

# Debt and austerity: international evidence and the case of Brazil

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## 1 Introduction

The term austerity indicates a policy of sizable reduction of government deficits and stabilization of government debt achieved by means of spending cuts or tax increases, or a combination of both. In this paper we ask two questions with an eye on the case of Brazil: what type of austerity policies can achieve the fiscal goals at the lowest costs in terms of output growth, and what are the electoral effects for governments implementing them?

If governments followed adequate fiscal policies most of the time, we would almost never have a need for austerity. Economic theory and good policy practice suggest that a government should run deficits during recessions – when tax revenues are lower and government spending is higher due to the working of fiscal stabilizers such as unemployment subsidies. These deficits should then be balanced by surpluses during booms, when spending needs are lower. Instead, governments often do not that. They run deficits during recessions but they do not

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accumulate surpluses during booms. In many Latin American countries they even follow countercyclical fiscal policies – namely, they run even bigger deficits during expansions than during recessions. As a result, debt grows up to the point of un-sustainability, and then a fiscal adjustment becomes necessary to avoid a meltdown.

Is there a threshold level of debt that is too high and can trigger a crisis? That critical level depends on many factors, including the credibility that the indebted country has accumulated in terms of past debt repayments, the composition of debt-holders, the currency denomination of the debt, the level of world interest rates and the term structure of the debt. For instance, Japan has a debt over GDP ratio of about 250 per cent. Although it does not help to get the economy out of stagnation, it is not a source of imminent crisis because a large part of the debt is held by the central bank and the rest is fully held by domestic creditors who are sure that the government will fulfill its obligations. On the opposite extreme, Argentina has experienced a debt crisis with the debt level at around 50 per cent of GDP. Argentina had in fact accumulated a reputation for defaults, its debt was held in large part by foreigners and was often denominated in foreign currency. Brazil is somewhere in between. The debt over GDP ratio is around 80 or 90 percent of GDP, depending on how one considers certain debt holdings of the central bank. This level is higher than for other Latin American countries, but it is held in large parts by Brazilian banks and households, and it is not subject to exchange rate risks since it is largely denominated in reals. Nevertheless, it is a source of concern. Without the recently legislated pension reform, financial markets might have reacted very negatively to increasing debt levels. The reform is a step in the right direction for financial stability, intergenerational fairness and for equity between private sector and public sector workers. Nevertheless, the fiscal savings generated by the pension reform are backloaded and, in any event, additional interventions to reduce the debt over GDP ratio are necessary. In particular, more efforts will be needed to tackle the dynamics of budget deficit driven by mandatory items, including wages, and social security benefits. These points have been made also by the 2019 OECD Economic Outlook for Brazil.

This paper first reviews evidence on the effects of various types of austerity measures adopted in 16 OECD countries in the last 40 years. Recent work by Alesina et al. (2019) shows that there are two different types of austerity. One is based upon increases in taxes, direct or indirect. This type of austerity is deeply recessionary. In the short to medium run (up to four years after implementation) it induces large declines in per capita GDP growth. On the other hand, austerity policies based upon spending cuts, at least in OECD countries over the four decades studied, have had very different effects. The costs, in terms of output losses, of reductions in government spending have been significantly lower. Austerity based upon tax hikes has generally not resulted in reductions of the debt over GDP ratio because of the reduction in the denominator. Instead, austerity based upon spending cuts has often resulted in significant reductions in the debt ratio. Accompanying policies matter. A relatively expansionary monetary policy helps, but it does not change the large difference between the tax based and expenditure based plans. The same holds for other accompanying policies, in particular structural reforms.

In the second part of the paper we review some recent IMF evidence (Alesina A. and Quinn (2019)) concerning the effect of structural reforms and how they may help implementing austerity. We show that liberalizing reforms are followed by an increase in growth but only with a lag of several months up to three years. The length of the lag differs for different types of reforms. That paper assembles the most complete dataset on liberalizing reforms currently available for basically every country in the world. It also shows that reforms implemented in good times (i.e. in booms) generate additional growth more rapidly than reforms implemented in bad times (i.e. in a recession). On the other hand, reforms which move against liberalization have negative consequences for growth. The positive effects of liberalization and the negative effects of tightening are similar in size and time pattern, but of course go in opposite direction. On the political side, however, sometimes the political push for reform may occur during a crisis; or the latter simply does not allow to wait to implement the reforms. In the paper, we will also discuss some evidence on the electoral consequences of

austerity and of liberalizing reforms.

We will then discuss what all these results imply for the current Brazilian fiscal situation. Using the model estimated by Alesina et al. (2015, 2019) and further developed by Favero and Mei (2019) on 16 OECD economies, we use Brazilian data to estimate the effect of various fiscal stabilization policies. We will also try to evaluate the recent pension reform. The reform will generate large savings (relative to projected spending) for the government which will begin to accumulate down the line in a few years. These savings will avoid the additional growth of government debt which would have occurred without them. However, this reform alone will not lead, based upon the tentative and always imperfect calculations for the long run, to substantial reductions in debt over GDP ratio, certainly not in the next decade or so. If the government wants to reduce the debt/GDP ratio relative to the current level, additional fiscal measures would be necessary. We show that a fiscal adjustment plan based upon spending cuts would have a short run and small reduction in GDP growth and would significantly reduce the debt/GDP ratio. We can say (approximately, see below for more details) that a reduction of one percentage point of the share of spending over GDP would lead to a reduction of around half of a percentage point in GDP growth over two years and a significant reduction of the debt/GDP ratio, totaling about two percentage points. The recessionary effect of this plan would be made even lower or disappear with accommodating monetary policy and liberalizing structural policy reforms. A clear enactment in advance of the policy measure would help stabilize expectations and confidence of investors and consumers. On the tax side simplification of the tax system, closure of loopholes and reduction of tax evasion seem the way to proceed rather than raising rates. The latter tax reforms should accompany the fiscal adjustment based upon spending cuts.

The paper is organized as follows. Section 2 will briefly discuss the accumulation of large debts. Section 3 will review the evidence on the effects of different types of austerity plans in OECD countries. Section 4 will discuss how accompanying policies, especially monetary policy and structural reforms, might interact with austerity. Section 5 will discuss the avail-

able evidence on the political and electoral consequences of austerity. Section 6 will draw implications for the current situation of Brazil from all the above mentioned evidence. The last section summarizes the implications of the paper for the current fiscal situation in Brazil.

## 2 Large public debts

Many countries around the world have accumulated large debt, at levels normally associated with war times. Figures 1 and 2 shows the debt over GDP ratio in several OECD countries, Latin American countries and Asian countries. Clearly, some of these debts have accumulated as a result of the large recessions caused by the financial crisis. However, many countries entered the crisis with an already compromised fiscal position, which in turn limited the ability of policy to respond to negative shocks.

As discussed above, a desirable fiscal policy implies deficits during recessions and surpluses during booms in order to keep the cyclically adjusted government budget close to balance. Instead, while governments are happy and ready to run deficits during recessions, they rarely compensate them with surpluses. Table 3 shows how historically OECD countries have had many more years of deficits than surpluses – and in the case of a few countries, only deficits. As we look at data from the 1990s onwards, the same has been the case for Brazil, as figure 3 shows. As a result, now the gross public debt over GDP ratio lies between 80 and 90 percent depending on how one counts certain debt holdings of the central bank. While OECD countries have failed to fully implement countercyclical policies which would have led to a cyclically adjusted budget balance, many Latin American countries have done even worse: they followed pro cyclical policies increasing deficit even more during boom years than recession years. Moving beyond the traditional explanation related to the supply of credit, Alesina et al. (2008) argue that in some economies rational voters might not trust corrupt governments' management of public resources. When voters see the economy booming, they demand higher utility – in form of lower taxes or better public goods - as they fear that

otherwise the available resources would be wasted in political rents.

### 3 Austerity: when it works and when it does not

Austerity policies are typically not a one year, one shot operation, but occur in multi year plans, announced in advance and then often revised in midcourse. Often, the government first decides a deficit reduction target, then – after usually much discussion in the legislature – an allocation of measures between spending cuts and tax increases is decided. Two elements are therefore important here: the multi year nature of the plan – which affects expectations – and the fact that decisions about tax hikes and spending cuts are not independent from each other, since they have to add up to the agreed upon deficit reduction target.

Based upon these ideas, Alesina et al. (2019) assemble data on the austerity plans of 16 OECD countries from 1978 to 2014. They allow for plans to change as new measures are added or removed, and allow the estimation of expectations of the public to adjust to the new announcements before and during the implementation of the plans. Since tax hikes and spending cuts are correlated, to allow econometric identification these authors separate plans which are mostly expenditure based (EB) from those which are tax based (TB). This dataset covers about 170 austerity plans, and analyzes approximately 3,500 single fiscal measures<sup>1</sup>.

Figure 4 shows the response of per capita output growth to EB and TB plans of the size of one percent of GDP. Austerity plans start in year zero and responses are cumulated over time, so the points along the impulse response functions measure the deviation – in this case of per capita output growth – from what it would have been without the change in fiscal policy. The reported confidence intervals – obtained through a block bootstrap procedure – are at the 90 percent level. TB plans, in red, are much more recessionary than the EB plans, in blue, and particularly within two years of the policy shift: EB plans have a mild recessionary effect within two years after a plan is introduced. TB plans have a long lasting, negative

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<sup>1</sup>The complete dataset is available at <http://www.igier.unibocconi.it/fiscalplans>

and more sizable effect on output, estimated to be close to 2 percentage points. Remember that these are averages of many plans, so in the case of EB plans the response is the average of small recessions, some cases of larger recessions and some cases of mild expansion, the so-called expansionary austerity. For examples of these case and more discussion, see Alesina et al. (2019).

Figures 5, 6 and 7 show how households' consumption, business investment, and net exports respond to plans. The different effect on output growth of TB and EB adjustments depends more on the response of private investment than of private consumption and net exports. During EB adjustments, private investment rises within two years. The response of net exports is not statistically different between the two types of plans. This fact sheds serious doubts about movements in the exchange rate being an important factor in explaining the differences in the effects of EB and TB austerity.

Figure 8 shows how consumer and business confidence react to austerity plans. Investors seem to welcome expenditure cuts, probably because they anticipate a future decline, or at least no increase, in taxation. Thus, they invest more as we showed above. Consumer confidence also increases a bit in response to EB plans, although less than business confidence. In fact, consumption growth does not respond very differently to the two types of adjustments. There may be several reasons for this. First, if some consumers face liquidity constraints, then they may be unable to translate confidence into increased consumption expecting lower taxes. They have to wait until their income actually increases. Alternatively, if government consumption is complementary to private consumption, then consumers might need to spend less. Cuts in transfers also may motivate consumers to work more in response to the wealth-effect on labor supply, which could in turn reduce the decrease in consumption.

Extending the analysis outlined above, aggregate government spending can be divided into transfers and all other outlays. Reductions in transfers to individuals have two effects. On the one hand, they operate as a tax increase that lowers disposable income. On the other hand, the incentive effects go in the opposite direction: lower transfers tend to increase labor

supply. It is thus not obvious (assuming you wanted to aggregate them) if they should be aggregated with taxes, as it is often done in the literature. Alesina et al. (2019) show that the effects of transfer cuts are analogous to cuts in other government outlays, and significantly less recessionary than tax hikes, as figure 9 shows. We will discuss in section 6 why this matters for the analysis of the macroeconomic consequences of the recent Brazilian pension reform.

What could explain these results? Alesina et al. (2019) suggest several possible explanations. One is that the difference is simply due to a systematic difference in accompanying policies: supportive monetary policy, exchange rate devaluations, structural reforms: all could help spending based austerity more than tax based austerity. The authors show that this is not the case. However this does not mean that accompanying policies are irrelevant. Appropriate policies may indeed reduce the costs of austerity but they do not eliminate the difference between EB and TB plans.

A second explanation has to do with expectations and confidence. Let us consider a case in which economy has an unsustainable public debt. Sooner or later a fiscal stabilization has to occur, a scenario that closely resembles the Brazilian case. The longer this is postponed, the higher the taxes that will need to be raised or the spending to be cut. When the stabilization occurs it removes the uncertainty about further delays which would have increased even more the costs of the stabilization. Uncertainty is more permanently removed with spending cuts, especially if they address the expansion of entitlements and other spending programs increasing automatically, a case in which otherwise taxes will need to be constantly increased to cover the higher outlays. Thus the confidence effect is likely to be much smaller for tax hikes, as expectations of future taxes will continue to rise. The findings we discussed above the behavior of business confidence during episodes of austerity support this view. A third explanation has to do with the distortionary effects of taxation on the supply side. Indeed, labor market adjustments might be very different following tax hikes or spending cuts.

Do these results generalize to developing countries outside the OECD group? Recent work by



Vegh et al. (2017) – focusing on VAT changes in 51 countries (21 industrial, 30 developing) for the period 1970-2014 – shows that the VAT multiplier is essentially zero at low initial tax rate levels and much larger as the initial tax rate and the size of the change in the tax rate increases. This result is line with the strongly recessionary and lasting effects of tax increases found by previous studies for advanced economies only. We need more research in this area, perhaps applying similar methodologies to the ones discussed earlier in this section.

## 4 Accompanying policies

### 4.1 Monetary policy

A natural question that arises when studying the effects of multi-year fiscal adjustment plans is the role played by monetary policy. Intuitively, a more accommodative stance of monetary policy might contribute to reduce the output losses associated with the fiscal correction. In contrast with the view of Guajardo et al. (2014), Alesina et al. (2019) argues that this channel has in fact mild effects on the overall impact of adjustments. Not only the heterogeneity between tax- and spending-based adjustments is almost unaffected by the ability of monetary policy to respond, but also the magnitude of the output and public finance effects of both types of adjustments is largely unchanged. These results are obtained by looking at an expanded macro econometric model that allows to study the effects of fiscal corrections both when nominal interest rates react, and when they are constrained to remain constant through the simulation horizon. This said, an accommodative monetary policy should nonetheless be considered as a positive compliment to a fiscal plan. The example of Canada’s successful consolidation in the 1990s provides a good reference. The government carried out a large fiscal adjustment based on a policy package based on cuts in public spending, with the support of an accommodating monetary policy and structural reforms, to which we turn in the next section. While not decisive, the current stance of monetary policy in Brazil - with

the benchmark Selic rate at historically low values - might however positively contribute to sustain the economy during the consolidation efforts.

## 4.2 Structural reforms

Alesina A. and Quinn (2019) develop the most comprehensive dataset to date of structural reform regulation for a large sample of 90 developing and developed countries. This dataset is unique not only in terms of country-time coverage, but also in the breadth of the sectoral areas covered. The indicators of regulation constructed cover both financial and real sector reforms. The former includes domestic finance, financial current account and capital account. Real sector reforms are trade (tariff), product and labor market. All indicators are scaled to vary between zero and one, with higher values representing greater liberalization. Differences in the values of each indicator across countries and over time indicate the variation in the absolute degree of economic reform within each sector. The dataset also identifies, documents, and provides the implementation date of major reforms and reversals in the policy areas covered in this paper. It is the first database to provide information on dates and magnitudes of policy changes for a large set of economies and structural areas.

The dataset was compiled by the Research Department of the IMF through a systematic reading and coding of policy actions documented in various sources, including national laws and regulations, as well as IMF staff reports. The database covers a balanced sample of 90 countries over the period 1973–2014 . It includes 29 advanced economies, 50 emerging markets, and 21 low-income countries, with a broad geographical representation. The countries included represent 96 percent of the world’s 2017 GDP. The following areas of reform are covered in the study.

- **Domestic financial sector.** This includes six dimensions of domestic finance regulation: credit controls, interest rate controls, bank entry barriers, banking supervision, privatization, and security market development.

- **Current and capital account.** This contains information about policy based on six categories: payment for imports, receipts from exports, payment for invisibles, receipts from invisibles, capital flows by residents, and capital flows by nonresidents.
- **Trade.** The indicator measures trade tariffs at the product level. Product-level tariff data are aggregated by calculating simple and weighted averages, with weights given by the export share of each product.
- **Product market.** The indicator covers liberalization in two network sectors: telecommunication and electricity.
- **Labor market.** The labor market liberalization (LML) indicator provides a new measure of employment protection legislation (EPL) related to the termination of full-time indefinite contracts for objective reasons. Three dimensions of EPL are considered: (1) procedural requirements, such as third-party approval; (2) firing costs, including severance payments and notice requirements; (3) grounds for dismissal with the possibility (or not) of redress.

To analyze the results, the authors use two econometric specifications. The first establishes whether reforms have significant effects on output. The second assesses whether these effects vary with the state of the economy prevailing at the time of the reform<sup>2</sup>. The effect of reforms is broadly symmetric between liberalizing reforms and tightening reforms (see figure 10). The former increase output in the medium term, while tightening reforms lead to a contraction in output in the short term – with the effect becoming less precisely estimated in the medium term. The difference in the absolute magnitude of the effect is not statistically significant. The response of reforms (both liberalizing and tightening) masks widely different effects according to overall business conditions (see figure 11). In an expansion, reforms have

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<sup>2</sup>The statistical method follows the approach proposed by Jordà (2005) to estimate impulse-response functions, a methodology used also by Auerbach and Gorodnichenko (2012), Ramey and Zubairy (2017) and Alesina et al. (2016) among others.

a sizable positive and statistically significant impact on output, whereas they have a negative and statistically significant impact in a recession – the difference in the response across the two economic regimes is statistically significant at 1 percent. The authors also show that these positive effects from liberalization are especially marked for domestic financial market liberalizations, trade and current and capital accounts.

## 5 The electoral effects of liberalization and austerity

The conventional wisdom is that large reductions in budget deficits are the political kiss of death for the governments that implement them. Conversely, governments get reelected when they increase deficits by spending more or taxing less. However, if one looks at the recent historical evidence on the electoral effects of austerity, the results are much less clear cut than the conventional wisdom would suggest. Sometimes, governments that engaged in even harsh austerity policies were reelected. Obviously, they might have been reelected *despite* these policies, not because of them, although many governments were reelected when austerity was a central electoral issue. Could it be that weak governments, knowing their vulnerability, do not embark on fiscal adjustments? Then, precisely because they are weak, they lose at the polls, and is it possible that the reverse holds for strong governments? Unfortunately, it is not easy to measure the strength of a government: often such strength (or weakness) depends on the personalities involved, on the leadership style etc., all of which are close to impossible to measure precisely.

There is a vast literature on fiscal policy and electoral results (see Alesina and Passalacqua (2016) for a survey). For example, Brender and Drazen (2008) show that voters are (weakly) likely to punish rather than reward budget deficits accumulated during the leader's term in office. Alesina et al. (2012, 1998) study whether large reductions of the budget deficit have negative political consequences. They consider a sample of OECD countries and find that austerity has a weakly positive, rather than negative, electoral effect: governments that have

reduced deficits are more likely (although by very little) to be reelected. Alesina et al. (2012) specifically focus on episodes of large fiscal adjustment in OECD countries. Their definition of the latter is simply an observed large reduction in the cyclically adjusted deficit, by more than 1.5 percentage points of GDP. Their sample is 1975–2008 for 19 OECD countries. They do not find any strong correlation in either direction: there is not a systematic statistical relationship between periods of austerity and reelection for the incumbent. Alesina et al. (2019) apply their methodology based upon plans and confirm these results. Work in progress at IMF (Alesina A. and Quinn (2019)) suggests that in OECD countries tax based austerity plans are electorally more costly than expenditure based austerity plans.

But what about liberalization policies? Alesina A. and Quinn (2019) investigate precisely this issue. The third set of results is that government which implement liberalizing reforms close to their reelection time suffer at the polls. Vote shares of the main governing party (or coalition) declines with reforms implemented in the election year. The state of the economy influences the estimated effects of reforms on incumbent vote. They show that when economies are in contractions, both liberalizing reforms and those moving in the opposite direction are penalized by the voters. In contrast, reforms undertaken during a growth expansion are not electorally punished and, in some cases, even rewarded. In other words, voters may not be able to distinguish well enough the effects of the business cycle and attribute the current state of the economy to the action taken by the government at that time, without allowing for the delays in effects of the reforms on the economy.

## **6 What does all this imply for Brazil?**

As discussed in the the preceding paragraphs, spending-based austerity plans have resulted in mild output slowdowns but in sustained improvements in debt ratios and in the overall fiscal position. In this section we extend the macro-econometric model first used by Favero and Mei (2019) to assess possible scenarios for output and debt following Brazil's possible

adjustment programs. Our goal is twofold. We first want to simulate how Brazilian macroeconomic aggregates would respond to the standard tax-based and spending-based adjustments observed in OECD countries over the past forty years. We carry out this exercise considering both the current Brazilian macroeconomic conditions, as well as different GDP growth and inflation scenarios when the adjustment is started. Our second goal is to more specifically assess the impact of the pension reform – which we treat as a spending-based adjustment plan – on medium-term (up to 5 years) per capita output growth and debt dynamics. Our projections reflect an estimated overall adjustment totaling up to between 630 and 800 billion real over a 10-year horizon. The model is able of studying the effects of both implemented and announced measures throughout the simulation horizon. In other terms, we do not only take into account the annual actual savings from the reform, but also the projected savings for future years. Since pension reforms – and more in general EB plans – are associated with increases in confidence due to the projected government savings, it is thus crucial that the model keeps track of such anticipation effects. Three aspects related to our simulations of the effects of the pension reform deserve some clarification here. First, our model assumes that legislated measures are fully credible and rule out instances in which agents anticipate that all or part of the policies announced for the future will then be reverted. In our case, a policy reversal would mean a reduction in the planned savings from the reform. Second our simulations reflect only the effects due to the pension reform without considering future implementation of tax and spending measures that might contribute to improve or worsen the fiscal position. Lastly, we treat the projected savings from the pension reform as exogenous shocks at the time of their final legislation by the Brazilian Parliament.

## **6.1 Macro econometric model**

We use a dynamic model to capture the dynamics of the five variables that enter the public debt identity: per-capita output growth, government revenues and spending, the GDP de-

flator and government net interest expenses. This model allows us to parsimoniously keep track of all the aggregates determining the evolution of the debt to GDP ratio over time. All the more technical details of the model are included in the appendix at the end of the paper. The estimation part is carried out on a sample of 16 OECD economies between 1978 and 2014, as detailed in Alesina et al. (2019) and Favero and Mei (2019). Based on this estimated model, we carry out simulations for the impact of various types of fiscal plans as well as of the recently legislated pension reform using the Koop et al. (1996) generalized method. Our simulations are carried out taking as initial conditions the macroeconomic indicators for Brazil in 2018 and 2019, and then considering their evolution over the 2020-25 period. Macroeconomic data for Brazil are the latest available from the IMF World Economic Outlook and Fiscal Monitor. We also consider perturbations to these initial conditions to assess if and how the effects of the fiscal plan would change with different GDP growth and inflation rates when the consolidation is launched.

## **6.2 Simulations**

### **6.2.1 Standard spending-based plan under Brazil macro conditions**

The first simulation exercise we carry out is the closest to the general framework adopted by Alesina et al. (2019), here extended to consider as starting conditions the macroeconomic indicators for Brazil in 2018 and 2019. The initial conditions for Brazil in terms of levels of government spending and revenues as a share of GDP, as well as the level of debt, are in the ball park of the 16 OECD countries analyzed by Alesina et al (2019), thus making that work particularly applicable to Brazil. Brazil would have the advantage that – relative to the round of austerity carried out in Europe after the Great Recession and the sovereign debt crisis – the economy is not in a recession and the monetary policy is not constrained by the zero lower bound. These two factors may help reduce the output cost of austerity measures.

We simulate the effects of an overall 1 percent of GDP <sup>3</sup> fiscal adjustment mainly carried out through either spending cuts (expenditure-based, EB) or tax hikes (tax-based, TB). A plan is labelled as either EB or TB if the majority of implemented measures is respectively on the spending or the tax side. In the case of EB plans, we also consider smaller accompanying tax measures that have been typically associated with spending-based plans in our sample of OECD economies. The same is also done for TB plans, for which we consider the smaller spending measures typically legislated with them. This methodology is justified by the evidence that tax and spending measures are never or very rarely legislated in isolation, and fiscal plans generally consist of a package of implemented and announced policy changes on both sides of the government's balance sheet. Thus, the one percent overall adjustments that we consider consist of a series of intra-temporally (tax and spending) and inter-temporally (implemented and announced) measures. For a more detailed illustration of the methodology through which the correlation between the headline measures and the accompanying ones we refer to Alesina et al. (2019) and Favero and Mei (2019).

Figure 12 reports the (cumulated) effects of EB and TB plans on per capita output growth and the gross government debt position. For an EB plan, relative to a scenario without policy adjustment and given Brazil's macroeconomic initial conditions, the impulse responses point to a loss in per capita growth of around 0.5 percent in the first two years of the adjustment. The effects on output are then neutral over the remaining years of the simulation horizon. The decline in the debt ratio is steady: five years after the introduction of a 1 percent fiscal correction, debt is reduced by around 2 percent. The gains from the reduction in the budget deficit (numerator effect) thus more than compensate the mild losses on output (denominator effect). For a TB plan, the fall in output is approximately twice as large as for an EB one, with per capita growth losses of around 1 percent in the first two years of the adjustment. As a result, the response of the debt ratio is not statistically different from zero over the simulation horizon. Analogous simulations carried out with different initial levels of output

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<sup>3</sup>One percent of GDP in the year before the consolidation starts.



Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Savings	6.4	21.9	33.4	47.3	65.6	84.7	104.3	126	148.4	169.9	807.9

Table 1: Fiscal impact of the pension reform - Projected savings

growth and inflation as implied by the GDP deflator produce analogous results.

### 6.2.2 Simulating the effects of the projected savings

We now look at the projected structure of the recently legislated pension reform. We study the effects of an adjustment that for its total size, year-by-year projected savings, and correlation between announcements of future policy changes mimics the current government plan. To allow comparability with the previous simulation exercises, we rescale the size of the correction to 1 percent of GDP in 2019 so that we are effectively looking at the impact of each percentage point of savings from the reform. Note that while our model is designed to carry out simulations over a medium-term horizon of 5 years, the projected fiscal measures that extent beyond the fifth year are still considered since they count as announcements of future savings. We consider two closely related variants of this exercise.

In the first we consider the official government projections for the reform, which is expected to produce an approximately 800 billion real savings over a 10-year horizon<sup>4</sup>, as detailed by table 1.

The output and debt responses from this simulation (figure 15) point to a more persistent loss of output per capita over a five-year horizon. The cumulated losses range between 0.5 and 1.5 percent. This translates into a response of the debt ratio that is not statistically different from zero. The reductions in the budget deficit due to the pension reform, at least as currently planned, will thus not be able to fully stabilize the debt ratio absent further policy measures. This is a scenario already discussed throughout 2019 by both IMF and OECD documents. While the pension reforms will certainly translate in a gradual improvement for

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<sup>4</sup>[http://sa.previdencia.gov.br/site/2019/05/Projecoes-Fiscais-da-PEC-06.2019-no-RGPS\\_Nota-Metodologica.pdf](http://sa.previdencia.gov.br/site/2019/05/Projecoes-Fiscais-da-PEC-06.2019-no-RGPS_Nota-Metodologica.pdf)

Year	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Savings	8	14	24	38	51	66	82	99	115	133	630

Table 2: Fiscal impact of the pension reform - Projected savings

the national accounts, further measures seem required for a full stabilization of the Brazilian debt over a medium-term horizon.

This result is confirmed in the second simulation exercise, where we consider the projections from the Instituicao Fiscal Independente. In this case, while the term structure of savings is almost preserved, the expected total savings amount to around 630 billion real<sup>5</sup>.

## 7 Summing up and policy implications

Brazil has a high debt over GDP ratio, especially by Latin American standards and with a level of government spending much higher than that of other countries at similar levels of GDP per capita. In fact the initial conditions in terms of debt levels and size of government in Brazil are not dissimilar from those of OECD countries. Therefore, the model by Alesina et al. (2019) can be applied to Brazil.

Two major obstacles lay on the path of a sound fiscal position in Brazil. One was the time dynamic of the pension system which was not sustainable, literally a “time bomb” for the budget that would have vastly aggravated the fiscal position of the government for decades to come. The second is the rigidity that the legislation and the Constitution impose on the management of public finances.

The first obstacle has been removed with the recent pension reform. These savings will avoid the massive additional growth of government debt which would have occurred without them. Since they will begin to accumulate down the line in a few years, this reform alone will not lead, based upon the tentative and always imperfect calculations for the long run, to substantial reductions in debt over GDP ratio, in the next decade or so. The pension

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<sup>5</sup>[https://www2.senado.leg.br/bdsf/bitstream/handle/id/563696/CI\\_03.pdf](https://www2.senado.leg.br/bdsf/bitstream/handle/id/563696/CI_03.pdf)

reform is thus a critical first step for a successful stabilization plan: without these savings, cuts on discretionary spending or tax increases would have been unable to keep up with the automatic explosion of pension expenditures.

Thus, if the target of the government is to reduce more aggressively the debt over GDP ratio the pension reform is not sufficient. The first question is: should the government reduce the debt to GDP ratio? And is this a good time to start this process? The accumulated evidence suggests that, when the choice is available, it is better to engage in fiscal stabilization when the economy is not in a recession. Fiscal consolidations are more likely to succeed with lower costs in terms of output losses and larger debt reductions if implemented when the economy is growing. This is the current case for Brazil after its serious recession of 2015-17. The evidence accumulate for OECD countries suggests that, in terms of output losses caused by fiscal stabilizations, spending cuts are much less costly than tax increases. Therefore the Brazilian government should move in that direction, looking for spending cuts rather than tax increases. It goes beyond the scope of this paper to discuss in which part of the budget to find possible cuts. It should be done protecting the poorest part of the population and avoiding that public services are provided for free or at below costs to the part of society which could afford them at market prices. For a country with such a large government like Brazil, compared to other countries at similar level of GDP per capita, this should be possible. Obviously, in order to do that, one needs to remove the tight obstacles in the Constitution that make flexible management of public spending impossible, a legislative process which may require many months if not a few years. On the tax side, simplification of the tax code, closures of loopholes, and reduction of tax evasion seem reasonable objectives. These will lead to increases in revenues without a raise in tax rates, or even reducing some of them.

Major fiscal stabilization plans are often accompanied by other policies which may help. Accommodating monetary policy would of course help, by contributing to keep interest low and supporting private investment. In fact the evidence provided in Alesina et al (2019a) shows

that private investment is the component of aggregate demand which react more positively to announcements of spending cuts because investors expect lower taxes in the future. An interest rate reduction would reinforce this channel. Structural liberalizing reforms would also help on the supply side. Recent evidence by Alesina A. and Quinn (2019) show that indeed these policies have a significant positive effect on growth, although with some significant delay from the moment they are introduced, up to 3 to 4 years. Thus in the context of a multi year fiscal stabilization plan these reforms should be front loaded. It goes beyond the scope of this paper to identify the details of the most needed and effective liberalizing reforms in Brazil, but they should be part of a broad package of reforms initiated with the pension reforms. Considering that many months if not a few years will be needed to revise the legislative environment which would allow for an aggressive fiscal stabilization based upon spending cuts, starting these structural liberalizing reforms now would led them to have an effect at the “right time”, namely when the (hopefully small) recessionary effect of the budget cuts will come into play.

Politicians naturally worry not only about the economic effects of policy reforms and fiscal stabilization but also about the effects of the latter at the polls. Pension reforms and other major spending measures aimed at reducing government total spending have been considered in the past the kiss of death for politicians implementing them. As discussed above, recent work including by Alesina et al. (2019) and Alesina A. and Quinn (2019) casts doubts about the negative relation between implementation of policy packages reducing spending and chances of re-election. This should motivate governments who care about the long-term sustainability of the country’s public finances to stick to the ongoing consolidation efforts. In particular recent work by Alesina A. and Quinn (2019) uses the same methodology based upon plans as we use in this paper and shows, for those 16 OECD countries, that *“tax-based consolidations carry large electoral costs, while expenditure-based consolidations are neutral on average. An austerity package worth 1% of GDP, carried out mostly through tax hikes, reduces the vote share of the leader’s party by about 7%. This negative effect of tax-based*

*consolidation is even stronger for right-leaning governments. Expenditure-based austerity, instead, has on average no negative electoral effect*". Recent results by Alesina et al (2019) also show that liberalizing structural reforms are not punished by the voters as long as they are implemented far from an election so that the beneficial growth effects of the reforms materialize. In addition voters have (understandably) a hard time distinguishing this complex timing. A reform introduced during a recession may lead the voters to blame the reforms for the current bad state of the economy. Thus, when possible, reforms should be implemented when the economy is doing relatively well.

In conclusion, the pension reform of Brazil should be an important beginning of a broader process for reforms and fiscal stabilization. Given the relatively "peaceful" macroeconomic situation of the country, and given the positive effect on expectations generated by the pension reform, Brazil is not on the verge of a fiscal crisis and the precise timing of the various policies necessary for a reduction of the debt/GDP ratio can be chosen not in state of crisis but in order to minimize their costs. Due to political constraints, however, reforms often occur only during a crisis when they cannot be postponed any longer, even though reforms during crises may have higher economic costs than reforms in economically peaceful times. Let's hope that a crisis is not necessary in Brazil to accelerate the path toward reforms.

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## 8 Appendix: macro-econometric model and figures

We use 5-equation dynamic model to capture the dynamics of the five variables that enter the public debt identity: per-capita output growth, government revenues and spending, the GDP deflator and government net interest expenses.

$$z_{i,t} = \begin{bmatrix} \Delta y_{i,t} \\ \Delta g_{i,t} \\ \Delta \tau_{i,t} \\ \Delta p_{i,t} \\ r_{i,t} \end{bmatrix} \quad a_i = \begin{bmatrix} a_{1,i} \\ a_{2,i} \\ a_{3,i} \end{bmatrix} \quad \textit{similarly for } b_i$$

$$\Delta y_{i,t} = A_1(L)z_{i,t-1} + \begin{bmatrix} a'_1 & b'_1 \end{bmatrix} \begin{bmatrix} g_{i,t}^u \\ g_{i,t-1}^a \\ g_{t,t+1}^a \\ \tau_{i,t}^u \\ \tau_{i,t-1}^a \\ \tau_{t,t+1}^a \end{bmatrix} \lambda_{1,i} + \chi_{1,t} + u_{1,i,t}$$

$$\Delta p_{i,t} = A_2(L)z_{i,t-1} + \begin{bmatrix} a'_2 & b'_2 \end{bmatrix} \begin{bmatrix} g_{i,t}^u \\ g_{i,t-1}^a \\ g_{t,t+1}^a \\ \tau_{i,t}^u \\ \tau_{i,t-1}^a \\ \tau_{t,t+1}^a \end{bmatrix} + \lambda_{2,i} + \chi_{2,t} + u_{2,i,t}$$



$$\Delta g_{i,t} = A_3(L)z_{i,t-1} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \end{bmatrix} \begin{bmatrix} g_{i,t}^u \\ g_{i,t-1}^a \\ \tau_{i,t}^u \\ \tau_{i,t-1}^a \end{bmatrix} + \lambda_{3,i} + \chi_{3,t} + u_{3,i,t} \quad (1)$$

$$\Delta \tau_{i,t} = A_4(L)z_{i,t-1} + \begin{bmatrix} \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \end{bmatrix} \begin{bmatrix} g_{i,t}^u \\ g_{i,t-1}^a \\ \tau_{i,t}^u \\ \tau_{i,t-1}^a \end{bmatrix} + \lambda_{4,i} + \chi_{4,t} + u_{4,i,t}$$

$$r_{i,t} = A_5(L)z_{i,t-1} + \lambda_{5,i} + \chi_{5,t} + u_{5,i,t}$$

where  $\Delta y$  is real per-capita output growth, while  $\Delta g$ ,  $\Delta \tau$ ,  $\Delta p$  and  $r$ , are respectively the first differences of government spending and revenues, inflation as implied by the GDP deflator, and government net interest expenditures as a percentage of GDP. The narratively identified fiscal corrections for country  $i$  in year  $t$  are decomposed into their three components: unanticipated  $(\tau_{i,t}^u, g_{i,t}^u)$ , implemented but previously announced  $(\tau_{i,t-1}^a, g_{i,t-1}^a)$ , and announced for the future at various horizons  $(\tau_{i,t+j}^a, g_{i,t+j}^a)$ . We also include country  $\lambda_i$  and time  $\chi_t$  fixed-effects in each equation.

The dynamics of the debt ratio for country  $i$  is determined in each period  $t$  by the intertemporal government budget constraint:

$$d_{i,t} = \frac{1}{(1 + x_{i,t})(1 + \Delta p_{i,t})} d_{i,t-1} + (g_{i,t} - \tau_{i,t}) + r_{i,t} + ASFA_{i,t} \quad (2)$$

where  $x_{i,t}$  is the real output growth (obtained by adding to  $y_{i,t}$  the exogenous population growth rate), while the other variables are the levels of the variables included in the VAR.

$ASFA_{i,t}$  is the augmented stock-flow adjustment. The need for stock-flow adjustment arises, for example, in the presence of revenue from sales or purchases of financial and non-financial assets, revaluations (in the case the debt is valued at market prices), and debt write-offs. These are all items which do not enter the definition of the primary surplus ( $g_{i,t} - \tau_{i,t}$ ). The augmented version of SFA also contains the spending and revenues components unaffected by fiscal corrections that we did not include in neither  $g_{i,t}$  nor  $\tau_{i,t}$ .

The dynamic system is estimated on a sample of 16 OECD economies between 1978 and 2014, as detailed in Alesina et al. (2019) and Favero and Mei (2019). Based on this estimated model, we carry out simulations for the impact of the recently legislated pension reform using the Koop et al. (1996) generalized method. The impulse responses for our macroeconomic variables in the vector  $z$  are therefore given by:

$$I(\mathbf{z}_t, \eta, \delta, I_{t-1}) = E(\mathbf{z}_{t+\eta} | e_t = \delta, I_{t-1}) - E(\mathbf{z}_{t+\eta} | e_t = 0, I_{t-1}) \quad (3)$$

Once initial conditions  $I_{t-1}$  are set, impulse responses for the five endogenous variables  $z_t$  in the dynamic model are computed at each time horizon  $\eta$  as the difference between the path of the variable in a scenario without fiscal correction (i.e. having set the vector  $e_t = 0$ ) and a scenario in presence of the pension reform. Confidence intervals are computed using bootstrap simulations with block-resampling of the residuals from the system, so that the correlation of residuals across equation is preserved. Our simulations are carried out taking as initial conditions the macroeconomic indicators for Brazil in 2018 and 2019, and then considering their evolution over the 2020-25 period. Macroeconomic data for Brazil are the latest available from the IMF World Economic Outlook and Fiscal Monitor.

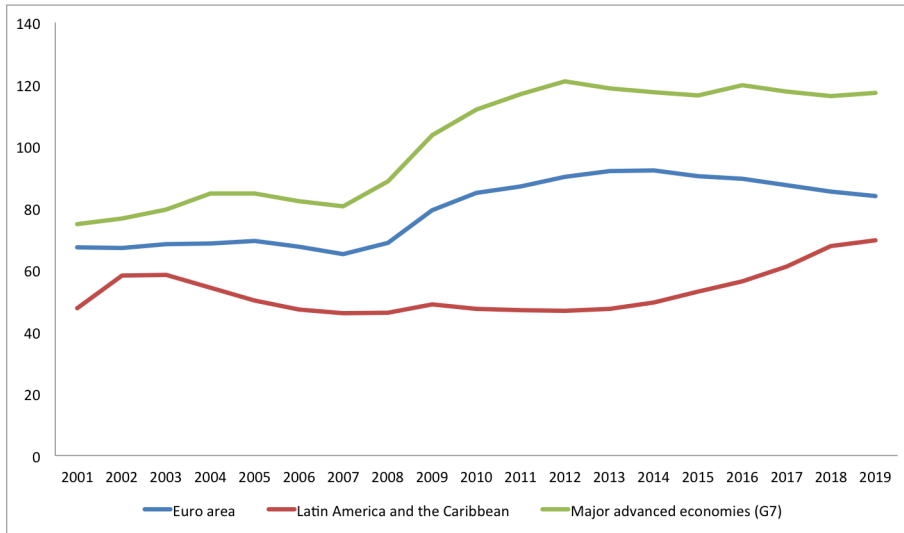


Figure 1: General government debt/GDP ratios by area - IMF WEO

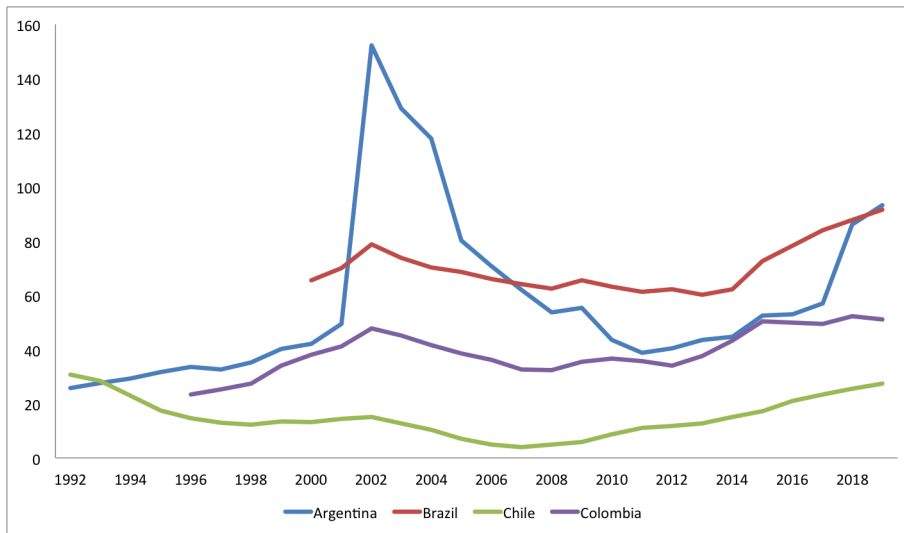


Figure 2: General government debt/GDP ratios in Latin America - IMF WEO

Table 1: Percent Years of Deficit over 1960-2011

	Australia	Austria	Belgium	Canada	Germany
Percent	80	82	96	76	78
Last Surplus	2008	1974	2006	2007	2008
	Denmark	Spain	Finland	France	UK
Percent	48	78	20	90	84
Last Surplus	2008	2007	2008	1974	2001
	Greece	Ireland	Italy	Japan	Netherlands
Percent	80	80	100	68	88
Last Surplus	1972	2007		1992	2008
	Norway	New Zealand	Portugal	Sweden	USA
Percent	4	46	100	42	92
Last Surplus	2011	2008		2008	2000

Source: Wyplosz (2014).

Table 3: Years of deficit over 1960-2011 - Wyplosz (2014)

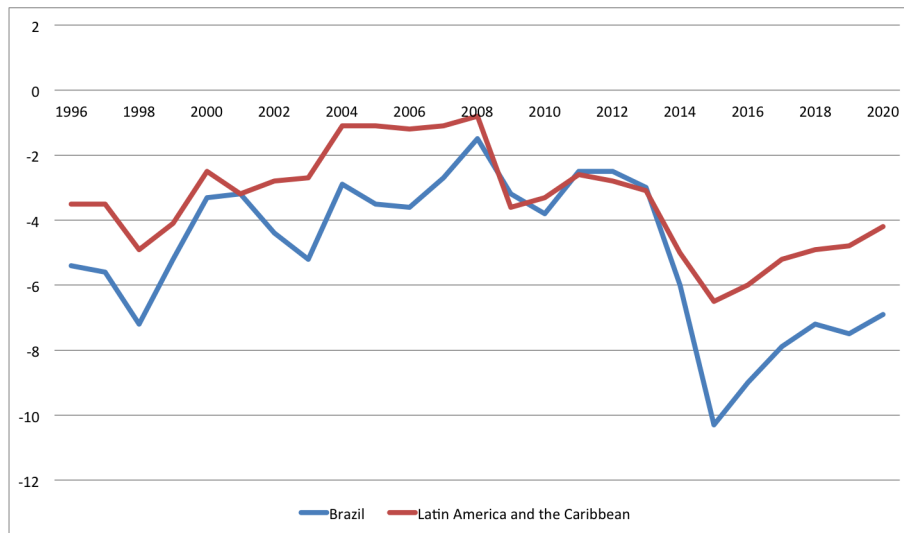


Figure 3: General government net lending/borrowing (% of GDP) - IMF WEO



Figure 4: Output response to 1 percent fiscal plan

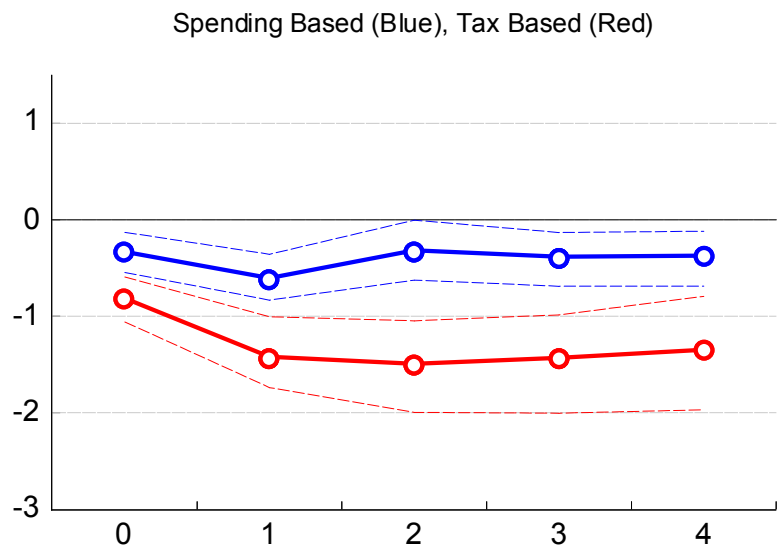


Figure 5: Consumption response to 1 percent fiscal plan



Figure 6: Investment response to 1 percent fiscal plan

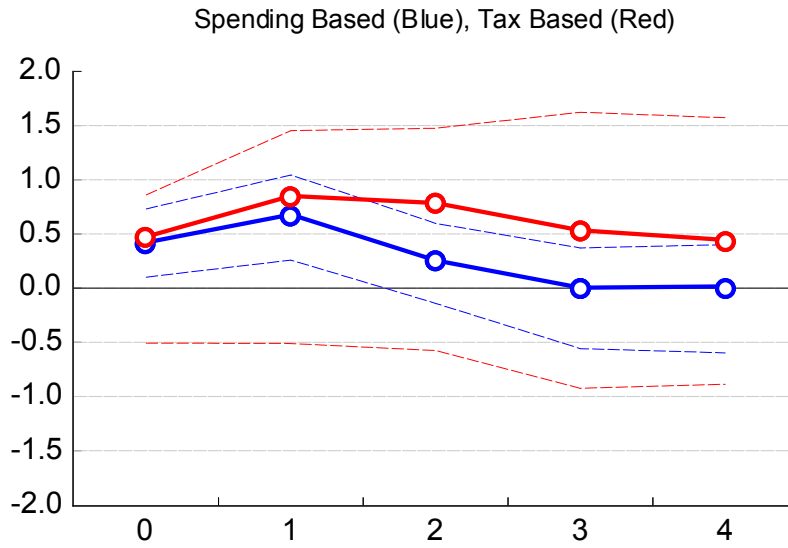


Figure 7: Net export response to 1 percent fiscal plan

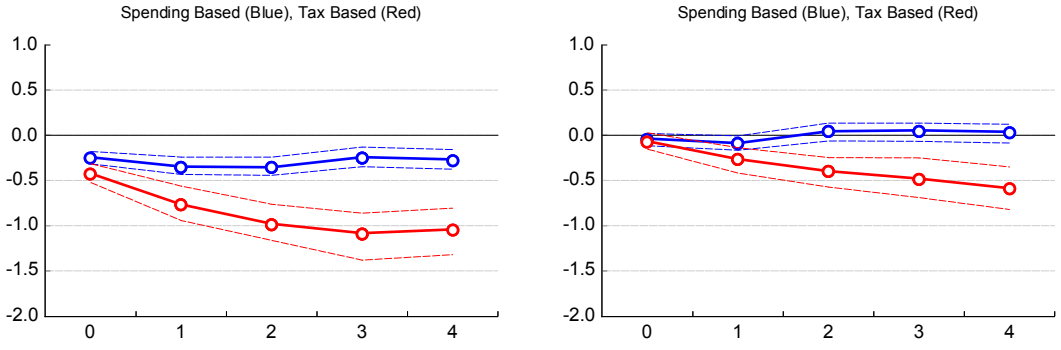


Figure 8: Consumer (left) and business (right) confidence response to 1 percent fiscal plan

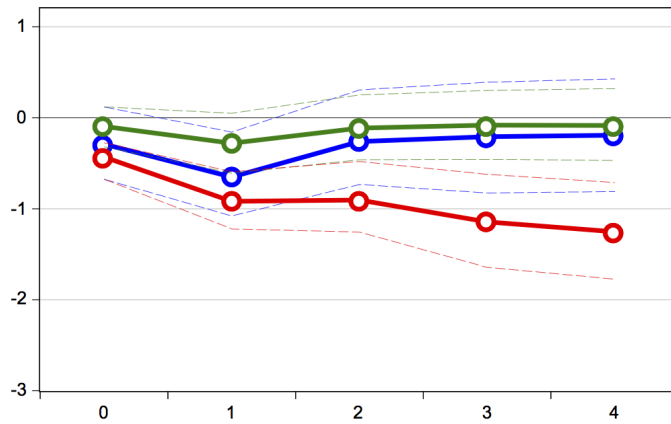


Figure 9: Output response to 1 percent fiscal plan. Transfer-based plan in green, government consumption-based in blue, tax-based in red.

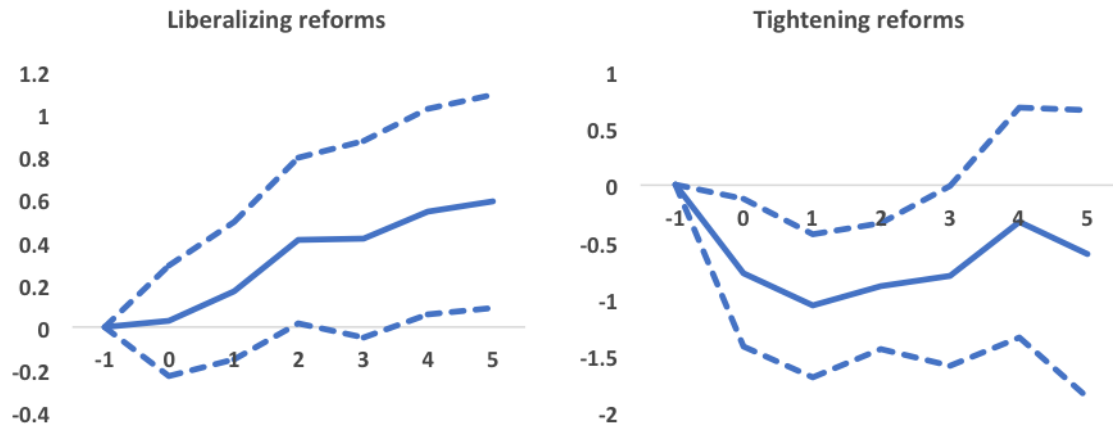


Figure 10: Output effect of liberalizing and tightening reforms (% of GDP)

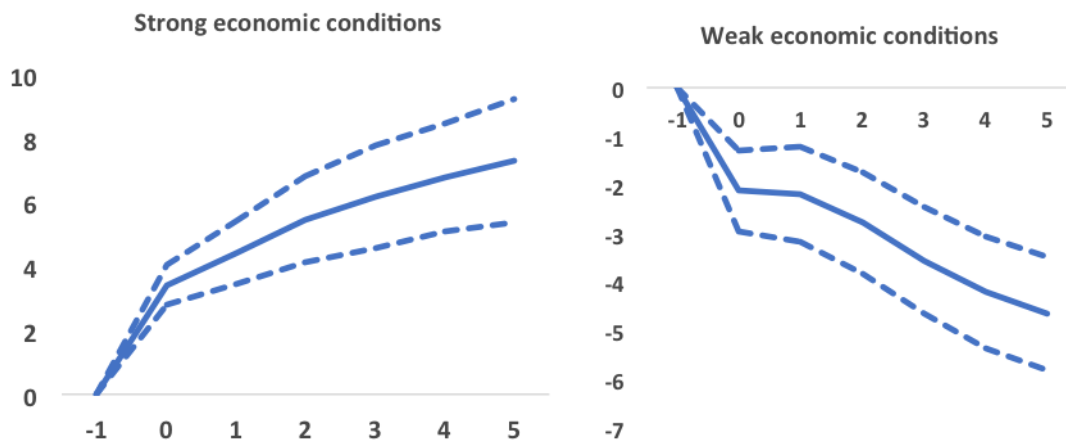


Figure 11: Output effect of reforms depending on economic conditions (% of GDP)



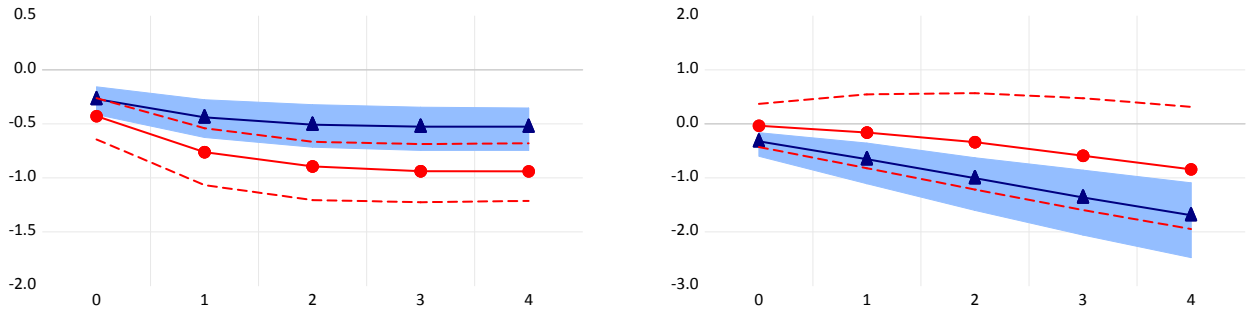


Figure 12: Response of per capita output (left) and gross debt position (right) to a standard 1 percent spending-based (blue) and tax-based (red) adjustment setting as initial conditions the macroeconomic variables for Brazil in 2018 and 2019.

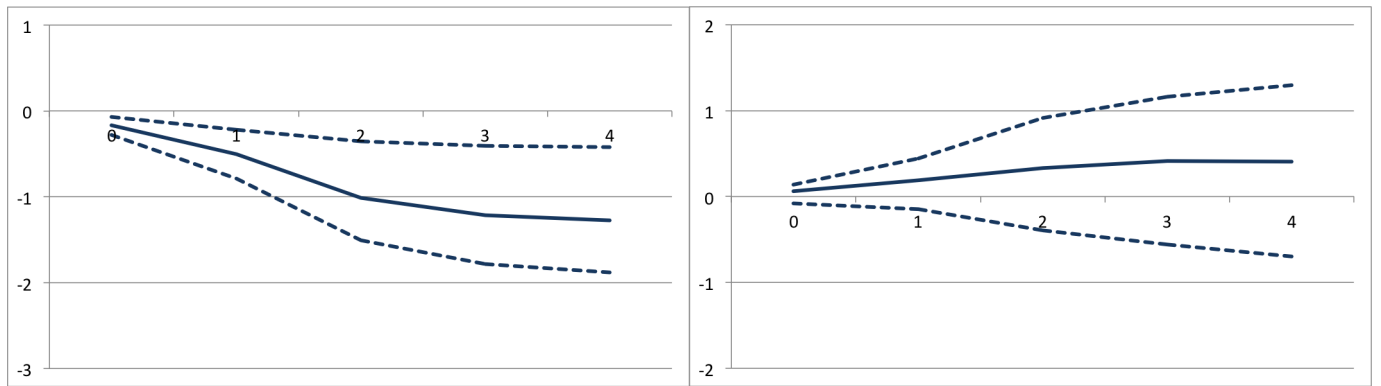


Figure 13: Response of per capita output (left) and gross debt position (right) to the projected fiscal savings from the 2019 pension reform.