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On the Impact of External Debt and Aid on Public Expenditure Allocation in Sub-Saharan Africa after the Launch of the HIPC Initiative

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Abstract

In the wake of the current financial and economic crises, the economies of sub-Saharan Africa find themselves squeezed between likely reductions in official development assistance and the pressing challenge to eradicate poverty. Public expenditure allocation to the social sector and to public investment is constrained by the need to pursue fiscal discipline in order to avert debt distress. Within a framework of public expenditure choice, the paper investigates the impact of the external debt-servicing constraint, as well as external aid, on government expenditure allocation in sub-Saharan Africa countries after the launch of the Heavily Indebted Poor Countries Initiative. Among the findings are: (i) the debt effect, while substantially lower than existing estimates for the pre-HIPC period, remains negative for the social sector, with education expenditure suffering the most from higher actual or predicted constraint-consistent debt servicing;

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Keywords: SSA, HIPC, public expenditure allocation, external debt and aid

JEL classification: F34, F35, H51, H52, H54, 055

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and (ii) ODA, particularly multilateral aid, has a significant positive effect on public investment. Furthermore, we observe that recent relatively low levels of debt seem temporary; low-income countries are likely to contract additional debt to fill their funding gaps, suggesting that appropriate measures must be undertaken in order to prevent the deleterious effects of debt, particularly on the social sector. Meanwhile, the additional finding that government effectiveness favours public investment as well as spending in the social sector suggests that increased attention on governance is called for.

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Acronyms

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1 Introduction

The current global financial and economic crises are predicted to have spillover effects on developing countries in sub-Saharan Africa (SSA), through capital flow and trade channels. Even though these countries were not affected by the first (i.e., financial) phase of the crises, they are likely to suffer from a financial shock because of the potential decrease in official development assistance (ODA) and credit cost surge following the recession in the developed world (Fosu 2010b). This would, thus, contribute to declining private capital flows and falling remittances, related to the economic difficulties and rising unemployment levels in the developed countries (Hernández and Gamarra 2010; Kasekende et al. 2010). In the meantime, SSA has already started experiencing shrinking volumes of exports, negatively affecting its terms of trade (IMF 2009). In fact, SSA current account balance, averaging 0.8 per cent of GDP between 2004 and 2008, fell to -2.3 and -1.2 per cent in 2009 and 2010, respectively (IMF 2011c: 3; 2011d: 95). The latest IMF projections indicate that the region's aggregate external balance would deteriorate in 2012 (-0.6 per cent of GDP) following a slight improvement in 2011 (+0.6 per cent of GDP; IMF 2011d: 95).

The joint crises were preceded by the fuel and food price shocks of 2007-08, which hit net oil-importing economies harshly and caused a drastic drop of SSA growth levels by some 70 per cent between 2007 and 2009. Dampened growth expectations seemed to reverse the promising prospects for both GDP and its per capita recorded since the middle of the 1990s (Fosu 2010b). Nonetheless, the region appears to have recovered quickly, taking advantage of the 'macroeconomic policy space that [SSA] countries had created during the 2004-08 upswing' (IMF 2011c: 4). In fact, real GDP grew by 4.9 per cent in 2010, and it is expected to expand further during 2011-12 (5.25-5.75 per cent prediction; IMF 2011c: 4; 2011d: 93).

This relatively positive picture must be tempered, however. First, the current financial risks remain and, second, resurgent growth masks wide differences among countries. Most importantly, the full impact of the crises on poverty is yet to be fully realized, especially if deteriorating fiscal positions lead governments to cut back on social programmes that benefit the poor.

Furthermore, as low-income countries face worsening fiscal positions, there is the real concern that the recent progress on debt may be reversed. Hernández and Gamarra (2010: 424), for instance, show that, 'For given financial conditions, debt burden indicators deteriorate monotonically with the duration (severity) of the export shock'. If so, then deeper export shocks could force SSA countries to incur additional borrowing and also to postpone the adoption of restrictive fiscal policies, thus reversing the progress on economic governance. Such an outcome would worsen debt burden indicators. Yet, if these countries managed to access new loans, financial conditions associated with these loans would likely be tightened, which could increase the risk of debt distress. Under tighter financial conditions, 'The adjustments that governments would need to implement in fiscal expenditures [in particular, social expenditures and public investment] and taxes, in order to assure continuity in the service of their debts, are significantly larger (albeit lasting shorter)' (ibid.: 430). Meanwhile, the deteriorating fiscal positions in many of the development partners, occasioned by the crises, suggest that ODA is likely to be curtailed.

Using pre-1995 data, Fosu (2007, 2008) shows that a binding predicted debt-servicing constraint, reflecting the liquidity constraint induced by the debt burden, would shift SSA government expenditure away from the social sector (education and health), while the effect of external aid on social sector spending is positive, though lower than that of constrained debt servicing. Thus, deteriorating debt and ODA situations, occasioned by the crises, would be deleterious to social sector allocation, with likely adverse implications for poverty. Moreover, Fosu (2010a) finds that ODA tends to increase public allocation toward public investment, so that decreasing ODA would have negative consequences for this form of investment that is often complementary to private investment.

The present paper may most appropriately be viewed as an extension of Fosu's empirical analysis (2007, 2008, 2010a) to the post-1994 period during which HIPC was introduced, resulting in significant reductions in the debt-servicing requirements in most SSA countries. For example, on average, the debt servicing ratio (DSR) of SSA countries fell from about 14.0 per cent in 1995 to nearly 5.0 per cent in 2009. Thus, the debt constraint might be less binding during this more recent period. If so, then debt's effect would be attenuated. In addition, of particular interest is the impact of ODA on public expenditure allocation in the post-HIPC era, when greater emphasis has been given on channelling aid towards budget support, which would likely increase fungibility. Moreover, we explore herein the effects of other variables not included in the above studies, such as: government effectiveness, age dependency, and ethnic fractionalization. As a further departure, we pay considerable attention to the effect on debt servicing under HIPC. Furthermore, ODA is disaggregated into its source components of bilateral and multilateral aid, that is, in addition to its total value. Finally, we concentrate here on the social sectors of education and health as well as on public investment[1] in order to highlight the high importance of these sectors for poverty reduction.[2]

Recent studies on the determinants of government expenditure and its size and composition changes include: (i) Okunade (2005) and Murthy and Okunade (2009), both of which analyse the determinants of health care expenditure in African countries; (ii) Shelton (2007), for a cross-sectional and inter-temporal investigation of defines, education and health care expenditure variation at the central and local government levels for a set of over 100 countries); and (iii) Vergne (2009), for the electoral impact of the allocation of public spending in 42 developing countries. These studies did not include any debt- or aid-related variables (Shelton 2007) or then included only aid but no debt-burden indicators (Murthy and Okunade 2009; Okunade 2005; Vergne 2009). Lora and Olivera (2007), on the other hand, assess the effect of total public debt on health and education, and find that higher debt ratios reduce social expenditures. They

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1 Gross domestic public investment (or gross fixed capital formation) includes outlays in addition to the stock of fixed assets of an economy (net of any sales of second-hand and scrapped fixed assets) by the government and non-financial public enterprises. Most outlays by government on military equipment are excluded. Thus, gross domestic fixed investment refers to land improvements (ex. fences, ditches, drains etc.), purchases of plants, machinery and equipment, construction of roads, railways, schools, offices, hospitals, private residential dwellings, commercial and industrial buildings and net acquisitions of valuables (World Bank 2010a).

2 Currently we do not include agriculture, which is arguably an important sector for poverty reduction, mainly because data for that sector are quite sketchy.

nevertheless consider both social expenditure and interest debt payments as shares of GDP. As highlighted by Fosu (2010a: 381), 'The use of expenditure shares [instead of shares of GDP] should reflect directly on the shift in the budget in response to changes in a given revenue component, particularly debt service'. Expenditure shares should indeed project the priorities of public sector allocation. Ouattara (2006) includes debt servicing among the set of regressors for explaining the variation in government consumption and public investment expenditure; yet, the study's contribution specifically falls within the fiscal response literature, typically focusing on the behaviour of recipient governments in response to aid flows (Fosu 2007, 2008, 2010a).

The present paper is organized as follows. Section 2 presents the empirical model; section 3 delineates the sample and data as well as estimate the constraining DSR; section 4 presents the estimation results for the government expenditure shares of education, health and public investment; and section 5 summarizes the main findings and then concludes.

2 The model

Following Fosu (2010a), for example, we estimate the following reduced-form model,[3]

$$g^j = g^j\left(D^X, F; \mathbf{W};\ u^j\right), \quad j = 1, \ldots, J$$

where $J = 3$ for the three sectors of interest: education, health and public investment; g^j is the j sector's share of public expenditure; D^X is the component of debt service predetermined with respect to budgetary allocation decisions and measuring the liquidity constraint facing a given country; F is foreign aid; $\mathbf{W}$ is a set of control variables defining the country's social welfare function;[4] and u^j is the stochastic error term.

We now discuss the expected signs of the effects for these covariates.

2.1 The main exogenous variables

These include:

D^X, Exogenous component of the debt service

The effect of this variable is generally ambiguous, depending on the Engel properties of the j sector and whether the consumable service provided by that sector is deemed by the government to be a normal or an inferior good (e.g., Fosu 2010a). However, the effect would likely be negative if the sector was considered to be of relatively low priority in the public budgeting process (ibid.).

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3 A reduced-form model instead of a structural model is estimated since the decisionmaking process that defines the latter is often not well understood; for details see, for instance, Fosu (2007, 2008, 2010a).

4 The government decisionmaker is assumed to optimize a social welfare function in its public provision decisions; for details, see ibid.

F, Foreign aid share of GDP

In general, the effect of ODA on government expenditure allocation will depend on the conditionality attached by donors to the foreign assistance they provide, as well as on the degree of aid fungibility that allows recipients to allocate public expenditure according to their own priorities (ibid.). Despite donors' apparent preference for allocation towards the social sector during the HIPC era, the increasing use of the budget-support modality is likely to enhance fungibility and to reduce the ODA impact on the social sector. In this paper, in addition to total ODA, we analyse the effects of multilateral and bilateral aid.

2.2 Control variables, generally defined by the parameters of the social welfare function

These include:

Q, Gross national income (GNI) per capita

The inclusion of GNI per capita in the model is intended to reflect the tendency of the social welfare function to favour certain types of public provision at higher levels of development. Mahdavi (2004: 1141), for example, suggests that in the course of economic development, public expenditure is likely to be diverted away from investments in infrastructure and human capital, and towards the financing of social safety nets and income maintenance programmes. If so, then a positive coefficient of GNI is implied.

G, Government effectiveness indicator

We introduce an indicator for government effectiveness to capture the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Keefer and Knack (2007) observe that public investment is dramatically higher in countries with limited political checks and balances, low-quality governance or no competitive elections.[5] Similarly, greater government effectiveness could lead to a better reflection of societal preferences on average so that a relatively optimal public expenditure mix is likely to be adopted. In general, without further knowledge of societal preferences, the effect of government effectiveness on expenditure allocation could not be appropriately signed. Nevertheless, greater government effectiveness should reduce the tendency of corrupt governments to tilt spending in favour of capital that is more prone to rent-seeking.

A, Age structure of the population

The age structure of the population is captured by the age dependency ratio for people younger than 15 or older than 64. The demand for health services is expected to be higher the greater the number of people below the age of 15 or above 64. Likewise, the subpopulation below 15 potentially increases school enrolment and the

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5 Keefer and Knack (2007: 567) measure public investment as central government expenditure (including current and capital) for transport and communication. This is a proxy for expenditure in economic infrastructure, and it is derived from the Government Finance Statistics (GFS) of the IMF. In this paper, however, we define public investment as specified in footnote 1 above.

demand for public education services. Its impact on public education expenditure is generally unclear, though. Glick and Sahn (2006), for example, report that public education systems in African countries have suffered from severe revenue shortfalls during a time when the school age population has grown rapidly, in part as a consequence of economic stagnation since the early 1980s until recently. Given that relatively high growth was recorded for SSA countries generally from the mid-1990s, however, we would expect a positive coefficient association with the age dependency ratio in the education expenditure estimation.[6]

E, Ethnic fractionalization

Mauro (1995: 693) shows the existence of a significant correlation between ethnolinguistic fractionalization and corruption in the public sector. Bureaucrats have tended to favour members of their own groups and to give emphasis to categories of government expenditure more prone to rent-seeking behaviour, and away from social expenditure (Delavallade 2006). Kimenyi (2006) also argues that in Africa ethnicity reduces provision of public goods. Annett (2001) additionally demonstrates that increasing levels of consumption are used as partial insurance against the risk of greater political instability and conflict induced by higher fractionalization. If so, then ethnic fractionalization should reduce public investment-type funding. In particular, Miguel (2004) finds that higher ethnic diversity is associated with lower funding for primary education in Kenya.

3 Sample, data and descriptive statistics

The sample includes 40 low-income and lower-middle-income SSA countries for the period 1995-2009. Of these 40 countries, 29 are Highly Indebted Poor Countries (HIPC). Table 1a shows the countries that achieved the HIPC decision point (DP)[7] between 1995 and 2009. Most of the HIPC SSA economies were deemed eligible for interim relief on their debt service falling due sometime between 1995 and 2009, but the DP was attained at different times.

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6 Note that though the age dependency variable used here also includes the share of the population over 64 years, it is swamped by the youth component. In fact, between 1995 and 2009, the ratio of younger dependents (people younger than 15) to the working age population (those aged 15-64) averaged 81.8 per cent, whereas the ratio of older dependents (people older than 64) to the working-age population averaged 5.8 per cent in SSA developing countries.

7 The decision point (DP) is the first stage of qualification for debt relief under the HIPC initiative. At this point, the qualifying country must have 'a current track record of satisfactory performance under IMF and International Development Association (IDA)-supported programmes, a poverty reduction strategy (PRS) in place, and debt burden indicators that are above the HIPC initiative thresholds using the most recent data for the year immediately prior to the decision point' (World Bank 2009). At the DP, the country will also agree on a list of completion point triggers (including a continued track record of satisfactory performance on an IMF programme and the implementation of the PRS for at least one year), the achievement of which will allow the country to 'graduate' from the HIPC initiative (ibid.). In the meantime, many participating multilateral and bilateral creditors will begin to provide debt relief. Hence, 67 per cent stock reduction is approved at the DP, in addition to 67 per cent flow reduction granted under the Naples terms in the three years prior to the DP achievement. If the debt condition remains unsustainable after the full application of the traditional debt relief mechanisms, the HIPC country will be granted further debt cancellation by bilateral creditors as well as multilateral relief under the Cologne terms (IMF 2011a).

Table 1
Coverage of SSA countries included in the sample

	Panel A: countries that achieved the HIPC DP between 1995–2009		
Benin	July 2000	Madagascar	December 2000
Burkina Faso	July 2000	Malawi	December 2000
Burundi	August 2005	Mali	September 2000
Cameroon	October 2000	Mauritania	February 2000
Central African Republic	September 2007	Mozambique	April 2000
Chad	May 2001	Niger	December 2000
Congo, Dem. Rep.	July 2003	Rwanda	December 2000
Congo, Rep.	March 2006	Sao Tome and Principe	December 2000
Cote d'Ivoire	March 2009	Senegal	June 2000
Ethiopia	November 2001	Sierra Leone	March 2002
Gambia, The	December 2000	Tanzania	April 2000
Ghana	February 2002	Togo	November 2008
Guinea	December 2000	Uganda	February 2000
Guinea-Bissau	December 2000	Zambia	December 2000
Liberia	March 2008		

	Panel B: Other countries included in the sample	
	Angola	
	Cape Verde	
	Comoros	(HIPC DP achieved in June 2010)
	Eritrea	(Eligible for HIPC debt relief)
	Kenya	
	Lesotho	
	Nigeria	
	Somalia	(Eligible for HIPC debt relief)
	Sudan	(Eligible for HIPC debt relief)
	Swaziland	
	Zimbabwe	

Source: United Nations (2011).

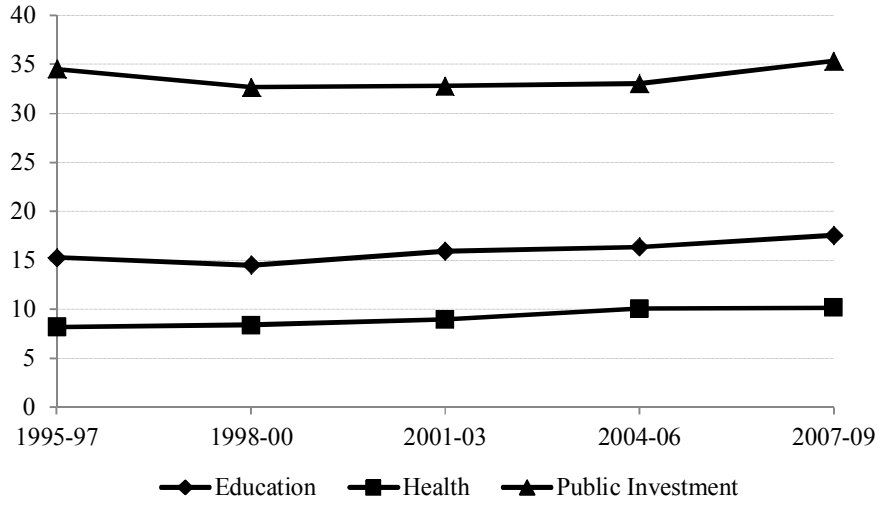
Panel B of Table 1 reports the countries that have reached the DP after 2009 (i.e., Comoros) or those that are eligible for the HIPC debt relief but have yet to achieve the DP (i.e., Eritrea, Somalia and Sudan) or do not qualify for the HIPC. The HIPC was established in September 1995 and officially endorsed by the World Bank, the IMF, the Paris Club and bilateral donors in 1996, with 'enhanced' HIPC introduced in 1999; 2009 is the last year of data availability for the majority of variables and countries.

Data sources and summary statistics for the variables used in the analysis are reported in the Appendix Table. Figure 1 depicts the trends in sector expenditure shares for three-year panel non-weighted averages between 1995 and 2009.

The shares of social spending on health and education followed a generally upward trend during 1995-2009; public investment share declined until 1998, remained stable between 1998 and 2004 and started increasing thereafter. Overall, inter-temporal government expenditure differences were limited, with the greatest variation equal to +2.30 percentage points recorded for public investment spending between 2004/06 and 2007/09. Cross-sectional variation was more pronounced: while the Angolan government allocated on average 4.79 per cent of its total budget to education (arithmetic mean for the entire period 1995-2009), the government of Lesotho assigned

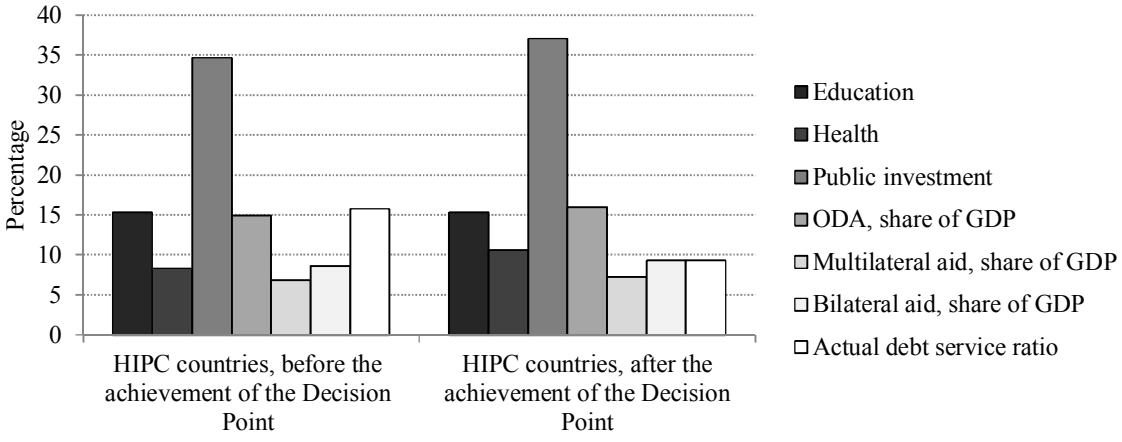
to this sector 25.58 per cent of its overall expenditure. The gap is narrower for the health share, with the minimum 3.28 per cent in Eritrea and maximum 14.46 per cent in Mozambique, but much larger for the public investment share, with 13.65 per cent in Zimbabwe and 54.67 per cent in Chad.

Figure 1
Trends in education, health and public investment expenditure shares
40 SSA countries, 1995-2009



Notes: Non-weighted means of government expenditure shares.
Source: Compilation by authors based on data from World Bank (2010a, 2011).

Figure 2
Average expenditure shares, aid (share of GDP)
and ACTDSR (share of exports) for HIPC countries:
Comparison before and after the achievement of the HIPC Decision Point



Source: Compilation by authors based on data from World Bank (2010a, 2011).

Figure 2 compares government expenditure shares, aid allocated by multilateral and bilateral donors (percentage of GDP), and actual debt service ratio (ACTDSR) for HIPC countries before and after the achievement of the decision point (DP). Expenditure shares generally increased after the DP was reached, and this is particularly the case for public investment (+2.42 percentage points) and health (+2.29 percentage points). This may be related to the positive impact of the HIPC on social sector expenditure given the emphasis placed by the initiative on social spending towards poverty reduction.

The HIPC initiative may have benefitted the SSA low- and low-middle income countries both through a DSR-reduction channel and through an ODAGDP-increase channel. Bilateral aid to HIPC economies increased more than multilateral aid (+0.64 as compared to +0.44 percentage points) after the achievement of the HIPC DP, which suggests that bilateral donors (most of all, DAC donors) welcomed the improvement in the debt position of the most-indebted poor countries. Meantime, the ACTDSR dropped by 6.47 percentage points, which may be due not only to the reduction of the debt burden towards sustainable levels prompted by the HIPC, but also to the HIPC requirement to clear all arrears to multilateral donors before the Decision Point and avoid accumulating new arrears thereafter (Martin and Johnson 2001).

3.1 Debt service estimation

In order to assess the impact of debt service on the allocation of government expenditure in the sample of SSA countries, we proceed by first estimating a more reliable measure of the liquidity constraint induced by debt service payments. Actual payments may reflect the ability and/or un/willingness of a country to pay, more than the effective debt-servicing burden that the country is facing (Fosu 2007, 2008, 2010a). The ACTDSR is thus regressed on the NETDEBTX (net debt as a share of exports) that is the difference between the public and publicly-guaranteed debt stock and international reserves. 'In effect, a larger debt outstanding signifies larger debt-servicing obligations, *ceteris paribus*, whereas a higher level of international reserves indicates that the country has a greater ability to service its debt, rendering the debt constraint less binding' (Fosu 2008: 369).

The variables that enter the DSR estimations, their sources and summary statistics are described in the Appendix Table. We first replicate the approach by Fosu (2007, 2008, 2010a) and report regression results in Table 2.

Interestingly, the estimate of the NETDEBTX coefficient of 0.016 in Table 2 is about the same as that of 0.015 reported by Fosu (2007, 2008, 2010a) for a slightly different sample of SSA countries and a different time period (1975-94 versus the current 1995-2009), with both estimates highly significant (z statistics: 4.31 for 1975-94 versus the current 7.79). The coefficient of determination (0.456) suggests a slightly lower level of fit than that implied by an estimate of 0.597 for 1975-94 (ibid.).

As a departure from Fosu (2007, 2008, 2010a), however, we subsequently introduce year dummies in the DSR regression, with the aim of accounting for possible temporal effects. In particular, we expect that the HIPC initiatives would reduce debt levels over time. Table 3 reports the estimated coefficients. As the Sargan-Hansen test statistic rejects the joint significance of over-identifying restrictions, the fixed effects (FE) results are shown this time.

Table 2
Panel regression results: RE estimation of ACTDSR

Dependent variable = ACTDSR (percentage)		
NETDEBTX	Percentage	0.016*** (7.79)
Constant		5.694***(3.94)
Observations		138
RSQ		0.456
Sargan- Hansen		1.15 (0.28)
Breusch-Pagan LM		14.09 (0.00)

Notes: Regression with cluster robust standard errors; z statistics in parentheses.

RSQ is the coefficient of determination. The Sargan-Hansen (or Hansen's *J*) statistic is a test statistic for overidentifying restrictions,[8] which is robust to arbitrary heteroscedasticity; the restrictions hold under the null. In addition, the statistic is robust to within-group correlation because the estimation is conducting by clustering within countries. The *J* statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of overidentifying restrictions (Baum 2006: 201). The Breusch-Pagan LM represents the Lagrangian multiplier test to choose between RE and pooled-OLS models. LM tests the null hypothesis of cross-equation error independence and is asymptotically distributed as chi-square with degrees of freedom equal to unity. Hansen and Breusch-Pagan LM statistics suggest that RE is to be preferred to both FE and OLS.

* p < 0.10, ** p < 0.05, *** p < 0.01.

Source: See text.

Table 3
Panel regression results: FE estimation of ACTDSR with year dummies

Dependent variable = ACTDSR (percentage)	Unit	
NETDEBTX	Percentage	0.013*** (3.46)
Yrs98_00	Yes=1	-1.814 (-1.55)
Yrs01_03	Yes=1	-3.918*** (-2.76)
Yrs04_06	Yes=1	-3.149* (-1.91)
Yrs07_09	Yes=1	-6.095*** (-5.49)
Constant		8.861*** (5.81)
Observations		138
RSQ		0.556
Sargan-Hansen		25.71 (0.00)
F-test for time effects		14.49 (0.00)

Notes: Regression with cluster robust standard errors; t statistics in parentheses.

* p < 0.10, ** p < 0.05, *** p < 0.01. See Table 2 for other notes.

Source: See text.

The year coefficients, jointly statistically significant at the 1 per cent level (see F-statistic for time effects), indicate that the debt service ratio (DSR) decreased through time from the base period (i.e., three-year average 1995-1997). We derive Table 4 from

8 In order to select between fixed effects (FE) and random effects (RE) estimators, we recall that the additional orthogonality conditions assumed under RE are overidentifying restrictions (Schaffer and Stillman 2010).

Table 3, in order to show marginal changes for significant time dummies' coefficients. The changes suggest that ACTDSR dropped particularly after 2000, when the majority of HIPC countries qualified for the HIPC DP (see Panel A of Table 1), and after the launch of the Multilateral Debt Relief Initiative (MDRI) in the second half of 2005.[9]

To more accurately reflect the impact of the HIPC debt relief on debt servicing, we drop the time dummy variables and introduce a decision point (DP) year dummy variable (HIPC_DP). For a HIPC country, HIPC_DP equals '1' from the time when the country achieved the DP (sometime between 1995 and 2009), and '0' for the years preceding the achievement. In the meantime, HIPC_DP is set to '0' for HIPC countries that qualified for the DP after 2009 and for non-HIPC countries. The RE results, which are preferred on the basis of the Hansen's *J* statistic and the Breusch-Pagan LM statistic, are reported in Table 5. The results show that achieving DP under the HIPC reduced the debt burden by an average of 3.13 percentage points.

Table 4
Marginal changes of estimated coefficients for time dummies

	Value of the coefficient	Marginal change
1995-97	8.861	-
1998-2000	8.861	-
2001-03	4.943	-3.918
2004-06	5.712	0.769
2007-09	2.766	-2.946

Source: Own computations based on Table 3 estimation results.

Table 5
Panel regression results: RE estimation of ACTDSR with HIPC_DP

Dependent variable = ACTDSR (percentage)		
	Unit	
NETDEBTX	Percentage	0.014*** (6.32)
HIPC_DP	Yes=1	-3.131** (-2.25)
Constant		7.641*** (5.01)
Observations		138
RSQ		0.460
Sargan- Hansen		1.75 (0.42)
Breusch-Pagan LM		15.54 (0.00)

Notes: Regression with cluster robust standard errors; z statistics in parentheses.
* p < 0.10, ** p < 0.05, *** p < 0.01. See Table 2 for other notes.
Source: See text.

9 Launched in June 2005, and first proposed by the G8, the Multilateral Debt Relief Initiative (MDRI) foresees 100 per cent cancellation of debt claims by the International Monetary Fund (IMF), the International Development Association (IDA) of the World Bank, and the African Development Fund (AfDF) on countries that qualified (or will eventually) for the completion point under the HIPC (the point at which debt relief from HIPC-participating creditors becomes irrevocable; World Bank 2009). As stated by the IMF, 'Unlike the HIPC Initiative, the MDRI does not propose any parallel debt relief on the part of official bilateral or private creditors or of multilateral institutions beyond the IMF, IDA, and the AfDF'. Nonetheless, the Inter-American Development Bank provided similar debt relief to the five HIPCs in the western hemisphere in early 2007 (IMF 2011b).

We use the results in Table 5 to predict the debt service ratio (PREDSR), and then compare the ACTDSR with the PREDSR in Table 6. The ACTDSR has a slightly smaller average, but a larger standard deviation (SD) than the PREDSR; the larger SD associated with ACTDSR could indicate that the 'debt-servicing ratio is a poor indicator of the debt burden' due to 'noise'; otherwise the greater standard error should lead to greater precision of the ACTDSR coefficient (Fosu 2010a: 384, 390: note 23).

The role of the HIPC initiative in possibly relieving the liquidity constraint of debt is further investigated by focusing on the subsample of countries that qualified for the HIPC between 1995 and 2009 (see Panel A of Table 1afor a list of these countries). We suspect that the longer the time elapsed since a country achieved the HIPC DP, the smaller the DSR. We test this hypothesis below in Table 7. DSR is regressed on NETDEBTX, HIPCDPYrs (the number of years from the attainment of the HIPC DP, zero prior to DP) and HIPCDPYrs^2 (HIPCDPYrs squared).

As expected, ACTDSR falls as the elapsed time from the achievement of the decision point under HIPC increases (see the negative coefficient for the HIPCDPYrs variable). Nonetheless, the coefficient associated with the quadratic term HIPCDPYrs^2 is positive (and significant at the 10 per cent level), suggesting that the reduction in debt servicing is at a decreasing rate. Hence, the impact of the HIPC initiative on the DSR seems to fade over time. Indeed, the results of table 7 suggest that the turning point is roughly 6 years (that is, 1.314/0.206).

Table 6
ACTDSR versus PREDSR: Comparison

Variable	Observations	Mean	Std ¤dev.	Min	Max
ACTDSR	138	10.93	9.78	0.11	49.60
PREDSR	138	11.51	7.00	4.29	41.90

Source: Own computations.

Table 7
Panel regression results: RE estimation of ACTDSR
with HIPCDPYrs and its square

Dependent Variable = ACTDSR (percentage)	Unit	
NETDEBTX	Percentage	0.015*** (7.38)
HIPCDPYrs	No. of years	-1.314** (-2.51)
HIPCDPYrs^2	Square	0.103* (1.89)
Constant		7.799*** (3.61)
Observations		101
RSQ		0.57
Sargan- Hansen		1.22 (0.75)
Breusch-Pagan LM		3.49 (0.06)

Notes: Regression with cluster robust standard errors; z statistics in parentheses.
* p < 0.10, ** p < 0.05, *** p < 0.01
See Table 2 for other notes.
Source: See text.

Table 8
Panel regression results: RE estimations of education,
health and public investment expenditure shares with PREDSR and ACTDSR

Dependent variable = Logarithmic sector expenditure shares

		Estimations with PREDSR			Estimations with ACTDSR		
	Unit	1. Education	2. Health	3. Public Investment	4. Education	5. Health	6. Public Investment
PREDSR or ACTDSR	Ln	-0.258***	-0.098	-0.007	-0.133***	-0.071**	0.042
		(-2.85)	(-1.41)	(-0.09)	(-2.92)	(-2.16)	(1.14)
ODAGDP	Ln	-0.102	0.027	0.229**	0.007	0.070	0.210**
		(-1.28)	(0.46)	(2.44)	(0.08)	(1.21)	(2.37)
PCGNI	Ln	-0.278*	-0.070	0.001	-0.156	-0.042	0.033
		(-1.77)	(-0.47)	(0.01)	(-1.10)	(-0.31)	(0.30)
GOVEFF	[-2.5,2.5]	0.227**	0.160	0.160*	0.249**	0.174	0.153*
		(2.36)	(1.48)	(1.89)	(2.48)	(1.64)	(1.82)
AGEDEP	Ln	-1.318**	-0.060	-0.245	-1.074	0.020	-0.273
		(-2.13)	(-0.14)	(-0.50)	(-1.62)	(0.05)	(-0.55)
ETHNIC	[0,1]	-0.686**	-0.436	0.005	-0.504*	-0.367	0.032
		(-2.41)	(-1.45)	(0.02)	(-1.71)	(-1.30)	(0.10)
Constant		11.695***	3.373	4.154*	9.214***	2.635	4.018*
		(3.47)	(1.26)	(1.73)	(2.69)	(1.05)	(1.66)
Observations		85	108	101	85	108	101
RSQ		0.272	0.227	0.241	0.271	0.300	0.222
Sargan-Hansen		4.49 (0.48)	5.85 (0.32)	5.02 (0.413)	4.80 (0.44)	5.46 (0.36)	6.91 (0.23)
Breusch-Pagan LM		20.01 (0.00)	39.92 (0.00)	34.52 (0.00)	19.02 (0.00)	23.28 (0.00)	35.89 (0.00)

Notes: All estimations are random effects regressions with cluster robust standard error;. z statistics in parentheses.

RSQ is the coefficient of determination. Sargan-Hansen is a test statistic to select between FE and RE; overidentifying restrictions, assumed under RE, hold under the null. The statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of restriction. Breusch-Pagan LM tests the null hypothesis of cross-equation error independence (that is pooled-OLS is to be preferred to RE), and is asymptotically distributed as chi-square with degrees of freedom equal to unity.

* p < 0.10, ** p < 0.05, *** p < 0.01.

Source: See text.

4 Estimation of equations: education, health and public investment expenditure shares

We now proceed with the estimation of the expenditure share equations involving education, health and public investment. We use in turn both the actual debt-servicing rate, ACTDSR, and the predicted debt servicing, PREDSR. If the HIPC initiative did indeed relieve the debt-servicing constraint, then there should not be a significant difference using either measure. Also included in the models are the aid variable, ODAGDP, and the other (control) variables.

Three-year data averaging is introduced in order to minimize non-systematic errors (Fosu 2010a: 385).[10] Given that the number of time periods (*T=5*) is much smaller than the number of countries (*N=40*) and the main requirement for large sample approximations ($T > N$) is not met for simultaneous estimation (Baum 2006), we estimate the equations separately. Furthermore, we opt for the RE results, given tests based on the Sargan-Hansen and the Breusch-Pagan LM statistics (see Table 8). We also use cluster-robust standard errors (clustering within countries). Regression results are presented in Table 8. The rather small sample sizes, particularly the case for education expenditure shares,[11] are due to missing data.

As in previous studies (e.g., Fosu 2010a), the debt-constrained variable PREDSR exhibits a negative sign in both the health and education expenditure share equations. Unlike previous estimates for 1975-94 (ibid.: Table 2), however, the estimated coefficients for 1995-2009 are quite small in magnitude (education: -0.258 versus -1.497; health: -0.098 versus -1.824). Indeed, the current coefficient is not even significant in the case of health. Using the actual debt-servicing payment ACTDSR, instead of PREDSR, also results in negative coefficients with small magnitudes, and even smaller than those of PREDSR. Nonetheless, the fact that the ACTDSR coefficients are statistically significant, unlike those for the pre-HIPC period (ibid.), suggests that the 'noise' in actual debt servicing is minimal, in the sense that ACTDSR may now reasonably accurately reflect a country's payment obligations and, hence, its debt burden. According to the present results, a higher level of debt servicing still implies lower allocations into the education and health sectors, but at much lower rates than in the pre-HIPC era.

As the results in Table 8 further suggest, ODA, measured by ODAGDP, does not seem to significantly alter the allocation for health or education. This outcome differs from that obtained by other studies. For example, Fosu (2010a) and Ouattara (2006) both find a positive effect of aid in these sectors. That aid may no longer affect allocation to these social sectors may simply reflect the possibility of higher fungibility of ODA, especially in the light of the increasing direction of aid towards budget support in recent years. However, as in the case of Fosu (2010a) and Ouattara (2006), for example, ODA apparently exercises a positive effect on the expenditure share for public investment.

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10 Fosu (2010a) considers five-year instead of three-year averaging given the longer time period (20 instead of 15 years) available for his analysis.

11 For education, missing values mainly concern Angola, Burkina Faso, Comoros, the Democratic Republic of Congo, Guinea-Bissau, Liberia, Mozambique, Nigeria, São Tomé and Príncipe, Somalia, Sudan, Tanzania and Zimbabwe.

Table 9
Robustness check: Panel regression results:
RE estimations of social sector and public investment expenditures with PREDSR

Dependent variable = Logarithmic sector expenditure shares

		Estimation with MULTILATERAL AID			Estimation with BILATERAL AID			Estimation with DAC AID		
		1a.	2a.	3a.	1a.	2a.	3a.	1a.	2a.	3a.
	Unit	Education	Health	Public Investment	Education	Health	Public Investment	Education	Health	Public Investment
PREDSR	Ln	-0.257***	-0.095	-0.007	-0.248***	-0.101	-0.015	-0.248***	-0.101	-0.013
		(-2.79)	(-1.36)	(-0.08)	(-2.81)	(-1.43)	(-0.18)	(-2.81)	(-1.43)	(-0.16)
Aid share of GDP	Ln	-0.076	0.042	0.223***	-0.039	0.004	0.175*	-0.030	-0.001	0.168*
		(-1.08)	(0.86)	(2.82)	(-0.46)	(0.07)	(1.94)	(-0.38)	(-0.03)	(1.91)
PCGNI	Ln	-0.268*	-0.058	0.006	-0.226	-0.085	-0.053	-0.220	-0.088	-0.056
		(-1.69)	(-0.39)	(0.06)	(-1.50)	(-0.59)	(-0.49)	(-1.45)	(-0.62)	(-0.52)
GOVEFF	[-2.5,2.5]	0.236**	0.150	0.156*	0.178**	0.174*	0.213***	0.174**	0.176*	0.215***
		(2.40)	(1.34)	(1.85)	(2.01)	(1.75)	(2.62)	(2.00)	(1.79)	(2.68)
AGEDEP	Ln	-1.285**	-0.096	-0.425	-1.309**	-0.076	-0.276	-1.311**	-0.082	-0.263
		(-2.03)	(-0.23)	(-0.89)	(-2.10)	(-0.18)	(-0.55)	(-2.11)	(-0.19)	(-0.52)
ETHNIC	[0,1]	-0.723**	-0.418	0.104	-0.659**	-0.442	-0.063	-0.660**	-0.441	-0.064
		(-2.54)	(-1.36)	(0.36)	(-2.19)	(-1.47)	(-0.19)	(-2.17)	(-1.46)	(-0.19)
Constant		11.387***	3.447	5.089**	11.113***	3.610	4.931**	11.073***	3.660	4.901**
		(3.36)	(1.31)	(2.17)	(3.30)	(1.38)	(2.08)	(3.27)	(1.41)	(2.08)
Observations		84	107	100	85	108	101	85	108	101
RSQ		0.270	0.208	0.273	0.230	0.217	0.211	0.225	0.214	0.206
Sargan-Hansen		5.18	4.79	4.30	6.17	6.60	6.26	6.08	6.91	6.31
		(0.39)	(0.44)	(0.51)	(0.29)	(0.25)	(0.28)	(0.30)	(0.23)	(0.28)
Breusch-Pagan LM		19.36	40.07	31.65	22.39	39.50	33.73	22.63	39.67	34.03
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes: All estimations are RE regressions with cluster robust standard errors. z statistics in parentheses.

RSQ is the coefficient of determination. Sargan-Hansen is a test statistic to select between FE and RE; overidentifying restrictions, assumed under RE, hold under the null. The statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of restrictions. Breusch-Pagan LM tests the null hypothesis of cross-equation error independence (that is pooled-OLS is to be preferred to RE), and is asymptotically distributed as chi-square with degrees of freedom equal to unity.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: See text.

Table 10
Robustness check: Panel regression results:
RE estimations of social sector and public investment expenditures with ACTDSR

Dependent variable = Logarithmic sector expenditure shares

		Estimation with MULTILATERAL AID			Estimation with BILATERAL AID			Estimation with DAC AID		
		4a.	5a.	6a.	4a.	5a.	6a.	4a.	5a.	6a.
	Unit	Education	Health	Public Investment	Education	Health	Public Investment	Education	Health	Public Investment
ACTDSR	Ln	-0.140***	-0.074**	0.064	-0.138***	-0.065**	0.052	-0.140***	-0.065**	0.053
		(-2.60)	(-2.21)	(1.46)	(-3.12)	(-2.00)	(1.47)	(-3.17)	(-1.98)	(1.47)
Aid share of GDP	Ln	-0.030	0.059	0.213***	0.061	0.035	0.155*	0.074	0.030	0.148*
		(-0.46)	(1.21)	(2.83)	(0.71)	(0.66)	(1.90)	(0.90)	(0.60)	(1.85)
PCGNI	Ln	-0.181	-0.048	0.060	-0.126	-0.054	-0.001	-0.120	-0.056	-0.004
		(-1.26)	(-0.35)	(0.57)	(-0.90)	(-0.41)	(-0.01)	(-0.85)	(-0.43)	(-0.04)
GOVEFF	[-2.5,2.5]	0.262***	0.161	0.147*	0.222**	0.197*	0.199**	0.215**	0.199**	0.201**
		(2.64)	(1.44)	(1.72)	(2.43)	(1.95)	(2.44)	(2.42)	(1.99)	(2.49)
AGEDEP	Ln	-1.029	-0.039	-0.459	-1.058	-0.006	-0.309	-1.041	-0.007	-0.299
		(-1.52)	(-0.09)	(-0.95)	(-1.57)	(-0.01)	(-0.60)	(-1.53)	(-0.02)	(-0.58)
ETHNIC	[0,1]	-0.515*	-0.347	0.127	-0.526*	-0.375	-0.012	-0.535*	-0.375	-0.013
		(-1.80)	(-1.21)	(0.45)	(-1.69)	(-1.33)	(-0.04)	(-1.69)	(-1.33)	(-0.04)
Constant		9.242***	2.998	4.771**	8.887***	2.937	4.631*	8.754**	2.962	4.619*
		(2.70)	(1.22)	(2.05)	(2.58)	(1.19)	(1.90)	(2.52)	(1.20)	(1.91)
Observations		84	107	100	85	108	101	85	108	101
RSQ		0.290	0.288	0.243	0.234	0.284	0.185	0.225	0.282	0.181
Sargan-Hansen		4.41	5.84	8.93	6.44	5.90	8.14	6.53	5.99	8.26
		(0.49)	(0.32)	(0.11)	(0.27)	(0.32)	(0.15)	(0.26)	(0.31)	(0.14)
Breusch-Pagan LM		19.02	20.89	33.49	21.95	23.51	35.51	22.28	23.60	35.72
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Notes: All estimations are RE regressions with cluster robust standard errors. z statistics in parentheses.

RSQ is the coefficient of determination. Sargan-Hansen is a test statistic to select between FE and RE; overidentifying restrictions, assumed under RE, hold under the null. The statistic is asymptotically distributed as chi-square with degrees of freedom equal to the number of restrictions. Breusch-Pagan LM tests the null hypothesis of cross-equation error independence (that is pooled-OLS is to be preferred to RE), and is asymptotically distributed as chi-square with degrees of freedom equal to unity.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Source: See text.

The estimated aid impact for public investment is remarkably similar: 0.215 for 1975-94 (Fosu 2010a: Table 2), compared to the present estimates for 1995-2009 of 0.229 and 0.210 reported in columns 3 and 6 of Table 8, respectively.

Considering the other covariates, we note that the effect of development level as measured by per capita income, PCGNI, is generally insignificant across the three sectors. Similar results were obtained in Fosu (2010a: Table 2), for instance, though the coefficient of PCGNI was weakly positive for education in that study for 1975-1994, in contrast to the weakly negative impact in the present 1995-2009 sample. The low precision of the estimate in either study suggests that it is difficult to identify education as either 'luxury' or 'non-luxury'.[12]

Public spending on education is also negatively related to age dependency, though with reasonable statistical significance only in the model with PREDSR, column 1. This result is similar to that in Dreher, Nunnenkamp and Thiele (2006). As observed above, AGEDEP, which is the fraction of the population below 15 years of age or over 64 to the working-age population, is heavily weighted towards the former (school) age group, especially in the light of the recent increasing emphasis on attaining free primary education in many African countries.

In the case of ethnic fractionalization, we estimate negative coefficients of ETHNIC for both education and health. In particular, the coefficient for education is statistically significant at the 5 per cent level in the regression with PREDSR, and at the 10 per cent level in the regression with ACTDSR. The results corroborate the current literature suggesting that ethnic fractionalization tends to reduce public provision (e.g., Kimenyi 2006; Miguel 2004). That the negative effect of ETHNIC is quite significant for education is particularly supportive of Miguel's empirical finding that ethnic fractionalization reduced funding for primary education in Kenya.

Government effectiveness, GOVEFF, exhibits positive coefficients in all three sectors, although most significantly for education and public investment. In the case of education, this finding corroborates the view that improvement in governance would reduce corruption and direct public expenditure towards the non-capital-intensive sectors (Fosu 2010a), consistent with Keefer and Knack (2007) and Rajkumar and Swaroop (2008). However, the current result is not consistent with this view if public investment is capital-intensive, unless societal preferences require relatively high levels of public investment and greater government effectiveness reflects such preferences.

We now check the robustness of the above results, especially as related to aid, by disaggregating ODA into multilateral aid, bilateral aid, and bilateral aid from DAC countries. With the Sargan-Hansen and the Breusch-Pagan LM test statistics favouring RE estimation over the FE and OLS alternatives, RE results are presented in Tables 9 and 10; the debt-servicing measures are the 'debt-constraining' variable, PREDSR, and actual debt servicing, ACTDSR.

The results corroborate those in Table 8. In particular, the effect of ODA remains positive for public investment regardless of the aid type (multilateral, bilateral, or,

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12 An increase in PCGNI would shift the expenditure in favour (against) of 'luxury' ('non-luxury') sector; for details see, e.g., Fosu (2010a).

DAC), though the precision of the estimate appears greatest when the ODA variable is multilateral aid, perhaps because the African countries' ODA is often dominated by this aid type. We observe, furthermore, that the findings for the effects of the other covariates remain intact. In particular, the debt-servicing impacts, whether measured by PREDSR or ACTDSR, are about the same across ODA types and are similar to our respective estimates in Table 8 when aggregate ODA was used.

5 Summary and conclusions

The current global financial and economic crises are expected to adversely affect poor countries in SSA both through a financial channel, represented by the likely fall in ODA, and through a trade channel, following the shrinking volumes of exports. Despite the current, better economic performance of many of these countries as compared to earlier economic crises, fiscal cautiousness is nonetheless advised in order to avert the risk of unsustainable debt burdens. Such burdens have been shown in previous studies to be especially significant for public expenditure allocation, with constrained debt servicing reducing spending shares in the social sectors of education and health. Yet, such social spending could be critical for poverty reduction.

Based on a 1995-2009 panel of 40 SSA countries, of which 29 are HIPC-eligible, this paper investigates the extent to which debt servicing has continued to be consequential for public expenditure allocation following the HIPC initiative, which was intended to reduce external debt to sustainable levels. In particular, does constraining debt servicing lead to reallocation away from education and health to the same degree as was observed prior to HIPC? Furthermore, the paper examines the impact of external aid on the health and education spending as well as on public investment, another sector with potentially important implications for poverty.

Results show that debt servicing continues to exhibit a negative impact especially on education expenditure; this is particularly the case for the predicted debt servicing, which arguably constitutes the more reliable measure of the liquidity constraint caused by debt repayment obligations. Nonetheless, our results also suggest that following the HIPC initiative, actual debt servicing has now become a more reliable indicator of the debt burden than previously. Furthermore, the debt impacts on both education and health expenditures are, respectively, much smaller than those for the pre-HIPC period. Similarly, the effect of ODA on education or health expenditure is now quite minimal; indeed, none of the estimates is significant, contrary to previous findings for the pre-HIPC period. However, we also find that foreign aid, especially multilateral aid, exhibits a positive effect on public investment, to the same degree as in earlier studies for the pre-HIPC period.

Among other covariates, ethnic fractionalization redirects public expenditure away from the social sector and, possibly, towards public investment. Moreover, government effectiveness generally benefits spending on both human and physical capital.

With respect to the variables constituting the paper's focus, the above results suggest that the HIPC initiative has succeeded in making debt levels more manageable for countries, at least for the purposes of public expenditure allocation. Unfortunately, we also found that the debt-reduction impact of HIPC is likely to be temporary, with the

debt-servicing rate rising after approximately six years following a typical HIPC country's DP achievement. Thus, appropriate measures are called for to counterbalance such a direction. In the meantime, the likely downward trends in ODA, especially given the detrimental effects of the present crises on the development partners' economies, are worrisome if public investment is to endure, at least for poverty-reduction purposes.

Acronyms

DSR	debt servicing ratio
FE	fixed effects
GNI	gross national income
HIPCs	highly indebted poor countries
IDA	International Development Association
MDRI	Multilateral Debt Relief Initiative
ODA	official development aid
PRS	poverty reduction strategy
RE	random effects
SSA	sub-Saharan Africa

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Variables in the DSR and the expenditure estimations; Data sources and summary statistics

Variable	Description	Unit	Obs.	Mean	Std dev.	Min.	Max	Source
ACTDSR	Actual debt service, share of exports	Percentage	155	10.76	9.60	0.11	49.60	World Bank (2011)
NETDEBTX	Net debt, share of exports	Percentage	139	371.85	480.94	-29.39	2,447.09	(ibid.)
Yrs98_00	Year dummy* (Years 1998-2000)	'1' for 1998-2000, '0' otherwise	200			0	1	
Yrs01_03	Year dummy (Years 2001-03)	'1' for 2001-03, '0' otherwise	200			0	1	
Yrs04_06	Year dummy (Years 2004-06)	'1' for 2004-06, '0' otherwise	200			0	1	
Yrs07_09	Year dummy (Years 2007-09)	'1' for 2007-09, '0' otherwise	200			0	1	
HIPC_DP	HIPC Decision-Point country dummy	'0' before the achievement of the DP, '1' thereafter	200	0.43	0.50	0	1	United Nations (2011)
HIPCDPYrs	No. of yrs from the achievement of the Decision Point (DP) under the HIPC initiative	'0' before the achievement of the DP, a positive integer thereafter	200	2.15	3.17	0	9.83	(ibid.)
HIPCDPYrs^2	Ibid., squared	Positive integer	200	14.65	26.82	0	96.69	(ibid.)
Education	Share of govt expenditure on education	Percentage	133	15.84	5.52	3.34	30.12	World Bank (2010a, 2011)
Health	Share of govt expenditure on health	Percentage	189	9.15	3.49	1.94	20.35	(ibid.)
Public investment	Share of govt expenditure on public investment	Percentage	163	33.61	12.52	5.81	70.42	(ibid.)
ODAGDP	ODA, share of GDP	Percentage	193	13.62	10.56	0.39	53.09	(ibid.)
Multilateral aid	ODA from multilateral agencies, share of GDP	Percentage	192	6.01	5.78	0.15	43.87	OECD(2011)
Bilateral aid	ODA from DAC and non-DAC countries, share of GDP	Percentage	193	8.00	7.20	0.15	56.85	(ibid.)
DAC aid	ODA from DAC countries, share of GDP	Percentage	193	7.91	7.11	0.15	55.72	(ibid.)
PCGNI	Gross national income (GNI) per capita	Constant 2000 US$	155	372.30	295.13	72.18	1,690.95	World Bank (2010a, 2011)
GOVEFF	Government effectiveness	[-2.5,2.5]	188	-0.88	0.50	-2.39	0.39	World Bank (2010b)
AGEDEP	Age dependency ratio for people younger than 15 and older than 64	Percentage	200	88.60	7.88	70.32	109.16	World Bank (2011)
ETHNIC	Ethnic fractionalization	[0,1]	195	0.68	0.23	0.00	0.93	Alesina et al. (2003)

Notes: * We exclude the base period yrs95-97 (years 1995-97) from the estimation of DSR.

Source of descriptive statistics: Authors' compilation..