Fiscal policy in Colombiaand a prospective analysis after the 2008 financial crisis

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Abstract

The purpose of this study is twofold: First, it provides an empirical characterization of fiscal policy in Colombia over the last decades, by assessing the three most relevant macroeconomic factors: the behavior of fiscal policy over the business cycle; whether it has been coherent with the long-term debt sustainability; and, whether it has been a significant source of macroeconomic volatility. The results are compared internationally. Second, it evaluates the fiscal stance of the Colombian authorities during the 2008 global financial crisis, and examines the adoption of a fiscal rule as an appropriate tool to manage public finances beyond the recovery phase.

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Fiscal policy in Colombia and a prospective analysis after the 2008 financial crisis

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1. Introduction

The purpose of this study is twofold: First, it provides an empirical characterization of fiscal policy in Colombia over the last decades, by assessing the three most relevant macroeconomic factors: (i) the behavior of fiscal policy over the business cycle; (ii) whether it has been coherent with the long-term debt sustainability; (iii) whether it has been a significant source of macroeconomic volatility. The results are compared internationally. Second, it evaluates the fiscal stance of the Colombian authorities during the 2008 global financial crisis, and examines the adoption of a fiscal rule as an appropriate tool to manage public finances beyond the recovery phase.

To meet the first objective, a standard fiscal reaction function was estimated, and other customary empirical techniques (fiscal impulses and co-integration test) were applied. The analysis led to the conclusion that discretionary fiscal policy in Colombia has been historically pro-cyclical; that it has been closely consistent with the long-term condition of debt sustainability; and that its volatility has been decreasing in recent years. Regarding the second objective, the analysis revealed that the Colombian fiscal authorities adopted a rather *neutral* posture during the crisis --a discretionary counter-cyclical (or pro-cyclical) fiscal plan to compensate for the decline in real activity has not been developed mainly because of the lack of fiscal space.

Two short and medium-term scenarios were considered to assess the fiscal effects of the crisis: one with a moderate impact and a quick economic recovery; and the other, with a slightly more severe impact and a slower growth recovery. As a result of the economic slowdown, the analysis shows that the government finances are likely to suffer a substantial decline: tax revenues will drop more than -4% in 2010 (in real terms); the primary balance

will be negative between 2009 and 2011 (higher than -1% of GDP); and debt levels will reach those attained at the beginning of the decade (above of 40% of GDP), when the central government finances were highly fragile.

Despite this short-term fiscal deterioration, the Colombian fiscal indicators had been improving over the pre-crisis period, as a result of a favorable domestic and external macroeconomic environment as well as various fiscal reforms. Going beyond the recovery phase, the adoption of a fiscal rule on government accounts would be a suitable tool to help consolidate the public finances in the long term. Prospective exercises were made to support the benefits of this tool. Overall this discussion is organized as follows: an empirical characterization of fiscal policy in Colombia over the last decades is provided in Section 2. The fiscal stance of the authorities during the 2008 global financial crisis is described in Section 3. An assessment of a fiscal rule to be applied to the long-term public finances is presented in section 4. Some conclusions are drawn in section 5.

2. Empirical characterization of the fiscal policy: the three major issues

2. 1. The fiscal stance throughout the cycle

A large number of empirical studies have found that the fiscal stance in industrial countries tends to be either a-cyclical or counter-cyclical, which is consistent with the stabilizing role of fiscal policy.[1] By contrast, other studies for developing countries –low and middle-income countries- or for emerging economies like Colombia, have usually concluded that their fiscal policies have a pro-cyclical character.[2] Among the reasons that explain pro-cyclical policies are: weak fiscal institutions, borrowing constraints, and the so-called *voracity effect*.[3] Gavin *et. al*. (1996) tested some of these factors for Latin American

[1] Gali (1994), Perotti (1999), Silgoner et. Al.(2003), Perotti (2004)
[2] Manesse (2006), Alesina and Tabellini (2005), Calderón, Duncan and Schmidt-Hebbel (2004), Kaminsky, Reinhart, and Végh (2004), Talvi and Végh, (2000); Gavin and Perotti (1997).
[3] According to Manasse (2006, Pg.7), the "voracity" effect takes place…"in economies lacking strong legal and political institutions. In such circumstances, a windfall in revenue exacerbates the struggle for fiscal "Redistribution, as each interest group tries to appropriate its share without fully internalizing the consequences of its own demand on general taxation. The lack of coordination, in this version of the familiar common pool problem, is ultimately responsible for a more-than-proportional increase in spending."

countries (LAC) in the nineties, reaching valuable conclusions. In particular, they found out that the fragile relationship of Latin America with the international financial markets was detrimental to the adoption of counter-cyclical policies. This occurs since these countries often face a loss of market confidence, during economic downturns, that intensifies borrowing constraints.

The Colombian fiscal policy through the cycle is explored empirically in this section, to validate the results found for other LAC. First, a reduced form model of a traditional reaction function is employed. The results are compared at an international level. Second, the fiscal impulses technique is applied which permits to do an annual evaluation of the fiscal stance. Assessing the causes of the fiscal posture during the cycles in Colombia is beyond the scope of this discussion.

a. The fiscal reaction function

The reduced form of the fiscal reaction function relates the fiscal balances in t (overall or primary), Bal_t, in percent of GDP, to the lagged (or contemporaneous) output gap, Gap_{t-1}, controlling the lagged debt-GDP ratio, $Debt_{t-1}$, and the lagged dependent variable. Equation [1] shows this postulation:

$$Bal_t = \alpha + \beta GAP_{t-1} + \lambda Debt_{t-1} + \delta Bal_{t-1} + \varepsilon_t \qquad [1]$$

where ε is an i.i.d. disturbance. In equation [1], $\beta<0$ is evidence of a pro-cyclical policy ($\beta>0$ countercyclical) which means that balance-to-GDP ratio falls when actual output increases relatively to potential output. Regarding the relationship between debt and fiscal balance, which was first used by Bohn (1988) to test government solvency (sustainability), it is required that $\lambda>0$. We will return to this subject in the next section.

Empirically, the endogenous variable of equation [1] could be estimated using three possible alternatives: actual balance, *Bal*; cyclical-adjusted balance, Bal^{CA}; or using only the cyclical component of the balance, Bal^{C}, which is given by the difference between the

first two concepts (i.e. $Bal^C = Bal - Bal^{CA}$). As it is shown below, in the first case, β reflects both the automatic stabilizer size and the endogenous change of the discretionary fiscal policy. In the second case, β gives the endogenous response of the fiscal policy to the cycle, precisely the indicator explored in this section. In the third case, β reflects exclusively the size of the automatic stabilizers.[4] Regarding the fiscal balance definition, it must include the interest payments on the public debt (overall balance, or *Bal*) or exclude these expenditures (primary balances, *PrimBal*). This second option is closer to the government budget constraints and reflects better the discretionary actions of the fiscal authorities.

$$\text{Bal} = \begin{cases} Bal \longrightarrow & \beta = \text{automatic stabilizer + changes in endogenous policy} \\ Bal^{CA} \longrightarrow & \beta = \text{endogenous response of fiscal policy} \\ Bal^{C} \longrightarrow & \beta = \text{automatic stabilizer} \end{cases}$$

Table 1 shows the estimation of the reaction function for Colombia employing annual data for the central government from 1960-2008. The outcomes are compared internationally with results derived from the Fatás and Mihov (2009) research.[5] Both for Colombia and for the OECD countries, the estimations were made through OLS (also with the instrumental variables method to control endogeneity problem) and incorporate dummy variables to capture possible changes in the fiscal regimes (structural breaks).[6] In both studies, the cyclical adjusted balances are estimated using the OECD methodology. [7]

The following two findings must be highlighted: first, the long-term fiscal position of the Colombian government has been pro-cyclical ($\beta < 0$). The different options of measuring the endogenous variable (Bal, Bal^{CA}, $BalPrim$, $BalPrim^{CA}$), are statistically significant and support this conclusion. Using the cyclically adjusted balance ($\beta = -0.155$), the parameter means that for each percentage point increase in the output gap, the structural balance

[4] Fatás A, and Mihov, I (2009)

[5] The Fatás and Mihov study was made, mainly, for the 12 major European Union economies (EU), USA, UK, and Japan for the period 1970-2005.

[6] In Colombia, the most significant dummy was detected in 1998, which coincides with a substantial increase in government spending rising from fiscal decentralization and social security programs implemented by the middle of the decade. In the European Union economies, the dummy applies since 1999, before the adoption of the single currency, and after the implementation the Stability and Growth Pact.

[7] For Colombia, see details in Lozano and Toro (2007).

deteriorates by about one sixth-part. If we evaluate the reaction function with the cyclically adjusted primary balance ($BalPrim^{CA}$), as recommended by some authors, the degree of pro-cyclicality is maintained (β = -0.139), and renders a better level of statistical significance (99%).[8]

The second outcome refers to results at an international level. In particular, the European Union governments maintained, on average, a pro-cyclical stance between 1970 and 2007 (β=-0.145), and only for the U.S., did the authors find evidence of a counter-cyclical stance (β = 0.133). For the Japan and the U.K cases, clear conclusions could not be drawn since the parameters were not statistically significant. Regarding the size of the automatic stabilizer, the parameter for Colombia is notably lower (0.131) than that of developed countries, where it ranges from 0.26 (for Japan) to 0.46 (for European Union countries).

b. The fiscal impulses

A fiscal impulse is defined as a change in the cyclically-adjusted fiscal balance between two periods, and can be assessed both with the overall balance (ΔOB^{CA}) and primary balance (ΔBP^{CA}). These indicators were compared with respect to output gap, in order to establish the fiscal stances through the business cycle. The advantage to use fiscal impulses rather than a reaction function is that a fiscal stance can be assessed annually. Figures 1 and 2 show the results for a shorter period (1994-2008).[9] The slope sign of the trend line captures the fiscal posture (on average) along those years. The negative correlations between fiscal impulses and the output gap point out to the dominance of pro-cyclical fiscal postures in Colombia in recent times. A pro-cyclical fiscal policy was also evident in the economic expansion of recent years (2003-2007), in which the economy grew at an average rate of 5.8%. Throughout the entire period considered, only four of the fifteen observations (years) displayed counter-cyclical fiscal stances.

[8] Because of data limitations, it was not possible to calculate the reaction function for sub-period (before and after the break changes in 1998).

[9] Quadrants I and III reflect a counter-cyclical stance as the fiscal balance improved with positive changes in output gap, and quadrants II and IV reflect the opposite case (pro-cyclical stance).

2. 2. Debt sustainability

From a macroeconomic perspective, debt sustainability is the second important empirical fact that must be considered. According to equation [1], if λ is positive, the government tries to increase the fiscal balance in order to react to the existing stock of public debt and comply with the inter-temporal budget constraint (IBC). The standard interpretation of such a result could be seen as a sign of a *Ricardian fiscal regime*. However, the literature has emphasized that sustainability of public finances would require not only that λ be positive but also *sufficiently* positive.[10] The results for Colombia show that λ = 0.057 when the reaction function is evaluated with the actual primary balance, as dependent variable, and that λ = 0.045, when it is evaluated with the cyclically-adjusted primary balance (Table 1). The latter parameter has a higher significance level (95%). These results provide evidence that the Colombian central government has been historically coherent with the IBC. Internationally, the clearest evidence of fiscal sustainability is offered by the U.S. and the G-12 countries of the European Union.

Cointegration analysis

A co integration analysis between the tax revenues (t_t) and the primary expenditures (g_t) of the central government was performed as an alternative technique to assess fiscal sustainability, and as a means to complement the analysis of parameter λ from the fiscal reaction function; in particular, it was important to assess if the size of such parameter was positive enough. The idea behind co integration analysis is that if we assume that the discount rate (δ) of the IBC follows a stationary process, as it is empirically commonplace, we can expect a long term relationship between these two variables (Hakki and Rush, 1991).[11] If this is the case, we use the reduced-form model $t_t = \sigma_0 + \sigma_1 D_t + \beta g_t + \varepsilon_t$, where σ´s and β are the cointegration parameters, D denotes dummies -capturing the possible structural changes-, which are estimated endogenously using Gregory and Hansen (1996) tests, and ε is the error term. Because of data availability constraints, this

[10] Alfonso (2005). See details in Afonso pg.14 and 24.

[11] The budget constraint could be expressed as $b_t = E_t \sum_{i=1}^{\infty} \delta^{-i} (t_{t+i} - g_{t+i})$, where b_t is the debt to GPP ratio, E_t is the expectative operator, and the no-ponzi game condition is imposed.

cointegration analysis was made for a shorter period with quarterly data (from 1990Q1 to 2008Q4).

Initially, both the unit root and the cointegration tests were checked as well as the long-term causality test between (t_t) and (g_t), through the Vector Error Correction Model, VECM. Two important findings emerged. First, variables were co integrated only considering a structural break in 2003Q1 (Table 2), which coincided with the adoption of some fiscal reforms known as "second generation-reforms", implemented to adjust government finances.[12] Second, there was evidence in favor of the expenditures-to-revenue-long-term determination-hypothesis, which means that the government spending has been determining the dynamics of its revenues (Table 3).[13] On the basis of these results, the fiscal sustainability test using Dynamics OLS (DOLS) and the sustainability test of Quintos (1995) were performed. The reduced-form model employed can be expressed as

$$t_t = \sigma_0 + \sigma_1 D_t + \beta g_t + \sum_{-q}^{q} \gamma_q \Delta g_{t-q} + \varepsilon_t \qquad [2]$$

where the forth term on the right side of [2] is used to control the short-term dynamic of the exogenous variable. Table 4 displays the results. Because the parameter β (β=0,48) is neither (statistically) close to one (which is the case of a *strong sustainability condition*) nor close to zero (*unsustainability condition*), we can conclude that the fiscal stance in Colombia, during the last two decades, has been *sustainable but in a weak sense* ($0<\beta<1$), which in practice means that the government has been compelled to make debt roll-over (partially or totally).[14]

2.3 Volatility

The volatility of fiscal policy is the third empirical aspect to be examined. According to the reaction function, equation [1], any exogenous discretionary fiscal decision, which is not

[12] The fiscal reforms are described in (Lozano, 2009).

[13] Table 3 shows that the error correction term (δ) is statistical significant only in the income equation.

[14] More details on these results are offered in Lozano and Cabrera (2009)

related to the debt level or to the state of the economy (output gap), is captured by the error ε_t. Consequently, the error behavior can be used to analyze the volatility of the discretionary fiscal policy, and therefore to get an idea of the role played by fiscal policy, from a macroeconomic volatility perspective. Table 5 shows errors volatility for Colombia since 1960. The results are compared with fiscal volatility figures found by Fatás et.al, (2009) for major OECD countries. In both cases, the overall actual balance is used as endogenous variable.

Fiscal volatility, measured by the error´s standard deviation (SD), was 0.84 for the overall period. Looking at sub-periods, the nineties registered higher fluctuations of the residuals (SD =1.37) than those of the seventies and eighties (SD = 0.61). The highest volatility reached in the nineties was partially associated to the public spending commitments of the Political Constitution of 1991, which generated a large deficit and high-debt levels for the central government by the turn of the century.

It is important to note that the highest fiscal volatility in Colombia, during the nineties, coincides with the highest level of economic growth volatility. However, this indicator has been decreasing in recent years, facilitating macroeconomic stabilization. Historically, fiscal policy in Colombia has been less volatile than in Japan and the U.K, but more volatile than in the U.S. and the G-20 countries of European Union. For the latter, volatility figures were substantially reduced after the adoption of the single currency in 1999. As was the case in Colombia, fiscal policy in the U.K. and the U.S. was less volatile after 1999.

3. The fiscal stance during the 2008 global financial crisis

As described in the previous section, from the 1960s discretionary fiscal policy in Colombia has been pro-cyclical; it has been consistent with the long-term condition of debt sustainability --although in a weak way, particularly over the last two decades; and it has registered decreasing volatility rates in recent years. Under this scenario, it is important to analyze how the 2008 global financial crisis affected public finances in Colombia, and whether its fiscal authorities are exploring new policy mechanisms conducive to long-term

self confidence. These queries are tackled, first, by describing the fiscal indicator behavior during the pre-crisis period; and second, by reviewing the changes in its forecasting, once the slowdown in economic activity became evident.

Regarding the first query, it is evident that in the course of last decade, Colombia's public finances have displayed a remarkable improvement. The fiscal balance of the consolidated public sector (CPS) shifted from a deficit of 4.9% of the GDP in 1999, to a small surplus of 0.1% of the GDP in 2008. In that period, the deficit of the Central Government (CG) went down from 6% to 2.3% of the GDP, and its debt level decreased from 47.5% of the GDP in 2002 to 36%, in 2008. These results were fostered by fiscal reforms designed to increase revenues (three tax reforms) as well as to moderate the growth of public expenditures (two pension reforms and two reforms to transfer resources at sub-national levels, among others). However, the most important factors of such a successful fiscal performance were the favorable internal and external macroeconomic circumstances, including the boom of oil prices.[15]

The sharp economic slowdown that began in the fourth quarter of 2008 and extended into 2009 caused a significant drop in the tax revenues of the central government, and the subsequent deterioration of its fiscal position. The Colombian economy has accumulated negative growth rates for the last four quarters, from -1% (2008Q1) to -0.2% (2009Q3). The external transmission channel (fall in commodity external prices, falling exports, falling remittances, temporary restriction of credit markets, etc.), was the most important channel of transmission of the global crisis. Despite the impact of these factors in tax revenues, fiscal authorities decided to keep the same expenditure levels to avoid a further contraction of the domestic demand, which could exacerbate the economic downturn.

As a result, the deficit of the central government for 2009 rose from an initially expected level of 2.6% of the GDP to a final level of 4% (Figure 3). The changes in fiscal forecasting meant a deterioration of the balance of 1.4% of the GDP. It is anticipated that the fiscal

[15] In 2004 for instance, the debt ratio was reduced in 4.5 points of the GDP, out of which 3.6 points were explained both by economic growth and by the appreciation of the COP. See details in Lozano (2009)

balance will continue to deteriorate in 2010, by the lagged effect of the crisis. Because this larger fiscal deficit is mainly explained by the fall of endogenous revenue and the preservation of public-expenditure rates, this fiscal stance can be typified as a-cyclical.

At the bottom of Table 6, the size of the automatic stabilizer for 2009 is calculated, i.e, the impact of the fall in economic activity on the government's fiscal balance; these results are compared internationally. The economic growth forecast for 2009 was reduced from an initial rate of 5% to a final rate of 0.5%, while the fiscal imbalance increased from 2,6% to 4% of the GDP correspondingly. Therefore, it can be concluded that for each percentage point of lower economic growth, the fiscal deficit deteriorated 0.3% of the GDP. The effect of the crisis for industrialized and emerging economies (G-20) would be, on average, very close to that found for Colombia.[16]

Short and medium term fiscal forecasting

The deterioration of the Colombian fiscal indicators in the short and medium terms will depend on the severity of the economic downturn in 2009 and 2010, and particularly on the recovery path of subsequent years. As will be the case of other Latin American Countries (LAC), economic recovery in Colombia will be conditional to the revitalization of the global economy and, in particular, of the U.S. economy and those of other important trading partners such as Venezuela, Ecuador and the E.U. Figure 4 displays two foreseeable scenarios for Colombia's economic growth for the period 2009 to 2011: Scenario 1 with a moderate impact of the international crisis and a quick economic recovery; and Scenario 2 with a slightly more severe impact and a slower economic recovery.

A comparison of the above-mentioned forecasting with the WEO-IMF growth-forecast for LAC leads to the conclusion that: i) the moderate growth scenario is coherent with what IMF is expecting for Colombia, and ii) the growth impact of the crisis in 2009 was more severe in countries like Mexico, Chile, and Brazil, even though the growth recovery has

[16] The effect of the automatic stabilizers on the fiscal balance is calculated using standard accounting techniques (see 1 in Table 6). For OECD and emerging economies, see IMF (2009).

been faster in these countries. The Colombian economic performance in these two years (2009-2010), is just equal to the average (simple) for the region (Figure 5).

Under each economic growth scenario and considering other consistent macroeconomic assumptions, a predicting exercise of tax revenue, primary balance and debt, for the short and medium terms, was carried out.[17] Figure 6 illustrates how the economic slowdown will have negative effects on the central government finances. In both scenarios, government revenues will decline, in real terms, more than -4% in 2010; the primary balance will be negative between 2009 and 2011 (higher than -1% of GDP); and debt levels will reach those recorded at the beginning of the decade (above of 40% of GDP), when the central government finances were highly fragile. With regards to the pre-crisis period (2007-2008), the debt level could increase in 2011 about 8 percentage points of the GDP.

Although the main fiscal indicators are declining in Colombia as result of the global crisis, it is certainly not a "huge fiscal decline," as has been the case of the majority of OECD economies. However, fiscal authorities are facing important policy challenges to guarantee the long-term sustainability of the public finances, and particularly to implement countercyclical tools that help face unexpected shocks like the 2008 crash. The defies are difficult and mounting since the Colombian government has been solving a larger demand for social expenditures, particularly in the social security services; the poverty level has increased in recent times (around of 45%); and the political internal conflict still remains to be solved.

4. Designing a fiscal rule to manage public finances

According to preliminary exercises of prediction, the primary balance for central government will return to an equilibrium level (not positive) only since 2014. This means

[17] The macroeconomic assumptions are derived from the balance of payments, and include inflation, exchange rate, external prices of major commodities, the import growth, and the economic growth of major trading partners.

that only by then, the debt to GDP ratio would return to its downward trend.[18] Under these circumstances, it is not advisable for the government to assume a passive fiscal posture in the upcoming years. The unexpected increase in fiscal deficits and public debt has raised concerns about the sustainability of public finances in Colombia, and underlines the need for additional adjustments in the medium term.

As was mentioned in section 3, Colombia has made significant progress towards fiscal consolidation over the last ten years. Nevertheless, the fiscal adjustments have not sufficed and, somehow, they have been partially reversed by the 2008 global financial crisis. The current scenario calls for the adoption of a fiscal rule (well-designed and well-implemented) on central government finances that would guide fiscal policy in medium and long terms and, particularly, anchor expectations regarding the sustainability of the public debt. The fiscal adjustments advanced to date constitute a credible prelude for the establishment of such a rule.

A recent IMF study states that in countries with no existing rule and relatively small adjustment needs (like Colombia), early implementation of a fiscal rule may help strengthen policy credibility. The confidence and credibility are essential to anchor long-term expectations about the sustainability of the public debt. Such anchoring, in turn, could help prevent adverse market reactions, including a higher risk premium, and facilitate the adoption of a prudent fiscal policy (IMF 2009). It should be recalled that Colombia does not have investment grade, like Chile, Brazil, Mexico, and Peru, which means that its debt is relatively more expensive. In this regard, the fiscal rule might help the country regain the investment grade that was lost in the late nineties.

From a macroeconomic standpoint, there is evidence that fiscal rules enhance the credibility of government decisions; allow countries to have countercyclical and sustainable fiscal policies; and contribute to economic stability and long-term economic growth.[19] The adoption of fiscal rules has become an institutional strategy for most OECD countries and

[18] This is mainly due to the fact that output gap remains negative until 2013.
[19] Kopits (2004), and Fatás and Mihov (2003).

for several LAC (Brazil, Chile, Mexico, and Peru). Colombia began to introduce fiscal rules by the end of the nineties, but mainly at the sub-national level. In particular, the operational expenditures and the debt levels of the sub-national governments were constrained to the performance of their own-revenues and to their payment capacity, respectively. Since then, local governments in Colombia have not been a source of fiscal disequilibrium.

Among several alternatives, the Colombian government is currently analyzing the cyclically-adjusted primary balance (CAPB) as one of the best indicators to fix the fiscal rule. The primary balance excludes the interest payments on the debt, over which the fiscal authority has no discretion. As such payments could be very sensitive to exogenous macroeconomic variables such as the exchange rate and the interest rates (domestic and external), may be appropriate that the rule would not depend on the volatility of these variables. Another advantage of focus on CAPB is that is relatively more controllable by the fiscal authorities. In addition, if the rule is adopted to guide fiscal policy towards the smoothing the economic fluctuations, the international evidence suggests that the CAPB becomes in one the best indicators since it allows the automatic stabilizers to operate fully.

Figure 7 displays a CAPB long-term prediction exercise, to examine the adoption of a fiscal rule on this indicator. For the reasons stated above, the coverage of the new rule would apply only to the central government finances. The fiscal forecasting exercise is made on the basis of a conservative macro-scenario, which does not contemplate any additional tax reforms, and is also consistent with the reduced fiscal space. Remarkably, the negative output gap will close smoothly until 2013 (right scale). Moreover, the CAPB will be negative until 2013 (-0.6% of the potential GDP, on average) and, thereafter, will remain almost in equilibrium for the following two years. Afterward, the CAPB will become positive (on average 1.6% of the potential GDP between 2016 and 2020).

In conformity to these results, the fiscal rule must have at least three key elements to secure credibility, counter-cyclicality, and fiscal discipline in the long term; moreover, it should be supplemented by other fiscal reforms to render feasible its implementation. First, the CAPB

rule must include more than one numerical target for the coming years, to make possible its fulfillment at the stage of economic recovery. Assuming that the fiscal rule would be adopted as of 2011, for instance, this paper proposes a numeral target in three steps: -0.5% of GDP for 2011, 2012 and 2013; +0.5% for 2014, and 2015; and finally, +1.5%, as of 2016. These goals must be reviewed at any prudential intervals (i.e. every 5 years) to introduce any required adjustments.

Second, the numeral target on CAPB must guarantee a decreasing trend for the debt-to-GDP ratio of the central government, so that in the long term (2020 and thereafter) it reaches levels close to (or below of) 30% of GDP. Finally, any positive or negative divergence in output gap with respect to what is considered here, will allow the government to design a counter-cyclical fiscal policy, to absorb partially any external shocks, and to smooth the business cycle. For the case of unusual and unpredictable exogenous financial and real shocks, generated from external and domestic sources (terms of trade, sudden stops in capital inflows, natural catastrophes, wars, and so on), is recommended that the fiscal rule includes explicitly clauses of scope to these events. This study offers evidence for the first two elements in Figures 9 and 10.

5. Conclusions

The following points summarize some of the most important findings of this study:

- From the 1960s, discretionary fiscal policy in Colombia has been pro-cyclical; it has been coherent with the long-term condition of debt sustainability -although in a weak sense, particularly over the last two decades; and it has registered a decreasing volatility in recent years. These have been the three most relevant traits of fiscal policy, from a macroeconomic perspective.

- Pro-cyclicality was assessed both through a standard fiscal reaction function and through fiscal impulses. The results show that, on average, for each percentage point increase in the output gap, the structural balance deteriorates by about one sixth-part. Fiscal sustainability was also evaluated through co-integration models.

These models offer evidence in favor of the expenditures-to-revenue-long-term determination-hypothesis, which means that the government spending has been determining the dynamics of its revenues. Between 1990 and 2008, on average, an increase of 1% of the GDP in the primary spending was associated with an increase of 0.48% of the GDP in tax revenues. In practical terms, this means that the fiscal stance was sustainable, but only in a weak sense.

- Throughout the pre-crisis period, public finances displayed a remarkable improvement in Colombia. Between 2002 and 2008, the fiscal balance of the central government went down from 5.3% to 2.3% of the GDP, and its debt level decreased from 47.5% to 36% of the GDP. These positive trends were fostered by fiscal reforms designed to increase revenues as well as to moderate the growth of the public expenditures. However, their most important causes were relative to favorable internal and external macroeconomic factors, including the boom of oil prices. The sharp economic slowdown that began in the fourth quarter of 2008 and extended into 2009 (the last four quarters have yield negative growth rates) caused a significant drop in tax revenues and the subsequent deterioration of the fiscal indicators.

- The deficit of the central government for 2009 rose from an initially expected level of 2.6% of the GDP to a final level of 4% (deterioration of 1.4%). It is anticipated that the fiscal balance will continue to decline in 2010, by the lagged effect of the crisis. Because this larger fiscal deficit is mainly explained by the fall of endogenous revenue and the preservation of public-expenditure rates, this discretionary fiscal stance can be typified as neutral or a-cyclical. It can be inferred that for each percentage point of lower economic growth, the fiscal deficit has been deteriorating by 0.3% of the GDP (i.e. 0.3 is the size of automatic stabilizer).

- An additional decline of the fiscal indicators in the medium term will depend on the severity of the economic downturn during 2009 and 2010, and mainly on the recovery path of subsequent years. As will be the case of other LAC, economic recovery in Colombia will be conditional to the revitalization of the global economy

and, in particular, of the U.S. economy, and those of other important trading partners such as Venezuela, Ecuador, and the E.U. Using two foreseeable scenarios for economic growth in Colombia, for the period 2009 to 2011, this analysis concludes that: the government revenues will decline, in real terms, more than -4% in 2010; the primary balance will be negative between 2009 and 2011 (higher than -1% of GDP); and the debt levels will reach those of the beginning of the decade (above 40% of GDP). Comparing to the pre-crisis period (2007-2008), in 2011, the debt level could increase by about 8 percentage points of the GDP.

- The unexpected increase of fiscal deficits and public debt, as a consequence of the global financial crisis, has raised concerns about the sustainability of public finances in Colombia. The short and medium term scenarios call for the adoption of a fiscal rule on central government finances that would guide fiscal policy in the future. The fiscal adjustments advanced to date constitute a credible prelude for the establishment of such a rule.

- The adoption of a fiscal rule may strengthen policy credibility. Confidence and credibility are essential to anchor long-term expectations about the sustainability of the public debt. This, in turn, could help prevent adverse market reactions, including a higher risk premium, and facilitate the adoption of a prudent fiscal policy. It should be recalled that Colombia does not have an investment grade, like Chile, Brazil, Mexico, and Peru, and that the fiscal rule might help the country regain the investment grade that was lost in the late nineties.

- The Colombian government is currently analyzing the cyclically-adjusted primary balance (CAPB) as one of the best indicators to fix the fiscal rule. After a CAPB long-term prediction exercise, this analysis suggests that the fiscal rule must have at least three key elements to secure credibility, counter-cyclicality, and fiscal discipline in the long term. First, the rule must include more than one numerical target for the coming years. Assuming that the rule would be adopted as of 2011, the numeral target must contain three levels: -0.5% of GDP for 2011, 2012, and 2013; +0.5% for 2014, and 2015; and +1.5% as of 2016. These goals must be

reviewed at any prudential intervals (i.e. every 5 years) to introduce any required adjustments.

- Second, the targets on the CAPB must guarantee a decreasing trend for the debt-to-GDP ratio of the central government, so that in the long term (2020 and thereafter), it reaches levels below of 30% of the GDP. Finally, any positive or negative divergence in output gap, with respect to what is considered here, will allow the government to design a counter-cyclical fiscal policy to absorb any external shocks, and to smooth the business cycle. This study offers evidence of these considerations.

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Tables and Figures

Table 1

Fiscal Reaction Function for Colombia[1/]

Dependent Variable	GAP_{t-1} Coefficient	s.e.	$Debt_{t-1}$ Coefficient	e.e.	Dep. Var. Lagged. Coefficient	s.e.	R^2
Bal	-0.122	(0.061)*	0.047	(0.027)*	0.782	(0.103)***	0.82
Bal^{CA}	-0.155	(0.061)**	0.028	(0.026)	0.716	(0.103)***	0.82
Bal^{C}	0.131♦	(0.009)***	-	-	-	-	0.81
PrimBal	-0.096	(0.053)*	0.057	(0.024)**	0.651	(0.099)***	0.61
$PrimBal^{CA}$	-0.139	(0.052)***	0.045	(0.023)*	0.576	(0.098)***	0.63
$PrimBal^{C}$	0.131♦	(0.009)***	-	-	-	-	0.81
Dependent Variable Bal^{CA}♠							
Zon	GAP_{t} Coefficient	s.e.	$Debt_{t-1}$ Coefficient	e.e.	Dep. Var. Lagged. Coefficient	s.e.	R^2
Euro Area (G-12)	-0.145	(0.061)	0.016	(0.006)***	0.721	(0.076)**	0.82
Japan	-0.042	(0.100)	0.005	(0.007)	0.904	(0.069)**	0.78
U.K.	-0.196	(0.127)	0.017	(0.032)	0.837	(0.095)**	0.67
U.S.	0.133	(0.065)***	0.028	(0.014)	0.770	(0.103)**	0.69
Dependent Variable Bal^{C}♠ Automatic Stabiliz							
Zon	GAP_{t} Coefficient	s.e.	$Debt_{t-1}$ Coefficient	e.e.	Dep. Var. Lagged. Coefficient	s.e.	R^2
Euro Area (G-12)	0.464	(0.005)***	-	-	-	-	1.00
Japan	0.267	(0.012)***	-	-	-	-	0.95
U.K.	0.391	(0.021)***	-	-	-	-	0.94
U.S.	0.293	(0.013)***	-	-	-	-	0.95

Notes: CA Cyclical Adjusted C Cyclycal Commponent

*** Significance at 99% level **Significance at 95% level *Significance at 90% level

♣ Período 1960 2008 ♠ From Fatas y Mihov (2009) Período 1975 2007

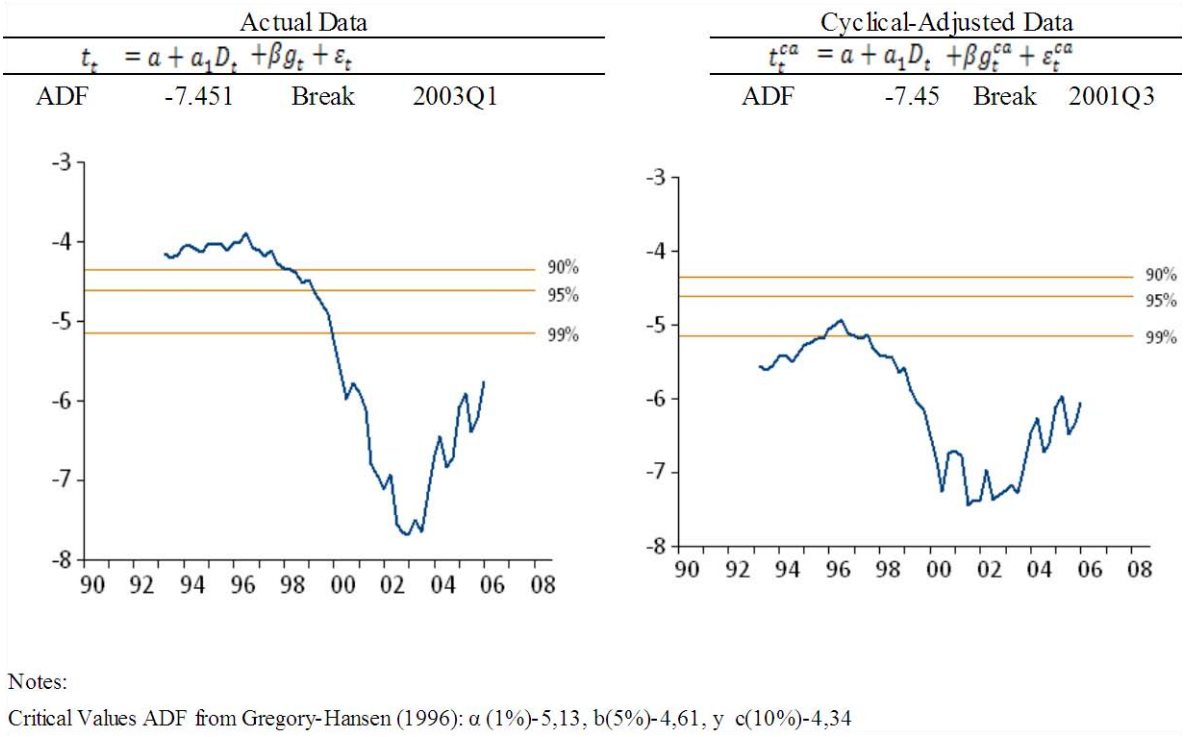
Source: Calculus of the author for Colombia and Fatas & Mihov (2009) for the OECD countries

Table 2. Unit Root Test

	Actual Data				Cyclical-Adjusted Data			
test	t_t	Δt_t	g_t	Δg_t	t_t^{ca}	Δt_t^{ca}	g_t^{ca}	Δg_t^{ca}
ADF	2.398	-6,076*	1.403	-16,1*	2.090	-13,48*	2.053	-17,701*
PP	0.222	-15,525*	0.193	-38,534*	0.161	-15.115*	0.398	-33,425*
KPSS	1,068*	0.139	1,014*	0.079	1,077*	0.133	1,131*	0.083

Notes:
ADF: Dickey-Fuller-Augmened; PP: Phillips-Perron; and KPSS Kwiatkowski-Phillips-Schmit-Shin
* at 99% of significance level

Table 3. Cointegration Test with Structural break (Gregory-Hansen Test)



Notes:
Critical Values ADF from Gregory-Hansen (1996): α (1%)-5,13, b(5%)-4,61, y c(10%)-4,34

Table 4. Revenue and Expenditures Nexus
Estimation through the VECM Model

Actual Data				Cyclical-Adjusted Data			
	Δt_t		Δg_t		Δt_t		Δg_t
α_0	0.01	$\hat{\alpha}_0$	0,002	α_0	0,001	$\hat{\alpha}_0$	0,002
	(0,001)		(0,002)		(0,001)		(0,003)
α_1	0,067	$\hat{\alpha}_1$	-0,439	α_1	-0,006	$\hat{\alpha}_1$	-0,527
	(0,136)		(0,229)***		(0,123)		(0,227)**
α_2	-0,306	$\hat{\alpha}_2$	0,266	α_2	-0,411	$\hat{\alpha}_2$	0,349
	(0,115)*		(0,193)***		(0,108)*		(0,200)**
β_1	0,084	$\hat{\beta}_1$	-0,882	β_1	0,063	$\hat{\beta}_1$	-0,856
	(0,084)		(0,142)*		(0,077)		(0,142)*
β_2	0,328	$\hat{\beta}_2$	-0.276	β_2	0,274	$\hat{\beta}_2$	-0,277
	(0,087)*		(0,147)**		(0,078)*		(0,145)*
δ	-0,604	$\hat{\delta}$	0,201	δ	-0,419	$\hat{\delta}$	0,196
	(0,177)*		(0,298)		(0,156)*		(0,289)

Causality Analysis

Actual Data			Cyclical-Adjusted Data		
Ho	Stadístic	P Value	Ho	Stadístic	P Value
$\beta_1 = \beta_2 = 0$	27,440	0,000	$\beta_1 = \beta_2 = 0$	23.792	0,000
$\hat{\alpha}_1 = \hat{\alpha}_2 = 0$	15,918	0,000	$\hat{\alpha}_1 = \hat{\alpha}_2 = 0$	21.293	0,000

*Significance at 99% level. **Significance at 95% level. ***Significance at 90% level

Table 5. Cointegration Relationship through DOLS (Stock y Watson)

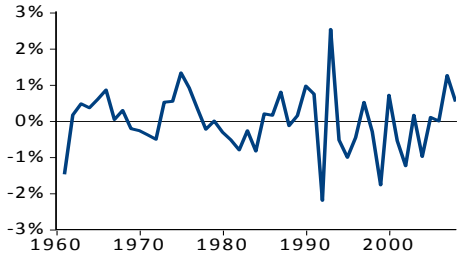
Actual Data			Cyclical-Adjusted Data		
$t_t = \alpha + \alpha_1 D_t + \beta g_t + \sum_{-q}^{q} \gamma_q \Delta g_{t-q} + \varepsilon_t$			$t_t^{ca} = \alpha + \alpha_1 D_t + \beta g_t^{ca} + \sum_{-q}^{q} \gamma_q \Delta g_{t-q}^{ca} + \varepsilon_t^{ca}$		
α	α_1	β	α	α_1	β
0.043	0,033	0,484	0,042	0,033	0,484
(0,012)*	(0,004)*	(0,096)*	(0,012)*	(0,005)*	(0,096)*

Sustainability Test (Quintos) [b]

Actual Data				Cyclical-Adjusted Data			
Step	*Ho*	*H1*	*t*	Step	*Ho*	*H1*	*t*
1	β = 0	β>0	5,169**	1	$\beta^{ca} = 0$	$\beta^{ca} > 0$	5,050**
2	β = 1	β<0	-5,508**	2	$\beta^{ca} = 1$	$\beta^{ca} < 0$	-5,395**

Notas:
[a] ( ) Sstandar error * Significance at 99% level
[b] Critical Values for Ho (10%) 1,295,(5%) 1,669, y (1%) 2,387
**Reject Ho at 99% level of significance

Table 6. Fiscal Volatility

Error Volatility (Fiscal Policy)			Growth Volatility	
		S.D Total Period 0.839		S.D Total Period 0.021
		SD by Sub-periods		SD by Sub-periods
	1961-70	0.648	1961-70	0.011
	1971-80	0.610	1971-80	0.018
	1981-90	0.610	1981-90	0.015
	1991-00	1.373	1991-00	0.029
	2001-08	0.815	2001-08	0.021

OECD COUNTRIES/1

COUNTRY	Before 1999	After 1999
	S.D (Fiscal Policy)	
Euro (G- 12)	0.304	0.146
Japan	1.096	2.543
U.K	1.845	0.899
U.S.	0.641	0.135

Note:
/1 From Fatás and Mihov (2009) Period 1960 - 2000

Table 7

Fiscal Balance in Colombia (% of GDP)

	2006	2007	2008	Forecasting 2009			
				Jun-08	March 09	Sep-09	Δ Forecasting
Central Government	**-3.4**	**-2.7**	**-2.3**	**-2.6**	-3.7	**-4.0**	-1.4
Decentralized Agencies	2.4	1.9	2.1	1.1	1.2	1.2	0.1
Cuasi-fiscal Operations	0.3	0.2	0.1	0.3	0.1	0.1	-0.1
Overall Balance	**-0.7**	**-0.6**	**-0.1**	-1.2	-2.4	-2.7	-1.4
Change in Balance	--	--	--	--	**-1.2**	**-0.3**	**-1.4**
	Automatic Stabilizers (A.S.) 2009						
a. Colombia							
Economic Growt (y)	6.9	7.5	2.5	5.0	1.0	0.5	-4.0
Δ in Econoic Growth (Δy)	1.2	0.6	-5.0	--	-4.0	-0.5	-4.5
Size of the State $(G/Y)^{/2}$	30.6	--	--	--			
Effect of A. S. on Fiscal Bal/1	--	--	--	--	**-1.2**	**-0.2**	**-1.4**
b. OECD Countries and Some Emergent Countries/2							
U.S	--	--	--	--	--	--	-1.5
Japan	--	--	--	--	--	--	-1.4
U.K.	--	--	--	--	--	--	-2.0
Spain	--	--	--	--	--	--	-1.8
Brazil	--	--	--	--	--	--	-0.5
Mexico	--	--	--	--	--	--	-0.8
Argentina	--	--	--	--	--	--	-0.8
G-20 (OECD and Emergents)				--	--	--	**-1.2**

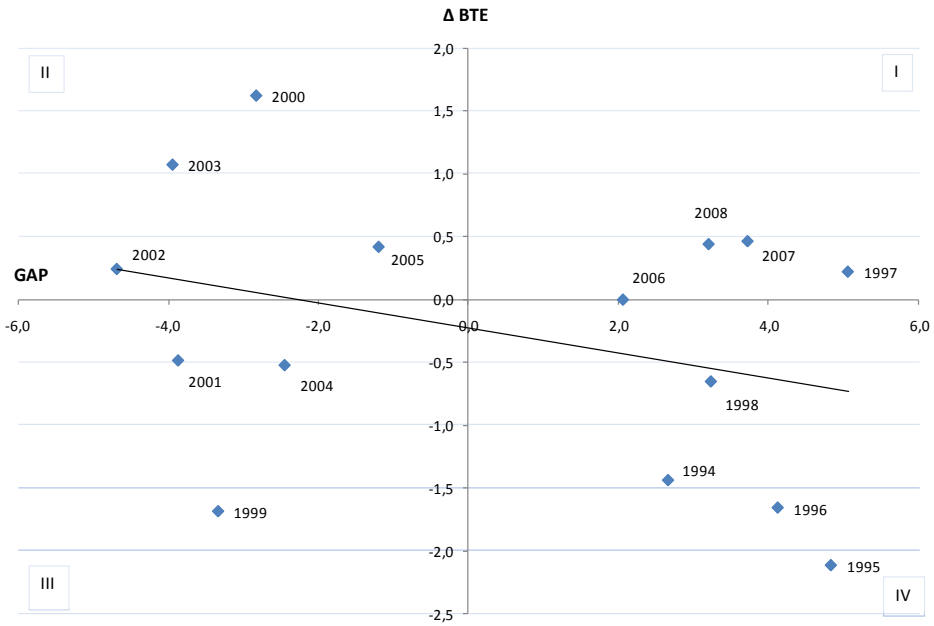
Source: Ministery of Finance, IMF (2009) and calculus of the author

/1 The size of the Automatic Stabilizer (A.S.) is stimate through of [2]:
$A.S \approx (G/Y)*\Delta OUTPUT\ GAP$ [1]
Asumming that $\Delta y_t \approx \Delta Brecha\ Y_t$, y then:
$EA_t \approx (G_t/Y_t)*\Delta y$ [2]
/2 From Table 11, pg 51, IMF (2009)

Source: Ministry of Finances and calculus of the author

Figure 1

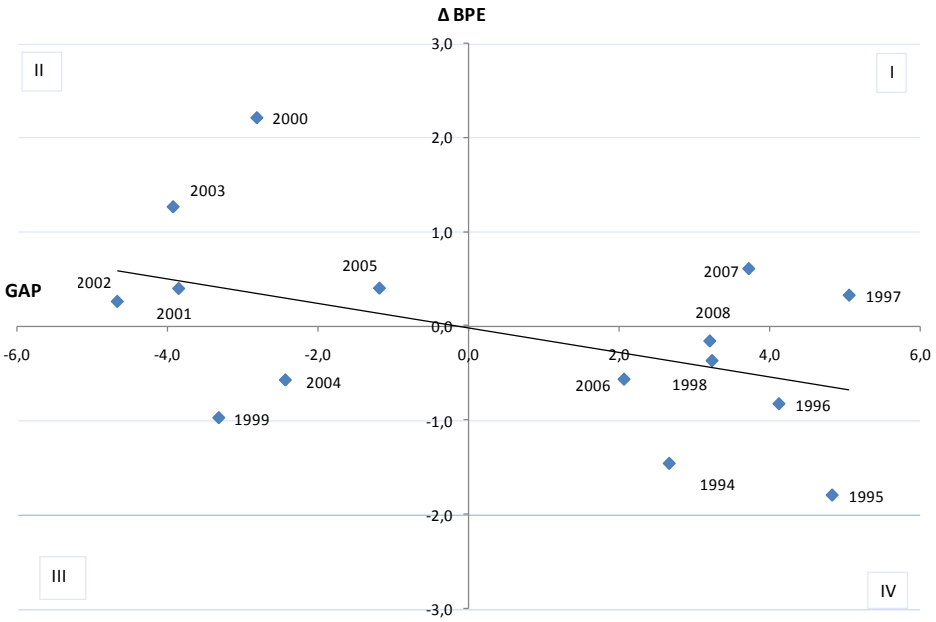
Fiscal Impulses (ΔOB^{CA}) vs. Output GAP: 1994-2008



Source: Calculus of the author (OB^{CA}: Cyclical-Adjusted Overall Balance)

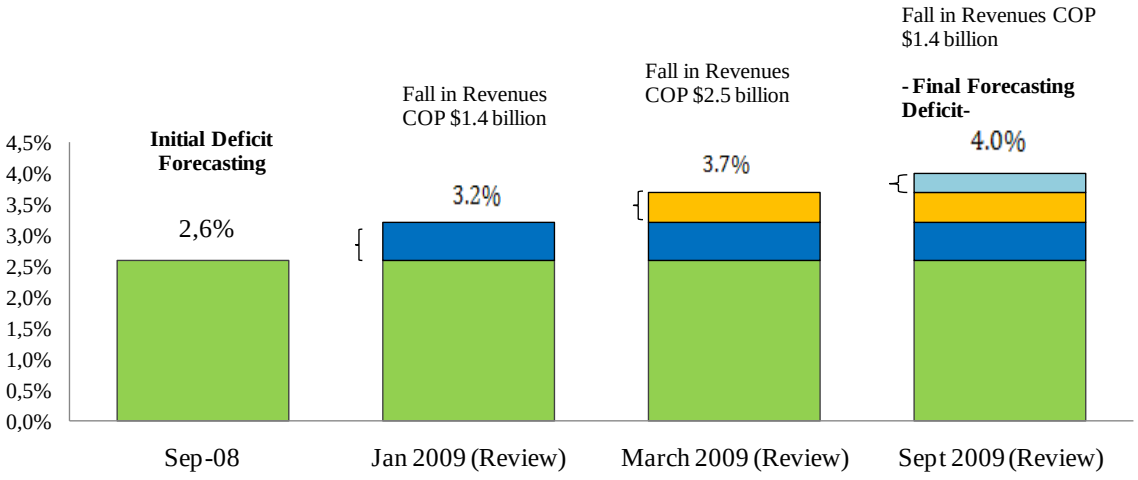
Figure 2

Fiscal Impulses (ΔPB^{CA}) vs. Output GAP: 1994-2008



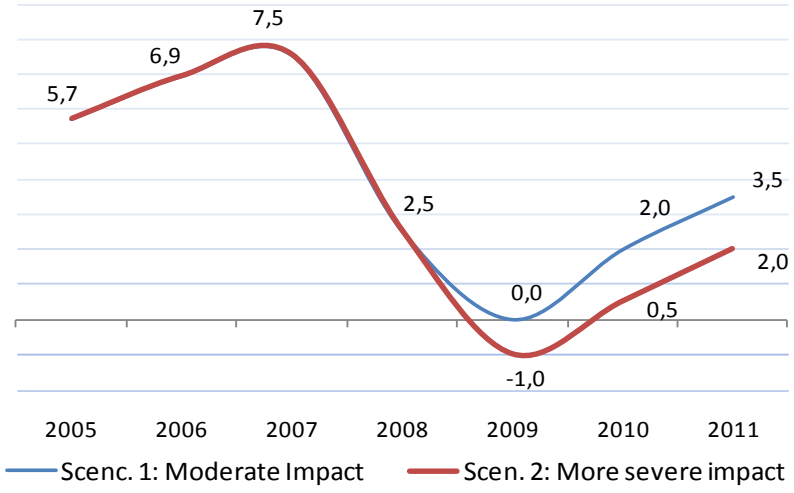
Source: Calculus of the author (PB^{CA}: Cyclical-Adjusted Primary Balance)

Figure 3
Changes in fiscal balance forecasting for 2009 (Percentages of GDP)



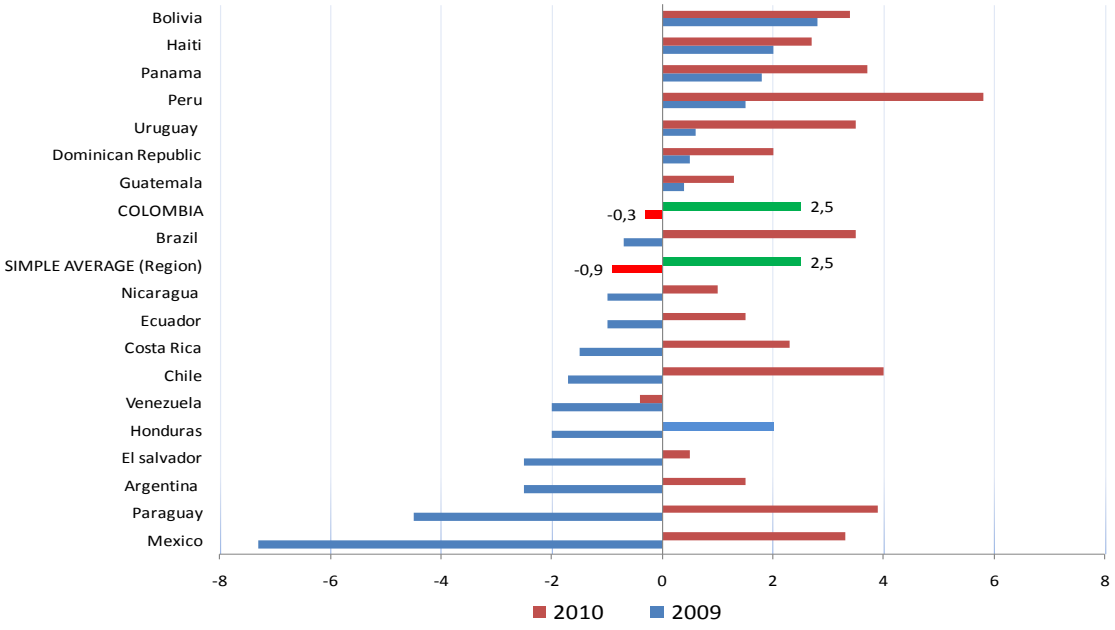
Source: Ministry of Finances

Figure 4. Scenarios of Short-Term Economic Growth



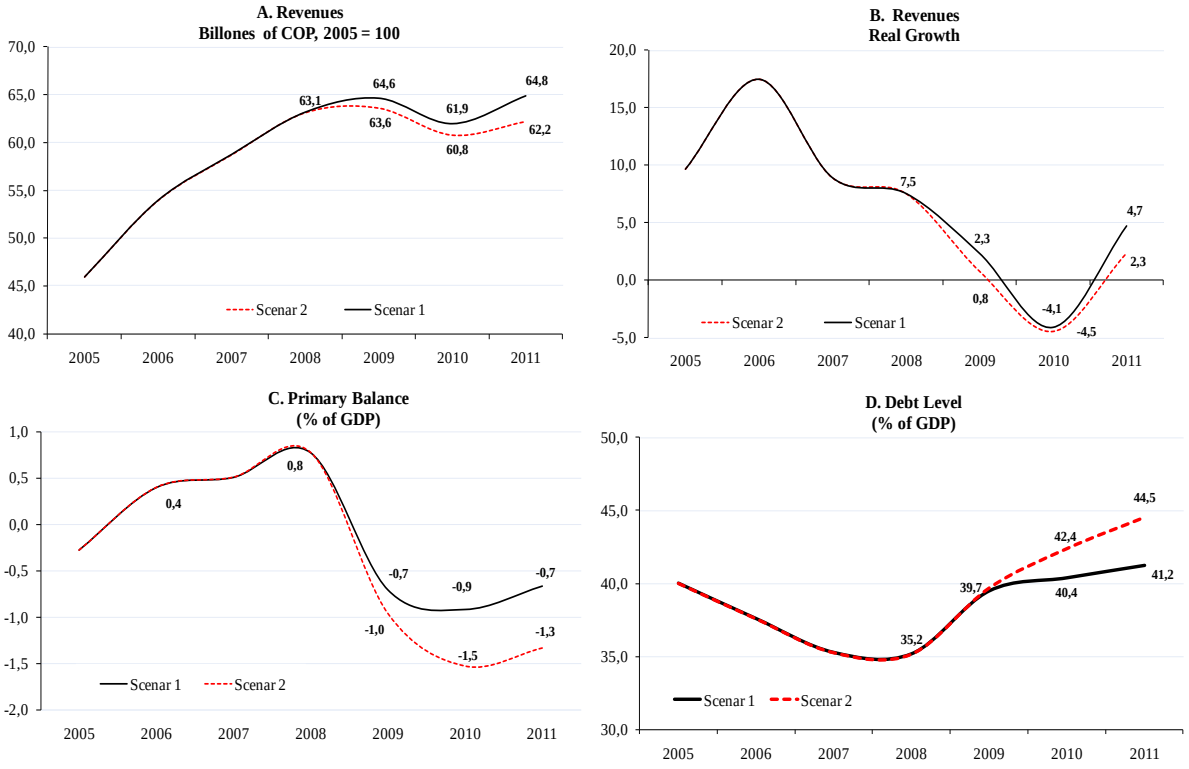
Source: Calculus of the author

Figure 5. Economic Growth for LAC: 2009-2010



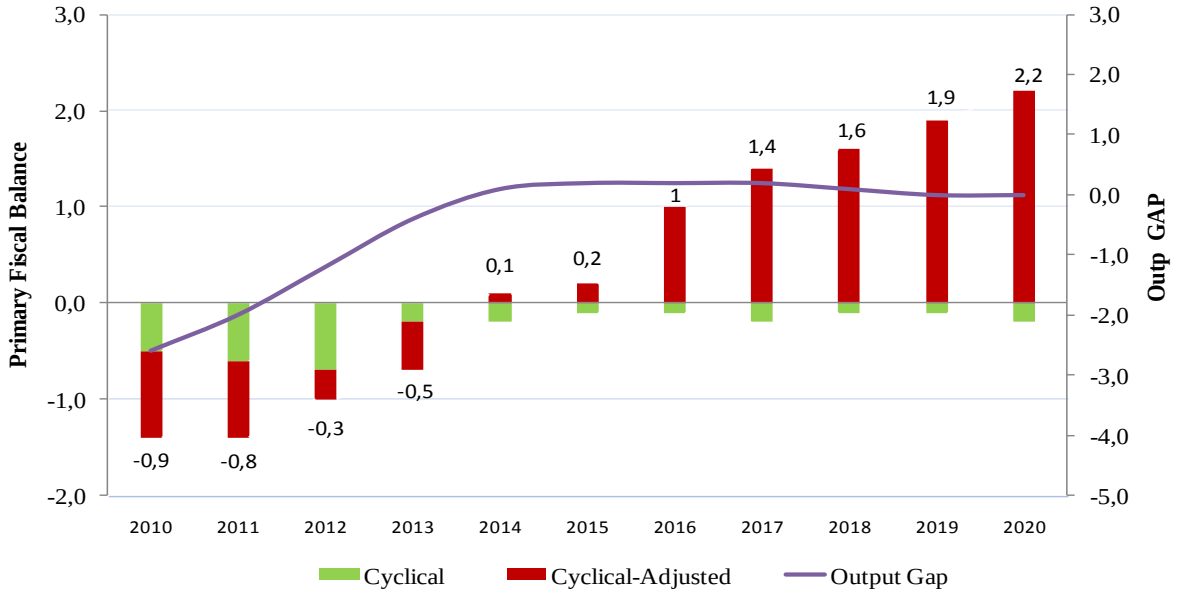
Source: WEO-IMF

Figure 6. Fiscal Effects of the Economic Slowdown



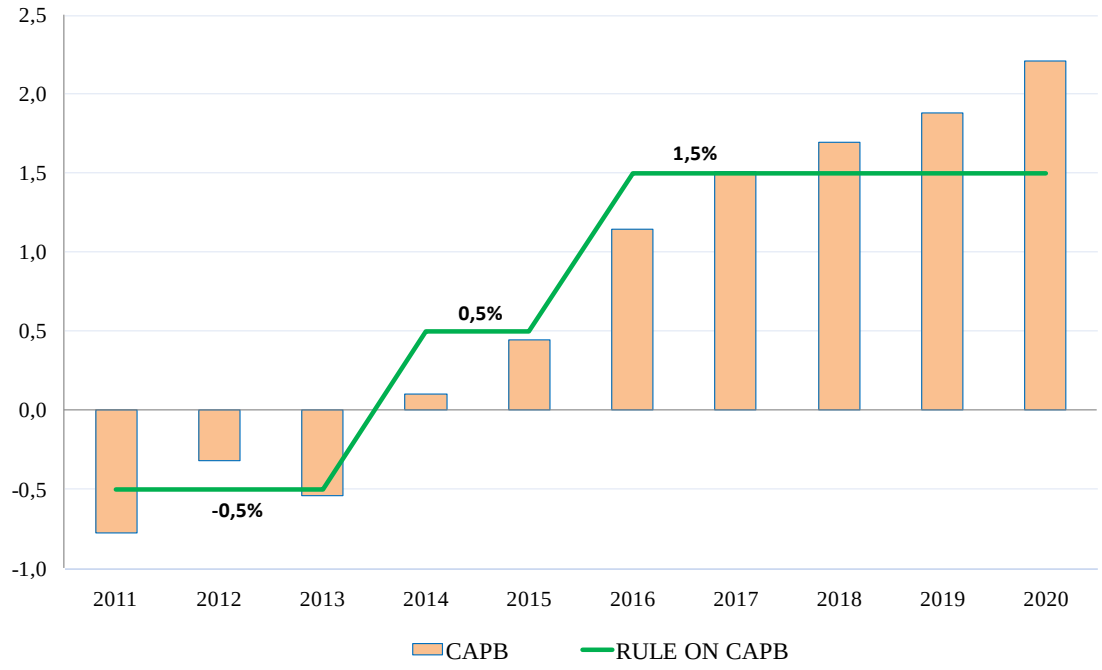
Source: Calculus of the author

Figure 7. Medium and Long Term Forecasting of the Cyclical-Adjusted Primary Balance (CAPB) for Colombia



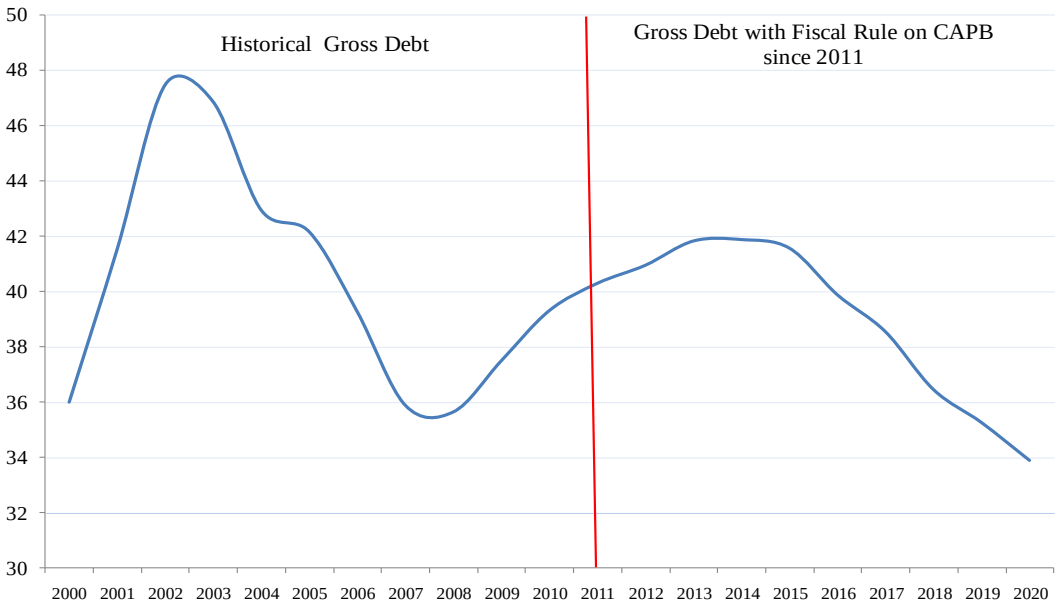
Source: Calculus of the author

Figure 8. Fiscal Rule on Cyclical-Adjusted Primary Balance (CAPB)



Source: Calculus of the author

Figure 9. Debt Forecasting with Fiscal Rule on CAPB
(Percentages of GDP)



Source: Calculus of the author