Debt and Deficits: Colombia's Unsustainable Fiscal Mix

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ABSTRACT

This paper presents an overview of recent fiscal history in Colombia, and it projects the future course of fiscal deficits and the debt-to-GDP ratio under several different budgetary scenarios. Our projections, which are based on the macroeconomic and fiscal models developed at the Ministry of Finance and Public Credit, suggest that the current path of fiscal policy is not sustainable. Substantial increases in the government's fiscal surplus are needed in order to return to a regime in which the debt-to-GDP ratio will stabilize in several decades. Our base case analysis suggests that stabilizing the debt-to-GDP ratio at 45 percent by the year 2030 would require a 1.8 percent of GDP reduction in the fiscal deficit, effective immediately. This assumes that the social security reforms introduced in the last Congress are enacted. If they are not, the required adjustment in the fiscal deficit is several percentage points greater.

The debt-to-GDP ratio in Colombia has risen sharply in the last decade, raising concerns about the long-run sustainability of fiscal policy. This comes after decades of relative debt stability, when Colombia was one of the most fiscally prudent nations in Latin America. Throughout the 1990s, substantial deficits for the consolidated public sector contributed to rising levels of public debt. In 1994, gross debt of the consolidated public sector amounted to 16.6 percent of GDP. By 1997, the debt had grown to 37.2 percent of GDP, and in 2001, it reached 64.5 percent. Net debt, gross debt less the financial assets of the public sector, also increased throughout this period. It reached 46 percent of GDP in 2001. Growth in the debt-to-GDP ratio at rates like those experienced in recent years cannot continue indefinitely. Eventually, the debt will reach a level at which lenders are unwilling to extend additional credit, and the country will face a financial crisis.

This paper investigates the magnitude of the fiscal policy adjustments that are needed to place Colombia on a sustainable fiscal path. Sustainable paths are ones that lead to long-run convergence of the debt-to-GDP ratio. There are many sustainable paths, corresponding to different levels of this steady-state ratio. All require a substantial reduction in the consolidated government deficit relative to current levels. Given the uncertainty of long-term projections of tax revenues and public sector outlays, and the sensitivity of such projections to assumptions about economic growth rates, the time path of petroleum revenues, and the need for future expansion of domestic security spending, calculations related to sustainability are imprecise. Nevertheless, our base case analysis suggests that stabilizing the debt-to-GDP ratio at 45 percent would require a 1.8 percent of GDP reduction in the fiscal deficit, effective immediately.

Our study is hardly the first to address the sustainability of Colombian fiscal policy, or to explore the impact of growing public sector indebtedness. Most of the recent studies conclude that the current fiscal posture is not sustainable, while studies done in the late 1980s and early 1990s are more optimistic. The most recent study we are aware of is Clavijo (2002). It finds that a three percent of GDP increase in government saving is needed to stabilize the debt-to-GDP ratio at roughly 50 percent. Posada and Arango (2000) found that debt could be stabilized if the current fiscal regime were

replaced with one in which the consolidated government ran a primary surplus of roughly 1.5 percent of GDP. An earlier study by the Commission for the Rationalization of the Public Expenditure and Finances (1997), using data that ended in the mid-1990s, concluded that stabilizing the public debt at a thirty year horizon would require annual primary surpluses of four percent of GDP.

Other studies have investigated the recent growth in public sector debt and tried to account for this pattern. For example, Herrera (2000) evaluated Colombia's debt policy in the framework developed in Barro (1979). He found that public debt has served the purpose of smoothing transitory fluctuations in the GDP and public expenses, although the marginal tax rate had not remained stable as the Barro (1979) model suggested. Correa (2000) found that public indebtedness had reduced macroeconomic stability since the beginning of the 1990s, in particular by increasing the cost of the fiscal crisis of 1998-9 and raising the volatility of interest rates. Arbeláez et.al. (2002) and Caballero (2002) discuss the interaction between government borrowing and other credit markets, and note that the growing supply of public debt may have affected the size and depth of other credit markets.

This paper uses detailed revenue and expenditure models developed in conjunction with the Ministry of Finance to evaluate the sustainability of current fiscal policies. The paper is divided into five sections. The first describes the recent fiscal history of Colombia, and highlights the shift from fiscal policies that were roughly in balance, to policies with sustained structural deficits, in the early 1990s. Section two explains the concept of debt sustainability, and discusses alternative ways to evaluate whether a debt load is sustainable. It also evaluates the sustainability of fiscal policy in a simplified model that focuses on steady-state relationships. Section three describes a more detailed model that we use to determine whether a fiscal policy is sustainable. This model relies on projections and scenarios that have been developed by CONFIS. This section then shows that the continuation of current structural deficits will lead to a rising debt-to-GDP path, which will eventually become unsustainable. We then calculate the reduction in the current deficit that is needed to achieve sustainability, and discuss several factors that our results are likely to be sensitive to. Section four examines the cost of deferring fiscal adjustment, and shows that even waiting five years before

reducing the structural deficit makes it much more difficult to restore long-term stability in the debt-to-GDP ratio. There is a brief conclusion that discusses institutional issues that may affect fiscal reform, as well as broader issues associated with reform.

1. Setting the Stage: Colombian Fiscal Policy 1990-2002

The recent deterioration of Colombian fiscal policy is attributable in part to a recession, but the decline that has taken place over the last decade can be attributed to several tax and expenditure reforms. Tables 1 and 2 present summary information on aggregate revenue and expenditures by the central national government (Table 1) and the non-financial public sector (NFPS, Table 2), along with disaggregate information for several categories of expenditure and taxation. The aggregate expenditure of the NFPS grew from 33 percent of GDP in 1990, to 37 percent in 1994, to 52 percent in 2001. Slightly more than half of this 19 percentage point increase was due to rising expenditure by the central government; its outlays rose from 9.5 percent to 20 percent of GDP between 1990 and 2001. Interest payments rose from 1.1 to 4 percent of GDP, and transfers increased from 4.2 to 10.7 percent of GDP. Expenditures of territorial entities increased from 1.6 to 4.2 percent of GDP during this period, further contributing to the growth of the public sector.

Between 1990 and 2001, NFPS expenditure rose by 19 percentage points of GDP. However, total tax revenues rose only from 12.4 percent of GDP in 1990 to 18.2 percent in 2000. Most of the growth in revenue was due to an increase in contributions to social security, which rose from one percent of GDP in 1990 to 2.7 percent in 2000. These revenues peaked at 3.5 percent of GDP in 1996. Tax revenues from the various departments dropped from 1.1 percent of GDP in 1990 to a negligible level in 2000, while revenues from municipalities grew from 1.0 to 1.9 percent of GDP. These statistics suggest that transfers to the territorial entities and rising expenditures for social security were key factors contributing to the imbalance in the Colombian public finances of the 1990s.

The cash fiscal balance, defined as total outlays less total revenues and net borrowing, has shown a deficit since 1995. Graph 1 shows the primary balance of both the central government and the NFPS for the period beginning in 1990. The deficit peaked in 1999, at 6.2 percent of GDP for the

NFPS and 6.8 percent for the Central National Government. A stronger economy in 2000 and 2001 led to some recovery in fiscal positions. The primary surplus of the NFPS was 0.9 percent of GDP in 2001. One consequence of rising debt levels and ongoing deficits has been an increase in the real interest rate at which the government borrows. Rising real interest rates make the problem of finding a sustainable fiscal policy worse, since they imply a higher interest burden for a given level of debt.

The recent emergence of substantial government deficits has led to a significant growth in government debt. We follow CONFIS (2002) in focusing on the net financial debt of the public sector. In December 2001, net financial debt was $87.2 billion, or 46 percent of GDP. At the same time, gross debt of the Non-Financial Public Sector was $120.8 billion, or 63.3 percent of GDP. Both measures of debt increased substantially in the period after 1990. Our analysis focuses on net debt, since it reflects the true indebtedness of the public sector. The net debt measure would be even better if the gross debt component included information on the government's implicit liabilities, for example those deriving from guarantees of deposits of insolvent banks or the social security system.

There have been several attempts to reverse the deteriorating fiscal position of the 1990s. Six tax reforms have been implemented since 1990, but sluggish economic growth has made it difficult to return the economy to a sustainable fiscal path. Two institutional factors have hampered the return to sustainability. One is the constitutional requirement that transfers to territorial entities represent nearly fifty percent of the central government's revenue. A second impediment to reaching a sustainable policy is the requirement that social expenditures should increase yearly, particularly spending on transfers and Social Security. This increase is required regardless of the state of the economy, so it is particularly burdensome in times of recession.

The latest attempt at fiscal adjustment took place in mid-2002, when Colombia was temporarily excluded from the global credit market. To place this experience in context, it is helpful to recall that in 1999 Colombia signed an agreement with the IMF in which the government committed to fiscal adjustment for a three year period, i.e. until 2002. The fiscal deficit targets for the total public sector were set as 3.6 percent of GDP in 2000, 2.5 percent in 2001 and 1.5 percent in 2002. These

goals were met in the first two years, but in 2002 the deficit for the non-financial public sector rose to 4.4 percent of GDP, well above the target.

The central government was primarily responsible for the failure to meet the target for 2002, since its deficit was 6.5 percent of GDP. This was partly offset by a surplus of 2.1 percent of GDP in the decentralized entities. The source of the central government deficit, in turn, was a combination of slower than expected growth in revenues and rapid expenditure growth. The Colombian economy grew 1.5 in 2002, while it had been projected to grow at 3.5 percent. In addition, total expenditures were 21.3 percent of GDP, substantially higher than the 19.2 percent target that had been set in the IMF agreement, and representing an increase from the 20.9 percent of GDP level in 2001.

Colombia was effectively excluded from both external and internal debt markets in the first half of 2002. The government of Colombia called for the support of the IMF and initiated negotiations for a new fiscal agreement. This process was still underway at the end of 2002. The government of Colombia proposed a fiscal adjustment package for 2003 and 2004 that was designed to ensure fiscal stability in the medium and long term. The government proposal also included more conservative assumptions about the future path of GDP growth, as well as commitments regarding inflation and external indebtedness. The government's proposal assumes GDP growth rates for 2002, 2003, and 2004 of 1.6 percent, 2.0 percent, and 3.3 percent, respectively. The goals for the consolidated public sector deficit are 4 percent in 2002, 2.4 percent in 2003, and 2 percent in 2004. Since the central government experienced a primary deficit of 1.4 percent of GDP in 2002, if the entire 2 percent of GDP fiscal adjustment by 2004 were carried out by the central government, it would lead to a primary balance of 0.1 percent of GDP in 2003, and 0.6 percent of GDP in 2004. The calculations we present below suggest that a move to a central government primary surplus of roughly 2 percent of GDP would be needed to stabilize the debt-to-GDP ratio at about 50 percent.

The package that was proposed in the IMF discussions of 2002 included tax reform, pension reform, the adoption of a fiscal responsibility law, and a referendum mechanism for reducing expenditures. The announcement of the reform package had a dramatic effect on Colombia's

borrowing costs, and restored the government's access to credit markets. The yield spread on Colombian debt peaked at 1120 basis points in September 2002, but it declined to just over 700 basis points after the adjustment package was announced and the tax and pension reforms were proposed to Congress.

Support from multilateral organizations was critical in avoiding a fiscal crisis in 2002. However, this support was conditioned on making substantial and immediate fiscal adjustment. We show in a later section that if fiscal adjustment is delayed, net debt could easily rise from 50 percent of GDP in 2002 to close to 66 percent in 2005. Markets would almost surely force a debt crisis before the debt reached that level. The 2002 experience suggests that debt levels much higher than fifty percent of GDP are effectively impossible.

2. The Concept of Sustainability

There are many possible definitions of what constitutes a "sustainable" level of government debt. At the most general level, macroeconomic theory imposes only relatively weak constraints on debt levels. As long as it is possible to find a path of future fiscal actions that, in conjunction with the current debt level, generate finite values of the discounted value of the government debt in all future periods, the current debt level is sustainable. One implication of this requirement is that, over long periods, the government cannot increase its debt faster than the real interest rate on this debt, although it is possible for the government debt to rise over time. Another way to interpret the implications of the intertemporal budget constraint is to say that the present discounted value of primary fiscal balances should be at least equal to the initial public debt. If a government is initially running primary deficits and has a stock of initial debt, it needs to run primary surpluses at some future date in order for the debt to be sustainable.

One difficulty with this theoretical definition of sustainability is that it implies that that a country could run very large primary deficits for a very long time if it could credibly commit to run primary surpluses in the long run. The future primary surpluses would satisfy the condition that the discounted value of primary balances is at least equal to the initial public debt. Such a path is

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unrealistic since the government may not be able to commit to such a path. Moreover, such a path would be very costly to pursue given the distortionary nature of taxation, and it may be difficult to sharply cut government spending at some future date after a long period of generous expenditure.

A more practical criterion for sustainability is that the ratio of public debt to GDP is non-increasing. In a country where the public debt to GDP ratio is growing, the "primary gap" is the difference between the fiscal primary balance and the primary balance required to stabilize the debt to GDP ratio. Such required primary balance will involve a larger surplus if the current public debt to GDP ratio is higher, and it will also be larger if the differential between the real interest rate and the growth rate of the economy is larger.

The current debt-to-GDP ratio is considered sustainable if it is possible to stabilize the debt-to-GDP ratio over the medium term. In this sense, a debt to GDP ratio of 150 percent is as sustainable as a debt to GDP ratio of 50 percent. In practice, the goal of debt stabilization may not be realistically achievable if the initial level of the debt is too high. Stabilizing the debt to GDP ratio might require cuts in government spending, or increases in taxes, that are not economically or politically feasible.

Much of our analysis uses the intertemporal budget constraint to track the evolution of the debt to GDP ratio under different fiscal policy paths. To formalize our analysis, we define b_t as the debt-to-GDP level at time t, γ_t as the ratio of government spending to GDP, τ_t as the ratio of tax revenue to GDP, r as the real interest rate, and g as the GDP growth rate. We assume for purposes of exposition that r and g are constant through time, but the basic sustainability analysis generalizes easily to the time-varying case. Note that $(\gamma_t - \tau_t)$ is the primary deficit as a fraction of GDP.

The equation of motion for the debt-to-GDP ratio, b_t, is:

(1) $\qquad b_t = [(1+r)/(1+g)]*b_{t-1} + (\gamma_t - \tau_t).$

If we take an initial debt level, b_0, as given, and we use (1) to solve for b_t as a function of this initial debt and the subsequent path of expenditures and taxes, we find

(2) $\qquad b_t = [(1+r)/(1+g)]^t*b_0 + \Sigma_j(\gamma_t - \tau_j)* [(1+r)/(1+g)]^{t-j-1}.$

Equation (1) can be used to find the primary balance that is required to stabilize the debt to GDP ratio at its current level. If $b_t = b_{t-1}$, then

(3) $[1 - (1+r)/(1+g)]* b_t \cong (g - r)*b_t = (\gamma_t - \tau_t)$.

This is a familiar condition. It is only possible for the government to run chronic fiscal deficits, and to make the current debt sustainable, if the growth rate of the economy exceeds the real interest rate. In the more usual case with r greater than g, sustaining the initial debt stock requires a primary surplus. In particular, taxes as a share of GDP must exceed expenditures as a share of GDP by the initial debt-to-GDP ratio, multiplied by the difference between the real interest rate and the growth rate. The primary gap is defined as the difference between the actual value of $(\gamma_t - \tau_t)$ and the value that would stabilize the debt, i.e. $(g - r)*b_t$.

Equation (2) allows us to project the future course of debt relative to GDP. By assuming an initial debt stock and an assumed subsequent path of fiscal policy, we can iterate (2) forward and compute the projected debt-to-GDP ratio implied by the given fiscal path. We do this to evaluate the debt-to-GDP path associated with various fiscal policies.

We can also use (2) by defining a debt-to-GDP target for a future date, b^*_t, and then ask how much fiscal adjustment is necessary to achieve this target. There are many such adjustment policies. If we use $\{a_j\}$ to denote a time series of fiscal adjustments, then such an adjustment policy will satisfy the debt target whenever

(3) $b^*_t = [(1+r)/(1+g)]^t*b_0 + \Sigma_j (\gamma_t - \tau_j - a_j)* [(1+r)/(1+g)]^{t-j-1}$.

We focus on the particular set of fiscal adjustments that make a constant change in the primary surplus as a share of GDP. If this adjustment is labeled a*, then

(4) $b^*_t = [(1+r)/(1+g)]^t*b_0 + \Sigma_j (\gamma_t - \tau_j - a^*)* [(1+r)/(1+g)]^{t-j-1}$.

We can solve for a*, which yields:

(5) $a^* = \{[(1+r)/(1+g)]^t*b_0 - b^*_t + \Sigma_j (\gamma_t - \tau_j)* [(1+r)/(1+g)]^{t-j-1}\}/\Sigma_j [(1+r)/(1+g)]^{t-j-1}$.

The fiscal adjustment a* is the amount of improvement in the primary fiscal surplus that is needed in every year between time 0 and time t to ensure that, starting from debt level b_t, the debt level in period t is b^*_t.

The foregoing discussion of the primary surplus, real interest rate, growth rate, and debt level enable us to calculate the fiscal adjustment necessary to stabilize the Colombian net public debt to GDP ratio to its expected end-of-year 2002 level of 50 percent. The calculations that we present assume that the real economy is in a steady state, so that growth rates and real interest rates will remain constant throughout the future. We relax this assumption in the next section.

Consider the case of a permanent growth rate equal to 3.0 percent and a permanent real interest rate of 7.5 percent. Since (r-g) equals 4.5 percent in this case, the required primary surplus to stabilize the debt ratio is 2.25 percent of GDP. Table 3 presents similar calculations for a range of different values of r-g. If (r-g) were lower than our benchmark value of 4.5 percent, say instead 2.5 percent as it would be if we assumed the same GDP growth and a permanent real interest rate of 5.5 percent, the required primary surplus would equal 1.3 percent of GDP. If the (r-g) differential were higher, say 6 percent, as it would be with the same GDP growth and a permanent real interest rate of 9.5 percent, then required primary surplus would be equal to 3.3 percent of GDP.

3. Analyzing Sustainability in Medium-Term Models

We now move beyond steady-state analysis to examine the sustainability of Colombian fiscal policy using data and models provided by various government ministries. Our expenditure projections were constructed with advice from the Technical Vice-Ministry of Finance and CONFIS, and with support from the DNP. We develop different scenarios and use them to evaluate the medium- and long-term evolution of government finances. We focus on estimating the adjustments to the primary balance that are needed to stabilize the debt/GDP level at various targets. The models that we analyze assume a path of economic growth rates, and then calculate the effect of various fiscal policy options. A richer framework could allow for feedback effects from fiscal policy to the rate of economic growth.

Because the growth rate is exogenous, there may be some inconsistencies between some of the variables in the scenarios that we analyze. Our debt projections include the cost of meeting payments on the current debt, as well as the additional debt that will be needed to finance future deficits.

Our findings are sensitive to the assumptions that we make about the initial level of the public debt, and to the pattern of required payments on the outstanding debt. We use NFPS net debt as our starting point, thereby excluding both the internal debt of the public sector, and its financial assets, from our analysis. We note that using net debt is subject to some debate, particularly because of difficulties in defining the boundaries of the relevant public sector. We use a debt-to-GDP ratio of 0.45 as our stabilization target. This target is designed to be a level at which capital market access will not be restricted, thereby lowering the risk of an adverse effect on long-term economic growth.

Our results are also very sensitive to assumptions about the performance of the oil sector. We try to explore this issue by considering several different scenarios for the production of ECOPETROL and the private oil companies.

3.1 Model Structure

The model of sustainability that we use was developed by CONFIS in the Ministry of Finance and Public Credit.

The model of sustainability of the NFPS[1], is based on Governments' Inter-temporal Budget Constraint, which examines the capacity of the public sector for financing and honoring the payments of its debts, assuming that tax revenues are enough for covering the total expenses and the service of the debt (Equation 3)

$$\tau_t = \alpha + \beta\left(g_t + r_t b_{t-1}\right) + \varepsilon_t$$

where τ_t are the total taxes; g_t are the total expenses; and $r_t b_{t-1}$ is the debt service (r being the interest rate and b the debt acquired in t-1)

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[1] Taken from the module on Fiscal sustainability of the NFPS in Colombia. Running manual. CONFIS.

The model has been developed in a recursive way, by calculating the debts' requirements and its service from the moments it is contracted, and making the spread of the public debt endogenous to the economic conditions of a particular moment in time.

In order to develop such analysis, the starting point is to establish the determinants of the change in spreads, which comes out from a regression where logarithm of the spread is the dependent variable, and the external free of risk interest rate and a matrix of the set of determinants of the change of the spread related to a probability of default, are the independent variables (Equation 4).

$$LogSPREAD_i = \alpha + \sum \beta_i X_i + \varepsilon_i$$

The matrix of the determinants is divided into 4 sub-groups, according to their characteristics: solvency variables, liquidity variables, external variable and dummy variables. Among these groups, some variables have a stronger impact on the spread, such as the economic growth, the relation between foreign repayments and international reserves, the indebtedness index, the fiscal deficit, exports to GDP, the deviation of the real exchange rate from its level of equilibrium, the foreign interest rate and whether the country incurred in default in the past[2].

It must be taken into account that the economy needs to grow at least at a rate equal to the real domestic interest rate, so that in-equilibrium primary balances can be generated and an adequate level of debt to GDP can be kept.

The assessment of the fiscal deficit considers tax revenues, other current income and capital resources, on the income side, and running expenses, costs of the public investments, and interest payments, on the expenditure side. These headings have been projected according to the criteria of the GDP growth, inflation and fiscal adjustments norms[3].

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[2] The changes in the spread are calculated by multiplying the spread of the year 2000 by the coefficients of the explanatory variables; the sum of the individual effects results in the total change of the spread. This value is used to determine the spread of the rest of the bonds issued by the Colombian public sector. This analysis is performed in a recursive way, which allows to find the spread of the public debt for the following years.

[3] The model took into account the projections made by the Macroeconomics Policy office of the Ministry of Finance and Public credit about the inflation and a economic growth path that leads to and average of 3,5 in the next decades, according to the fiscal adjustment norms and to the expenditure.

The dynamics of the model uses the primary balance projected by CONFIS (results of the current transactions of the entities to which a financial follow up is done of their cash transactions) and the macroeconomic assumptions, as the basic input. After including the primary results, the model generates the amount of the service of the debt to be paid in terms of capital and interests, the disbursements that are required in each period, and the stock of the debt at the end of the year. In turn these results feed the balance of payments through the external component of the debt, and the current transactions of the entities through the payments of interests.

The structure of the model for generating the above mentioned results, is divided into the following steps:

The starting point is the stock of the public debt for a base year, in this case 1999. To this stock and to the primary balances of the different components of the NFPS, the interest payments of the contracted debt and the new debt are added. As a result, the fiscal deficit is obtained. By adding the amount to be paid for internal and foreign amortizations, the total financing needs are calculated.

The resources for financing the deficit and that are not a part of the current revenues of the nation, such as the privatizations and profits of the Banco de la República, are then taken into account when running the model. In the first case, the contracts agreed with the IMF (ISAGEN and ISA) are included; in the second case, projections are run assuming that the seignorage is equal to the growth of the amount of money in the economy.

Now, for constructing the module of the debt, the service of the debt contracted in the years before 2001 was taken into account, considering the characteristics of the rates, the stock level and the terms for each one of the foreign credits drawn and the TES placed. If this heading is subtracted, as well as the resources for financing the deficit and that are not part of the current incomes of the nation, from the total of the financing needs, then the requirements for new indebtedness are obtained.

With respect to the management of the new debt, the requirements are divided into internal and foreign, taking into account the criteria of each of the entities of the public sector. In the case of the Central Government, a 50% internal and 50% foreign is assumed; for ECOPETROL and for the

territorial entities it is assumed that all the new indebtedness is internal; for the Social Security two thirds of the indebtedness is assumed as internal and one third as external; and for the other entities of the NFPS, it is supposed that 50% of all the new disbursements are internal.

In the same way, the new disbursements of the external debt are divided into debt credits with the multilateral banking (30%)[4], and placements in foreign bonds (70%)[5] at 5, 10 at 20 years, in different proportions, estimated according to debt criteria at longer terms in the next few years (suggested by the DCGP). After getting the sum to be paid by interests and amortizations of the new external debt, this sum is added to the total of the previously contracted debt, and in this way the total service of the debt is calculated.

Regarding the internal debt, it is assumed that the new debt is issued in TES, at 1,3,5 or 7 years; as with the external debt, it is assumed that the economic conditions allow a more long-term indebtedness[6]. The total service of the internal debt is got in the same way as in the case of the external debt, and the results of these two are added, to arrive at the total debit balance of the debt.

Finally, the debt model has a section exclusively devoted to the management of the yields of the Social Security. The starting point is the operational balance, subtracting the interests, and which can be affected by any pension reform. To this primary result, the yields generated by the reserves of the sector are added, assuming that such reserves are placed in TESs (kind b and UVR); in this way, the yields are the interests generated by those TESs. With this sum, it is possible to determine if the sector has enough resources to fulfill its pension payments.

3.2 Baseline Results and Alternative Scenarios

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[4] The payment of the debt to multilateral organizations is deferred to 12 years, with 4 years of grace period; the payments of interests are done on the debit balance of the previous period, applying a Libor rate, at six months plus a constant 75 pb spread.

[5] The bonds are repaid in annual installments and they generate interests equivalent to the foreign interest rates plus the spread of country risk.

[6] The payment of amortizations of the external debt is similar to the payment of the external debt. The interests are determined through a basic rate that assumes an international parity in interest rates, and a spread that is reflected in the country risk, through time.

We begin by presenting results for a base scenario, which we call the Baseline Scenario. This scenario assumes an economic growth rate of 1.5 percent in 2001, rising to 4 percent in 2007, and declining to 3.5 percent in 2010 and for the next twenty years. We make the same economic growth rate assumptions in two of our other scenarios. Another scenario, Scenario 3, assumes higher growth rates. Table 4 describes the growth rates that we assume in each of the different scenarios.

The baseline scenario also assumes an adjustment of the public finances in 2002. As a result of the Taxation Reform Law (Law 663 of 2000), expenditure reform (Law 617 of 2001), and transfer reform (Legislative Act 1 of 2001), the primary National Government balance is set equal to one percent of GDP beginning in 2002. The baseline scenario also assumes that the Social Security system is reformed, along the lines of proposals that have been submitted to the Congress, and that the ISS is restructed in the health care sector. With respect to the oil sector, the baseline scenario assumes that ECOPETROL will make significant investments in the Cartagena refinery. In addition, we follow a "medium" crude oil production scenario of 900,000 bbl/day.

Table 5 presents both deficit and debt projections for the baseline scenario. The scenario implies that the debt level would increase to 60 percent of GDP around 2015 and would reach 125 percent of GDP in 2030. These statistics clearly indicate that the baseline scenario is not sustainable. Even if the policy changes that we assume in the baseline are adopted, it still may not be possible to stabilize the debt.

The baseline scenario makes conservative assumptions with respect to the prospective balance between outlays and revenues. There are several potential expenditure shocks that could require substantially greater outlays than the baseline assumes. One such shock might involve the new security needs of the country. Higher expenditure might flow to the military or to the criminal justice system. A second potential shock might arise from the need for higher expenditures on public investment. Recent reductions in this investment have delayed expansion of the coverage of public utilities and social services. Of course, adjustments in expenditure should also include improvements in efficiency, when attending incoming needs. The supplemental policy scenarios that we consider are

designed to provide information on the robustness of our findings from the baseline scenario. We do this by considering three other scenarios, and by exploring the primary balance that is needed to stabilize the debt-to-GDP ratio in each case after 30 years.

Table 6 presents further detail on the differences between the various scenarios that we consider. The differences from the baseline case are concentrated in the following areas: projected economic growth rate; defense and security expenditure and coverage of social services; and other local infrastructure such as housing and jails. Scenario 1 includes a level of additional military expenditure. Given current conditions, this could be considered as a realistic reference scenario. Scenario 2 adds additional public investment in public utilities and services. These additional expenditures would be part of the national budget. The current rules for allocating this expenditure are assumed to remain in force, which implies no significant improvements in the efficiency of the expenditures. Finally, Scenario 3 assumes that in addition to the higher level of outlays on the military, there will also be expenditures on social programs that will lead to coverage for the basic needs of the population during the next fifteen years. This scenario also assumes some increase in the efficiency with which expenditure is allocated, as well as an economic growth rate that is one percentage point per year higher than the growth rate in the baseline scenario.

The main differences between Scenarios 2 and 3 can be illustrated along several dimensions:

(i) Military Outlays. In Scenarios 1 and 2, military spending is higher than in the base scenario, but it is considered to be minimal in terms of transfers to the Police and the Military Forces. Personal security services and investment rise only modestly. Scenario 3, however, includes the additional effort for accelerating the definition of the armed conflict. It includes a higher level of transfers, general expenses, personal services of military forces and police services.

(ii) Social and Health Expenditure. In Scenario 2, the coverage in elementary and middle education would go from 86.8 percent in 2001 to 85.6 percent in 2015. In Scenario 3, education coverage would reach 100 percent by 2015. In all three scenarios we assume that the health sector will

cover all of the population by 2015. Only Scenario 3 assumes some increase in the efficiency of expenditures.

(iii) Infrastructure Spending. Expenditures on infrastructure are greater in Scenario 3. Coverage of basic infrastructure, and of aqueducts and sewage systems for the urban population, would rise from 94.1 percent and 87.2 percent, respectively, in 2001, to 96 percent and 100 percent in 2015 in scenario 2. Under scenario 3, by 2015 all households would be covered under both services.

(iv) Public Housing. In 2001, 86.2 percent of those in the urban population with income lower than four times the minimum wage received public housing. Scenarios 1 and 2 would preserve this level of coverage, while Scenario 3 would bring the coverage rate to 100 percent by 2015.

The quantitative results from the various scenarios can be shown easily in graphical format. Graphs 2 and 3 show the finances of the central government, the social security sector, ECOPETROL, and the regions under the benchmark scenario. As we noted above, there is too little fiscal adjustment in this scenario, so we discover debt rising along an explosive path by the middle of the current century. The graphs show a rapid recovery for the primary balances of the central government over the next five years, with a deficit close to 2 percent of the GDP in 2000 and 2001, but a surplus of close to 1 percent of the GDP beginning in 2006. For social security, however, the deficit increases starting in 2000, and does not decline after that. For the regional and local entities, as well as for public enterprises, the primary surplus falls relative to the levels in 2001 and 2002, but still remains positive.

Graph 4 displays the primary balances of the central government in each of the four scenarios that we consider. The starting point for all of the plots is a surplus of 0.91 percent of GDP. This is followed by a deficit that reaches 0.82 percent of GDP in 2006, but then returns to surplus with a surplus of 1.1 percent of GDP in 2010. Graph 5 shows the primary balances for the Consolidated Public Sector, without stabilizing, in the four scenarios. These balances lead to different paths for the net public debt. In the "non-stabilized projections," there are substantial primary deficits, and these

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deficits lead to eventual explosion of the public debt in all scenarios. Graph 6 shows the net debt trajectories for the non-stabilized scenarios.

To evaluate the change in fiscal policy that would be needed to avoid the unsustainable outcomes described above, we compute the primary surplus that would be needed, for a thirty year period starting in 2003, to keep the economy on a sustainable path. Table 7 shows these required primary surpluses. In the baseline scenario, the required additional surplus is of 1.8 percent of GDP. In Scenarios 1, 2, and 3, the required primary surpluses are 2 percent, 2.5 percent, and 3.2 percent of GDP, respectively. The surpluses that would stabilize the debt in Scenarios 2 and 3 are higher than in the baseline case because the non-stabilized primary deficits are higher. These scenarios include a higher level of public spending than the benchmark. Note that even though scenario 3 involves greater public spending than scenario 2, we have assumed that this spending results in a faster pace of economic growth than the growth path in scenario 2. The higher growth rate reduces the required level of incremental surplus that restores fiscal balance. Based on the results shown in Table 7, we can conclude that following the expenditure paths and achieving the incremental surpluses in each case leads to stable evolution of the debt-to-GDP ratio over the 2010-2030 period.

Graph 7 shows the path for the stabilized primary balances for the central national government in each of the four scenarios, and Graph 8 presents analogous information for the consolidated public sector. Graph 9 shows the pattern of the stabilized debt in each of the four scenarios.

Our findings suggest that even the combined effect of the 2000 tax reform, the pension reform that we consider, favorable outcomes with respect to oil production, and a reduction in public expenditure by one percent of GDP, there would still be a need for an additional 1.8 percent of GDP in revenue net of outlays. This can only be achieved by further tax increases and expenditure reductions, in some combination. If the one percent of GDP reduction in spending does not materialize, then the increase in revenue that is needed to stabilize the debt at 45 percent of GDP, around 2030, must amount to 2.8 percent of GDP. The increase would be even larger if there is a further increase in military spending, or if the timetable for expanding coverage of infrastructure, housing, and social

services is accelerated. On a favorable note, if economic growth proves to be faster than the rate that we have assumed, then the required increase in revenues would be somewhat smaller. In general, faster growth translates into a lower incremental revenue need.

3.3. Sensitivity Analysis and Cautions

Any analysis of future fiscal circumstances is subject to great uncertainties. We have made strong assumptions about the future course of fiscal policy, of economic growth, of oil production, of military outlays, and of Social Security reform. Changing any one of these factors has an important effect on our baseline calculations of the required level of fiscal tightening that leads to a sustainable fiscal position. It is difficult to summarize the sensitivity of our findings in a short paper; there is no substitute for re-running the fiscal model and examining the outcome under different assumptions. In this section we describe some of the key sources of uncertainty in our analysis.

Assumptions About Economic Growth. Our results are quite sensitive to our assumptions about economic growth. There is also an open question of how fiscal balances affect the future path of economic growth. In the long run, there is no doubt that fiscal imbalances decelerate growth; and in the short and medium terms, a debt perceived as not sustainable hinders the external financing and discourages the private investment that is needed for promoting growth. While there may be short- and long-term effects of the fiscal deficit on growth rates, our analysis does not allow for such effects.

The Effect of Income Growth on Tax Collections. Our analysis assumes a unitary elasticity of tax collections with respect to GDP. In reality, the recent fiscal history of Colombia suggests that tax reforms that were designed to raise revenue have often failed to have their desired effect, in large part as a result of tax evasion. This raises questions about the extent to which revenues will rise with GDP.

Future Social Security Outlays. All the scenarios that we consider assume that a pension reform will take place. We assume that this reform will follow the lines of proposals that were introduced in Congress early in 2002. In the absence of reform, however, the fiscal deficit would be substantially worse. The social security deficit alone would rise from 3.5 percent of GDP in 2002 to

5.5 percent of GDP in 2017. It would still be 2 percent of GDP by 2030. Addressing the social security deficit is clearly a key element of fiscal reform.

The pension reform that has been proposed to Congress is not, by itself, enough to solve the problem. Roughly sixty percent of the projected deficit is the result of pensions that have already been awarded, or that are going to be awarded very soon. An adjustment of the social security benefit structure which eventually eliminated all subsidies except for the minimum pension, which rationalized the exemption regimes of the General System of Law 100 Pensions, which eventually integrated teachers into the general system, and which eventually corrected the abuses possible within the Law 100 transition regime, would at the most achieve a reduction of one fourth of the social security deficit. Only 15 percent of the deficit could be corrected through higher contributions from affiliates. But raising contributions would be regressive and would negatively affect the labor market.

Budgetary Implications of Oil Production and Exploration. Our budget projections are highly dependent on the profits generated by ECOPETROL. The dependence is even greater than it might appear because the oil sector also generates income taxes and other taxes paid by the sector's companies: The income taxes paid by oil companies represent about one quarter of the taxes paid by all "legal persons." Additionally, the royalties that go to the territorial entities as well as those that are saved in the FAEP also benefit the balance sheet of the public sector. Consequently, any reduction in oil sector activity substantially and negatively affects the fiscal balance of the public sector. There is likely to be just such a negative effect in four years, when crude oil extraction is projected to decrease. Our projections suggest that the primary balance deteriorates, reaching –9 percent of the GDP in 2006, and then recovers to 1 percent of the GDP in 2010. This pattern assumes that there is substantial investment in the Cartagena refinery; this investment reduces the surplus of ECOPETROL by about $200 million.

Graph 10 shows that the production of current wells is going to decrease from the rate of 540 thousand barrels per day today to close to 100 thousand barrels per day around 2010. This is the lower stripe of the graph. New drilling and incremental production contracts have already been signed, or

are about to be so, and they will increase and recover the production to a level equivalent to the current production level (intermediate stripe of the graph). Our scenario builds in an assumption about the production that will flow from new wells. We use the P80 ECOPETROL scenario, which assumes a 20 percent probability of success on new drilling. This appears to be reasonable, given the history of the recent findings in Colombia. It is possible that the new exploration could result in greater findings, which could increase the production by an additional 200 thousand barrel per day by 2010.

The volatility of the public sector revenue that flows from the oil sector suggests caution in linking fiscal adjustment to the oil production sector. Over the medium run, it would be very useful to separate the operation of the oil industry from the public finances, so that the investment program for the petroleum sector is not dependent on the fiscal needs of the nation.

Tax Increases vs. Expenditure Reductions. A small empirical literature on the dynamics of fiscal policy suggests that tax increases tend to be shorter-lived than expenditure reductions, all else equal. One factor that our projections highlight is the need for long-lived fiscal changes, since the current fiscal policy results in deficits over a long period. To place the required changes in perspective, Graph 11 shows the historical record of the primary balances of the Non-Financial Public Sector and for the Central Government. The kinds of consolidated balances that would be required for stabilizing the debt have not been seen for the past two decades, except in 1986-1994. Nevertheless, the recent (since 1999) correction of 2 percent of GDP represents a substantial improvement, and suggests that significant fiscal changes can in fact be carried out.

Other Fiscal Contingencies. The public debt has a contingent component whose costs are determined by specific factors and risks in certain areas. Future social security outlays are one such commitment, but there are many others, such as those in the energy and communications sectors. The balances of some of the most important government companies, such as TELECOM and the ISS, include provisions for charges that will almost certainly have to be assumed by the Central Government. We suspect that additional primary surplus requirements are going to be needed to cover or account for these provisions. Clavijo (2002) proposes assuming an additional required primary

surplus of 0.5 percent of GDP. There may also be other contingencies associated with the electricity sector, roads, territorial debt that is warranted by the central government, and the potential need to rescue the financial sector.

Addressing potential budgetary contingencies is an important priority. Some advances have been made with respect to organizing a fund for certain contingencies, such as those of public utility companies, but Telecom and the ISS are still not covered by such funds. Moreover, the existing funds may not provide adequate controls to combat moral hazard. It is also important to develop procedures that will avoid the commitment of further resources to contingencies that are not adequately funded.

Inflation and Real Interest Rates. Our scenarios have not considered potential future shocks to real interest rates, or inflation shocks that might raise the cost of foreign debt and thereby increase the effective debt burden of the Colombian government. Such shocks would require even larger primary fiscal surpluses to sustain the current level of government debt.

Exchange Rate. Although a big portion of the public debt is denominated in foreign currency, this analysis does not take into account the implications of an unexpected increment in the exchange rate. However, in other chapter, (Arbeláez y Roubini, "Interactions between Public Debt Management and Debt Dynamics and Sustainability: Theory and Application to Colombia"), a similar study is made, in order to sketch the debt sensitivity to this macroeconomic variable.

4. Deferred Stabilization.

Our discussion in the last two sections has focused on fiscal adjustment that takes place immediately and persists for thirty years. We now consider what happens if the primary adjustment does not occur right away, and a primary fiscal gap of roughly 2.8 percent of GDP persists for several additional years. In this case the debt to GDP ratio rises, and when adjustment takes place, the required adjustment is larger than in the current-adjustment case. For example, with a permanent primary gap of 2.8 percent as in the benchmark, the debt to GDP ratio would rise from 50 percent of

GDP to about 75 percent of GDP in about eight years (by 2010) and close to 95 percent of GDP in fifteen years (by 2017).

The most likely outcome in this scenario would be a debt crisis, probably well before the debt-to-GDP ratio reached 95 percent. However, we can consider how the required fiscal adjustment would evolve if the capital markets allowed the debt-to-GDP level to rise substantially from its current level. Assume that Colombia runs a primary deficit of 2.8 percent for the next eight years and then decides to stabilize the debt ratio to the higher level close to 75 percent of GDP. This stabilization could be the outcome of two alternative or complementary scenarios: i) deciding that continuing with primary gaps would lead to an unsustainable debt path, and therefore implementing a primary adjustment to stabilize the debt ratio; ii) a market-imposed lending cutoff that forces the country to make a primary adjustment that stabilizes the debt ratio at 75 percent of GDP.

In such a situation, what would be the required fiscal adjustment? The answer is complex as it depends on at least four factors: (i) how the required primary fiscal balance changes with a debt of 75 percent for unchanged permanent real interest rates and growth; (ii) how the higher debt ratio affects the equilibrium real interest rate; (iii) how the higher debt ratio and higher equilibrium real interest rate affect the permanent growth rate of the country; and (iv) how the lower growth rate affects the permanent fiscal balance.

Table 8 shows that the interaction of these four factors significantly increases and exacerbates the primary gap at a debt ratio of 75 percent, relative to a debt ratio of 50 percent. Let us consider the various steps of the argument.

i) Higher Debt Burden Impact on the Primary Gap. First, suppose that stabilizing the debt ratio at 75 percent has no effect on the long run real interest rate or the growth rate or the permanent primary balance. Then, as shown in Table 8, stabilizing the debt ratio at 75 percent implies a required primary balance of 3.3 percent of GDP, rather than the 2.3 percent of GDP that was required to stabilize the debt at the 50 percent level. This is the direct burden of stabilizing at a higher stock of debt. Approximately, a ten percent of GDP increase in the debt burden leads to a higher (debt-

stabilizing) required primary balance of 0.1 percent of GDP if the (r-g) differential is 1 percent; so, a 25 percent increase in the debt ratio (from 50 percent to 75 percent) leads to an increase of about one percent in the required primary balance if r-g = 4.5 percent. So, the failure to adjust the primary balance in 2002 with a 2.8 percent primary adjustment leads to an increase the permanent primary adjustment needed to stabilize the debt ratio to 3.8 percent of GDP.   Failure to adjust early to lower debt ratio levels is very costly as it implies a much bigger permanent primary adjustment burden.

ii) Impact of the Higher Debt Burden on Long-Run Real Interest Rates. A higher debt ratio will cause a higher permanent real interest rate as the default risk premium would be much higher when the debt ratio is higher. This permanent cost would be likely to emerge even if the country were to successfully stabilize its debt ratio to the higher level of 75 percent; in fact, higher debt levels are inherently more risky, especially when the country can be buffeted by future growth, terms of trade and real interest rate shocks and investors are risk averse. By how much would the equilibrium real interest rate go up if the debt ratio were 75 percent rather than 50 percent? It is hard to assess but a conservative estimate would be one hundred basis points. In our benchmark case, with r equal to 7.5 percent and g equal to 3.0 percent, the real interest rate would increase from 7.5 percent to 8.5 percent. This increase in the real interest rate would in turn increase the debt stabilizing required primary balance and the primary gap: at a debt ratio of 75 percent, the debt stabilizing primary balance would increase from 3.3 percent to 4.1 percent if r increases by 1 percent. Thus, the primary gap would increase from 3.8 percent of GDP to 4.6 percent, much higher than the benchmark value of 2.8 percent, in the case in which the debt ratio was stabilized at 50 percent rather than 75 percent.

iii) Impact of Higher Debt Burden on Long-Run Growth. If real interest rates are higher, investment will be lower and the permanent long run growth rate of the economy will also be lower. We noted in the last section that the models provided by the government ministries do not incorporate any effect along these lines. But we now try to recognize this effect, because lower growth will imply even larger debt-stabilizing primary balances and even larger primary gaps. The quantitative effect of higher interest rates on growth is not well identified, but to illustrate the effects, consider a case in

which the growth rate falls by 1 percent when the real interest rate increases by 2 percent. In this case, an increase in the real interest rate of 2 percent because of the higher debt ratio (r=9.5 percent and g=2 percent) would lead to a primary gap increase the required primary balance of 5.6 percent of GDP rather than 4.8 percent that would emerge if the increase of 2 percent in r does not lead to a fall in growth of 1 percent. In this case, the primary gap goes up to 6.1 percent rather than the 5.3 percent in the case where r increases but g does not change. This illustration shows that failure to stabilize debt ratios earlier and at lower levels may lead to a permanent doubling of the primary gap and the primary adjustment required to stabilize the debt ratio.

iv) <u>Impact of Higher Debt Burden on the Permanent Primary Balance.</u> There is also another effect of the failure to stabilize early at a lower debt ratio. If the growth rate of the economy will be lower in the long run, the permanent primary balance will be lower too. There are two reasons why this would be the case: first, lower growth means lower revenues and possibly lower revenue to GDP ratios; second, lower growth may lead to a higher government spending to GDP ratio if the path of spending is partly independent of the GDP growth path and if lower growth leads to higher spending to support the incomes of those who are hurt by lower growth. Once again it is difficult to assess the magnitude of this effect, but it is clear that it will reinforce the first three effects, and make the costs of delayed adjustment even larger.

Note that once a higher debt level is reached, say 75 percent rather than 50 percent, the costs of avoiding a very high primary gap at that level and of attempting to reduce the debt ratio to a lower level, rather than stabilizing it at the higher 75 percent level, are very high. For example, in the benchmark scenario with a 3.8 percent primary gap and a required primary balance of 3.3 percent to stabilize the debt ratio at 75 percent, it would take nine years of primary balances of 6 percent (rather than 3 percent) to bring back the debt ratio from 75 percent to 50 percent. After that, the permanent primary balance would still have to remain at a permanent value of 2.3 percent to stabilize the debt ratio at 50 percent. Thus, any attempt to reduce the debt burden rather than stabilizing it at the higher

level in a delay scenario would be extremely costly as it would entail a relatively long intermediate period of very high, and possibly unachievable, primary surpluses.

5. Conclusion: Budget Reform and Institutional Constraints

The foregoing calculations suggest that under reasonable assumptions, current fiscal policy is not sustainable. Given the importance of social security in the federal budget, moving back to a sustainable fiscal policy is likely to require changes in this program. Further substantial changes in both expenditure programs and in tax policies are likely to be needed, too. Although the required changes are large, there have been prior periods in which similarly large changes in fiscal stance have been adopted.

Reforming the fiscal situation requires both tactical changes, such as increases in tax collections and reductions in some program expenditures, as well as strategic changes. The latter might involve reforms of the institutional structure of fiscal policy-making. The process of improving the fiscal balance is constrained by substantial institutional inflexibilities, such as those related to transfers, obligations and fiscal warrants. The budget process is not sufficiently transparent, particularly in the separation of the capital and the current budget. There are many possibilities for creative accounting. Macro-fiscal rules also warrant consideration. The Organic Law of Budget suffers from transparency problems, and it does not place clear restrictions on the relationship between outlays, fiscal receipts, and the overall level of national income.

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Table 1: Evolution of the Public Finances for the Central National Government (percent of GDP)

			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total Income			8.8	10.4	10.7	11.5	11.4	11.2	11.9	12.5	11.9	12.7	13.3	14.6
	Tax revenue		8.0	9.1	9.6	9.8	9.9	9.6	10.1	10.8	10.5	10.7	11.4	13.2
		IncomeTax	3.4	4.6	4.7	4.5	4.1	4.1	4.0	4.5	4.3	4.3	4.3	5.4
		Internal VAT	1.7	2.0	2.2	2.6	2.6	2.6	3.3	3.3	3.2	3.2	3.3	3.7
		Stamps National	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
		Tax, Financial Transactions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.6	0.7
		External Activity[1]	2.5	2.2	2.0	2.6	2.7	2.7	2.5	2.8	2.7	2.3	2.5	2.8
		Others	0.0	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.3	0.2
	Tax Income and Others [2]		0.8	1.3	1.1	1.6	1.4	1.5	1.8	1.7	1.3	1.9	1.8	1.4
Total expenditure			9.4	10.0	10.6	11.8	12.5	13.3	15.2	16.0	16.6	18.8	18.9	20.0
	Current Expenditure		7.7	8.0	8.6	9.9	10.6	11.3	12.9	13.4	15.0	17.3	17.3	18.3
		Personal Services	1.6	1.8	2.0	2.2	2.4	2.4	2.2	2.3	2.5	2.7	2.7	2.7
		Interests	1.1	1.2	1.0	1.1	1.1	1.2	1.8	2.0	2.9	3.3	3.9	4.0
		Transfers	4.2	4.2	4.9	5.7	6.1	6.7	7.9	8.0	8.7	10.3	9.8	10.6
		General expenses & Others	0.7	0.7	0.6	0.7	0.9	0.8	0.8	1.0	0.9	0.8	0.8	0.9
	Investment		1.7	2.0	2.0	1.9	1.9	2.0	2.3	2.6	1.6	1.5	1.5	1.5
Net Loan			0.1	0.6	1.8	0.4	0.1	0.2	0.4	0.1	0.2	0.6	0.4	0.6
Primary Balance			0.5	1.5	1.1	0.8	-	-	-	-	-	-	-	-
Cash Fiscal Balance			-	-	-	-	-	-	-	-	-	-	-	-

❖ External VAT + Customs Tariffs
❖ Others: Special Funds and Capital Resources

Source: Data base constructed by Fedesarrollo for the Mission on Public Income, with information of the Ministry of Fianace and Public Credit and Banco de la República.

TABLE 2: Evolution of Public Finances for the Non Financial Public Sector (percent of GDP)

			1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Total Income			32.78	34.33	34.99	35.03	36.89	39.31	43.28	44.86	43.07	46.30	47.17	47.66
	Tax		12.38	13.34	12.50	12.75	15.75	16.58	17.31	18.03	18.01	20.91	18.18	19.66
	Non Tax		20.40	20.99	22.49	22.28	21.15	22.73	25.97	26.83	25.06	25.40	29.00	27.99
		Gross production	12.53	12.44	11.29	12.22	10.36	10.18	10.16	10.70	10.39	10.41	11.28	10.88
		Contribution by CNG [1]	4.62	4.46	5.01	5.70	5.61	5.88	7.00	7.04	7.51	8.63	8.15	8.98
		Others	3.25	4.08	6.19	4.36	5.18	6.67	8.82	9.08	7.16	6.35	9.56	8.13
Tota Expenditurel			33.18	34.31	35.11	34.98	36.77	39.62	44.98	48.14	48.19	51.65	51.15	52.03
	Current Expenditure		26.35	27.31	27.69	26.78	28.76	30.59	33.87	35.99	38.44	42.10	42.08	43.19
		Interests [2]	3.35	3.63	3.26	2.77	2.75	2.83	3.49	3.39	4.31	5.06	5.43	5.24
		Personal services	5.78	5.80	5.90	6.52	6.87	6.93	7.31	7.51	7.86	8.52	8.01	8.09
		Transfers	7.02	7.33	7.92	10.83	12.45	14.11	16.33	16.51	18.25	20.18	20.83	22.42
		Others [3]	10.20	10.55	10.59	6.65	6.69	6.72	6.73	8.61	8.24	8.40	7.81	7.88
	Capital expenditures		6.82	7.01	7.43	8.21	8.01	9.03	11.11	12.14	9.64	9.52	9.07	8.61
		Investment [4]	6.39	6.62	7.02	7.78	7.53	8.77	10.27	11.65	9.29	9.26	8.81	8.59
		Others	0.43	0.39	0.41	0.43	0.48	0.26	0.84	0.51	0.46	0.29	0.26	0.24
Net Loan			0.11	-0.02	0.07	-0.17	0.00	0.00	0.00	0.00	0.00	0.10	0.02	0.09
NFPS Balance [5]			-0.51	0.03	-0.19	0.22	0.12	-0.31	-1.70	-3.28	-3.40	-6.22	-3.65	-3.82
Gross Debt			-	-	-	-	14.20	13.72	29.31	34.44	38.96	51.12	58.98	63.25
Net Debt			-	-	-	-	14.20	13.72	22.49	24.65	26.42	34.80	40.46	44.82
Primary Balance			2.95	3.64	3.14	2.82	2.87	2.52	1.80	0.11	0.80	-0.06	0.91	0.87

1 Includes Investment and Functioning   2. Includes Internal and External Debt's Interests   3. Includes General Expenses and Commercial Operations
4. Corresponds to gross fixed capital formation.   5. Corresponds to total revenue subtracting total expenditure and net Loan.

Source: Database developed by Fedesarrollo for the Mission on Public Income, with information of the Ministerio de Hacienda y Crédito Público and ethe Banco de la República

Table 3: Primary Surplus Required to Stabilize Debt-to-GDP Ratio at 0.50, Steady State Analysis

Interest Rate	r-g	Required Primary Balance/GDP
Growth Rate = 3.0 Percent/Year		
4.5	1.5	0.75
5.5	2.5	1.25
6.5	3.5	1.75
7.5	4.5	2.25
8.5	5.5	2.75
9.5	6.5	3.25
10.5	7.5	3.75
Growth Rate = 2.0 Percent/Year		
4.5	2.5	1.25
5.5	3.5	1.75
6.5	4.5	2.25
7.5	5.5	2.75
8.5	6.5	3.25
9.5	7.5	3.75
10.5	8.5	4.25

Table 4: Assumptions About Economic Growth Rate, Various Scenarios

Year	Baseline and Scenarios 1, 2	Scenario 3
2001	1.5	2.5
2002	2.5	3.5
2003	3.5	4.5
2004	3.6	4.6
2005	3.7	4.7
2006	3.9	4.9
2007	4.0	5.0
2008	3.8	4.8
2009	3.4	4.4
2010 – 2030	3.5	4.5

Table 5: Fiscal Deficit and Debt Projections, Baseline Scenario without Stabilization (percent of GDP)

Year	Deficit		Debt	
	Central Gov't	Total Public	Central Govt't	Total Public
2001	-5.62%	-3.72%	43.9%	48.1%
2002	-4.57	-2.58	44.5	46.8
2003	-4.32	-3.18	47.9	49.1
2004	-5.23	-5.18	50.2	51.2
2005	-5.55	-5.78	52.3	53.5
2006	-5.94	-6.30	54.8	56.3
2007	-5.81	-6.07	57.5	59.1
2008	-5.62	-5.85	60.0	61.8
2009	-5.71	-5.98	62.5	64.4
2010	-5.99	-6.01	65.0	66.8
2015	-8.55	-11.11	79.1	87.1
2020	-14.06	-18.23	108.8	126.2
2025	-25.27	-33.13	170.8	206.6
2030	-41.53	-55.68	279.0	349.9

Table 6: Assumptions Underlying Alternative Scenarios

| Year	Additional Military Spending		Additional Infrastructure Spending		Additional Social Expenditure	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
2002	0.18%	0.11%	0.12%	0.54%	0.13%	0.31%
2003	0.36	0.42	0.12	0.55	0.29	0.28
2004	0.24	0.38	0.12	0.58	0.45	0.40
2005	0.25	0.44	0.20	0.74	0.63	0.55
2006	0.34	0.48	0.12	0.52	0.82	0.67
2007	0.29	0.42	0.12	0.53	0.96	0.79
2008	0.32	0.36	0.12	0.54	1.10	0.90
2009	0.35	0.39	0.12	0.54	1.25	1.02
2010	0.37	0.42	0.12	0.48	1.39	1.13
2011	0.40	0.45	0.10	0.38	1.50	1.25
2012	0.29	0.36	0.13	0.33	1.67	1.36

Table 7: Debt-to-GDP Ratios and Required Primary Surplus to Stabilize Debt in Various Scenarios

	Baseline	Scenario 1	Scenario 2	Scenario 3
Debt-GDP Ratio in 2010	0.62	0.64	0.76	0.71
Debt-GDP Ratio in 2030	3.29	3.62	5.76	4.00
Debt-GDP Ratio on "Stabilized Path", 2010	0.42	0.42	0.41	0.46
Debt-GDP Ratio on "Stabilized Path," 2030	0.45	0.44	0.49	0.32
Primary Surplus Required to Achieve Stabilized Path	1.8	2.0	3.2	2.5

Table 8: Required Primary Surpluses to Stabilize Debt at 75 Percent of GDP

Interest Rate	r-g	Required Primary Balance/GDP
Growth Rate = 3.0 Percent/Year		
6.5	3.5	2.63
7.5	4.5	3.38
8.5	5.5	4.13
9.5	6.5	4.88
10.5	7.5	5.63
Growth Rate = 2.0 Percent/Year		
6.5	4.5	3.38
7.5	5.5	4.13
8.5	6.5	4.88
9.5	7.5	5.63
10.5	8.5	6.38

Graph 1: Primary Balance of the Central Government and Non-Financial Public Sector, 1990-2002
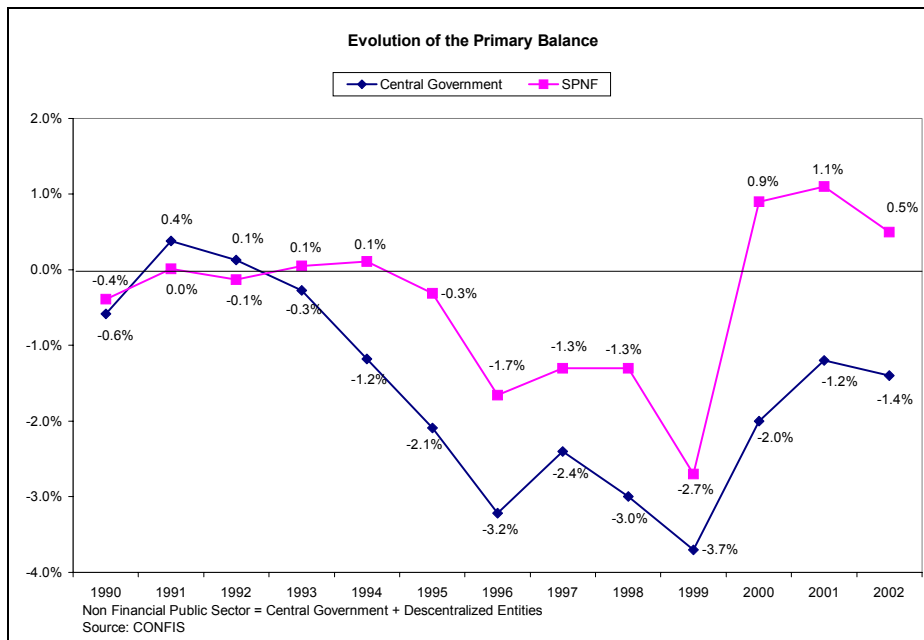
Graph 2: Primary Balance of the Central National Government and the Social Security: Base Scenario, Not-Stabilized (percent of GDP)
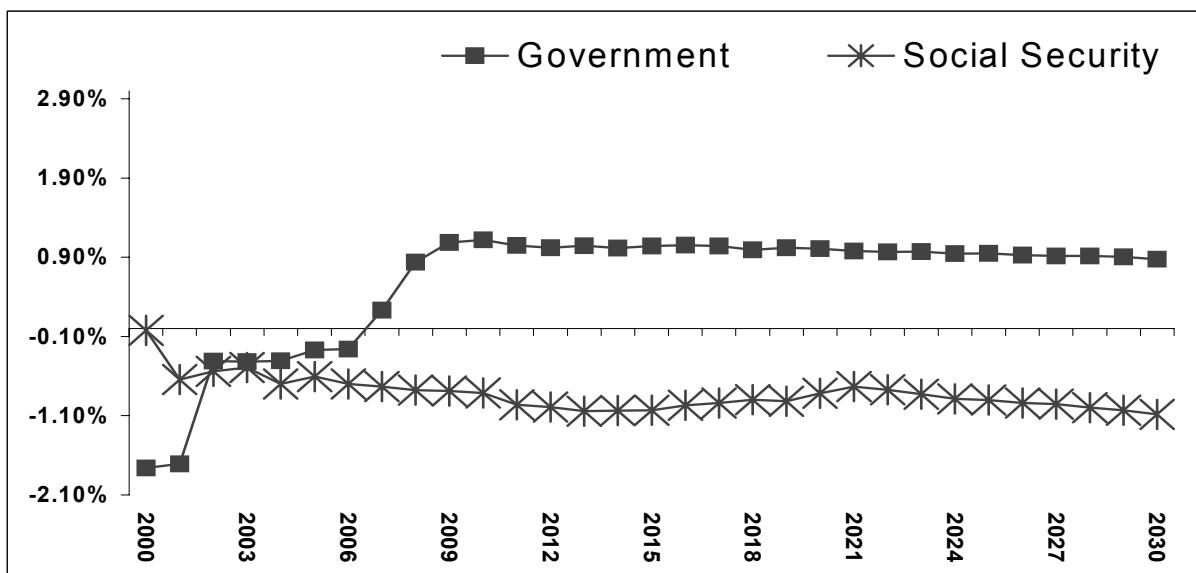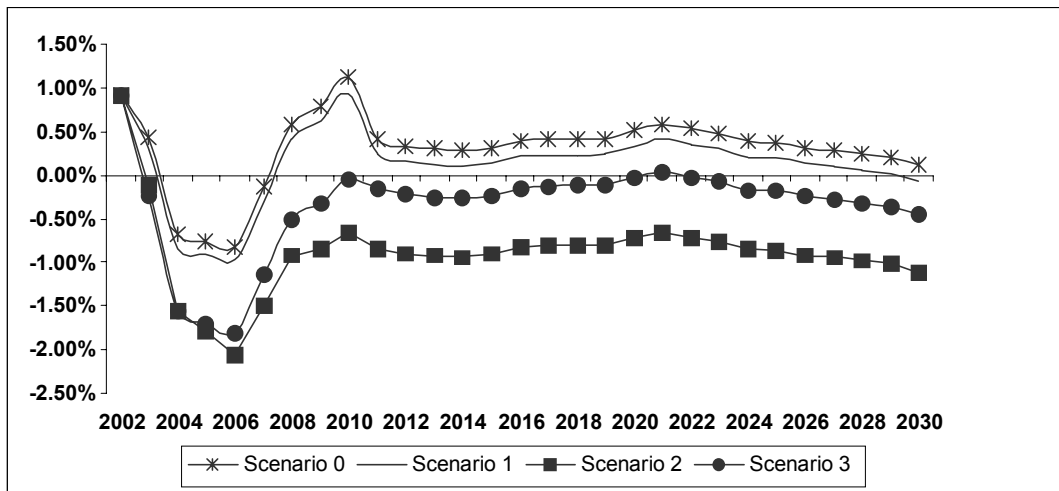
Graph 3: Primary Balances of ECOPETROL, Regional and Local, and the other Public Entities: Base Scenario (percent of GDP)
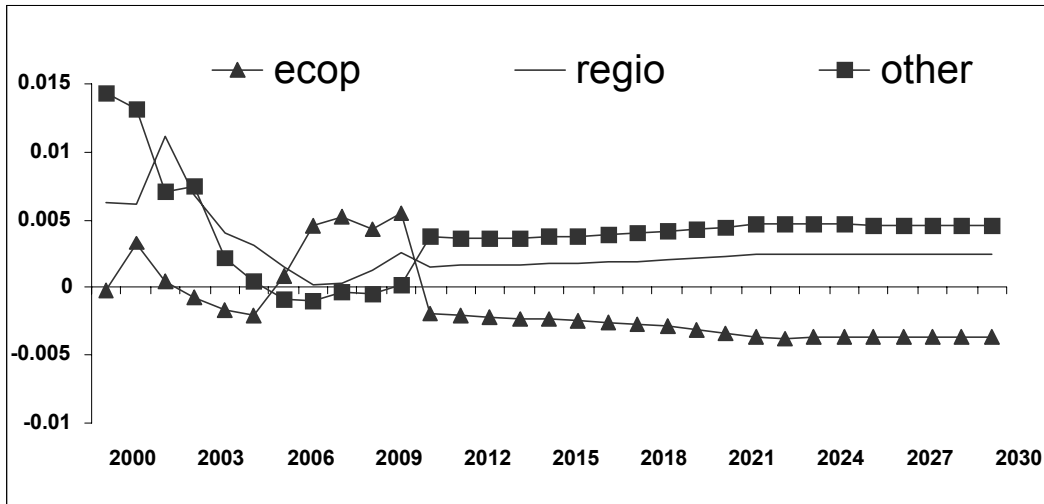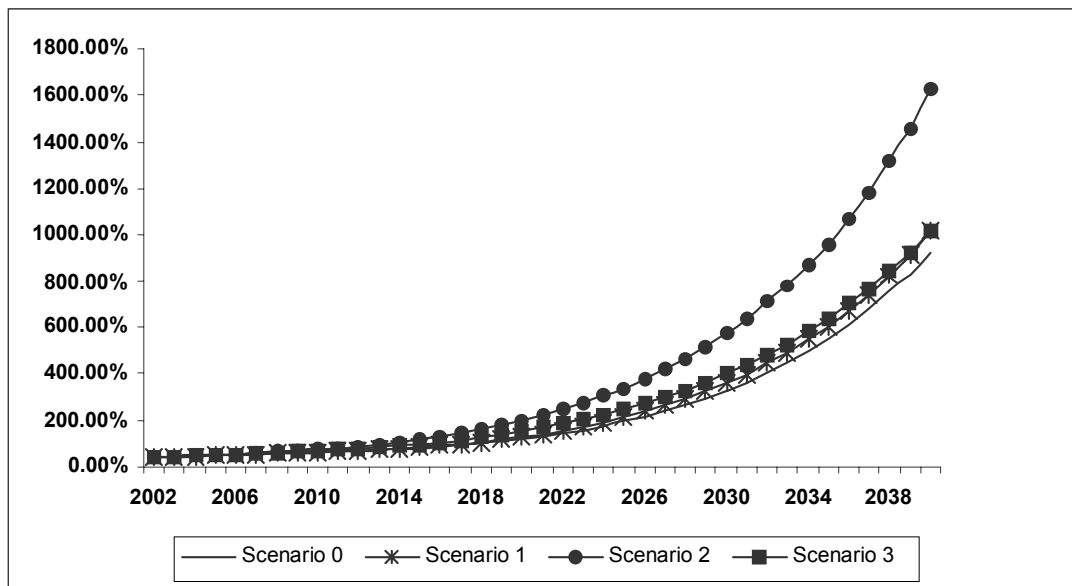

Graph 4: Primary Balance of the Central National Government: Not-Stabilized, All Scenarios (percent of GDP)
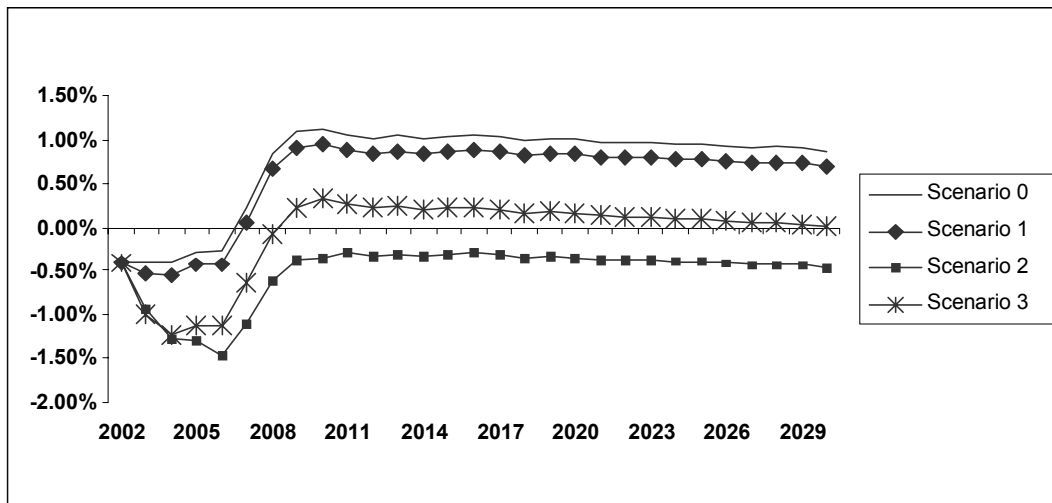
Graph 5: Primary Balance, Consolidated Public sector: All Scenarios, Not Stabilized (percent of GDP)

Graph 6: Consolidated Net Debt's stock level: Not-Stabilized Scenarios (percentGDP)
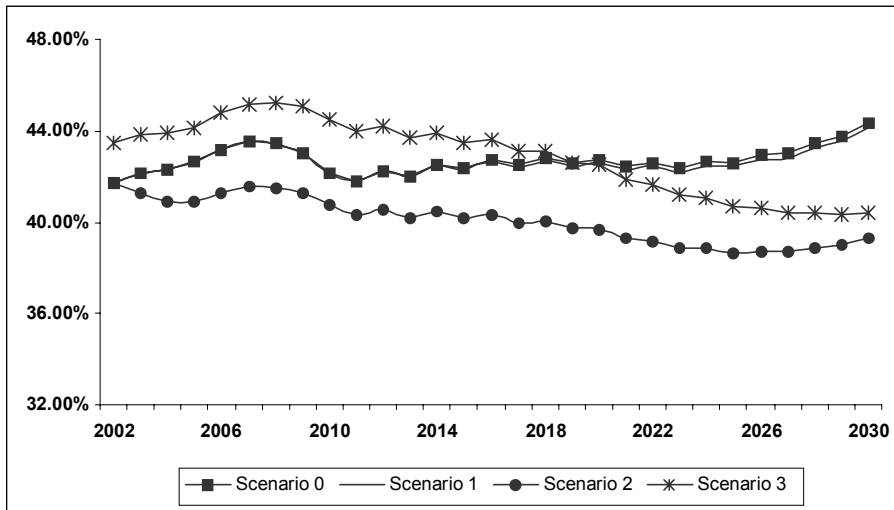
Graph 7: Primary Balances, Central National Government: All Scenarios, Stabilized (percent GDP)
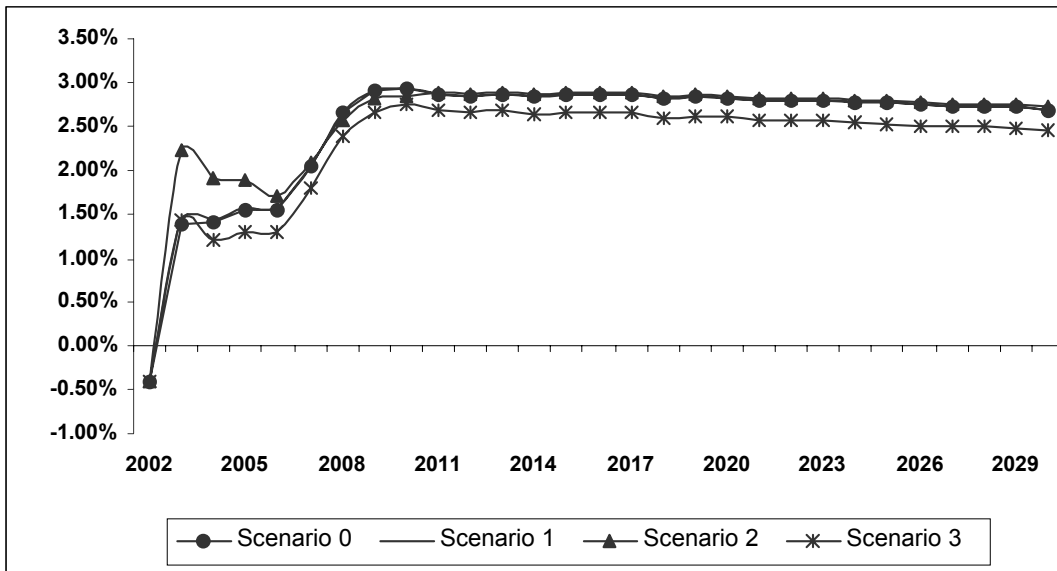
Graph 8: Primary Balances, Consolidated Public Sector: Stabilized Scenarios (percent of GDP)
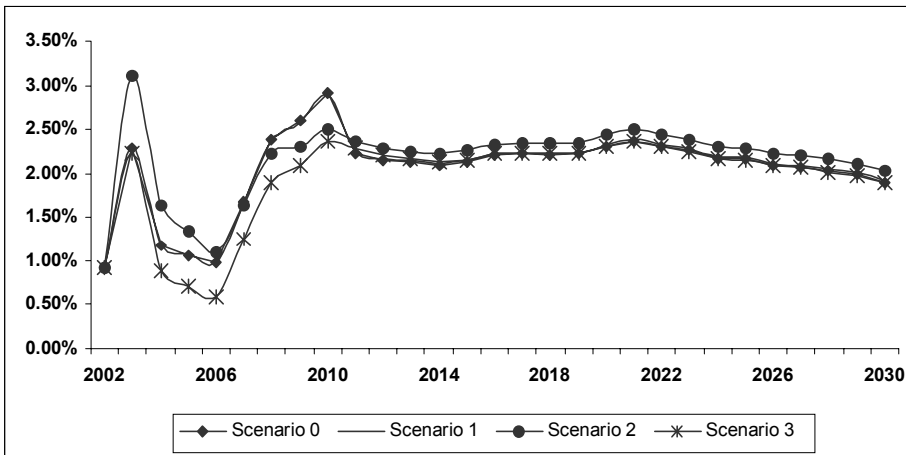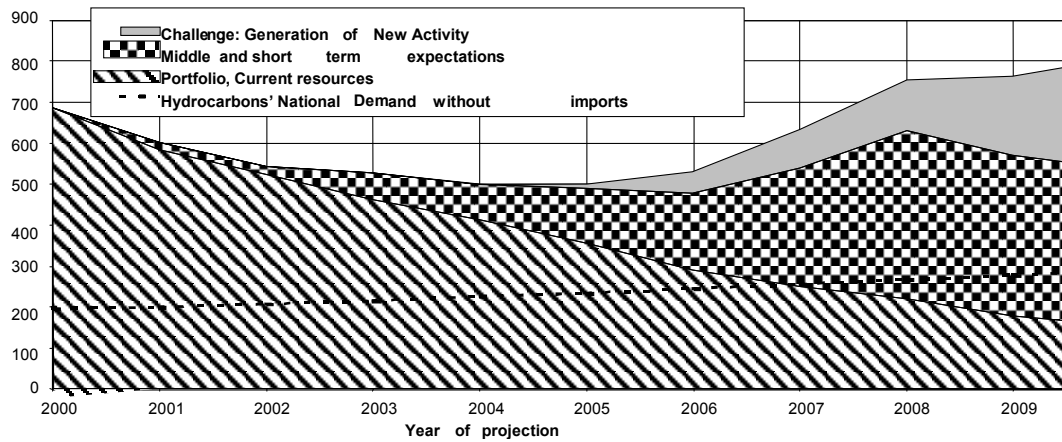
Graph 9: Net Consolidated Debt as a Percent of GDP, Stabilized Scenarios

Graph 10: Scenario P80: New Exploratory Cycle

Graph 11: Historical record of primary balances of the public non-financial sector and of the Central Government