Debt Position of Developing Countries and New Initiatives for Debt Reduction
A Panel Data Fixed Effects Estimation of the HIPC Initiatives

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Abstract
In September 1996, the World Bank and the International Monetary Fund launched the Heavily Indebted Poor Countries Initiative (HIPC). This initiative was endorsed by 180 governments around the world as an effective and welcome approach to help poor, severely indebted countries reduce debt as a part of the overall poverty reduction strategy. Three years later, the initiative was enhanced to provide more debt relief faster.
Using a panel data fixed effect estimation, this study assesses the achievements of the first and second HIPC initiatives and explores further areas of intervention that might help the HIPCs graduate from debt rescheduling and achieve sustainable growth and poverty alleviation. Despite moderate achievements of the HIPC measures so far, this paper argues in favour of a HIPC III initiative. Much more relief is needed to link debt reduction to poverty alleviation if the expectations raised by the HIPC initiatives are to become reality.

Keywords: debt relief, HIPC initiatives, panel data, governance.

1. The HIPC Debt Problem
Since the debt crisis of the 1980s, the international financial community has been providing help to debtor countries in reducing their external debt burdens in order to foster growth, reduce poverty, hunger and achieve sustainable food security. This assistance has taken the form of the provision of concessional financing from international financial institutions, debt relief from official creditors mainly in the context of Paris Club rescheduling, and in some cases, through bilateral action by the creditors. These measures have resulted in considerable success in alleviating the external debt burden of many middle-income countries. Many poor countries, however, continue to suffer from unacceptable levels of poverty and heavy external debt burdens. This group of countries has been classified as Heavily Indebted Poor Countries (HIPCs).

Over the past few decades, weak policies, adverse environmental and other external factors and sometimes misguided borrowing and lending decisions have increasingly impeded progress toward sustainable economic and social development. This, in turn, made the debt burdens of the poorest countries ever more unmanageable. As it had become clearer that much more needed to be done to help countries break the poverty-debt cycle, a global consensus emerged on the need to confront high poverty and crushing debt levels head-on (IMF and World Bank, 2001).
In response, in September 1996, the World Bank and the IMF launched the initiative for Heavily Indebted Poor Countries (HIPC). This initiative was endorsed by 180 governments around the world as an effective and welcome approach to help poor, severely indebted countries reduce debt as a part of the overall poverty reduction strategy. In addition, the HIPC Initiative called for faster and broader debt release for poor countries that pursue economic and social policy reforms. In September 1999, the initiative was significantly enhanced to provide more debt relief to more countries faster (World Bank, 2002).

About eight years after these initiatives were launched, little effort appears to have been directed towards assessing empirical evidence whether they have had positive or negative effects on debt stock, debt service and poverty expenditures. Likewise, whether HIPCs have responded in a similar manner to HIPC measures remains unanswered. This study, therefore analyses the beneficial effects of the new debt reduction initiatives and their contribution to development.

This paper is organised as follows. Section 2 reviews the objectives and hypotheses of the study, whereas section 3 describes the methodological approach used. Section 4 discusses the empirical results and section 5 concludes with policy implications.

2. Research Objectives and Hypotheses
The main objective of this study is to provide an answer to the question: What have been the beneficial effects of the new debt reduction initiatives and their contribution to development. Specifically, we seek to answer the following questions:
1. What have been the effects of the new debt reduction initiatives on debt stock, debt service and poverty-reducing expenditures in HIPCs?
2. How much of the impacts on debt stock, debt service and social expenditures is due to HIPC debt relief?
3. Is good governance a source of variability in response to HIPC measures?
4. Under what conditions could the HIPC initiatives be more effective and what are the prospects for economic growth and poverty alleviation in the future?

We hypothesize that:

**Hypothesis 1.** HIPC measures have not significantly reduced debt stock and debt service of HIPCs. Consequently, the debt positions of the HIPCs have not been changed significantly and the impact on economic growth in the future remains limited.

**Hypothesis 2.** Poverty-reducing expenditures of HIPCs remain unchanged after implementation of HIPC measures. Therefore, the HIPC debt relief did not improve the potential for poverty alleviation.

**Hypothesis 3.** The responses of countries to HIPC measures in terms of debt stock, debt service and poverty-reducing expenditures depend on factors such as: i) government effectiveness, ii) control of corruption, and iii) political stability.
3. Data and Methodology

Data on debt service, debt stock and poverty-reducing expenditures were taken from World Development Indicators and Global Development Finance (2004) and HIPC documents. Estimates of governance indicators were taken from Kaufmann et al. (2002).

The approach used in this analysis uses a panel data fixed effect regressions with econometrical models in order to quantify the changes that have occurred in terms of debt stock, debt service and poverty-reducing expenditures within the framework of the HIPC Initiatives and isolate their causes as well.

Due to the heterogeneity of HIPCs and the relatively short period of HIPC implementation, panel data allowing fixed group effects estimation was formulated to isolate the impacts of HIPC debt relief. Panel data sets are more oriented toward cross-section analyses; they are wide, but typically short. Even though modelling in this setting calls for some complex stochastic specifications (Greene, 2003); a panel analysis (cross sectional-time series) offers a better framework for analysing the HIPCs. The fixed effects approach appears to be the most appropriate for the questions under research.

Three interaction factors were introduced in the model: HIPC debt relief* -Political Stability, Government Effectiveness and Control of Corruption. The idea is that we may expect high beneficial effects in HIPCs with improved governance records. Therefore, creditors’ institutions may be interested in promoting such factors in order to establish an environment conducive to debt relief initiatives in the future. Estimations of the model and statistical analyses were performed using EXCEL and three econometrical packages: LIMDEP, SAS and SPSS.

The various models used in this study have their merits and limitations. In bringing them together, we intend to improve the efficiency of the study. Despite methodological limitations, findings show a meaningful pattern that could not be set aside.

- Model Specification

General Form of the Panel Regression Model

\[
\begin{align*}
EDT_{it} &= f_1 (HIPC, DSR, PEXP, IIL, AGRO, GDPG, GRC, GOV, CTR, POL, D) \\
DSR_{it} &= f_2 (HIPC, EDT, PEXP, INF, AGRO, GDPG, GOV, CTR, POL, D) \\
PEXP_{it} &= f_3 (HIPC, DSR, EDT, GRNE, AGRO, EBG, AID, GOV, CTR, POL, D)
\end{align*}
\]

Functional Form of the Panel Model\(^1\)

\[
\begin{align*}
EDT_{it} &= \sum_{j=1}^{N} a_{1j} I_{Djt} + a_1 HIPC_{it} + a_2 DSR_{it} + a_3 PEXP_{it} + a_4 IIL_{it} + a_5 AGRO_{it} + a_6 GDPG_{it} + a_7 GRC_{it} + a_8 GOV_{it} \\
&+ a_9 CTR_{it} + a_{10} POL_{it} + \epsilon_{it}
\\
DSR_{it} &= \sum_{j=1}^{N} b_{1j} I_{Djt} + b_1 HIPC_{it} + b_2 EDT_{it} + b_3 PEXP_{it} + b_4 INF_{it} + b_5 AGRO_{it} + b_6 GDPG_{it} + b_7 GOV_{it} + b_8 CTR_{it} \\
&+ b_9 POL_{it} + \epsilon_{2it}
\\
PEXP_{it} &= \sum_{j=1}^{N} c_{1j} I_{Djt} + c_1 HIPC_{it} + c_2 EDT_{it} + c_3 DSR_{it} + c_4 GRNE_{it} + c_5 AGRO_{it} + c_6 GDPG_{it} + c_7 GOV_{it} \\
&+ c_8 CTR_{it} + c_{10} POL_{it} + \epsilon_{3it}
\end{align*}
\]

\(^1\) For variable description, see footnote of section 4.1.
4. Modelling the Effects of the HIPC Initiatives

4.1 Results of the Models estimation

The results of the model, including some classical statistics, are reported in Table 1.

Table 1: Estimation of the panel model coefficients (Fixed effects are available upon request)

<table>
<thead>
<tr>
<th>Variables</th>
<th>EDT Stock Equation</th>
<th>Debt Service Equation</th>
<th>Poverty Expenditures Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDT</td>
<td>DEP</td>
<td>-0.029** (-0.723)</td>
<td>0.11** (1.035)</td>
</tr>
<tr>
<td>DSR</td>
<td>-0.30ns (-0.86)</td>
<td>DEP</td>
<td>-0.069** (-2.275)</td>
</tr>
<tr>
<td>PEXP</td>
<td>1.175ns (0.97)</td>
<td>-0.534ns (-1.320)</td>
<td>DEP</td>
</tr>
<tr>
<td>HIPC</td>
<td>-3.928*** (-3.01)</td>
<td>-2.228*** (-5.609)</td>
<td>-0.134ns (-1.114)</td>
</tr>
<tr>
<td>AGRO</td>
<td>0.390** (2.28)</td>
<td>0.063** (1.072)</td>
<td>-0.001ns (-0.91)</td>
</tr>
<tr>
<td>GDPG</td>
<td>-0.870ns (-1.35)</td>
<td>-0.098ns (-0.457)</td>
<td></td>
</tr>
<tr>
<td>POL</td>
<td>-21.950** (-2.16)</td>
<td>0.392ns (0.108)</td>
<td>9.50* (1.133)</td>
</tr>
<tr>
<td>CTR</td>
<td>-5.742ms (-0.82)</td>
<td>-0.884ms (-0.355)</td>
<td>-0.506ns (-0.827)</td>
</tr>
<tr>
<td>GOV</td>
<td>21.339* (-1.87)</td>
<td>-1.871ms (-0.448)</td>
<td>-0.958ns (0.992)</td>
</tr>
<tr>
<td>GRC</td>
<td>0.663ns (1.46)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIPC</td>
<td>1.960*** (3.45)</td>
<td>-0.276** (-2.076)</td>
<td></td>
</tr>
<tr>
<td>INF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRNE</td>
<td></td>
<td>-0.485*** (-6.052)</td>
<td></td>
</tr>
<tr>
<td>EBG</td>
<td></td>
<td>-0.489*** (-5.663)</td>
<td></td>
</tr>
<tr>
<td>AID</td>
<td>0.129*** (3.281)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hausmann Statistic 33.10*** 12.40ns 13.96ns
Adjusted R-squared 94% 64% 87%
Model test F [34, 62] = 47.99*** [32, 60] = 6.17*** [34, 62] = 20.15***

Source: Own computations; data from Kaufmann et al., 2002; GDF, WDI and HIPC documents, 2004.
***Significant at 99%. **Significant at 95%. *Significant at 90%. nsNot significant. t-values in brackets.

The above results suggest that the HIPC debt relief did significantly reduce the debt stock and debt service of HIPCs. The flow effect of debt relief however, is small. HIPC relief did not directly affect poverty expenditures of HIPCs, suggesting no significant resource has been freed as part of the initiatives.

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2 EDT<sub>t</sub><sup>i</sup> = External Debt Stock (in percent of gross domestic product) of the ith-country in year t
DSR<sub>t</sub><sup>i</sup> = Debt Service Ratio (in percent of exports of goods and services) of the ith-country in year t
PEXP<sub>t</sub><sup>i</sup> = Poverty Expenditures (in percent of gross domestic product) of the ith-country in year t
HIPC<sub>t</sub><sup>i</sup> = HIPC debt relief (in percent of gross domestic product) of the ith-country in year t
INF<sub>t</sub><sup>i</sup> = Inflation rate (consumer price) of the ith-country in year t
AGRO<sub>t</sub><sup>i</sup> = Annual growth of export of goods and services (%) of the ith-country in year t
GDPG<sub>t</sub><sup>i</sup> = Annual growth of gross domestic product (%) of the ith-country in year t
GRNE<sub>t</sub><sup>i</sup> = Gross national expenditures (in percent of gross domestic product) of the ith-country in year t
GRC<sub>t</sub><sup>i</sup> = Gross capital formation (in percent of gross domestic product) of the ith-country in year t
EBG<sub>t</sub><sup>i</sup> = External balance on export of goods and services of the ith-country in year t
AID<sub>t</sub><sup>i</sup> = Aid (in percent of gross national income) of the ith-country in year t
hl<sub>t</sub><sup>i</sup> = IBRD and IDA loans (in percent of gross domestic product) of the ith-country in year t
CTR<sub>t</sub><sup>i</sup> = Control of corruption index of the ith-country in year t
GOV<sub>t</sub><sup>i</sup> = Government effectiveness index of the ith-country in year t
POL<sub>t</sub><sup>i</sup> = Political stability index of the ith-country in year t
Nonetheless, the relief has had an indirect, but small effect on poverty expenditures through debt service reduction. Much of the changes reported in poverty expenditures are due to aid and most probably to other factors.

It is therefore concluded that debt relief has contributed to increasing poverty-reducing expenditures, but this impact is small. Surprisingly, the results also indicate that the impacts of HIPC measures in terms of debt stock have been diluted by fresh loans contracted during the same period.

**4.2 Determinants of HIPC Responses**

The HIPC debt relief was interacted with three governance dimensions (political stability, control of corruption and government effectiveness) in the above equations to determine whether good governance is a source of variability in response to HIPC measures. The results are reported in Table 2.

**Table 2 Estimation of the interaction coefficients**

<table>
<thead>
<tr>
<th>Interaction Terms</th>
<th>Debt Stock Equation</th>
<th>Debt Service Equation</th>
<th>Poverty Expenditures Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIPC*POL</td>
<td>-0.817ns (-0.31)</td>
<td>2.839*** (3.716)</td>
<td>-253ns (-1.087)</td>
</tr>
<tr>
<td>HIPC*CTR</td>
<td>-6.353** (-1.98)</td>
<td>-0.455ns (-0.466)</td>
<td>-0.235ns (-0.778)</td>
</tr>
<tr>
<td>HIPC*GOV</td>
<td>0.797ns (0.21)</td>
<td>-0.788ns (-0.681)</td>
<td>0.502ns (1.580)</td>
</tr>
</tbody>
</table>

Source: Own computations; data from Kaufmann et al., 2002; GDF, WDI and HIPC documents, 2004. ***Significant at the 99% level. **Significant at the 95% level.*Significant at the 90% level. nsNot significant. t- values in brackets.

Two interaction factors have the expected negative sign in the debt stock equation. The third interaction factor is positive, but it is not significant. The same is true for the debt service equation. In this case, however, the interaction factor with the unexpected sign is highly significant. As to the poverty expenditures equation, only one coefficient has the expected positive sign, but none of the interaction terms are significant.

The above analysis does not allow drawing firm conclusions; it may indicate that the control of corruption and political stability indicators are important determinants of the debt stock and debt service effects of HIPC relief respectively. This result indicates that poor governance, especially high corruption levels, is a binding constraint to achieving both short-term and long-term debt sustainability.

Further empirical evidence confirms that the improvement of the debt position of HIPCs may spur, in most cases, economic growth and alleviate poverty in the future.

**5. Conclusions and Policy Implications**

All in all, findings reported above provide a mixed picture of the effects of the HIPC initiatives. Moreover, this analysis reveals that not only debt relief is crucial, but also aid and loans are vitally important for the development of HIPCs.

Based on the above results and despite the achievements of the HIPC measures, this research argues in favor of a HIPC III Initiative. Much more relief is needed to strengthen the link between debt relief and poverty alleviation if the rhetoric surrounding the initiatives is to become a reality. In addition, aid and loans are vitally important for the development of HIPCs. A good governance environment is a precondition for increasing the effectiveness of external assistance.
Therefore, HIPC\text-em{s} need to improve their governance. Larger share of debt relief should be targeted to countries with good governance. Peer pressure should be emphasized on countries with poor governance in order to facilitate internal reforms. The New Partnership for African Development (NEPAD) offers a suitable framework for such role. However, the effect of debt relief is a long term process; success cannot be expected overnight.
References


EASTERLY, W. (1999), How Did Highly Indebted Poor Countries Become Highly Indebted?
Reviewing two decades of debt relief; unpublished draft, World Bank, Washington DC.


