

The Challenge of Fiscal Sustainability in Brazil

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1. Introduction

Two things have recently changed in fiscal policy the world over. The first is that sustained low real interest rates have made it possible for governments to run larger deficits and carry larger debts. The second is that COVID-19 crisis made it imperative to use this enhanced fiscal space.

Both changes are qualitatively and quantitatively important. Start with the first. In the 1980s and 1990s, real interest rates were positive and, in some countries, high.¹ In those circumstances, a government with large debts had to pay a sizeable share of its budget in interest every year. That was money not spent on health, education, welfare, or green infrastructure. In that situation, most economists—even progressive economists—counseled prudence.²

Today, with the real interest rate near zero, a country in the same situation must make real interest payments of, well, zero. In fact, if the real rate of interest is persistently lower than the rate of growth of the economy, a government can increase expenditures today without necessarily having to raise taxes tomorrow to pay for that additional expenditure. No wonder, then, that the recent episode of low interest rates worldwide has facilitated greater fiscal activism and faster public debt accumulation.

That activism was greatly enhanced by the COVID crisis. The pandemic made it essential both to provide disaster relief to affected households and businesses as well as provide a stimulus for the eventual recovery. According to the Fiscal Monitor published by the International Monetary Fund, 2020 fiscal deficits reached nearly 12 percent of world GDP and global public debt, at nearly 100 percent of GDP, was the highest on record.³ The tendency toward a more expansionary fiscal stance was generalized, but advanced economies enacted much larger fiscal programs than did developing countries: the IMF estimates that in 2020 advanced countries ran fiscal deficits of 13.3 percent of GDP, while the estimate for low-income developing economies is less than half of that, at 5.7 percent of GDP. Emerging economies come out in between, at 10.3 percent of GDP.

Greater fiscal activism was surely justified during the pandemic. But as economies begin to return to normal, economists and policymakers are increasingly wondering where the limits to debt accumulation lie, and how those limits vary between advanced and emerging economies.

The experience of Brazil is a particularly important in this regard. At over 90% of GDP, its public debt is larger than that of most emerging economies and comparable to the debt of advanced nations like the United States and the United Kingdom, both of which crossed the threshold of 100% of GDP in the course of 2020. Short-term interest rates are reasonably low in Brazil, but the yield curve is steeper than is among advanced economies, and this constrains the government's ability to fund itself with long (and safe) maturities. How to ensure fiscal stability and sustainability has become a paramount concern in Brazilian policy debates. This paper analyzes the current state of debts and deficits, assesses the associated fiscal risks, and suggests ways forward.

¹ In the case of Brazil, real rates were substantial until quite recently.

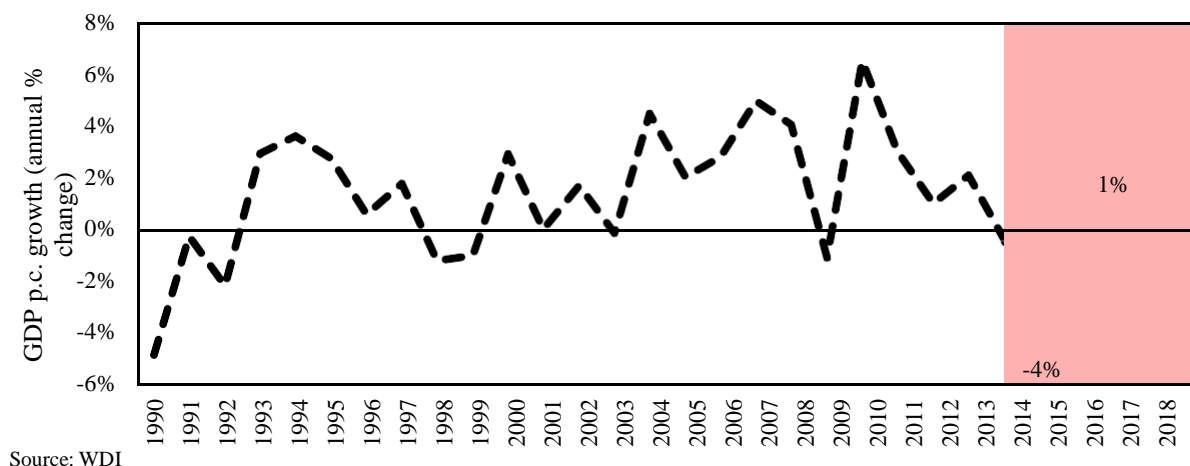
² On the connection between low interest rates and sustainability, see Blanchard (2019) and Reis (2020)

³ Fiscal Monitor Update, January 2021. Available at <https://www.imf.org/en/Publications/FM/Issues/2021/01/20/fiscal-monitor-update-january-2021>

2. Brazil Before the Pandemic

Brazil was in a challenging macroeconomic and fiscal position prior to the COVID-19 crisis. Just five years earlier, the country had experienced the worst economic contraction in its history. GDP growth slowed significantly in 2014 and turned sharply negative in 2015-16 (Figure 1) due to the fall in global commodity prices, especially crude oil and agricultural products, and the fallout from the Lava Jato corruption scandal. In 2017-19, the economy rebounded amid significant political turbulence, but barely enough to generate per capita income gains.

Figure 1 – Pre-COVID GDP per capita growth



Brazil’s overall fiscal deficit ballooned to 10 percent of GDP in 2015 (Figure 2), narrowing to 6 percent by 2019 and leaving the non-financial public sector’s debt⁴ at 90 percent of GDP (Figure 3), a level higher than that of most income and regional peers. The large deterioration of the fiscal balance between 2013 and the 2014-2019 period was explained by an increase in primary expenditures of around 2 p.p. of GDP per year (largely driven by social security expenses), an average increase in interest expenditures of 1.5 p.p. of GDP and a decline in revenues of approximately 1 p.p. of GDP.

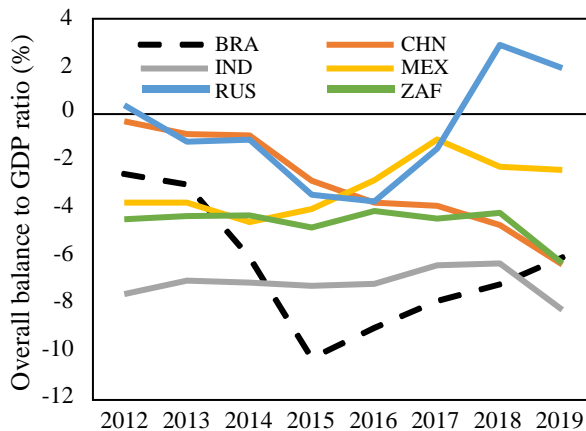
Two major reforms were enacted to limit the fiscal deficit and curb debt accumulation in the aftermath of the commodity price decline and Lava Jato scandal. First was a public spending rule approved in December 2016 during President Michel Temer’s administration (2016-2018). The policy capped federal expenditures at the 2016 level for twenty years. Under the rule, nominal federal primary expenditures (19.9% of GDP in 2016) may rise only with inflation, not real GDP growth or population growth. Second, a pension reform was approved in October 2019 during President Jair Bolosnaro’s administration (2019-ongoing). Among other changes, the pension reform gradually increases the retirement age to 65 and 62 from 56 and 53 for men and women,

⁴This IMF definition of the debt stock excludes Eletrobras and Petrobras and includes sovereign debt on the balance sheet of the Central Bank and is included so that Brazil can be compared to peers covered in the IMF data. A more typical definition of the public debt stock is the General Government Gross Debt, which does not include sovereign debt on the balance sheet of the central bank, stood at 74.3% of GDP in 2019 and also showed a significant increase since 2014. See sub-section 3 for a more detailed discussion.

respectively. Pension spending in Brazil is remarkably high, accounting for 44% of the Federal government’s budget and 8.6% of GDP in 2018, and was projected to rise rapidly prior to the reform⁵.

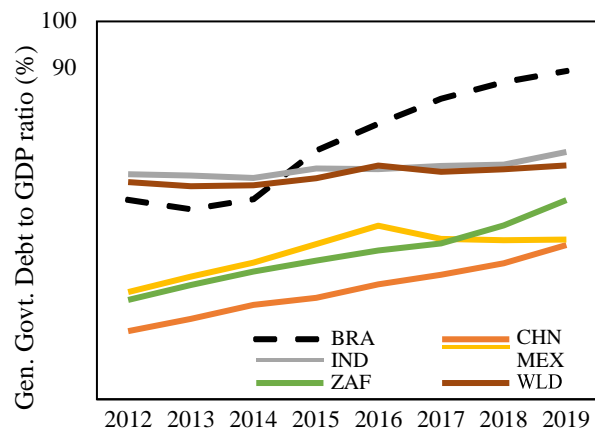
In short, the deterioration in Brazil’s public finances was significant in 2014-2019, leaving the country in a challenging fiscal position to confront the COVID-19 pandemic. The 2015-16 recession was detrimental for fiscal accounts. And the reforms, though very significant, came too late to offset the large fiscal deficits and the resulting debt accumulation.

Figure 2 – Overall fiscal balance, 2012-19



Source: IMF Fiscal Monitor (Oct 2020)

Figure 3 – Debt to GDP trajectory, 2012-19



Source: IMF Fiscal Monitor (Oct 2020)

3. Debt and Deficits at Different Levels of Government

As outlined by Dieguez and Ladeira (2010), Brazil’s public sector includes the central bank, public social security system, as well as the three levels of government (federal, state, and municipal) and their respective public companies. The federal government includes the national treasury and social security system, while the central government includes the national treasury, the social security system and the central bank. Although Brazilian authorities construct various gross and net debt concepts at these different levels of aggregation, most of the attention focuses on the general government’s gross debt (GGGD), which is used by two of the three rating agencies (Moody’s and Fitch) as the main metric for debt sustainability purposes.

The GGGD measures the debt of federal, state, and municipal governments to the private sector and the public financial sector. Importantly, the metric excludes the debt of state-owned companies, such as Eletrobras and Petrobras, and excludes the liabilities of the Central Bank, although it does include its open-market operations commitments to the financial sector (mostly repurchase agreements), which totaled 17% of GDP as of December 2020. GGGD is net of

⁵ “Can Brazil’s pension reform kick-start the economy?” *Foreign Policy*, October 23 2019 ([link](#))

intergovernmental holdings of federal securities, so government paper held by the public pension system and the central bank, for instance, is not counted.

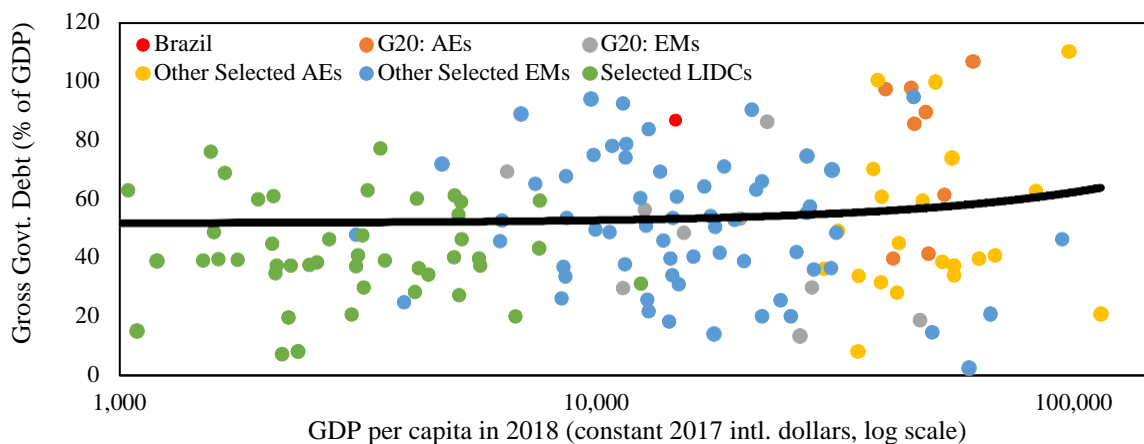
Another important metric is the federal public debt (FPD), which captures the debt securities that the federal government (which excludes the central bank) is responsible for. Like the GGGD, the FPD nets out securities held by other public entities (including the central bank).

As of December 2020, the FPD accounted for R\$ 4.76 trillion, or 72% of the R\$ 6.62 trillion in general government gross debt (GGGD). The difference between FPD (published by the National Treasury) and GGGD (published by the Central Bank) is largely explained by repo operations conducted by the Central Bank, which stood at R\$ 1.24 trillion or 19% of the GGGD in December 2020. The next largest difference is foreign debt, which stood at R\$ 243 billion in the FPD statistics and R\$ 823 billion in the GGGD statistics.⁶

Brazil's debt ratios are very high relative to peers. The country's ratio of GGGD to GDP for 2020(p) is in the 92nd percentile or 73rd place of the 81 emerging market economies covered in the World Economic Outlook (Oct. 2019). This ranking is misleading, however, because the countries that have higher indebtedness ratios are essentially small islands (Cabo Verde, Barbados, Belize, Jamaica, Antigua and Barbuda). Putting those aside, Brazil is the emerging economy with the highest ratio of gross debt after Egypt and Angola, surpassing even Argentina. Brazil's debt is large even when compared to advanced economies. Brazil's debt ratio for 2020(p) is in the 67th percentile of advanced economies and is higher than that of the UK and the average of the EU.

As Figure 4 illustrates, Brazil (the red dot) is above almost all emerging market economies (the blue and gray dots). The debt also higher than many advanced economies (the yellow and orange dots). It is also above the black trendline, meaning that its debt-to-GDP ratio is higher than what would be predicted given its income level in a simple bi-variate regression.

Figure 4 – Gross government debt and income in 2020p



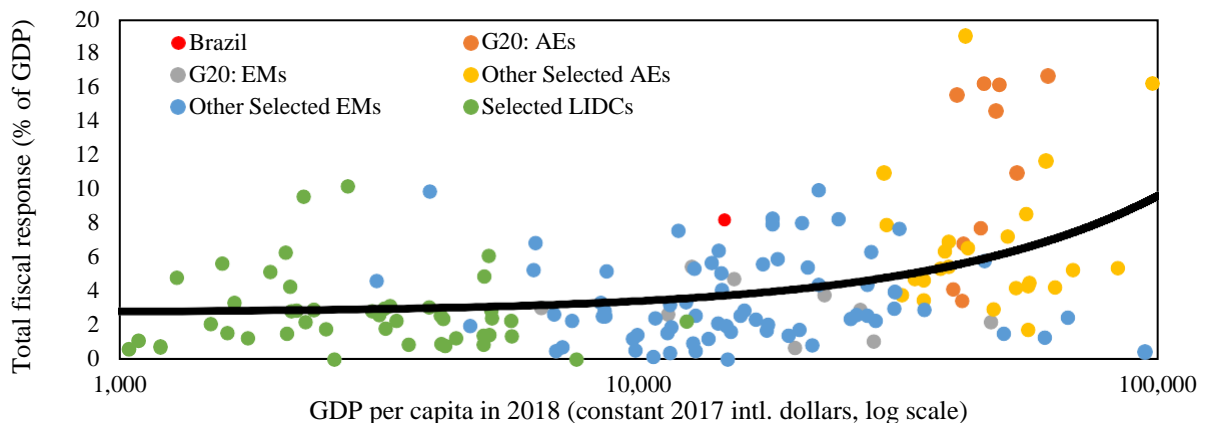
Source: WDI, IMF WEO (Oct 2020)

⁶ Information on the cost, structure and maturity of the FPD is considerably more detailed than for the GGGD.

4. The Pandemic and Brazil’s Response

Brazil responded vigorously to the pandemic, taking discretionary fiscal measures totaling 8.3% of GDP to support the health sector and economy. This number excludes the effect of any automatic stabilizers (like unemployment insurance, progressive taxes, etc.) that kicked in as income fell. The magnitude of discretionary measures was larger in Brazil than in most countries of Brazil’s income level, most emerging market economies and indeed many advanced economies. As Figure 5 shows, Brazil is considerably above the black line, meaning it spent more than its income level would have predicted. Moreover, despite being an emerging market with around US\$ 15,000 in income per capita, Brazil’s spending level was more on par with the advanced economies (the yellow and orange dots) than with emerging market economies (the blue and gray points).

Figure 5 – Above-the-line fiscal response to COVID-19 crisis



Source: WDI, IMF Fiscal Monitor (Jan 2020)

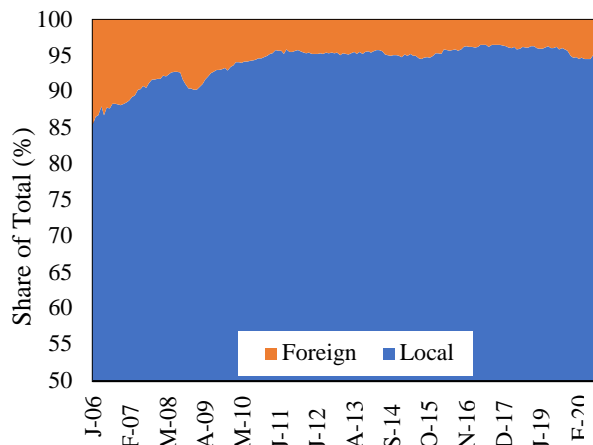
According to the January 2021 update to the IMF Fiscal Monitor, Brazil spent R\$ 505 billion (7.1% of GDP) on targeted assistance for the elderly, poor and unemployed through an expansion of “Bolsa Familia”; an “Emergency Aid” cash transfer for informal workers and low-income households; a subsidized job retention scheme for the private sector; temporary electricity subsidies for poor families; one-off transfers to subnational governments to compensate for revenue losses and to cover social and health costs; and foregone revenue from the temporary suspension of the financial transactions tax. The government also committed R\$ 79 billion (1.2% of GDP) on health expenditures and foregone revenue from suspended import taxes on health products. At the time of writing, it is not yet clear how fast extraordinary COVID-related spending will wind down in 2021 and whether the expenditure ceiling will be breached for a second year.

The constitutional amendment approved in March 2021 suggests spending will slow sooner rather than later. The additional cash transfers approved by congress (0.6% of GDP to poor families over four months) are smaller than those for 2020 (4% of GDP over eight months), suggesting a degree of fiscal prudence, a notion that the other provisions in the bill suggest as well. Importantly, the bill also included automatic spending cuts for the federal and subnational governments that are triggered when spending approaches the ceiling approved in 2016, which may prove crucial to curb the growth of mandatory spending. A plan to cut tax expenditures from 4% of GDP to 2% over 10 years was also included, again signaling fiscal consolidation.

5. Brazil’s Debt: Composition, Average Maturity, and Cost of Borrowing

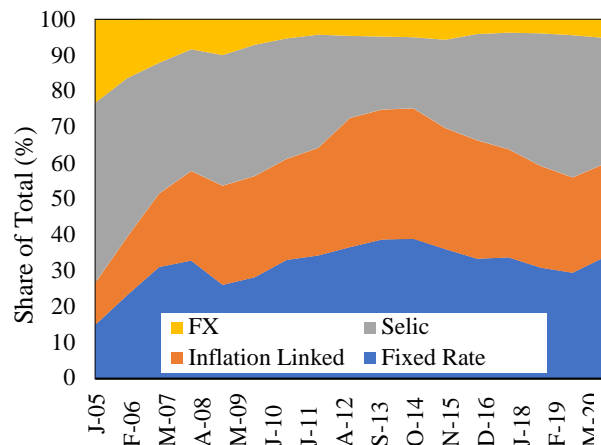
Brazil’s public debt has some distinct features that set it apart from emerging market and regional peers. First, the country’s FPD is overwhelmingly in local currency (Figure 6), limiting the balance-sheet effects of volatility in the exchange rate. Second, much of Brazil’s FPD is indexed (Figure 7), with around a quarter linked to inflation, roughly a third linked to the SELIC policy rate, and five percent linked to the exchange rate. Fixed rate debt is just a third of the total. Moreover, Brazil’s FPD is essentially held by residents, who owned 92% of the stock as of December 2020.

Figure 6 – FPD stock comp. by currency



Source: Brazil National Treasury

Figure 7 – FPD composition by instrument

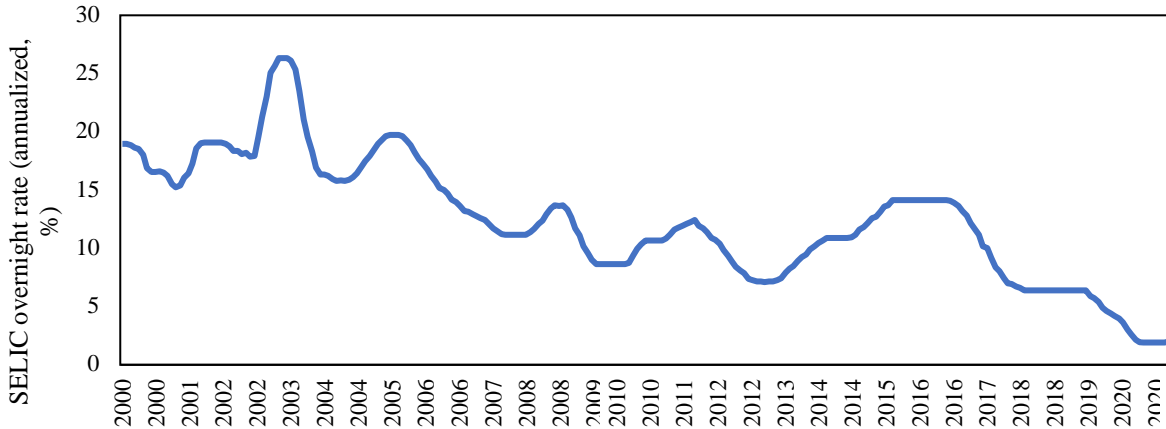


Source: Brazil National Treasury

Brazil’s FPD has an average remaining duration of 3.6 years as of January 2021. This is the weighted average of the remaining duration on the domestic debt (3.4 years) and the external debt (7.7 years). Within the domestic debt, fixed-rate debt (34% of the total) has a short average duration of 1.8 years, while SELIC-linked debt (35% of the total) has a duration of 2.7 years, FX-linked debt (5.0% of the total) has a longer duration of 3.5 years and inflation linked debt (26% of the total) has the longest duration of 6.5 years. Overall, over a quarter (27%) of the FPD stocks matures in the next 12 months, 17% matures the following year, 17% matures the year after that, with the remaining 39% maturing after 36 months.

Short-term interest rates have fallen dramatically in Brazil over the past two decades. The SELIC overnight rate, the central bank’s policy rate, has fallen from a high of 26% in 2Q2003 (on an annualized basis) to just 1.9% in 1Q2021, as illustrated by Figure 8. In the context of persistent mid to high single-digit inflation, real interest rates have come down significantly as well. While real short-term rates were 13% on average in the 2000-2005 period, they have fallen to just 3% in the 2015-2020 period.

Figure 8 – SELIC overnight rate

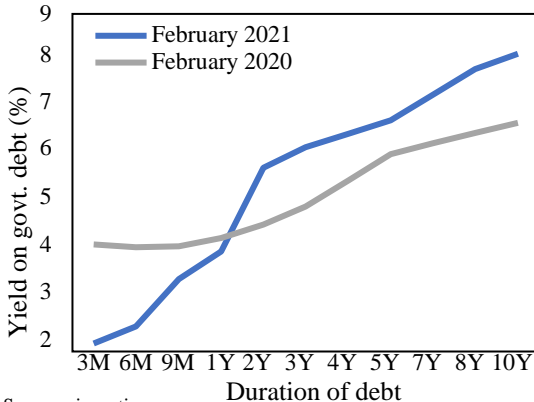


Source: Brazil Central Bank

In March 2021, the Central Bank raised the SELIC policy rate 75 basis points and signaled it would hike rates another 75 b.p. in May. The move is intended to anchor inflation expectations, which have crept up somewhat in 2021, and halt the depreciation of the Real against the dollar. Despite the expected 150 b.p. increase, the SELIC will remain near all-time lows.

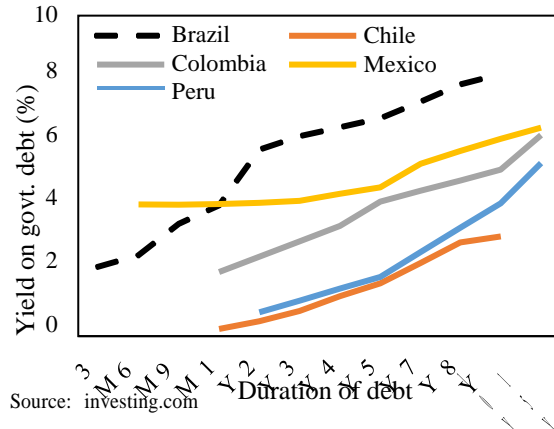
Brazil’s local currency yield curve has steepened significantly since the beginning of the pandemic (Figure 9). While the government’s short-term borrowing costs have fallen from around 4% in nominal terms to around 2% for three month issues over the course of a year, yields on instruments longer than two years in maturity have risen by approximately 1 p.p.. Compared to Latin American peers, Brazil has a much steeper yield curve and has higher nominal borrowing costs, especially at shorter maturities (Figure 10).

Figure 9 – Change in Brazil’s yield curve



Source: investing.com

Figure 10 – L.C. yield curve for LAC countries

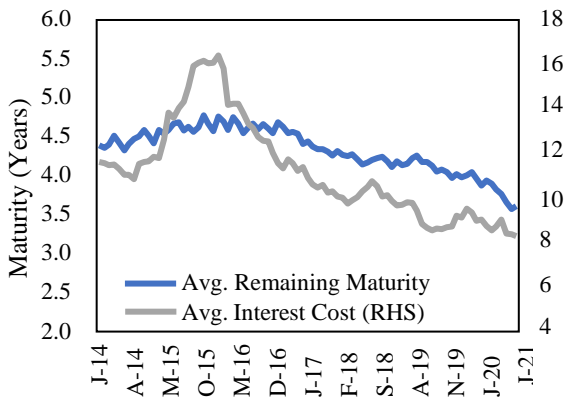


Source: investing.com

At the onset of the pandemic, during the second and third quarter of 2020, Brazil more than halved the average maturity of its federal public debt (FPD) issuances (Figure 11). This led to lower borrowing costs for the government due to the steepness of the yield curve, especially at shorter maturities. The average cost and remaining maturity of Brazil’s FPD stock had already been

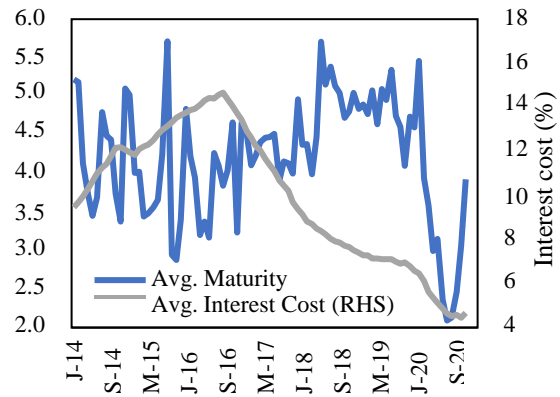
declining since early 2016, and the shortening of new issuances accelerated that trend (Figure 12). Evidently, the shortening of maturities and diminishing interest cost came at the price of increased annual gross financing needs (from additional amortizations) and increased exposure to an increase in interest rates or rollover risk, a point we will return to shortly.

Figure 11 – Avg. maturity and cost of FPD



Source: Brazil National Treasury

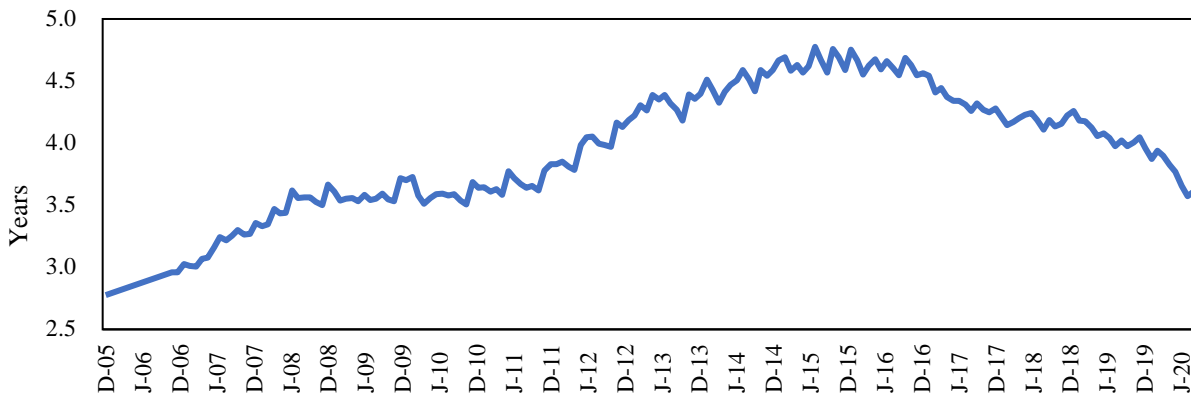
Figure 12 – Avg. maturity and cost of FPD issuances



Source: Brazil National Treasury

Despite the shortening of the average maturity of the FPD stock and new FPD issuances during the COVID crisis, the duration of the public debt is not unusually low from a historical perspective. As of January 2021, the average remaining duration of the entire stock (3.6 years), is the same as it was on average in the 2008-2012 period, as Figure 13 illustrates. While the Treasury did issue debt at a remarkably short average duration of 2.1 years in September 2020 (Figure 12), something Brazil had not seen in 15 years, the average duration of new FPD issuances quickly rose, and the overall duration of the debt stock did not fall beyond levels seen earlier this decade.

Figure 13 – Historical average remaining maturity of FPD



Source: Brazil National Treasury

6. Debt Dynamics in Theory and Practice⁷

Much of the traditional discussion on debt sustainability is grounded in a simple equation of motion, which we derive here. As a matter of definitions, if there are no government asset purchases, the debt in the current period is equal to the debt the previous period plus (1) the debt that was issued to pay for the interest on the stock and (2) the additional debt that was issued/(retired) by the primary deficit/(surplus). Mathematically, this is given by the following relation:

$$D_t = D_{t-1}(1 + r_t) - pb_t.$$

where D is the debt stock, r is the average interest rate on the debt stock, pb is the primary balance and the subscript t indicates the time period. We may also state, as a matter of accounting, that:

$$Y_t = Y_{t-1}(1 + g_t)$$

This equation merely states that output (Y) in one period is equal to output in the previous period multiplied by the growth rate of output between periods (g). If we divide these two definitions, one by the other, we obtain:

$$\frac{D_t}{Y_t} = \frac{D_{t-1}}{Y_{t-1}} \frac{1 + r_t}{1 + g_t} - \frac{pb_t}{Y_t}$$

This is the equation of motion that relates the ratio of debt to GDP in period t to the same ratio the previous period with three key parameters: the average interest rate on the debt stock, the growth rate of GDP and the primary fiscal balance.

The equation above does not mean that the debt can grow forever. In addition, governments are constrained by the fact that creditors will not allow government to roll over debt indefinitely and run a “Ponzi game.” Technically, this means that the present value of future debt as a percentage of GDP must converge to zero. By imposing this “no-Ponzi game” condition we get the intuitive result that the debt stock must be smaller than or equal to the present value of future primary surpluses. In other words, although a wide range of primary balance paths are allowed, the debt must be eventually paid down.

A second insight can be gleaned by imposing the condition that the debt stock remain constant between periods. Then, the primary balance path is constant and given by:

$$pb_t = D \frac{r_t - g_t}{1 + g_t}$$

Thus, in steady state, the difference between average interest on the debt stock and growth ($r - g$) determines whether the government must run primary fiscal surpluses or deficits to stabilize debt dynamics.

Recent discussions on debt sustainability in times of record low interest rates (e.g. Reis (2020)) highlight, among other things, that the present value of primary surpluses can be lower than the outstanding debt, that government can run perpetual deficits and that government can finance an

⁷ This sub-section is based on Blanchard (1990) and Chalk and Hemming (2000).

expansion of spending by collecting a bubble premium on the debt. Unfortunately for Brazil, those facts apply only to advanced economies, where r is less than g .

In Brazil, real borrowing costs on the GGGD have been higher than real GDP growth for all but one of the past 14 years where good data is available (see Table 1 below). Even before the historic 2015-16 recession, when the economy was in an expansionary period, the average real interest rate on the debt was larger than real GDP growth rate in 6 out of the 7 years. In short, in recent good times and bad, r has been greater than g .

Table 1 – r and g in Brazil, 2007-2020

Year	Average Real Interest Rate (r)	Real GDP Growth (g)	Interest Growth Difference ($r - g$)	Gross General Government Debt	Theoretical Stabilizing Primary Balance
2007	7.4%	6.1%	1.3%	56.7%	0.7%
2008	6.3%	5.1%	1.2%	56.0%	0.6%
2009	6.4%	-0.1%	6.5%	59.2%	3.9%
2010	4.5%	7.5%	-3.0%	51.8%	-1.4%
2011	6.0%	4.0%	2.0%	51.3%	1.0%
2012	4.3%	1.9%	2.3%	53.7%	1.2%
2013	4.8%	3.0%	1.8%	51.5%	0.9%
2014	4.6%	0.5%	4.1%	56.3%	2.3%
2015	1.7%	-3.6%	5.3%	65.5%	3.6%
2016	6.1%	-3.3%	9.4%	69.8%	6.8%
2017	7.7%	1.3%	6.4%	73.7%	4.7%
2018	4.7%	1.8%	2.9%	75.3%	2.1%
2019	3.1%	1.4%	1.7%	74.3%	1.3%
2020	0.4%	-4.1%	4.5%	89.2%	4.1%

Source: Brazil Central Bank, own calculations. Note: Avg. real interest rates on the GGGD debt stock are constructed by deflating their nominal cost by CPI inflation.

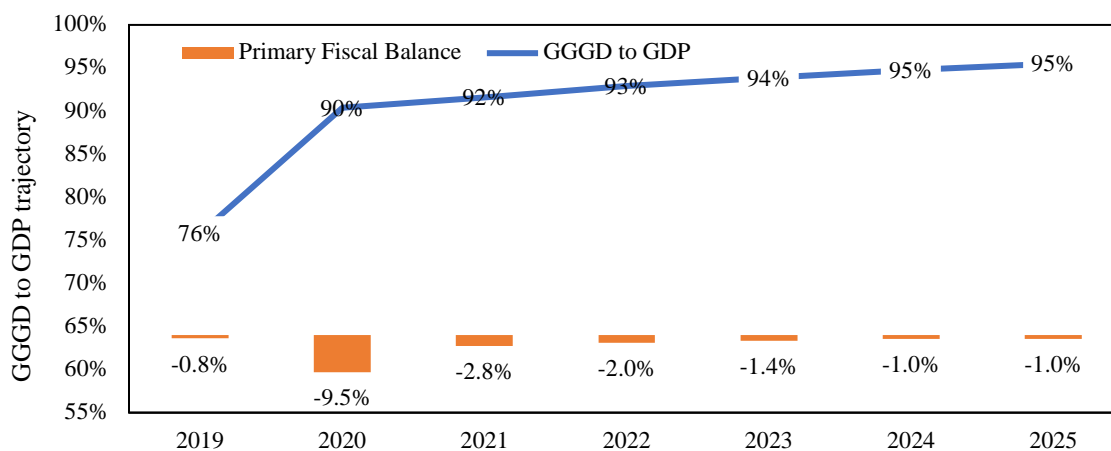
Given Brazil's relatively weak growth trajectory and historically high interest rates, it is reasonable to suppose that $r - g$ will remain positive (or at best near zero) for the foreseeable future, meaning the country will eventually need to run primary fiscal surpluses or at least a primary balance of zero to ensure debt sustainability. The country probably cannot afford to run large deficits for prolonged periods of time like advanced economies have in recent years.

7. Stylized Debt Sustainability Scenarios

The time-path of fiscal adjustment in the next few years will crucially determine debt dynamics. At one end of the spectrum of possibilities, epidemiological and economic developments in 2021 turn out to be favorable, notwithstanding rising cases, ICU occupancy rates and deaths in February and March 2021, greatly reducing the need for extraordinary COVID-related spending. In this possible world, the government can undertake a “rapid fiscal consolidation”, resuming relatively small primary deficits from 2021 onwards, as advertised in the Treasury’s investor presentations, and in adherence to the 2016 expenditure ceiling.

In this scenario⁸, GGGD to GDP rises from 90% of GDP in 2020 to around 95% of GDP by 2025 (Figure 14). With new debt being issued at an average duration just over 4 years, gross financing needs are 26% of GDP on average over the forecast period, a level that exposes the government to significant rollover risk (also known as refinancing risk). Rollover risk refers to the prospect that maturing debt may have to be rolled over at a higher interest cost or may not be able to be rolled over at all, causing interest expenses to rise rapidly in the case of the former or a debt crisis in the case of the latter. A recent example of very costly refinancing is from Argentina in 2018⁹, where the Central Bank had to issue Lebac instruments at a nominal rate of 40% to assure there would be market appetite to roll-over maturing short-term debts.

Figure 14 – Debt dynamics under “rapid fiscal consolidation”



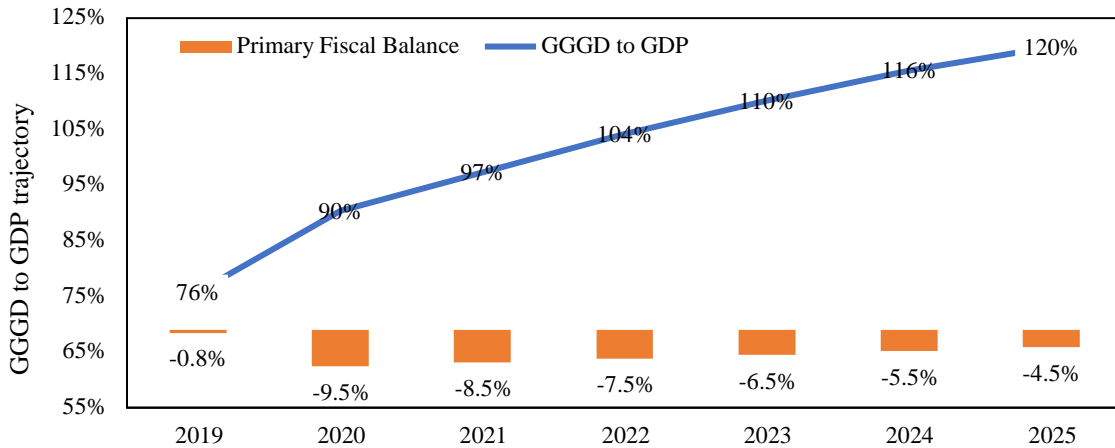
Source: Cental Bank, Tesouro Nacional, own calculations

⁸ The modeling takes the main macro-fiscal inputs from the *Investor Presentation* on the Federal Public debt and its appendices, dated February 2021. Real GDP growth is assumed to be 3.3% in 2021 and 2.5% thereafter. Inflation slows from 4.5% in 2020 to 3.3% in 2025. The exchange rate remains stable at roughly 5 R\$/US\$. Average internal borrowing rates are 5.8% nominal for the forecast period and 6.3% for external borrowing. The average duration of debt is constant at just over 4 years. The model does not endogenize changes in inflation, interest rates or the exchange rate from a deterioration in debt sustainability.

⁹ See Bloomberg news article ([here](#)) or Reuters note ([here](#))

At the other end of the spectrum, the health and economic effects of the pandemic are likely to persist for several years, necessitating large and continued extraordinary spending in the medium term. In this “limited fiscal consolidation” scenario, the debt to GDP ratio rises worryingly fast (Figure 15). And this is even without endogenizing the likely increase in real borrowing costs and the slowdown in growth that would occur relative to the baseline in the debt sustainability simulations, which would make the debt trajectory steeper. In this second scenario, which would be consistent with a *de facto* suspension of the 2016 expenditure ceiling, gross financing needs are 33% of GDP on average over the forecast period, peaking at 37% in 2025, a level that exposes the government to high rollover risk. The existence of the second scenario, now less likely with the automatic spending cuts approved in March 2021, might explain why markets are pricing fiscal and debt risks through the steepening of the yield curve.

Figure 15 – Debt dynamics under “limited fiscal consolidation”

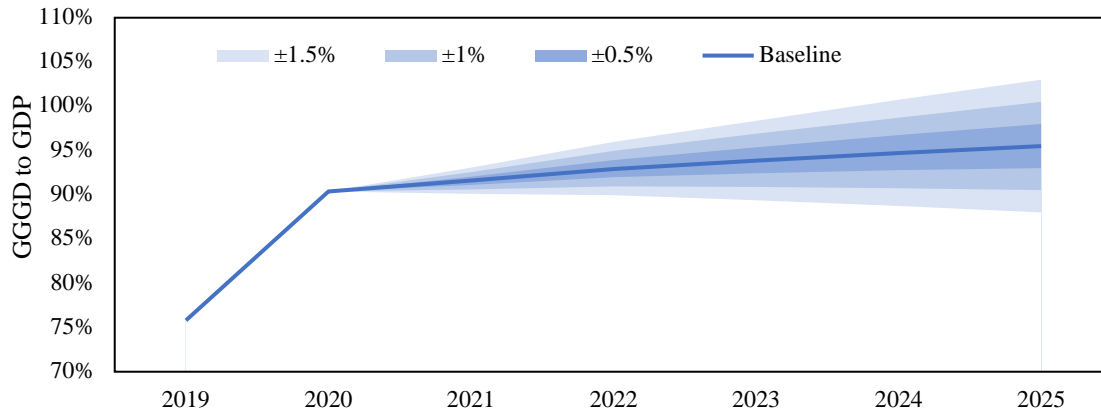


Source: Cental Bank, Tesouro Nacional, own calculations

8. Real Growth, Fiscal Balances and Real Interest Rates

Numerical simulations can shed some light on how sensitive Brazil’s debt trajectory is to changes in the key macro-fiscal parameters. All else equal, the “rapid fiscal consolidation” scenario discussed previously is highly sensitive to changes in the primary fiscal balance relative to the baseline outlined by the treasury in its January 2021 investor presentation, as illustrated by Figure 16. The fans in the fan chart assume that each year, the primary fiscal balance is plus/minus some amount from the baseline, so the effect cumulates over time. By 2025, primary fiscal balances that are 1% of GDP higher/(lower) than in the baseline “rapid fiscal consolidation” scenario yield a debt to GDP ratio that is approximately 5% of GDP lower/(higher). This simulation must be interpreted with some caution, as it does not account for the endogeneity that may exist between the fiscal balance trajectory and other key parameters, like growth, interest rates, and inflation.

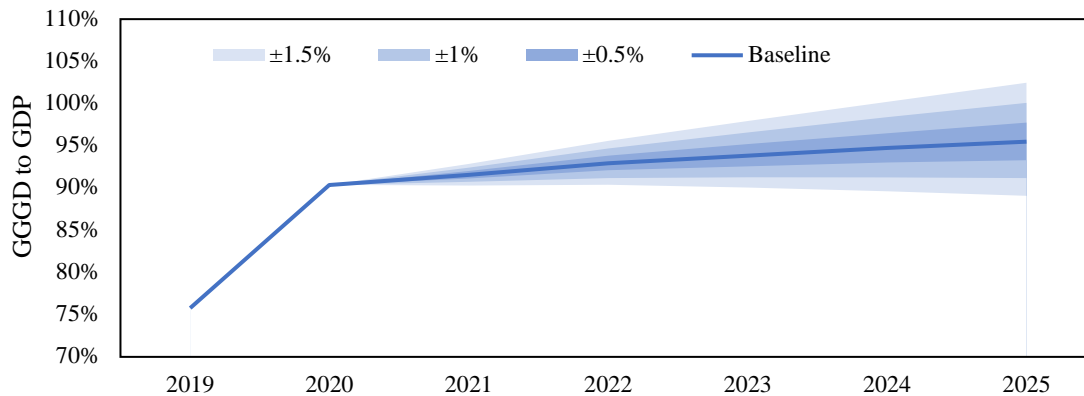
Figure 16 – Sensitivity of “rapid fiscal consolidation” to changes in the primary balance



Source: Cental Bank, Tesouro Nacional, own calculations

Likewise, the debt trajectory is highly sensitive to the real GDP growth rate. As Figure 17 shows, if the real growth rate of the economy accelerates/(decelerates) by 1% of GDP per year, the effect cumulates and by 2025, the debt to GDP ratio is 4.5% of GDP lower/(higher) than in the baseline “rapid fiscal consolidation” scenario. Again, this assumes other parameters are held constant.

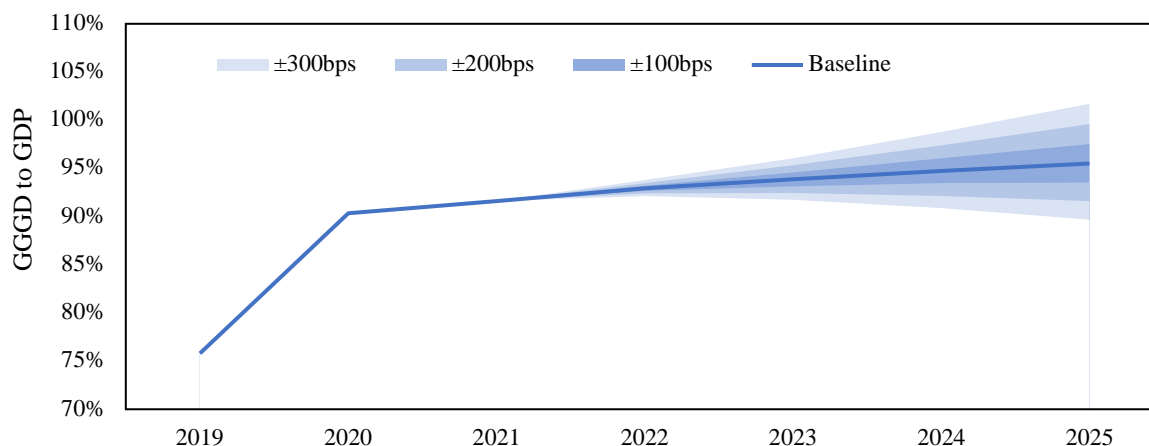
Figure 17 – Sensitivity of “rapid fiscal consolidation” to changes in real growth rate



Source: Cental Bank, Tesouro Nacional, own calculations

Last, the debt trajectory is also sensitive to changes in real interest rates, modeled here as changes in nominal interest rates without the corresponding movement in forecasted inflation. Holding everything else constant, if interest rates on new debt issuance were to move by 200 basis points throughout the forecast period, the debt to GDP in 2025 would end up approximately 2.7% of GDP higher or lower than in the baseline (Figure 18).

Figure 18 – Sensitivity of “rapid fiscal consolidation” to changes in real interest rates



Source: Cental Bank, Tesouro Nacional, own calculations

9. The Risk of Self-Fulfilling Panics

Debtors with a great deal of public debt which must be rolled over in short horizons leave themselves open to episodes of self-fulfilling pessimism. One early account, due to Sachs, emphasizes creditor coordination failures: if one creditor expects others will not rollover their debt, then the best response may be not to roll-over debt either, causing a liquidity crunch in government that leads to actual default. Another mechanism was first highlighted by Calvo (1988). When debt is in domestic currency, fear of inflation or devaluation will cause nominal interest rates to rise. But a government confronted with a very high nominal interest rate may be tempted to allow inflation to rise, because otherwise the ex-post real interest rate is too high. This mechanism, too, generates multiple equilibria.

Rodrik and Velasco (2000) explore the role of short-term debt in these panics in a framework where the cost and maturity of public debt is simultaneously determined in a small, open economy. The model highlights that panics may only occur if investors take on enough short-term debt. It also shows how the size of a potential run and its welfare consequences are proportional to the amount of short-term debt outstanding. Alesina *et al.* (1990) discuss the importance of these issues for Italy, a country that historically has had (and continues to have) a large public debt.

These results are important because the share of short-term debt in Brazil’s FPD stock has risen from a low of 14% in mid-2019 to 27% in January 2021, a share not seen since mid-2014, all while GGGD to GDP has risen from 56 to 89% of GDP. Likewise, the average maturity of the FPD stock has fallen from 4.7 years in mid-2016 to 3.6 years in January 2021. This raises the risk of a run, where creditors shift their expectations from optimism to pessimism and decline to roll over maturing debt. This can shift the economy to the bad equilibrium, causing serious fiscal strain.

This is not an outcome that is certain or pre-ordained, but there are reasons to remain vigilant about rollover risk in Brazil. The volume of short-term debt is at a record-high and the temptation to shorten maturities is strong given the investor appetite for short term debt and steepness of the yield curve (relatively inexpensive short-term debt, expensive long-term debt). In addition, the risk

of rising U.S. interest rates and local rates in Brazil (to control inflation and the exchange rate) may raise borrowing costs and again prompt a move toward more short-term debt.

There are also some reasons to remain optimistic about rollover risk in Brazil. Most of the holders of public are residents and domestic institutional actors. And as discussed previously, most of the debt is in local currency. The international experience suggests strongly that countries with large debts in domestic currency are much less exposed to rollover risk. The reason, of course, is that the local Central Bank can always serve as lender of last resort to the fiscal authority.

Although Brazil's constitution (Art. 164) forbids the central bank from financing the government directly or indirectly and only allows public security purchases on the secondary market for monetary policy purposes, if a crisis appeared imminent, the monetary authority could probably find ways to act as a lender of last resort (LLR). Such an action would likely avert or contain a debt and currency crisis at the cost of putting the central bank's directors in legal peril. As Robitaille (2011) notes, the "threat of legal action [against central bank authorities] continues to be taken seriously" as exemplified by the recent calls for legal protections for policymakers involved in purchasing private debt securities in debt markets as part of Brazil's QE program.¹⁰¹¹

10. Inflate Away the Debt?

The characteristics of Brazil's debt reduce both the potential for it to be inflated away and the attractiveness of the proposition for government. First, to the extent that an increase in the price level or growth rate mechanically reduces the real size of the government's liabilities, it also implies real losses for holders of local currency debt, most of which are residents of Brazil. Local financial institutions (mostly banks) hold around 30% of the FPD, domestic investment funds hold 25%, pensions hold 23%, insurance entities hold 4%, and government itself holds 4%, with the remainder being held by non-residents (9%) and "others" (5%). Thus, an inflationary debt haircut could have significant implications for the stability of the financial system, among other factors.

Second, the potential for inflation to reduce real debt service costs is limited. Since around two thirds of the debt stock is indexed, debt service costs on over half of the stock would rise with any increase in inflation. Still, government would see a temporary reduction on real interest expenditures on the fixed rate debt, with holders seeing a real reduction in interest income. In addition, if expected inflation were to rise, nominal interests and likely *ex ante* real interest cost of fixed rate debt would rise as market participants switched into indexed debt. Thus, the real interest savings from debt service for fixed-rate debt would diminish over a few years, as previously issued fixed rate debt was rolled over into indexed debt or more expensive fixed-rate debt.

Third, a large share of expenditures in Brazil is legally tied to inflation, meaning that the improvement to the fiscal balance from inflation is limited. Around half of the federal government's spending is on pensions, which by law must rise with the prior year's inflation rate. Similarly, around 20% of the federal budget is the public payroll, which includes pensions for

¹⁰ See Reuters news article covering the topic ([link](#))

¹¹ That said, Brazil has been moving towards more central bank independence recently. A new law (from February 2021) sets fixed four-year terms for the central bank president outside the political cycle and protects them from being fired over disagreements in monetary policy.

retired civil servants, which are also legally tied to inflation. Around 15% of the budget is health and education, which is also subject to minimum spending rules. Thus, the improvement in the fiscal balance resulting from inflation is limited in Brazil relative to countries whose government expenditures are not *de jure* linked to inflation.

In short, the potential for inflating the debt away is quite limited. An increase in inflation would mostly produce a one-off reduction in the real level of the government's debt stock, with proportional losses for the overwhelmingly domestic holders of the debt, would cause a relatively small real reduction in debt service costs that would fade over time as old, fixed rate debt is rolled over into new indexed debt, and would yield limited improvements in the fiscal balance due to the *de jure* and *de facto* links between budgetary expenditures and inflation.

11. A Doom Loop?

Inflating away the debt may be an unattractive proposition, but debt default and restructuring may pose even larger welfare costs. In aggregate, the financial system (including public and private, foreign, and domestic banks and BNDES) holds around R\$ 1.4 trillion (or 20% of GDP) in FPD securities as of Jan 2021. This amount is slightly smaller than the total capitalization (equity) of all depository institutions of R\$ 1.6 trillion (or 21%) of GDP for the same period. Thus, any haircut to the public sector's debt would have obvious and immediate implications for the solvency of banks (not to mention investment funds, pension companies and insurance companies).

If banks suffered losses from debt default and restructuring, that might require bailouts from the Federal Government, which would in turn increase the financial pressures on the government that debt default and restructuring sought to remediate in the first place. In this context, the cashflow relief from debt default could be significantly diminished by the liquidity pressures inherent in bailing out the financial system.

12. Conclusion

Brazil illustrates the point that despite low interest rates across the world, there are limits to debt and deficits in the post-COVID world. The country's local currency debt composition is a luxury few emerging markets enjoy, but the debt stock is comparatively very large, and much of it comes due in the relatively short term, resulting in high annual gross financing needs and high rollover risk. Brazil took important strides towards fiscal sustainability with the 2016 expenditure ceiling, the 2019 pension reform and the 2021 constitutional amendments, but the country's unusually steep yield curve reflects that in the medium term, significant fiscal policy risks remain.

For an emerging market, Brazil's share of tax revenue in GDP is already quite high so there is limited room to use taxation alone to address the emerging fiscal risks. Expenditure cuts face obvious political difficulties, especially given the country's level of inequality. Regardless of the path that Brazilian democracy chooses, two things are certain: action is needed, and Brazil would no doubt benefit from greater fiscal certainty and stability at this point in its history.

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