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The performance of fiscal policy under an inflation targeting regime: What can be learned by the Brazilian fiscal rules?

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Abstract

This paper aims at, on the one hand, analyzing the Brazilian fiscal performance since the implementation of inflation targeting regime (ITR), June 1994, and the usefulness of fiscal rules to reach fiscal discipline in Brazil. On the other hand, it tries to evaluate what would have happened to the Brazilian government deficit if the new fiscal regime, that was implemented in 2016, would have been applied after the implementation of the ITR. Into this direction, we present an empirical analysis to describe three different fiscal rule scenarios, which includes a restriction related to inflation, depending on the preferences of the fiscal authorities: the austere, the symmetric or indifferent or the growth-promoting environment. The main result of our empirical analysis is that, even in a context of ITR, the use of proper fiscal rule (countercyclical fiscal policy) helps to rationalize fiscal consolidation efforts by promoting a favorable environment for economic growth.

KEYWORDS

Brazil, domestic debt, fiscal rules, primary fiscal result

JEL CODE

H62, H63, H68, H72

1 | INTRODUCTION

As is well known, the global financial crisis (GFC), 2007–2008, has increased the usual difficulties to finance government deficits worldwide, despite the need of operating countercyclical fiscal policies

to mitigate its impact on the real economic activity.[1]

For that reason, the need to reduce public debt and government deficits, without harming growth, has renewed the debate on the usefulness and effectiveness of fiscal policy rules, and their complementarity with discretionary measures. In 1990, only seven countries of those belonging to the International Monetary Fund (IMF) had fiscal rules. On the contrary, in 2009 there were 80 countries with any kind of fiscal rule: 21 developed countries, 33 emerging markets and 26 low-income countries. Being the adoption of national fiscal rules more significant in Europe and Latin America, while supranational rules has been adopted mainly in low-income countries (IMF, 2009).

Brazil has traditionally constituted a good example of implementing fiscal rules. Since the mid-1990s, the Brazilian government has tried to maintain a primary surplus in public accounts to ensure greater price stability and the control of public debt. Since the Plan Real (RP), July 1994—the Brazil's most successful stabilization policy since the mid-1960s[2]—, the Brazilian government has explicitly applied fiscal rules as a strategy to control public debt, reach confidence in the international financial system and to mitigate the capital flight. But, more recently, the scenario of deterioration of public accounts, in the period after the GFC, and some years later particularly in 2014 and 2015, has led to the need for implementing anew fiscal rule in 2016.

If we have a look to the Brazilian Central Bank (BCB) data, under the government of Fernando Henrique Cardoso (FHC), 1995–2002, the primary surplus was not achieved only in 1997. From 2003 to 2010, during the Lula da Silva administration, the primary fiscal result was positive over the whole period, and during the Dilma Dousseff government, 2011–2016, the primary fiscal result declined and deteriorated, reaching negative results in 2014, 2015 and 2016. Those figures represent an annual average of the primary fiscal deficit over GDP of 1.6%, 3.2% and 0.5%, respectively.

The deterioration of public deficit was exacerbated after the triggering of the GFC and the "great recession, 2009–2010". The primary surplus declined sharply due to the Brazilian recession of 2009 and, mainly, after the adoption of countercyclical fiscal measures by the economic authorities.[3] Thus, given this scenario of deterioration of the Brazilian fiscal budget (see Table A1, in Appendix) and, consequently, the increase of public debt,[4] Dilma Rousseff started her second term, in January 2015, defending and implementing austerity measures, mainly fiscal policy, as a necessary condition to avoid the stagflation (negative economic and high inflation). In fact, the main reason why she decided to adopt an orthodox program was the pressure exerted by the financial market, to face the risk of a credit downgrade of Brazil by international rating agencies.

[1]To clarify the idea of "usual difficulties to finance government", it is important to mention the following: (a) the impacts of the GFC on developed countries and emerging economies were completely different—mainly, because the first ones, due to the fact that they have convertible currencies, are able to print sovereign debts, while the last ones are not able of printing sovereign debts; (b) the GFC brought additional problems for emerging economies, that is, balance of payments disequilibrium—thus, these countries started to present both a fiscal deficit and a current account deficit (a situation referred as "twin deficits"); and (c) the GFC also caused a double impact in the economies, namely, on the flows and the stocks. For instance, in Ireland and Greece, the government needed to rescue the financial system, and, as a result, the public debt increased substantially, while in the United States the impact of the GFC took place during the crisis because the counter-cyclical policies required an intertemporal fiscal adjustment. For additional details see: Herr, Niechoj, Thomasberger, Truger, and VanTreeck (2012).

[2]Additional details related to RP can be found in Ferrari-Filho & Paula (2003).

[3]It is important to mention that counter-cyclical fiscal policies were, in general, adopted by emerging economies not only after the GFC, but also after the Euro crisis, in 2011.

[4]By the way, according to the IMF (2017) data, Brazil has the highest public debt among emerging economies.

Later, when Dilma Rousseff was deposed, in 2016, and Michel Temer became president in her place for the rest of the term (December 2018), he imposed more neoliberal policies of austerity in the form of cuts in public services and government investments. Moreover, the government submitted, and it was approved by the Brazilian National Congress, a constitutional amendment aimed to consolidate a rigid fiscal adjustment named the new fiscal regime (NFR). The purpose of the NFR consists in, over the coming twenty fiscal years, create a Constitutional law that will force to limit the annual variation of the primary (current) expenditure to the prior year's variation of the consumer price index (IPCA). In that scenario, which particularly reveals a fiscal crisis in the context of the wider GFC, there can be no doubt that it is important to examine Brazil's public finances.

Having in mind those considerations, this article analyses, on the one hand, the Brazilian fiscal performance since the implementation of the inflation targeting regime (ITR), in June 1999, and the Fiscal Responsibility Law (FRL),[5] in May 2000, focusing on the usefulness of fiscal rules to reach fiscal discipline in Brazil. On the other hand, the article also explores the outcome of a given explicit fiscal policy rule under different scenarios. In other words, it tries to analyze whether the new fiscal rule, designed by the NFR, would have influenced fiscal consolidation and regional growth in Brazil over the last decade.

Thus, to that aim, we will perform a counterfactual exercise calculating the figures for fiscal deficit/surplus when fiscal authorities are constrained by a fiscal rule keeping the growth of the public expenditure below the growth of the inflation.

The obtained results will help us to verify if, indeed, a fiscal rule of these characteristics can contribute to the achievement of public surpluses without provoking an inflationary process. The achievement of public surpluses, or even the reduction of fiscal deficit, without affecting to the inflation rate, would signify that independent monetary policy could ensure a low and stable inflation rate. In our empirical exercise, we will present three different fiscal rules according to the NFR of 2016, but allowing for describing three different scenarios depending on the preferences of the fiscal authorities: the austere, the symmetric or indifferent or the growth-promoting attitude for contributing to a sustainable fiscal adjustment. In other words, we will describe three types of fiscal rules depending on the concerns of government: first, aimed to reduce deficit and debt paying little attention to economic growth; second, paying the same attention to fiscal discipline and to the economic growth; and, finally, minimizing fiscal discipline but favoring economic growth.

Besides this Introduction, the article is divided as follows: Section 2 shows an overview of the fiscal results, domestic debt and economic growth in Brazil, after the ITR. In Section 3, it is discussed the theoretical framework of the NFR that will allow us to analyze and simulates the usefulness of fiscal rules. Finally, Section 4 summarizes and concludes.

2 | AN ANALYSIS OF THE PERFORMANCE OF THE FISCAL RESULTS AND THE ECONOMIC GROWTH IN BRAZIL SINCE THE ITR

2.1 | The period 1999–2015[6]

As is well known, since 1999, Brazilian macroeconomic policy based on the ITR, the FRL, and a flexible exchange rate regime, has been characterized by the New Consensus Macroeconomics (NCM) framework.[7] More specifically, (a) the second term of the FHC government (1999–2002) was broadly

[5]FRL aimed at controlling public resources, as well as creating rules regarding the balance between revenue and expenditure for Union, states and municipalities.

[6]This subsection is based on Ferrari-Filho and Cardim de Carvalho (2007), and Cunha, Prates, and Ferrari-Filho (2011).

[7]The NCM framework is based on three equations: IS curve, Phillips curve and Taylor rule equation. For additional details and a critical analysis of the NCM, see, respectively, Arestis (2007) and Carlin and Soskice (2006).

coherent, pursing a Washington Consensus (WC) type of strategy, (b) the first Lula da Silva term (2003–2006) was marked by the continuation, and in some respects radicalization, of FHC's government in macroeconomic policies,[8] (c) the second term of Lula da Silva (2007–2010) the economic policies underwent a slight change of course—particularly fiscal policy that was orchestrated to support implementation of the Growth Acceleration Program (*Programa de Aceleração do Crescimento*, PAC), an ambitious program of public and private investment in infrastructure and social projects; the BCB injected liquidity into the economy, mainly after the GFC, and reduced the basic interest rate (Special System for Settlement and Custody, Selic); and the public banks operated on the credit market; and finally, (d) in the Dilma Rousseff government (2011–2016)[9] the macroeconomic policy became more flexible, especially the fiscal policy.

In the NCM environment, the ITR strategy does not consider fiscal policy as a powerful macroeconomic instrument (in any case, it is hostage to the slow and uncertain legislative process), believing, instead, that monetary policy moves first and forces fiscal policy to align with monetary policy (MISHKIN, 2000). For this reason, in the Brazilian case, a fiscal rule (given by the FRL) was introduced to avoid fiscal dominance process (i.e., a situation in which the government expenditures affect the inflation rate and the flow of monetary base, and, as a result, monetary policy is driven by fiscal policy).[10] Moreover, due to the fact that the pass-through from exchange rate changes to inflation is very significant in the Brazilian economy, the BCB uses interest rate not only to control inflation directly but also to control exchange rate pressures, with evident "fear of floating" behavior[11]; thus, ITR may lead to a more stable currency, since it signals a clear commitment to price stability under a de jure floating exchange rate system.

From 2003 to 2006, the Lula da Silva's economic policies were inspired by the NCM. In that context, the BCB followed orthodox guidelines, such as implementing a tight monetary policy to keep inflation under control, and deepening a process of financial liberalization, by introducing a set of new regulations that included facilitation for both outward and inward transactions. Regarding fiscal policy, the primary fiscal surplus was increased in order to assure the conditions for fiscal solvency.

Fiscal policy shifted course slightly in order to extend social protection and income transfer programs, increase the minimum wage and expand public investment, especially investment under the PAC implementation, in 2007. The BCB, however, continued to operate monetary policy in such a way as to meet inflation targets. The effects of the PAC on the Brazilian improved the macroeconomic conditions joint

[8]At the beginning of his term, Lula da Silva nominated Antonio Palocci, coming from the right wing of the Workers" Party for being Ministry of Finance, and also nominated Henrique Meirelles, a formner chair of BankBoston in Latin America, as the president of the BCB. As a result, (a) primary fiscal surplus were increased from 3.5% to more than 4.25% of GDP, in order to assure the conditions of fiscal solvency, (b) the average annual Selic increased from 19.2%, in 2002, to 23.0%, in 2003; and (c) the process of financial liberalization was deepened. For additional details, see Arestis, Paula, and Ferrari-Filho (2007).

[9]It is important to mention that the second term of Dilma Rousseff was from January 2015 to August 2016 because the Brazil's Senate voted to remove her from office for manipulating budget.

[10]This idea is related to the fiscal theory of the price level (FTPL). When taking as reference for the expansion of public spending the growth of inflation, the adoption of a monetary dominant or Ricardian regime is being explicitly admitted. Under the monetary dominant regime, monetary policy behaves actively (determining the amount of money, the interest rate and the prices of the economy), while fiscal policy is adjusted passively, following a Ricardian rule; that is, fiscal policy guarantees its own solvency without making use of seigniorage. In other words, the fiscal deficit adjusts endogenously to fulfil the government intertemporal budget constraint (Woodford, 2001). The FTPL is developed, among others, in the works of Leeper (1991), Sims (1994), and Cochrane (1998, 2001). Critical evaluations of the FTPL can be found in McCallum (2001) and Buiter (2002).

[11]"Fear of floating" is a situation which monetary authorities prefer a stable exchange rate to a floating exchange rate regime. For additional details, see Calvo and Reinhart (2002).

to a positive external environment. The external position was benefited by the boom of the commodity prices, and the improvement of international liquidity. As a result, the Brazilian economy grew, between 2004 and 2007, 4.6% on average (Table A2, in Appendix). Thus, in this scenario, Brazilian's economic authorities underestimated the consequences of the GFC. When fourth-quarter 2008 GDP was announced (−3.6%), the figure cast doubt on the notion that Brazil was impervious to the effects of crisis.

However, Lula da Silva's response to the international crisis, although late, represented an important shift from previous crisis episodes. Thus, after the crisis of 2008 hoping to steady the humors of financial investors, and responded to the contagion effect of the systemic crisis with a broad variety of countercyclical fiscal measures. In addition, the BCB reduced Selic.

Despite these economic measures, with the fall in all private components of demand, GDP growth fell to −0.3% in 2009, but as a result of the countercyclical economic policies, in 2010 the economy recovered strongly: the GDP growth rate was 7.6%. In late 2010 and 2011, the first year of Dilma Rousseff's term, to avoid inflationary pressures, thus in 2011, the primary surplus target and the basis interest rate increased (Tables A1 and A2, in Appendix).

However, due to the gradual worsening in the international scenario (Euro crisis in September 2011, and the decline in growth in emerging economies, including China), Dilma Roussef's government implemented some important changes in the "modus operandi" of economic policy. Those changes included the adoption of a more gradualist strategy of the BCB to deal with inflation,[12] and the introduction of a countercyclical fiscal policy. The Euro crisis affected the Brazilian economy mainly by the commercial side and by the deterioration of the entrepreneurs' expectations about the future of the world economy.

In 2014, the economic authorities decided to implement more expansionary fiscal policies. However, once again, public expenditures and tax reduction were not enough to compensate for the overall reduction in the aggregate demand. In this context, the primary fiscal result was negative (0.6% of GDP) and the GDP growth dropped to 0.1% (Tables A1 and A2, in Appendix). In 2015 and 2016, the Brazilian economy accumulated more primary fiscal deficits, as can be seen in Table 1, with an increase in net public debt. In this context, the government was forced to introduce changes in the fiscal rule, that is, the NFR was implemented in 2016.

2.2 | The way toward the NFR of 2016

As it was showed in the previous subsection, the economic scenario that has led to the need for implementing the fiscal rule of 2016, that is, the NFR, can be explained, in summary, by the following factors:

1. A reduction of the economic growth rate that generated a reduction of income, especially from 2014 to 2016, when the Brazilian economy entered into a recession;[13]
2. The limitation for the future increase of income, given the size of the tax burden;
3. A continuous increase of government expenditure for financing an extremely aggressive policy of domestic subsidies as of 2011, joint with countercyclical policies without having significant effects on the economic recovery; and

[12]It is important to mention that the deceleration of the inflation, due to the reduction in the commodities prices and in domestic demand, made possible a steady policy of reduction of Selic. c (Special System for Settlement and Custody).

[13]Given the Brazilian recession, and high inflation, mainly in 2015, there was a decline in the volume of tax burden. This deterioration of the nominal and real taxes collected by the government from 2014 to 2016 can be identified as the Tanzi effect. For additional details about Tanzi effect, see: Tanzi (1977).

TABLE 1 Government deficit (+)/surplus (−) (government deficit growing as the inflation does $\psi = 1$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Def	−3.51	−3.90	−3.30	−3.36	−3.63	−1.90	−2.20	−3.09	−2.52	−1.76	0.57	1.88	2.51
FR_d	−7.79	−6.96	−5.90	−4.60	−4.74	−4.58	−2.27	−3.19	−3.32	−1.99	−1.20	0.56	0.41
FR_s	−10.48	−9.75	−7.41	−5.68	−6.39	−6.13	−2.77	−5.42	−4.63	−2.69	−2.21	−0.63	−1.54
FR_g	−11.49	−11.89	−8.43	−6.52	−8.32	−8.29	−3.42	−8.87	−7.01	−4.62	−4.80	−3.02	−3.98

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively.

Source. Own elaboration based on data from Tables A1 and A2 (Appendix).

4. A significant increase in the interest rate to counteract the rising inflation, from 2014 to 2016, which increased financial expenses.

Given that, the NFR seeks to provide a solution to only one aspect of the problem: reduce expenditures (to pursue a fiscal surplus) and guarantee debt sustainability, without having impact on prices. This temporary solution will became problematical over time, because (a) it does not address the federal government current revenues, in that it does not implement mechanisms either to smooth its cycles or minimally adjust the dynamics of federal government current expenses, (b) it makes no provision for federal governments financial expenses, (c) it constrains the fiscal policy of the next five governments and, lastly, (d) it prevents any countercyclical use of fiscal policy, particularly during crisis, when it is necessary to expand public investments, which will only be possible in the wake of the NFR by reducing expenditures in other areas of the federal budget.

Thus, the idea of the NFR is to avoid and replace a fiscal dominance process for a monetary dominance, a situation in which the BCB has the capacity of achieving the price stability.

Before going to the exercise analysis, it is important to mention that, on the one hand, the NFR seems to take financial fiscal expenses as given, and fundamentally disciplines only current public expenses, and, on the other hand, the economic authorities seems to neglect that the government revenue responds elastically to the economic cycle.

Thus, Brazil needs a fiscal regime that controls not only the current expenses, but, mainly, the variables (Selic, among others)[14] that contribute to the increase the financial deficit.

3 | THE NFR AND THE NEW FISCAL POLICY RULE: A SIMPLE ILLUSTRATION FOR THE BRAZIL

In a context of high government deficit, high inflation and economic recession, the fiscal rule proposed by the Brazilian government has been designed to assure that the nominal growth of government expenditures of central government does not be higher than the rate of inflation of the previous year. The government rationale for supporting that kind of fiscal policy is that fiscal adjustment is important for controlling inflation, for recovering the credibility of economic policy, and, mainly, as a condition for achieving a reduction of the interest rate. This argument seems to be not appropriate to the Brazilian economy, due to the following reasons: (a) since the ITR, the Brazilian inflation has been related, mainly, to the indexation process, cost-push effects and exchange rate devaluations (Arestis, Ferrari-Filho, & Paula, 2011; Modenesi & Araujo, 2013); (b) besides fiscal responsibility, balance of payments equilibrium is so important to assure or recover "confidence" to economic agents[15]; and (c) a low and stable interest rate is the main condition to balance the finance fiscal result and, as a result, the fiscal budget.

Moreover, a relevant issue in the analysis of Brazilian fiscal policy is the evolution of income and the tax burden. Although there is some methodological controversy to calculate a long series of harmonized gross tax burden,[16] there is a certain consensus that it has increased significantly since the

[14]According to the National Treasury data, with reference to December 2016, the Brazilian public debt totalled around 70.5% of GDP. The configuration of the public debt bonds was as follows: pre-fixed interest rate, which includes Selic, was around 35.7%, price index was approximately 31.8%, floating interest rates was around 28.2% and 4.2% was indexed at the exchange rate (Tesouro Nacional, 2017).

[15]Moreover, according to the Keynes' *The General Theory of Employment, Interest and Money*, confidence, in chapter 12, has to do with the decision maker's trust in the relevance and credibility of the information and thought processes used to create the expectation.

[16]IBGE and *Secretaria da Receita Federal do Brasil* disclose gross tax burden data which, in general, are different since they are calculated using different methodologies, although the differences are not necessarily significant. In addition, there is the problem of the revision of GDP data.

end of the 1980s. According to the IPEADATA (2017), the gross tax burden in 1994, the year in which the RP was implemented, was 27.9% of GDP, while in 2016 the gross tax burden reached 33.0% of GDP.

This increase in the fiscal burden, at least until the beginning of the GFC, can be associated with fiscal stability and the expansion and strengthening of the social protection system in Brazil. It is important to mention that the fact that the tax burden is relatively high, especially in comparison with countries with the same level of development, it could be an obstacle to future increases in government spending, particularly in the social area. However, it also makes difficult to finance government spending in the long term, once there is no room for increasing incomes. Likewise, the inability to increase revenues in a period of economic slowdown has erode public accounts, causing a significant increase in net public debt from 33.8% of GDP in December 2013 to 42.6% in December 2016.[17] In this environment, the search for at least a certain stability of government debt as a percentage of GDP is the main argument for maintaining primary surpluses in fiscal accounts and the institution of the NFR in 2016.

3.1 | A counterfactual analysis of the NFR

Aimed to shed some light on the debate on the convenience of using the new Brazilian fiscal rule of 2016, and its policy implications, we will perform a counterfactual analysis. Our purpose is twofold. On one hand, we will try to offer a general view on the performance of fiscal rules, designed to control excessive government deficits. On the other hand, we will explore the implications of constraining the growth of government expenditures below the growth of inflation, as the new Brazilian fiscal rule of 2016 does.

We will follow a fiscal policy rule along the lines of Ballabriga and Martinez-Mongay (2002). The rule has been conceived with stabilization purposes, and consequently the government deficit responds negatively to the output variations. This rule links an explicit government deficit objective with deviations of the public debt level from its optimum level, augmented with the inflation growth rate constraint to capture the particular Brazilian government proposal, such as:

$$g^o = -[\delta(d_{-1} - d^o) + \theta y + \psi \dot{p}], \tag{1}$$

where g^o is the primary deficit target (relative to GDP), that depends on the differential of public debt in the previous period (relative to GDP) in relation to the debt level target ($d_{-1} - d^o$), on the income level y, and also on the inflation rate $\dot{p}$.

Furthermore, we assume that current government deficit adjusts itself with the previous period value in the proportion ρ being $0 \leq \rho \leq 1$. Given that $(1 - \rho) + \rho = 1$, and therefore $\rho < 1$, this implies that the authorities are tied by the initial conditions, in such a way that if the deficit is high, it should be reduced.

$$g = (1 - \rho)g^o + \rho g_{-1}. \tag{2}$$

According to Equation (2), the effective deficit is a weighted average of the target deficit and the past deficit.

From (1) and (2), the fiscal policy rule will be as follows:

[17]Data of the BCB (2017), taking into account the three levels of government. It is important to note that there is also gross debt, which rose from 53.3% of GDP in December 2013 to around 72.0% in December 2016, and is also a widely used indicator.

$$g = -(1-\rho)\delta(d_{-1} - d^o) + \rho g_{-1} - (1-\rho)\theta y - (1-\rho)\psi \dot{p}. \quad (3)$$

On the other hand, to explore the implications of fiscal consolidation on economic growth, we will take into account the expected growth rate of GDP, $\hat{y}$, instead of its level. Assuming rational expectations, the expected growth rate of GDP could be proxy by the previous period growth rate. Given the same applies for the expected inflation rate, our particular fiscal policy rule will be:

$$g = -(1-\rho)\delta(d_{-1} - d^o) + \rho g_{-1} - (1-\rho)\theta \hat{y}_{-1} - (1-\rho)\psi \dot{p}_{-1}. \quad (4)$$

Notice our proposed fiscal rule, is inspired by the new Brazilian fiscal rule of 2016, since it incorporates the lagged inflation growth as a constraint for the government deficit. But our rule is also designed in terms of the accumulated debt, and the inertia of the previous deficit. Those elements allow for a smoothed evolution of the fiscal deficit. Moreover, our fiscal rule also relates the fiscal deficit with the output growth. In that sense, our rule incorporates a simple mechanism that links the evolution of the government deficit with the cycle, allowing for countercyclical fiscal policies.

Trying to analyze what would have happened to the Brazilian public deficit if would have be oriented by the new rule of 2016, we will calculate government deficit obtained from Equation (4) in the following manner:

1. First, we propose a "disciplined" scenario in which there is a greater concern about deviations of debt and accumulated deficit than about deviations in production. Therefore, we would have $\delta = \rho = 0.75$, and $\theta = (1-\rho) = 0.25$. This will be called the "disciplined, conservative, or debt averse" scenario;
2. Second, we will also calculate the government deficit for two other scenarios: the "symmetrical" scenario, in which $\delta = \rho = \theta = (1-\rho) = 0.5$; and
3. Finally, the "growth drivers" scenario, in which $\delta = \rho = 0.25$ and $\theta = (1-\rho) = 0.75$.

Those values have been assigned had-hoc to the parameters. The intention is to define three intervals or threshold in which the rule produces different results for the deficit, depending on the preferences of fiscal authorities. Our aim is not to calibrate or estimate the attitude or preferences of Brazilian government, but offer a framework of reference. In other words, the values we have assigned only try to characterize the three types of possible scenarios. We are not trying to characterize the current Brazilian scenario, but compare the current figures with those given by the range of possibilities.

Using these figures, we will calculate the deficit generated by the fiscal rule given by Equation (4) according to the scenarios already described. Regarding the inflation constraint, in a first approximation, we will assume a fully indexation of the government deficit, that is, the coefficient accompanying inflation in Equation (1) it will take the value one, $\psi = 1$. In other words, when $\psi = 1$ the deficit growth is the maximum allowed by the rule of 2016, which limit the expenditure growth below (or equal) the inflation rate growth. The rules would be as follow:

1. "Disciplined" scenario:

$$g_d = -0.1875(d_{-1} - d^o) + 0.75 g_{-1} - 0.0625 \hat{y}_{-1} - 0.25 \dot{p}_{-1}.$$

2. "Symmetric" scenario:

$$g_s = -0.25(d_{-1} - d^o) + 0.5 g_{-1} - 0.25 \hat{y}_{-1} - 0.5 \dot{p}_{-1}.$$

3. "Growth promoting" scenario:

$$g_g = -0.1875(d_{-1} - d^o) + 0.25g_{-1} - 0.5625\hat{y}_{-1} - 0.75\dot{p}_{-1}.$$

In Table 1, we show deficit data taken from Tables A1 and A2 (Appendix) and calculations using the proposed rules, where we have used the average of the debt of the period as proxy of the debt target. We also show in Chart 1 the paths of the actual deficit and the deficit calculated from the proposed rules.

We find that the use of fiscal rules, including an inflation ceiling as the new Brazilian fiscal rule does, would have contributed to increase the government surplus, improving the net lending position of public accounts. Regarding the different rules considered, the best results have been reached using the one promoting economic growth.

In a second step, to check the robustness of our results and the desirability of impose to the government deficit (expenditure) the limit of the inflation growth, we will perform a sensitivity analysis as follows. In the calculations showed above, we have assumed that Brazilian government allows for the maximum growth of government expenditure (government deficit in terms of our rule). In other words, we have considered the coefficient of inflation rate in Equation (1) equal to one, $\psi = 1$. Now we will repeat our calculations for different values of that coefficient, specifically we will give to ψ the values of 0.75; 0.5; 0.25 and zero ($\psi = 0$ means not to include inflation as a constraint). Tables 2–5 and Charts 2–5, show the results for those different inflation coefficients in the already proposed scenarios.

In the sensitivity analysis, we have computed the deficit/surplus path under three scenarios in which the growth of government expenditure (deficit) is gradually reduced (Tables 2–4 and Charts 2–4). We observe that in all the cases, it would be suitable to adopt an explicit fiscal rule. In other

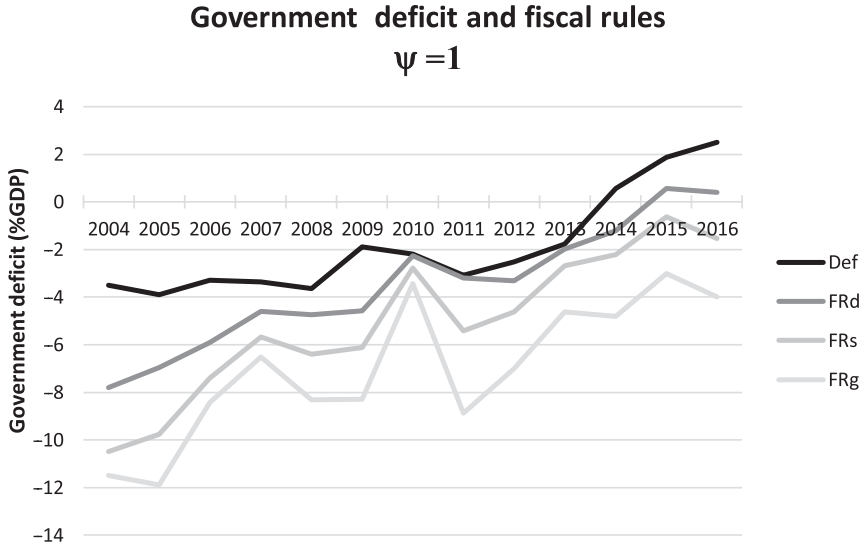

CHART 1 Government deficit and fiscal rules ($\psi = 1$)

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively

Source. Own elaboration based on Table 1

TABLE 2 Government deficit (+)/surplus (—) (government deficit growing below the inflation does $\psi = 0.75$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Def	−3.51	−3.90	−3.30	−3.36	−3.63	−1.90	−2.20	−3.09	−2.52	−1.76	0.57	1.88	2.51
FR_d	−7.19	−6.48	−5.54	−4.40	−4.46	−4.21	−2.00	−2.82	−2.91	−1.63	−0.83	0.97	1.08
FR_s	−9.28	−8.80	−6.69	−5.28	−5.83	−5.39	−2.23	−4.67	−3.81	−1.96	−1.47	0.17	−1.81
FR_g	−9.68	−10.46	−7.36	−5.93	−7.48	−7.17	−2.61	−7.75	−5.79	−3.52	−3.69	−0.20	−1.97

Note. Def refers to government deficit (+) or surplus (—), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively.

Source. Own elaboration based on data from Tables A1 and A2 (Appendix).

TABLE 3 Government deficit (+)/surplus (—) (government deficit growing below the inflation does $\psi = 0.5$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Def	−3.51	−3.90	−3.30	−3.36	−3.63	−1.90	−2.20	−3.09	−2.52	−1.76	0.57	1.88	2.51
FR_d	−6.59	−6.01	−5.18	−4.20	−4.18	−3.84	−1.73	−2.45	−2.50	−1.26	−0.45	1.37	1.75
FR_s	−8.08	−7.85	−5.98	−4.88	−5.27	−4.65	−1.69	−3.92	−2.99	−1.23	−0.72	0.98	1.14
FR_g	−7.88	−9.03	−6.28	−5.33	−6.64	−6.06	−1.80	−6.63	−4.56	−2.42	−2.57	−0.60	0.05

Note. Def refers to government deficit (+) or surplus (—), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively.

Source. Own elaboration based on data from Tables A1 and A2 (Appendix).

TABLE 4 Government deficit (+)/surplus (−) (government deficit growing below the inflation does $\psi = 0.25$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Def	−3.51	−3.90	−3.30	−3.36	−3.63	−1.90	−2.20	−3.09	−2.52	−1.76	0.57	1.88	2.51
FR_d	−5.98	−5.53	−4.83	−4.01	−3.90	−3.47	−1.46	−2.07	−2.09	−0.89	−0.08	1.77	2.42
FR_s	−6.03	−6.02	−4.28	−3.66	−3.87	−3.00	−0.68	−2.63	−1.40	0.14	0.46	1.64	2.02
FR_g	−6.07	−7.60	−5.21	−4.74	−5.81	−4.95	−0.99	−5.51	−3.34	−1.32	−1.46	0.61	2.06

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively.

Source. Own elaboration based on data from Tables A1 and A2 (Appendix).

TABLE 5 Government deficit (+)/surplus (−) (government deficit growth not restricted by inflation growth $\psi = 0$)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Def	−3.51	−3.90	−3.30	−3.36	−3.63	−1.90	−2.20	−3.09	−2.52	−1.76	0.57	1.88	2.51
FR_d	−5.38	−5.05	−4.47	−3.81	−3.62	−3.10	−1.18	−1.70	−1.68	−0.53	0.29	2.17	3.10
FR_s	−5.67	−5.94	−4.54	−4.09	−4.15	−3.17	−0.61	−2.43	−1.36	0.24	0.76	2.59	3.83
FR_g	−4.27	−6.17	−4.13	−4.14	−4.97	−3.84	−0.18	−4.39	−2.11	−0.22	−0.34	1.82	4.04

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively.

Source. Own elaboration based on data from Tables A1 and A2 (Appendix).

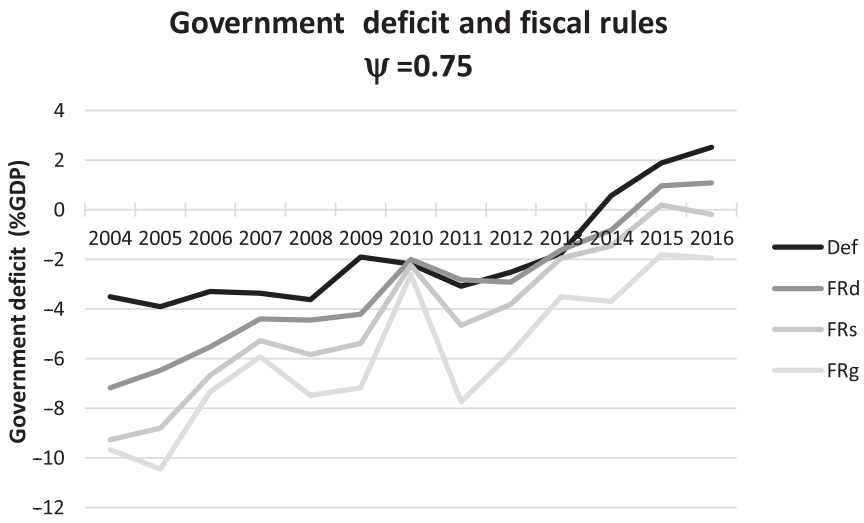

CHART 2 Government deficit and fiscal rules ($\psi = 0.75$)

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively

Source. Own elaboration based on data from Table 2

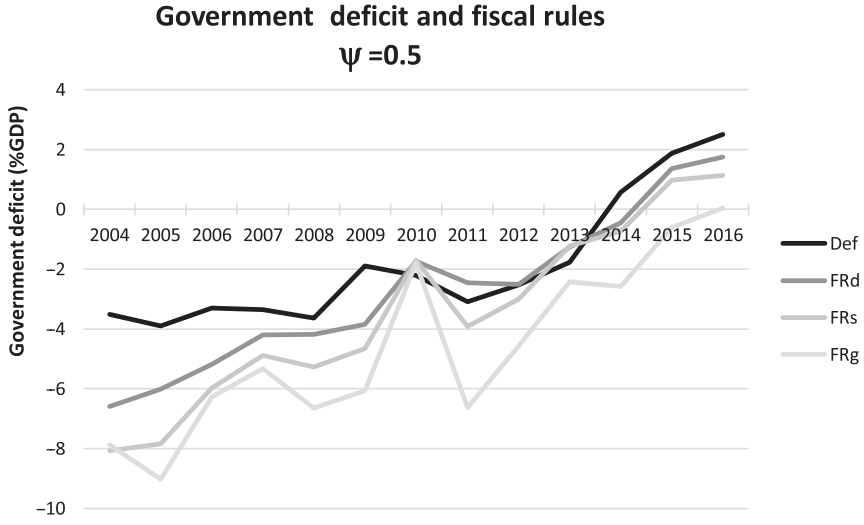

CHART 3 Government deficit and fiscal rules ($\psi = 0.5$)

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively

Source. Own elaboration based on data from Table 3

words, our proposed fiscal rules, inspired by the NFR, when incorporating the lagged inflation growth as a constraint, would have contributed to favor the government surpluses. Those surpluses decrease, or even turn into a deficit, when the deficit (expenditure) growth is not fully indexed to inflation ($0 < \psi < 1$).

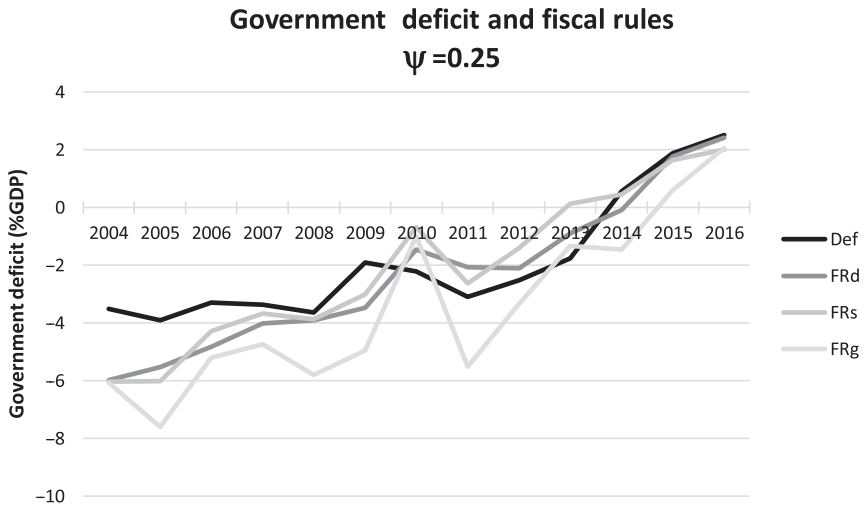

CHART 4 Government deficit and fiscal rules ($\psi = 0.25$)

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively

Source. Own elaboration based on data from Table 4

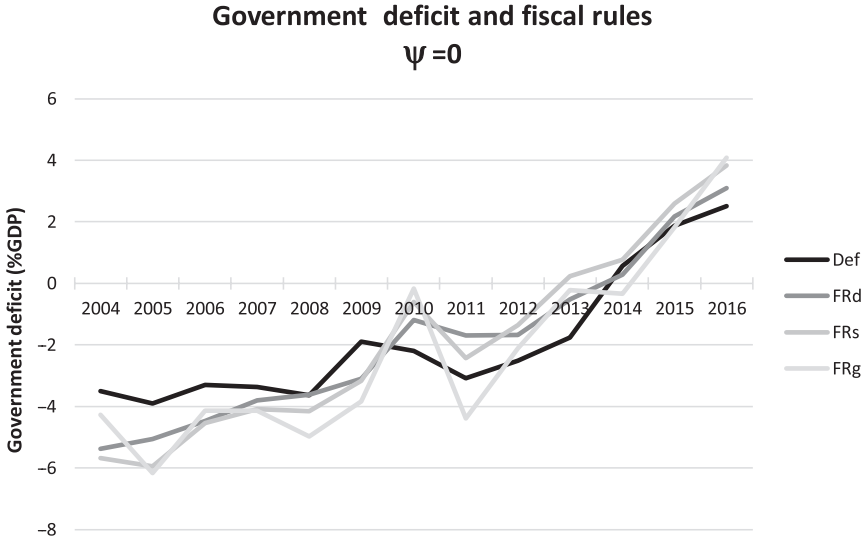

CHART 5 Government deficit and fiscal rules ($\psi = 0$)

Note. Def refers to government deficit (+) or surplus (−), meaning, respectively, net borrowing and net lending positions, and FR_d, FR_s and FR_g stand for the disciplined, symmetric and growth-promoting fiscal rules, respectively

Source. Own elaboration based on data from Table 5

Additionally, in Table 5 and Chart 5, we show the results when the fiscal rule does not include inflation as a constraint ($\psi = 0$). Under that rule, the deficit/surplus path is not always improved. Moreover, the use of a fiscal rule, without considering the inflation ceiling, seems to be not useful for years 2014, 2015 and 2016.

Based on these findings, our experiment to calculate the deficit/surplus path using the fiscal rule proposed in this article, shows that:

1. If a fiscal rule constrained by inflation had been followed, the government surplus would have been improved or the deficit would have softened. And when using the rule promoting economic growth, the best results would be achieved;
2. A responsible compliance with the rule would have led to healthier public finances during the period analyzed, particularly after the GFC; and
3. The Brazilian NFR pursue fiscal consolidation without having impact on prices, but does not implement mechanisms to smooth economic cycles. Our proposed rule amplifies those objectives including debt reduction and the smoothed reduction of fiscal deficit. As showed in our results, any version of our proposed rule would have improved the deficit/surplus path of the Brazilian fiscal performance. From that, we could conclude that, when adopting a fiscal rule, the governments should take into account not only initial levels of deficit, but also initial levels of debt and the specific features of their economies. This conclusion is particularly interesting when there is a need to reduce debt and deficit without harming growth.

To sum, our exercise shows that fiscal rules contribute to increase the government surplus or decrease the government deficit, improving the net lending position of public accounts or diminishing the need of borrowing. Regarding the different rules considered, using the one promoting economic growth could be reached the best results.

4 | SUMMARY AND CONCLUSIONS

In this article, we have analyzed the Brazilian fiscal performance since the implementation of the ITR, and the usefulness of fiscal rules to reach fiscal discipline in Brazil. The use of fiscal rules under the Brazilian FRL of 2000, implemented jointly with an ITR, provided positive fiscal results that were deteriorated progressively.

However, the decline of the government surplus, mainly after the GFC, added to a decrease of the economic growth rate, the increase of the tax burden and the increase of the interest rate for counteracting a rising inflation, were among the factors that provoked the redefinition of the fiscal rule. Thus, in 2016 was introduced the NFR that established that the growth of government expenditure must be kept below the inflation growth. Consequently, a monetary dominant regime was explicitly admitted.

Before continuing with our conclusions, it is important to emphasize the main difference between the FRL and the NFR: the first one admitted the possibility of a countercyclical fiscal policy (by the way, it was implemented during the GFC and the Euro crisis) and stimulates the automatic stabilizer. While to freeze total real spending for 20 years at the levels reached in 2016, as the NFR proposes, implies, on the one hand, that in a context of recession, in which government revenues fall, fiscal deficit will be worst, and, on the other hand, the macroeconomic policy will continue to be characterized by a monetary dominance regime.

The NFR tries to reduce expenditures, to pursue a fiscal surplus, and to guarantee debt sustainability, without having impact on prices. In other words, the rule not only is aimed to achieve fiscal discipline, but also the rule helps to controlling inflation and avoiding higher interest rates. But this temporary solution will become problematical over time, because it does not address the federal government current revenues, and it does not implement mechanisms to smooth economic cycles, particularly during crisis, when it is necessary to expand public investments, which will only be possible in the wake of the NFR by reducing expenditures in other areas of the federal budget.

On the contrary, the rule we proposed in this paper, although is inspired by the NFR of 2016 including the inflation as a constraint, has been augmented with several additional objectives. Our

rule is also designed in terms of the accumulated debt, and the inertia of the previous deficit. Those elements allow for a smoothed evolution of the fiscal deficit. Moreover, our fiscal rule also relates the fiscal deficit with the output growth. In that sense, our rule incorporates a simple mechanism that links the evolution of the government deficit with the economic cycle, allowing for countercyclical fiscal policies. Thus, we have characterized three different fiscal rules describing three different scenarios depending on the preferences of the fiscal authorities: the austere or disciplined, the symmetric or indifferent or the economic growth attitude for promoting a sustainable fiscal adjustment.

From our results, we can conclude that would have been better using a fiscal rule including a restriction related to inflation, particularly after the GFC. We also find that the use of fiscal rules, including an inflation ceiling as the new Brazilian fiscal rule does, would have contributed to increase the government fiscal surplus and decrease the government debt. Regarding the different rules that we have proposed, the best results have been reached using the rule promoting economic growth.

When comparing the figures of the Brazilian deficit/surplus from 2004 to 2016 with those calculated using our rule under the three different scenarios, the historical Brazilian fiscal performance is closer to the results provided by the austere or disciplined scenario. But following a growth-promoting type rule, as it was also proposed, the results would have been better. In any case, any of our proposed fiscal rules performs better than the Brazilian ones used along the analyzed period. The reasons behind could be related to the additional objectives we have included: our rule not only pursues fiscal surplus without having impact on prices, but also allows for a smoothed evolution of fiscal deficit linked to the accumulated debt, and our rule is also linked to the output growth evolution.

Summing up, on the basis of these findings, in an ITR, our exercise shows that fiscal rules contribute to favor the government surplus, improving the net lending position of public accounts. Besides, as we have seen, regarding the different rules considered, using the one promoting economic growth could be reached the best results. Therefore, we could conclude with due caution, that the use of proper fiscal rules could help to rationalize fiscal consolidation efforts by promoting a favorable environment for economic growth.

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APPENDIX

TABLE A1 Primary fiscal result/GDP and financial fiscal result/GDP, %

Year	Primary fiscal result/GDP	Financial fiscal result/GDP
1999	−3.20	8.7
2000	−3.50	6.9
2001	−3.60	7.0
2002	−3.20	7.6
2003	−3.40	8.5
2004	−3.51	6.6
2005	−3.90	7.4
2006	−3.30	6.8
2007	−3.36	6.1
2008	−3.63	5.4
2009	−1.90	5.3
2010	−2.20	5.3
2011	−3.09	5.7
2012	−2.52	4.8
2013	−1.76	3.3
2014	0.57	6.1
2015	1.88	7.2
2016	2.51	6.5

Note. The negative and positive results mean, respectively, surplus and deficit.
Source. IPEADATA (2017).

TABLE A2 Inflation rate, nominal interest rate (Selic) and GDP growth, %

Year	Inflation rate	Selic[a]	GDP growth
1999	8.9	19.0	0.3
2000	5.9	16.5	4.3
2001	7.7	19.0	1.3
2002	12.5	22.0	3.1
2003	9.3	17.5	1.2
2004	7.6	17.25	5.7
2005	5.7	18.5	3.1
2006	3.1	13.25	4.0
2007	4.5	11.25	6.0
2008	5.9	13.75	5.0
2009	4.3	8.75	−0.2
2010	5.9	10.75	7.6
2011	6.5	11.0	3.9
2012	5.8	7.25	1.9
2013	5.9	10.0	3.0
2014	6.4	11.75	0.1
2015	10.7	14.25	−3.8
2016	6.3	13.75	−3.6

[a]It is end of period.

Source. IPEADATA (2017) and BCB (2017).