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FISCAL SUSTAINABILITY, DEBT DYNAMICS AND DEBT RELIEF: THE CASES OF NICARAGUA AND HONDURAS

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Due to the use of standardized data from other multilateral institutions, the data presented may differ from national data essentially because of differences in definitions, statistical conventions and data handling methods.

I. Introduction

In the fall of 1996, and as part of a new approach towards poverty reduction, the World Bank and the International Monetary Fund developed a wide-ranging plan to provide debt relief to many of the poorest nations in the world. This program, which has come to be known as the Highly Indebted Poor Countries (HIPC) debt relief initiative, contemplates the forgiveness of a fraction of these countries bilateral and multilateral debt. An eligibility requirement for participating in the program is that the country in question develops a well-defined poverty alleviation program. The funds freed-up by debt-relief should be devoted to effective social programs that, in the eyes of the multilateral institutions, will contribute to the reduction of poverty. In addition, the country is expected to implement broad economic reforms aimed at strengthening the productive sector and increasing growth potential. By early 2002, 22 poor countries had made substantial progress in negotiating debt relief within the context of the HIPC initiative. See Table 1 for a list of countries.[1] Once these countries have received debt relief they are expected to move towards a positive development path. The regional development agencies – including the Interamerican Development bank in the case of Latin America – are expected to play an important role in the formulation and implementation of this new phase in the countries' development strategy.

The amount of actual debt relief contemplated in the HIPC initiative varies from country to country. A basic principle guiding the program is that in the post-HIPC era the country in question will be able to achieve *"external sector sustainability,"* and thus will not require new rounds of debt forgiveness.[2] In 2001, the World Bank and the IMF (2001) stated the principle guiding the initiative in the following way:

> "[B]y bringing the net present value (NPV) of *external debt* down to about 150 percent of a country's exports or 250 percent of a country's revenues at the

[1] In September 1999 the initiative was revised and the elegibility criteria were standardized. This revised program has come to be known as "The Enhanced HIPC Initiative." Details on the day-to-day progress in the HIPC initiative can be found in the following IMF-maintained web site: http://www.imf.org/external/np/exr/facts/hipc.htm

[2] The World Bank and the IMF (2001) recognize that there is no assurance that these countries will not face debt problems in the future. According to this document, achieving sustainability will require a rapid and stable rate of economic growth.

decision point, it aims to eliminate this critical barrier to longer term debt sustainability for these countries." (p;. 4; emphasis added).

A particularly important question refers to the type of fiscal policy that will be consistent with maintaining debt sustainability in the post HIPC era. As the above quote suggests, the multilaterals have focused on policies required to stabilize the ratio of *external debt* to exports. A comprehensive answer to the fiscal sustainability question, however, requires going beyond the country's external debt, and to consider the sustainability of *aggregate* public sector debt, including both foreign as well as domestic debt. While many HIPC nations have little domestic debt, others have accumulated a significant stock of debt that has been purchased by the local banking sector, pension funds and individuals. Indeed, by ignoring the role of domestic debt, sustainability analyses may ***underestimate*** the magnitude of the fiscal effort that poor countries will have to make in the post-HIPC era. Very large required fiscal adjustments could have, in turn, important political economy consequences. First, the adjustment may result in a reduction of funds available to implement the anti-poverty programs. And second, very large reductions in primary expenditures may result in political instability and reform backtracking.

The purpose of this paper is to analyze the relationship between fiscal policy, *aggregate public sector debt* sustainability, and debt relief. In particular, we develop a methodology to compute the fiscal policy path that is compatible with aggregate debt sustainability in the post-HIPC era. This model explicitly considers the role of domestic debt, and quantifies the extent to which future debt sustainability depends on the availability of concessional loans at subsidized interest rates. The working of the model is illustrated for the cases of Honduras and Nicaragua. Both countries differ markedly in terms of the burdens of their external and internal debts. Nicaragua is a country that in 2002 had one of the highest net public external debt to GDP ratios in the world: approximately 280%. In addition it has a large internal public debt (over 50% of GDP; see details below). On the other hand Honduras has been able to maintain its public external debt at much lower levels (66% of GDP) and has a low internal debt. Moreover, while Nicaragua has followed a lax approach to public debt issuance, Honduras has very

strict rules regarding the issue of new public debt[3]. Both countries, however, have relied very heavily on foreign assistance and aid.

The results from our simulation analysis indicate that unless Nicaragua receives substantial concessional aid in the future, its public sector debt is likely to, once again, become unsustainable. The reason for this is that in the absence of large volumes of concessional assistance Nicaragua would be forced to undertake a fiscal adjustment in the order of 6% to 8% of GDP with respect to the current situation during 2001, to achieve sustainability. The social security reform and a likely reduction in donations in the future could increase this figure by as much as 2.5% of GDP. Adjustments of this magnitude usually crowd out social expenditures, including poverty alleviation programs, and tend to create political economy difficulties. In the case of Honduras, our simulation exercise shows that under reasonable parameters the country's fiscal stance as of 2001 is sustainable. However, the significant increase in current expenditures in the last several years, introduce some concerns regarding the ability of this country to remain in its current sustainable path.

Although these results have been obtained for the specific cases of Nicaragua and Honduras, the methodology used is very general and underlies two general problems that affect most HIPC countries: First, ignoring the existing domestic debt burden is likely to result in highly misleading analyses. Second, the international community should be aware that sustainability would depend very heavily on the future availability of subsidized concessional loans. And third, overestimating the future rate of growth of (real) GDP will tend to result in highly misleading results.

The rest of the paper is organized as follows: In Section II we develop a model of debt relief and fiscal sustainability. In Section III the model is calibrated and simulated for the case of Nicaragua. In Section IV the model is calibrated and simulated for the case of Honduras. Finally, in Section V we present some concluding remarks. In the Appendix we develop a similar model but for current account sustainability.

[3] For instance, external public debt has to be under concessional terms.

II. Debt Dynamics and Debt Relief: An Analytical Framework

An economy is said to have achieved fiscal sustainability when the ratio of public sector debt to GDP is stationary, and consistent with the overall demand – both domestic and foreign –for government securities.[4] An important byproduct of public sector sustainability analyses is the computation of the public sector's *primary balance* compatible with a sustainable and stable debt to GDP ratio.[5] This "sustainable primary balance" has become an increasingly important variable in macroeconomic analyses, and is now routinely included as a disbursement condition in IMF programs. The World Bank and the IMF have analyzed the external debt sustainability issue using a "present value constraint" approach.[6] This approach consists of analyzing whether, once debt forgiveness is granted, the net present value of the country's external debt stabilizes at its "steady state" level relative to GDP.[7] In general, it is considered that a ratio of the net present value of external debt to GDP of approximately 50% is sustainable over the long run.[8] Three main characteristics of the World Bank-IMF approach should be noted: (1) It assumes implicitly that if the country implements an appropriate set of economic reforms, the debt-to-GDP ratio achieved immediately after debt relief will be sustainable in the longer run. (2) It assumes (also implicitly) that in the long run the country in question will be able to maintain access to concessional financing. And (3), the "net present value" of external debt used in these calculations is lower from the *face value* of the debt. The reason for this is that poor nations have access to concessional loans at subsidized interest rates.[9]

The sustainability model presented in this section has been developed with the cases of Honduras and Nicaragua in mind. It expands previous work in several directions. First, and as pointed out above, it goes beyond foreign debt, and explicitly considers the role of domestic debt in analyzing fiscal sustainability. Second, we

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[4] Naturally, the debt ratio may be calculated relative to an alternative benchmark, such as exports. On sustainability analyses see, for example, Milesi-Ferreti and Razin (1996, 2000) and Edwards (2002).
[5] The primary balance is defined as the nominal balance, excluding interest payments.
[6] See, for example, World Bank and IMF (2000), Lachler (2001), and World Bank (2002).
[7] See Cuddington, (1995).
[8] In rigor, as pointed out above, the target is to achieve a net present value of debt to exports of 150%.
[9] Naturally, using the net present value of debt is equivalent to using the face value and explicitly introducing the subsidized interest payments in the future cash flows.

consider the case where the country's access to subsidized debt declines gradually through time. This is an important assumption, and is based on the notion that after reaching a certain GDP per capita, countries tend to rely mostly on debt issued on commercial terms. Third, it assumes that the economy takes some time to reach the steady state. The model, thus, also focuses on the dynamic behavior of the key variables during the transition.

II.1 The Basic Framework

We consider two types of public debt: (A) Concessional (or subsidized) debt granted by the multilaterals or other donors, and denoted by DC. And, (B) debt issued on commercial terms, DD. In what follows we call this debt "domestic debt". The basic characteristic of this debt is that it is issued on commercial terms, hence in practice both domestic and foreign residents can hold this type of debt (in this sense it can also be external debt[10].

In the base case we assume that both type of debt are denominated in foreign currency (US dollars).[11] At any moment in time total public sector debt is the sum of DC and DD; also, at any time t, the net increase in total (dollar denominated) debt is equal to the sum of the increase in these two types of debt: $\Delta D_t = \Delta DC_t + \Delta DD_t$. From the "uses" side, net debt increases (ΔD_t) are equal to interest payments, plus the primary balance (pb), minus seignorage. More specifically:

$$(1) \qquad \Delta D_t = \{ r_t^C DC_{t-1} + r_t^D DD_{t-1} \} + pb_t - \Delta B_t$$

Where, r_t^C and r_t^D are *nominal* interest rates on each type of debt. ΔB_t is the change in the monetary base; this corresponds to seignorage, and its actual magnitude will depend on the rate of domestic inflation, as well as on ratio of the monetary base to nominal

[10] This is important because when, in some scenarios, we assume that in the steady state the concessional debt is zero, we are not meaning that necessarily external debt is zero.

[11] This assumption corresponds quite closely to the case of many of the poorer nations; extending the analysis to the case where part of DD is denominated in domestic currency is rather simple. Moreover, in order to simplify the presentation in the basic analysis we work with GDP in dollars.

GDP[12]. In this equation a positive pb denotes a ***primary deficit***. In what follows we denote nominal GDP (measured in dollars) as Y.

The main interest of this study is computing the primary balance to GDP ratio that is consistent with fiscal "sustainability" in the post-debt forgiveness period. That is, we are interested in the value of $(pb / Y)_t$ that, in the post-HIPC era, is consistent with changes in aggregate public sector debt that are on a sustainable path. A sustainable path of aggregate public sector debt is defined, in turn, as a situation where increases in each type of debt are in line with the pace at which national and international creditors desire to accumulate government-issued securities. Without loss of generality we assume that in the post-HIPC period the donor community is willing to increase its accumulation of this country's concessional debt at an annual rate of θ.[13] Likewise, we assume that holders of domestic debt are willing to accumulate it at a rate equal to β. In the long run, an important constraint is that neither the concessional nor the domestic debt-to-GDP ratios grow without limit. In other words, in the long run these ratios should be bounded. Denoting the real rate of GDP growth by g, and the rate of dollar inflation by π^*, these constraints may be written as:[14]

$$(2) \qquad \theta \leq (g + \pi^*) \; ; \; \beta \leq (g + \pi^*) \; .$$

These conditions are required to assure convergence of the primary balance ratio (pb / Y) through time – see equation (3), below, for details. With regard to seignorage, in the base case simulations we assume that the domestic rate of inflation is π, and that the income elasticity of demand for money is unity. Alternative assumptions regarding the income elasticity of the demand for money can be easily incorporated into the analysis (see Edwards and Vergara, 2001).

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[12] Obviously there are limits regarding the seignorage. At some inflation rate the reduction in money demand more than offsets the higher inflation rate, hence seignorage decline. In Edwards (2002) it is shown that such a limit can be reached with a relatively low rate of inflation. For instance it is shown that in the case of Nicaragua an inflation rate of 12% is associated with a greater fiscal effort.

[13] It is easy to generalize the analysis to the case were θ changes through time.

[14] Since we are assuming that all debt is dollar-denominated, we can write the rate of growth of dollar denominated GDP as the sum of the rate of real GDP growth, plus the rate of US inflation. If domestic currency denominated debt is allowed, we would have to make a correction related to debt valuation issues.

From equation (1), and using the sustainable rates of growth of both types of debt (θ and β), a very general expression for the dynamic behavior of the sustainable primary balance to GDP ratio may be obtained. This is the primary balance to GDP ratio that, at any period of time t, is consistent with the aggregate debt to GDP ratio being on a sustainable path (a positive number denotes a primary deficit):[15]

$$(3) \qquad (pb_t / Y_t) = [\{\theta - r_t^C\}(DC_0 / Y_0) e^{(\theta - g - \pi^*)(t-1)} + \{\beta - r_t^D\}(DD_0 / Y_0) e^{(\beta - g - \pi^*)(t-1)}][1/(1 + g + \pi^*)] + (g + \pi)(B_0 / Y_0).$$

Where (DC_0 / Y_0) is the initial ratio of the face value of concessional debt to GDP.[16] Likewise, (DD_0 / Y_0) is the initial domestic debt to GDP ratio. π is the (target) rate of domestic inflation and (B_0 / Y_0) is the initial ratio of base money to GDP.[17] In equation (3) the initial debt to GDP ratios (DC_0 / Y_0) and (DD_0 / Y_0) should be interpreted as the ratios prevailing immediately after the HIPC-sponsored debt reduction has been granted.

Equation (3) shows that the dynamic path for the sustainable primary balance depends on a number of key variables, including nominal interest rates on both types of debt, the rates of domestic and foreign inflation, the rate of growth of real GDP, and the sustainable rates of growth of both types of debt (θ and β). In the rest of this section we provide a discussion of the way in which the availability of concessional financing and the rate of growth of GDP affect the sustainable primary balance.[18]

This "correction term," however, would only be relevant if there are changes in the real exchange rate. See the discussion below for greater details.

[15] Notice that in order to make this equation more operational we have expressed most of the relevant variables as a percentage of nominal GDP.

[16] Notice that this model focuses on the "face value of debt." Naturally, a perfectly equivalent expression can be derived on the basis of the present value of debt. The approach followed here is, however, more transparent as it provides a clear description of the flows involved.

[17] It should be noted that the results obtained from this model refer to the fiscal effort under the assumption that the country achieves a certain target rate of growth and a certain target rate of domestic inflation. In that sense these are conditional results are not the outcome of a general equilibrium exercise.

[18] See the discussion in IMF and IDA "Nicaragua: Decision Point Document for the HIPC Initiative," December 7, 2000, on possible donors' behavior in the post HIPC period. We return to this issue in the next couple of sections where we present our computations for Nicaragua and Honduras.

II.2 Concessional Debt and Sustainable Fiscal Policy

In order to organize the discussion, we consider four possible cases for the evolution of concessional loans through time. These cases go from a rather conservative scenario, where concessional loans are rolled over every year with no additional funds being available, to an optimistic one where concessional loans are assumed to grow at the same rate as nominal GDP. More specifically:

- **Case A**: It is assumed that maturing consessional loans are fully rolled over. That is, the nominal *value* of concessional debt is maintained constant through time, and no net funds (in nominal dollars) are provided. In terms of the model, this means that $\theta = 0$.
- **Case B**: Under this scenario we assume that the donor community is willing to maintain *the real dollar value* of the concessional debt at the level it had immediately after debt reduction is granted. In this case, $\theta = \pi^*$, and concessional debt grows at the international rate of inflation. To the extent that the rate of growth of real GDP (g) is positive, the concessional debt to GDP ratio will gradually converge towards zero.
- **Case C**: It is assumed that the international community is willing to increase concessional funds in real terms. More specifically, in this case we assume that $\theta = (\phi\, g + \pi^*)$, where $0 \leq \phi < 1$. (Notice that we have ruled out the case where $\phi = 1$. That case corresponds to scenario D).
- **Case D**: This is the most optimistic of all four scenarios, and assumes that the donor community is willing to provide sufficient concessional funds as to maintain the concessional debt to GDP ratio at the immediate post HIPC level. This is, in this case $\theta = (g + \pi^*)$.

Existing studies on the HIPC initiative have mostly concentrated on Case D, and have assumed that after the HIPC initiative the country will continue to have access to substantial amounts of concessional financing. As pointed out above, however, this appears to be an optimistic assumption that will tend to underestimate the type of effort required to maintain fiscal sustainability. In that sense, the approach followed in this

paper is more general and provides insights on the relationship between donors' behavior and the type of fiscal policy effort required to achieve sustainability.

In order to concentrate on the effects of concessional funds availability, in the rest of this section we assume that domestic debt (DD) grows at a rate equal to that of nominal GDP. This means that $\beta = (g + \pi^*)$, and that the ratio of DD to GDP will remain constant and equal to its period 0 level[19].

Table 2 summarizes the basic results for the primary balance and debt ratios under the four alternative scenarios defined above. While the rows refer to the four scenarios, the columns provide the key results from this analysis. In column (a) we present the equations for the dynamic behavior of the sustainable primary balance. Column (b) contains the equations for the steady state sustainable primary balance. In column (c) we present the stationary concessional debt to GDP ratio (DC / Y). Finally, in column (d) we present the stationary domestic debt to GDP ratio (DD / Y). The equations in Columns (b) – (d) correspond, then, to the case when $t \rightarrow \infty$. A number of insights emerge from this table:

- In the first three cases (A through C) the steady-state ratio of concessional debt to GDP – which is reported in Column (c) -- is equal to zero. The three cases differ, however, on the speed at which this steady state is achieved. However, even in Case A – which is the "most conservative" scenario – the speed at which the concessional debt ratio is reduced is very gradual (see the simulations in the following sections).
- In Case D, the steady state concessional debt to GDP ratio is equal to its value in the initial period. The reason for this is that under this scenario the sustainable debt to GDP ratio is equal to the one prevailing immediately after the debt is forgiven. This is also the reason why in Case D the dynamic and steady equations for the sustainable primary balance are the same.
- In all four cases the steady state ratio of domestic debt to GDP is equal to the period 0 level. This is the result of assuming that $\beta = (g + \pi^*)$.

[19] In the next sections we explore the case when domestic (or commercial) debt changes in time.

- Cases A, B and C have the same steady state sustainable primary balance. The reason for this is that in all three cases the steady state level of concessional debt is equal to zero. The equation for this steady-state sustainable primary balance is equivalent to the one obtained in debt dynamic models for middle-income countries, or countries that have no access to subsidized debt. Notice that the steady state primary balance can correspond either to a deficit or to a surplus. If the rate of growth of nominal GDP in dollars is low, relative to the interest rate on domestic debt, it is *likely* that the country will need to run a primary surplus in the long run. Whether or not this is actually the case, will depend on the importance of seignorage.
- Under Case D the country's fiscal effort is lower than under any of the other three cases. The reason for this is that under Case D the country has continuous access to subsidized financing.
- The long run sustainable primary balance under Case D may be either a deficit or a surplus. If the weighted average of interest rates is higher than the nominal rate of GDP growth, the country is likely to be required to run a primary surplus in the long run. Again, the magnitude of seignorage will determine whether this is, indeed, the case.
- The equations in Column (b) show that the existence of domestic debt has an important effect on the long run primary balance. In fact, from these equations it is clear that ignoring domestic debt may result in a substantial underestimation of the fiscal effort required to maintain fiscal sustainability. Under a set of plausible parameter values, this fiscal effort may be underestimated by as much as 3 percentage points of GDP per year. This point becomes particularly clear in the simulations presented below for the cases of Nicaragua and Honduras.

III. Debt Sustainability Under Alternative Donor Behavior: The case of Nicaragua

In this section we illustrate the working of the model using data for Nicaragua, one of the poorest countries in the Western Hemisphere, and one that for decades has been burdened by an extremely high external debt. In Section IV, on the other hand, we present our results for the case of Honduras.

In 2000 Nicaragua's total external debt had reached a face value of $6.8 billion, representing 280% of the country's official GDP.[20] At that time the World Bank and IMF (2000) have calculated that in terms of net present value this debt represented $4.5 billion, or approximately 180% of GDP.[21] The enhanced HIPC initiative contemplates reducing Nicaragua's external debt burden to a net present value of approximately US$ 1.32 billion or 150% of exports. This, in turn, amounts to 55% of official GDP. After forgiveness is granted, the face value of Nicaragua's external debt is expected to be approximately US$ 4.2 billion, or 167% of official GDP.[22]

In addition to its very high external debt, Nicaragua has other characteristics that are likely to affect its long run sustainability. First, it also has a very high domestic debt burden – in excess of 60% of GDP in 2002. This ratio is several times higher than that of other HIPC nations. As Table A.1 shows, the average domestic debt to GDP ratio in a group of HIPC countries is only 16.5%. Second, an as shown in Table 3, during the last few years Nicaragua has run very large fiscal deficits, with the primary deficit to GDP ratio averaging 4.4% during 1999-2001. This deficit level is much larger than those of other Latin American nations. In fact, most countries in the region run a primary surplus. Third, Nicaragua relies very heavily on grants and donations by NGOs to finance its public sector expenditures. And fourth, remittances from migrants represent a very

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[20] There is general agreement that Nicaragua's official GDP underestimates "real" GDP. There is less agreement, however, on the magnitude of this underestimation. While according to the World Bank (2002) "adjusted" GDP is approximately 1.7 times the official figure, other experts have argued that the adjustment should be closer to 1.3 times. For the sake of consistency, in the rest of the paper we use official GDP data. The results, however, would not be affected significantly if adjusted data are used.

[21] This figure assumes that Nicaragua has used all "traditional" debt relief mechanisms available to it under the so-called "Naples terms." See World Bank and IMF (2000), Tables 3 and 4.

[22] See World Bank and IMF (2000) for details. It is expected that debt relief under this initiative will be granted in mid-2003.

important source of current account financing.[23] A useful exercise is to compare the sustainable primary balance that emerges from the model's simulation with the actual balances during the last few years and with the expected balance for the current year. This comparison will provide some guidelines on of the type of fiscal adjustment – if any – that Nicaragua will have to undertake after the HIPC-sponsored debt relief is granted.

III.1 Parameterization of the Model

In this sub-section we briefly present the parameter values used in the sustainability exercise for Nicaragua (See Table 4 for a summary).

Post-HIPC Concessionary Debt to GDP Ratio, (DC_0 / Y_0):, The HIPC initiative considers reducing the face value of the external debt to approximately US$ 4.2 billion, or 167% of GDP. Thus, the value of (DC_0 / Y_0) used in the baseline computations is, then, equal to 1.67.

Post-HIPC Domestic Debt to GDP Ratio, (DD_0 / Y_0): Both the Treasury and the Central Bank of Nicaragua have issued large volumes of domestic debt. This stock of domestic debt – which in late 2001 reached 60% of GDP – has different origins, including bonds issued by the treasury to compensate individuals whose property was expropriated during the Sandinista rule, and bonds issued by the Central Bank to support commercial banks that failed during the late 1990s and early 2000s – see Edwards and Vergara (2001), World Bank (2002), and Lachler (2001) fore details. In the base-line computations we use a value of (DD_0 / Y_0) equal to 0.6. It is important to notice that this domestic debt ratio (at 60% of GDP) is high from a comparative perspective. This is so, quite independently of the fact that Nicaragua already has a very large concessional debt burden, and that Nicaragua's official GDP is likely to be significantly underestimated. Even if, as was argued earlier, "true" GDP is 1.3 to 1.7 times "official" GDP, the domestic debt burden is still high.

Rate of Future Accumulation of Debt, θ and β: We use the values corresponding to scenarios A-D discussed above. For Scenario C, we assume that $\phi = ½$, and, thus, that $\theta = ((g/2) + \pi^*)$. See Table 4 for details.

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[23] On the behavior of the current account in Nicaragua see, for example, IMF (2001), Edwards and Vergara (2001) and Edwards (2002).

Rate of Growth of Nominal GDP (in US$): The World Bank and the IMF (2000) have assumed that Nicaragua's real GDP will grow at 5.5% in real terms in the period 2002-2008 and at 5% into the longer run. We believe that these projections are highly optimistic. Thus, and in order to investigate the role of growth on sustainability, we consider alternative values of real GDP growth, ranging from 2% to 7% per year. With respect to US inflation we assume 2.5% per year during the period under study.

Interest Rates: We assume a baseline value of the concessional rate of interest of 3% in nominal terms. This is the result of considering an interest rate of 0.75% on multilateral debt, and an interest rate on bilateral rate debt of 4.75% in nominal terms.[24] With respect to the commercial rate of domestic debt, we assume in the base case scenario that the government can borrow, on average, at 12% in nominal US dollar terms. In 2001, interest rates on domestic debt approached 20% due to the election uncertainty. During 2002 interest rates have gone down below 10%. We consider that 12% can be considered a reasonable long-term interest rate for Nicaragua.[25]

Domestic rate of inflation: In the baseline sustainability exercise we assume that Nicaragua maintains an inflationary target of 8.5 % per annum. This rate of inflation, in turn, is assumed to be the result of a combined international inflation of 2.5% and a rate of devaluation of the crawling peg Córdoba of the 6% per year.

III.2 Nicaragua's Sustainable Fiscal Policy Path: Basic Results

Table 5 contains the results from computing the sustainable primary balance, under the four scenarios described above. In this Table a positive number refers to a *primary deficit*, and year 1 should be interpreted as the first year after debt forgiveness has been granted.[26] That is, ***the smaller the number in this table (i.e. the more negative it is) the larger the fiscal effort Nicaragua required to achieve sustainability***. The most salient results from this table are:

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[24] See Edwards and Vergara (2001) and World Bank and IMF (2000). We also make a simulation assuming that the interest rate on concessional debt is only 1.5% (see section III.3)

[25] See Banco Central de Nicaragua, "Informe Sobre la Deuda Interna" Various Issues.

[26] Thus, if debt relief is granted – as expected, in mid-2003, year 1 in Table 5 should be interpreted as referring to year 2004.

- Depending on the scenario and of the assumed rate of growth of GDP, the sustainable balance may be either a *deficit* (a positive number in Table 5), or a surplus (a negative number in Table 5).
- The sustainable primary balance is highly sensitive to the rate of real GDP growth. The higher the rate of growth, the smaller the fiscal effort that the country has to make. Consider, for instance, Scenario C: for a real rate of growth of GDP of 4% per year, the country has to run a sustainable primary deficit of 0.38% of GDP during the first year. Then, this deficit has to decline gradually, reaching a 0.01% of GDP surplus in year 10, and stabilizing at a surplus of 2% of GDP in the steady state. If the rate of growth goes up to 5%, then the country would be able to run a primary *deficit* of 1.81% of GDP during the first year. On the other hand, a lower rate of growth of GDP will result in a lower sustainable deficit. At a 3% annual real GDP growth, a primary surplus of 1.08% of GDP is needed in year one.
- Only under two scenarios (C and D), and for rates of growth of real GDP in excess of 4% and 3% respectively, is the sustainable primary balance path characterized, every year, by a *primary deficit*.
- Under Scenarios A and B, which are the more conservative ones in terms of the future availability of subsidized loans a *primary surplus* is required for all rates of growth considered in this analysis**.** This would imply a major adjustment relative to the current situation. This result is particularly important, since it illustrates the extent to which Nicaragua's future fiscal efforts are sensitive to future evolutions of concessional assistance.
- Even under Scenario C – which is characterized by real increases in concessional aid through time –a primary surplus is required every year, if the rate of growth of real GDP is lower than 4% of GDP
- It is possible, for instance, that by overestimating the future availability of "soft loans," analysts will underestimate the extent of fiscal adjustment required in the years to come. We return to this issue below.

Table 6 contains the evolution of the concessional debt to GDP ratio under the four basic scenarios. The computations have been made for a number of alternative future rates of growth of real GDP.

The rate at which this ratio declines in Scenarios A through C depends on the assumed rate of growth of GDP. In every one of these three scenarios, the rate of decline of the concessional debt to GDP ratio is gradual. For instance, under Scenario C, if GDP grows at an annual rate of 5% per year, after ten years the ratio of concessional debt to GDP is still over 100% of GDP.[27] In scenario D, which assumes the greatest availability of subsidized loans in the future, this ratio remains constant at 167%.

Which of these four scenarios is more "realistic"? The World Bank and IMF (2000) have projected that Nicaragua will receive an average disbursement of net concessional loans in the neighborhood of US$ 200 million per year during the first five years of the post HIPC era. This projection is similar to the figures obtained from Scenario C, which assumes that in the post HIPC period concessional loans grow at a rate of $\theta = ((g/2) + \pi^*)$. In that sense, then, Scenario C may be considered as the most "realistic" of the four. For this reason, in Sub-Sections III.3, III.4 and III.5, on extensions, the role of grants and donations, and tax reform, we center on this scenario. Notice that the actual average primary deficit for 2000-2001 (Table 3) exceeds every single entry in Panel C of Table 5. This is a strong indication that Nicaragua is currently on a clear unsustainable path, and that a major fiscal adjustment will be required.

III.3 Extensions

In this section we extend the model in several directions, and we investigate the way in which changing some of the key assumptions affect the basic results presented in Tables 5 and 6. In particular, we deal with the following three extensions: (a) The case where the initial ratio of domestic debt to GDP is not the same as the steady state equilibrium ratio, (b) We investigate how a lower cost of domestic debt is likely to affect

[27] By construction in all three scenarios the domestic debt to GDP ratio remains constant at 0.6. We consider alternative cases in our sensitivity analysis below.

fiscal sustainability[28]. (c) The case when the interest rate on concessional debt is 1.5%. This could be achieved with a decline in the interest rate on bilateral debt. (d)The case when GDP is underestimated. In order to maintain the discussion focused, we report the results from these four extensions for the case where $\theta = ((g/2) + \pi^*)$, or Scenario C.

III.3.1. Changes in the Long Run Domestic Debt Ratio

The simulation exercises reported above assumed that: (1) The ratio of concessional debt to GDP declines through time. And (2), the ratio of domestic (commercial) rate to GDP remains constant at its initial level (in the actual simulations, this ratio is assumed to remain at 0.6). There is no reason for the latter to be the case, however. Indeed, it is perfectly possible for the demand for domestic debt (relative to the country's GDP) to change through time. Generally speaking, it is possible to argue that as the concessional debt to GDP ratio declines, domestic debt will increase until it reaches a new equilibrium. In the case of Nicaragua, however, at 60% of GDP, domestic public sector debt is **already very high** by international standards.[29] This, then, suggests that, if anything, it is possible that in the future Nicaragua's sustainable domestic debt to GDP will be lower than what it is today. For this reason, and in order to consider a more conservative perspective, we simulated the sustainable primary balance path under the assumption that the domestic debt to GDP ratio declines gradually from its current 0.6 level to 0.45, a level that is still quite high from a Latin American comparative perspective. The results for the dynamic sustainable path are reported in Panel A of Table 7. As may be seen, the magnitude of the fiscal effort experiences some important changes relative to the results reported in Table 5. For instance, if growth is assumed to be 5% of GDP, the fiscal balance will have to improve in one half of one percent of GDP to remain on the sustainable path. That is, instead of being able to run in the first year a primary fiscal deficit of 1.81% of GDP, it would be able to run a deficit of 1.31% of GDP. In the steady state, however, as the level of the domestic debt is lower, the country would have to run a smaller primary surplus (0.67% of GDP).

[28] In Edwards and Vergara (2001) the model is also extended for the cases where the real exchange rate is initially overvalued by 10%, relative to its long run equilibrium, and the case for a different inflation rate (12% instead of 8.5%). The results do not vary significantly from those presented in Table 5.

III.3.2 The Cost of Domestic Debt

In Panel B of Table 7 we present the sustainable path for the primary balance under the assumption that the (nominal) cost of domestic debt returns to last year's level (15%). The results obtained indicate that, as expected, the fiscal effort in the post-HIPC era is quite sensitive to the cost of capital. The higher the cost of domestic debt, the higher the fiscal effort required in the post-HIPC period.

III.3.2 The Cost of Concessional Debt

In panel C of Table 7 we present the case when the interest rate on concessional debt is 1.5% rather than 3%. As at the beginning concessional debt is 167% of GDP this makes a big difference. For instance while in the base case of scenario C (table 5) the sustainable primary balance was a primary deficit 0f 0.38% of GDP in the first year, under this new scenario with lower interest rate on concessional debt the required primary deficit is 2.73% of GDP. As concessional debt declines over time, the difference between both scenarios narrows as times pass by, being nil in the steady state.

III.3.4 The Case when GDP is underestimated

There is general agreement that Nicaragua's official GDP underestimates "real" GDP. There is less agreement, however, of the magnitude of this underestimation. While accordingly to the World Bank (2002) "adjusted" GDP is approximately 1.7 times de official figure, others experts have argued that the adjustment should be closer to 1.3 times. If it is assumed that the debt relief under HIPC is the same independently on the underestimation of GDP, then the only adjustment that has to be made to our results is to divide each cell of Table 5-C by the factor of adjustment. Indeed, in the model (see Table 2) the right hand side of both the steady state and the transition equations are divided by GDP. In other words, the real adjustment (in Córdobas) is the same, but as percentage of GDP is lower by the factor of adjustment.

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[29] See for example the data on domestic debt to GDP ratios for the Latin American nations in Table 8 of Goldman Sachs (2002).

III.4 Grants, Donations and Fiscal Adjustment After HIPC

The exercises presented above provide estimations for alternative sustainable paths for the *primary balance*, after the government has received grants, transfers and *"donations."* However, in most HIPC countries, including in Nicaragua, future fiscal efforts are also be affected by the evolution of transfers and grants provided by the advanced nations' and the NGOs. If these grants and transfers decline as a percentage of GDP, the magnitude of the fiscal adjustment has to be larger than otherwise. At any moment in time the public sector budget constraint is given by:

$$(6) \qquad pe + r\,D - t - G - \Delta B = \Delta D,$$

where pe is primary expenditure, r D refers to interest payments on all the public sector debt, t are taxes, G are grants and donations, Δ B is seignorage, and Δ D refers to net increases of aggregate public sector debt. Using the definition of primary balance (pb), this expression may be rewritten as follows:

$$(7) \qquad pe - t = pb + G.$$

The left hand side of equation (7) includes two policy variables – primary expenditure and taxes. The two terms in the left hand side, on the other hand, are pre-determined. pb is the primary balance required to achieve sustainability, and is given by the analysis presented in the preceding sections, and G are grants and donations from the international donor community.

The World Bank and IMF (2000) have estimated that grants and transfers to the HIPC countries will decline in the post debt forgiveness era. In the case of Nicaragua are expected to decline from 7.3% of GDP in 2000 and 2001, to approximately 4% of GDP in the year 2007. According to these estimates, this decline will be significant beginning in the year 2004. These projections further suggest that for most poor countries, life after HIPC will not be easy. In the case of Nicaragua there is another event that will require even further fiscal adjustment. The government has announced that in 2003 it will implement a social security reform, along the lines of the Chilean model. A well-known

feature of this type of reform is that it generates significant transitional fiscal costs. In the case of Nicaragua we have estimated that the incremental deficit generated by this reform will reach approximately 2.5% of GDP by 2005.

III. 5 Tax reform

As pointed out above, the required primary deficit after grants (equation 7) can be obtained through a reduction in the primary expenditure (pe) or through an increase in taxes (t). Most analyses assume (implicitly) that in order to achieve sustainability, primary expenditures have to be adjusted downward. This, of course needs not be the case. In fact, it is possible that this adjustment is shared between higher tax revenues and lower expenditures. The Nicaraguan authorities have recognized this, and have proposed a tax reform program that through the broadening the tax base and the elimination of several tax exemptions is expected to increase tax revenues significantly. The government has estimated that the proposed tax reform will generate additional revenues in the order of 2.5% of GDP, starting in 2003. An analysis of the technical merits of this proposed reform – including the realism of the expected increase in revenues – is well beyond the scope of this paper. For this reason we do not opine on the proposed reform itself; instead, we take the government forecast for 2003 at face value, and we project tax revenues forward making some reasonable assumptions on their income elasticity. In particular, and on the bases of the experiences of other developing nations at approximately) the same level of development than Nicaragua, we assume that these additional tax revenues will increase with an elasticity of 1.1 for some time (until year 10) and from then on with an elasticity of one[30].

We now can adjust our scenario C in Table 5 to find out what the sustainable primary balance is after the tax reform. The results are shown in Table 8 (this table shows what the sustainable primary deficit is given that there is a tax reform. Thus it can be compared with panel C of Table 5). It is interesting to note that even assuming that the tax reform indeed results in an increase in revenues of 2.5% of GDP, in every scenario there is still an adjustment required with respect to the fiscal situation in 2001. If we take

[30] The tax reform is suppose to have not only a direct but also an indirect effect through a reduction in tax evasion. This justifies a higher than one elasticity for some time.

the average primary deficit of 1999-2001 (4.4% of GDP) and a GDP growth between 4% a 5%, then in the steady state there is still a required adjustment of between 5% and 6% of GDP. In the short run the required adjustment is smaller, but still positive – see Table 8 for details.

III.6 Nicaragua: Policy Discussion

From the previous analysis it is possible to obtain the following conclusions:

- Assuming a GDP growth of 4% during 2003 and 2004 – arguably an optimistic assumption --, Nicaragua should have a primary deficit which does not exceed 0.4% of GDP during these years. In the following years the sustainable primary deficit will depend fundamentally on GDP growth. Assuming the same 4% GDP growth the primary deficit will have to decline gradually to a balance primary balance. If GDP growth were 5% it could maintain a deficit close to 2% in the first years, gradually declining to 1% in year ten.
- In the steady state, assuming a growth rate between 4% and 5%, Nicaragua should converge to a primary surplus of between 1% and 2% of GDP.
- In 2001 the primary deficit reached 7.7% of GDP. This figure is well above any of the cells presented in Table 5.C. ***This means that the 2001 primary deficit is not sustainable for any rate of growth.***
- The tax reform of 2002 is expected to raise about 2.5% of GDP on annual bases. Some people argue that this estimation is on the optimistic side. However, still assuming that additional tax revenues will be 2.5% of GDP, Nicaragua has to make an additional fiscal effort.
- At the moment of writing this report the government of Nicaragua was expected to make a major fiscal adjustment basically on the side of capital expenditure. If this were the case Nicaragua could go back to the sustainability track. Nonetheless it is important to make clear that the ideal combination would include also some current expenditure cuts. Indeed, current expenditure is generally more permanent (it is more difficult to cut it) so the sooner it adjusts the easier to do it. Secondly, a cut in current expenditure means an increase in government saving which is needed to support private capital formation and growth in Nicaragua.

- The social security reform is scheduled to start next year. This will produce an additional deficit of about 2.5% of GDP. In addition grants are expected to gradually decline overtime. Both factors imply that the fiscal adjustment will have to continue over the following years to achieve fiscal sustainability.
- Finally, it is important to mention that when the debt to GDP ratio is too high – or when it is perceived as being too high -- countries' become particularly vulnerable to external shocks. Recent experience in a number of countries, including Argentina in 2001, indicates that a particularly dangerous situation develops when creditors decide not to rollover maturing debt. This phenomenon has come to be known as a "sudden stop," a term pioneered by Rudiger Dornbusch and further developed by Guillermo Calvo. If the debt in question is foreign debt, the "sudden stop" will be translated into a rapid and unsustainable current account situation, a situation that historically has been followed by a "current account reversal." These, in turn, can be very costly in terms of reduced investment, employment, output and growth. In the case of Nicaragua the danger of a "sudden stop" refers to domestic debt – which as we have argued has reached a limiting level -- rather than foreign debt. If, for whatever reason, creditors all of the sudden decide not to roll over this debt, the government will be forced into quasi-insolvency. In this case there would be very few options open; and all of them would be traumatic and would generate a costly solution. It is indeed for this reason that the implementation of measures aimed at dealing with the debt problem now, rather than later, should be undertaken.

IV. Debt Sustainability Under Alternative Donor Behavior: The case of Honduras

In this section we extend the model to the case of Honduras. This country presents important differences as compared to Nicaragua. First, in Honduras total public external debt is 66% of GDP (as compared to 280% in Nicaragua). Second, total domestic public debt is only 3% of GDP (as compared to 60% in the case of Nicaragua)[31]. Finally, Honduras has an explicit external debt policy, which states that any additional debt has to be at least 35% in concessional terms.

In the December 1999 the Executive Directors of the IDA and the IMF agreed that Honduras should be eligible for debt relief under the Enhanced HIPC initiative – for details see the document "Honduras: Decision point Document for the Enhanced HIPC Initiative," World Bank and IMF, June 20, 2000. In early 2000 the face value of Honduras total external debt was US$4,288, representing 184.7% of the country's exports of goods and non-factor services, and 79% of nominal GDP – in this calculation we are using a figure of US$ 5.4 billion for GDP. In terms of net present value, total external debt was US$ 3.3 billion in early 2000; implying ratios of 142% relative to exports and 61% relative to GDP – see Table 9 of the "Decision Point" document. By early 2002, according to the Central bank of Honduras, the face value of public sector external debt was US$ 4.2 billion, and GDP amounted to US$ 6.4 billion. The external debt to GDP ratio was, thus, 66%. I t is expected that the enhanced HIPC initiative will result in a reduction in the face value of Honduras' external public debt of approximately US$ 750 million. This means that in terms of GDP the initial (period 0) debt to GDP ratio in the post HIPC era will be 54%, significantly lower than that of Nicaragua which we discussed in the preceding section.

Table 9 presents the basic fiscal numbers in Honduras during the last several years. It is clear that they look much better than in Nicaragua. In 2001 the overall balance after grants of the non-financial public sector was a deficit of 1.5% of GDP. [32] The primary balance after grants has been on surplus during the last several years. However there is a concern regarding the path over the last years of these figures. For instance,

[31] This figure does not include the domestic debt of the BCH. The reason being that this debt has been issued mainly to sterilize capital inflows. This is, it has a counterpart in international reserves. However, in the extensions we include the domestic debt of the BCH. According to the Memoria Anual 2001 of the BCH it is 10% of GDP.

current expenditure has increased form 23% of GDP to 27% of GDP since 1998. The overall balance after grants went from a 3.5% of GDP surplus in 1998 to a deficit of 1.5% of GDP in 2001. Finally, the primary surplus has declined in about 7% of GDP in the last four years.

IV.1 Parameterization of the Model

In this sub-section we briefly present the parameter values used in the base run of the sustainability exercise for Honduras (See Table 10 for a summary). In subsequent runs we expect to perform some robustness test, considering the impact of alternative assumptions regarding the key parameters.

Post-HIPC Concessionary Debt to GDP Ratio, (DC_0 / Y_0):, The HIPC initiative considers reducing the face value of the debt in approximately 18% of GDP. Thus, the value of (DC_0 / Y_0) used in the baseline computations is, then, equal to 0.54.

Post-HIPC Domestic Debt to GDP Ratio, (DD_0 / Y_0): Domestic public debt in Honduras is 3% of GDP. In the extensions we add to this figure the gross domestic debt of the BCH.

Rate of Future Accumulation of Debt, θ and β: We use the values corresponding to scenarios A-D discussed above. However we have here a difference with the case of Nicaragua. Indeed, in cases A-C in the steady state concessional external debt is zero (it converges to zero). If we maintain domestic debt at 3% of GDP we would be saying that the equilibrium ***total*** public debt in Honduras in the steady state is only 3% of GDP. This is clearly not reasonable. Hence, we assume that concessional debt declines accordingly to scenarios A-C, but that in the long term it is replaced by domestic or external debt at non-concessional (or commercial) terms[33]. We assume that this replacement takes place once concessional debt reaches 40% of GDP. Thus, total public debt is 43% of GDP in the steady state. As can be seen in Table 12 only in scenarios A and B concessional debt falls below 40% of GDP at some point during the first ten years. Only in those cases we assume that the replacement for commercial debt takes place.

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[32] The quasi-fiscal deficit has been on average during 1999-2001 only 0.1% of GDP.

[33] In the case of Nicaragua we assumed no replacement because the domestic debt was already high. However in both cases we assume that in the steady state there is no concessional debt (with the exception of scenario D).

Rate of Growth of Nominal GDP (in US$): As in the case of Nicaragua, and in order to investigate the role of growth on sustainability, we consider alternative values of real GDP growth, ranging from 2% to 7% per year. With respect to US inflation we assume 2.5% per year during the period under study.

Interest Rates: We maintain the assumption we made for Nicaragua regarding the concessional rate of 3% in nominal US dollars. As for domestic or commercial debt we assume an interest rate in US dollars of 10%. The much lower external and internal debt make it reasonable to think in a lower long - term interest rate for Honduras than for Nicaragua. In 1999-2001 interest rates on domestic debt fluctuated between 12% and 15% (in Lempiras, the domestic currency). With a depreciation of the domestic currency of about 5% per year this is a dollar interest rate between 7% and 10%. We use the upper level, because the current debt is short-term (90 to 360 days) and we assume that if it replaces the concessional debt through time, it would have to have a longer maturity[34]. We also make a simulation for a higher interest rate on non-concessional debt.

Domestic rate of inflation: Inflation in Honduras in 2001 was 8.8%. For 2002 the authorities expect a similar rate. Hence, we decided to maintain the same assumption that for Nicaragua, this is an inflation rate of 8.5%.

IV.2 Honduras' Sustainable Fiscal Policy Path: Basic Results

Table 11 contains the results from computing the sustainable primary balance, under the four scenarios described above. In this Table a positive number refers to a *primary deficit*, and year 1 should be interpreted as the first year after debt forgiveness has been granted.[35] That is, the smaller the number in this table (i.e. the more negative it is) the larger the fiscal effort Honduras required to achieve sustainability. The most salient results from this table are:

[34] For practical purposes we maintain the assumption of all debt denominated in US dollars. We could easily switch to a Lempiras denominated interest rates. In this case we would assume a constant real exchange rate and it would make no difference. Note that if in the long run there is no concessional debt, it makes no difference in this scenario domestic and external (at market conditions) debt.

[35] Thus, if debt relief is granted – as expected, in mid-2003, year 1 in Table 11 should be interpreted as referring to year 2004.

- As in the case of Nicaragua, depending on the scenario and of the assumed rate of growth of GDP, the sustainable balance may be either a *deficit* (a positive number in Table 11), or a surplus (a negative number in Table 11).
- Also, as in the case of Nicaragua, the sustainable primary balance is highly sensitive to the rate of real GDP growth. The higher the rate of growth, the smaller the fiscal effort that the country has to make. Consider, for instance, Scenario C: for a real rate of growth of GDP of 4% per year, the country has to run a sustainable primary deficit of 1.66% of GDP during the first year. Then, this deficit has to decline gradually, reaching a deficit of 1.54% in year 10, and stabilizing at a surplus of 0.4% of GDP in the steady state. If the rate of growth goes up to 5%, then the country would be able to run a primary *deficit* of 2.0% of GDP during the first year. On the other hand, a lower rate of growth of GDP will result in a lower sustainable deficit. At a 3% annual real GDP growth, a deficit of 1.3% of GDP is needed in year one.
- One important difference with the case of Nicaragua is that in the case of Honduras in Scenarios B, C and D, under all growth rates, small primary deficits are consistent with sustainability during the first ten years. In steady state only in Scenario D and under high GDP growth rates in Scenarios A, B and C (5% or more GDP growth), a small primary deficit is consistent with sustainability.
- Under Scenario A, which is the more conservative one in terms of the future availability of subsidized loans, a *primary surplus* is required in the first two years for all rates of growth considered in this analysis**.** On the other hand, under Scenario D, the most optimistic one in terms of the future availability of subsidized loans, a primary deficit is consistent with sustainability for all rated of growth considered in this analysis. This illustrates the extent to which Honduras' future fiscal efforts are sensitive to future evolutions of concessional assistance.
- As we have assumed that in Scenarios A-C concessional debt is replaced with commercial debt once the former falls below 40% of GDP, we observe some breaks in the required primary balances once debt has reached that level. Indeed, up to that point the country has been undertaking an effort to reduce **total** debt, while from then on total debt remains constant (concessional debt declines while

commercial debt increases). For instance, under Scenario A for a GDP growth rate of 4%, concessional debt falls below 40% of GDP in year 6 (Table 12). As we can see from Table 11 in that same year the required balance changes from a 0.27% of GDP surplus to a 0.57% of GDP deficit.

- Under Scenario D concessional debt remains forever at its initial level (60% of GDP), so the primary balance is the same for any GDP growth. Under Scenario C concessional debt falls below 40% of GDP after year 10.

Table 12 contains the evolution of the concessional debt to GDP ratio under the four basic scenarios. As before, the computations have been made for a number of alternative future rates of growth of real GDP. The rate at which this ratio declines in Scenarios A through C depends on the assumed rate of growth of GDP. In every one of these three scenarios, the rate of decline of the concessional debt to GDP ratio is gradual. For instance, under Scenario C, if GDP grows at an annual rate of 5% per year, after ten years the ratio of concessional debt to GDP goes from 54% of GDP to 43% of GDP. In scenario D, which assumes the greatest availability of subsidized loans in the future, this ratio remains constant at 54%.

As in the case of Nicaragua, we assume that Scenario C, which assumes that in the post HIPC period concessional loans grow at a rate of $\theta = ((g/2) + \pi^*)$, is the most realistic. For this reason, in what follows we center on this scenario.

IV. 3 Extensions

In this section we extend the model in the following three directions: (a) The case where the domestic debt to GDP ratio is 53% instead of 43%. In this case the country would start replacing concessional debt for commercial debt when the former reaches 50% of GDP. (b) The case where the cost of the domestic (or commercial) debt is 15% rather than 10%. (c) The case where the initial domestic debt to GDP is 6% rather than 3%. We simulate this case given some concerns regarding the real size of the domestic debt. In order to maintain the discussion focused, we report the results from these four extensions for the case where $\theta = ((g/2) + \pi^*)$, or Scenario C.

IV.3.1 Change in the Long Run Domestic Debt Ratio

The simulation exercises reported above assumed that: (1) The ratio of concessional debt to GDP declines through time. And (2), the ratio of domestic (commercial) rate to GDP increases until it reaches a new equilibrium. This equilibrium was assumed to be 43% of GDP[36]. We now assume that the equilibrium debt is 53% of GDP. For our simulations we take the same approach as before. This is, we assume that once the level of concessional falls below 50% of GDP new commercial debt is issued so as to keep that level.

Table 13, panel A, shows the results of this new simulation. Only under high growth rates (6% and 7%) Honduras can have a sustainable primary deficit in the steady state.

IV.3.2 The cost of domestic debt

Table 13, panel B, simulates the situation where the cost of domestic debt is 15% rather than 10%. As expected there is a significant change in the steady state sustainable primary balance. Under all growth rates used in this exercise Honduras would need a primary surplus. The range goes from 3.5% of GDP (when growth is 2%) to 0.9% of GDP when growth is 7%.

IV.3.3 Higher initial domestic debt

Table 13, panel C, simulates the situation where the initial domestic debt to GDP ratio is 13% instead of 3%. We simulate this case given some concerns regarding the domestic debt of the central bank. As indicated in the Memoria Anual 2001 of the BCH, there is a total amount of internal central bank debt of 10% of GDP. This debt is comprised of CAMs (Certificados de Absorción Monetaria) issued by the mostly to sterilize capital inflows. Hence the debt has a counterpart on the asset side represented by international reserves. If in this sustainability analysis we consider net debt, then this BCH debt should not be included. This is the reason why we did not include it in our

[36] The current level of commercial debt is 3% of GDP. The assumption is that concessional debt is replaced by commercial debt once the former falls below 40% of GDP, such that the new issues imply that the sum of concessional debt plus new commercial debt stays at 40% of GDP. Adding the 3% of GDP of initial domestic debt we obtain the total public debt (43% of GDP).

previous simulations. In the simulation reported in this subsection, however, we take the **gross debt,** which includes the BCH debt. Hence internal debt is 13% of GDP instead of 3% of GDP and total debt in the steady state is 53% of GDP. As expected, in this case the fiscal effort is larger than when the initial stock of domestic debt is lower.

IV. 4 Grants, Donations and Fiscal Adjustment After HIPC

As in the case of Nicaragua, although at a much lower level, Honduras receives a significant amount of grants that help to finance public expenditures. Hence, future fiscal efforts are also affected by the evolution of transfers and grants provided by the advanced nations' and the NGOs. If these grants decline as percentage of GDP, the magnitude of the fiscal effort has to be larger than otherwise. In the case of Honduras during the last years grants have amounted to about 1.5% of GDP. A future decline in these transfers would require an additional fiscal effort. Additionally, a possible social security reform in the future would have the same consequences, at least in the initial years.

IV. 5 Honduras: Policy Discussion

From the previous analysis it is possible to extract the following conclusions with respect to Honduras debt dynamics and fiscal sustainability in the post HIPC era:

- Our simulations show that, unlike Nicaragua, Honduras does not have an unsustainable fiscal position at the moment. Indeed, assuming a GDP growth of 4% during the next few years, Honduras could have a primary deficit in the order of 1.7% of GDP. In 2001 it had a primary surplus of 0.5% of GDP. In the following years the sustainable primary deficit will depend fundamentally on the rate of real GDP growth. Assuming the same 4% GDP growth the primary deficit will have to decline gradually over the next years and to reach a surplus of 0.4% of GDP in the steady state. If GDP growth were 5% it could maintain a deficit of about 2% in the first years, and almost a balance in the steady state.
- Although the latest fiscal figures of Honduras are well within these ranges, it is a source of concern that the fiscal situation has been deteriorating during the last three years. The primary surplus declined from 7.3% of GDP in 1998 to 0.5% of GDP in 2001. This has been produced basically by huge increases in current

expenditures. If the government does not change its trend regarding fiscal expenditure, sooner rather than later Honduras might be heading towards an unsustainable fiscal position.

- The expected reduction in grants and donations and a possible social security reform in the future, stress the need to make the necessary adjustments in order to keep the fiscal accounts under the sustainability track.

IV. Concluding Remarks

A fundamental goal of the debt relief HIPC initiative is to help poor countries move towards macroeconomic sustainability. The World Bank, the IMF and the Interamerican Development Bank have argued that this will not be automatic, and will require implementing reforms that will help accelerate growth. The model developed in this paper shows that whether a country indeed achieves sustainability is likely to depend on three additional set of variables: (1) The initial stock of domestic debt. (2) The availability of concessional loans going forward. And (3), the future path of grants and donations.

The application of the model to the case of Nicaragua illustrates the challenges of the post HIPC period. Under a reasonable set of assumptions regarding future GDP growth, concessional loans and donations, the required fiscal adjustment appears to be severe. Whether this adjustment will affect the country's ability to implement an effective poverty reduction program is still to be seen.

In the case of Honduras, the analysis shows that under reasonable parameters the fiscal policy of this country is currently sustainable. However, the significant increase in current expenditures in the last several years, introduce some concerns regarding the ability of this country to remain in its current sustainable path.

Although we have made several extensions to the model, our basic results indicate that, in order to achieve a sustainable public debt path in the following years, Nicaragua requires a primary deficit between 0.4% and 1.8% of GDP, while Honduras a primary deficit between 1.5% and 2.0% of GDP. This assumes that long term GDP growth in both countries is between 4% and 5%. As compared to the current situation this means that Nicaragua requires a fiscal adjustment of between 6% and 8% of GDP. If we add the

likely reduction in donations plus the fiscal effects of the social security reform, this figure could increase by 2.5% of GDP in the future. In the case of Honduras the current situation (2001) is sustainable, although there are concerns regarding the increase in current expenditure in the last several years. If this trend continues, sooner rather than later Honduras will face sustainability problems.

As regards to the steady state Nicaragua requires a primary surplus of about 1.5% of GDP while Honduras a surplus of about 0.2% of GDP.

TABLE 1: HIPC Initiative: 22 HIPCs having reached their Decision Points*

COUNTRY	GDP Per Capita (US$)
Benin	380
Bolivia	1010
Burkina Faso	240
Cameroon	580
Gambia, The	340
Guinea	510
Guinea-Bissau	160
Guyana	760
Honduras	760
Madagascar	250
Malawi	190
Mali	240
Mauritania	380
Mozambique	230
Nicaragua	430
Niger	190
Rwanda	250
Sao Tome & Principe	270
Senegal	510
Tanzania	240
Uganda	320
Zambia	320
Simple average	389

* Source: World Bank.

TABLE 2: Sustainable and Steady State Primary Balances and Debt to GDP Ratios Under Alternative Scenarios*

	(a) Dynamic path of "sustainable" primary balance to GDP	(b) Steady state "sustainable" primary balance to GDP ratio	(c) Stationary concessional debt to GDP ratio	(d) Stationary domestic debt to GDP ratio
CASE A: $\theta = 0$	$(pb_t / Y_t) =$ $[- r_t^C (DC_0 / Y_0)$ $e^{-(g+\pi^*)(t-1)} +$ $\{g + \pi^* - r_t^D\} (DD_0 / Y_0)]$ $[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(pb / Y) =$ $\{g + \pi^* - r^D\}$ $(DD_0 / Y_0)[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(DC / Y) = 0$	$(DD / Y) = (DD_0 / Y_0)$
CASE B: $\theta = \pi^*$	$(pb_t / Y_t) =$ $[\{\pi^* - r_t^C\} (DC_0 / Y_0)$ $e^{-g(t-1)} +$ $\{g + \pi^* - r_t^D\} (DD_0 / Y_0)]$ $[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0)$	$(pb / Y) =$ $\{g + \pi^* - r^D\}$ $(DD_0 / Y_0)[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(DC / Y) = 0$	$(DD / Y) = (DD_0 / Y_0)$
CASE C: $\theta = (\phi g + \pi^*)$	$(pb_t / Y_t) =$ $[\{\phi g + \pi^* - r_t^C\} (DC_0 / Y_0)$ $e^{-\phi g(t-1)} +$ $\{g + \pi^* - r_t^D\} (DD_0 / Y_0)]$ $[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0)$	$(pb / Y) =$ $\{g + \pi^* - r^D\}$ $(DD_0 / Y_0)[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(DC / Y) = 0$	$(DD / Y) = (DD_0 / Y_0)$
CASE D: $\theta = (g + \pi^*)$	$(pb_t / Y_t) =$ $(D_0 / Y_0)[(g + \pi^*)$ $- r^C (DC_0 / D_0) - r^D (DD_0 / D_0)]$ $[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(pb / Y) =$ $(D_0 / Y_0)[(g + \pi^*)$ $- r^C (DC_0 / D_0) - r^D (DD_0 / D_0)]$ $[1 / (1 + g + \pi^*)]$ $+ (g + \pi)(B_0 / Y_0).$	$(DC / Y) = (DC_0 / Y_0)$	$(DD / Y) = (DD_0 / Y_0)$

* For explanations, see the text.

TABLE 3: Consolidated Public Sector Balance in Nicaragua: 1995-2001 (Percentage of GDP)

	1995	1996	1997	1998	1999*	2000	2001
A. Total Current Revenues	29.2	31.3	34.2	36.9	35.4	32.9	32.9
B. Total Current Expenditures	40.3	47.4	44.3	44.3	51.1	48.3	53.7
C. Overall Balance Before Grants	-11.1	-16.1	-10.0	-7.4	-15.7	-15.4	-20.8
D. Overall Balance After Grants	-5.0	-7.3	-4.6	-3.6	-7.0	-8.1	-13.4
E. Primary Surplus After Grants	-1.0	-4.0	0.4	1.5	-2.1	-3.5	-7.7

* In 1999 Hurricane Mitch resulted in a major emergency, and generated an increase in foreign assistance.
Source: The World Bank (2002) and BCN.

Table 4: Parameter Values Used in Nicaragua's Sustainability Exercises

Parameter	Symbol	Assumed Value	Comments and Sources
Initial Concessional debt to GDP ratio	(DC_0 / Y_0)	167%	Taken from HIPC documents, including the "Decision Point Document"
Initial Domestic debt to GDP ratio	(DD_0 / Y_0)	60%	Taken from different official documents (see text).
Rate of accumulation of concessional debt going forward	θ	Different assumptions, depending on the scenario being considered.	Some scenarios assume that even in the steady state Nicaragua has a considerable debt to GDP ratio; other assume that in the very long run Nicaragua graduates from concessional assistance.
Rate of accumulation of domestic debt	β	$(g + \pi^*)$	Assumes that initial ratio is maintained.
Rate of growth of nominal GDP in US dollars	$(g + \pi^*)$	We assume several alternative values for real growth (g), ranging from 2% to 7%; we assume a rate of US inflation of 2.5% per year.	The sustainable path of the primary balance will critically depend on the growth assumptions.
Interest rate on concessional funds	r^C	3.0%	Taken from projections made by IDA and IMF
Interest rate on commercial funds	r^D	12%	Taken from long term trends and based on comparable countries
Monetary base to GDP ratio	(B_0 / Y_0)	0.09	Actual ratio in 2001
Domestic rate of inflation	π	8.5%	The baseline case considers 8.5%.

TABLE 5: Nicaragua's Sustainable Primary Balance Path Under Alternative Scenarios*

SCENARIO A
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	-8.16%	-7.41%	-6.68%	-5.96%	-5.25%	-4.55%
2	-7.94%	-7.16%	-6.38%	-5.62%	-4.87%	-4.14%
3	-7.74%	-6.92%	-6.10%	-5.31%	-4.53%	-3.76%
4	-7.55%	-6.69%	-5.84%	-5.02%	-4.21%	-3.42%
5	-7.37%	-6.47%	-5.60%	-4.75%	-3.92%	-3.10%
6	-7.19%	-6.27%	-5.37%	-4.50%	-3.65%	-2.82%
7	-7.02%	-6.08%	-5.16%	-4.27%	-3.40%	-2.56%
8	-6.86%	-5.89%	-4.96%	-4.05%	-3.18%	-2.33%
9	-6.71%	-5.72%	-4.77%	-3.85%	-2.97%	-2.11%
10	-6.56%	-5.56%	-4.59%	-3.67%	-2.78%	-1.92%
St. State	-3.36%	-2.66%	-1.97%	-1.30%	-0.63%	0.03%

SCENARIO B
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	-4.16%	-3.45%	-2.76%	-2.07%	-1.40%	-0.74%
2	-4.14%	-3.43%	-2.73%	-2.04%	-1.36%	-0.69%
3	-4.13%	-3.41%	-2.70%	-2.00%	-1.31%	-0.64%
4	-4.11%	-3.39%	-2.67%	-1.97%	-1.27%	-0.59%
5	-4.10%	-3.36%	-2.64%	-1.93%	-1.24%	-0.55%
6	-4.08%	-3.34%	-2.62%	-1.90%	-1.20%	-0.51%
7	-4.07%	-3.32%	-2.59%	-1.87%	-1.17%	-0.48%
8	-4.06%	-3.30%	-2.57%	-1.84%	-1.14%	-0.44%
9	-4.04%	-3.28%	-2.54%	-1.82%	-1.11%	-0.41%
10	-4.03%	-3.27%	-2.52%	-1.79%	-1.08%	-0.38%
St. State	-3.36%	-2.66%	-1.97%	-1.30%	-0.63%	0.03%

Table 5 (Continuation)

SCENARIO C
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	-2.56%	-1.08%	0.38%	1.81%	3.22%	4.60%
2	-2.57%	-1.10%	0.33%	1.73%	3.10%	4.44%
3	-2.58%	-1.13%	0.29%	1.66%	2.99%	4.29%
4	-2.59%	-1.15%	0.24%	1.59%	2.89%	4.14%
5	-2.59%	-1.17%	0.20%	1.51%	2.78%	4.00%
6	-2.60%	-1.19%	0.15%	1.45%	2.68%	3.87%
7	-2.61%	-1.21%	0.11%	1.38%	2.58%	3.73%
8	-2.62%	-1.24%	0.07%	1.31%	2.49%	3.61%
9	-2.62%	-1.26%	0.03%	1.25%	2.40%	3.48%
10	-2.63%	-1.28%	-0.01%	1.18%	2.31%	3.36%
St. State	-3.36%	-2.66%	-1.97%	-1.30%	-0.63%	0.03%

SCENARIO D
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
2	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
3	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
4	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
5	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
6	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
7	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
8	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
9	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
10	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%
St. State	-0.96%	1.30%	3.51%	5.69%	7.83%	9.94%

* A positive number means that the country is able to run a primary deficit. For details on the computations, see the discussion in the text and the equations in Table 2.

TABLE 6: Evolution of Nicaragua's Concessional Debt to GDP Ratio Under Alternative Scenarios*

SCENARIO A
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	167.00	167.00	167.00	167.00	167.00	167.00
2	159.73	158.18	156.66	155.17	153.70	152.27
3	152.78	149.83	146.96	144.18	141.47	138.84
4	146.13	141.92	137.86	133.96	130.20	126.59
5	139.77	134.42	129.33	124.47	119.84	115.42
6	133.69	127.32	121.32	115.65	110.30	105.24
7	127.87	120.60	113.81	107.46	101.52	95.96
8	122.31	114.23	106.76	99.84	93.43	87.49
9	116.98	108.20	100.15	92.77	86.00	79.77
10	111.89	102.49	93.95	86.20	79.15	72.74
St. State	0.00	0.00	0.00	0.00	0.00	0.00

SCENARIO B
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	167.00	167.00	167.00	167.00	167.00	167.00
2	163.73	162.14	160.58	159.05	157.55	156.07
3	160.52	157.41	154.40	151.47	148.63	145.86
4	157.37	152.83	148.46	144.26	140.22	136.32
5	154.28	148.38	142.75	137.39	132.28	127.40
6	151.26	144.06	137.26	130.85	124.79	119.07
7	148.29	139.86	131.98	124.62	117.73	111.28
8	145.38	135.79	126.91	118.68	111.06	104.00
9	142.53	131.83	122.03	113.03	104.78	97.20
10	139.74	127.99	117.33	107.65	98.85	90.84
St. State	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 6 (Continuation):

SCENARIO C
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	167.00	167.00	167.00	167.00	167.00	167.00
2	165.32	164.51	163.71	162.93	162.16	161.40
3	163.66	162.05	160.49	158.95	157.46	156.00
4	162.02	159.64	157.32	155.08	152.89	150.77
5	160.39	157.26	154.22	151.29	148.46	145.72
6	158.78	154.91	151.19	147.60	144.16	140.83
7	157.19	152.60	148.21	144.00	139.98	136.11
8	155.61	150.32	145.29	140.49	135.92	131.55
9	154.04	148.08	142.43	137.06	131.98	127.15
10	152.50	145.87	139.62	133.72	128.15	122.89
St. State	0.00	0.00	0.00	0.00	0.00	0.00

SCENARIO D
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	167.00	167.00	167.00	167.00	167.00	167.00
2	167.00	167.00	167.00	167.00	167.00	167.00
3	167.00	167.00	167.00	167.00	167.00	167.00
4	167.00	167.00	167.00	167.00	167.00	167.00
5	167.00	167.00	167.00	167.00	167.00	167.00
6	167.00	167.00	167.00	167.00	167.00	167.00
7	167.00	167.00	167.00	167.00	167.00	167.00
8	167.00	167.00	167.00	167.00	167.00	167.00
9	167.00	167.00	167.00	167.00	167.00	167.00
10	167.00	167.00	167.00	167.00	167.00	167.00
St. State	167.00	167.00	167.00	167.00	167.00	167.00

* In these computations we have used Nicaragua's official GDP figures. For details on the computations see the text and the equations in Table 2.

TABLE 7: Extensions and Sensitivity Analysis: Sustainable Primary Balance to GDP Ratio*
(Scenario C)

A: DECLINE OF DOMESTIC DEBT FROM 60% TO 45%

	GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	-3.06%	-1.58%	-0.12%	1.31%	2.72%	4.10%
2	-3.03%	-1.57%	-0.14%	1.25%	2.62%	3.95%
3	-3.01%	-1.56%	-0.16%	1.20%	2.53%	3.81%
4	-2.98%	-1.56%	-0.18%	1.15%	2.43%	3.68%
5	-2.95%	-1.55%	-0.20%	1.10%	2.35%	3.55%
6	-2.92%	-1.54%	-0.22%	1.05%	2.26%	3.42%
7	-2.89%	-1.53%	-0.23%	1.00%	2.18%	3.30%
8	-2.87%	-1.52%	-0.25%	0.96%	2.10%	3.19%
9	-2.84%	-1.51%	-0.26%	0.91%	2.03%	3.07%
10	-2.81%	-1.50%	-0.28%	0.87%	1.95%	2.97%
St. State	-2.28%	-1.74%	-1.20%	-0.67%	-0.15%	0.37%

B: COST OF DOMESTIC DEBT AT 15%

	GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	-4.28%	-2.78%	-1.31%	0.14%	1.56%	2.96%
2	-4.29%	-2.81%	-1.36%	0.06%	1.44%	2.80%
3	-4.30%	-2.83%	-1.40%	-0.02%	1.33%	2.65%
4	-4.31%	-2.85%	-1.45%	-0.09%	1.23%	2.50%
5	-4.32%	-2.88%	-1.49%	-0.16%	1.12%	2.36%
6	-4.32%	-2.90%	-1.54%	-0.23%	1.02%	2.22%
7	-4.33%	-2.92%	-1.58%	-0.30%	0.92%	2.09%
8	-4.34%	-2.94%	-1.62%	-0.36%	0.83%	1.96%
9	-4.35%	-2.96%	-1.66%	-0.43%	0.74%	1.84%
10	-4.35%	-2.98%	-1.70%	-0.49%	0.65%	1.72%
St. State	-5.08%	-4.37%	-3.66%	-2.97%	-2.29%	-1.62%

* For details on the computations, see the discussion in the text.

TABLE 7 (Continuation)

C: COST OF CONCESSIONAL DEBT AT 1.5%

	GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	-0.17%	1.30%	2.73%	4.14%	5.53%	6.89%
2	-0.20%	1.24%	2.64%	4.01%	5.34%	6.65%
3	-0.23%	1.18%	2.55%	3.88%	5.17%	6.42%
4	-0.26%	1.12%	2.46%	3.75%	5.00%	6.20%
5	-0.29%	1.07%	2.37%	3.62%	4.83%	5.99%
6	-0.32%	1.01%	2.28%	3.50%	4.67%	5.79%
7	-0.35%	0.96%	2.20%	3.38%	4.51%	5.59%
8	-0.38%	0.90%	2.12%	3.27%	4.36%	5.40%
9	-0.41%	0.85%	2.04%	3.15%	4.21%	5.21%
10	-0.44%	0.80%	1.96%	3.05%	4.07%	5.03%
St. State	-3.36%	-2.66%	-1.97%	-1.30%	-0.63%	0.03%

TABLE 8: Nicaragua's Sustainable Primary Balance Path after Tax Reform*

	GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	-0.06%	1.42%	2.88%	4.31%	5.72%	7.10%
2	-0.07%	1.41%	2.84%	4.25%	5.62%	6.96%
3	-0.07%	1.39%	2.81%	4.18%	5.52%	6.83%
4	-0.07%	1.37%	2.77%	4.12%	5.43%	6.70%
5	-0.07%	1.36%	2.74%	4.06%	5.34%	6.57%
6	-0.08%	1.34%	2.70%	4.01%	5.26%	6.45%
7	-0.08%	1.33%	2.67%	3.95%	5.17%	6.34%
8	-0.08%	1.32%	2.64%	3.90%	5.09%	6.23%
9	-0.08%	1.30%	2.61%	3.85%	5.02%	6.12%
10	-0.09%	1.29%	2.58%	3.80%	4.94%	6.02%
St. State	-0.82%	-0.09%	0.62%	1.32%	2.00%	2.68%

Note: Each cell shows the sustainable primary deficit given a tax reform which is expected to collect 2.5% of GDP in year one. For instance, assuming a 4% GDP growth a primary deficit of 2.88% of GDP in year 1 is equivalent to a primary deficit of 0.38% of GDP if the tax reform was not implemented.

TABLE 9: Non-Financial Public Sector Balance in Honduras: 1995-2001
(Percentage of GDP)

	1995	1996	1997	1998	1999	2000	2001*
A. Total Current Revenues	30.3	30.2	29.4	31.8	33.0	31.5	31.8
B. Total Current Expenditures	23.1	23.6	22.8	22.9	23.0	25.2	27.1
C. Overall Balance Before Grants	-3.9	-2.9	-1.0	2.9	0.8	-1.8	-3.0
D. Overall Balance After Grants	-3.2	-2.0	-0.1	3.5	2.6	-0.3	-1.5
E. Primary Surplus After Grants	2.5	3.2	4.9	7.3	5.0	1.9	0.5

* Preliminary.
Source: BCH.

Table 10: Parameter Values Used in Honduras' Sustainability Exercises

Parameter	Symbol	Assumed Value	Comments and Sources
Initial Concessional debt to GDP ratio	(DC_0 / Y_0)	54%	Taken from BCH and from Secretaría de Finanzas
Initial Domestic debt to GDP ratio	(DD_0 / Y_0)	3%	Taken from different official documents
Rate of accumulation of concessional debt going forward	θ	Different assumptions, depending on the scenario being considered.	Some scenarios assume that even in the steady state Honduras has a considerable debt to GDP ratio; other assume that in the very long run Honduras graduates from concessional assistance.
Rate of accumulation of domestic and (or) non-concessional debt	β	$\geq (g + \pi^*)$	Assumes that initial ratio is maintained or that it increases as it replaces concessional debt
Rate of growth of nominal GDP in US dollars	$(g + \pi^*)$	We assume several alternative values for real growth (g), ranging from 2% to 7%; we assume a rate of US inflation of 2.5% per year.	The sustainable path of the primary balance will critically depend on the growth assumptions.
Interest rate on concessional funds	r^C	3.0%	Taken from projections made by IDA and IMF
Interest rate on commercial funds	r^D	10%	Taken from long term trends and based on comparable countries
Monetary base to GDP ratio	(B_0 / Y_0)	0.08	Actual ratio in 2001
Domestic rate of inflation	π	8.5%	The baseline case considers 8.5%.

TABLE 11: Honduras' Sustainable Primary Balance Path Under Alternative Scenarios*

SCENARIO A
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	-0.87%	-0.74%	-0.62%	-0.50%	-0.37%	-0.25%
2	-0.80%	-0.66%	-0.52%	-0.39%	-0.25%	-0.12%
3	-0.73%	-0.58%	-0.43%	-0.29%	-0.14%	0.00%
4	-0.67%	-0.51%	-0.35%	-0.19%	-0.04%	0.11%
5	-0.61%	-0.44%	-0.27%	-0.11%	1.31%	2.89%
6	-0.56%	-0.37%	0.57%	2.58%	3.10%	3.33%
7	-0.50%	0.69%	2.22%	2.44%	2.63%	2.79%
8	0.00%	1.71%	1.89%	2.06%	2.19%	2.31%
9	1.28%	1.45%	1.59%	1.70%	1.79%	1.86%
10	1.08%	1.20%	1.30%	1.37%	1.42%	1.45%
St. State	-1.42%	-0.91%	-0.41%	0.08%	0.57%	1.04%

SCENARIO B
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	0.42%	0.54%	0.65%	0.76%	0.87%	0.98%
2	0.43%	0.54%	0.66%	0.77%	0.88%	1.00%
3	0.43%	0.55%	0.67%	0.78%	0.90%	1.01%
4	0.44%	0.56%	0.68%	0.79%	0.91%	1.03%
5	0.44%	0.57%	0.69%	0.80%	0.92%	1.04%
6	0.45%	0.57%	0.69%	0.81%	0.93%	2.55%
7	0.45%	0.58%	0.70%	0.82%	2.88%	3.43%
8	0.46%	0.58%	0.71%	2.46%	2.92%	3.03%
9	0.46%	0.59%	1.26%	2.51%	2.59%	2.65%
10	0.47%	0.60%	2.19%	2.25%	2.28%	2.29%
St. State	-1.42%	-0.91%	-0.41%	0.08%	0.57%	1.04%

Table 11 (Continuation)

SCENARIO C
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	0.94%	1.30%	1.66%	2.01%	2.36%	2.71%
2	0.94%	1.30%	1.65%	1.99%	2.33%	2.65%
3	0.94%	1.29%	1.63%	1.97%	2.29%	2.61%
4	0.93%	1.28%	1.62%	1.94%	2.26%	2.56%
5	0.93%	1.27%	1.60%	1.92%	2.22%	2.51%
6	0.93%	1.27%	1.59%	1.90%	2.19%	2.47%
7	0.93%	1.26%	1.58%	1.87%	2.16%	2.43%
8	0.92%	1.25%	1.56%	1.85%	2.13%	2.38%
9	0.92%	1.25%	1.55%	1.83%	2.10%	2.34%
10	0.92%	1.24%	1.54%	1.81%	2.07%	2.57%
St. State	-1.42%	-0.91%	-0.41%	0.08%	0.57%	1.04%

SCENARIO D
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
2	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
3	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
4	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
5	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
6	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
7	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
8	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
9	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
10	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%
St. State	1.46%	2.07%	2.68%	3.27%	3.86%	4.43%

* A positive number means that the country is able to run a primary deficit. For details on the computations, see the discussion in the text and the equations in Table 2.

TABLE 12: Evolution of Honduras' Concessional Debt to GDP Ratio Under Alternative Scenarios*

SCENARIO A
Rate of real GDP growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	54.00	54.00	54.00	54.00	54.00	54.00
2	51.65	51.15	50.66	50.17	49.70	49.24
3	49.40	48.45	47.52	46.62	45.74	44.89
4	47.25	45.89	44.58	43.32	42.10	40.93
5	45.20	43.47	41.82	40.25	38.75	37.32
6	43.23	41.17	39.23	37.40	35.67	34.03
7	41.35	39.00	36.80	34.75	32.83	31.03
8	39.55	36.94	34.52	32.29	30.21	28.29
9	37.83	34.99	32.38	30.00	27.81	25.79
10	36.18	33.14	30.38	27.87	25.59	23.52
St. State	0.00	0.00	0.00	0.00	0.00	0.00

SCENARIO B
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	54.00	54.00	54.00	54.00	54.00	54.00
2	52.94	52.43	51.92	51.43	50.94	50.47
3	51.90	50.90	49.93	48.98	48.06	47.17
4	50.89	49.42	48.01	46.65	45.34	44.08
5	49.89	47.98	46.16	44.43	42.77	41.20
6	48.91	46.58	44.38	42.31	40.35	38.50
7	47.95	45.22	42.68	40.30	38.07	35.98
8	47.01	43.91	41.04	38.38	35.91	33.63
9	46.09	42.63	39.46	36.55	33.88	31.43
10	45.18	41.39	37.94	34.81	31.96	29.37
St. State	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 12 (Continuation):

SCENARIO C
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	54.00	54.00	54.00	54.00	54.00	54.00
2	53.46	53.19	52.94	52.68	52.43	52.19
3	52.92	52.40	51.89	51.40	50.91	50.44
4	52.39	51.62	50.87	50.14	49.44	48.75
5	51.86	50.85	49.87	48.92	48.00	47.12
6	51.34	50.09	48.89	47.73	46.61	45.54
7	50.83	49.34	47.92	46.56	45.26	44.01
8	50.32	48.61	46.98	45.43	43.95	42.54
9	49.81	47.88	46.05	44.32	42.68	41.11
10	49.31	47.17	45.15	43.24	41.44	39.74
St. State	0.00	0.00	0.00	0.00	0.00	0.00

SCENARIO D
Rate of real GDP Growth

Year	2.00%	3.00%	4.00%	5.00%	6.00%	7.00%
1	54.00	54.00	54.00	54.00	54.00	54.00
2	54.00	54.00	54.00	54.00	54.00	54.00
3	54.00	54.00	54.00	54.00	54.00	54.00
4	54.00	54.00	54.00	54.00	54.00	54.00
5	54.00	54.00	54.00	54.00	54.00	54.00
6	54.00	54.00	54.00	54.00	54.00	54.00
7	54.00	54.00	54.00	54.00	54.00	54.00
8	54.00	54.00	54.00	54.00	54.00	54.00
9	54.00	54.00	54.00	54.00	54.00	54.00
10	54.00	54.00	54.00	54.00	54.00	54.00
St. State	54.00	54.00	54.00	54.00	54.00	54.00

* In these computations we have used Honduras' official GDP figures. For details on the computations see the text and the equations in Table 2.

Table 13: Extensions and Sensitivity Analysis: Sustainable Primary Balance to GDP Ratio*
(Scenario C)

A: INCREASE IN COMMERCIAL DEBT FROM 43% TO 53%

	Rate of real GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	0.94%	1.30%	1.66%	2.01%	2.36%	2.71%
2	0.94%	1.30%	1.65%	1.99%	2.33%	2.65%
3	0.94%	1.29%	1.63%	1.97%	2.29%	2.61%
4	0.93%	1.28%	1.62%	1.94%	2.82%	3.81%
5	0.93%	1.27%	1.73%	3.00%	3.60%	4.02%
6	0.93%	1.27%	2.56%	2.98%	3.38%	3.76%
7	0.93%	1.92%	2.43%	2.81%	3.17%	3.51%
8	0.92%	1.92%	2.30%	2.65%	2.97%	3.26%
9	1.11%	1.83%	2.17%	2.48%	2.77%	3.02%
10	1.40%	1.74%	2.05%	2.33%	2.57%	2.79%
St. State	-1.95%	-1.34%	-0.74%	-0.15%	0.43%	1.00%

B: COST OF DOMESTIC DEBT AT 15%

	Rate of real GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	0.80%	1.16%	1.52%	1.88%	2.22%	2.57%
2	0.79%	1.15%	1.51%	1.85%	2.19%	2.52%
3	0.79%	1.15%	1.49%	1.83%	2.15%	2.47%
4	0.79%	1.14%	1.48%	1.80%	2.12%	2.42%
5	0.79%	1.13%	1.46%	1.78%	2.08%	2.38%
6	0.78%	1.12%	1.45%	1.76%	2.05%	2.33%
7	0.78%	1.12%	1.44%	1.74%	2.02%	2.29%
8	0.78%	1.11%	1.42%	1.71%	1.99%	2.25%
9	0.78%	1.10%	1.41%	1.69%	1.96%	2.21%
10	0.77%	1.10%	1.40%	1.67%	1.93%	2.43%
St. State	-3.48%	-2.95%	-2.43%	-1.92%	-1.42%	-0.92%

*For details on the computations, see the discussion in the text.

TABLE 13 (Continuation)

C: INITIAL DOMESTIC DEBT IS 13% OF GDP

	Rate of real GDP Growth					
Year	**2.00%**	**3.00%**	**4.00%**	**5.00%**	**6.00%**	**7.00%**
1	0.41%	0.88%	1.33%	1.78%	2.22%	2.66%
2	0.41%	0.87%	1.32%	1.76%	2.19%	2.61%
3	0.41%	0.86%	1.30%	1.73%	2.15%	2.56%
4	0.41%	0.85%	1.29%	1.71%	2.12%	2.51%
5	0.40%	0.85%	1.27%	1.69%	2.08%	2.47%
6	0.40%	0.84%	1.26%	1.66%	2.05%	2.42%
7	0.40%	0.83%	1.25%	1.64%	2.02%	2.38%
8	0.40%	0.83%	1.23%	1.62%	1.99%	2.34%
9	0.39%	0.82%	1.22%	1.60%	1.96%	2.30%
10	0.39%	0.81%	1.21%	1.58%	1.93%	2.52%
St. State	-1.95%	-1.34%	-0.74%	-0.15%	0.43%	1.00%

APPENDIX:

Debt Relief and Current Account Sustainability: An analytical Framework

A key requirement of the HIPC initiative is that, once debt relief is granted, the beneficiary country achieves macroeconomic "sustainability" and, thus, will not request a new round of debt forgiveness in the future. Generally speaking, macroeconomic sustainability has two key elements: (1) fiscal sustainability, defined as maintaining a primary balance consistent with a stable public sector debt to GDP ratio; and (2) current account sustainability, defined as a situation where the current account balance is consistent with solvency. This latter requirement, in turn, means that the current account balance is consistent with a stable the ratio of "external debt to GDP (Milesi-Ferreti and Razin 1996)." Analyses of current account sustainability have become particularly popular among investment banks and other market participants. For instance, private sector analysts interested in assessing emerging nations' vulnerability have used Goldman-Sachs GS-SCAD Model developed in 1997 extensively. More recently, Deutsche Bank (2000) has developed a model of current account sustainability both to analyze whether a particular country's current account is "out of line," and to evaluate the appropriateness of its real exchange rate.

In this Appendix we developed a model of current account sustainability for a poor country. It is assumed that this country has two types of external debt: (a) concessional debt, at a subsidized rate of interest; and (b) debt on commercial terms. Moreover, the model assumes that the country receives a substantial flow of remittances from migrant workers, and that there also are significant grants and donations from NGOs and other type of organizations. Also, we assume that in the initial period – or period zero – a proportion of the country's concessional debt is forgiven. The model provides expressions for the sustainable path of the current account to GDP ratio, as well as for its steady state sustainable level. If the sustainable current account differs from the actual balance, the country in question will need to go through an adjustment process in order to reconcile the actual and sustainable balances. Under most circumstances this adjustment will

entail both expenditure reducing policies, as well as a real exchange rate realignment. Although no formal expression for the required real exchange adjustment is derived, we do provide a discussion of the main channels at work. The current account is said to be "sustainable" when it is consistent with solvency. Solvency, in turn, requires that the ratio of the (net) international demand for the country's liabilities (both debt and non-debt liabilities) stabilizes at a level compatible with foreigners' net demand for these claims on future income flows (Edwards 2002). The sustainability literature has focused, almost exclusively, on the long run (steady state) sustainable current account deficit. This emphasis, however, is not particularly useful in the context of the HIPC countries, where economic conditions – including the accessibility to concessional loans and to the private international capital market – are likely to change once the debt is forgiven. Nor is the emphasis on the steady state particularly helpful from a policy point of view. Indeed, policy makers are interested in understanding whether the economy is on a *sustainable path* at any particular moment in time. Moreover, from a political economy perspective, what matters is the type of adjustment – if any -- that the country will have to make in order to move towards, and remain on, a *sustainable current account path*. In the analysis that follows we assume that the initial period – or period zero – corresponds to the moment immediately after the country in question has been granted debt relief within the context of the enhanced HIPC initiative. The current account balance is defined as follows (a positive number refers to a current account deficit):

$$(1) \qquad cad_t = idpay_t + td_t - rem_t.$$

Where $idpay_t$ are net payments of interests, royalties and dividends; td_t is the trade balance (including non-financial services), and rem_t are net remittances received from abroad. In many emerging nations, grants and "donations" are included in the capital account. Equation (1) is measured in foreign exchange – U.S. dollars, say. By definition the current account deficit is equal to net capital inflows (or capital account balance) KF_t, minus the change in the stock of international reserves (ΔR_t): $KF_t = cad_t + \Delta R_t$. Net

capital inflows, in turn, may be broken up into several components: (a) Net changes in concessional debt, ΔDC; (b) net changes in international debt contracted on commercial terms, and issued both by the public and private sectors, ΔDE. (c) Net change in private portfolio investment, ΔP. (d) Net foreign direct investment flows, including net real estate purchases, FDI. And, (e) grants and donations by international aid organizations, including NGOs (don).

$$(2) \qquad KF_t = \Delta DC_t + \Delta DE_t + \Delta P_t + FDI_t + don_t = cad_t + \Delta R_t.$$

In order to derive the "sustainable" path of the current account through time it is necessary to obtain expressions for the sustainable evolution of its components. Of course, the dynamic behavior of these variables is constrained by the requirement that they converge to their long run desired and stable ratios.

Generally speaking, the international community's policy towards the provision of concessional funds may be captured by the following expression for the rate of growth of subsidized loans through time:

$$(3) \qquad d \ln DC_t = (\phi g + \pi^*).$$

where g is the rate of growth of real GDP in the recipient country, π^* is dollar inflation, and $0 \leq \phi \leq 1$. The actual trajectory of the sustainable path of the current account will depend strongly on the value of ϕ. This, in turn is a policy variable of the international community, and is exogenous to the HIPC countries. If $\phi = 0$, the international community is willing to maintain the real value of DC constant at the post HIPC level. In this case, however, no additional funds in *real terms* are provided. At the opposite end, $\phi = 1$ implies that the international donor community is willing to provide sufficient concessional funds as to maintain the DC to GDP (Y) ratio at the immediate post HIPC level. This is, however, an overly optimistic assumption, that ignores the fact that subsidized funds tend to decline as countries reach higher stages in the development process. This declining trend in the availability of concessional financing is captured by

ϕ smaller than one, but greater than zero. In what follows, and unless otherwise stated, we will assume that $0 < \phi < 1$.

The rate of growth of net commercial external debt ($d \ln DE_t$) is assumed to be the sum of two components:

$$(4) \qquad d \ln DE_t = \varphi_0 + \varphi_1(\{(DE/X)^* - (DE/X)_{t-1} \}).$$

Where the first component is $\varphi_0 = g + \pi^*$, and the second component is a function of the divergence between international investors' desired holdings of this country's debt, relative to its exports – denoted by $(DE/X)^*$ --, and their actual holdings in the previous period. An advantage of this formulation is that it allows for the possibility that the initial debt to exports ratio differs from the long run desired level. Naturally, once the steady state is achieved, $\{(DE/X)^* - (DE/X)_{t-1} \} = 0$, and the rate of growth of commercial terms external debt is equal to $\varphi_0 = g + \pi^*$.[37] Assuming that the degree of openness of the country, measured by the ratio of exports to GDP ($\chi = X/Y$) remains stable, the steady state rate of growth of DE is compatible with maintaining a stable debt to GDP ratio $(DE/Y)^*$. With regards to (net) portfolio flows, we follow a similar approach, and we assume that their evolution through time is governed by the following equation:

$$(5) \qquad d \ln P_t = \sigma_0 + \sigma_1 \{ ((P / X)^* - (P_{t-1} / X_{t-1})) \}.$$

Where, as in the case of commercial debt, $\sigma_0 = g + \pi^*$. In the steady state, $(P / X)^* = (P_{t-1} / X_{t-1})$, and the second term in equation (5) disappears. We assume that foreign direct investment *flows* behave according to the following dynamic equation:

$$(6) \qquad (FDI_t / X_t) = (FDI_{t-1} / X_{t-1}) + \kappa \{((FDI / X)^* - (FDI_{t-1} / X_{t-1})) \}.$$

[37] Naturally the analysis can be easily extended to the case where DE grows at a rate equal to a fraction of $g + \pi^*$.

That is, the *flow* of FDI converges in the long run to a desired ratio relative to exports. The speed of convergence is given by κ.[38] We assume that the monetary authorities have a well-defined demand for international reserves, and that their goal is to maintain a stable ratio of reserves to exports. That is, $d \ln R_t = \xi_0 + \xi_1 \{ ((R / X)^* - (R_{t-1} / X_{t-1})) \}$, and $\xi_0 = g + \pi^*$. With regards to grants and donations, we assume that they are exogenous.

After manipulating the equations presented above, it is possible to obtain an expression for the *sustainable path* of the current account deficit. In order to facilitate the comparison between the approach developed here and other models of current account sustainability, it is useful to express the sustainable path relative to GDP. Under the assumption of a stable degree of openness (χ), the path of the current account to GDP ratio is given by:[39]

$$(7) \quad (cad_t / Y_t) = \alpha (\phi g + \pi^*) (DC_0 / Y_0) e^{g(\phi - 1)(t-1)} + \alpha \chi \delta_{t-1} d \ln (DE_t) + \alpha \chi \rho_{t-1} d \ln (P_t) + + (FDI_t / Y_t) + (don / Y)_t - \chi d \ln (R_t).$$

Where (DC_0 / Y_0) is the concessional debt to GDP ratio in the period immediately after the debt is forgiven under the HIPC initiative. As before, g is the rate of growth of real GDP, π^* is the international (dollar) rate of inflation, α is equal to the inverse of $(1 + g + \pi^*)$, χ is the degree of openness of the economy measured as the exports to GDP ratio, δ is the ratio of domestic debt to export, and ρ is the ratio portfolio investments to exports. This equation clearly captures the importance of concessional financing in determining the sustainable path of the current account through time. If, as most HIPC studies implicitly or explicitly assume, after the debt is forgiven the country will continue to have substantial access to concessional financing, ϕ will be high. The limiting

[38] Notice that while the behavior of the other components of the capital account has been modeled in terms of stocks, we have used a "flow approach" to describe FDI behavior. The reason for this is that there is little information on the desired stock of FDI; on the other hand, there is abundant information on the determinants of the flow of FDI investment.

[39] It should be noted that the results obtained from this model refer to the current account deficit under the assumption that the country achieves a certain target rate of growth and a certain target rate of domestic inflation. In that sense these are conditional results are not the outcome of a general equilibrium exercise. This expression also assumes that the degree of openness, $\chi = X/Y$, is stable through time.

scenario occurs when ϕ is equal to one. In this case, the first right hand side term in equation (7) will exhibit no dynamics and will collapse to $\alpha (g + \pi^*) (DC_0 / Y_0)$, an expression that is familiar from simple, static models of sustainability. In this case, which may be labeled as "optimistic," the concessional debt to GDP ratio achieved immediately the HIPC initiative (in period 0) is maintained indefinitely. If, alternatively, it is assumed that ϕ is smaller than one (but greater than zero), DC will increase in real dollar terms, while at the same time the DC to GDP ratio would decline through time. In the steady state long run, the concessional debt to GDP ratio (DC / Y) will converge to zero, playing no role in long run sustainability. This is, indeed, a more realistic scenario, and one that is consistent with the nature of the development process countries' accessibility to subsidized official financing tends to decline as GDP grows. In the analysis that follows we will concentrate on the case where $0 \leq \phi < 1$. Equation (7) indicates that the sustainable path of the current account will also depend on the evolution of commercial debt, portfolio investment, grants and on reserves policy. For each of these variables there are three important determinants of their short term behavior: (a) their initial value; (b) the long run desired ratio relative to exports; and (3) the speed of adjustment. Finally, the sustainable path of the current account also depends strongly on the real rate of growth of GDP: the higher the growth rate, the larger is the sustainable deficit. This simple result suggests that being overly optimistic about the future performance of the economy will tend to result in an underestimation of the external effort required to achieve sustainability. Edwards and Vergara (2001) have argued that this is the case in many HIPC-related exercises.[40]

In long run equilibrium, and under the assumptions of a stable degree of openness (χ) and of $0 \leq \phi < 1$, the steady state sustainable current account deficit will be given by:[41]

$$(8) \qquad (cad / Y)^* = (DE/X)^* \chi (g + \pi^*) \alpha + \chi (FDI/X)^* +$$

[40] Naturally, in the final analysis the rate of growth is an endogenous variable, and will depend on the nature and depth of the debt forgiveness program. Endogenizing the rate of growth is, however, beyond the objectives of the current paper.

$$(P/X)^* \chi \ (g + \pi^*) \alpha - (g + \pi^*) \chi \ (B/X)^* + \chi \ (don / X).$$

Notice that in the framework developed here – and more specifically, in equations (7) and (8) – interest rates appear to play no role in on long run sustainability. The reason for this, of course, is that this analysis has focused on the *current account* and not on the *trade balance*. Interest rates (and dividend flows) play a key role, however, in determining the *trade balance* consistent with a specific sustainable current account path. In Section III I discus in some detail the role of interest rates in assessing broadly defined external sustainability in Nicaragua.

The analysis developed in this section may be interpreted as a more general version of the one taken by other studies on current account sustainability, including the works of Milesi-Ferreti and Razin (1998, 2000), Goldman-Sachs (1998), Edwards (2002) and Deutsche Bank (2000). More specifically, the model presented here differs from traditional analyses in the following respects: First, it explicitly considers the existence of two types of external debt: concessional and commercial. In the longer run, however, the ratio of subsidized debt to GDP converges to zero. Second, the model developed here explicitly considers the existence of a well-defined demand for international reserves. Third, this model assumes that a sizable proportion of the country's concessional debt is forgiven within the context of the HIPC initiative. Fourth, it allows for a key role for grants and donations. Fifth, the approach developed in this paper explicitly considers remittances as an important source of capital account financing. And sixth, the current analysis puts particular emphasis on the transitional sustainable path of the current account balance.

From a policy analysis point of view, a useful exercise is to compare the sustainable primary balance that emerges from the model's simulation with the actual balances during the last few years. This comparison will provide some guidelines on the type of external adjustment – if any – that the country in question will have to undertake after the HIPC-sponsored debt relief is granted. In particular, this type of exercise will

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[41] If we assume a positive (DC / Y) in the longer run, equation (6) will have to be adjusted accordingly. This is simple, ands amounts to adding the term $(DE/Y)^* (g + \pi^*) \alpha$ to the right hand side of this equation.

provide useful information in studies that assess the possible need for real exchange rate adjustments in the future.[42]

[42] For a recent discussion on debt relief under HIPC see Birdsall and Williamson (2002).

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TABLE A.1: Overall Debt, Domestic Debt and External Debt in Selected HIPC Countries: End of 2001

	Overall debt	Domestic debt	External debt
Burkina Faso	76.8	13	63.8
Cameroon	93.2	15.6	77.6
Gambia	161.8	33.6	128.2
Guyana	261.2	84.3	176.9
Honduras	67.3	3.2	64.1
Madagascar	5.0	5.0	106.4
Niger	97.6	10.4	87.2
Rwanda	176.9	1.0	175.9
Sao Tome	618.4	0.4	618
Senegal	9.9	9.9	n.a.
Uganda	68.8	5.2	63.6
Average	158.5	16.5	156.2

Source: IMF Staff estimates

n.a.: Not available.