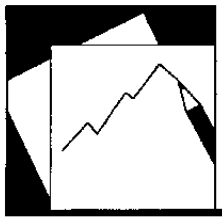
WP/03/187



IMF Working Paper

Fiscal Sustainability in African HIPC Countries: A Policy Dilemma?

Annalisa Fedelino and Alina Kudina

INTERNATIONAL MONETARY FUND

 WP/03/187

IMF Working Paper

Fiscal Affairs Department

Fiscal Sustainability in African HIPC Countries: A Policy Dilemma?

Prepared by Annalisa Fedelino and Alina Kudina[1]

Authorized for distribution by Rolando Ossowski

September 2003

Abstract

This paper looks at the link between fiscal policy and debt sustainability in a number of African countries participating in the Heavily Indebted Poor Countries (HIPC) Initiative. The paper finds that, on the basis of current fiscal policies, debt levels will remain unsustainable even after these countries graduate from the HIPC Initiative. This finding has important policy implications. By the very requirements of the HIPC Initiative, these countries are expected to increase significantly their poverty-reducing expenditure—possibly resulting in weaker fiscal primary balances and worsening debt sustainability outlook. As offsetting fiscal tightening may not be viable, ensuring debt sustainability may thus require increased availability of (nondebt-creating) grants. Otherwise, debt sustainability in HIPC countries may prove elusive in the long term.

JEL Classification Numbers: F3, F34, F35

Keywords: Debt sustainability; HIPC Initiative; concessional financing

Author's E-Mail Address: afedelino@imf.org; alina.kudina@said-business-school.oxford.ac.uk

---

[1] This paper was prepared while Alina Kudina was a summer intern at the Fiscal Affairs Department of the IMF during the summer of 2002. We would like to thank Ali Abbas, Celine Allard, Marco Cangiano, James Daniel, Christina Daseking, Peter Heller, Erik Lueth, Eric Mottu, Shamsuddin Tareq, and participants in an FAD seminar where a first draft of this paper was presented, for useful comments and suggestions. Luis Blancas provided outstanding research assistance. The usual disclaimer applies.

Table of Contents Page

I. INTRODUCTION

The Heavily Indebted Poor Countries (HIPC) Initiative, originally launched in 1996 and further enhanced three years later, was designed to address debt problems and poverty reduction in some of the world's poorest countries. Its basic principle is that participating countries (HIPCs) benefit from a reduction in the stock of their external debt to sustainable levels in exchange for continued efforts in macroeconomic stabilization, structural adjustment, and poverty reduction (as shown by a satisfactory track record under IMF- and IDA-supported programs). Savings from reduced debt service would allow HIPCs to finance higher spending in poverty-reducing programs; and the international community would stand ready to continue to provide highly concessional and nondebt-creating (grant) financing to those countries that have successfully embraced the HIPC Initiative.[2]

In simple terms, the HIPC Initiative aims at reducing the net present value (NPV) of external debt to a maximum of 150 percent of exports (or, for small open economies, to 250 percent of government revenue) at the time of the so-called "HIPC Completion Point." These thresholds have the merit of establishing "a methodology for determining debt relief, thereby ensuring equity of treatment among beneficiary countries and equitable burden-sharing among creditors" (IMF, 2001).

The HIPC Initiative has met with considerable success.[3] Yet, it has been recognized that bringing a *single* debt measure down to a critical threshold at a *single* point in time is no guarantee against future debt problems (IMF, 2001); and that "debt relief under the HIPC Initiative provides a basis, but not a guarantee, for long-term debt sustainability in HIPC countries" (IMF, 2002a). While the debt relief granted under the HIPC Initiative will substantially reduce the debt service due on existing debt, maintaining debt sustainability will also crucially depend on future macroeconomic policies, growth performance, and financial assistance from donors. The recent global economic uncertainty and the fall in commodity prices have also added a new dimension to achieving debt sustainability in many HIPCs.

---

[2] For a detailed history of the HIPC Initiative and its main principles, see Abrego and Ross (2001), IMF(2002a), and *http://www.imf.org/external/np/exr/facts/hipc.htm* and its references. In this paper, HIPC Initiative refers to "Enhanced" HIPC Initiative, as reformulated in 1999.

[3] "Some three dozen HIPCs are expected to qualify for assistance under the enhanced HIPC Initiative, the great majority of which are sub-Saharan African countries. Debt relief packages are now in place for 26 countries under the enhanced HIPC Initiative framework (Benin, Bolivia, Burkina Faso, Cameroon, Chad, Ethiopia, The Gambia, Ghana, Guinea, Guinea-Bissau, Guyana, Honduras, Madagascar, Malawi, Mali, Mauritania, Mozambique, Nicaragua, Niger, Rwanda, São Tome and Príncipe, Senegal, Sierra Leone, Tanzania, Uganda, and Zambia), with total committed assistance estimated at some US$25 billion in NPV terms, or about US$41 billion in nominal terms. Of these countries, six (Uganda, Bolivia, Mozambique, Tanzania, Burkina Faso, and Mauritania) had reached their completion points under the enhanced Initiative by end-2002, at which time debt relief was delivered unconditionally" (PIN/02/122 of September 28, 2002). Easterly (2002) also notes that the HIPC Initiative seems to have been so far more successful than past debt relief efforts.

This paper will explore in more depth the link between fiscal policy and debt sustainability in a number of African HIPCs. The main reason is that HIPCs are expected to increase significantly their poverty-reducing expenditure, which could possibly result in larger budget deficits and financing needs, and ultimately in a deteriorating debt sustainability outlook. Our analysis will look at the primary fiscal positions consistent with debt sustainability, draw some lessons on the adequacy of current fiscal policies in the selected HIPCs, and outline possible policy implications on how to implement sustainable fiscal policies.

The paper is organized as follows. Section II sets out with a summary of the HIPC framework for debt sustainability; it then describes the model used in this paper. Section III presents some stylized facts for assessing debt sustainability in a selected sample of African HIPCs. Empirical results on debt sustainability in the selected HIPCs are presented in Section IV. Section V draws some conclusions and policy implications.

II. Debt Sustainability and the Relevance of Fiscal Policy

In a "simplified" debt sustainability framework, the debt dynamics is typically expressed as a function of past debt stock, the differential between interest and growth rates, and the primary fiscal position.[4] Based on this broad analytical framework, the HIPC Initiative aims at ensuring debt sustainability through three main channels. First, through a direct reduction of external debt stocks. Second, through lower interest rates, as new external financing would take place at highly concessional terms. Third, through higher growth rates, by removing possible debt overhangs and refocusing public expenditure towards growth promotion and poverty reduction.

The first two channels have an immediate positive impact on debt dynamics. The third channel, however, could in principle have an adverse effect in the short term: while higher poverty-reducing expenditure (such as on health and education) is likely to contribute to higher growth rates with a lag, it may immediately weaken the primary fiscal position (unless it is fully financed by grants or higher revenue or it is fully offset by cuts in other expenditure). Therefore, higher poverty-reducing expenditure could actually result in a deterioration of the debt dynamics, at least in the short term.

Reliance on grants and low rates on concessional finance, if maintained for the indefinite future, could allow HIPCs to sustain quite sizeable primary deficits. However, the HIPC Initiative aims at creating self-sufficiency, and allow HIPCs to graduate eventually from concessional

---

[4] According to the *accounting* approach, the debt is sustainable when its ratio to GDP can be stabilized at its level d. This requires a primary fiscal balance s (revenue minus non-interest expenditure), expressed in percent of GDP, that satisfies the following relationship:

$$s = \frac{(r - g)}{(1 + g)} d$$

where g is the real rate of economic growth, and r is the real interest rate on the debt stock. While this framework is analytically very simple, it does not take into account the government intertemporal budget constraint nor does it consider the level of fiscal deficit that is financeable. These shortcomings are addressed in the *present value budget constraint* (PVBC) approach. See, for example, Cuddington (1997), and Chalk and Hemming (2000).

financing. All the more, this makes the question of the debt sustainability in HIPCs—and the link with sustainable fiscal policies—worth addressing.

A. The HIPC Framework

While extensive literature exists on how to define debt sustainability (see Chalk and Hemming, 2000, for a useful review), the HIPC Initiative rests on an empirical concept of debt sustainability; the main criteria are summarized in the Box below. [5]

Debt Sustainability Criteria Under the HIPC Initiative

The HIPC Initiative is designed to reduce the net present value (NPV) of external public debt to the following ratios upon reaching the HIPC Completion Point:

NPV of external debt/exports 1/ 2/	150 percent
NPV of external debt/revenue 1/ 3/	250 percent

subject to the following qualifying thresholds:

Exports/GDP	30 percent
Revenue/GDP	15 percent

Source: http://www.imf.org/external/np/exr/facts/hipc.htm.
1/ The NPV is computed on public and publicly guaranteed external debt.
2/ A 3-year average of exports is used.
3/ For those economies that are highly open (with an exports/GDP ratio of at least 30 percent) and make a strong fiscal effort (expressed by a revenue/GDP ratio of at least 15 percent), the debt-sustainability target is set at a ratio of NPV of external debt/revenue of 250 percent ("fiscal window").

Some features of these criteria are worth pointing out:

- The HIPC Initiative focuses on **external debt**.
- The HIPC Initiative is based on the **NPV definition of debt**, which allows the aggregation of various debts with different servicing costs and maturities; it also captures the effective debt-service burden, especially in cases where interest rates differ markedly from market rates.
- **Exports are the main scale variable** used to compute debt ratios under the HIPC framework, as they measure the foreign-exchange earning capacity of a country to service its external debt.[6]

[5] For example, "the purpose of debt sustainability analysis is to assess whether a country with a given profile of scheduled external debt payments is able in all likelihood to meet its current and future external debt obligations in full without resorting to rescheduling in the future or accumulation of arrears" (IMF, 1996b).

- The **HIPC sustainability thresholds** are derived from **empirical analysis** calculated on the basis of a single point in time (a country's debt position upon graduating from the HIPC Initiative—the so called HIPC Completion Point).[7]

In sum, in the HIPC framework the role of fiscal policies and their impact on debt sustainability is not explicitly taken into account. We try to address this gap in what follows.

B. An Alternative Framework: The Role of Sustainable Fiscal Policies

Our framework is based on the following criteria for debt sustainability:

- Both **external and domestic liabilities** are considered, for three main reasons. First, while external debt may be sustainable, the total stock of debt may not be, due to higher stock levels and generally higher servicing costs on average when domestic debt is also included. Second, to the extent that HIPCs do not have access to international capital markets and donors are the main providers of external financing, domestic financing may become a significant source of funds with important macroeconomic and debt sustainability implications. Third, in a number of countries, past and current governments' role in the economy, for example in the parastatal sector, has left a legacy of sizeable domestic liabilities (explicit and contingent); these liabilities also impact on governments' ability to sustain given fiscal policies. Thus, neglecting the role of domestic debt might actually underestimate the magnitude of the fiscal effort and/or external assistance that HIPCs will have to seek in the post-Completion Point era to reach and "lock in" debt sustainability.

- Debt sustainability in this paper is assessed on the basis of the **nominal stock of debt**, rather than NPV levels; concessional (subsidized) interest payments are explicitly included in future cash flows.[8] This is done mainly because of analytical simplicity, as the NPV calculations would vary over time subject to expiring grace periods, maturity profiles, and changing discount rates.[9]

---

[6] Adam and Bevan (2001) argue that as HIPCs can conceivably rely on positive net transfers, their debt servicing capacity depends not only on their ability to generate foreign exchange earnings, but also on how much foreign assistance is expected in the future. Since HIPCs will be receiving net transfers from abroad, then debt-to-exports ratio can actually underestimate their ability to sustain a given level of debt.

[7] Appendix I in IMF (2001) shows that the incidence of rescheduling during 1993–97 for countries with an NPV of debt-to-exports below 150 percent ratio in 1991–93 was only 12 percent. For those with NPV ratio above 200 percent, the incidence of rescheduling rose to 70 percent. This empirical evidence supports the adequacy of the debt sustainability thresholds defined under the HIPC Initiative.

[8] There is an equivalence between using NPV of debts or using nominal (face value) of debts and explicitly accounting for the associated concessional interest payments. See Edwards (2002).

[9] For specifics on the NPV calculations, see: *http://www.imf.org/external/np/exr/facts/hipc.htm.* In addition, NPV calculations tend to hide the gross financing needs a government faces from maturing debt. For example, although two loans can be NPV-equivalent, one loan may involve larger bunched principal repayments and higher refinancing needs.

- **Nominal GDP** is used here as the relevant **scale variable** to assess debt sustainability, for two main reasons. First, if total (domestic and external) stocks of debt are considered, GDP may be a more appropriate scale variable as it measures the ability of the economy as a whole to generate income.[10] Second, using variables directly expressed in foreign currency (such as external debt and exports) may conceal the immediate implications of exchange rate changes on debt sustainability. In our framework a country will experience a deterioration in its debt dynamics if its currency depreciates—even in the absence of new foreign borrowing—due to both a revaluation effect on the stock of outstanding foreign currency-denominated liabilities and the related higher interest rates (expressed in domestic currency). In the circumstances, this country would have to increase its fiscal effort, denominated in domestic currency, in order to be able to service its debt.

- Finally, rather than defining specific debt sustainability thresholds, **a model** is used to assess debt sustainability. An important by-product of the framework is the calculation of primary fiscal positions consistent with a sustainable debt. **This is an important ingredient, as the primary fiscal balance is the policy instrument available to a country to ensure that its debt remains sustainable.** If not, a government would need to either increase revenue and/or reduce expenditure to generate the required adjustment in its primary position.

The model draws from Edwards (2002). Debt sustainability is reached when the ratio of debt to GDP is stationary, and consistent with the overall demand—domestic and external—for government securities.[11] This allows an evolution of the stock of debt based on assumptions on creditors' behavior. The model also allows for declining concessional financing over time (which is consistent with countries graduating from concessional financing once a certain income level is reached); and it assumes that it takes time to reach the steady state. Our approach, however, differs from Edwards' in two main respects. First, all variables are denominated in local currency, to allow explicit consideration of exchange rate and domestic inflation fluctuations. Second, the model is solved in discrete time to provide a higher degree of accuracy for short- to medium-term dynamics.

The model focuses on the dynamic behavior of the key variables during the transition to the steady state. The budget constraint expressed in domestic currency is expressed as follows:

---

[10] In principle, revenue could be an even more appropriate scale variable, as it measures a government's ability to raise resources to service the debt. However, projecting revenue into the future—an essential ingredient of our exercise below—would depend on many policy variables and macroeconomic developments whose assessment is beyond the scope of this paper. While the same considerations apply to GDP projections, it is nonetheless more straightforward to use the latter for the sake of simplicity.

[11] This is the main difference from the accounting approach—which defines sustainability as stability of debt ratios—as it is the "willingness" of the government's creditors that ultimately makes a certain level of debt sustainable. In the accounting approach, it is therefore implicitly assumed that government's liabilities can continue to grow at the nominal rate of growth of the economy, so that the debt/GDP ratio remains constant.

$$-S_t + r_t^d B_{t-1}^d + r_t^f E_t B_{t-1}^f = \Delta B_t + \Delta H_t \qquad (1)$$

where

S_t is the government primary balance, defined as revenue (including grants, as they are nondebt-creating) less expenditure, excluding total interest payments;

$B_t = B_t^d + E_t B_t^f$ is the stock of nonmonetary financial liabilities in period t (excluding foreign exchange reserves) composed of domestic and external liabilities, the latter converted at the end of period nominal market exchange rate, E_t; hence,

$\Delta B_t = B_t^d - B_{t-1}^d + E_t B_t^f - E_{t-1} B_{t-1}^f$;

r_t^d is the nominal interest rate on government bonds denominated in domestic currency, B_t^d;

r_t^f is the nominal interest rate on government debt denominated in foreign currency, B_t^f;

H_t is the stock of monetary liabilities, or base money. This variable captures the effect of seignorage, whose size depends on the degree of monetization of the economy, the income elasticity of the demand for money, and the rate of domestic inflation.[12]

Equation (1) basically tells us that changes in fiscal balance (the left-hand-side) need to be financed by changes in debt or monetary base or both (the right-hand-side).

For simplicity, it is assumed that external creditors provide financing on concessional terms, while domestic creditors provide financing at commercial terms (see also Cuddington, 1997). This is not unreasonable, considering that most external financing to HIPCs is provided by multilaterals or bilaterals—the latter applying in most cases, concessional terms similar to those granted by the former. In particular, the donor community is willing to accumulate concessional debt at a rate equal to θ,

$$B_t^f = (1+\theta) B_{t-1}^f, \qquad (2)$$

while domestic debt is accumulated at a rate equal to ∂,

$$B_t^d = (1+\partial) B_{t-1}^d \ . \qquad (3)$$

The main question the model is trying to answer is whether, after reaching the HIPC Completion Point and benefiting from debt relief, HIPCs debt levels are sustainable on the basis of current and projected fiscal primary balances. Or, alternatively, whether HIPCs can achieve primary balances—the relevant policy variable—that will allow them to maintain sustainable debt levels.

---

[12] Seignorage revenue can be seen as a source of fiscal financing, especially in developing countries (see, for example, Cuddington (1997)).

Starting from equation (1) and requiring external and domestic debt to grow in line with (2) and (3) respectively, the following relationship between the primary balance, base money, domestic and external concessional debt is obtained[13]

$$s_t = \frac{r_t^d - \partial}{1+n_t} b_{t-1}^d + \frac{(r_t^f - \theta)(1+e_t)}{1+n_t} b_{t-1}^f - \frac{\pi_t}{1+n_t} h_{t-1} \qquad (4)$$

where s, b and h refer to the ratio of corresponding upper case variables to nominal GDP;
∂ is the growth rate of domestic debt;
θ is the growth rate of concessional debt;
n is the nominal GDP growth rate;
e_t is the change in the nominal exchange rate (a positive change denotes a depreciation); and
π is the inflation rate. For simplicity, it is assumed that the GDP deflator is equal to domestic inflation, so that $1+n = (1+g)(1+\pi)$ where g is the rate of real GDP growth.

Equation (4) states that the primary position is directly related to the level of interest and exchange rate changes, and inversely to growth rates and seignorage. In addition, the larger the difference between concessional (domestic) interest rate and rate of accumulation of external (domestic) debt, the higher the corresponding level of primary balance consistent with debt sustainability.

Solving (4) recursively yields the dynamic primary balance consistent with debt sustainability. This is the level of primary balance that, in any period, ensures a sustainable path for the overall debt to GDP ratio, as follows

$$s_t = \frac{r_t^d - \partial}{1+n_t} \prod_{i=0}^{t-1} \frac{1+\partial}{1+n_i} b_0^d + \frac{(r_t^f - \theta)(1+e_t)}{1+n_t} \prod_{i=0}^{t-1} \frac{(1+\theta)(1+e_i)}{1+n_i} b_0^f - \prod_{i=o}^{t-1} \frac{\pi_i}{1+n_i} h_0 \qquad (5)$$

where period 0 refers to the year of the HIPC Completion Point (when all debt relief is granted), so as to anchor the analysis from the post-HIPC reduced stock of debt. While the interpretation of equation (5) is now "clouded" by the discounting factors, the basic relationships are the same as in equation (4), but with magnitudes weighted by the discounting.

In the long run, both external and domestic debt ratios should be bounded. This is an important constraint, that ensures that neither the concessional nor the domestic debt ratios grow without limit. This condition is also required to guarantee the convergence of the primary balance ratio over time.[14] Hence,

---

[13] It is assumed that money demand has unitary income elasticity.

[14] In principle, an unbounded debt/GDP ratio could be possible in prolonged periods of high interest rates. Sustainability in such a case would therefore require ever growing primary fiscal surpluses—a unlikely possibility in reality. Hence, the size of primary fiscal surpluses must be constrained, because the government cannot collect

$$\prod_{i=0}^{t-1} \frac{(1+\theta)(1+e_i)}{(1+n_i)} \leq 1 \quad \text{and} \quad \prod_{i=0}^{t-1} \frac{(1+\partial)}{(1+n_i)} \leq 1. \tag{6}$$

In case n and e are constant over time, the conditions expressed in (6) become:

$$\theta \leq \frac{n-e}{1+e} \qquad \text{and} \qquad \partial \leq n. \tag{7}$$

For simplicity, it is assumed that domestic debt remains constant as a share of GDP at time *0*, that is $\partial = n$. For the external debt, two cases will be considered based on (7), so as to map a range of possible primary positions consistent with a no Ponzi-scheme restriction (that is, no explosive debt dynamics).

Case 1: All maturing external debt is fully rolled over, so that its nominal value remains constant (and declines as a ratio to GDP); that is, $\theta = 0$.[15] This is a very conservative scenario, as no new concessional financing is provided on a net basis.

Case 2: It is assumed that the donor community is willing to continue to provide concessional financing, so that the stock of external debt to nominal GDP remains constant at its post-HIPC Completion Point level; that is, $\theta = \frac{n-e}{1+e}$. This is the most optimistic assumption consistent with the upper-bound condition expressed in (7).

Under the first case, the sustainable balance evolves according to the following path:

$$s_t = \frac{r_t^d - n_t}{1+n_t} b_0^d + r_t^f \prod_{i=0}^{t-1} \frac{1+e_i}{1+n_i} b_0^f - \prod_{i=0}^{t-1} \frac{\pi_i}{1+n_i} h_0 \tag{8}$$

with steady state at (when $t \rightarrow \infty$):

$$s_t = \frac{r_t^d - n_t}{1+n_t} b_0^d. \tag{9}$$

---

more revenue that the economy generates as income. This condition ultimately requires that, if the interest rate is greater than the growth rate, debt ratios need to be bounded. For more analytical details, see Chalk and Hemming (2000) and references therein.

[15] If the exchange rate depreciated faster than nominal GDP growth rate, then even a simple rollover of external debt would not allow for a contraction of the debt to GDP ratio. This is however an extreme scenario. In addition, while it would be possible to include negative values of θ in the admissible set of solutions, this in practice would imply that in each period a country is a net payer of external debt—an unlikely scenario for cash-constrained HIPCs.

The second case provides the following solution for the primary balance:

$$s_t = \frac{r_t^d - n_t}{1+n_t} b_0^d + \frac{r_t^f + r_t^f e_t - n_t + e_t}{1+n_t} b_0^f - \prod_{i=0}^{t-1} \frac{\pi_i}{1+n_i} h_0 \qquad (10)$$

with steady state at:

$$s_t = \frac{r_t^d - n_t}{1+n_t} b_0^d + \frac{r_t^f + r_t^f e_t - n_t + e_t}{1+n_t} b_0^f . \qquad (11)$$

In the first case, the steady-state ratio of concessional debt to GDP is equal to zero, as the nominal stock remains at the level B_0^f while GDP continues to grow. In the second case, the steady state level of concessional debt ratio is, by construction, equal to b_0^f. As in this case countries have access to concessional financing, they can sustain their stock of debt with lower fiscal effort than under the first scenario.

III. Assessing Debt Sustainability in African HIPCs: Stylized Facts on Key Variables

Based on the model presented in Section II, we now turn to look at developments in some variables needed for the assessment of debt sustainability in a sample of 12 HIPC African countries: Benin, Burkina Faso, Cameroon, Ethiopia, Ghana, Malawi, Mali, Mozambique, Senegal, Tanzania, Uganda, and Zambia. These countries have been selected because they encompass different experiences with macroeconomic stabilization and varying stages in the debt sustainability exercise under the HIPC Initiative.[16]

By definition, as all these countries have, until recently, participated or are still participating in the HIPC Initiative, their stock of external debt is sizeable. For example, at end-2001, the stock of external debt to GDP in these countries ranged from a minimum of 55 percent in Uganda, to as high as 144 percent and 148 percent of GDP in Zambia and Malawi, respectively.[17]

Table 1 presents data on three key macroeconomic variables to be used in our exercise—namely, growth rate, inflation and exchange rate—during the period 1991–2000. This will

16 The analysis in this paper is based on end-2002 information. Of the selected countries, four (Burkina Faso, Mozambique, Tanzania, and Uganda) had already reached the HIPC Completion Point by end-2002; others are expected to reach it in the course of 2003; while for a small group this goal remains more elusive in the immediate future (for example, Ghana, Malawi, and Zambia are not expected to reach the Completion Point earlier than 2004).

17 These figures refer to the nominal stock of external debt; the corresponding NPV ratios are obviously much lower, ranging from 20 percent in Uganda and 49 percent and 51 percent in Malawi and Zambia, respectively. Nominal debt levels are used in our simulations, for the reasons explained in Section II.

provide a summary benchmark against which to measure projected macroeconomic performance over the medium term.

Table 1. Average Real GDP Growth, Nominal Exchange Rate Changes, and Inflation, 1991-2000 1/

	Real GDP Growth (Annual average, in percent)			Nominal Exchange Rate Change 1/ (Annual average, in percent)			Inflation 2/ (Annual average, in percent)		
	1991-95	1996-2000	1991-2000	1991-95	1996-2000	1991-2000	1991-95	1996-2000	1991-2000
Benin	4.2	5.3	4.8	13.8	7.5	10.6	11.5	3.8	7.6
Burkina	4.1	5.4	4.7	13.8	7.5	10.6	6.3	2.4	4.3
Cameroon	-1.9	4.7	1.4	13.8	7.5	10.6	6.7	3.1	4.9
Ethiopia	0.9	5.0	2.9	25.0	5.6	14.9	13.0	1.2	6.9
Ghana	4.3	4.3	4.3	33.3	37.2	35.2	26.4	24.8	25.6
Malawi	3.0	4.0	3.5	42.0	39.2	40.6	32.2	29.6	30.9
Mali	2.5	5.3	3.8	13.8	7.5	10.6	5.9	1.5	3.7
Mozambique	3.3	7.9	5.6	60.0	9.6	32.4	47.3	12.4	28.7
Senegal	1.5	5.3	3.4	13.8	7.5	10.6	6.8	1.4	4.1
Tanzania	1.8	4.1	2.9	22.9	7.9	15.1	27.3	12.3	19.6
Uganda	7.3	6.2	6.8	13.3	11.8	12.6	20.3	5.4	12.6
Zambia	-3.0	2.7	-0.2	86.2	34.2	58.0	98.8	28.8	60.0
Sample average	2.3	5.0	3.7	29.3	15.3	21.8	25.2	10.6	17.4
Memorandum items:									
Africa	1.2	3.6	2.4	...	...	...	42.6	16.2	65.8
Sub-Saharan Africa	1.1	3.5	2.3	...	...	...	51.5	19.9	81.7
HIPCs	2.5	4.6	3.6	...	...	...	72.9	24.4	115.1

Source: IMF, World Economic Outlook database; and authors' calculations.
1/ National currency per U.S. dollar.
2/ Based on average CPI levels for each year.

On average, macroeconomic conditions remained weak over the 1990s: annual inflation reached 17 percent and annual exchange rate depreciation averaged 22 percent. Real GDP growth rate was above 5 percent only in Mozambique and Uganda, while it remained negative in Zambia—the worst performer in the sample, with average inflation and exchange rate depreciation reaching about 60 percent. However, other countries did not perform considerably better. Inflation was in single digits only in a handful of them, while it was above 20 percent for the rest. The lower bound for average annual exchange rate depreciation was a non-negligible 11 percent (Benin, Burkina Faso, and Cameroon). In such economic environment, growth remained depressed—the group's average growth reached only 3.7 percent, a modest performance for low-income countries with rapid population growth and widespread poverty.

However, averages over the whole decade conceal general improvements in macroeconomic conditions in the second half of the 1990s. As a result of stabilization efforts and broad structural reforms, price level and exchange rate fluctuations were reduced more than twofold, to 10 percent and 15 percent, respectively; this also contributed to a significant increase in growth rates—the last five year average rebounded to 5 percent from just above 2 percent over the preceding five years.[18]

[18] In addition, improved performance in Benin, Burkina Faso, Cameroon, Mali and Senegal also reflects a 50 percent devaluation for the whole French Common Franc Area in 1994.

We also look at volatility, measured by the ratio of a variable's standard deviation to its mean. Volatility is quite high in the sample: it exceeds two in every third case (Table 2).

Table 2. Volatility of Real GDP Growth, Nominal Exchange Rate Changes, and Inflation, 1991–2000 1/

	Real GDP Growth Volatility 1/			Nominal Exchange Rate Change 2/ Volatility 1/			Inflation 3/ Volatility 1/		
	1991-95	1996-2000	1991-2000	1991-95	1996-2000	1991-2000	1991-95	1996-2000	1991-2000
Benin	0.1	0.1	0.2	2.6	1.2	2.4	1.4	0.5	1.5
Burkina	0.9	0.4	0.6	2.6	1.2	2.4	1.7	1.3	1.8
Cameroon	1.6	0.1	2.9	2.6	1.2	2.4	1.8	0.9	1.8
Ethiopia	9.8	0.9	2.3	2.5	0.6	2.9	0.6	3.9	1.3
Ghana	0.2	0.1	0.1	0.5	1.0	0.8	0.7	0.5	0.6
Malawi	4.0	0.5	2.3	2.5	1.2	1.9	0.9	0.5	0.7
Mali	2.2	0.3	1.0	2.6	1.2	2.4	2.1	2.2	2.4
Mozambique	2.0	0.5	1.0	0.4	1.2	1.0	0.2	1.5	0.8
Senegal	1.9	0.1	0.8	2.6	1.2	2.4	2.1	0.6	2.5
Tanzania	0.6	0.2	0.5	0.8	0.8	1.0	0.2	0.5	0.5
Uganda	0.5	0.3	0.4	2.6	0.6	1.9	0.8	0.6	1.1
Zambia	2.0	1.1	26.6	1.4	0.7	1.5	0.7	0.3	1.0
Sample average	2.1	0.4	1.1	2.0	1.0	1.9	1.1	1.1	1.3
Memorandum items:									
Africa	1.3	0.3	0.8				0.2	0.5	0.6
Sub-Saharan Africa	1.6	0.3	0.8				0.2	0.5	1.3
HIPCs	0.8	0.2	1.0				0.3	0.5	0.7

Source: IMF, World Economic Outlook database; and authors' calculations.
1/ Averages expressed in percentages. Volatility of variables is defined as the ratio of standard deviation (from geometric mean) to geometric mean.
2/ National currency per U.S. dollar.
3/ Based on average CPI levels for each year.

Zambia, Cameroon, Ethiopia, and Mali experienced the most severe macroeconomic instability—average volatility exceeded 2 in this subset, whereas Tanzania enjoyed the most stable environment, with volatility lower than 0.7.

A note of caution should, however, be raised when analyzing volatility data. Although average volatility for Ghana and Mozambique is among the lowest in the sample—at 0.49 and 0.89, respectively—it signals "stability" around high averages. Hence, these two countries' macroeconomic environment did not fare much better than more "unstable" conditions around comparatively lower averages. Despite these limitations, volatility nonetheless remains a useful gauge for the stability of macroeconomic conditions, and therefore can help assess the reliability of medium-term projections.

Finally, volatility also varies across variables. The growth rate is the most stable variable, whereas the exchange rate is the most unstable. In the sample, volatility of average real GDP growth (excluding Zambia, which is an outlier) is 1.1, while average volatility of exchange rate changes reaches 1.9. This finding further justifies our extension of the theoretical model presented in Section II to incorporate exchange rate changes into debt sustainability analysis, as exchange rate fluctuations are an important source of downside risks to debt sustainability in an environment of large external debt, as is the case in African HIPCs.

IV. Some Simulation Results on Debt Sustainability

In this section, we apply the model presented in Section II to compute the fiscal primary positions consistent with debt sustainability in our sample of countries; we then use stress testing to assess the robustness of our findings and their sensitivity to variations in the main assumptions. Finally, simulated primary balances are compared to actual and projected primary fiscal positions in the baseline year (that is, the year following the HIPC Completion Point) to draw conclusions about the "safety"—in terms of debt sustainability—of current and projected fiscal policies.

In our sample, the average stock of external debt/GDP ratio is projected to stand at 76 percent at the Completion Point, whereas domestic debt is about 13 percent of GDP (Table 3).[19] These levels of debt are high; we therefore need to assess whether they can be financed given the assumptions on the availability of external concessional financing.

GDP is projected to grow at almost 6 percent on average over the 10-year period following the HIPC Completion Point—which compares to the last half-decade growth of 5 percent. However, projected inflation and exchange rate changes—averaging 3.7 percent and 1.8 percent, respectively—imply substantial improvements relative to last decade's performance, when these variables were as high as 22 percent and 17 percent, respectively.

The cost of servicing domestic debt is projected at about 12 percent on average;[20] whereas the interest rate on external debt is assumed to be 0.75 percent for all countries.[21] As explained in Section II, domestic debt is assumed to grow in line with nominal GDP; while external debt follows two "extreme" cases. In the first case, countries have no access to additional new funds, that is, the nominal stock of external debt remains unchanged and therefore gradually declines as a ratio to GDP. This case corresponds to $\theta = 0$. In the second case, θ has the highest possible value compatible with a no-Ponzi scheme solution, so as to maintain the external debt to GDP ratio constant over time. Therefore, these two cases represent the most conservative and

---

[19] Data for simulations are based on HIPC related documents, and projections provided by the area department. As Burkina Faso, Mozambique, Tanzania, and Uganda had reached completion point by end-2001, end-June 2002 data are used for these countries; for the others, data on external debt are based on the projected debt stock after reaching the completion point. For the domestic debt, we have used the latest available historical data. While the coverage of debt should be as broad as possible and consistent across countries, the definition of domestic debt largely refers to explicit domestic liabilities of the central government only.

[20] Domestic interest rates are projected to remain stable over the projection period, which has important implications for the simulation results (see below).

[21] In these countries, external financing is provided almost exclusively by either official bilaterals or multilateral institutions; the former typically charge interest rates comparable to those of the latter. Hence, our assumption of a 0.75 interest rate on external financing is reasonable.

the most optimistic scenarios regarding creditors' behavior consistent with our model—all other possible outcomes being located in between.[22]

Table 3. Main Assumptions for Assessing Debt Sustainability in Selected HIPCs

	Real GDP Growth	Inflation	Exchange Rate Change	Domestic Interest Rate	External Interest Rate	External Debt/GDP	Domestic Debt/GDP	Reserve Money/ GDP
	(10-year annual averages post-HIPC Completion Point, in percent)							
Benin	6.4	2.0	-0.2	6.5	0.8	54.8	0.9	20.0
Burkina Faso	5.8	2.7	-0.3	6.5	0.8	61.4	8.0	8.8
Cameroon	5.0	1.9	-0.2	6.5	0.8	57.5	13.3	8.8
Ethiopia	6.0	4.0	1.1	0.5	0.8	95.9	41.8	19.1
Ghana	5.0	6.4	3.0	15.6	0.8	90.2	23.7	10.9
Malawi	5.4	5.0	2.8	40.0	0.8	148.8	15.0	5.7
Mali	4.8	2.1	-0.2	6.5	0.8	65.4	4.2	11.2
Mozambique	7.3	6.2	5.2	26.9	0.8	42.0	5.3	8.1
Senegal	6.1	1.9	-0.3	3.2	0.8	45.9	7.0	7.3
Tanzania	5.9	4.0	2.3	8.0	0.8	65.9	16.6	7.0
Uganda	6.3	3.5	6.2	8.0	0.8	59.2	5.8	5.2
Zambia	4.0	5.0	2.5	20.0	0.8	128.7	18.3	4.0
Memorandum items:								
Post-HIPC countries 1/	6.3	4.1	3.4	12.1	0.8	57.1	8.9	7.3
Interim HIPC countries 2/	5.3	3.5	1.1	11.8	0.8	85.9	15.5	10.9
Sample average	5.7	3.7	1.8	11.9	0.8	76.3	13.3	9.7

Source: Various HIPC country documents.
1/ Burkina Faso, Mozambique, Tanzania and Uganda (as of end-2002).
2/ Benin, Cameroon, Ethiopia, Ghana, Malawi, Mali, Senegal, and Zambia.

Two main caveats to these assumptions should be noted. First, the simulated primary positions computed in this section are conditional upon the assumptions shown in Table 3. As these assumptions are not the result of a general equilibrium exercise, our results are therefore dependent on certain target real growth and inflation rates. One may add, these assumptions are also quite optimistic relative to past performance in most of these countries. Second, the assumption of stable domestic interest rates is critical, in particular for those countries with large initial stocks of domestic debt and where the domestic interest rate is over time "dominated" by the growth rate. By construction, this implies that, other things being equal, such countries will be able to afford comparatively "looser" fiscal policies (see, for example, Ethiopia).

[22] In principle, it would even be possible to assume negative values of θ. However, this would imply that creditors demand to be repaid on a net basis. Given HIPCs' financing constraints and the proclaimed willingness of the international community to stay engaged in these countries, this scenario is not adopted here.

A. Baseline Scenario: Case 1 ($\theta = 0$)

The simulation results are presented in Table 4.[23] Under this scenario—no new additional external financing on a net basis—only two countries (Ethiopia and Senegal) could afford having a small budget deficit in the first 10 years of the simulation period; the others would have to run fiscal surpluses to be able to service their stock of debt. The magnitude of necessary budget surpluses varies from as little as 0.1 percent of GDP (Burkina Faso) to as large as 4.7 percent of GDP (Malawi). Countries that had already graduated from the HIPC Initiative at end-2002 require a lower level of budget surpluses (less than 0.4 percent of GDP on average), whereas other HIPCs need to run larger surpluses, at about 0.6 percent of GDP.

Table 4. Sustainable Fiscal Primary Balances: Case 1 Simulations Results 1/

Year after HIPC Completion Point	1	2	3	4	5	10	15	20	Average, 10 years	Average, 20 years
					(In percent of GDP)					
Benin	0.31	0.28	0.25	0.23	0.21	0.14	0.08	0.05	0.21	0.15
Burkina Faso	0.20	0.15	0.16	0.14	0.12	0.03	-0.03	-0.06	0.11	0.04
Cameroon	0.39	0.31	0.24	0.22	0.20	0.13	0.07	0.03	0.22	0.14
Ethiopia	-3.06	-3.09	-3.13	-3.17	-3.20	-3.34	-3.43	-3.49	-3.21	-3.32
Ghana	0.24	0.85	0.76	0.55	0.43	0.31	0.24	0.18	0.46	0.35
Malawi	4.97	4.87	4.81	4.76	4.71	4.50	4.36	4.26	4.70	4.53
Mali	0.40	0.33	0.31	0.29	0.27	0.19	0.13	0.09	0.27	0.20
Mozambique	0.99	1.71	0.83	0.69	0.68	0.67	0.63	0.60	0.84	0.73
Senegal	0.14	-0.07	-0.10	-0.12	-0.13	-0.20	-0.24	-0.27	-0.11	-0.18
Tanzania	0.37	0.31	0.28	0.25	0.22	0.12	0.05	0.00	0.22	0.13
Uganda	0.57	0.59	0.46	0.29	0.25	0.17	0.10	0.04	0.32	0.21
Zambia	2.69	2.64	2.60	2.55	2.51	2.33	2.20	2.11	2.50	2.35
Memorandum items:										
Average for post-HIPC 2/	0.53	0.69	0.43	0.34	0.32	0.25	0.19	0.15	0.37	0.28
Average for interim HIPC 3/	0.76	0.77	0.72	0.66	0.62	0.51	0.43	0.37	0.63	0.53

Source: Authors' calculations.
1/ See equation (8).
2/ Burkina Faso, Mozambique, Tanzania and Uganda (as of end-2002).
3/ Benin, Cameroon, Ethiopia, Ghana, Malawi, Mali, Senegal, and Zambia.

Post-HIPC countries are able to sustain their debt with comparatively lower fiscal effort because, on average, they are projected to enjoy better macroeconomic fundamentals, and, most importantly, lower debt ratios (Table 3); while interim HIPC countries have to adopt slightly tighter fiscal policies to sustain their debt levels.

[23] All the simulation results reflect the impact of seignorage, as per equations (8) and (10). However, given the relatively low projections for inflation, and based on the low stock of reserve money in all these countries due their modest degree of monetization, seignorage does not play a significant role as a source of fiscal revenue.

B. Baseline Scenario: Case 2 ($\theta = \frac{n-e}{1+e}$)

In this case, where concessional foreign financing is assumed to be provided so as to maintain the external debt to GDP ratio unchanged, all countries in the sample can afford to run primary deficits that range from -1.7 percent of GDP (Mozambique) to a remarkable -11 percent of GDP (Ethiopia) (Table 5).

Table 5. Sustainable Fiscal Primary Balances: Case 2 Simulations Results 1/

Year after HIPC Completion Point	1	2	3	4	5	10	15	20	Average, 10 years	Average, 20 years
					(In percent of GDP)					
Benin	-3.89	-4.14	-4.10	-4.08	-4.08	-3.92	-3.92	-3.92	-3.99	-3.95
Burkina Faso	-4.83	-5.10	-4.74	-4.70	-4.67	-4.47	-4.47	-4.47	-4.68	-4.58
Cameroon	-3.17	-3.41	-3.61	-3.61	-3.61	-3.42	-3.42	-3.42	-3.45	-3.43
Ethiopia	-10.03	-10.75	-10.75	-10.75	-10.75	-10.75	-10.75	-10.75	-10.68	-10.71
Ghana	-9.62	-5.53	-5.44	-5.84	-5.86	-5.86	-5.86	-5.86	-6.16	-6.01
Malawi	-6.46	-7.33	-4.90	-4.90	-4.90	-4.90	-4.90	-4.90	-5.30	-5.10
Mali	-3.85	-4.32	-4.22	-4.19	-4.19	-3.92	-3.92	-3.92	-4.04	-3.98
Mozambique	-1.51	0.52	-3.22	-2.83	-2.07	-1.73	-1.73	-1.73	-1.78	-1.75
Senegal	-3.06	-3.58	-3.60	-3.60	-3.60	-3.45	-3.45	-3.45	-3.52	-3.48
Tanzania	0.40	-4.41	-4.75	-4.65	-4.74	-4.74	-4.73	-4.72	-4.18	-4.46
Uganda	0.70	4.49	-4.05	-2.30	-2.46	-2.43	-2.43	-2.43	-1.58	-2.00
Zambia	-4.25	-5.13	-4.99	-4.99	-4.99	-4.99	-4.99	-4.99	-4.93	-4.96
Memorandum items:										
Average for post-HIPC 2/	-1.31	-1.13	-4.19	-3.62	-3.48	-3.34	-3.34	-3.34	-3.05	-3.20
Average for interim HIPC 3/	-5.54	-5.52	-5.20	-5.25	-5.25	-5.15	-5.15	-5.15	-5.26	-5.20

Source: Authors' calculations.
1/ See equation (10).
2/ Burkina Faso, Mozambique, Tanzania and Uganda (as of end-2002).
3/ Benin, Cameroon, Ethiopia, Ghana, Malawi, Mali, Senegal, and Zambia.

While these results may appear "excessive" at first, their rationale lies in the *perpetual* availability of extremely inexpensive concessional financing. In sum, these countries would be able to increase considerably their expenditure as their macroeconomic environment improves—this is because each year concessional financing would increase by a factor equal to the nominal rate of growth multiplied by the exchange rate change. Nonetheless, it has to be kept in mind that this scenario rests on very optimistic assumptions about creditors' behavior—in this regard, it is rather illustrative, as these assumptions are unlikely to hold for the indefinite future. Finally, a word on Ethiopia. In this case, the interest rate on domestic debt is actually lower than the already low external interest rate, at a meager 0.5 percent. As it is assumed that the stock of domestic debt grows in line with nominal GDP, Ethiopia can therefore enjoy an additional cushion of "cheap" financing for quite expansionary fiscal policies.

Contrary to the previous case, post-HIPC countries would now have to run lower fiscal deficits compared to interim HIPCs. As the former group's debt ratios are projected to be lower than

those in the latter group, post-HIPCs would be receiving comparatively lower assistance—by construction—and therefore would have to adopt much tighter fiscal policies.

C. Baseline Scenario: Preliminary Conclusions

Based on the model presented in Section II, Case 1 and Case 2 represent the upper and lower bounds of possible fiscal positions consistent with debt sustainability, as they reflect very conservative and very optimistic assumptions, respectively, about creditors' behavior. In this respect, the mid-range solution may provide a more realistic scenario. For this reason, Table 6 presents deviations of both average primary positions over the last three years and projected primary positions from mid-range solutions. A positive deviation would indicate that, on average, the corresponding country is "beyond" its sustainable fiscal position—some form of fiscal adjustment, and/or increased non-debt creating flows, would hence be required to bring it back to sustainable debt levels.

Table 6. Historical, Projected and Simulated Primary Balances 1/

	Primary Balance			Deviation	
	1999-2001 Average	Projected	Mid-range Sustainable Primary Balance 2/	From average	From projection
			(In percent of GDP)		
Benin	0.4	-3.8	-1.9	-2.3	1.9
Burkina	-3.4	-5.5	-2.3	1.1	3.2
Cameroon	4.7	3.2	-1.6	-6.3	-4.8
Ethiopia	-6.8	-5.6	-6.9	-0.2	-1.4
Ghana	-0.5	-0.1	-2.8	-2.3	-2.8
Malawi	-4.0	1.8	-0.3	3.7	-2.1
Mali	-4.2	-4.5	-1.9	2.3	2.6
Mozambique	-3.0	-5.3	-0.5	2.5	4.8
Senegal	0.2	0.0	-1.8	-2.0	-1.8
Tanzania	-1.1	-2.8	-2.0	-0.8	0.8
Uganda	-2.4	-4.6	-0.6	1.7	4.0
Zambia	-2.6	-2.1	-1.2	1.4	0.9

Source: IMF country documents; and authors' calculations.

1/ The primary balance is defined as total revenues and grants minus total primary expenditures. For post-HIPC countries (Burkina, Mozambique, Tanzania and Uganda, as of end-2002), data refer to 2002/03. For the other countries, data refer to projections one year after HIPC Completion Point.

2/ Computed as the average of results for Case 1 and Case 2 (Tables 4 and 5).

Recent fiscal performance fails the sustainability test in six countries in our sample (Burkina, Malawi, Mali, Mozambique, Uganda, and Zambia, fourth column in Table 6). Looking ahead, as a number of HIPC countries are projected to implement substantial fiscal primary adjustment, one would expect their fiscal positions to be sustainable. However, the projected fiscal primary balance turns out to be not sustainable in seven countries (last column in Table 6): relative to

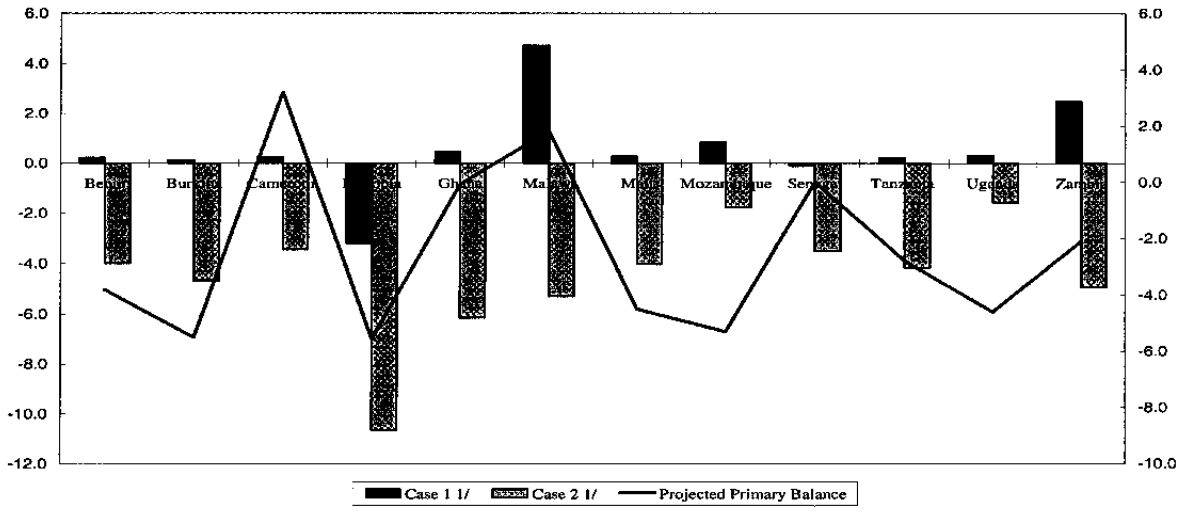
previous results, Burkina, Mali, Mozambique, Uganda, and Zambia are repeat offenders; Malawi drops from the group, while Benin and Tanzania are added to it.

The non-sustainability of the four post-HIPCs is quite telling: as these countries have made considerable progress in macroeconomic stabilization, they are now "allowed" to increase their expenditure levels to address poverty reduction needs. For example, Tanzania is projected to increase its expenditure level by more than 4 percent of GDP, to above 22 percent of GDP, in 2002/03 relative to the previous fiscal year. However, based on our framework, this may result into this country's swinging back into unsustainable debt levels.

These findings would imply that, in order to reach debt sustainability, these countries should adopt tighter fiscal policies than currently envisaged. This however may lead to a dangerous vicious circle—fiscal tightening may result in lower growth, which in turn would require even higher fiscal surpluses to sustain given debt ratios. Furthermore, large fiscal adjustment may come at the cost of cutting much needed poverty reduction programs—resulting again in lower GDP growth.

It is however possible to assume that HIPCs will continue to enjoy sizeable external assistance (to an extent closer to the Case 2 upper bound), at least for the next few years. In such a case, they would be able to run more expansionary fiscal policies without immediately jeopardizing their sustainability position. Figure 1 shows that, relative to Case 2 results, all countries, with the exception of Mali, Mozambique, and Uganda would have sustainable projected fiscal positions.

Figure 1. Sustainable Primary Balances: Post-HIPC Projections versus Baseline Scenario Simulations
(In percent of GDP)



Source: HIPC documents; staff calculations.
1/ Based on 10-years post-HIPC average.

Finally, before turning to stress testing, it is worth saying a few words about the steady state solution for the fiscal primary position associated with the two scenarios (as per equations (9) and (11)). The speed of reaching the steady state depends on the value of θ—the smaller the value of θ, the faster the steady state is achieved. Smaller inflows of additional external financing in each period (that is, lower values of θ) is a major factor contributing to a faster decline in the stock of external debt. As to the steady value of the external debt *ratio*, it is zero for all values of $0 \leq \theta < \frac{n-e}{1+e}$ (as the nominal debt level by definition grows at a slower pace than nominal GDP). For $\theta = \frac{n-e}{1+e}$, the Case 2 upper bound, the steady state level of the debt ratio is equal to its initial level (that is, the level attained at the HIPC Completion Point).

D. Stress Testing

The robustness of our findings is now tested against variations from the baseline scenario assumptions, as follows:

- a 30 percent drop in the real GDP growth rate relative to the baseline assumption, in the first five years following the HIPC Completion Point;
- a cumulative 30 percent depreciation of the exchange rate relative to the baseline assumptions in the first three years after the HIPC Completion Point (i.e. 10 percent each year);
- an increase in the external interest rate gradually to 4 percent over 20 years, to account for possible graduation from concessional financing;
- all the previous shocks combined together; and
- the replacement of the baseline assumptions with the historical average over the 5-year period 1996–2000 for growth, inflation, and exchange rate changes.[24]

These assumptions are obviously arbitrary. However, given the spotty macroeconomic performance of the sample HIPCs in the last decade, they are not completely unrealistic; growth could in fact be lower on account of, among other things, terms of trade shocks, political factors, and general global conditions; these same factors could similarly affect exchange rate developments. The increase in the external interest rate is also a concrete possibility. However, the 30 percent increase assumed here has to be seen in relation to the very low levels of concessional rates HIPCs can enjoy—even including the shock, interest rates would definitively remain much lower than market rates HIPCs would be charged were they to access international capital markets, given their generally high country risk.

---

[24] In addition, given that most HIPCs rely on a very narrow export base, they are particularly prone to commodity price shocks. A case could therefore be made for exploring sensitivity to these shocks. As GDP—rather than exports—is the relevant scale variable in our analysis, this case is not pursued in this paper.

Results are presented in Tables 7 and 8 and Figures 2 and 3. Unsurprisingly, in all cases the countries need to make higher fiscal adjustments (i.e. more ambitious fiscal policies should be adopted relative to the baseline) since all considered shocks are adverse. Under Case 1 (Table 7) the 30 percent drop in the growth rate should be accompanied by improvements in primary fiscal balances by 0.4 percent of GDP on average. A corresponding gradual increase in the external interest rate would call for improvements in the primary positions by 0.4 percent of GDP on average. An adjustment of 0.1 percent of GDP is required in the case of the exchange rate shock. If all the shocks were to happen simultaneously, these countries would need to strengthen their primary positions by 0.8 percent of GDP. All in all, the impact of the shocks is not sizeable (Figure 2), as the baseline scenario under Case 1 already requires very tight fiscal policies.

Under Case 2, where it is assumed continuous strong donors' financing, the impact of the same shocks is more sizeable, and therefore the magnitude of deviations from the baseline is much larger (Table 8 and Figure 3). In this case, the 30 percent fall in the growth rate would require a 0.7 percent of GDP improvement in primary positions on average; a similar adjustment is mandated in case of the gradual increase in the external interest rate. However, the 30 percent exchange rate depreciation would require an average 2.1 percent of GDP improvement in primary balances (against 0.1 percent of GDP under Case 1). The impact of the exchange rate shock is more sizeable in Case 2 as foreign currency denominated debt remains at the same level as percent of GDP, whereas it declines in Case 1; hence, the shock is applied to a larger base. As a result, the effect of all shocks taken together is also more substantial under the Case 2: the primary position should by strengthened by 3.4 percent of GDP on average.

In the circumstances, while countries could still afford to run primary fiscal deficits, these would need to be smaller than under the baseline. But some countries would actually find themselves in a more vulnerable position: while generous donor support would allow them to run comparatively more expansionary fiscal policies, at the same time shocks relative to the baseline would substantially reduce their "safety" margin in terms of sustainable policies. This is an important consideration, as deviations from baseline projections may occur— especially given the historically high volatility of macroeconomic conditions in these countries.

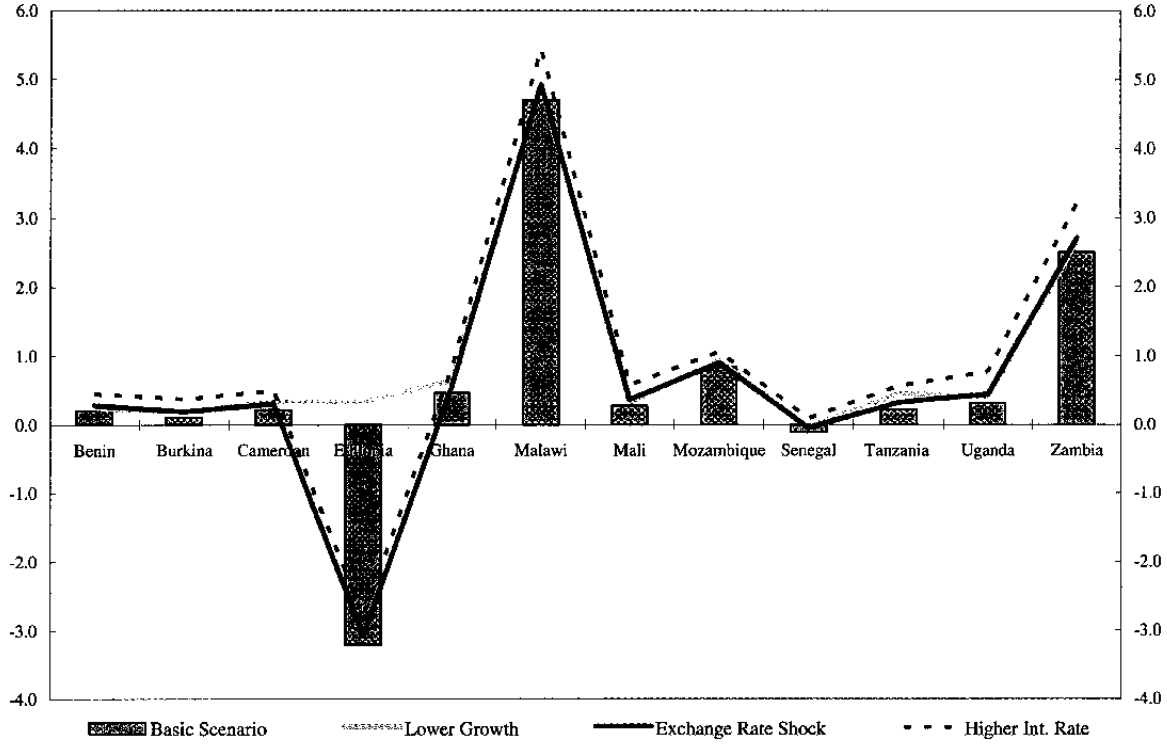
As a final test to gauge the sensitivity of the two baseline scenarios, we replaced the baseline assumptions with historical average values over the second half of the 1990s for real GDP growth, exchange rate changes and inflation (as shown in Table 1). As countries' macroeconomic conditions were in that period worse (in some cases, considerably worse) than those projected for the post-HIPC Completion Point period, we would expect countries to require tighter sustainable fiscal positions relative to the baseline results. Our findings for Case 2 confirm this expectation: on average, the selected countries would have to adjust by almost 5 percent of GDP relative to the baseline (Table 8, last column).

Table 7. Sensitivity Analysis: Projected Primary Balances, Case 1, 10-Year Averages

	Baseline	Lower Growth	Deviation relative to baseline	Higher External Interest Rate	Deviation relative to baseline	Exchange Rate Depreciation	Deviation relative to baseline	All Variables	Deviation relative to baseline	Historical Values	Deviation relative to baseline
					(In percent of GDP)						
Benin	0.2	0.2	0.0	0.4	0.2	0.3	0.1	0.7	0.5	0.3	0.1
Burkina	0.1	0.2	0.1	0.4	0.3	0.2	0.1	0.7	0.6	0.4	0.2
Cameroon	0.2	0.3	0.1	0.5	0.3	0.3	0.1	0.8	0.6	0.3	0.0
Ethiopia	-3.2	0.3	3.5	-2.8	0.4	-3.1	0.1	-2.1	1.1	-1.6	1.7
Ghana	0.5	0.6	0.2	0.8	0.4	0.6	0.1	1.3	0.8	-2.1	-2.6
Malawi	4.7	4.9	0.2	5.4	0.7	4.9	0.2	6.2	1.5	2.2	-2.5
Mali	0.3	0.3	0.1	0.6	0.3	0.4	0.1	0.9	0.6	0.5	0.2
Mozambique	0.8	0.9	0.1	1.1	0.2	0.9	0.1	1.3	0.5	0.5	-0.4
Senegal	-0.1	0.0	0.1	0.1	0.2	0.0	0.1	0.3	0.4	0.1	0.2
Tanzania	0.2	0.5	0.2	0.6	0.3	0.3	0.1	0.8	0.6	-0.9	-1.1
Uganda	0.3	0.4	0.1	0.8	0.5	0.4	0.1	1.2	0.9	0.3	-0.1
Zambia	2.5	2.6	0.2	3.2	0.7	2.7	0.2	3.9	1.4	-0.5	-3.0
Memorandum item:											
Sample average	0.5	0.9	0.4	0.9	0.4	0.7	0.1	1.3	0.8	0.0	-0.6

Source: Authors' calculations.

Figure 2. Sustainable Primary Balances: Case 1 Stress Testing
(In percent of GDP)



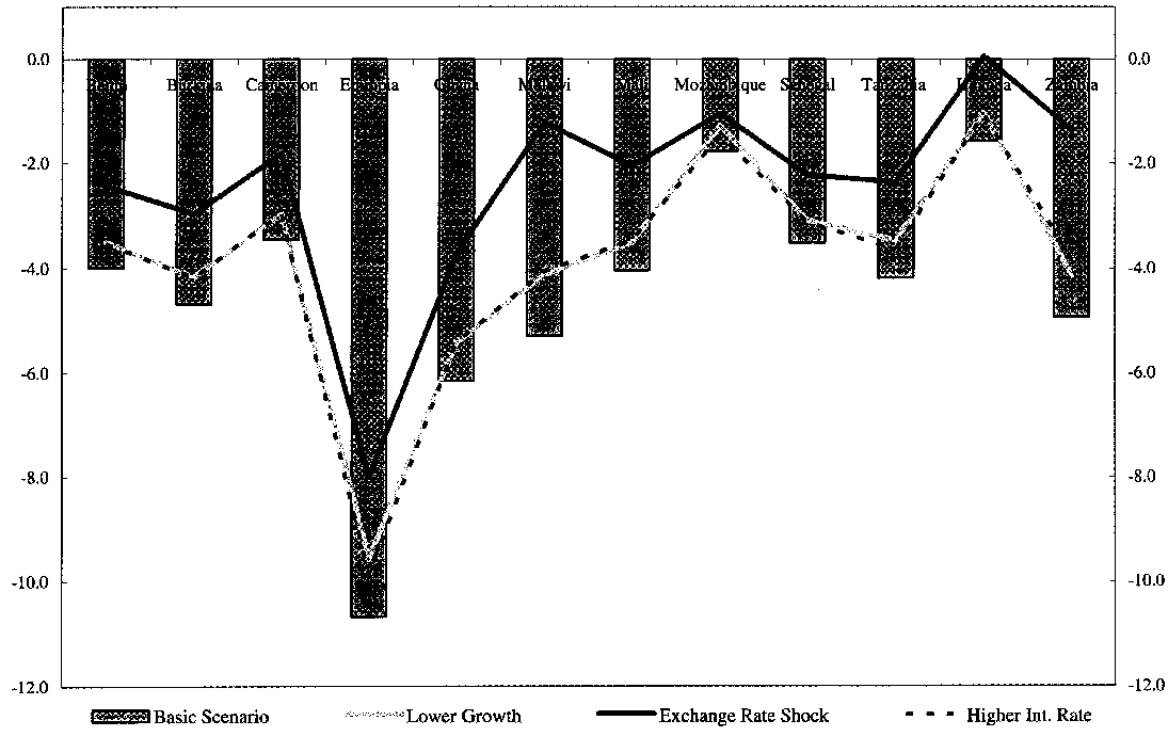
Source: Authors' calculations.

Table 8. Sensitivity Analysis: Projected Primary Balances, Case 2, 10-Year Averages

	Baseline	Lower Growth	Deviation relative to baseline	Higher External Interest Rate	Deviation relative to baseline	Exchange Rate Depreciation	Deviation relative to baseline	All Variables	Deviation relative to baseline	Historical Values	Deviation relative to baseline
					(In percent of GDP)						
Benin	-4.0	-3.5	0.5	-3.5	0.4	-2.4	1.6	-1.5	2.5	-0.4	3.6
Burkina	-4.7	-4.2	0.5	-4.2	0.5	-3.0	1.7	-1.9	2.8	0.2	4.9
Cameroon	-3.4	-3.0	0.5	-3.0	0.5	-1.8	1.6	-0.8	2.6	0.1	3.6
Ethiopia	-10.7	-9.6	1.1	-9.9	0.8	-8.0	2.7	-6.1	4.6	-2.1	8.6
Ghana	-6.2	-5.4	0.7	-5.4	0.7	-3.7	2.4	-2.2	3.9	3.2	9.4
Malawi	-5.3	-4.1	1.2	-4.1	1.2	-1.2	4.1	1.3	6.6	8.1	13.4
Mali	-4.0	-3.5	0.5	-3.5	0.6	-2.1	2.0	-1.0	3.1	0.9	5.0
Mozambique	-1.8	-1.3	0.5	-1.5	0.3	-1.0	0.7	0.0	1.8	-3.1	-1.4
Senegal	-3.5	-3.1	0.4	-3.1	0.4	-2.2	1.3	-1.4	2.1	0.5	4.0
Tanzania	-4.2	-3.5	0.7	-3.6	0.5	-2.4	1.8	-1.3	2.9	-5.6	-1.4
Uganda	-1.6	-1.0	0.5	-1.1	0.5	0.1	1.6	1.1	2.7	0.4	1.9
Zambia	-4.9	-4.1	0.8	-3.8	1.1	-1.4	3.6	0.6	5.5	2.0	6.9
Memorandum item:											
Sample average	-4.5	-3.9	0.7	-3.9	0.6	-2.4	2.1	-1.1	3.4	0.3	4.9

Source: Authors' calculations.

Figure 3. Sustainable Primary Balances: Case 2 Stress Testing
(In percent of GDP)



Source: Authors' calculations.

For Case 1, results are mixed (Table 7, last column): in five of the sample countries (Ghana, Malawi, Mozambique, Tanzania, and Zambia), the sustainable primary position is actually looser than under the baseline (on average, by about 2 percent of GDP). While these results may appear puzzling at first, they are nonetheless justified by the model design. Under Case 1, the major source of financing for countries over time is, by assumption, domestic debt (as external debt remains constant in nominal terms, and therefore "shrinks" relative to the size of the economy as time goes by). These five "anomalous" countries are those where inflation, in the second half of the 1990s, averaged more than 10 percent—or even more than 20 percent in the case of Ghana, Malawi, and Zambia. Therefore, for these countries, considerably higher inflation relative to the baseline (where the projected average inflation is just above 5 percent, Table 3) would actually allow them to make use of "cheaper" domestic financing, and hence run comparably higher fiscal deficits/lower fiscal surpluses than under the baseline scenario.

To summarize, our simulations demonstrate that the majority of the sample HIPCs is expected to face more or less severe debt sustainability problems after graduation from the HIPC Initiative. Unless these countries undertake fiscal adjustment, they may be likely to slide back into a debt trap. Still, the degree of unsustainability varies among countries—even two countries (i.e. Mozambique and Uganda) that have already graduated from the HIPC Initiative do not face "rosy" prospects on the basis of current policies . However, these conclusions are rather sensitive to the assumptions on growth rate, interest rate, and exchange rate dynamics. A worsening of macroeconomic conditions vis-à-vis the projections (that in some cases appear rather sanguine relative to past performance) could push previously safe countries into debt unsustainability again.

V. Conclusions and Policy Implications

The framework presented in this paper is subject to a number of limitations. First, it relies on specific exogenous assumptions on growth, inflation, exchange rates and interest rate developments. Second, the behavioral assumptions on foreign creditors' willingness to provide concessional financing do not change over the projection period, while creditors may well react to progress (or lack thereof) in HIPCs' policy implementation and macroeconomic developments. A full-fledged general equilibrium exercise—which is beyond the scope of this paper—would be required to model endogenously our assumptions. Finally, the framework is deterministic and does not factor in the probability of certain outcomes and their impact on debt sustainability.

Conclusions are therefore indicative. Nonetheless, our framework captures the impact of projected fiscal policies on debt sustainability in selected HIPCs. It suggests that, in assessing debt sustainability, total debt stocks (including domestic and external liabilities) should be considered, and stress testing of the main macroeconomic variables should be undertaken.

HIPCs are expected to increase considerably their expenditure in poverty-reducing programs. Depending on the availability of concessional financing, some of the countries in the sample are projected to pursue fiscal policies that may not be sustainable; others are projected to adopt

fiscal policies that would leave them vulnerable and, in case of negative shocks, push them to unsustainable debt positions.

Based on these findings, a few policy implications can be derived. As some countries may need to compensate for the gap between projected fiscal policies and sustainable fiscal policies, three (not mutually exclusive) options are possible: (1) scale (or slow) down ambitious expenditure programs; (2) generate higher level of domestic revenue; and (3) secure higher nondebt-creating grants.

As HIPCs face daunting social needs, the first option may not be really feasible, nor may it be fair. Would this option be appropriate, given the growth implications it may have? Would it be politically feasible? (A tightening of spending programs could actually generate back-tracking of reforms.) As higher expenditure levels should translate into higher growth to reach and maintain debt sustainability, however, there is a need to prioritize expenditure programs, ensure their efficiency, factor in recurrent costs of foreign-financed capital expenditure, and promote sounder public expenditure management systems to guarantee that funds reach their intended purposes.

The second option—increase revenue mobilization in HIPCs—is possibly one that cannot make an immediate significant impact. Reforming and rationalizing tax systems, for example through broadening the tax base, is certainly a worthwhile endeavor, but takes time.
In addition, in some of these countries tax bases are narrow, as their economies rely mainly on primary (nonmonetary) sectors and largely informal activities. Generating significantly higher domestic revenue will therefore require a general transformation of the economic system and business practices.

The last option—securing higher grants—would imply that the international community stays engaged beyond the delivery of the HIPC debt relief, as HIPCs need continuous concessional assistance to implement their poverty reduction strategies in a sustainable way. As some of these countries already "suffer" from significant aid dependency, however, they will simultaneously need to promote an enabling environment for higher private nondebt financing flows, for example, through foreign direct investment. Hence, the reform agenda will need to focus not only on fiscal policies, but also on the transparency and stability of the regulatory and business environment.

The constraints in preventing large foreign debt from building up to unsustainable levels reveals a policy tension in HIPCs between the need to promote and maintain macroeconomic stability and the need to secure external financing in the amounts required to facilitate growth and reduce poverty. While debt sustainability is a necessary condition for maintaining macroeconomic stability, donors are encouraged to increase lending to HIPCs—possibly a recipe for reverting to unsustainable debt levels. The jury is out on this dilemma: it is difficult to determine in advance whether external financing—current and prospective—is too high given growth prospects in HIPCs, or whether growth prospects would improve thanks to substantially higher external financing. In some cases, external financing may even be detrimental to sectors necessary to promote growth and reduce poverty—for example, to agriculture and manufacturing—due to Dutch-disease effects. In addition, large foreign exchange flows may need to be sterilized via

issuance of (expensive) domestic debt, thus reintroducing the debt sustainability problem from the "back door." While this paper does not enter into the merit of the aid dependency debate, these issues are nonetheless worth noting.

Our discussion has therefore a simple (and possibly alarming) bottom line. Unless HIPCs improve their primary fiscal positions or grant financing is sustained at current, or possibly higher, levels, debt sustainability in HIPCs may prove elusive in the long term.

References

Abrego, Lisandro, and Doris C. Ross, 2001, "Debt Relief under the HIPC Initiative: Context and Outlook for Debt Sustainability and Resource Flow," IMF Working Paper 144 (Washington: International Monetary Fund).

Adam, Christopher S., and David L. Bevan, 2001, "Fiscal Policy Design in Low-Income Countries," paper prepared for UNU/WIDER research project on New Fiscal Policies for Poverty Reduction and Growth, Helsinki, Finland, November.

Beaugrand Philippe, Boileau Loko, and Montfort Mlachila, 2002, "Assessing The Choice Between External Debt in Financing Budget Deficits: The Case of Central and West African Countries," IMF Working Paper 79 (Washington: International Monetary Fund).

Chalk, Nigel, and Richard Hemming, 2000, "Assessing Fiscal Sustainability in Theory and Practice," IMF Working Paper 81 (Washington: International Monetary Fund).

Cuddington, John, 1997, "Analyzing the Sustainability of Fiscal Deficits in Developing Countries," Policy Research Paper 1784 (Washington: World Bank).

Easterly, William 2002, "How Did Heavily Indebted Poor Countries Become Heavily Indebted? Reviewing Two Decades of Debt Relief," *World Development*, Vol. 30 (October), pp. 1677–96.

Edwards, Sebastian, 2002, "Debt Relief and Fiscal Sustainability," NBER Working Paper 8939, (Cambridge, Massachusetts: National Bureau of Economic Research).

International Monetary Fund, 1996, "Debt Sustainability Analysis for the Heavily Indebted Poor Countries," IMF Paper SM/96/22 (Washington: International Monetary Fund).

———2001, "The Challenge of Maintaining Long-Term External Debt Sustainability," IMF Paper SM/01/94 (Washington: International Monetary Fund).

——— 2002a, "Status of Implementation of the Enhanced HIPC Initiative and Update on Financing of PRGF and HIPC Operations and Subsidization of Post-Conflict Emergency Assistance." Available via the Internet: *http://www.imf.org/external/np/hipc/2002/status/092302.htm*

——— 2002b, "The Enhanced HIPC Initiative and the Achievement of Long-Term External Debt Sustainability," IMF Paper SM/02/95 (Washington: International Monetary Fund).

———2002c, "Review of Key Features of Poverty Reduction and Growth Facility—Staff Analysis," IMF Paper SM/02/51, Supplement 1 (Washington: International Monetary Fund).

———Various Countries' HIPC documents.