

Debt Relief Incentives in Highly Indebted Poor Countries (HIPC): An Empirical Assessment

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Abstract For more than two decades, the majority of countries in the African continent have experienced repeated episodes of rising external debt and debt service, which has led to numerous efforts of external debt relief. This paper provides new evidence on the effects of the Heavily Indebted Poor Countries (HIPC) Initiative on different economic and social indicators in 60 low income countries (LICs). Results show that LICs that were included in the HIPC Initiative marginally performed better than non-HIPC countries. There is evidence that countries that have reached the completion point of the HIPC Initiative by 2005 have experienced an average improvement in investment, health care, gross secondary education enrollment, and GDP per capita growth.

Keywords HIPC initiative · Debt relief incentive · Economic performance

JEL F34 · H63 · O11

Introduction

For more than two decades, many developing countries have experienced repeated episodes of rising external debt and debt service burdens that have been accompanied by low investment and slower economic growth. The lack of economic progress experienced by the debt ridden developing countries has led to calls for measures to alleviate some of their debt burden. Advocates for debt cancellation have argued that most of the debt are odious (Adams 2004) and unjustified. Others considered the debt to be immoral, unethical and illegitimate (Tegucigalpa Declaration in 1999 at the Launching of Jubilee 2000).

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The economic argument made for debt forgiveness is based on the Debt Overhang hypothesis. Debt overhang occurs if the stock of external debt in a country exceeds a country's repayment ability with some future probability, such that expected debt service increasingly depends on a country's output level. This means that some of the returns from investment are being used for debt service. Debt service is therefore considered as an implicit tax, thereby discouraging investment (Domar 1944; Krugman 1988; Sachs 1989), and stifling economic growth which makes it virtually impossible for highly indebted countries to escape poverty (Clements et al. 2005). Thus, it is believed that cancellation of external debts will encourage investment, economic growth and improve standard of living (Rajan and Subramanian 2005). This belief led to the adoption of the Heavily Indebted Poor Countries (HIPC) Initiative in 1996 which was subsequently enhanced in 1999 by the IMF and World Bank.

This paper aims at investigating the incentive effects of the HIPC Initiative on investment and economic growth of recipient countries. The paper is structured as follows: In "The HIPCs and Debt Relief Initiatives", a definition of HIPCs and a brief review of the history of debt relief initiatives are presented. "The HIPC Initiative: a Literature Review" summarizes the incentive framework of debt relief in a country that exhibits bad behavior. The data used in the study is discussed in the "Data" section. Empirical evidence of the effects of HIPC Initiative is reported in "Descriptive Statistics on the Effect of HIPC Initiative." The final section concludes.

The HIPCs and Debt Relief Initiatives

The HIPCs are a group of poor countries that were identified in the early 1990s as having excessive levels of external debt (for a listing of HIPCs see Table 7). These countries were jointly considered for debt relief under the HIPC Initiative which was instituted by the World Bank and IMF in 1996 and enhanced¹ in 1999. The HIPC Initiative is designed as an agreement among the major players in international finance with the objective of easing the debt burden of some of the world's poorest countries. It calls for the voluntary provision of debt relief by all creditors (multilateral, bilateral, or commercial debt) with the goal of providing a permanent exit from repeated debt rescheduling (Gunter 2003) and for long term debt sustainability (Arnone et al. 2005). For countries to qualify for assistance under the enhanced initiative the following criteria are to be satisfied:

- Face unsustainable external debts after the full application of the traditional debt relief mechanisms (such as the application of Naples terms under the Paris Club agreement). An external debt is considered unsustainable if its Net Present Value (NPV) to export ratio is above 150%. For very open economies where the exclusive reliance on external indicators may not adequately reflect the fiscal burden of external debts; a NPV of debt-to-export target below 150% is

¹ It was enhanced because the 250% NPV of external debt to export threshold was considered high and arbitrary (Rugumamu 2001). This requirement resulted in only seven countries (Uganda, Bolivia, Burkina Faso, Guyana, Ivory Coast, Mozambique and Mali) qualifying for the initiative in the first three years. Moreover, the enhanced program was linked with ongoing poverty reduction efforts in indebted countries, (World Bank; Gunter 2003).

recommended if the country meets two criteria at the decision point: an export-to-GDP ratio of at least 30% and a minimum threshold of fiscal revenue in relation to GDP of 15%. For countries meeting these thresholds, the NPV of external debt-to-export target will be set at a level which achieves a NPV of debt-to-revenue of 250% (known as Fiscal Window) ratio at the decision point (IMF; Sun 2004).

- The country should be eligible for highly concessional assistance from the International Development Association (IDA), the part of the World Bank that lends on highly concessional terms. Countries must also be members of the IMF's Poverty Reduction and Growth Facility (PRGF)².
- Establish a track record of reforms and develop a Poverty Reduction Strategy Paper (PRSP). A PRSP describes a country's macroeconomic, structural, and social policies programs to promote growth and reduce poverty, as well as associated external financing needs. The PRSPs are prepared by governments through a participatory process involving civil society and development partners, including the World Bank and the IMF.

Once the above conditions are met, countries are admitted into the pre-decision point, the first stage of the program. To be considered for the decision point that offers partial debt relief, countries have to keep a good track of reforms and social policy and must develop the PRSP. In the last stage—the completion point, countries are supposed to implement reforms agreed upon at the decision point satisfactorily and must adopt and implement the PRSP for at least 1 year. At this stage, debtors are offered irrevocable debt reduction. If the amount of external debt reduced at this stage is not sufficient for a country to have sustainable external debt, a topping up of debt relief is offered.

Prior to the HIPC initiative, other debt relief measures have been implemented, such as the UNCTAD³ in 1979; the G-7 summit meetings in Venice in 1987, Toronto in 1988; Houston 1990; London in 1991; Naples in 1995; and Lyon in 1996 which paved the way for the HIPC Initiative. In June 2005, the Multilateral Debt Relief Initiative (MDRI) was endorsed by the G-8 countries. It was proposed at their meeting that three multilateral institutions—the IMF, the International Development Association (IDA) of the World Bank, and the African Development Fund (ADF) cancel one hundred percent of their debt claims on countries that have reached or will eventually reach the completion point under the joint IMF-World Bank enhanced HIPC initiative. The main aim of the Multilateral Debt Relief Initiative (MDRI) is to provide full debt relief and to free up additional resources as a means of assisting highly indebted countries meet the Millennium Development Goals (MDGs)⁴ which are focused on halving poverty by 2015. Current projections show that once all 40 HIPCs reach the completion point, the MDRI will result in the cancellation of \$48 billion over the life of the loans and that the HIPC initiative will

² The Poverty Reduction and Growth Facility (PRGF) were established in September 1999, by the IMF with the objective of making poverty reduction and growth mouhre central to lending operations in its poorest member countries. The PRGF-supported programs are framed around comprehensive, country-own PRSPs. The targets and policy conditions in a PRGF-supported program are drawn from the country's PRSP.

³ United Nation Conference on Trade and Development

⁴ They are a set of time-bound and quantified targets for reducing extreme poverty and extending universal rights by 2015 (Human Development Indicators 2005).

Table 1 Payoffs structure of the debtor under different assumptions

	Rents	Probability of Success	Probability of Failure	Payoffs
Good behavior (G)	0	P_G	$1 - P_G$	$P_G Y_D + (1 - P_G) Y'_D$
Bad behavior (B)	R	P_B	$1 - P_B$	$P_B Y_D + (1 - P_B) Y'_D + R$

provide approximately \$98 billion in relief. Accordingly, if all of the 40 potentially eligible countries were to complete the process, the two initiatives will provide roughly \$147 billion in relief. As of 2006, total debt relief under the MDRI and HIPC initiative was put at \$97.6 billion and \$48.9 billion, respectively.

The HIPC Initiative: A Literature Review

Sachs (1985), Krugman (1988), Dooley (1989), and Claessens (1990), have presented models addressing the incentive effects of debt reduction for a country suffering from debt overhang. The tenant of these models is that in reducing the face value of external debt, investment will be increased and debt service payments encouraged. This view is not universally accepted. Easterly (2002) does not accept this proposition. He pointed out that many HIPCs were provided debt relief in the past, yet such relief had in many instances led to poor behavior and more debt accumulation. He cites evidence which show that their poor performance due to irresponsible behavior resulted into more debt accumulation.

A theoretical framework on how bad behavior may influence debt accumulation, debt relief, and investment are outlined below. The framework presented⁵ assumes two agents: a debtor and a creditor. It further assumes that the debtor can exhibit either a bad or a good behavior. Bad behavior leads to private benefits or rents (R). The payoff structure of the debtor country before debt service and debt relief initiative may be described by the entries in Table 1.

An investment project is assumed to result into a pair of transfers $\{Y_D, Y'_D\}$ to the debtor and $\{Y_L, Y'_L\}$ to the creditors. In case of failure, it is assumed that $Y'_D = Y'_L = 0$. It is also assumed that the debtor equally values the rent and income from the investment project, but is willing to trade-off the rents for debt reduction. In the model, good behavior can be induced if the expected payoff from good behavior was greater than the payoffs from bad behavior, that is;

$$P_G Y_D \geq P_B Y_D + R \text{ or } \Delta P \cdot Y_D \geq R \text{ or } Y_D \geq \frac{R}{\Delta P} \quad (1)$$

Where $\Delta P = P_G - P_B$

It is also important that the lenders must be able to at least recover the loan and for debtors to breakeven as given by Eq. 2;

$$P_G (Y - Y_D) \geq (I - S) \quad (2)$$

⁵ The theoretical model is described in the paper: "Overcoming the Disincentive Effects of External Debts and Bad Behavior in Low Income Countries: Implication for Debt Relief Initiative." Presented at the 34th Eastern Economic Association Annual Conference, March 2008.

Now assume that debt relief can only be offered if reforms that reduce R are instituted by the debtor country. For reforms to be instituted, the benefit and cost to the debtor country has to be taken into consideration. Reforms will be beneficial to the debtor if the rent received through bad behavior is less than the potential benefits that would accrue to the country from debt reduction. In this situation, it is beneficial for the debtor and creditor, if the debtor initiates reforms, while the creditor offers external debt reduction, as stipulated by the HIPC Initiative. The expectation then is that economic growth and investment should improve following the institution of the HIPC Initiatives. This proposition is tested and the finding is reported in a subsequent section. The effects of HIPC Initiatives are empirically estimated using a panel sample consisting of 60 low income countries. Description of the sample is given in the next section.

Data

An unbalanced panel of 60 low income countries was used to assess the incentive effects of the HIPC. Most of the economic data were obtained from the World Development Indicators (WDI). The data for the regime type is obtained from the Polity IV project's assessment of constitutional democracy. A summary statistics and correlation matrix of the data used are presented in Tables 8 and 9, respectively in the "Appendix."

Descriptive Statistics on the Effect of HIPC Initiative

The HIPC Initiative in addition to improving the external debt situation in indebted poor countries, aimed at improving the living conditions in these economies. An overview of the implication of said initiatives on social and economic conditions in countries receiving debt relief may be gleaned from data reported Table 2. The table groups the 60 low income countries into four groups based on their HIPC status in 2005; non-HIPCs, pre-decision point, decision point, and completion point countries. The data is subdivided into three five-year periods; 1990–1995, 1996–2000 and 2001–2005.

From Table 2, there is evidence showing HIPCs that had attained the completion point by 2005 had witnessed a significant average improvement in health care (measured as the percentage of children immunized from DPT and measles) and secondary education enrollment during the period from 2001 to 2005. It is also observed that (in terms of the Polity IV index, a measure of democracy) completion point countries also witnessed an improvement in their index. There is also evidence of an average improvement in electorate participation in decision making as measured by the Vanhanen's index of participatory democracy. It is worth noting that the pre-decision point countries had on average performed worst than the other groups of countries in almost all the indicators.

Empirical Evidence on the Effect of the HIPC Initiative

The empirical analysis provided in this section utilizes the GMM method estimator proposed by Arellano and Bover (1995). This method combines regressions in

Table 2 Five year averages of economic and social indicators

	1990–1995	1996–2000	2001–2005
GDP per capita growth			
Non-HIPCs	0.002	0.031	0.037
Completion point	–0.001	0.018	0.022
Decision point countries	–0.023	–0.009	0.021
Pre-decision point countries	–0.041	0.040	–0.002
Investment growth			
Non-HIPCs	0.070	0.054	0.059
Completion point	0.090	0.035	0.077
Decision point countries	0.035	–0.001	0.116
Pre-decision point countries	0.085	0.058	0.022
Democracy (Polity IV index)			
Non-HIPCs	–0.786	–0.12	0.346
Completion point	0.509	2.111	3.803
Decision point countries	–2.867	–0.082	3.712
Pre-decision point countries	–1.564	–0.564	–1.548
Participation (Vanhanen's index)			
Non-HIPCs	26.11	30.123	32.001
Completion point	20.698	25.208	26.368
Decision point countries	14.865	19.68	23.281
Pre-decision point countries	19.947	19.378	19.509
Gross secondary school enrolment			
Non-HIPCs	43.831	41.209	45.094
Completion point	19.884	28.649	38.147
Decision point countries	20.544	27.979	36.179
Pre-decision point countries	32.859	35.089	41.492
DPT Immunization (% of children 12–23 years)			
Non-HIPCs	67.509	74.579	76.674
Completion point	60.694	63.34	77.178
Decision point countries	58.1	54.346	64.927
Pre-decision point countries	49.481	55.065	58.22
Measles Immunization (% of children 12–23 years)			
Non-HIPCs	69.509	74.547	75.474
Completion point	62.028	65.72	75.767
Decision point countries	57.03	54.404	62.545
Pre-decision point countries	50.807	56.543	59.60

differences with regressions in levels to estimate the regression model. More precisely, lagged levels of the variables are used as instruments for the equation in difference and lagged differences of the variables as instruments for the equations in levels. The choice of this estimator is motivated by the fact that the standard

difference estimator is known to have large finite sample bias and poor precision. Moreover, GMM models take care of the problem of endogeneity that may arise between the explanatory variables. It also solves potential correlation problems that may exist between the unobserved country specific characteristics.

The two GMM equations, an investment equation and a growth equation, are estimated to investigate the effects of external debt and the HIPC Initiative on economic performance.

The investment equation (Eq. 3) is given by;

$$\text{Inv}_{it} = \phi \text{Inv}_{it-1} + \phi_1 \text{Debt}_{it-1} + \phi_2 \text{Regime}_{it} + \phi_3 \text{HIPC}_{it} + \phi_4 \text{Openness}_{it} + \phi_5 \text{CA} + \phi_6 \text{Inflation}_{it} + \varepsilon_{it} \quad (3)$$

Where:

$$\text{Regime} \begin{cases} = 1 \text{ if a political regime is considered as undemocratic} \\ = 0 \text{ otherwise} \end{cases}$$

$$\text{HIPC}_{it} \begin{cases} = 1 \text{ if year} \geq 1999 \\ = 0 \text{ otherwise} \end{cases}$$

In the equation, current investment depends on its past values, external debt to export ratio in the previous period, a variable to capture the effect of regime type, an HIPC year dummy to assess the effect of instituting the initiative on investment, the degree of openness, the current account balance, and the rate of inflation. The openness indicator captures the idea that countries that are more open attract foreign investment. The current account variable is included to assess the effect of a continuous deficit on investment in low income countries.

The regression results are presented in Table 3. From column 1, a unit increase in the ratio of external debt to export will reduce investment by about 0.06 units. Other results from column 1 show that a unit increase in the degree of openness will result into an increase in investment by approximately 0.3%. The results also show that a unit increase in current account deficit is shown to give rise to an increase in investment of about 1.3%.

As mentioned earlier the HIPC period dummy is included in the equation to capture the effect of the initiative on investment. Column 2 shows that the HIPC Initiative period has resulted into an average improvement in investment of about 4.3%. In column 3, the HIPC's dummy is included in the estimation to assess whether countries that were included in the program from 1999 have witnessed improvement in investment. The result as expected is positive and significant, indicating that countries that were considered for debt relief and reforms have experienced an improvement in investment of about 6.3%.

It is worth noting that not all countries included in the program actually received debt reduction, as they have not adhered fully to the conditions spelled out by the initiative. To capture this, in column 4 estimation, the variable completion is included to capture whether countries that have instituted reforms and received partial or full debt reduction have experienced an improvement in investment. The coefficient is significant and positive, indicating that countries that have reached

Table 3 Investment results for 60 low income countries

Dependent Variable: Log of Investment to GDP				
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Investment _{t-1}	-0.181 ^c (-1.66)	-0.182 (-1.51)	-0.181 (-1.50)	-0.182 (-1.51)
External debt/Export _{t-1}	-0.063 ^c (-1.71)	-0.079 ^b (-2.86)	-0.077 ^b (-2.88)	-0.078 ^b (-2.85)
Openness _t	0.381 ^a (4.45)	0.382 ^a (5.19)	0.383 ^a (5.05)	0.382 ^a (5.14)
Current account _t	-0.755 ^b (-3.15)	-0.776 ^a (-3.46)	-0.773 ^b (-3.41)	-0.768 ^a (-3.41)
Inflation _t	0.152 (0.88)	0.137 (0.81)	0.132 (0.77)	0.135 (0.80)
GDP growth	0.374 (1.02)	0.394 (1.06)	0.414 (1.11)	0.404 (1.09)
Regime type _t	-0.076 ^c (-1.76)	-0.043 (-1.16)	-0.047 (-1.20)	-0.047 (-1.20)
HIPC _{YR}	-	0.047 ^c (1.96)	-	-
¹ HIPC	-	-	0.066 ^c (1.77)	-
² completion _t	-	-	-	0.137 ^c (1.69)
Constant	-3.121 ^a (-9.61)	-3.111 ^a (-10.49)	-3.125 ^a (-10.50)	-3.116 ^a (-10.51)
Number of observations	1,129	1,129	1,129	1,129
AR(1) p-value	0.468	0.516	0.513	0.509
AR(2) p-value	0.083	0.111	0.112	0.104
Hansen test p-value	0.467	0.707	0.682	0.695

^{a,b,c} significant at 1%, 5% and 10% respectively

1. HIPC is a dummy variable, 1 for countries that were included in the HIPC Initiative from 1999 and zero otherwise

2. Completion is a dummy variable. 1 for countries that have reached the completion point of the HIPC initiative by 2005 and zero otherwise.

their completion point as of 2005 have experienced improved investment of about 13.8%.

The results for the HIPCs do not differ much from those reported for the full panel. The main difference between the two may be seen from data reported in columns 2 and 3 of Table 4. The external debt variable becomes insignificant after the inclusion of the HIPC_{YR} and Completion point dummies, respectively.

Next a look at the growth equation given by:

$$\text{Growth}_{it} = \delta_1 Y_{it-1} + \delta_2 \text{Debt}_{it-1} + \delta_3 \text{Regime}_{it} + \delta_4 \text{HIPC}_{YR}_{it} + \sum_{j=1}^K \delta_j X_{jit} + \varepsilon_{it} \quad (4)$$

Equation 4 suggests that per capita GDP growth is determined by a lagged level of real GDP per capita, external debt to export ratio, a variable to capture the effect of regime type, the HIPC year dummy, and a set of control variables (X_{jit}). The additional variables to include are the level of investment, net exports, fiscal balance, openness and inflation. The level of investment will capture the effect of capital

Table 4 Investment results for 40 HIPCs

Dependent Variable: Log of Investment to GDP			
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Investment _{t-1}	-0.199 ^c (-1.95)	-0.211 (-1.58)	-0.210 (-1.58)
External debt/Export _{t-1}	-0.069 ^b (-2.27)	-0.107 (-1.57)	-0.106 (-1.51)
Openness _t	0.349 ^a (4.64)	0.312 ^a (3.57)	0.314 ^a (3.67)
Current account _t	1.29 ^b (-2.60)	-1.836 ^a (-2.74)	-1.836 ^a (-2.75)
Inflation _t	0.022 (0.07)	0.098 (0.34)	0.0096 (0.34)
GDP growth _t	0.794 ^a (3.16)	0.876 ^a (3.74)	0.876 ^a (3.74)
Regime type _t	0.023 (0.52)	0.026 (0.56)	0.026 (0.56)
HIPC _t	-	0.070 ^c (1.93)	-
Completion _t	-	-	0.124 ^c (1.88)
Constant	-2.896 ^a (-6.31)	-2.943 ^a (-7.40)	-2.953 ^a (-7.48)
Number of observations	806	806	806
AR(1) p-value	0.366	0.389	0.390
AR(2) p-value	0.115	0.151	0.141
Hansen test p-value	0.933	0.974	0.974

^{a,b,c} significant at 1%, 5% and 10% respectively

input on growth, while net exports (exports less imports) will help in assessing the implication to growth of encouraging exports in low income countries. Both investment and net exports coefficients are expected to be positive. The fiscal balance would indicate the potential effect on growth of reducing government spending, while openness will assess the implication of openness on growth in highly indebted poor countries. Inflation is expected to negatively affect growth in low income countries.

The results for the full panel sample are presented in Table 5. Column 1 shows that the stock of accumulated external debt to exports has a negative and significant effect on per capita GDP growth, while the coefficients for investment, net exports and government budget balance turned out to be positive and statistically significant. The results indicate that GDP per capita would fall by 0.05% as a result of an increase of 1 point of accumulated external debt to export ratio.

In this equation estimation, the impact on growth turned out to be smaller compared to the negative impact on investment obtained from Eq. 3, and remains significant in columns 2, 3 and 4, when the dummies for HIPC Initiative, HIPC countries and completion point country are employed.

The investment and net exports coefficients are positive as was expected which support the call for promoting investment and exports in low income countries. The fiscal balance is positive and significant in some specifications, an indication that a higher fiscal deficit may have detrimental effects on growth.

In column 2 of the table, the results are reported where the HIPC year dummy has been included to capture the effect of the initiative on growth. The coefficient

Table 5 Effects on GDP per capita for 60 low income countries

Dependent Variable: Per Capita GDP Growth				
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Real per capita GDP _{t-1}	-0.301 ^a (-2.69)	-0.288 ^b (-2.46)	-0.298 ^b (-2.14)	-0.329 ^b (-2.43)
External debt/Export _{t-1}	-0.055 ^a (-3.38)	-0.054 ^a (-3.28)	-0.053 ^a (-2.87)	-0.059 ^a (-3.69)
Openness _t	0.003 (0.06)	0.010 (0.18)	-0.009 (-0.16)	-0.003 (-0.07)
Investment _t	0.086 ^b (2.40)	0.088 ^b (2.22)	0.087 ^a (2.83)	0.097 ^b (2.65)
Inflation _t	-0.018 (-0.36)	0.029 (0.38)	0.03 (0.40)	0.015 (0.17)
HIPC _{YR}	-	0.011 (1.49)	-	-
HIPC	-	-	0.015 ^c (1.67)	-
Completion	-	-	-	0.032 ^c (1.66)
Net exports _t	0.401 ^a (2.43)	0.421 ^b (2.43)	0.407 ^b (2.38)	0.411 ^a (2.68)
Political Regime _t	-0.013 (-0.48)	-0.014 (-0.56)	-0.012 (-0.47)	-0.014 (-0.57)
Fiscal balance _t	0.213 ^c (1.75)	0.208 ^c (1.75)	0.309 (0.79)	0.328 (0.89)
Constant	2.279 ^a (2.84)	2.156 ^a (2.70)	2.30 ^a (2.69)	2.135 ^a (2.86)
Number of observations	933	933	933	933
AR(1) p-value	0.005	0.006	0.005	0.004
AR(2) p-value	0.130	0.143	0.154	0.156
Hansen test p-value	0.897	0.883	0.929	0.931

^{a,b,c} significant at 1%, 5% and 10% respectively

surprisingly did not turn out to be significant. Moreover, its inclusion did not significantly reduce the effect of external debt on growth.

In column 3 of the table, the HIPC dummy variable is introduced to capture the countries that were included in the initiative. The result is significant and positive, indicating that countries that were considered for the initiative did experience an average improvement in GDP per capita of about 1.5%. In column 4, a dummy variable is included to capture the countries that have successfully completed the program. The result is positive and significant and shows that completion point countries have witnessed an average improvement in growth of about 4.7%.

The results for the 40 HIPCs are presented in Table 6. The findings do not differ much from those presented in Table 5, with only the fiscal balance being insignificant. Unlike the investment equation results, where the external debt variable was insignificant with the inclusion of the HIPC_{YR} and completion point dummies; the effect of external debt remains negative and significant for growth.

A number of tests were performed to assess the validity of the instruments for the GMM estimation. The first test examines the null hypothesis that the error term, ε_{it} is serially uncorrelated. In the system specification, a test is performed to check on whether the differenced error term (that is, the residual of the regression in differences) shows second-order serial correlation. First-order serial correlation of

Table 6 The Effects on GDP per capita for HIPCs

Dependent Variable: Real Per Capita GDP Growth			
	Coefficient (t-statistics)	Coefficient (t-statistics)	Coefficient (t-statistics)
Real per capita GDP _{t-1}	-0.503 ^a (-3.05)	-0.522 ^a (-3.59)	-0.532 ^a (-3.64)
External debt/Export _{t-1}	-0.056 ^c (-1.90)	-0.060 ^b (-2.10)	-0.061 ^b (-2.16)
Openness _t	-0.001 (-0.02)	-0.017 (-0.26)	-0.027 (-0.43)
Investment _t	0.059 ^b (2.14)	0.059 ^b (2.26)	0.057 ^b (2.68)
Inflation _t	-0.107 (-0.85)	-0.051 (-0.47)	-0.028 (-0.21)
HIPC _{YR}	-	0.015 ^c (1.67)	-
Completion	-	-	0.034 ^c (1.7)
Net exports _t	0.426 (1.60)	0.493 ^b (1.86)	0.548 ^c (1.81)
Political regime _t	0.022 (0.58)	0.026 (0.69)	0.024 (0.71)
Fiscal balance _t	-0.012 (-0.05)	-0.008 (-0.03)	-0.045 (-0.18)
Constant	3.409 (3.00)	3.564 ^a (3.65)	3.653 ^a (3.47)
Number of observations	676	676	676
AR(1) p-value	0.015	0.002	0.009
AR(2) p-value	0.232	0.288	0.333
Hansen test p-value	0.983	0.975	0.976

^{a,b,c} significant at 1%, 5% and 10% respectively

the differenced error term is expected even if the original error term (in levels) is uncorrelated, unless the latter follows a random walk. The results indicate no second order correlation of the error term.

The second employs the Hansen tests of over identifying restrictions to assess the validity of the instruments. The results indicate the instruments used are valid. Lastly, to address the potential problem of heteroskedasticity, the reported standard errors and test statistics are heteroskedasticity-robust.

Conclusion

Debt reduction measures in the past decades have increasingly been used as a means of providing assistance to indebted countries. However, previous debt relief measures failed to create the necessary incentive effects on investment and growth in heavily indebted poor countries.

The main results in this paper show that investment and growth has improved in HIPCs since the institution of the HIPC Initiative. There is also evidence that health care and education enrollment experienced some improvement in countries that have reached the completion point of the HIPC. Thus, the argument put forth here as suggested by the theoretical framework summarized earlier in the paper, is that debt reduction should be coupled with reforms when considering debt relief initiatives in indebted countries characterized by bad behavior.

Appendix

Table 7 List of countries by completion point status

HIPCs (40 countries)			Non-HIPCS (20 countries)
22 Completion Point countries (Year reached)	7 Decision Point countries	Pre-Decision Point (11 countries)	
Benin (April 2003)	Burundi	Central African Republic	Bangladesh
Bolivia (June 2001)	Chad	Comoros	Bhutan
Burkina Faso (April 2002)	Democratic Republic of Congo	Côte d'Ivoire	Cambodia
Cameroon (May 2006)	Republic of Congo	Eretria	Equatorial Guinea
Ethopia (April 2004)	The Gambia	Haïti	India
Ghana (July 2004)	Guinea	Kyrgyz Republic	Kenya
Guyana (December 2003)	Guinea-Bissau	Liberia	Lao PDR
Honduras (April 2005)		Nepal	Lesotho
Madagascar (October 2004)		Somalia	Moldova
Malawi (August 2006)		Sudan	Mongolia
Malí (February 2003)		Togo	Myanmar
Mauritania (June 2002)			Nigeria
Mozambique (September 2001)			Pakistan
Nicaragua (January 2004)			Papua New Guinea
Níger (April 2004)			Solomon Islands
Rwanda (April 2005)			Tajikistan
São Tomé et Príncipe (2007)			Uzbekistan
Senegal (April 2004)			Vietnam
Sierra Leone (2007)			Yemen, Republic
Tanzania (November 2001)			Zimbabwe
Uganda (May 2000)			
Zambia (April 2005)			

IMF (2007)

Table 8 Data source, mean and standard deviation

Variable	Measurement	Source	Mean	Standard Deviation
Size of a country (Size)	Log of population	WDI	15.779	1.561
Level of development	per capita GDP	WDI	5.838	0.608
Inflation	Consumer Price Index	WDI	0.083	0.108
Total external debt	TED/GDP (%)	WDI	4.351	0.906
External debt/export		WDI	5.877	0.932
Fiscal balance	Budget balance/GDP	WDI	-0.056	0.059
Current account (CA)	CA/GDP	WDI	-0.073	0.113
Trade openness	(Export + Import)/GDP	WDI	4.055	0.557
Debt rescheduled		GDF	0.0214	0.411
Investment	Percentage of GDP	WDI	-1.684	0.487
Weak government indicators				
Constitutional (Polity)	1 if polity ≤ 0 , 0 otherwise	Polity IV	0.629	0.483
Participatory		Vanhanen	0.597	0.491

Table 9 Correlation matrix

	Investment	Current Account Balance	Openness	GDP Growth	Inflation	Per Capita Growth	Net Exports	External Debt/Export
Investment	1.000							
Current account balance	-0.302	1.00						
Openness	0.499	-0.190	1.00					
GDP growth	0.233	-0.019	0.073	1.00				
Inflation	-0.083	0.033	-0.058	-0.164	1.00			
Per capita growth	0.070	-0.025	0.105	0.982	-0.145	1.00		
Net exports	-0.428	0.354	-0.297	-0.074	0.032	-0.106	1.00	
External debt/export	-0.267	-0.147	-0.374	-0.050	0.066	-0.065	-0.100	1.00
Fiscal balance	-0.022	0.182	-0.010	0.225	0.221	0.011	0.0597	-0.112

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