upper Secondary	513,000	2,718,570	2,205,570	33
	Total	3,735,000	9,247,377	5,512,377	73
LMICS					
	Primary	2,075,000	3,909,748	1,834,748	18
	Lower Secondary	1,326,340	2,100,093	773,753	12
	Upper Secondary	1,009,059	2,546,363	1,537,304	23
	Total	4,410,399	8,556,203	4,145,805	53

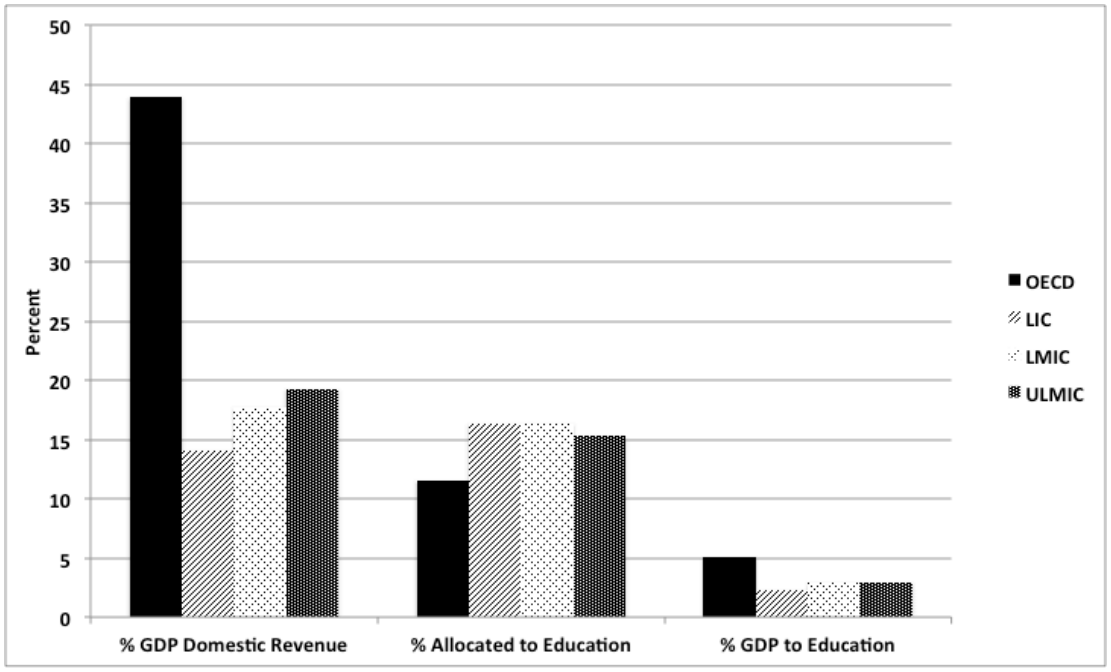
As noted, these amounts appear large but they reflect an investment over a period spanning 50 years. Looked at in this way, the annual spending could be envisioned to be less than USD 10 billion a year across Africa initially, tapering off to much less as the stock of buildings increases and demographic transition eventually happens.

The Financing Dilemma

The basic dilemma of public education financing of recurrent costs in LICs and the challenge they present can be explained graphically. Figure 9 below shows domestic revenue and government budgets as a percent of GDP and the consequential amounts allocated to education based on typical values for OECD and LICs, LMICs and UMICs. OECD countries collect over 40% of GDP in revenues and about 12% of this is spent on education with result that spending is about 5% of GDP.

In contrast, LICs and LMICs in Africa collect on average about 17% of GDP in domestic revenue which funds all public expenditure. At the same time they allocate on average about 17% of total public expenditure to education (16% in LICs, 17% in LMICs and 19% in UMICs). 17% of 17% is about 2.9% of GDP being spent on education.

Figure 9: Domestic Revenue, Education Budget and Education as 3% of GDP

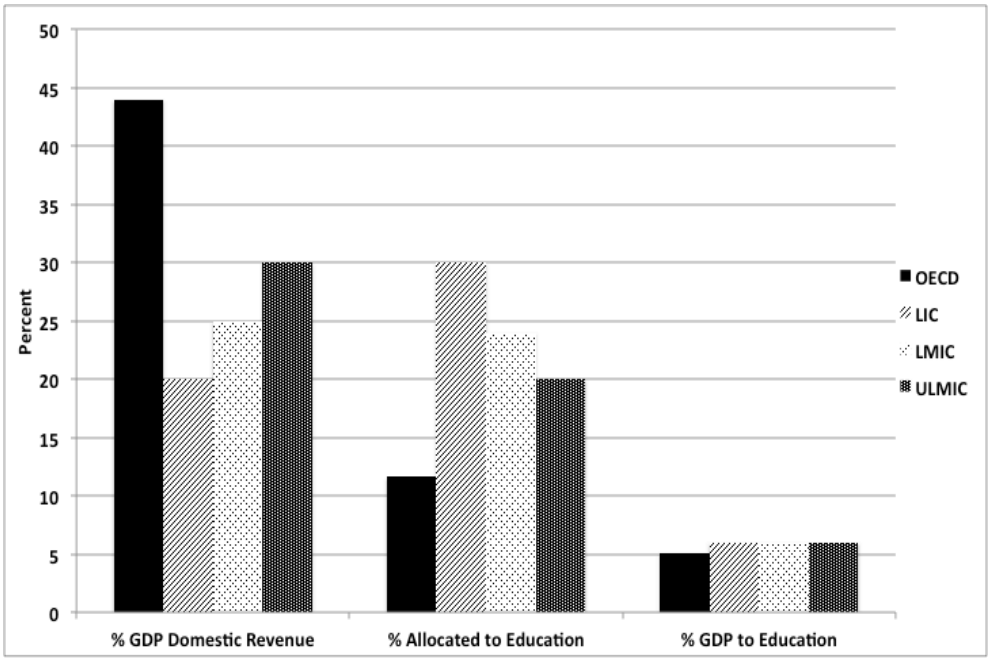


Source: Authors Infographic, 2016

The financial modelling shows that at least 6% of GDP would need to be allocated to education in LICs and LMICs to achieve the goals set by national governments and the SDGs. To achieve this, LICs and LMICs would have to increase domestic revenue substantially, and increase the proportion of this being allocated to the education budget. This can be seen in Figure 10. In this simulation domestic revenue has been increased to 20%, 25% and 30% in LICs, LMICs and UMICs respectively. The government allocation to education has been increased to 30%, 24% and 20% respectively, resulting in 6% of GDP being allocated to education.

Achieving such large increases in domestic revenue will not be easy and would require significant fiscal reform. It would also require that governments reprioritise education and allocate a larger share of domestic revenue in excess of the 20% benchmark of the SDGs. This is more than 50% greater than current spending, especially in LICs. These projections represent upper limits on what may be possible. To generate more resources from domestic revenue beyond 30% of GDP, or increase the proportion of the budget to education beyond 30%, has no historical precedent and is unlikely to be realised.

Figure 10: Domestic Revenue, Education Budget and Education as 5% of GDP



- Source: Authors Infographic, 2016

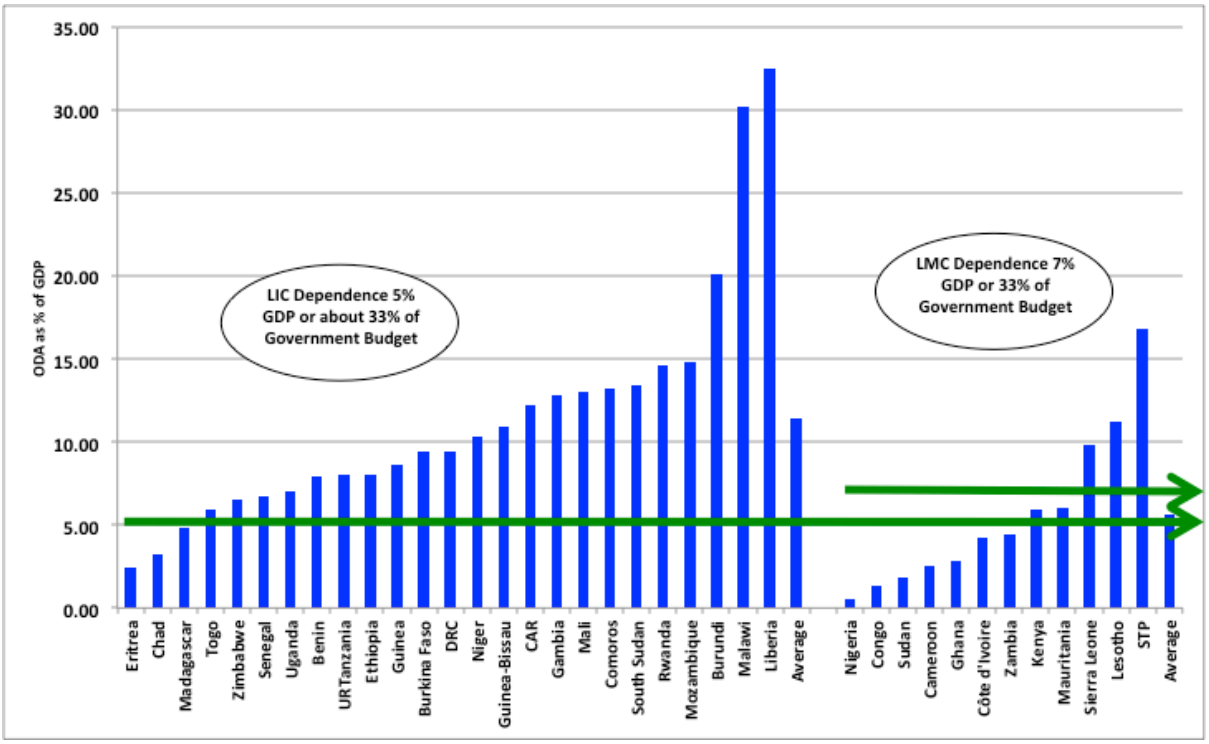
Aid Dependence

5.2.7 More aid could help raise spending towards 6% of GDP. However, higher levels of external support may create aid dependence and distort domestic decisions to reflect externally defined priorities. If the AEF is African-owned and African-managed it will be sensitive to external dependence for recurrent and capital financing. There is also a risk that in all but the short term, high levels of aid dependence may make sustainable development financed from domestic revenue more elusive. If external support is intended to be catalytic leading to transformations that generate sustained development, then it must ebb and flow according to need and impact. Over time, aid should decrease rather than increase.

Arguably aid to education, like aid in general, is subject to a curve of diminishing returns with an optimum level above which its impact diminishes. A simple indicator of aid dependence is the value of aid as a proportion of GDP. This averages 11% for LICs in SSA and 4% in LMICs. About 35% receive more than 10% of GDP. Above 10% of GDP aid is likely to be financing half or more of government spending and be a very visible component of national politics.

Given that education has often been prioritised as a focus for aid in the poorest countries, it is likely that about a third of the LICs and a significant number of LMICs are approaching thresholds of aid dependence. Using the available data the picture for LICs and LMICs in Africa is as shown in Figure 11. This data set does not include the richest countries e.g. Algeria, Angola, Botswana, Egypt Gabon, Mauritius, Morocco, Namibia, South Africa, Tunisia that are unlikely to be aid dependent. Nor does it include the poorest on which there is no data but aid dependence is probably high e.g. South Sudan, Somalia.

Figure 11: Aid Dependence in LICs and LMICs



It is therefore important to ascertain how much external assistance currently contributes to GDP as a whole and, if it can be attributed to education, how much of education spending is externally financed. Feasible plans should include judgements of sustainability which are likely to plan for a falling share of aid as a proportion of GDP over a defined period. Analysis may also suggest that above a particular threshold, AEF resources should not be allocated if they increase external dependence.

Debt

Public debt in LICs and LMICs has been rising and it is now estimated that about 20 countries are at risk of debt distress. The number facing difficulties has doubled in the last five years as economic recovery has encouraged more lending, credit has been cheap and global capital has been able to increase its leveraging of assets. Significantly concessional finance appears to have been falling as a percentage of all borrowing, especially in the LMICs. In addition lenders now include sovereign wealth funds and non-DAC donors and a growing volume of loans related to large scale infrastructure projects financed through Chinese development banks.

As demand for financing increases and aid remains static in volume it is predictable that lending will grow. The issue is to manage this lending so that there is no risk of non-accrual and no judgement that new loans are poor value for money. Both the Highly Indebted Poor Country (HIPC) programme in 1996 and the Multi-lateral Debt Relief Initiative (MDRI) were needed because debt servicing exceeded the capacity of poor countries to repay loans. They were designed to protect social sector investment during economic downturns. A repetition of the events that lead to structural adjustment and a lost decade of development has to be avoided.

Eligibility for loans should be linked to the proportion of national budgets that is externally financed (e.g. aid as a % of GDP and of the national budget and the extent of effort to generate domestic revenue (e.g. tax receipts as % of GDP and government budget)) to limit aid dependence. It should also be linked to indicators of levels of indebtedness (e.g. debt as a % of GDP, debt servicing as a % of the government budget, rate of growth of public and private debt). The World Bank sets thresholds for debt in its Debt Sustainability Framework. These specify that external debt should be less than 50% of GDP and less than 23% of net revenue. Though MDBs generally adhere to these guidelines it is not clear that other development partners necessarily work within them. Private sector lenders may seek to de-risk investments with guarantees from third parties and may seek diversion of grant money to blend grants with loans and reduce interest rates to borrowers but not to lenders.

Concluding Remarks and Implications for the AEF

This analysis of financing shows that public educational finance is driven by the (i) the demographic of the number of children and young adults, (ii) the cost per student, and (iii) the desired level of participation at different educational levels. In LICs, LMICs and UMICs in Africa the parameters that determine these drivers are different to many other parts of the world. Specifically, demographic transition has not taken place in most low enrolment countries, meaning that there are many more learners per tax paying adult than in countries with demographic transition.

In addition costs per student in Africa are high relative to GDP at all levels except primary. Typically secondary school places cost at least twice as much as those at primary level and as much as ten times at tertiary level. All high enrolment countries have a lower ratio of costs at different levels. OECD countries spend nearly as much on primary as secondary students, and not much more at higher education level.

Gaps in financing arise when governments do not collect enough in domestic revenue to finance the services they provide, including schools. There are two ways of closing gaps in financing. The first is to collect more domestic revenue through effective fiscal policy. The second is to make better use of the resources available through gains in efficiency and lower costs per student.

Aid to education is sometimes considered a third option. This is misleading. If external financing is in the form of grants, these are not suited to meeting recurrent costs e.g. teachers' salaries. If the financing is in the forms of loans, these have costs that have to be borne from domestic revenue raising with the transaction costs and repayments appearing as part of the national budget. If aid enhances fiscal efficiency and improves service delivery in a replicable way, it can accelerate development and have the effect of closing financial gaps.

In summary:

Sub-Saharan Africa is different to other regions of the world and has at least ten substantial divergences:

- A different experience of colonialism to other parts of the low income world
- Persistent levels of economic under development in many countries
- Widespread economic dependence on extraction of natural resources
- Delayed demographic transition

- Poor infrastructure
- Challenges for good governance
- The largest number of aid dependent States in any region
- Persistent under funding of education systems
- Falling volumes of aid to education
- Poor revenue collection to finance public goods

Comparison between LICs, LMICs and UMICs in SSA reveals the following.

- Within Sub-Saharan Africa LICs, LMICs and UMICs co-exist and present radically different challenges for educational financing. In SSA there are 27 LICs, 14 LMICs, and 7 UMICs. There are about 570 million Africans in LICs, 420 million in LMICS and 66 million in UMICs. Over 70% of those in poverty live in LICs. About 45% of the population in LICs are below14 years old compared to 40% in LMICs and only 31% in UMICs.

- Wealth is very unevenly distributed between countries. 54 % of the population lives in LICs but they account for less than 20% of the GDP of SSA. Three LMICs - South Africa, Nigeria, and Angola - account for about 40% of the total GDP of SSA. The next ten economies account for 10% of total GDP. On some predictions about half of the LICs should become LMICs by 2030 if economic growth is sustained and population growth slows.

- LICs allocate about 3.7% of GDP to education and 14% of government budgets. LMICs spend more at about 4.6%, and allocate nearly 17% of government budgets. UMICs achieve 5.5% of GDP and 19% of government budgets. This is coupled with the lower rates of growth in the child population – 2.7%, 1.8% and 1.5% in LICS, LMICs and UMICs respectively which makes it easier to spend more per child and manage learning with lower pupil teacher ratios. It also translates into much lower rates of out of school children about 65% of whom are in LICs. There are large differences in the willingness to finance education systems with the difference between the lowest and highest commitments of GDP and government budgets varying by a factor of four.

- LICs and LMICs mostly have primary gross enrolment rates over 100%. The differences in participation are much larger at secondary level where LICs have GERs averaging less than 40% and LMICs about 60%. LMICs have nearly twice the proportion in higher education than LICs. Costs per student are greater in LMICs and UMICs than LICs. Costs tend to fall relative to GDP per capita as countries get richer. Higher education can cost more than ten times as much per student than primary schooling.

- LICs spend about $18 billion a year to run their education systems. LMICs have to spend about $60 billion. Though they have fewer students they have much higher costs. Implementing SDG4 would require about $15 billion additional funding every year in LICs and about $26 billion in LMICs. This would be ten times current aid levels and is not realistic. Most of the costs are to finance the expansion of lower and upper secondary schools. Capital expenditure would add up to $10 billion a year 60% of which would be in LICs.

- Implementing SDG4 needs about 6% of GDP to be spent on education. LICs and LMICs raise about 17% of GDP in revenue. On average they allocate about 17% of their government budgets to education. This translates into 17% of 17% = 2.9% of GDP which is not nearly enough.

In conclusion six issues stand out in relation to LICs, LMICs, UMICs and the AEF.

First, SSA has inter country and intra-country variations that mean approaches to educational financing driven by global diagnoses of the problems of LICs and LMICs are unlikely to be valid across the continent. Nor will solutions to problems in LICs in SSA necessarily be similar to those needed in LMICs and UMICs. An AEF located in Africa will be able to address both the need for diagnoses of problems grounded in SSA and the importance of tailoring solutions to the circumstances of different member States.

Second, as an African institution the AEF should be best placed to leverage resources that are derived from assets located in Africa. It has the possibility of leveraging resources to support its own programme of loans and grants by exploring the wide range of options available that could creates sustainable financing free of increased debt. It can also welcome international partners that share its goals to contribute to its resources. Countries differ greatly in the size, viability and capacity of their private sectors and in their willingness to invest in public goods. International private sector organisations may have very different motivations to governments and small and medium sized enterprises domiciled in LICs and LMICs.

Third, AEF is focusing on post basic education TVET, STEM and HEST for youth and young adults with a special interest in employment and human resource development. Other development agencies prioritise basic education and are therefore complementary to AEF investment priorities. External financing of basic education and investment in pre-school are well served by existing agencies. The AEF will therefore concentrate on higher levels of education where technical knowledge and skill are acquired by Africans and will build on existing capacity.

Fourth, the AEF considers all African member states eligible for support and investment. It will support programmes in and across LICs, LMICs and UMICs. This complements the other agencies that that only consider LICs or LMICs but not both. The AEF can therefore address the needs of low income and educationally excluded populations in the full range of African countries which have very varied poverty lines and income distributions.

Fifth, the AEF has a locational advantage for analysis, project and programme appraisal, ownership and accountability because it is physically housed on the African continent. This reduces costs of infrastructure, staffing and rents compared to other global locations and dramatically reduces the environmental impact and opportunity costs of carbon emission intensive travel. An African economy will benefits from the physical presence of an African international organisation and the employment, services and convening power it provides. The AEF therefore can offer value added Africa specific services that complement the high cost global services of global agencies. The AEF can act as the host for meetings on the African content assuming these address common concerns and reflect AEF leadership of programmes for Africa.

Finally the AEF addresses *three* of the Goals set for SDG4 which are not the priority of any other African regional development agency. These are:

- Goal 4.3 By 2030, ensure equal access for all women and men to affordable and quality technical, vocational and tertiary education, including university
- Goal 4.4 By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship
- Goal 4.5 By 2030, eliminate gender disparities in education and ensure equal access to all levels of education and vocational training for the vulnerable, including persons with disabilities, indigenous peoples and children in vulnerable situations

The AEF is also focussed on the needs of the largest numbers of Out of School children and youth who are over 14 years old and are beyond the basic education cycle. This is different to other development agencies.

External assistance can accelerate the pathways towards the goals laid out in national plans and indicated by the SDGs. It can also hinder progress if the assistance that is given simply fills existing gaps rather than addresses the underlying causes of underfunding. Sustainable educational development depends on the development of fiscal states that can support their social sector expenditure from domestic revenue. New kinds of assistance are needed that do not fill gaps temporarily but which help transform systems to higher levels of efficiency, effectiveness and reach, especially in the relatively high cost fields of STEM and TVET. Uniquely the AEF is proposing to prioritise STEM and SDGs 4.3, 4.4 and 4.5 in SSA, and will welcome complementary contributions from other partners. It is also proposing to support fiscal reforms related to education that are the only long term method of providing sustainable financing.