

Analysis of Brazilian National Treasury Primary Auctions in the 2000s: an MMT interpretation

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1. Introduction

There are many factors to consider when discussing the impact of the stock of domestic public debt on long-term interest rates and the government's ability to issue obligations at said rates. Primary factors include the stock of debt relative to GDP, as it is argued that large stocks of government domestic debt relative to GDP cause market participants to distrust the government's ability to honor future payments, which in turn exerts upward pressure on the interest rate and provides difficulties for the Government to finance itself.

In this view, investors in public bonds would have bargaining power to "reject" some types of bonds and/or to "accept" buying them only at high interest rates. They would be "bond vigilantes" that could cause difficulties in rolling-over the debt and pressure interest rates to move higher. This "vigilance" would be reinforced by the International Rating Agencies, whose downgrades would increase the pressure of debt costs and, in the worst-case scenario, cause a flight of capital, especially in the case of a loss of an investment grade rating.

This paper aims to analyze if these arguments can sufficiently describe Brazil's experience in the 2000s, through an examination of the results of the Brazilian National Treasury primary auctions. It will be analyzed if there is evidence of an impact of the size of the stock of Brazilian Domestic Public debt in the costs and volume of new issues by the Brazilian National Treasury auctions. In regards to downgrades of international agencies, we will exam if they exerted strong and persistent impacts in the auctions in terms of volume, type of bonds and interest rates. Finally, we will briefly exam repurchase ("repo") operations of the Brazilian Central Bank, looking for evidence of the coordination between BNT and BCB, which always maintains the interest rate target and drains the liquidity generated by Treasury operations.

In order to arrive at the conclusion provided above, the paper is divided into four sections. Section 2 discusses the theoretical framework of the current analysis, based on the Functional Finance approach and Modern Monetary Theory. Section 3 presents the results of the Brazilian National Treasury auctions, including a focused examination within the period of downgrades by international

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rating agencies and this relationship with the repo operations by Brazilian Central Bank. Section 4 concludes the analysis.

2. Theoretical framework

The theoretical framework of this paper is based upon the Functional Finance approach and Modern Monetary Theory (MMT). MMT was originally inspired by Smith, Knapp, as well as Keynes, and with respect to fiscal issues is inspired by the work of Abba Lerner. The approach is also strongly enriched by the contributions of Godley, Mosler and Minsky. The theory seeks to show the validity of the analytical framework of functional finance in contemporary economics, looking at the elements of modern monetary systems. Two theoretical premises are relevant to our current analysis: i) the interest rate is exogenous and fixed by the Monetary Authority; ii) The State cannot default on its obligations denominated in its own currency.

The first premise maintains that the interest rate is exogenously determined by the Central Bank as a policy variable and implies there is no process of market-clearing. The stock of money adjusts to the given exogenous interest rate, resulting in the endogeneity of money. This means that the volume of credit lent by banks has the counterpart of the creation of demand deposits, which, in turn, determine the volume of bank reserves. Given the exogenous interest rate, the government adjusts the monetary base by selling and buying bonds, that is, it controls the reserves in the banking system in order to maintain the target interest rate.

The exogeneity of the interest rate also applies, to a large extent, in the long run, since in the real world the long rate tends to be a function of the expectation of the short rate in the future. In this way, the government can influence long-term interest rates, among others, giving clear indications of the direction in which it will fix short-term rates in the future.

The second premise, that a government that issues domestic debt in its domestic currency will never default is related to the fact that the government spends by crediting private bank accounts thereby adding reserves into the banking system, which suggests there is no need for the government to finance its spending by the private sector, as it has been extensively defended by MMT (Wray 1998, 2010, Wray 2015, Bell 2000, Rezende 2009). Since the Central Bank can always buy public bonds in the secondary market, and must do so in order to maintain the interest rate target, also means that public bonds in the local currency are highly liquid, and therefore will always be an asset desired by investors to incorporate into their portfolio.

From a macroeconomic and monetary perspective, Governments that issue its own currency, unlike households, do not need previously acquired receipts in order to spend, in the form of taxes or the sale of bonds, because those expenditures are made by keystrokes that credit reserves in the

commercial banks accounts of the system, and governments can always afford larger keystrokes. Actually, the result of government spending is private savings:

“Government deficit spending creates nongovernment sector saving in the form of domestic currency (cash, reserves and Treasuries). This is because government deficits necessarily mean the government has credited more accounts through its spending than it debited through taxes”. (Wray, 2015, p. 110).

In this sense, a sovereign currency-issuing government never needs taxation or the issuance of bonds before undertaking any level of expenditure. Indeed, on a daily basis, government expenditure doesn't match receipts from taxes, and the primary fiscal results are not known until the end of the fiscal year.

As deficit spending means that banks have more reserves, and the government can always make larger keystrokes, there is nothing such as “bond vigilantes” that could refuse to “accept to finance” a sovereign government, pressuring for higher interest rates or forcing it to default. If the market investors do not want to buy public bonds at the rate the government is willing to pay, the government can make the keystrokes and “just leave the reserves in the banks instead” (Wray 2015, p. 110).

In other words, a reaction by the market against budget deficits or increasing the levels of debt to GDP – meaning that they don't buy bonds in Treasury Auctions – doesn't force the government to borrow at higher interest rates, as it has always the option to not sell the bonds. Note, however, that it is unlikely that banks would prefer to hold reserves earning zero percent interest rates than buying public bonds and earning the rate at which the Treasury is willing to accept. And if that happens, the government will be paying less in interest expenses, rather than higher.

“Refusing to “roll over” maturing bonds simply means that banks taken globally will have more reserves (credits at the issuing government's central bank) and less bonds. Selling bonds that have not yet matured simply shifts reserves about – from the buyer to the seller.(...) Neither of these activities will force the hand of the issuing government; there is no pressure on it to offer higher interest rates to try to find buyers of its bonds. From the perspective of government, it is perfectly sensible to let banks hold more reserves while issuing fewer bonds.” (Wray 2015, p 120).

As a consequence, the government will always be able to pay for goods, services, and its maturing debt denominated in its own currency, and therefore, there is no risk of default in sovereign debt.

Rezende (2009) explains the operational process of government spending in Brazil, arguing that the Brazilian Fiscal Responsibility Law imposes a considerable amount of “borrowing” limits and other constraints, but they are all self-imposed, as it is “meaningless to discuss debt or fiscal sustainability and federal government solvency (...) The federal budget deficits do not burden either

the government or taxpayers; rather federal government deficits allow the non-government sector to net save in the form of the government's IOUs." (Rezende 2009, p. 94-95)³.

Considering the above process, public debt issuance is related to the management of interest rates as well as portfolio allocation decisions, and not of the need for the government to finance itself. Public debt issuance is not a necessary form of financing, just as tax financing is not. Public debt issuance occurs to reduce the liquidity generated by public spending and refers to the need to bring the interest rate to the level desired by monetary policy since the increase in reserves in the financial system tends to generate a downward pressure on interest rate. In this case, the Treasury leaves the banks with more reserves; therefore, the Central Bank will have to conduct repo operations in order to drain these reserves and maintain its target rate of interest.

From the macroeconomic point of view, the Government should use fiscal policy and public debt denominated in its local currency to maintain a level of spending that manages the demand corresponding to the level of full employment and the maximum use of its productive resources. Controlling demand inflation and maintaining full employment should be the ultimate goals of the government, and if there is a public deficit for this to be achieved, this is only a result. Given the multiplier effects of spending on economic growth, the public deficit and the size of the debt become endogenous and play a subsidiary role in the analysis.

Thus, based on the fundamentals of Functional Finance and MMT, the government should prevent inflation and control aggregate spending to avoid insufficient effective demand. These should be the main goals of the government, which should have its fiscal instruments to achieve them, without the need to follow any principle of a balanced budget and sound finance. If the fiscal program to prevent demand inflation and unemployment results in a higher level of expenditure than the collection of taxes, a public deficit must be incurred. Finances must be "functional" in the sense that spending must be functional to reach the full employment of economic resources.

In the perspective of periphery countries, however, it can be argued that there are some constraints for functional finance, which are related to external restrictions on the Balance of Payments, and the volatility of international capital flows as well as the exchange rate. These factors can diminish the space for the use of fiscal policy to increase demand and, indeed, are within the purview of MMT.

First, MMT always claim that a country can incur a current account deficit *as long as* other countries want to accumulate or retain its IOUs. Therefore, in the case of periphery countries, if multipliers effects of the government spending in local currency result in pressure for importing goods

³ IOU is an expression used by MMT that means "I owe you".

by the private sector (the “traditional” external constraint of developing countries), the limits are related to the amount of IOUs desired by other countries.

“If there is no foreign demand for domestic IOUs (government currency or bonds, as well as private financial assets) issued in the currency of a developing nation, then its foreign trade becomes something close to barter: it can obtain foreign produce to the extent that it can sell something abroad. This could include domestic real assets (real capital or real estate) or, more likely, produced goods and services (perhaps commodities, for example). It could either run a balanced current account (in which case revenues from its exports are available to finance its imports), or its current account deficit could be matched by foreign direct investment.” (Wray 2015, p. 124).

Besides, it is highlighted by the authors that a sovereign government can always afford to buy goods and services that are sold *in its own currency*, and recognizes issues concerning periphery currencies:

“Most nations fall between two extremes of “special” nations that issue reserve currencies (US, UK, Japan, European Monetary Union, Canada Australia) and developing nations that face a situation where no one outside their nation wants their currency. The “in-between” nations find some external demand for assets denominated in their currency, which allows them to run current account deficits balanced by capital account surpluses. The governments of these “in-betweeners” can issue their own currency to buy anything for sale in their own currency (i.e. domestic output) plus things for sale in other currencies by exchanging their currency for foreign currency – which, again, will depend on external demand for assets denominated in their currency. Are they more constrained than the “special” nations that issue reserve currencies? Yes.” (Wray 2015, p. 125).

Finally, the volatility of international capital flows is recognized and capital control is purposed as “an alternative method of protecting an exchange rate while pursuing domestic policy independence.” (Wray 2015, p. 146). And referring to developing countries:

“They can increase policy space either through policies that generate foreign currency reserves (including development that increases exports), or they can protect foreign currency reserves through capital controls.” (Wray 2015, p. 127)

There are some critics, though, that argue that those factors, with respect to developing economies, are stronger than postulated by MMT and that, as a consequence of the international hierarchy of currencies, developing countries don’t have a choice to strongly rely on its fiscal policy and its domestic public debt to manage the level of aggregate demand. Fiscal policy should signalize the guarantee of debt-payments for investors, including foreigners, through the maintenance of a balanced budget and/or debt to GDP ratios under a non-increasing path, while monetary policy has to maintain high interest rates to prevent exchange rate volatility and devaluation (that leads to inflation). The autonomy of domestic policy, in this sense, is lost (Vergnhanini & Conti 2017, Palley, 2014, Vernengo & Caldentey 2019).

Our argument here is that MMT does recognize external constraints in developing countries as highlighted in the quotes above (and these are only a few examples). Secondly, we agree that not being a reserve currency country, such as the USA, implies submission to the international flow of capitals and that a crisis of Balance of Payments is certainly dangerous for any country. We also agree that pressures to devalue exchange rate leads to inflation and harm workers due to lower real wages.

However, our argument is that capital flows do not respond directly (and in that strength) to unbalanced budgets or increasing outstanding debt to GDP in a local currency. An expansive fiscal policy can stimulate aggregate demand and generate pressure on the Balance of Payments through multiplier effects that would lead to increases in imports, and current account deficits. But in normal times, this impact *does not* cause a crisis of Balance of Payments. Developing countries are subject to the flows of capital within international financial markets, such as an the increase of the prime rate by Federal Reserve that tends to attract capital towards US Treasuries, and capital controls should be used to diminish the vulnerability of speculative capital flows. In this sense, developing countries do lose minor degrees of autonomy of domestic policy, since it might be difficult to counter exchange rate devaluations that lead to inflation and real wage losses. But we advocate, firstly, that MMT recognize this aspects and, secondly, that, if countries do not rely on external debt issued in another currency and use policies to tackle external restriction (such as accumulation of international reserves and stimulating innovation), the space for fiscal policy is higher and should be used to pursue full employment and ameliorate the gaps that put ourselves in a peripheral condition. If there is no threat of a crisis in the Balance of Payments, which is the current case of Brazil, there is no need for austerity and there is no “threat” for the National Treasury to spend in order to achieve social and economic development, and therefore mitigate the external restriction condition.

In the next two sections we will examine the results of the Brazilian National Treasury to provide evidence that the MMT framework helps to understand there is space for these goals to be achieved.

3. Auctions of Brazilian National Treasury in the 2000s

In this section, we aim to show how the Brazilian National Treasury has been able to successfully sell bonds and has not been “threatened” by any supposed bargaining power of the market, in the period analyzed. On the contrary, there is no evidence of “bond vigilantes”. Also, downgrades of international agencies *did not* cause a persistent pressure on the rates registered on the auctions nor a persistent change in the amount of bonds sold to the market. It will be argued that the market doesn’t “reject” Brazilian Treasury offers, on the contrary, it is the Treasury who has bargaining power to reject the market offers at rates the Treasury does not want to pay. If the Treasury

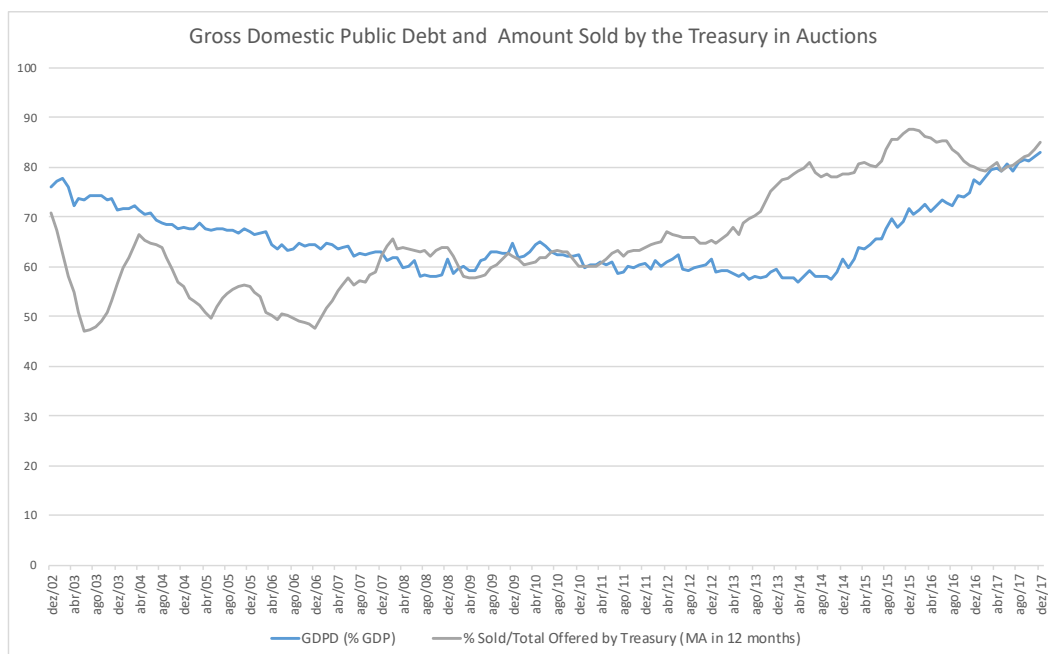
doesn't sell bonds in the auctions, we will show evidence that the Brazilian Central Bank (BCB) drains the excess reserves in the secondary market by repo operations in order to maintain its interest rate target.

The present analysis is focused in the auctions where the Brazilian National Treasury (BNT) sells bonds to the market (in opposition to the ones which it buys bonds, the purchase auction), in a competitive way. The BNT announces the volume it is going to offer and the dealers offer the price they are willing to pay. We are also only analyzing domestic public debt in local currency – the Real.

3.1. General performance of the BTN Auctions

To begin with, despite the increasing stock of public debt to GDP since 2014, the amount of bonds sold, in relation to the total amount offered by the Treasury in the auctions, has increased. This means that there is no “distrust” or “rejection” of the market to buy Brazilian domestic public bonds in Reais due to the increasing stock of the debt. Actually, as shown in graph 1 below, the percental sold in relation to the total offered by the Treasury, which could be a proxy of the level of the “acceptance” by the market, increased in 2014-15, when the debt/GDP was also increasing. And it is higher than the level in 2003-06, when the debt/GDP was decreasing. It doesn't seem that an increasing stock of the debt makes the market distrust the Treasury and not buy its bonds.

Graph 1

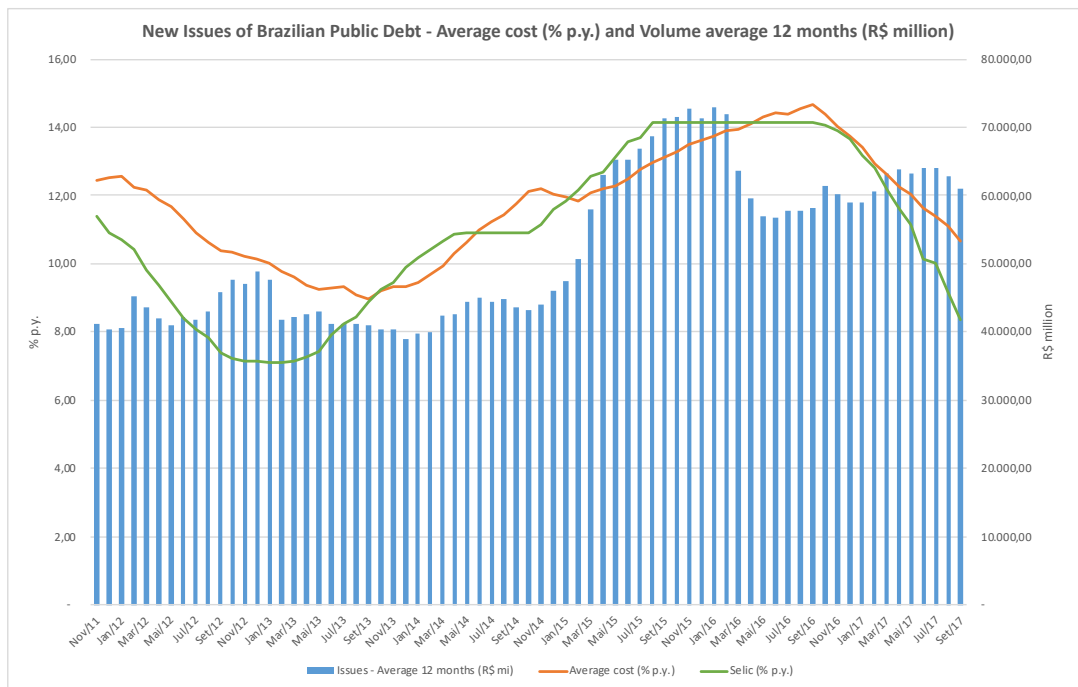


Source: Brazilian National Treasury and Brazilian Central Bank.

The next graph also shows, that despite the increasing stock of the domestic debt in relation to GDP from 2014, the BTN could increase the volume of new issues, and with an average cost that

follows the target rate of the BCB, the Selic. Actually, despite the increasing stock of debt to GDP, its cost decreased from 2016, along with Selic. Therefore, the argument that an increasing size of the debt stock creates pressure for “risk premium” or hamper the ability to sell bonds doesn't fit the data.

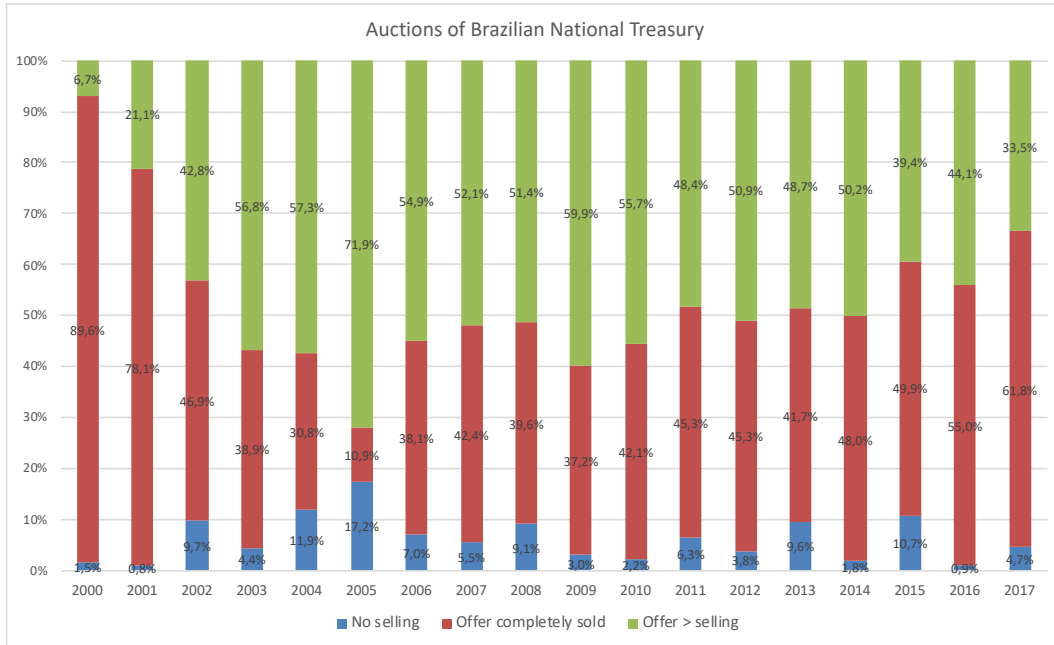
Graph 2



Source: Brazilian National Treasury and Brazilian Central Bank.

Reinforcing the argument that the Treasury is not “captured” by the market, we can see, in the graph 3, that auctions in which the Treasury doesn't sell any bonds corresponds to the smallest share through the whole period of analysis, from 2000 to 2017. Instead of a “rejection” by the market, we could argue that it was the Treasury who rejected market offers and denied to sell bonds by the prices offered by the market. It should also be noted that the share of auctions in which the Treasury sold all the bonds it offered were relatively high, more than 45%, for the majority of the time. Therefore, there seem to be no difficulty in selling bonds by the Treasury, nor evidence of “bond vigilantes”.

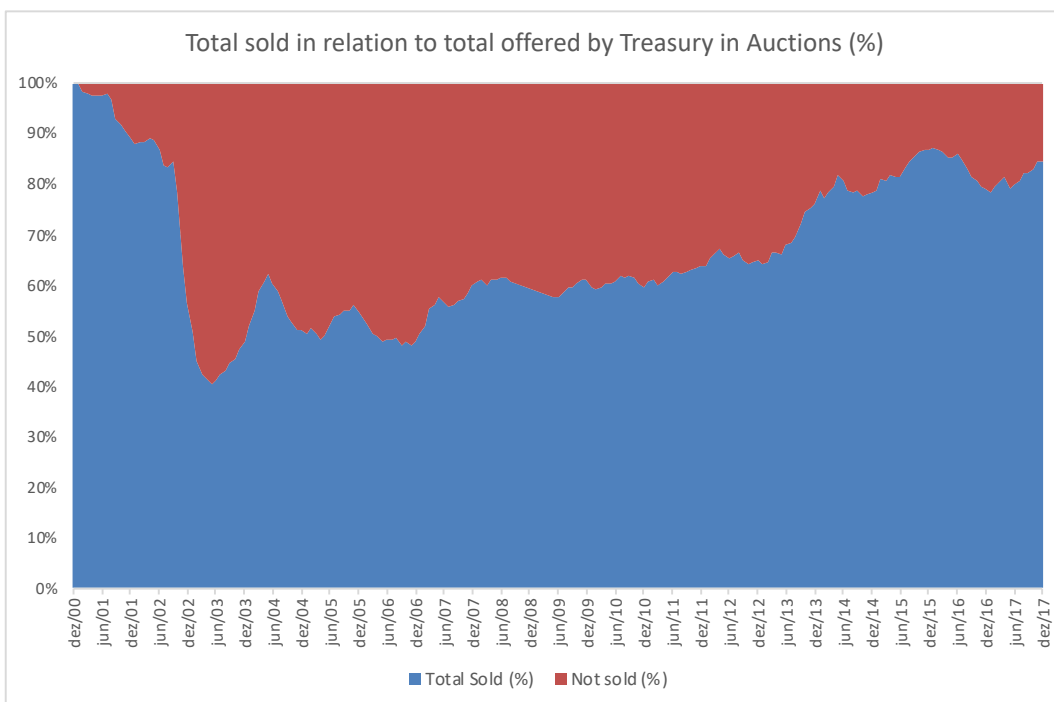
Graph 3



Source: Brazilian National Treasury and Brazilian Central Bank.

If we exam the amount sold in relation to the amount offered by the Treasury (detailing the green bars of graph 3), the results reinforce the previous argument. There is a pattern of an increase since 2005, that is, the market has been buying increasing amounts of bonds offered by the Treasury. And this is occurring despite the increasing stock of debt to GDP, as shown before. Again, there is no signal of difficulty of selling bonds by the Brazilian National Treasury.

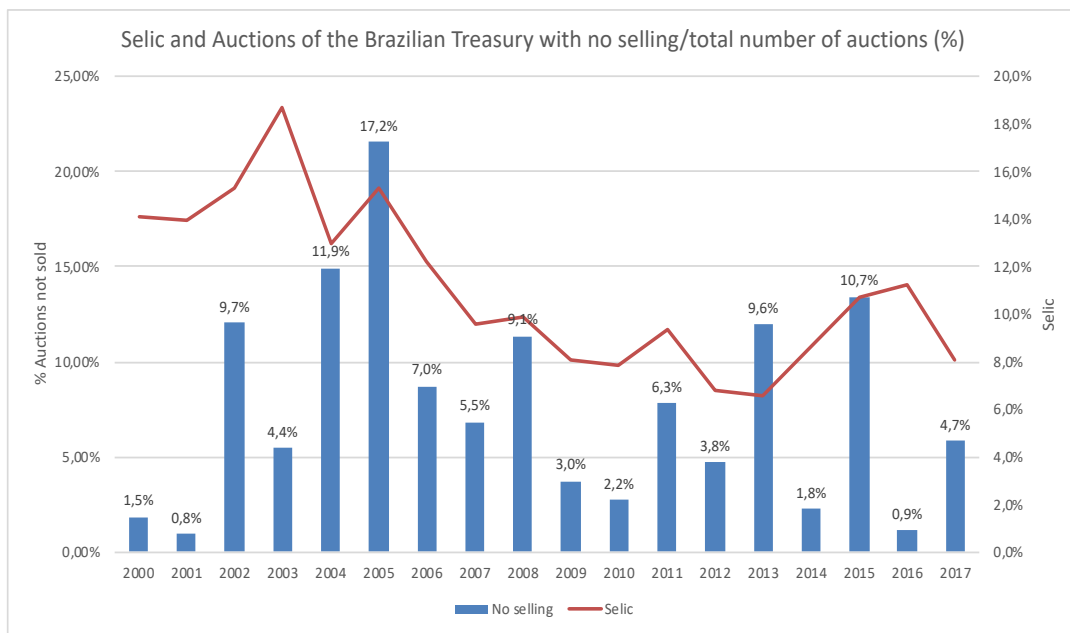
Graph 4



Source: Brazilian National Treasury.

In addition, if we analyze the auctions with zero selling, the percentage in relation to the total number of auctions is mainly less than 10% in the period of analysis (graph 5). The highest levels occurred in times of greater uncertainty and political instability, such as 2002 (Lula's election), 2008 (international financial crisis), 2013 and 2015 (domestic political crisis). A relation with the interest rate is evident, since the Selic showed an upward trend in those years, which may indicate two possibilities: agents might prefer to wait to buy bonds in future auctions, when the interest rates are expected to be higher, or, the Treasury refused to pay premiums required by the agents (which might be high in regard to the expectation of an interest trajectory rise). This was most likely the case in 2004 and 2005.

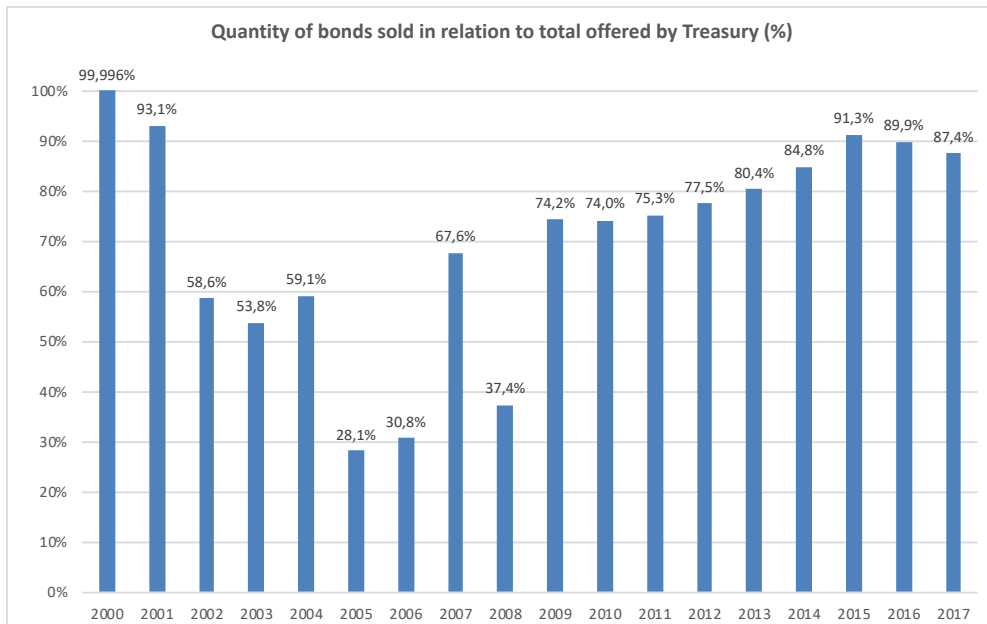
Graph 5



Source: Brazilian National Treasury and Brazilian Central Bank.

Finally, the quantity of bonds sold in relation to the total offered, suggests the same results as seen above. Between 2009 and 2012, the market bought, on average, 75,25% of public bonds offered by the Treasury. This number increased to 86,76% between 2013 and 2017. The smallest numbers were in the same unstable periods pointed out before.

Graph 6



Source: Brazilian National Treasury and Brazilian Central Bank.

3.2. Impact of downgrades on the Brazilian National Treasury Auctions

Firstly, to facilitate the analysis, and adopting a methodology similar to Canuto & Fonseca dos Santos (2003), we assigned a scale from zero to ten to the agency's notes, as shown in table 1. It is worth noting that the three agencies do not follow the same standard of classification, but the grades are comparable. It should also be noted that a downgrade occurs when the agency decreases the rating, and a downgrade with loss of "investment grade" occurs when the rating falls below "BBB-" or "Baa3". The loss of investment grade should have a more significant impact because the rules of pension funds do not allow them to invest in assets of countries without this rating.

Table 1

Ratings of International Agencies				
	Moody's	S&P	Fitch	Scale
Investment Grade	Aaa	AAA	AAA	10
	Aa1	AA+	AA+	9,5
	Aa2	AA	AA	9
	Aa3	AA-	AA-	8,5
	A1	A+	A+	8
	A2	A	A	7,5
	A3	A-	A-	7
	Baa1	BBB+	BBB+	6,5
	Baa2	BBB	BBB	6
	Baa3	BBB-	BBB-	5,5
Non-investment grade	Ba1	BB+	BB+	5
	Ba2	BB	BB	4,5
	Ba3	BB-	BB-	4
	B1	B+	B+	3,5
	B2	B	B	3
	B3	B-	B-	2,5
	Caa1	CCC+	CCC+	2
	Caa2	CCC	CCC	1,5
	Caa3	CCC-	CCC-	1
	Ca	CC	CC	0

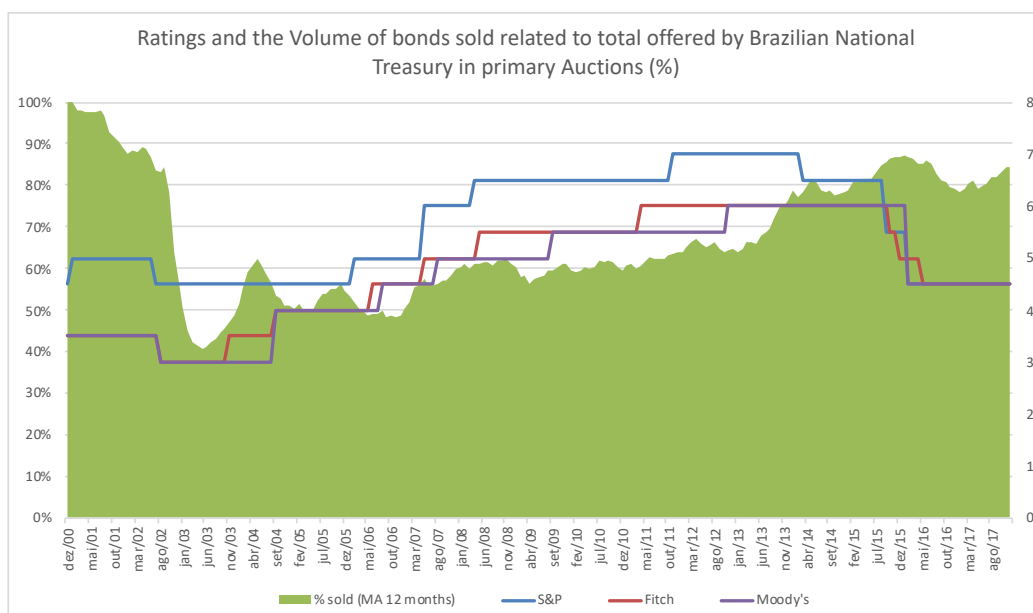
In Brazil, there was a loss of “investment grade” in assets denominated in local currency at the end of 2015 and early 2016, a movement initiated by Standard & Poor's and followed by Fitch and Moody's.

Table 2

Downgrades for long term-debt					
Period	Agency	Foreign Currency	Local currency	Action	Embi+
20/jun/02	Fitch	B+	-	Downgrade, negative perspective	1.593
21/jul/02	Standard & Poor's	B+	BB	Downgrade, negative perspective	1.619
21/ago/02	Moody's	B2	B2	Downgrade, stable perspective	1.877
21/out/02	Fitch	B	B	Downgrade, negative perspective	1.988
21/mar/14	Standard & Poor's	BBB-	BBB+	Downgrade, review of perspective to stable	234
11/ago/15	Moody's	Baa3	Baa2	Downgrade, review of perspective to stable	342
09/set/15	Standard & Poor's	BB+	BBB-	Downgrade, review of perspective to negative	363
15/out/15	Fitch	BBB-	BBB-	Downgrade, negative perspective	408
16/dez/15	Fitch	BB+	BB+	Downgrade with Loss of "investment grade"	499
17/fev/16	Standard & Poor's	BB	BB	Downgrade with Loss of "investment grade"	535
24/fev/16	Moody's	Ba2	Ba2	Downgrade with Loss of "investment grade"	506
05/mai/16	Fitch	BB	BB	Downgrade, negative perspective	397
11/jan/18	Standard & Poor's	BB-	BB-	Downgrade, review of perspective to stable	223
23/fev/18	Fitch	BB-	BB-	Downgrade, review of perspective to stable	236

As can be seen in Graph 7, the volume of bonds sold by BNT has not been affected persistently after downgrades by rating agencies. The most critical year was 2002, with a significant decrease in the volume sold (compared to the volume offered), due to the strong instability in financial markets associated to President Lula’s election, with reflections in exchange rates and long term interest rates. Also, monetary policy fixed an abnormal low level for the interest rate target and adopted strategies that added unnecessary instability to financial market, such as the anticipation of the mark-to-market value of investment fund shares. Even though, the effect was not persistent, the volume sold by the BTN increased months later, in March of 2003.

Graph 7



Source: Brazilian National Treasury.

Besides 2002, there was a decrease in the amount sold by BNT in late 2015 and early 2016, when the downgrade was accompanied by a loss of the "investment grade" rating. We will exam these periods in more detail. We will first analyze issues per type of bond and maturity, then external capital flows and foreign holdings of public bonds, and finally, the interest rates in the bonds sold in the primary auctions.

An overview of issues between 2000 and 2017 shows that during these downturns (2002, and 2015-16), when financial market volatility increased, the issue of "Letras Financeiras do Tesouro" (LFTs) had increased (see Table 3). Given that this is a post-fixed security indexed to the overnight rate target by BCB (Selic), this result is expected, since the market prefers not to assume fixed positions in times of uncertainty and the Treasury, in turn, does not sanction the market-required premiums on prefixed bonds, which tend to be higher due to uncertainty. In 2015, when the "investment grade" was lost, there was a reduction in the share of "Letras do Tesouro Nacional" (LTN), a prefixed bond, as well as in the "Notas do Tesouro Nacional Série B" (NTN-B), bonds with a prefixed rate and indexed to the consumer inflation rate with a longer maturity.

The average maturity of the LFT actually increased during the period, achieving the highest level of 6 years, on average, even after the downgrades. The maximum maturity of LTNs issued after the downgrade of 2015 did not change in relation to previous years, at the level of 4 years.

Table 3

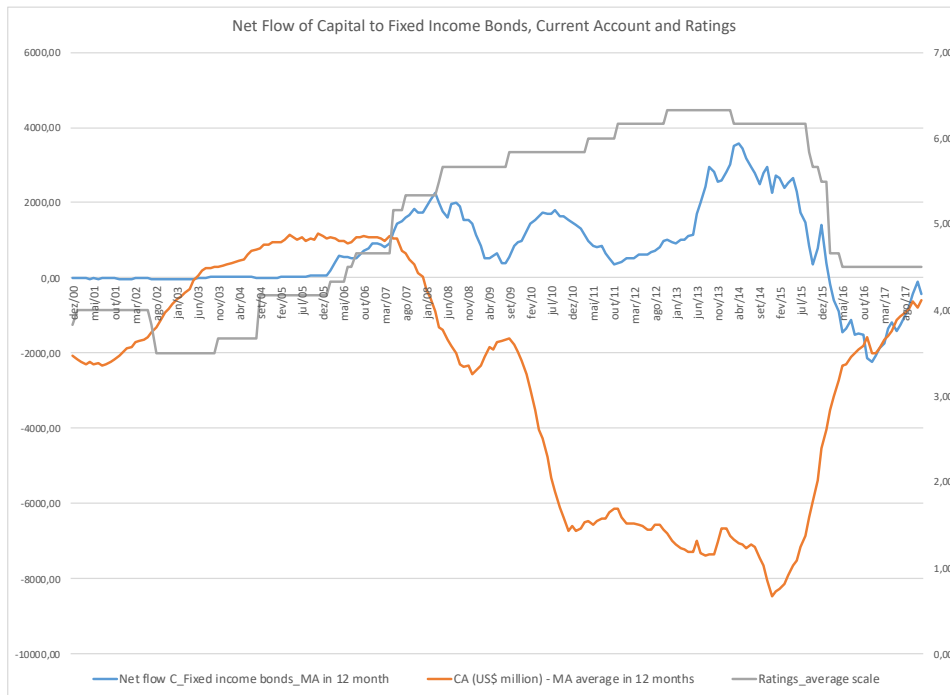
	Share of bonds issued by BNT							Maturity (years)	
	LFT	LTN	NTN-B	NTN-C	NTN-D	NTN-F	Total	LFT	LTN
2000	51,8%	48,2%	-	-	-	0,0%	100%	1 to 6	1,83
2001	53,3%	39,0%	-	7,6%	0,1%	0,0%	100%	2 to 5,3	2,2
2002	48,4%	42,2%	-	5,0%	4,3%	0,0%	100%	0 to 3,1	1,8
2003	62,7%	34,2%	1,0%	2,1%	-	0,0%	100%	0 to 4,6	1,7
2004	38,8%	56,3%	1,8%	2,2%	-	0,9%	100%	0 to 5,2	1,8
2005	33,3%	58,3%	6,1%	0,3%	-	2,0%	100%	1 to 4,4	2,5
2006	18,8%	56,4%	14,0%	0,4%	-	10,4%	100%	3toa 5	2,7
2007	23,5%	39,1%	15,7%	-	-	21,8%	100%	3 to 6	2,25
2008	39,6%	34,6%	13,4%	-	-	12,4%	100%	3 to 6	2,33
2009	29,4%	47,0%	8,4%	-	-	15,1%	100%	3 to 6	2
2010	24,5%	46,1%	15,2%	-	-	14,2%	100%	3,5 to 6	2,5
2011	14,9%	58,9%	20,0%	-	-	6,2%	100%	4 to 6,7	4
2012	4,0%	67,0%	21,0%	-	-	8,1%	100%	5 to 6	4,04
2013	24,2%	52,4%	12,7%	-	-	10,8%	100%	5 to 6	3,75
2014	23,3%	56,8%	9,8%	-	-	10,0%	100%	6	4,05
2015	34,5%	48,3%	8,9%	-	-	8,4%	100%	6	4,05
2016	24,9%	51,7%	14,2%	-	-	9,2%	100%	6	4,05
2017	31,3%	47,0%	11,7%	-	-	10,0%	100%	6	4,04

Source: Brazilian National Treasury.

In regard to international capital flows, it can be seen in graph 8 that the net flow to fixed income bonds (both public and private) started decreasing *before* the downgrades, probably due to the increasing current account deficits (and devaluing exchange rates). We are not testing causality, but it can be seen that downgrades occurred after the inflection of the external net flow path. After the downgrades, the net flow became negative, but seemed to return in 2017. Since the downgrade

meant also the “loss of investment grade”, this might have affected pension funds, which cannot invest in assets without this rating and have to liquidate their position.

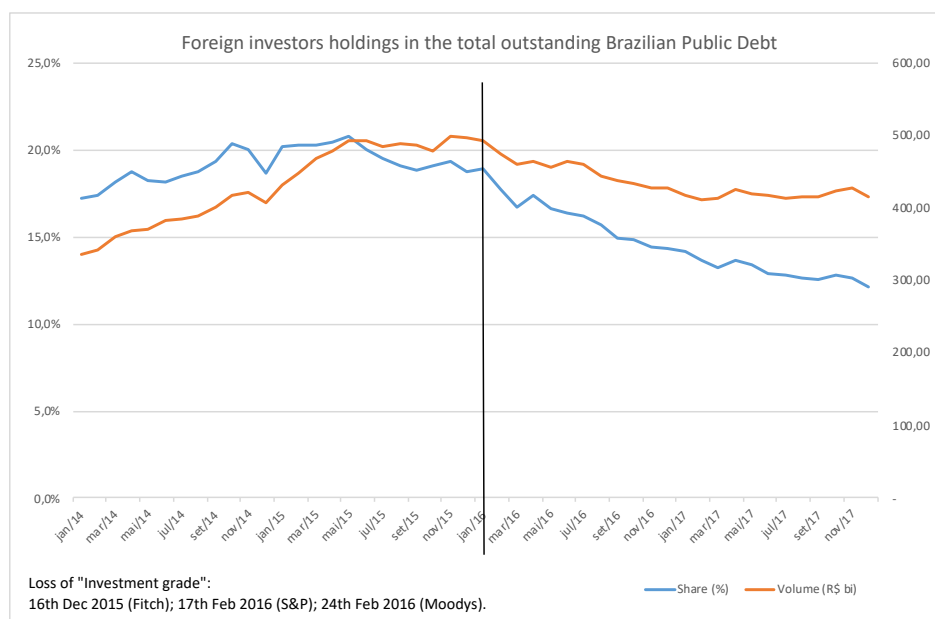
Graph 8



Source: Brazilian Central Bank and International Rating Agencies.

However, if we exam the total outstanding domestic public debt in Reais, we find both the share and volume of foreign investors holdings were less affected. We can't state with complete accuracy if this capital left the country (since capital account data aggregates capital flows to private and public assets), but there is no evidence that, in regards to public bonds, the loss of investment grade caused a strong selling movement by non-resident investors in public bonds in Reais.

Graph 9

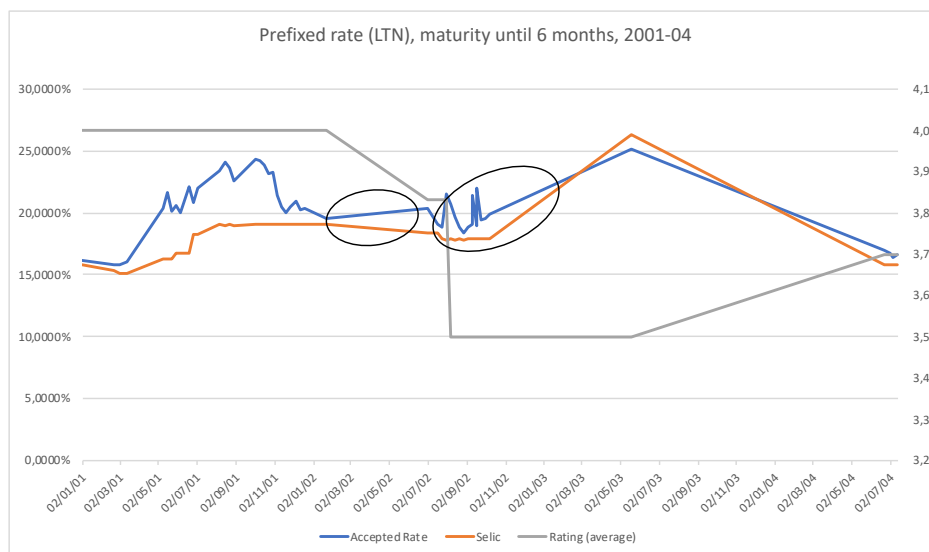


Source: Brazilian National Treasury.

Finally, we are going to analyze the behavior of the interest rates of public bonds sold in the primary auctions during the period of downgrades. We chose to focus on the LTN because it is a fixed-rate bond and therefore we can compare the LTN with the Selic rate to analyze the spread between the two. As maturities affect interest rates, we divide these bonds into three groups: up to six months, six months to one year, and more than one year. We will first analyze the case of 2002, when there was only one downgrade, and then the case of 2015-16, when the downgrade represented a loss of investment grade. To facilitate the graph interpretations, we made an average of the rating scale of the three international agencies (S&P, Fitch and Moody's).

In the case of short LTNs of up to six months, it can be observed that after the first downgrade carried out by Fitch in June 2002, there was a small increase in rates within the auctions, with a spread in relation to the Selic (first circle). When the other agencies followed the downgrade, the rates showed a greater oscillation and rose, but with a decreasing spread in relation to the Selic (second circle). Most likely due to the expectations of a reduction in Selic, LTN rates were even below the Selic for a period (negative spread) until the beginning of 2004. We can, therefore, say that the downgrades had a temporary effect of oscillation on the rates, which did not persist.

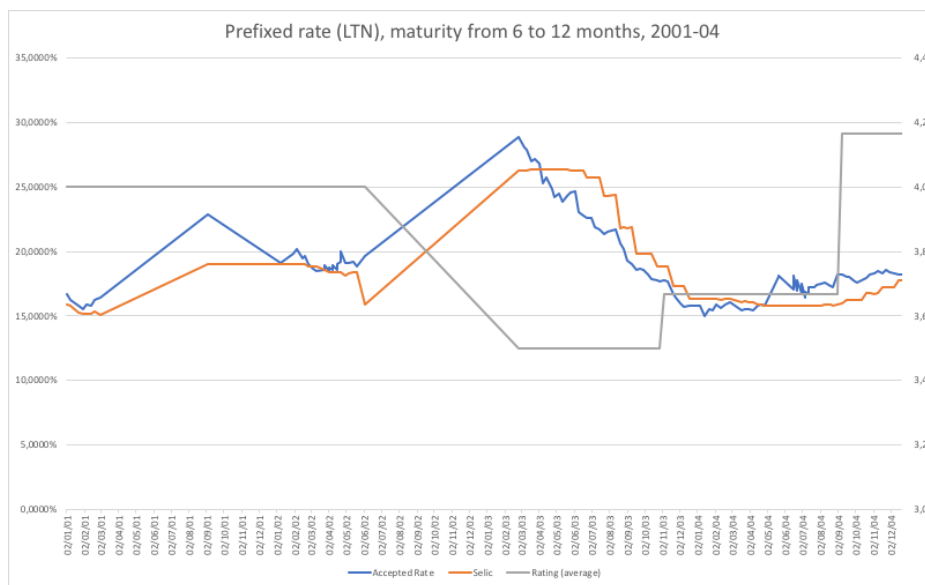
Graph 10



Source: Brazilian National Treasury and Central Bank, and International Rating Agencies.

For LTNs with 6 to 12 months maturity, rates also rose after the 2002 downgrades, but without so much volatility in the days ahead of the downgrade. In the auctions, the rates of these bonds were also below the Selic for a while, showing that the agents had already incorporated into their expectations the declining trajectory of the Selic (see graph 11 below). The LTNs with a maturity greater than 1 year presented a very similar pattern. The rates increased right after the downgrade, following the Selic, and remained lower than the Selic between August 2002 and early 2004, reflecting, in the same way, that the agents had already incorporated in their expectations the reduction of the target of the BCB.

Graph 11

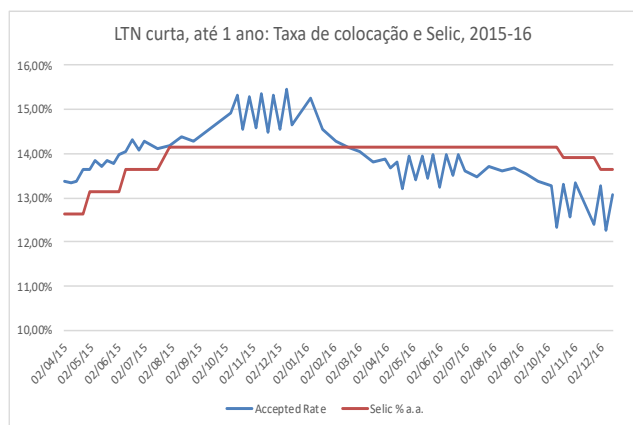


Source: Brazilian National Treasury and Central Bank, and International Rating Agencies.

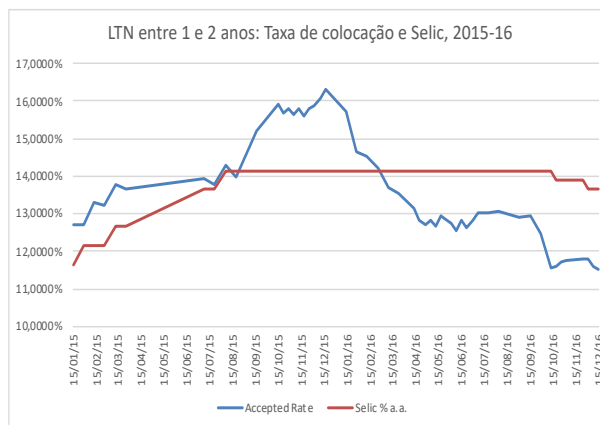
In summary, the LTN rates in the primary auctions of BNT showed some oscillation after the downgrades (especially in short bonds of up to six months), but they were not persistent. The trend of these rates followed the Selic (with positive and negative spreads), reflecting the expectations of future interest rate targeting by BCB. The downgrades of 2002 did not have a persistent effect on auction rates.

We will now move on to the analysis of the rates in the period of 2015 and 2016, when the downgrade was accompanied by a loss of the "investment grade" rating. The spread over Selic increased right after the downgrade but then declined and became negative (Selic higher than the LTN rate), also reflecting, as in 2002, the expectation of a declining target rate of interest as signaled by monetary policy. The same behavior was observed in all maturities.

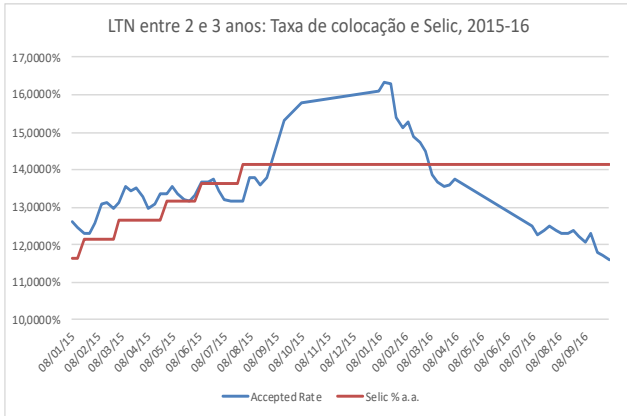
Graph 12



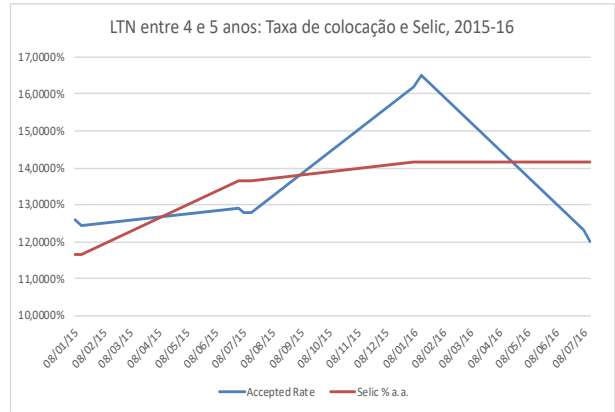
Graph 13



Graph 14



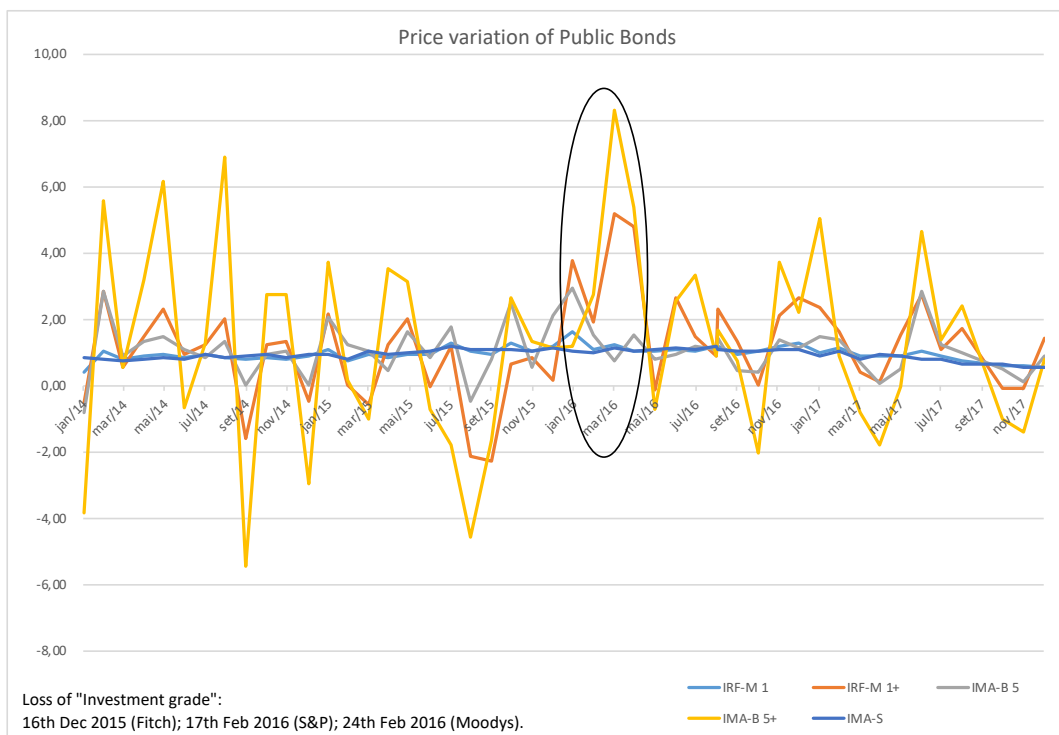
Graph 15



Source: Brazilian National Treasury and Central Bank.

If the LTN issuance rates at the auctions were not persistently affected during the downgrades with investment-grade loss, the same can be said with respect to the secondary market trading prices (graph 16). The Anbima (National Association of Financial and Capital Market Entities) indexes correspond to the price of a basket of securities traded in the secondary market: IMA-S corresponds to negotiated prices of LFTs; IMA-B 5 to the NTN-Bs with a maturity of up to 5 years; IMA-B 5+ to the NTN-B with a maturity higher than 5 years; IRF-M 1 to LTN with a maturity up to 1 year; and IRF-M 1+ to LTNs with a maturity greater than 1 year. Note that soon after the loss of investment grade, in December 2015 (circle), the prices of long-term bonds (IRF-M 1+ and IMA-B 5+) increased, which shows that there was no “run” from these bonds, instead, the demand increased. Prices of post-fixed and shorter bonds were not so affected. Note that IMA-S and IRF-M 1 remain almost stable.

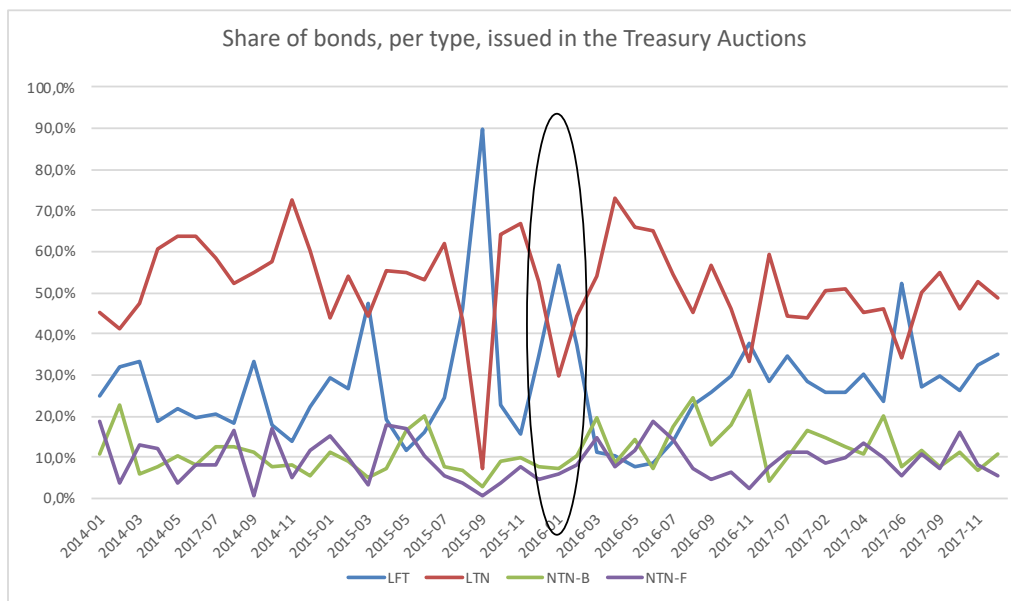
Graph 16



Source: Anbima.

It is interesting to note that, while in the secondary market there seems to have been an increase for the demand of long term bonds, reflected in its higher price, there was a reduction of the issuance of these bonds in the primary market, and an increase of the issuance of LFTs (circle in Graph below). This shows that the Treasury preferred not to sell prefixed bonds at the rate the market wanted to pay and chose to sell post-fixed bonds instead.

Graph 17



Source: Brazilian National Treasury.

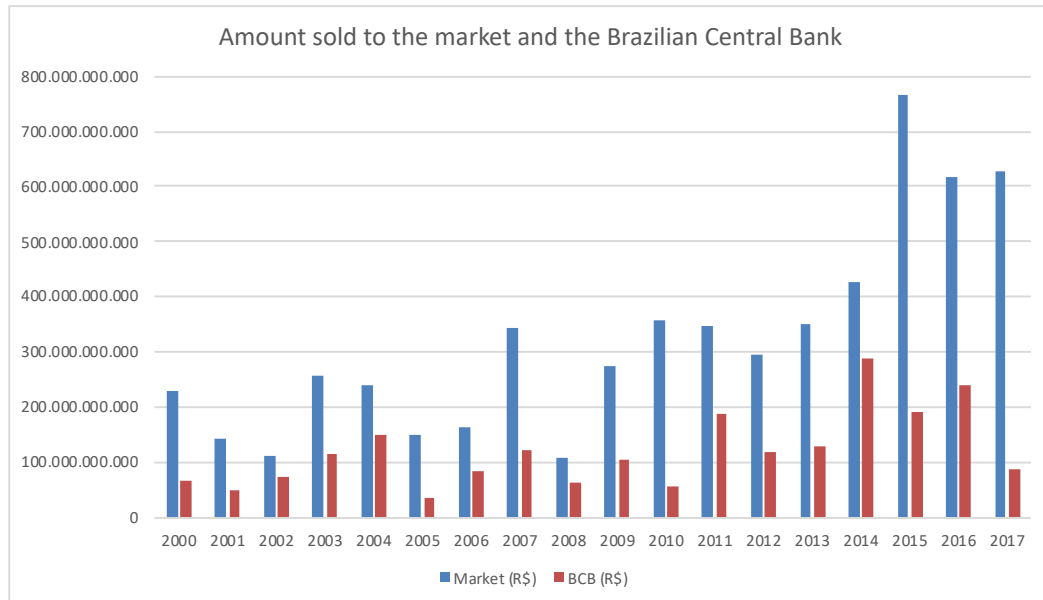
To sum up this section, during the most critical periods of financial instability when there were downgrades from international agencies (2002 and then 2015-16), we have shown that: i) in the primary auctions, issues of post-fixed rate bonds increased to the detriment of prefixed rate bonds; ii) short and medium term bonds (LFT and LTN) were also higher in relation to long term ones such as NTN-Bs; iii) the interest rates of the bonds sold in primary auctions oscillated, but not persistently; iv) prices in the secondary market showed there was no run from prefixed or long term bonds; iv) there were outflows of external capital to fixed income bonds (public and private), but the movement started before the downgrades, most likely related to the increasing current account deficits and depreciating exchange rate; iv) the impact in the foreign holdings of public domestic bonds does not seem to reflect a run of those investors (selling in systemic movement).

3.3. National Treasury and Central Bank: fiscal results and repo operations

In this section we will analyze evidence of the relationship between the issuance of bonds by the BTN and the repo operations of the BCB. The next graph shows the volume of bonds sold by the Treasury to the Brazilian Central Bank to roll over the public bonds in the Central Bank's portfolio

(permission given by the Fiscal Responsibility Law, art. 39). These are the only issues made through public auctions to the Central Bank. It is indicative of the coordination between the two institutions as that, depending on the results of the auctions, the Central Bank needs to maintain its portfolio in order to be able to conduct open market operations and maintain the interest rate target.

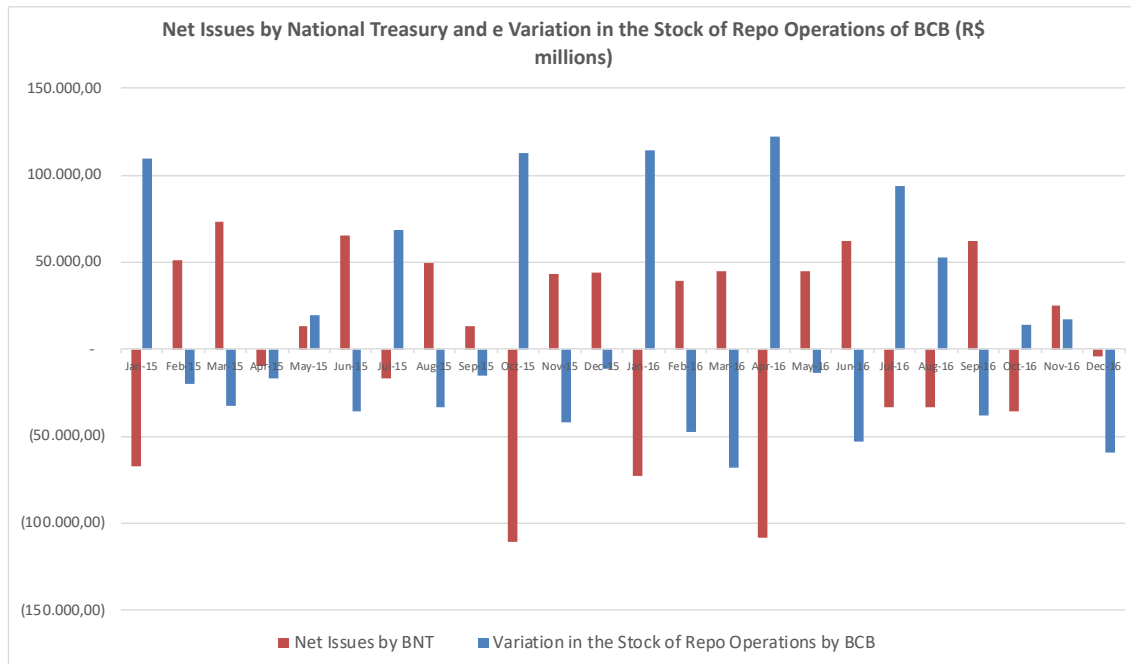
Graph 18



Source: Brazilian National Treasury.

A focused analysis in the relevant period of the downgrade with loss of the investment-grade rating, using monthly data, also provides insights about this issue. With the exception of April and May of 2015, and December 2016, net issues by the Treasury and repo operations by the Central bank have inverse relation. When the net issuance of the BNT are positive (meaning that sales of bonds were higher than redemptions, thus draining liquidity from the financial system), the Central Bank did not acted in the borrowing position in the secondary market. On the contrary, it assumed a selling position, reducing the repo operations. Alternatively, when the net issuance by the BNT was negative, meaning the purchase/redemptions of bonds were higher than sales, the BCB volume of repo operations offset the liquidity in the reserve system.

Graph 19



Source: Brazilian National Treasury and Central Bank.

These numbers seem to indicate that the Central Bank and Treasury coordinate their actions and, when the Treasury does not sell the securities it is offering in the auctions, the Central Bank can act in the secondary market through repo operations. The Treasury does not “need to finance” itself through the sale of bonds in primary auctions. In fact, the Treasury sells bonds to wipe away the excess reserves generated by fiscal spending and this is why MMT says that Treasury bond sales operations are no longer a fiscal operation to finance Government, but a monetary operation to adjust the amount of reserves in order to maintain the interest rate target. As a consequence, there are no bond vigilantes, because if the Treasury does not accept the rates offered by the market in the auctions, it can choose to not sell the bond and let the Central Bank dry up the liquidity in the secondary market by repo operations.

4. Conclusion

First and foremost, the stock of Brazilian domestic federal public debt in Reais in relation to GDP does not influence the average cost of debt persistently. The average cost of debt closely follows the Selic, not only because of the direct effect of the LFTs but also because the Selic serves as a reference for the other rates, mainly due to the expected future interest rate effect signaled by monetary policy.

With regard to auctions, the increase in the stock of debt does not necessarily coincide with an increase in rates, dismantling the argument that a larger debt generates distrust in the market, which is reflected in higher interest rates. The volume of bonds sold at the auctions also did not reflect signs

of difficulty to primary issues and debt rollover. The percentage of auctions with full sales in relation to the total volume offered by the BNT remained around 50% in the whole period of analysis, and the percentage of auctions with no sale of bonds was always low, less than 10%. Also, the quantity of bonds in relation to total offered by the Treasury was high through the whole period.

These indicators oscillated in moments of uncertainty and volatility in the financial market, such as 2002 (Lula's election), 2008 (international financial crisis) and 2015-16 (domestic political crisis and downgrade with a loss of investment grade). In these periods, issues of post-fixed and short maturity bonds usually increased in detriment of the prefixed and long maturity bonds, and the interest rate registered in the auctions also increased. But the effects were temporary. Even after the loss of investment grade, long-term rates were compatible with market expectations and there was no evidence of a running from public debt, including foreign investors.

Finally, we observed evidence of coordination between the Brazilian National Treasury and the Brazilian Central Bank regarding the issuance of bonds in the primary auctions and repurchase operations in the secondary market. If investors don't want to buy public bonds at the rate the Treasury wants to pay, the Treasury can choose not to sell the bonds and leave the banks with more reserves, which will be drained by the Central Bank by repo operations, ensuring the interest rate target.

We conclude that the market has no bargaining power to demand persistent risk premiums and threaten the ability of the Brazilian Government to spend in its own currency. As can be seen from the above analysis, there are no "bond vigilantes" in Brazil capable to prevent the use of fiscal policy and public debt in Reais to pursue full employment and economic development.

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