the Education Commission

Background Paper

The Learning Generation

Spending Beyond Education

Supporting Education Through Complementary SDG Spending

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EXECUTIVE SUMMARY

Building on evidence from secondary sources, as well as initial results observed in work carried out by Development Finance International, which indicated a that spending across social services aimed at achieving the MDGs, can lead to improvements in education enrolment and completion rate, this study sought to test this relationship. Through a combination of correlation and econometric analysis this study looked at the relationship of this "beyond education" spending and improvements in meeting completion or enrolment rates at primary and secondary school level.

In order to test this DFI carried out econometric and correlation analysis. As a first step, the analysis of the relationship between "beyond education" spending, and the prospect of reaching the MDGs for completion was tested, indicating a stronger correlation between broader spending and the prospects of reaching the MDG for education completion, than between education spending and the same MDG. As a second step, DFI has attempted to analyse the relationship between spending on education and the broader MDGs, using econometric analysis. Initial testing found a good for completion. The correlation result for the relationship between spending on education and primary net enrolment was weaker, partly because many countries had already attained high enrolment levels in earlier years, so that high current spending was maintaining rather than increasing these levels. In terms of broader econometric testing, we have found a significant relationship between the amount of education spending and results, with the strongest results for completion rather than enrolment. An increase of US$1 per capita in education spending leads to a 0.1% rise in completion. However, beyond this result, we have come up against major problems in conducting econometric testing, mainly due to data weaknesses and availability.

Based on the results, the following policy implications for the Commission's recommendations are drawn:

1. emphasise the need to increase funding for all the "social sectors" of the SDGs, to accelerate the achievement of results on the education SDGs.
2. emphasise the need for strong cross-sectoral planning and results-based budgeting at country level.
3. present evidence that education are "productive" to reverse recent switches of focus to infrastructure.
4. any earmarking, advocated should be for a broader range of social sectors than just education
5. as also stressed in the companion paper on debt, given the large overall financing needs for the broader social SDGs,[1] the bulk of the financing for education and these other social

sectors must come from tax revenue and, in the case of low income countries, concessional external funds

Background and Methodology

The education community is already well aware of evidence that education spending helps countries to reach the other MDGs, notably in terms of health and nutrition. [2] However, there is also evidence that spending on other key poverty and human development sectors (e.g. health, nutrition, social protection, WASH) improves education outcomes. For instance, investments in health services, and improvements to nutrition can have a positive impact on improving education outcomes. Health impacts on cognitive development and school participation, with poor health or nutrition leading to poor participation, irregular attendance and high rates of school drop-out.[3] Social protection has been shown to have very good linkages to improved access, retention, completion and outcomes in both low- and middle- income countries.[4] For instance, the Bolsa Escola programme in Brazil has been shown to have a significant positive impact on school attendance, with 50% of benefits reaching the two lowest income deciles.[5] School feeding programmes have boosted school participation rates, especially for girls, in Bangladesh, and increased attendance rates in Burkina Faso and Uganda.[6] Spending on water, sanitation and hygiene can help improve attendance, particularly for girls. For instance, when girls spend long hours collecting water this impacts on the time they can devote to education, with increased access to water having a positive impact on school attendance[7]; and if girls don't have access to separate toilet facilities this impacts on their attendance at school. [8]

These are examples of well targeted and complementary interventions which have been shown to help to deliver the Education For All and Millennium Development Goal education targets over the last 15 years. Given these interventions are also closely linked with the kinds of programmes and policies which have been central to achieving the MDGs, it is also safe to assume that higher spending on the sectors targeted at achieving the MDGs, would help to boost education outcomes. That is, education spending needs to be complemented by other "social" spending in order to maximize education results – especially to reach the most marginalised. While conducting a 2015 study for Oxfam America, funded by the Gates Foundation, on the relationship between government spending and attainment of the MDGs, DFI began to notice an emerging pattern which seemed to suggest that this might be the case. That is, countries which spent a higher proportion of their overall budget across all of the MDGs were seen to be making very good progress towards the MDG education target on Universal Primary Education.[9]

At the Commission's research meeting in January in London, DFI indicated that the initial patterns observed could be further explored to ascertain in more detail if there is a positive relationship through econometric and correlation analysis. Subsequently, Development Finance International (DFI) was commissioned to carry out a background study by the Education Commission, which entailed a short piece of econometric and correlation analysis to support the hypothesis that education outcomes are improved through complementary social sector spending.

2) Analysis Emerging from the Oxfam America Study/Country Experiences

As mentioned above, in an earlier study carried out by DFI with Oxfam America, on the relationship between government spending and attainment of the MDGs, DFI began to notice an emerging pattern; countries which spent a higher proportion of their overall budget across all the MDGs, and in a more balanced way (rather than focussing on one sector such as education) had better prospects of reaching, or making some of the most remarkable progress on, the education (and other) MDG target. However, countries that appeared to only focus on one sector, at the detriment of others, seemed to do not as well.

This was based on a sample of a data matching MDG spending allocations - using the Government Spending Watch (GSW) database - and data on MDG outcomes using the *World Development Indicators* (WDI).[10] The assessment of progress on MDG outcomes, was based on whether or not the country has met, or is likely to meet, the targets linked to seven of 8 MDGs. In the case of education this was based on completion targets, and an assessment of progress over the lifetime of the MDGs. This allows comparison of each country's performance against its national target, from 1990 to the latest available data, and projected trends to the 2015 target. DFI used this to assess whether countries have already met the target, or look almost certain to meet the 2015 target. "Social sector/ MDG spending" from GSW, includes spending data, measured as a percentage of total government spending in order to judge "policy effort": education, health, social protection, WASH, agriculture.[11]

Some countries who had been deemed to make excellent progress on the education target, were clearly the countries who were spending both relatively high allocations, relatively evenly, across all social sectors. For instance, Rwanda, has relatively high spending patterns across all social sectors - even if their education spending is lower than other sub-Saharan Low Income Countries as a percentage of their budget. This leaves no one sector "orphaned" due to a lack of budget allocation. This is also supported by a very strong policy package which gives rounded support to households and families – i.e. the one cow per child policy, which gives nutritional support to the family, or very good progress on WASH MDG targets. This has led to some very good progress in terms of improved completion rates over the last decade.[12]

Malawi is also another example of a country with high spending levels across a number of sectors, with close to 50% of their total budget spent on social sectors; they also spend this relatively equitably high spending across the board. They have made good and steady progress in reaching close to 75% completion rate in 2012, compared to 28% at the MDG baseline. While Bhutan spreads their social sector spending spread evenly, and at the upper ends of levels across a number of sectors; they have made massive inroads in terms of meeting the education targets, going from 23% to 100% completion rates over the MDGs. Similarly, Nepal has made good progress, with net enrolment ratio moving from 66% to 99% and completion rates at 95% since the start of the MDGs, and also has good and even spending patterns across social sectors. Many of other countries had similar patterns, which seemed to be pointing to a positive picture that outstanding progress on the MDGs, and more specifically in education, may well be linked to spending across all social sectors.[13]

Furthermore, in a recent analytical piece commissioned by the International Budget Project (IBP) to look at the key factors in delivering the MDGs through budget commitments, the DFI team also noted that some of the most successful countries in making the most progress on meeting the MDG targets also have a strong policy to budgeting frameworks linked to achieving the MDGs. This was seen to be the case in low-income countries with PRSP strong processes. Being

able to match results and actions to policy can have a significant impact in being able to hold governments accountable for delivering on targets. DFI concluded more must be done to improve this in planning and measuring for the SDGs.[14] In addition, a recently commissioned piece for the Global Education Monitoring Report also noted that improving more integrated planning for the SDGs will require political will, backed by institutional systems that support it.[15] Both of these reports suggest that to improve cross-sector efficiencies, and help to make increased social sector spending work harder, better systems need to be in place to support cross-sectoral planning and results-based budgeting at country level, when designing and implementing national development strategies to include the achievement of the SDGs, in order to maximise the positive interactions among spending in social sectors for SDG results.

3) Results of Additional Analysis

In order to test some of the initial patterns noted above, DFI carried out econometric and correlation analysis to test whether:

- Education results/outcomes are improved through increased MDG/social spending in countries.
- MDG-SDG[16] -related education results are enhanced when countries spend more broadly on other MDG/social spending (health, social protection, agriculture WASH).

Specifically, the following key hypotheses were tested:

- that higher primary education spending leads to better results in primary school
- that higher overall education spending leads to better results within the education system
- that higher primary education, and broader "social sector/MDG" spending, leads to higher results in primary education.
- that higher total education spending and broader "social sector/MDG" spending leads to better results within the education system.

Data for 71 countries were included in the tests/results (which listed in Annex 1).[17]

3.1. Correlation Analysis

As a first step, the analysis of the relationship between "beyond education" spending, and the prospect of reaching the MDG for completion, identified preliminarily in the work for Oxfam America, was retested and made more rigorous through simple correlation testing. The test was conducted using the Government Spending Watch data for 71 countries on education spending as of 2014, and assessments of prospects for reaching the completion MDG based on the World Bank World Development Indicator MDG database, supplemented by country specific MDG, development planning and education sector reports.

The findings of this test are shown in Table 1 below. They indicate that there is a stronger correlation between broader spending and the prospects of reaching the MDG for education completion, than between education spending and the same MDG (whether spending is measured as a proportion of total spending, or in US$ per capita).

TABLE 1n CORRELATION BETWEEN SPENDING AND COMPLETION

Spending Indicator	***Correlation with prospects for reaching the completion MDG***

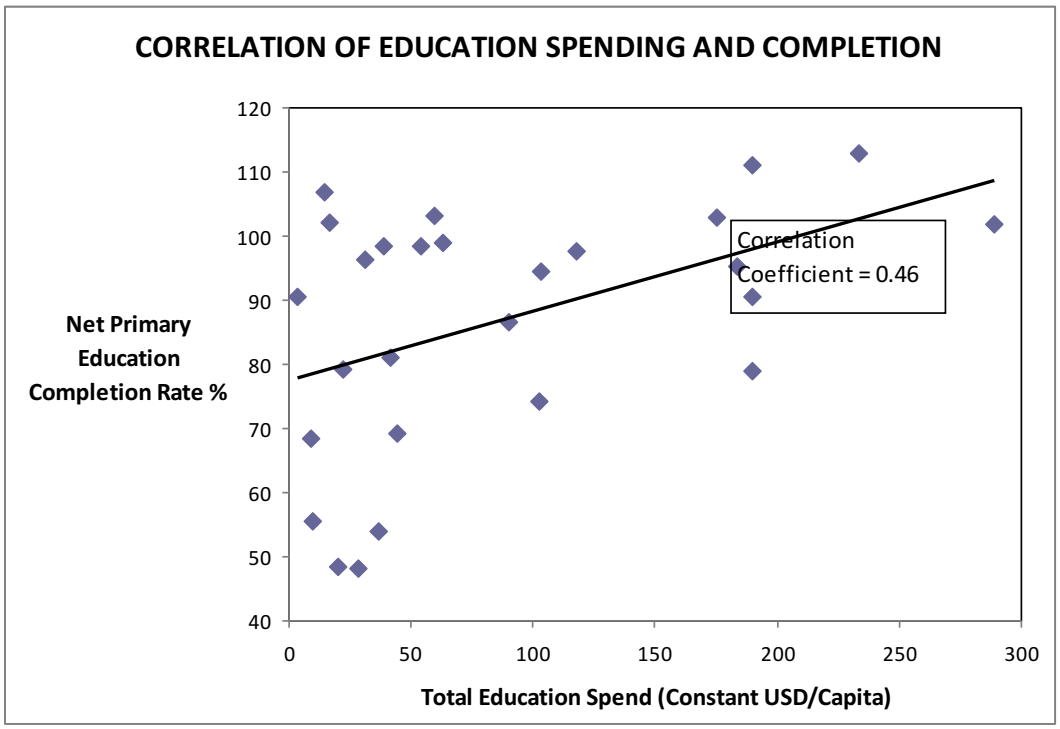
Education spending as a % of total spending	***0.06***
Broader MDG spending as % of total spending	***0.21***
Education spending in US$ per capita	***0.32***
Broader MDG spending in US$ per capita	***0.47***

2.2. Econometric Testing

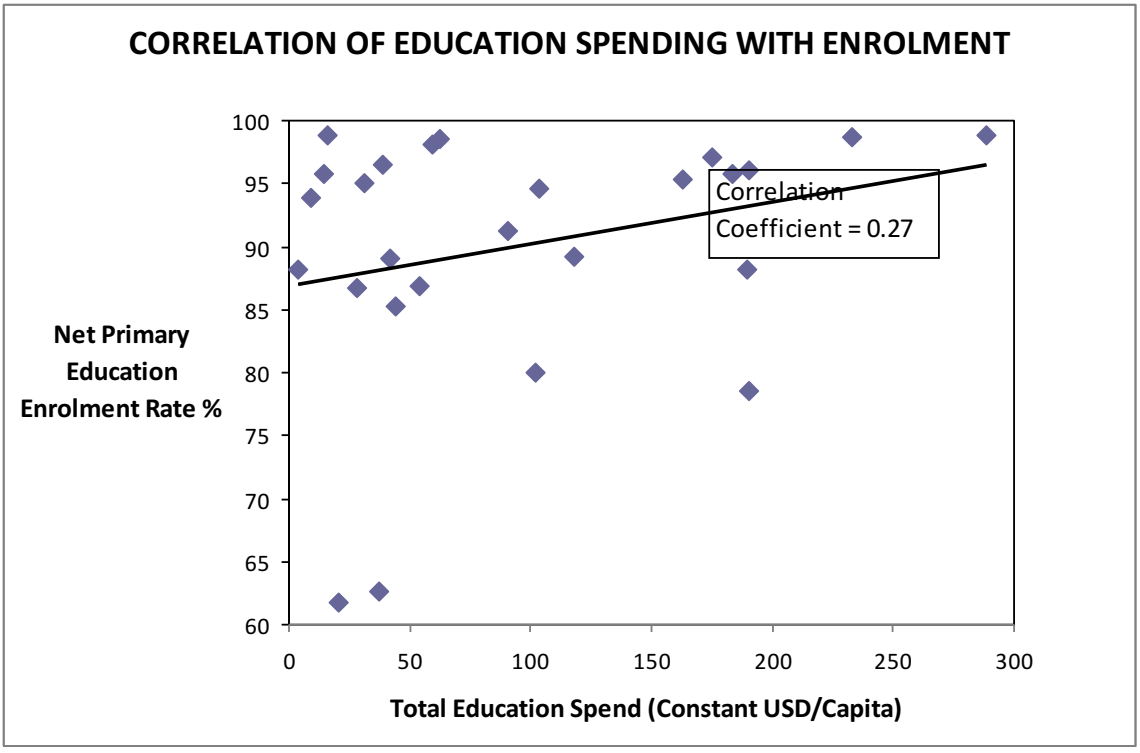
As a second step, DFI has attempted to analyse the relationship between spending on education and the broader MDGs, and results for education MDGs on enrolment and completion. Initial testing (shown in Graph 1 below) found a strong correlation of 0.46 for completion. The correlation result for the relationship between spending on education and primary net enrolment was weaker at 0.27 (see Graph 2), partly because many countries had already attained high enrolment levels in earlier years, so that high current spending was maintaining rather than increasing these levels.

The data-sets included completion and enrolment rates in primary school, and secondary enrolment.[18] This was also complemented by using World Economic Outlook data on per capita income and a governance indicator (as measured by the CPIA budget and financial management indicator) to allow for national income levels and governance, respectively, as impacting on results.

Graph 1



Graph 2



In terms of broader econometric testing, we have found a significant relationship between the amount of education spending and results, with the strongest results for completion rather than enrolment. An increase of US$1 per capita in education spending leads to a 0.1% rise in completion; the same increase in spending leads to a 0.03% increase in primary net enrolment, and of 0.08% in secondary net enrolment. This result is robust when per capita GDP and budget management performance (as measured by the CPIA budget and financial management indicator) are included in the specification.

However, beyond this result, we have come up against major problems in conducting econometric testing, with almost all initial tests producing statistically insignificant results (apart from strong relationships with GDP per capita), for the following reasons:

- due to a surprising and unanticipated lack of actual data on education completion, we have been able to obtain only 20-30 observations for completion data for the 72 countries for which GSW data are available, even if use 2013 data.[19]
- in terms of primary enrolment, the differences among country enrolment rates in more recent years are so small in most cases (due to progress in earlier years) as to make results also statistically insignificant.
- including CPIA data reduces the number of observations available even further.
- because of the low number of observations, all the initial econometric tests are resulting in very high constants, rendering their results highly questionable. To overcome this, we would need to test time series. These are available for education and broader spending since 2008 in GSW, but it seems that for education results we might need to "intrapolate/extrapolate" data – almost making up data (for many countries since 2010), which we would be reluctant

to do, especially given that in other work for GCE, Oxfam and UNESCO we have noted considerable volatility in country trends towards attaining enrolment/completion MDGs

- there is an even lower number of observations on primary education spending, making all econometric specifications non-robust and therefore not worth testing.
- it would also be desirable to test data with appropriate lags – given that spending would not impact on completion for several years – but the same caveats about data on completion apply, so that so far we have been able to test only for a one-year lag.
- Given all of these data issues, we do not believe that further econometric tests would produce robust results.

4) POLICY IMPLICATIONS OF THE ANALYSIS

Based on the results derived so far, the following policy implications can be drawn:

6. the Commission should emphasise the need to increase funding (by governments and donors) for all the "social sectors" of the SDGs, i.e. health, nutrition, WASH and social protection, in order to accelerate the achievement of results on the education SDGs (and on the other "social SDGs" if spending on education is increased) .
7. it should also emphasise the need for strong cross-sectoral planning and results-based budgeting at country level, when designing and implementing national development strategies to include the achievement of the SDGs, in order to maximise the positive interactions among spending in social sectors for SDG results.
8. it should present centrally the evidence that education (and other social sectors) are as "productive" or more productive than funding of production or large-scale infrastructure in promoting growth and inclusive pro-poor/anti-inequality development, so as to reverse many governments' and donors' recent switches of focus from these sectors to infrastructure.
9. if suggesting any earmarking, it should advocate earmarking for a broader range of social sectors than just education, so as to broaden the coalition supporting earmarking for pro-poor spending, rather than singling out education.
10. as also stressed in the companion paper on debt, given the large overall financing needs for the broader social SDGs,[20] the bulk of the financing for education and these other social sectors must come from tax revenue and concessional external funds, reversing recent moves to more expensive funds (such as bonds and PPPs), or there is a high risk of another widespread debt crisis which will undermine education funding.

Annex one: list of countries included in study

Country	
Afghanistan	Kosovo
Albania	Kyrgyz Republic
Angola	Lesotho
Armenia	Liberia
Bangladesh	Madagascar
Belize	Malawi
Benin	Mali
Bhutan	Moldova
Burkina Faso	Mongolia
Burundi	Mozambique
Cambodia	Nepal
Cameroon	Nicaragua
Cape Verde	Niger
Central African Republic	Papua New Guinea
Colombia	Peru
Congo	Rwanda
Cote d'Ivoire	Samoa
Djibouti	Sao Tome and Principe
Dominican Republic	Senegal
DRC	Sierra Leone
Ecuador	Solomon Islands
El Salvador	South Africa
Ethiopia	South Sudan
Fiji	Sri Lanka
Ghana	Swaziland
Guatemala	Tajikistan
Guinea-Bissau	Tanzania
Guyana	Timor Leste
Haiti	Togo
Honduras	Tonga
India	Uganda
Jamaica	Vanuatu
Jordan	Zambia
Kenya	Zimbabwe
Kiribati	

[1] According to SDSN and DFI costings, the social sector SDGs are expected to require additional public spending of x and 1.5 respectively

[2] For instance, see the following summary of evidence to date, 2013, EFA Global Monitoring report, "Education transforms lives": http://www.unesco.se/wp-content/uploads/2015/02/Education-transforms-lives.pdf. Or http://unesdoc.unesco.org/images/0023/002305/230508e.pdf for a summary of current evidence,

[3] There is good evidence that health and nutrition has a positive impact on improving education outcomes in; "Background paper prepared for the Education for All Global Monitoring Report 2009: Linkages between Nutrition, Ill-Health and Education" here: http://unesdoc.unesco.org/images/0017/001780/178022e.pdf

[4] A good summary of evidence in LICs and LMICs can be found in this study "Social Protection, Poverty Reduction and Pro-Poor Growth" OECD Policy Guide https://www.oecd.org/dac/povertyreduction/43573310.pdf

[5] Graziano Da Silva, José, Mauro Eduardo Del Grossi and Caio Galvão de França, eds. (2011). The Fome Zero (Zero Hunger) Program: The Brazilian Experience. NEAD (Centre for Agrarian Studies and Rural Development) Special Series 13. Rome: Food and Agriculture Organization of the United Nations; and Brasilia: Ministry of Agrarian Development.

[6] World Bank (2012a). Do school feeding programs help children? From Evidence to Policy, Note 66544. Washington, D.C. January

[7] Nauges, Celine and Jon Strand. (2011). Water Hauling and Girls' School Attendance: Some New Evidence from Ghana. Koolwal, Gayatri and Dominique van de Walle (2010). Access to Water, Women's Work and Child Outcomes.

[8] UNICEF. "Water, Sanitation and Hygiene" Updated May 2010. http://www.unicef.org/media/media_45481.html

[9] This research ("Identifying SDG vanguard countries") was commissioned to look at countries who have made good/remarkable progress on their MDG targets and thus look likely to have a solid springboard into SDGs, including with well-developed policies addressing sector spending on the MDG

[10] see http://data.worldbank.org/mdgs

[11] The spending data for this series is more limited for some sectors, notably WASH and social protection. However, given the relative importance of spending on health, agriculture and education, for the overall budget size, and the smaller relative importance of WASH or social protection in lower income countries, DFI was confident that for the majority of countries having spending on the three categories of health, agriculture and education, ideally compared with spending data on one or more of WASH/social protection is a good enough proxy for "total social spending".

[12] They have had very good results in terms of bringing up completion rates to around 66% from an incredibly large dip after the genocide of only around 3% – pre-genocide the levels are around 43%.

[13] All data from the Oxfam America DFI study. Many of these countries made really large steps forward, and often more decisive meeting of other targets which didn't necessitate 100% coverage, i.e. having malnutrition or improving access to clean water etc,

[14] Upcoming publication on lessons from budgets for meeting the MDGs for accelerating the SDGs.

[15] DFI Background paper for the Global Education Monitoring report 2016

[16] It was agreed to look at secondary schooling as well given the increased focus on this as "basic education" and universal secondary education in the SDG-era.

[17] The countries chosen are those with MDG spending data in the GSW database. See the table in Annex 1 for a full list of countries. The GSW database was used for this study because it is the only database with uptodate comparable data on MDG spending across multiple countries and sectors. For more details on GSW see www.governmentspendingwatch.org

[18] Net enrolment, and gross completion from UIS were chosen for better datasets

[19] Pauline Rose indicated in the recent London meeting that they might have more recent completion data for a wider range of countries, which they could supply to us if the Commission agrees. It might be possible for us to test these data in the final version of the paper.

[20] According to UN SDSN and DFI costings, the SDGs are expected to require additional public spending of $1.4 trillion per year ($343-360 billion for low-income countries and $900- 944 billion for lower-middle-income countries) and $1.5 trillion extra in public financing annually, respectively. See SDSN paper here: http://unsdsn.org/wp-content/uploads/2015/09/151112-SDG-Financing-Needs-Summary-for-Policymakers.pdf

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