



WP/06/180

IMF Working Paper

Do Debt-Service Savings and Grants Boost Social Expenditures?

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IMF Working Paper

Policy Development and Review Department

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July 2006

Abstract

This Working Paper should not be reported as representing the views of the IMF.

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This paper evaluates whether debt relief and grants can boost social expenditures in low-income countries. It finds that declines in debt-service help raise social expenditures, but no relationship between grants and social expenditures. Moreover, since the mid-1980s, low-income countries have managed to fully insulate social expenditures from the effects of budgetary tightening. The magnitude of the impact of these effects on social expenditures, however, is dwarfed by the resources needed to enable these countries to reach the Millennium Development Goals.

JEL Classification Numbers: F34, F35, H51, H52

Keywords: Debt relief, grants, social expenditures, Millennium Development Goals

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¹ The author thanks Ms. Daseking and Messrs. Joshi, Berg, Ghosh, Kraay, and Plant for many helpful comments. All remaining errors are the responsibility of the author.

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I. INTRODUCTION

At the Development Assistance Committee meeting of the Organization for Economic Cooperation and Development (OECD) in 1996, a series of socioeconomic targets were set for developing countries to reach by a target date of 2015. Subsequently, these targets were also embraced by the multilateral agencies and were reinforced by heads of governments at the United Nations General Assembly (the Millennium Assembly) in September 2000. Inter alia, the targets or Millennium Development Goals (MDGs) aim at eradicating poverty and hunger, achieving universal primary education, promoting gender equality and maternal health, reducing child mortality, ensuring environmental sustainability, and combating diseases. Since then, considerable emphasis has been placed on assisting low-income countries to reach these goals. Their achievement requires a massive resource transfer from advanced to low-income countries in the form of debt-service savings and grants.

To help low-income countries raise their welfare and attain the socioeconomic targets, the Heavily Indebted Poor Countries (HIPC) Initiative was launched in 1996 as a comprehensive approach to debt reduction. In mid-2005, the HIPC initiative was supplemented by a new multilateral debt relief proposal aiming to eliminate the debts of HIPC countries owed to the IMF, World Bank, and African Development Bank at a projected cost of about \$55 billion.

The outcome of such a large resource transfer of course, depends on whether debt-service savings are spent on items that generate improvements in welfare. In this regard, a positive association between expenditures on health and education and the associated MDGs has been documented in Gupta and others (2002). They find that increased public expenditure on education is associated with improvements in both access to, and attainment in, schools, while increased public expenditure on health care reduces mortality rates for children. These findings support earlier work on health expenditures by Bidani and Ravallion (1997), although some studies find that the contribution of public health outlays to health status is insignificant (Kim and Moody (1992); Filmer and Pritchett (1997)).

Rather than focusing on the association between social expenditures and outcomes, this paper looks at whether, historically, debt-service savings and increased grants have translated into rising expenditures on health and education. So far, the literature on the relationship between debt-service or relief and public expenditures has produced mixed results. Clements, Bhattacharya, and Nguyen (2003) find that the ratio of debt-service to output is significantly negatively related to the public investment rate; their coefficient of 0.2 indicates that a decline in the debt-service ratio from 10 percent to 5 percent of GDP would raise the public investment rate by about 1 percent of GDP, some of which incorporates investment expenditures on education. In contrast, Kraay and Chauvin (2005) have recently argued that debt relief has not contributed to any significant change in health and education expenditures. In their analysis, debt relief is calculated as the change in the nominal amount of debt written off multiplied by one *minus* the average concessionality rate. While they cross-check data reported by the debtor with comparable creditor data, the debt-relief data still remain noisy. Moreover, simplifying assumptions must be made regarding the

amount of concessionality because of the lack of information on the terms of debt reschedulings.

Although the use of debt service directly rather than imputed values for debt-relief eliminates the need for assumptions on the degree of concessionality of various loans, changes in debt service can occur for reasons that are unrelated to debt relief, such as changes in borrowing strategies. It could be argued, however, that the estimate obtained using changes in debt service is a lower bound of the true effect, since those changes associated with debt relief should have a greater impact on social expenditures than changes in debt service associated with other reasons because they are more closely targeted toward these expenditures.

Another dimension of the issue is whether the debt level in addition to debt-service has a significant impact on social expenditures and whether these effects are comparable for low and middle-income countries. In an intertemporal context, it could be argued that the debt ratio should be a more significant determinant of expenditures for countries that are not credit constrained, since countries, like individuals, may adjust consumption according to the permanent income hypothesis. This type of behavior is likely for middle-income countries, because the magnitude of the debt ratio has an important bearing on the ability of these countries to obtain new loans at low spreads. Mody and Saravia (2003) have shown that high debt ratios lower the likelihood of bond issuance, while Hilscher and Nosbusch (2004) have shown that high debt levels are significantly correlated with high emerging market bond spreads. Low-income countries, in contrast, are more likely to be credit constrained and to rely on concessional loan financing because of the difficulty of issuing debt themselves. For the low-income group, changes in debt-service are likely to have greater effects on social expenditures.

In the last section, the estimates obtained in this paper from a relationship between debt-service and social expenditures are combined with other estimates of the effects of social expenditures on the social indicators embodied in the Millennium Development Goals. These estimates highlight the disparity between resources that are currently allocated to social needs and those that are needed for the achievement of the MDGs.

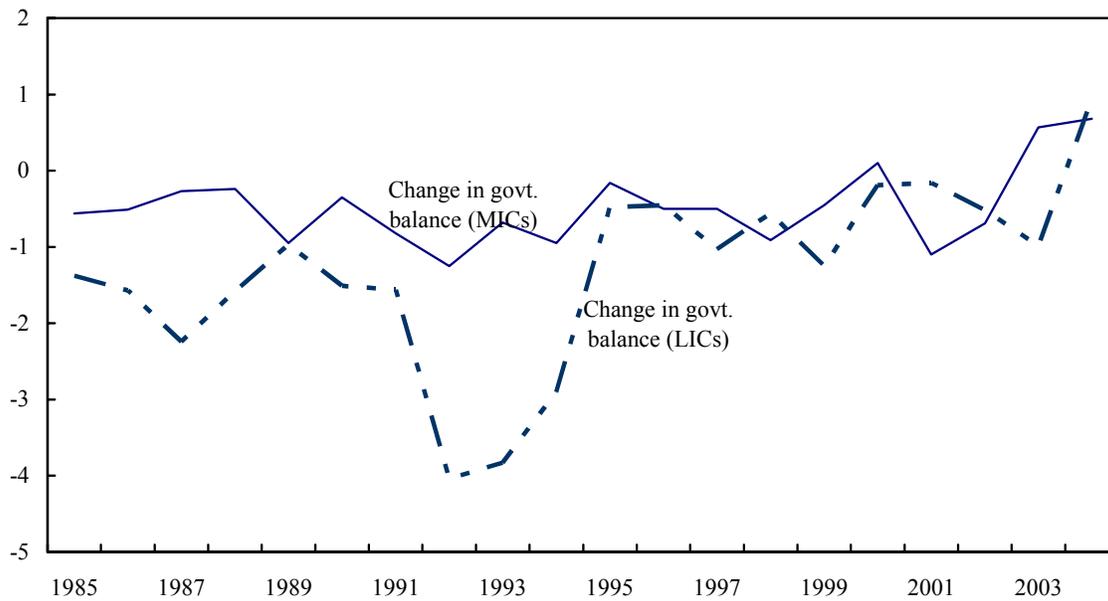
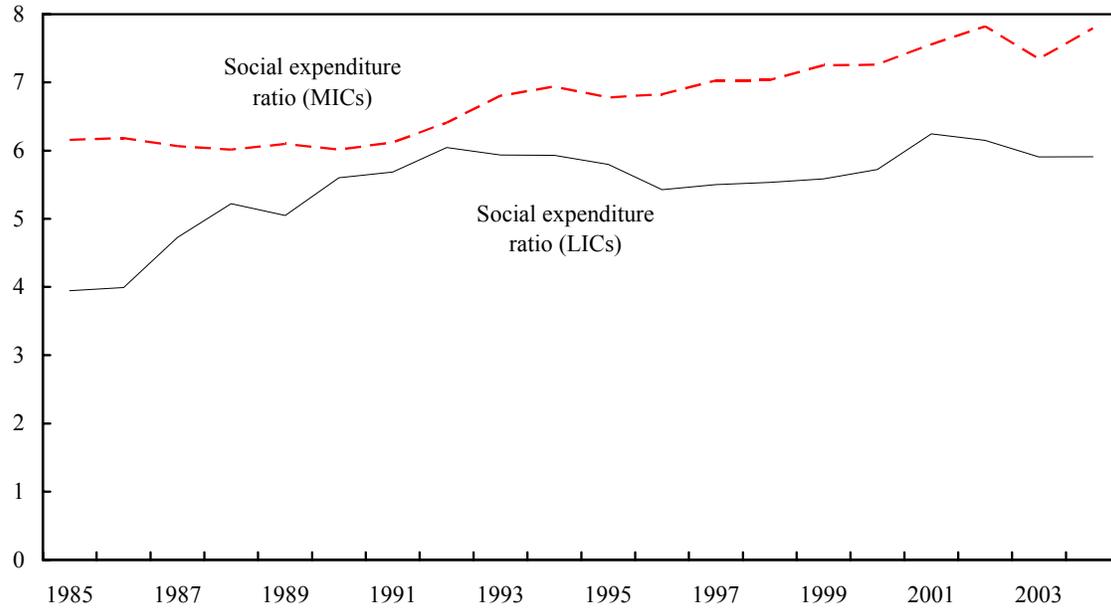
II. DATA SAMPLE

The sample is made up of developing countries that publish data on health and education expenditures (about 110 countries) and was obtained from the IMF Fiscal Affairs Department database. The time period covered in the paper is constrained by data availability and runs from 1985–2003/2004.

While health and education (social) expenditures in relation to output rose rapidly through the early 1990s among low-income countries, they have not risen subsequently. Social expenditures rose from about 4 percent of output in 1985 to almost 6 percent of output in 1992 but have lost some of this gain subsequently (Figure 1). In contrast, the ratio among middle-income countries has risen fairly consistently over time with the most recent estimate at almost 8 percent of output. Therefore while the disparity in the social expenditure ratio

among low and middle-income countries shrank to almost zero in 1992, it has risen subsequently to about 2 percent of output in 2004.

Figure 1. Trends in Social Expenditures and Government Budget Balances
(in percent of output)



Source: FAD database

There appears to be an inverse relationship between sharp budgetary movements and social expenditures. Budgetary movements are defined as the change in the government budget balance divided by lagged output and this variable is depicted for low and middle-income countries (except for oil exporting Arab countries) in Figure 1.² Among low-income countries (LICs), the change in the budget balance became sharply negative in the early 1990s at over 4 percent per year. During this period, the ratio of social expenditures to output reached its peak. Subsequently, changes in the budget balance have been much more moderate and the social expenditure ratio has also fallen from its earlier peak. While changes in the budget balance among middle-income countries (MICs) have been much less variable, they also have shown a strong inverse relationship with social expenditures.

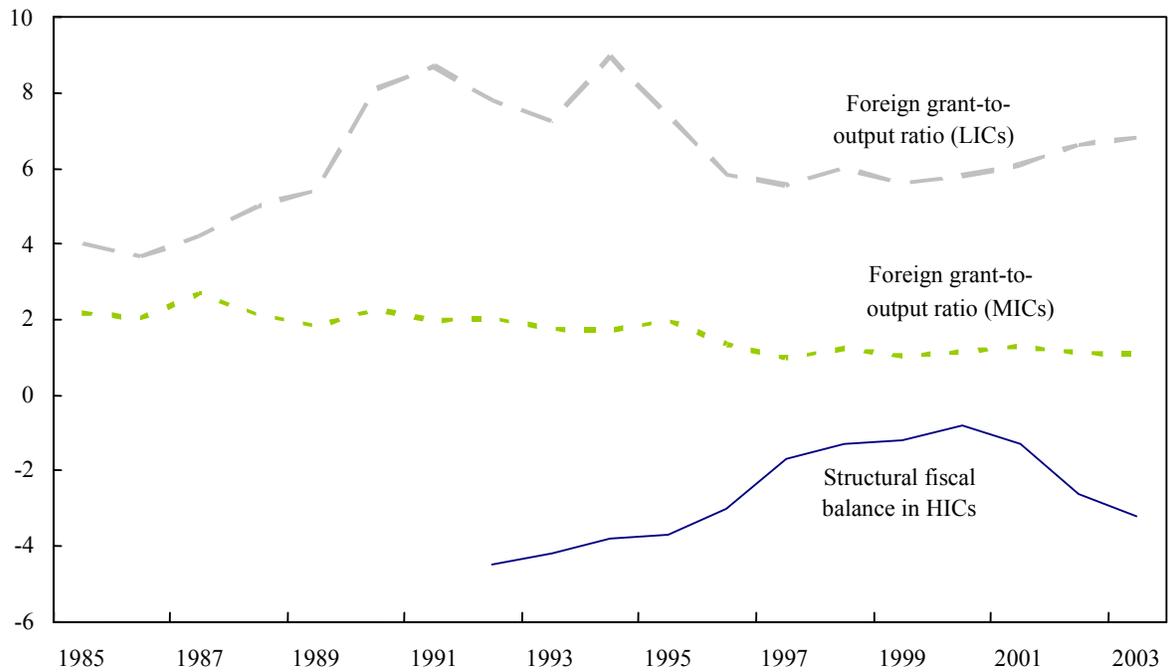
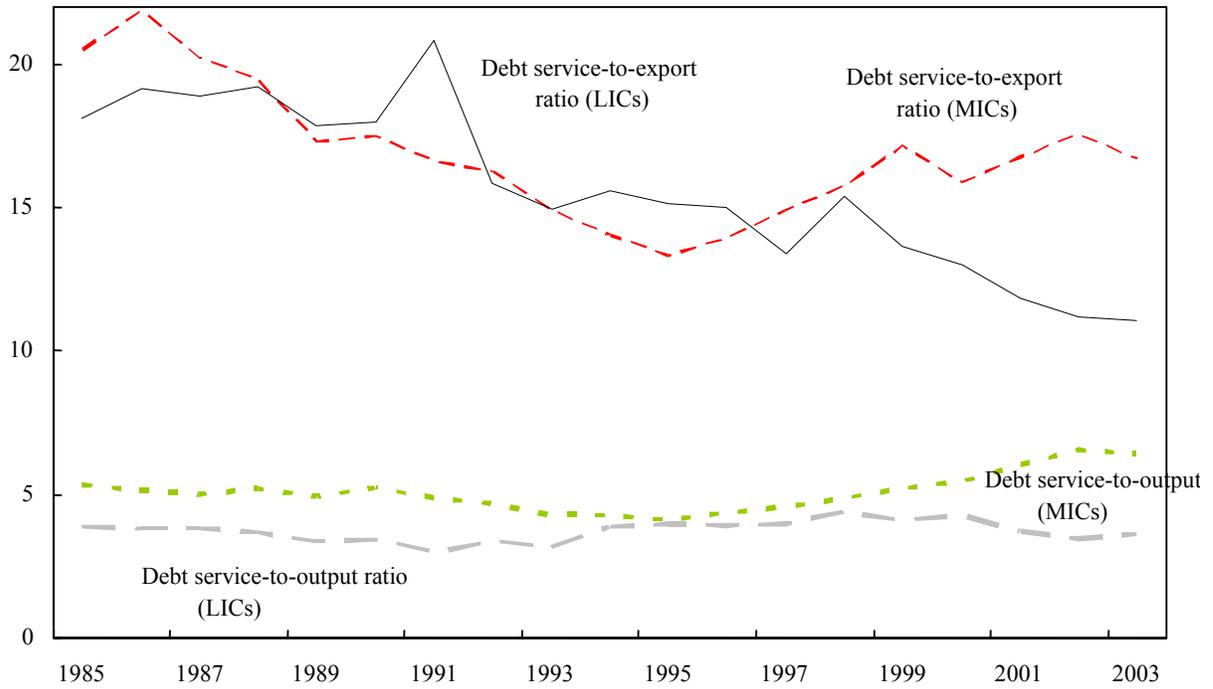
Debt-service in relation to exports has declined over time among developing countries although debt-service in relation to output has not fallen. Debt-service in relation to exports fell sharply among low and middle-income countries through 1995 but the profiles have diverged between the two income groups subsequently (Figure 2). The sharp rise in world trade is a main factor accounting for this decline because, in relation to output, both ratios have been much flatter. The initial decline among middle-income countries was also assisted by the finalization of the Brady bond deals. With the assistance of debt relief, the debt-service ratio has continued to decline to about 10 percent in 2004 in LICs. Current projections for HIPC countries suggest that the ratio will fall further to 5 percent by 2007. Debt-service in relation to output is projected to decline by 1 percent among the HIPC countries through 2007.

Grants to low-income countries show the most variation over the past two decades. They more than doubled in relation to output between 1985 and 1994 but then declined precipitously for the next two years before trending upwards in connection with the HIPC initiative. In contrast, grants to middle-income countries have been on a gradual decline over time and currently only amount to 1 percent of GDP on average. A possible explanation for the sharp decline in grants to LICs in the mid-1990s is that many donor governments were reducing fiscal deficits over this period and foreign aid budgets were typically among the first to be cut back. Indeed, between 1992 and 1997, the ratio of overseas development assistance to donor output fell from 0.33 percent to 0.22 percent and there is a close inverse relationship between the level of the structural balance in industrialized countries and grants to developing countries, hinting that in times of fiscal consolidation, grants for development are one of the first budgetary items to be eliminated.³

² The oil exporting Arab countries were excluded from the chart because budgetary changes are volatile associated with changes in world oil prices.

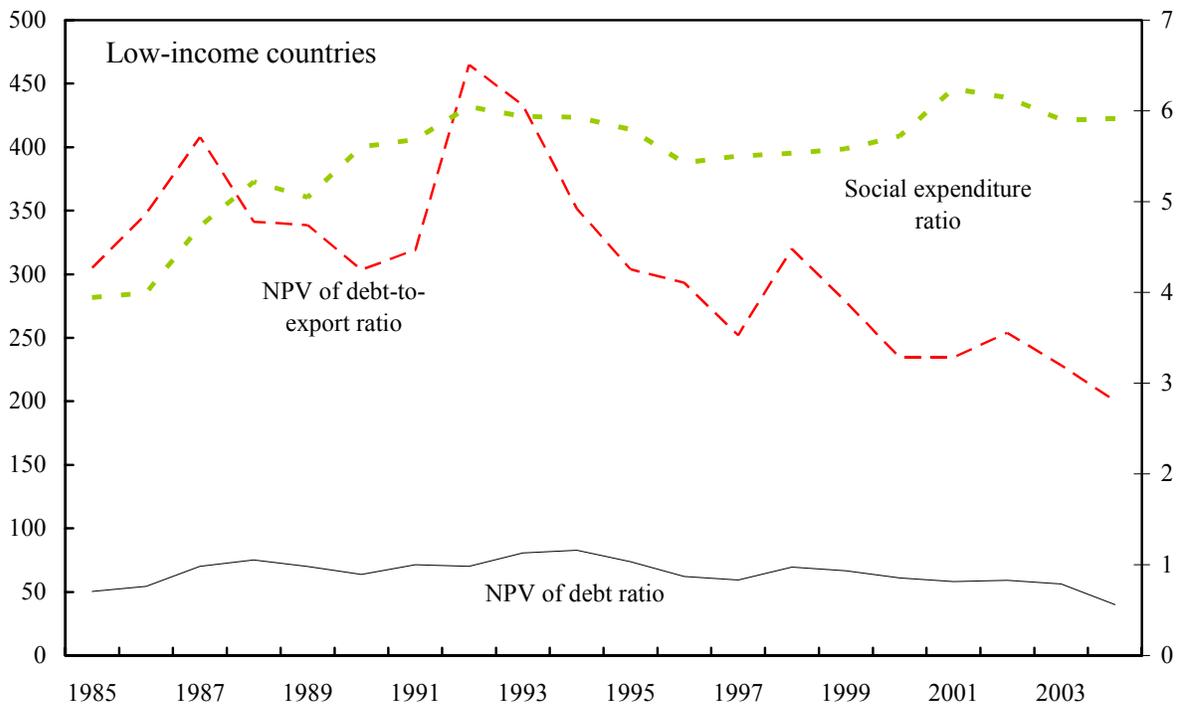
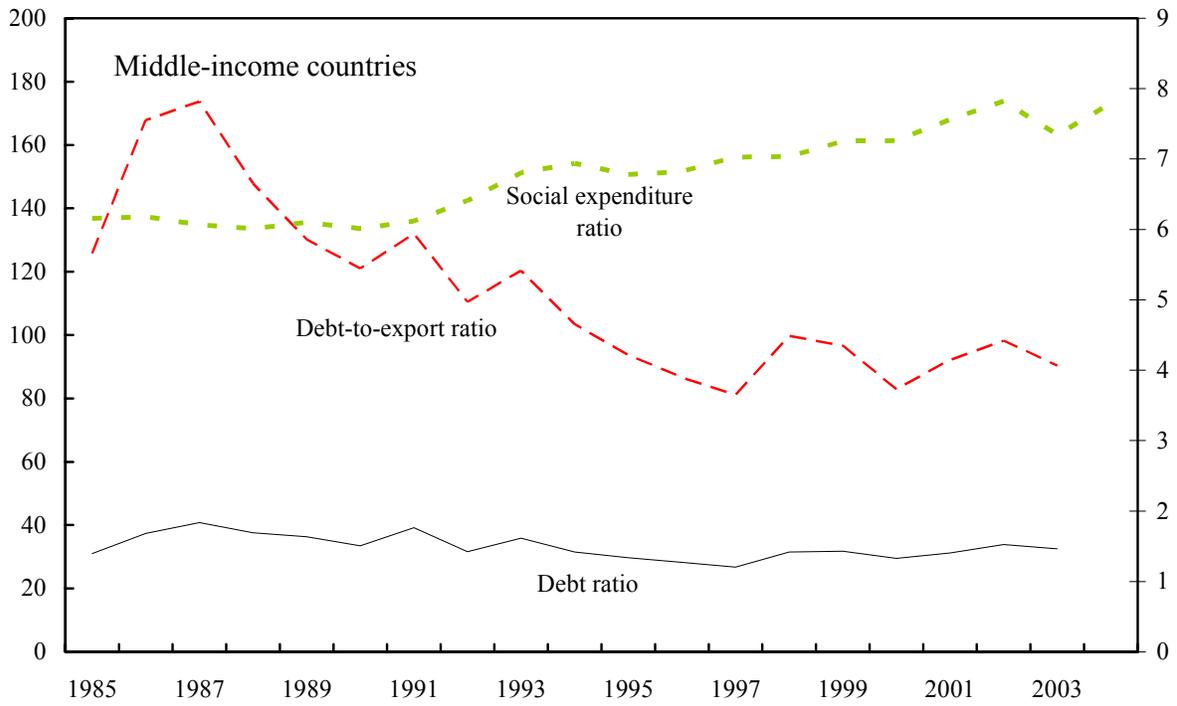
³ Gross borrowing is not considered in this paper on the assumption that borrowing is explicitly targeted to specific projects that do not overlap with social expenditures.

Figure 2. Trends in Debt Service for Middle- and Low-Income Countries
(in percent)



Source: FAD database

**Figure 3. Debt and Social Expenditure Ratios
(in percent of GDP)**



Source: Global Financial Statistics, World Bank.

Note: NPV denotes net present value.

Consistent with the decline in the debt-service-export ratio over time, the ratio of the net present value of debt to exports has also fallen among middle and low-income countries. It peaked in the early 1990s for low-income countries associated both with weak export growth and rising debt levels but has trended downward since the introduction of the HIPC initiative in 1996, averaging about 200 percent of exports in 2004 (Figure 3). Among middle-income countries, the debt ratio has fallen since the aftermath of the debt crisis in the late 1980s, and stood at about 80 percent of exports in 2003.

III. ECONOMETRIC ANALYSIS

To test whether reductions in debt-service and increases in grants are associated with rising expenditures on health and education and whether these expenditures are insulated from budgetary changes, a parsimonious specification for the determinants of both types of social expenditures was considered. In analyzing the determinants of public expenditures, authors have included a variety of variables - inter alia foreign aid in relation to output, output per capita, and a proxy for urbanization (Baicker, Baldacci et al., Clements et al.). The foreign aid variable is included in the analysis because it likely relaxes the government's budget constraint, allowing for higher expenditures on social objectives. This of course assumes that the foreign aid is not perfectly targeted toward other expenditures, especially traded goods. The output per capita variable is a proxy for the level of development. As income levels rise, the demand for health and education increases more than proportionately, assuming that it is a normal goods. Urbanization is likely to result in lower social expenditures, controlling for the level of income, because it lowers the transportation component of these expenditures. Finally, target variables should also play a role in deciding on current expenditures so that countries with low literacy rates would, *ceteris paribus*, spend more on education. On the other hand, countries with low literacy rates may have been forced to curtail education spending because of the severe resource constraints that they face, in which case the country specific effect could be negative.

Since the number of countries is large while the time-series dimension of the data is relatively short, cross-section time-series analysis seems most appropriate for the estimation of the social expenditure equations. The basic equation can be represented as follows:

$$y_{it} = \alpha y_{i,t-1} + \sum \beta x_{i,t} + \eta_i + v_{it}$$

where η is the country specific effect and v is a disturbance which is uncorrelated with the other explanatory variables. Since the lagged dependent variable is correlated with the country specific effect, this requires the use of the Arellano-Bond procedure of transforming the endogenous variable into first differences and using instruments for this variable that are lagged at least two periods.

A. Determinants of Social Expenditures

To explain developments in the ratio of health and education expenditures to output, the second lag of this ratio is used as an instrument, under the assumption that the country specific effect is correlated with the error term. For the debt-service and debt ratios, one period lags are used with both variables interacted with middle and low-income dummy

variables. Lagged levels of the aid ratio, the youth literacy rate, output per capita and population density variables are also used. As for the debt-service and debt ratios, positive and negative changes in the budget balance are interacted with middle and low-income dummy variables.

The assumption of no correlation between the error term and the instruments cannot be rejected since the Hansen statistic for over identifying restrictions is insignificant. Moreover, negative first order serial correlation is present, consistent with the transformation of the original model into first differences to eliminate the correlation between the country specific effect and the error term. However, no second order correlation is present.

Debt-service and debt stock variables are included in the baseline specification to assess whether either or both variables significantly influence social expenditures and whether these effects are comparable between low and middle-income countries. The debt-service coefficients (columns 1 and 2, Table 2) are insignificant for middle-income countries, suggesting that middle-income countries are not credit constrained in spending resources on education and health. In contrast, the coefficients on the debt ratio are significantly negative for middle-income countries suggesting that in response to a debt or wealth shock, social expenditures are reduced significantly. Indeed, at a debt to export ratio of 200 percent, social expenditures are less by $\frac{1}{4}$ percentage point of output than in a country with no debt.

For low-income countries, the debt-service coefficient is significantly negative in terms of both exports and output while the stock of debt is insignificant. These results are consistent with the view that low-income countries are credit constrained and therefore their expenditures are sensitive to changes in the flow of resources rather than the stock of wealth or debt.

Based on latest estimates, the debt-service ratio is projected to decline by 1 percent of GDP on average between 2004 and 2007 in low-income countries. This decline is likely to boost social expenditures by about 0.35 percent of output in the long-run according to the coefficient estimates of this paper. A projected decline in debt-service in relation to exports by 5 percentage points over the same time interval will similarly be associated with a long-run rise in social expenditures by about 0.5 percent of output.

The impact on social expenditures of a decline in debt-service is significantly stronger than for an increase in grants since the coefficient on grants is barely positive. This is consistent with the view that many grants are targeted toward explicit projects that are unrelated to social expenditures, and that targeting the marginal dollar of aid at social expenditures is difficult. Moreover, it is also consistent with the choice to exclude government borrowing from the equation (see footnote 2).

Interestingly, governments have managed to insulate social expenditures from budgetary consolidation in low-income countries because of the desire to improve social indicators. On the other hand, among middle-income countries, social expenditures are cut considerably when the budget balance is needed to strengthen. For middle-income countries it appears that social expenditures are no different from other expenditures as a source of budgetary savings. Indeed, a 1 percentage point rise in the budget balance in middle-income

countries would lead to a 0.04- 0.05 percent decline in the ratio of social expenditures to output, slightly below the historical average ratio of social expenditures for this group and implying that the social expenditure share would change little in response to the budgetary improvement. While social expenditures are not sensitive to positive changes in the budget balance for low-income countries, they are sensitive to declines in the budget balance, with a coefficient of ranging between -0.08 and -0.1.

In terms of the other variables, the population density variable is significant at or above the 90 percent level of confidence for both debt-service measures while the youth literacy variable is significant at this level in the equation explaining debt-service in terms of output. The positive coefficient on the youth literacy rate suggests that countries with low literacy rates may have been forced to curtail education spending because of the severe resource constraints that they face. Countries with the highest population densities (Malta and Mauritius) spend about 2 percent of output less on health than the country with the lowest density (Mongolia) while Niger, a country with a youth literacy rate of about 20 percent spends over 2 percentage points of output less on health and education than Guyana, with a youth literacy rate of 100 percent.

It could be argued that the significant effect of debt-service changes on social expenditures for low-income countries is related to the fact that both variables have trended in opposite directions over the past two decades (at least for debt-service measured in terms of exports). To ascertain whether trends are responsible for the relationship, time dummies were added to the specification (columns 3 and 4). While the introduction of time dummies makes the coefficient on debt-service in relation to output insignificant for low-income countries, the coefficient on debt-service in relation to exports remains significantly negative, and comparable to the value in the specification without time dummies.

Finally, a test was conducted to determine whether the coefficient estimate on debt-service was sensitive to the inclusion of specific countries and/or time periods. This test eliminated about 150 observations that significantly influenced the stability of the coefficient estimates, but removing these observations from the sample did not affect the debt-service coefficients (estimates not reported).

B. Developments Since the Introduction of HIPC Initiative

Since the introduction of the HIPC initiative it is possible that the relationship between social expenditures and budgetary changes has strengthened. As discussed in the introduction, the HIPC initiative was introduced in 1996 emphasizing the importance of using savings from debt-service reductions to raise poverty related spending. To test for any relationship changes, a dummy variable for low-income countries for the period since 1995 was interacted with the budget balance and introduced into the specification. The coefficient was insignificant so that the sensitivity of social expenditures to an increase in the budget balance has remained unchanged.

Table 1. Coefficient Estimates for All Social Expenditures

Lagged dependent Variable	0.856 ***	0.857 ***	0.83 ***	0.852 ***
Debt service- export ratio for low-income countries (LICs)	-0.018 *		-0.017 *	
Debt service- export ratio for middle-income countries (LICs)	0.007		0.007	
Debt service-output ratio for low-income countries		-0.048 **		-0.038
Debt service-output ratio for middle-income countries		0.02		0.02
Debt ratio for LICs	0.0003	0.001	0.0002	0.001
Debt ratio for MICs	-0.001 **	-0.005 *	-0.002 ***	-0.006 **
Aid/GDP	0.01	0.006	0.014	0.006
Positive change in budget balance for low-income countries	0.045	0.04	0.043	0.031
Negative change in budget balance for low-income countries	-0.096 ***	-0.084 **	-0.087 **	-0.072 * 1/
Positive change in budget balance for middle-income countries	-0.047 **	-0.044 **	-0.026	-0.019
Negative change in budget balance for middle-income countries	-0.042 **	-0.046 *	-0.055 ***	-0.058 **
Youth literacy rate	0.004	0.005 *	0.003	0.004
Output per capita (logarithm)	0.103	0.091	0.153	0.1
Population density (logarithm)	-0.097 **	-0.109 **	-0.095 **	-0.099 **
Dummy for Middle East oil exporting countries	-0.47 ***	-0.49 ***	-0.61 ***	-0.58 ***
Test Statistics				
Hansen test of overidentified restrictions	75.5	75	52.9	62.2
A-Bond test for AR(1)	-4.21 ***	-4.12 ***	-4.44 ***	-4.3 ***
A-Bond test for AR(2)	0.36	0.38	0.24	0.28
Number of observations	771	772	771	772

Sources: FAD database; GFS database; World Bank.

1/ The hypothesis of no effect of changes in the budget balance on social expenditures cannot be rejected for low-income countries after 1995.

It is possible that other expenditures have become less sensitive to budgetary changes in recent years, so that even if the amount of resources devoted to social objectives has not become more sensitive to the budgetary cycle, the share of expenditures on social objectives may have done so. To test this hypothesis, separate regressions were estimated for total expenditures (Table 3).

Interestingly, changes in debt-service have no impact on the total expenditure envelope, suggesting that debt-service savings have been targeted toward social expenditures in particular. On the other hand, the aid ratio is significantly positive, so that this type of aid appears to be channeled to non-social expenditures. As for the social expenditure ratio, positive changes to the budget balance have not influenced the expenditure ratio among low-income countries suggesting that the budgetary boost has come from higher revenues; this is also the case for middle-income countries. Since 1995, the sensitivity of expenditures to budget declines has increased significantly among low-income countries, suggesting that tax reductions are increasing becoming a rarity. Indeed, the coefficient varies between -0.85 and -0.95 for the post 1995 period.

Since both social and other expenditures are highly sensitive to declines in the budget balance among low-income countries, the ratio of the two expenditures was considered to identify which component is more cyclically sensitive. The results reveal that while the social expenditure share is insulated from increases in the budget balance for low-income countries (in contrast to middle-income countries), all countries' social expenditure shares decline when the budget balance gets worse. Finally, the social expenditure ratio is closely related to per-capita income, suggesting that richer countries are placing more resources into the achievement of social objectives.

IV. LIKELIHOOD OF ACHIEVING THE MDG TARGETS

How does the amount of debt-service reductions compare with the amount of resources likely to be needed to achieve the MDGs? Sadly, the former is well short of the latter, since the effort required to reach the MDGs is huge. Let's first consider the child mortality target; it specifies that child mortality should decline by 67 percent on average between 1990 and 2015. Table 3 presents basic indicators for the sample, broken up between low- and middle-income countries. The current average mortality rate is about 33 deaths per 1,000 infants among middle-income countries but about four times this amount among low-income countries. Moreover, while 63 percent of middle-income countries are projected to achieve a reduction of 67 percent in the child mortality rate by 2015, only 24 percent of low-income countries are projected to do so.⁴

⁴ The projection is based on maintaining the average annual decline in the child mortality rate over 1990–2003 through 2015.

Table 2. Coefficient Estimates for All Expenditures

					1/	1/
Lagged dependent variable	0.708 ***	0.712 ***	0.748 ***	0.753 ***	0.748 ***	0.709 ***
Debt service- export ratio for low-income countries (LICs)	-0.002		0.012		0.014	
Debt service- export ratio for middle-income countries (MICs)	0.014		0.033		-0.002	
Debt service-output ratio for low-income countries		0.131		0.185		0.062
Debt service-output ratio for middle-income countries		0.06		0.072		0.068
Debt ratio for LICs	-0.002	-0.001	-0.002 **	-0.015 *	-0.001	0.005
Debt ratio for MICs	0.002	0.014	0.001	0.014	-0.005	-0.015
Aid/GDP	0.17 ***	0.171 ***	0.15 ***	0.165 ***	0.012	0.009
Positive change in budget balance for LICs	-0.057	-0.121	-0.103	-0.097	0.274 **	0.311 ***
Positive change in budget balance post 95 for LICs					-0.119	-0.071
Negative change in budget balance for LICs	-0.684	-0.708 ***	-0.525 ***	-0.6 ***	0.274 **	0.311 ***
Negative change in budget balance post 95 for LICs			-0.344 **	-0.332 *	-0.119	-0.071
Positive change in budget balance for MICs	-0.051	-0.06	-0.073	-0.089	-0.007	0.022
Negative change in budget balance for MICs	-0.64	-0.651 ***	-0.624 ***	-0.607 ***	0.271 ***	0.266 ***
Output per capita (logarithm)	1.06 ***	0.638 **	0.926 ***	0.74 ***	0.836 ***	0.977 ***
Test Statistics						
Hansen test of overidentified restrictions	89.5	84.1	85.8	88.1	83.7	90
A-Bond test for AR(1)	-5.91 ***	-5.87 ***	-5.91 ***	-5.93 ***	-4.81 ***	-4.84 ***
A-Bond test for AR(2)	-1.73 *	-1.67 *	-1.69 *	-1.63	0.11	-0.01
Number of observations	1,339	1,356	1,339	1,356	978	986

Sources: FAD database; GFS database; World Bank.

1/ In columns 5 and 6 the dependent variable is the ratio of social expenditures to all expenditures.

Table 3. Child Mortality Indicators and Health Expenditures

	Middle-Income Countries	Low-Income Countries
Average mortality rate for all countries (2003)	32.6	117.9
Average mortality rate for countries projected to miss the MDG target (2003)	98.5	138.2
Percent projected to achieve MDG target 1/	63.0	24.1
Average health expenditures for all countries (2003)	2.6	1.8
Health expenditures for countries projected to miss the MDG target (2003, in percent of GDP)	2.1	2.0
Increased health expenditures needed to reach target (in percent of GDP, Gupta and others (2002))	2.1	2.2

Sources: FAD database; GFS database; World Bank.

1/ Countries are projected to reach the MDG target if the annual decline in child mortality over 1990–2003 is higher than the annual decline required between 2004 and 2015 to achieve a 67 percent in the rate.

The mortality rate of those low-income countries that are not projected to reach the health target is about 20 children per thousand higher than the average mortality rate in 2003. Health expenditures in relation to GDP at 2 percent in these countries are comparable to the low-income country average of 1.8 percent of GDP. Although it could be argued that less efficient use is being made of the resources, these countries are more heavily affected by the AIDS virus.

To translate the shortfall in the child mortality outcome into expenditure requirements, estimates were found documenting the relationship between health expenditures and declines in child mortality. Gupta and others (2003) estimate an elasticity of 0.3 between changes in health expenditure and declines in the infant mortality rate. Using this estimate, health expenditures need to rise by more than 2 percentage points per annum for the low-income countries that are unlikely to reach the target without additional financing. A similar annual expenditure increase is required for middle-income countries that are not expected to reach the MDG by 2015. Moreover, it could be argued that Gupta and other's estimate is an upper bound of the effect, since the elasticity estimated by Filmer and Pritchett (1997) is -0.1. If we take this estimate, health expenditures would need to rise by more than 6 percentage points of output to reach the MDGs.

The percentage of countries likely to reach the primary education enrollment target by 2015 is comparable to the percentage likely to reach the health target. The primary education enrollment target is full coverage; and, already, the average primary enrollment rate among middle-income countries is almost 93 percent, while the enrollment rate among low-income countries is below 68 percent (Table 4). Over 60 percent of middle-income countries are

Table 4. Primary Enrollment Indicators and Education Expenditures in 2003

	Middle Income Countries	Low Income Countries
Average enrollment rate for all countries (in percent)	92.9	67.8
Average enrollment rate for countries projected to miss the MDG target (in percent)	86.6	57.1
Countries at full enrollment (in percent)	31.1	11.5
Countries projected to achieve MGD target by 2015 (in percent) 1/	60.6	30.8
Average education expenditures for all countries (in percent of GDP)	4.7	4.1
Education expenditures for countries projected to miss the MDG target (in percent of GDP)	5.6	3.9
Increased education expenditures needed to reach target (in percent of GDP, Gupta and others (2002))	3.3	8.4
Increased education expenditures needed to reach target (in percent of GDP, Balducci and others (2004))	1.3	6.4
Increased education expenditures needed to reach target (in percent of GDP, Mignat and others (2003))		3.5

Sources: FAD database; GFS database; World Bank.

1/ Countries are projected to reach the MDG target if the annual increase in primary enrollment over 1990–2003 is sufficient to achieve a 100 percent primary enrollment rate by 2015.

projected to reach the MDG for primary enrollment by 2015, including those that have already achieved full coverage, while about 31 percent of low-income countries are projected to reach this target by 2015.

The current enrollment rate of those low-income countries that are not projected to reach the full enrollment target by 2015 is 57 percent, about 10 percentage points lower than the average enrollment rate among LICs in 2003. This difference is partly explained by the slightly lower expenditures in relation to GDP in these countries (3.9 percent) relative to the low-income country average (4.1 percent).

To translate the shortfall in the primary enrollment ratio into expenditure requirements, three estimates were found for the effects of increased education expenditures on the enrollment rate. First, Gupta and others (2002) have estimated that a 1 percent increase in the ratio of education expenditures to output would raise the enrollment rate by 3 percent. If we apply this effect to the disparity between full primary education coverage and each country's projected enrollment rate in 2015 based on the historical pattern, an additional infusion of more than 8 percent of output is required for low-income countries. This figure is unrealistically high since almost 60 percent of primary education coverage has been achieved at a resource cost of at most 4 percent of GDP, and, presumably, some of this

expenditure is allocated to secondary and postsecondary education. While nonlinear effects may develop as the target for primary enrollment is reached, its achievement is unlikely to require such a large increase. Second, Baldacci and others (2004) find that a 1 percentage point increase in education expenditures leads to a 0.16 percentage point increase in the enrollment rate, implying an additional infusion of 6 ½ percent of GDP is needed to achieve full coverage. While lower than the Gupta and others (2002) estimate, it is still on the high side. Finally, Mignat and others (2003) have carried out a comprehensive study of primary school enrollment and completion rates on a country-by-country basis. They find that on average, only about 3 ½ percent of output is needed to achieve full primary education enrollment among low-income countries. This figure is consistent with the current resource cost of producing a 60 percent enrollment rate.

In short, although debt-service savings generate increased expenditures on health and education, the effects are small in relation to the expenditure amounts needed for those countries whose indicators are far from the MDGs; indeed, the required increase in resources dwarfs the effects of debt-service savings and higher grants estimated in this paper. Taking the largest coefficient estimates from this paper, the projected 1 percent decline in debt-service in relation to output through 2007 would raise social expenditures by only about 0.4 percent of output. Therefore, although the multilateral debt relief initiative clearly relaxes the budget constraint for the HIPC countries, it is insufficient by itself to enable these countries to reach the Millennium Development Goals by 2015.

V. CONCLUSION

This paper has shown that declines in debt-service costs among low-income countries help to raise health and education expenditures significantly. Perhaps even more importantly, low-income countries have managed to fully insulate social expenditures from the effects of fiscal tightening over the past two decades, thereby protecting social expenditures from the effects of budgetary consolidation.

Interestingly, although higher debt ratios have no bearing on the choice of incurring expenditures on health and education among low-income countries, they adversely impact such expenditures among middle-income countries. A possible reason for this difference is that low-income countries are constrained in the amount of financing that they can receive and therefore spend directly out of donor financing. Under normal circumstances, middle-income countries can smooth their consumption paths in response to temporary shocks, although they adjust social expenditures in response to longer-lasting economic shocks.

Finally, although debt-service savings for the HIPCs are likely to boost social expenditures and improve their millennium development indicators, the magnitude of these effects are dwarfed by the financial resources needed to reach the MDGs.

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