**MINISTRY OF FINANCE**
**MINISTER`s OFFICE**

## BRAZILIAN TREASURY TECHNICAL NOTE

# Estimated Trajectory of Brazilian General Government Gross Debt

Brasília, 07/29/2015

The evolution of the public debt is an important indicator of a country´s fiscal strength. In Brazil, one of the key parameters for the definition of the fiscal targets, especially the target for the primary balance of the consolidated non-financial public sector, is the public debt trajectory.

Recently, in conformity with the Fiscal Responsibility Law (Article 9), the Federal Government released the Primary Revenues and Expenditures Report as of May/June 2015, indicating the need for a change in the primary balance targets for the public sector established in 2015's Budgetary Guidelines Law (LDO). The targets were reduced to 0.15% of GDP in 2015 and to 0.7% of GDP in 2016. The reduction owed to the sharp drop in tax collection recorded in the first six months of 2015 resulting from the economic slowdown occurred in recent months and several domestic and international factors.

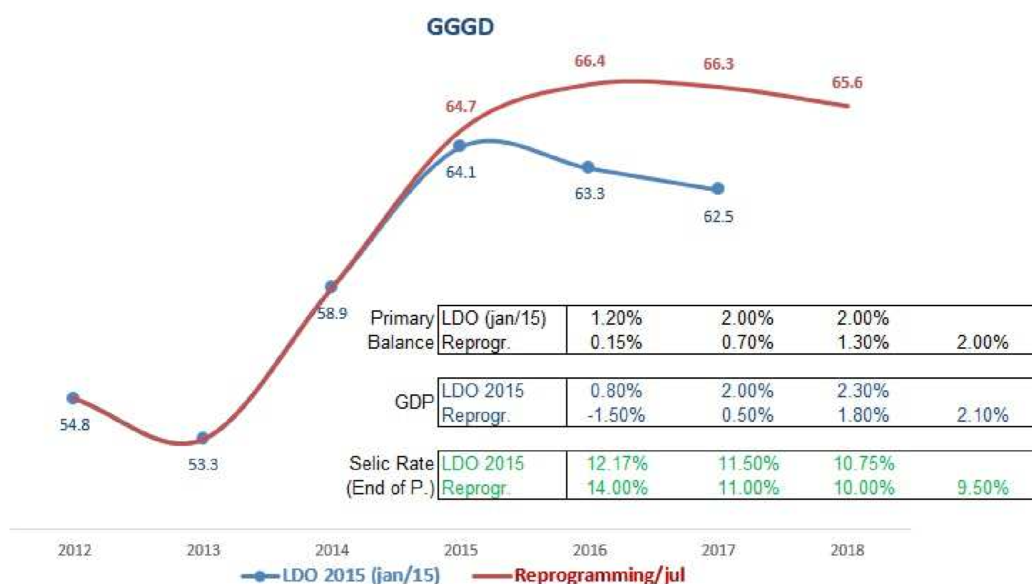
The aforementioned report also brought an estimate for the General Government Gross Debt (GGGD) trajectory calculated by Brazilian Central Bank. This estimation considered economic parameters indicated by the Ministry of Finance`s Economic Policy Secretariat (SPE) based on the Focus Market Survey published by the Central Bank. These parameters include, among others variables, expected GDP real growth, the exchange rate at the end of each year and the average interest rate (SELIC), all for the 2015 -2017 period (Table 1).

**Table 1 – Parameters used in the General Government Gross Debt Estimation – SPE/MoF**

| | | 2015 | 2016 | 2017 |
|---|---|---|---|---|
| SPE/MoF | **GDP** | -1.50% | 0.50% | 1.80% |
| | **Primary Balance** | 0.15% | 0.70% | 1.30% |
| | **Exchange Rate** | 3.2 | 3.37 | 3.4 |
| | **Selic (Average)** | 13.12% | 12.61% | 10.30% |
| | **Selic (Year End)** | 14.00% | 11.00% | 10.00% |

Based on these parameters, the evolution of the General Government Gross Debt--GGGD to GDP showed changes from the trajectory presented at the 2015's LDO. The ratio moved from 64.1% to 64.7% in 2015, from 63.3% to 66.4% in 2016, and from 62.5% to 66.3% in 2017. As a result from the reduction of the primary balance target for 2015 and 2016 and lower GDP growth in these years, the downward inflection point on the debt trajectory was pushed back a year, showing a small reduction from 2017.

**Figure 1 – General Government Gross Debt in the 2015 LDO and in the May-June Reprogramming Report**




Estimates of the gross debt may differ because of methodological reasons as well as of differences in the macroeconomic parameters used as inputs. It is worthy then to analyze the differences between the projections presented by the government and some published by the private sector, especially from the financial sector, following the publication of May-June's Reprogramming Report. In addition to comparing them with the Report´s estimates, we will compare them with the estimated paths resulting from using the National Treasury´s own model, when the macroeconomic parameters accompanying the private sector projections are

plugged in this model. The Treasury model is very similar and yields results very close to the one used by the Central Bank.

The comparisons carried out in that fashion indicate that most often the projections published by the private sector diverge from those shown in May-June's Report due mainly to differences in the parameters used. In fact, plugging those parameters that accompany the private sector projections in the Treasury model usually yielded results quite similar to those in the banks' original projections. In other cases, there was a clear methodological divergence, resulting in projections above or below those produced by National Treasury's methodology.

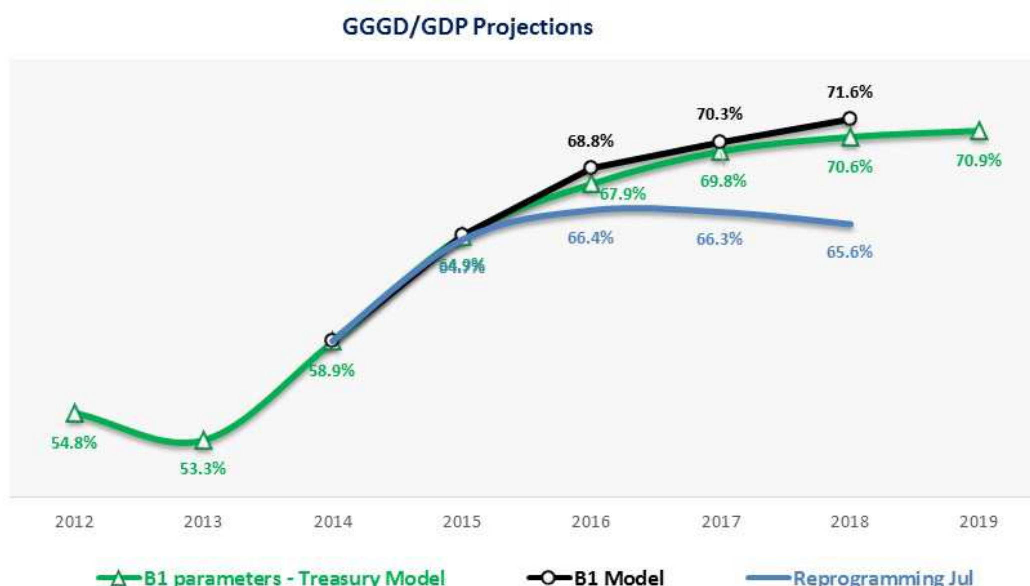
We will next discuss the projections made public by three different banks. Bank 1 projection, to start, points to a GGGD/GDP estimation far more adverse than the one presented in May-June Report, including an upward trend for this ratio until 2020. The parameters used by Bank 1 for growth, interest, exchange rates and primary balance values in the coming years were substantially more pessimistic than those found in the Government Report (Table 2).

**Table 2 – Parameters used in the General Government Gross Debt Estimation – Bank 1**

| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| SPE/MoF | GDP | -1.50% | 0.50% | 1.80% | | | |
| | Primary Balance | 0.15% | 0.70% | 1.30% | | | |
| | Exchange Rate | 3.2 | 3.37 | 3.4 | | | |
| | Selic (Average) | 13.12% | 12.61% | 10.30% | | | |
| | Selic (Year End) | 14.00% | 11.00% | 10.00% | | | |
| Bank 1 | GDP | -2.20% | -0.20% | 0.80% | 1.90% | 1.90% | 2.10% |
| | Primary Balance | 0.15% | 0.70% | 0.90% | 1.20% | 1.70% | 1.60% |
| | Exchange Rate | 3.20 | 3.50 | 3.56 | 3.56 | 3.62 | 3.75 |
| | Selic (Average) | 13.46% | 12.85% | 9.60% | 8.50% | 8.50% | 8.50% |

In view of the result from the Treasury model when the parameters used by Bank 1 are plugged in, it is clear that the difference between the trajectory published by Bank1 and the one in the May-June's Reprogramming Report is due to differences in parameters. It should be noted that Bank 1 projection, not only considers a much weaker GDP growth trend but also suggests a primary surplus trajectory well below that in the government report. The lower primary balances may be due to an assumption that no new measures towards fiscal will be adopted and its slow increase will be the result simply of higher GDP growth.

**Figure 2. Brazil General Government Gross Debt Projections – Reprogramming Report x Bank 1**




In any case, a projection for the gross debt approaching 70% demonstrates the need to keep pursuing fiscal consolidation measures, in order to ensure the gradual decline of this ratio towards 60% and below. This decline is essential, given that the 70% threshold is well above the debt/GDP ratio observed for developing countries with sovereign credit rating in the BBB + to A- notches. Such ratings would be compatible with an environment of lower long-term interest rates in Brazil.

The projection presented by Bank 2 (B2), another house with business in the Brazilian fixed income market, also features more pessimistic macroeconomic parameters than the Reprogramming Report, particularly by supposing an economic contraction in 2016, growth rate of 1.0% in 2017, and 2.0% in the following years.

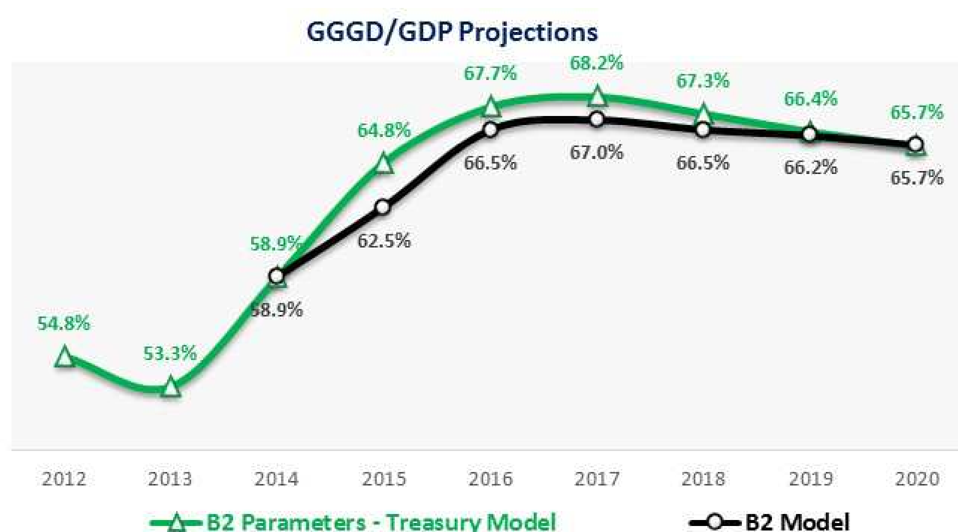
**Table 3 – Parameters used in the General Government Gross Debt Estimation – Bank 2**

| | | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|
| SPE/MoF | GDP | -1.50% | 0.50% | 1.80% | | | |
| | Primary Balance | 0.15% | 0.70% | 1.30% | | | |
| | Exchange Rate | 3.2 | 3.37 | 3.4 | | | |
| | Selic (Average) | 13.12% | 12.61% | 10.30% | | | |
| | Selic (Year End) | 14.00% | 11.00% | 10.00% | | | |
| Bank 2 | GDP | -2.40% | -0.50% | 1.00% | 2.00% | 2.00% | 2.00% |
| | Primary Balance | 0.10% | 0.70% | 1.30% | 2.00% | 2.00% | 2.00% |
| | Exchange Rate | 3.40 | 3.60 | 3.71 | 3.81 | 3.93 | 4.04 |
| | Selic (Average) | 13.60% | 14.60% | 12.0% | 11.50% | 11.50% | 11.50% |

In Bank 2 projections the GGGD/GDP ratio stabilizes at a relatively higher level. Applying the macroeconomic parameters presented by Bank 2 into the Treasury model, on the other hand, indicates a higher GGGD/GDP level in initial years followed by a gradual decrease in later years. This shows that a primary surplus of 2% of GDP tends to be enough, but necessary to induce such a decrease, even when GDP growth is more modest and interest rates higher than those projected by the May-June's Reprogramming Report.

The discrepancy between the figures presented by Bank 2 and those obtained by plugging their macroeconomic parameters to the Treasury model does not affect significantly the GGGD's overall risk assessment. However, these projections differ significantly from the one presented by Bank 1. This divergence stems from the premise used by Bank 1 that the primary surplus does not return to 2% of GDP in the period of analysis, and, therefore, the GGGD/GDP ratio maintains an upward trend. In the case of Bank 2, the forecast shows a decrease in the GGGD/GDP ratio, albeit modest, as of 2017.

**Figure 3. Brazil General Government Gross Debt Projections – Reprogramming Report x Bank 2**




Despite the relevance of having a primary target of at least 2% of GDP to drive the GGGD/GDP ratio into a downward trend, it is important to emphasize that the projection of the GGGD/GDP in Brazil contains some degree of complexity related to the diversity of liabilities (and costs associated) that compose the debt. Therefore, the use of simple analytical models to project the GGGD/GDP evolution may produce results that do not fully capture the actual dynamics of the ratio.

A forecast recently disclosed by yet another bank (Bank 3), based on a simplified analytical model, presents a different trajectory for the GGGD, even though this bank assumes a primary surplus of 2% of GDP in later years and an economic growth above 2% per year (see table 4).

**Table 4 – Parameters used in the General Government Gross Debt Estimation – Bank 3**

| | | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| SPE/MoF | GDP | -1.50% | 0.50% | 1.80% | | |
| | Primary Balance | 0.15% | 0.70% | 1.30% | | |
| | Exchange Rate | 3.2 | 3.37 | 3.4 | | |
| | Selic (Average) | 13.12% | 12.61% | 10.30% | | |
| | Selic (Year End) | 14.00% | 11.00% | 10.00% | | |
| Bank 3 | GDP | -2.00% | -0.10% | 2.00% | 2.20% | 2.20% |
| | Primary | 0.10% | 0.50% | 1.30% | 2.00% | 2.00% |
| | Exchange Rate | 3.40 | 3.60 | 3.71 | 3.81 | 3.93 |
| | Selic (Average) | 13.70% | 13.31% | 11.13% | 10.50% | 10.50% |

The debt projection obtained by the simplified analytical model[1] suggests a continuous increase in the GGGD/GDP ratio, despite the recovery of the primary surplus. Nevertheless, inserting their macroeconomic parameters to Treasury's model indicates, once again, a downward trend in the GGGD/GDP ratio as the primary surplus approaches 2% of GDP. Moreover, the application of the macroeconomic parameters used by Bank 3 to the Treasury model provides a debt trajectory very close to the one presented by the May-June Reprogramming Report, with a stable debt that begins to decline as of 2017.

[1] The common analytical derivation adopts an equation like the following: $d(t) = \frac{\left(\frac{r(t)-g(t)}{100}\right)}{\left(\frac{1+g(t)}{100}\right)} * d(t-1) - p(t)$ , where p(t) is the primary balance to GDP, g(t) is the real GDP growth rate, d(t) is the GGGD/GDP ratio and r(t) is the real interest rates.

**Figure 4. Brazil General Government Gross Debt Projections – Reprogramming Report x Bank 3**

The set of forecasts explored so far indicate, in different ways, the importance of raising back the primary surplus target. By doing this, the risks of the GGGD/GDP ratio reaching levels close to 70% are greatly reduced, even when GDP growth is modest. The projections also suggest that a primary surplus target of 2% of GDP or higher could drive the GGGD/GDP ratio towards 60% in scenarios of modest economic growth, or towards lower levels in a scenario of stronger recovery. In this environment, the Brazilian public debt returns faster to a trend that supports a persistent decrease in long-term interest rates, more investment and a rise in employment and labor income.

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