

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

CAROLINE TEIXEIRA JORGE

**A CRITICAL ANALYSIS OF BRAZILIAN PUBLIC DEBT IN THE 2000s
FROM THE MMT PERSPECTIVE**

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Tese de Doutorado apresentada à banca examinadora do Programa de Pós-Graduação em Economia (PPGE) da Universidade Federal do Rio de Janeiro, como parte dos requisitos necessários para a obtenção do título de Doutora em Economia, sob a orientação do Prof. Dr. Carlos Pinkufeld Monteiro Bastos.

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Para meus pais, Tatyana e Maria Helena.

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ABSTRACT

This dissertation aims to present the institutionality of Brazilian Government spending and financing through the issuance of domestic public debt in the local currency, the Real. By adopting Modern Monetary Theory, we discuss the concerns of default of public debt denominated in the local currency of a sovereign government should not prevail and avoid public expenditure to bring the economy to full employment. We analyze both public debt structure and Primary Auctions in the 2000s, to provide evidence that the coordination between the National Treasury and Central Bank can guarantee that the government has much more bargaining power than the market in influencing the debt cost both in the short and long term – and that not being able to refinance this debt is not a real possibility. On one hand, monetary policy determines directly the short-term rate as a policy variable, and influences the medium- and long-run rates by affecting expectations and by operations within the secondary market. On the other hand, the Treasury can control the debt cost by offering the maturities that attend to demand conditions and can refuse to sanction high rates required by market participants. There are no “bond vigilantes” capable of threatening the government to afford expenditure in its own currency due to a supposed inadequate profile or size of the domestic public debt.

Key Words: Modern Monetary Theory, Domestic Public Debt, Treasury, Central Bank.

RESUMO

A tese tem por objetivo apresentar a institucionalidade dos gastos do Governo e do financiamento por meio de emissão de dívida doméstica denominada em moeda local (Real). Com base na Teoria Moderna do Dinheiro, discutimos que as preocupações com default da dívida pública doméstica em Real não deveriam existir e impedir que o gasto público conduzisse a economia ao pleno emprego. Analisamos o perfil (e gestão) da dívida pública brasileira e os leilões primários do Tesouro Nacional nos anos 2000, buscando mostrar que a coordenação entre o Tesouro e o Banco Central garantem que o governo tenha muito mais poder de barganha do que o mercado para definir o custo da dívida no curto e médio prazo, e que o risco de refinanciamento (possibilidade de não conseguir se financiar via emissão de dívida) não existe. De um lado, a política monetária determina diretamente a taxa de juros, e influencia a taxa média e longa afetando as expectativas com suas operações no open Market. De outro, o tesouro pode controlar o custo da dívida oferecendo prazos que atendam à demanda, e se recusando a sancionar elevados prêmios de risco. Não há “bond vigilantes” capazes de ameaçar a capacidade do governo de emitir dívida em moeda local devido a um suposto perfil ou tamanho da dívida pública doméstica.

Palavras-chave: Teoria Moderna do Dinheiro, Dívida Pública Doméstica, Tesouro, Banco Central.

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INTRODUCTION

One of the most debated issues in Brazil's economic policy making is the public debt, denominated in the local currency. There are several interconnected elements that are raised in this public debate. The first is an alleged bullish impact on interest rates arising from "bond vigilantes" that would be able to demand high risk premiums, increase the costs of public debt and create difficulties for government financing. Of course this debate is related to a more basic discussion which is the eventual possibility that the government can default in its local currency denominated debt. In neoclassical theory, based on the natural rate of interest, this would be a result of the crowding-out effect of public expenditure as well as of the distrust in the ability of the government to satisfy its intertemporal budget constraint. For Post Keynesian theory, "bond vigilance" could be related to the uncertainty generated by a government who is not able to portray its commitment to boost the economy in periods of insufficiency of effective demand. This basic general question is a source of heated debate among international scholars and policy makers, and is also linked to another discussion, especially in Brazil - the debt structure of public debt.

In this way, the difficulty of the market to "accept" public bonds would be reinforced by an "inadequate" public debt structure, too concentrated on the short-term or on certain maturities, because the Treasury would need to roll-over high volumes of debt in short periods of time, becoming a hostage of the market. Also, a debt profile with a high share of post-fixed securities could generate uncertainty about the government future ability to pay its commitments in the case of rising interest rates. There are also concerns with respect to future inflation associated to monetization and capital losses. As a consequence, a "bad" public debt profile could reinforce the demand for risk premium, especially in fixed rate bonds and longer-term maturities. Ultimately this could aggravate the climate of distrust over sovereign debt sustainability, impeding a more significant reduction in interest rates and hindering public financing.

The general terms of this discussion can be found in reports from multilateral institutions, debt managers, rating agencies and even corporate media outlets. As a result, there is almost a consensus about the risk of an excessive growth of domestic public debt. The effort to bring the public debt to a sustainable path is the basis for the prescription of strong public spending cuts that would generate primary surpluses. Also, the debate about

the debt structure results in a strong policy stance that should grant a longer-term/fixed rate debt profile. This “benchmark” should be permanently pursued by public debt managers and, allegedly, result a term structure with lower interest rates of an economy, as well as debt predictability, reducing Treasury risk to rollover and refinance the debt.

The theme of government financing by bond issuance and its relation to interest rates and debt costs is rather relevant specially because it might curtail the scope for fiscal policy, which in a heterodox perspective is relevant to sustaining effective demand and then long term growth. Also, because the cost of public debt, especially long-term bond rates, have a distributive crucial role and also may help to establish a reference for private market interest rates.

In the specific case of Brazil, the existence of “Letra Financeira do Tesouro – LFT”, a public bond indexed to the fund rate targeted by the Brazilian Central Bank (the Selic rate), is considered by some authors an “anomaly”, which reduces the predictability of debt trajectory and the effectiveness of monetary policy, discourages demand for longer term bonds and prevents the formation of a term structure curve of interest rates. Most of these arguments are related to the feature that LFTs have duration zero, as they are indexed to the Selic rate. The creation of LFTs dates back to the 1980s and is considered by most economists as a key to achieving stabilization, but the growing share of debt stock after the 1990s is heavily criticized. Some economists even advocate for the elimination of this kind of bond, arguing that they contribute to the high level of interest rates in Brazil.

According to this interpretation, considering the supposed existence of bond vigilantes, policy makers should be aware not only of the size of the domestic public debt, in order to prevent losing bargaining power to the market, but also about the public debt structure, including concerns in regards to the share of LFTs.

However, viewed from the Functional Finance perspective, and as extensively developed by Modern Monetary Theory, the arguments mentioned above misunderstand the real role of sovereign government expenditure and domestic public debt – denominated in local currency – in the real world. Fiscal policy should pursue full employment independently from any “sound” finance prescription to curb the size of public debt. In fact, a sovereign government cannot default in its own currency and there is no such thing as bond vigilance regarding debt issuance denominated in the local

currency. Debt size and profile are not relevant to a Government's financing capacity nor to both short and long interest rates. Indeed, a sovereign government is always able to afford expenditure in its own currency, and therefore, debt issuance should not even be considered a financing operation, but a policy instrument to control interest rates in the reserve market. The coordination between the Treasury and Central Bank makes the government much more powerful and capable than the private sector in a modern capitalist economy, and, in that sense, debt management might influence debt costs and the yield curve for long term assets, but not to “guarantee” government financing in local currency, which will always occur.

Given the above contextualization, the thesis intends to answer to what extent the size and profile of the Brazilian domestic federal public debt actually influences the long-term interest rate and the Treasury's capacity to issue debt, both with regard to debt rollover and new issues. If the impact is not as relevant as advocated, given the importance of fiscal policy in sustaining effective demand and economic growth, the arguments for restrictions on public spending can be dismissed, creating more room for this important autonomous growth-generating expenditure.

From a theoretical point of view, the dissertation aims to analyze the relations between government spending, domestic public debt (denominated in local currency) and interest rates. From an empirical point of view, the dissertation aims to apply the concepts of MMT to the Brazilian domestic public debt market, addressing critically the supposed impacts of debt size and composition on debt cost and supposed difficulties in Treasury debt issuance. We also intend to do an in-depth investigation into the legal and institutional aspects of the relationship between the Central Bank of Brazil and the National Treasury, which may clarify the monetary and fiscal nexus operations.

To achieve these goals, the dissertation is divided in three chapters, besides this introduction and the conclusion with final remarks. Chapter 1 aims to present the theoretical views of the relation between domestic public debt and interest rates, and the impacts on the cost of public debt, in the neoclassical approach, Post-Keynesian - meaning the literature that follows closely to Keynes' ideas and the General Theory, and Modern Monetary Theory (MMT). The chapter also aims to explore how these theories describe government financing through debt issuance, and the role of public debt management in influencing the cost of debt. For this purpose, there will be a section exploring the benchmark literature and yield curves theories, since debt management is

considered important for the economy's term structure of interest rates. By adopting the MMT approach, which better explains how a sovereign government really spends, we will proceed to the next chapters with an empirical analysis of the Brazilian case in the 2000s.

Chapter 2 will present the Brazilian institutional framework regarding government expenditure and the relation between the Central Bank and National Treasury. Themes such as the Brazilian budget legislation, the Treasury account in the Central Bank and the Primary Dealer System will be explored. The chapter will also provide an empirical analysis of the Treasury Primary Auctions to investigate if there is any constraint for Treasury to afford expenditures by debt issue, including periods of increased volatility such as when there were downgrades by international rating agencies. We will investigate if there is any evidence of the existence of bond vigilantes in the Brazilian public domestic debt market.

Chapter 3 will provide an empirical analysis of the discussion of chapter 1 on public debt management and benchmark, applied to the Brazilian case. Firstly, we are going to present the arguments of Brazilian economists who affirm that the structure of the Brazilian domestic public debt - too concentrated in the short term and in floating rate bonds - contributes for the private market to have bargaining power to require high risk premiums and also if this profile avoids debt lengthening. There will be a great focus on the "Letras Financeiras do Tesouro – LFTs", considered, as already mentioned, an anomaly that creates a financial perverse circuit of short termism in Brazil. Then we are going to investigate if the structure and management of Brazilian public debt (type of bonds, maturity and debt holders) has been determinant for its cost, as a result of an "adequate" profile in accordance to a supposed bond vigilance by the private market.

The empirical analysis of chapters 2 and 3 is mostly based on the Brazilian Central Bank and National Treasury public statistics. There is also data from the Brazilian Financial and Capital Markets Association (ANBIMA). The period under analysis is the 2000s, using the longest historical series of those databases provided since 2000. Some of them, such as data of debt structure from National Treasury statistics, start in 2006. We are not analyzing the 1990s because it is a period of high inflation and successive stabilization plans, and we do not aim to analyze the public debt market in such extreme conditions.

With this research, we intend to show that the debate on Brazilian domestic public debt in Real's is dominated by the mainstream economic vision, which ends up exaggerating the bargaining power of the market and creating constant restrictions on public spending and public debt, which is not based on the real logic of public spending. Even among some heterodox, there is a conservative view of public finance. We seek to offer a reinterpretation of the evolution of the Brazilian debt market in the light of an alternative theoretical approach, which opens room for greater autonomy of fiscal policy and the use of both public deficits and debt as instruments to sustain effective demand.

CHAPTER 1: GOVERNMENT SPENDING, DOMESTIC PUBLIC DEBT AND INTEREST RATES

This chapter aims to discuss how public spending is related to debt issue in the theories of the Neoclassical, Post-Keynesian and Modern Monetary Theory framework, as well as the impacts on interest rates and on the cost of public debt (domestic and denominated in local currency). Next, the literature will be presented on debt management and yield curve theories in their alleged relation to the financing of public spending via public debt. Finally, adopting the Modern Monetary Theory framework, we will present our interpretation of how a sovereign government really spends and influences the cost of public debt.

1.1. Government spending and interest rates

1.1.1. Monetarist Approach

In the neoclassical approach, federal spending can be financed through taxation, and bond issuance to the private sector or to the Central Bank. In the case of a primary fiscal deficit this mechanisms have an impact on interest rates and inflation. In its turn, interest rate is endogenously determined by market forces, based on the interaction between demand and money supply, in a process of market clearing that defines the natural interest rate, a level that does not cause inflation. As public spending affects the supply and demand of savings, it affects also the interest rates and might cause inflation.

There is no causal connection from debt to interest rate unless permanent fiscal deficits are maintained, which would threaten the sustainability of the government's intertemporal budget constraint. Therefore, the causal relation is from the flow of spending (not debt stock) to the interest rate.

Public spending financed by taxation, according to the standard orthodox interpretation, is not an object of this dissertation research. This section is focused on the case of deficit spending with public debt issuance by the Treasury to the Central Bank or to the private sector, using as a reference Dornbusch & Fischer (1982).

The first case is of a debt-financed deficit by the private sector which causes an increase in interest rates by reducing national private savings. According to the loanable fund's theory, individuals will only buy public bonds and increase their savings if they forego present consumption in exchange for remuneration that compensates for this disutility. Thus, starting from the balance between the supply and demand of savings that defines the natural rate of interest, a new demand for savings to purchase public bonds will only be met with a rise in the interest rate. This, in turn, will lead to a reduction in private investment spending, a process known as crowding out. It should be noted that the variable that causes the rise in the interest rate is deficit spending (which is a flow), not the stock of debt.

On the other hand, deficit spending financed by the issuance of public bonds to the central bank is considered "debt monetization", because it creates monetary base. The Treasury sells a bond to the central bank and receives a deposit which is used to purchase goods and services from the private sector, which now has a larger base of money without a counterpart in terms of net assets. Alternatively, when the issuance of bonds is to the private sector, the monetary base stays unchanged because the Treasury receives money from the private sector when it sells the bonds, and then increases the monetary base again when spends in goods or services.

In this sense, the government budget constraint can be defined by:

$$P \cdot \text{BuD} = P_b \Delta B_f + P_b \Delta B_p \approx \Delta H + P_b \Delta B_p \quad (1)$$

Where BuD is the Budget Deficit, ΔB_p is the change in the number of government bonds (passive), ΔB_f is the variation in the number of securities held by the Central Bank, P_b is the price of the bond, and ΔH is the monetary base variation. The equation shows that deficit spending is financed by bond issuance for the private sector or by monetization (Dornbusch & Fischer, 1982, p. 431).

The effect of debt monetization, in the case of a transitory deficit, is a permanent rise in the price level caused by monetization, and a reduction in interest rates for the same reason. If the deficit is permanent, there will be an increase in the inflation rate due to the process of continually increasing the monetary base. By causing inflation, deficit spending via monetization is considered financed by an inflation tax. And for the same reason, it is said that the primary deficit should only be financed by taxation or debt

issuance to the private sector, as monetization is similar to the creation of a tax and causes inflation.

Eventually the rise in the inflation rate pushes down the demand for currency to the point that total seigniorage drops. Thus, there is a maximum limit for seigniorage through this strategy, or, there is limit for the government to finance its deficit through monetization. The idea is that the deficit causes an imbalance in the market, so that the public and the private sector will be competing for the acquisition of goods, with the government issuing currency and the private sector trying to get rid of it. The inflation rate will continue to rise and, eventually, the economy may suffer from hyperinflation in case of increasing deficits.

In short, a monetarily financed deficit (issuance of bonds directly to the central bank), in the conventional neoclassical model, causes an increase in the price level if it is temporary, an increase in the inflation rate if it is permanent, and a reduction in the interest rate in both cases. It should be noted that the causal relationship is also from the flow of government spending to interest rates, not the stock of debt. There is also no mention of the possibility of default on public debt arising from an inability to finance, but rather the risks associated with monetization and hyperinflation.

We will now follow the model developed in Fullwiler, which uses Blanchard's (1990) model, to analyze the assumptions of debt sustainability. Dividing the previous equation (1) by P, government budget constraint can be represented by:

$$G_t + i_t B_t - T = + \Delta B_t + \Delta M_t \quad (2)$$

The intertemporal government budget constraint combines the earlier constraint given by equation (2) with the discount of future primary deficits to present value by the interest rate on government bonds. Denoting the debt to GDP ratio (real) at a point in the future as b_{t+n} , we have:

$$b_{t+n} = b_t(1 + r - \Theta)^n + \sum_{k=1}^n [(g_{t+k} - t_{t+k})(1 + r - \Theta)^{n-k}] \quad (3)$$

Where lowercase letters represent percentage of real GDP, “r” is the interest rate on government bonds, and “ Θ ” is the real GDP growth rate. Discounting both sides by the current interest rate minus real GDP growth, we have:

$$\frac{b_{t+n}}{(1+r-\Theta)^n} = b_t + \sum_{k=1}^n \frac{g_{t+k} - t_{t+k}}{(1+r-\Theta)^k} \quad (4)$$

The neoclassical interpretation of government's intertemporal budget constraint imposes an additional condition that the present value of the debt to GDP ratio tends to zero for sufficiently large values of n , that is, for distant periods of time:

$$\lim_{n \rightarrow \infty} \frac{b_{t+n}}{(1+r-\Theta)^n} = 0 \quad (5)$$

Replacing (5) in (4), we have:

$$0 = b_t + \sum_{k=1}^n \frac{g_{t+k} - t_{t+k}}{(1+r-\Theta)^k} \quad (6)$$

Rearranging:

$$b_t = \sum_{k=1}^n \frac{t_{t+k} - g_{t+k}}{(1+r-\Theta)^k} \quad (7)$$

According to equations (6) and (7), in order of the debt-to-GDP ratio not to grow infinitely, the government must generate primary surpluses large enough so that its present values, discounted at the government bond rate, equal the current value of debt stock. If the previous equation does not hold there will be a permanent fiscal imbalance and the debt trajectory will be considered “unsustainable”. The “fiscal balance” indicator measures the size of the future surpluses needed to bring their present value to a sustainable path for debt.

If this intertemporal constraint is not met, fiscal deficits will generate a permanent upward pressure on the interest rate. This rise may eventually lead to an inflationary process if the government has to opt for monetization. And in this case:

“The fiscal authorities are ultimately left with the choice of rising inflation if the national debt is serviced through money creation or renegeing on debt service commitments.” (Fullwiler, 2008, p. 5)

The higher cost of debt feeds a perverse cycle to the fiscal imbalance. The consequent need for greater funding reinforces the demand for premia and the crowding-out effect caused by higher interest rates, which ultimately, undermines economic

growth, generating a new cycle of greater deficits and negative expectations. This would increase the likelihood of more monetization and more inflation.

In short, there is a dichotomy associated with public deficit financing, as it might generate inflation and a reduction in interest rates in the case of monetization, or increase interest rates in the case of non-monetized larger indebtedness with the private sector. Both possibilities are related with permanent deficits that generate an unsustainable debt stock trajectory, once the government's intertemporal constraint is not respected. In this case, future fiscal results brought to present value do not equal the current value of the debt stock, causing the private sector to demand increasing risk premiums on government securities.

1.1.2. **Post-Keynesian**

In the post-Keynesian approach, meaning the literature which follows Keynes's writings closely (Davidson, 1994, 2002; Carvalho, 1992), the interest rate is a monetary phenomenon, the result of the liquidity preference of economic agents and the supply of money. Liquidity preference will determine a demand for currency which, given the supply, will result in a certain interest rate. This process also involves uncertainty about the future interest rate, a condition that raises the critical role played by liquidity preference (in the form of currency holding) as a means of preserving wealth.

As in neoclassical economics, the interest rate is not directly related to the size of the debt stock, but it is related to the flow of public spending and the budget outcome. There is some concern about fiscal balance, but not as a goal in itself. Fiscal deficits should be pursued in order to achieve full employment.

Keynes (1973) proposes that the budget should be divided between current expenditures - corresponding to expenditures related to the provision of indispensable public goods to society, such as health, education and security - and the capital expenditures budget, corresponding to a flexible portion of the budget available to face downturns in the business cycle. The current spending budget should always remain in balance, to neutralize them as a source of pressure when the economy is already in full employment. The management of aggregate demand should be allocated to the fiscal policy capital budget and financed to avoid side effects on the money market and upward pressure on interest rates.

However, Pimentel (2018) shows that even separating the budgets, Keynes didn't believe that current budget equilibrium should be a goal no matter what. Deficits should be done in recessive periods, when taxes receipts usually decrease, and he didn't defend cut in expenditures just to keep the balance in this budget, if there was unemployment (Pimentel, 2018, p. 28).

Davidson (2007) also criticize fiscal discipline as a goal by itself and demonstrate that most orthodox economists mean by this policy don't lead to full employment neither avoid the possibility of current account crises. By maintaining capital budget spending on productive investment projects, fiscal deficits should be pursued to stimulate the economy. Functional Finance approach from Lerner is discussed in Davidson (2007):

In any case, if we accept the functional finance role for fiscal policy, then whenever aggregate demand is insufficient to create employment opportunities for all who are willing to work at the going wage, then the government has a responsibility to induce an increase in aggregate demand in order to assure sufficient sales and profit opportunities for our private sector entrepreneurs for them to hire enough workers to achieve full employment. (Davidson, 2007, p. 66)

In regards the fiscal imbalance during recession periods, a Brazilian post-keynesian approach by Carvalho (2008), does not recommended public spending to be financed through taxes, as this would be a further factor of income reduction, before the multiplier effects of public spending could be felt. Nor should the State finance these deficits with long-term securities, since the savings resulting from the increase in income will not yet be available, and therefore there would be no savers demanding long term securities. The issuance of *long-term* bonds could eventually push up the interest rate, causing the crowding-out effect on private investment.

In economic recessions, the expenditure should be financed by the placement of short-term securities that would absorb the idle monetary balances held by the public as a liquidity reserve. Once the effects of public spending on income expansion were completed, the savings needed to absorb long-term bonds without pressure on interest rates would be generated. With the revenue from bond issuance and taxes – both resulting from multiplier effects of public spending - the government could pay off its short-term debt (Carvalho, 2008, pp. 18-19).

As expectations play a very significant role in this approach, an irresponsible fiscal government could depress private investment because it could create the expectation of future austerity, that in turn could trigger liquidity preference and reduce

their appetite for long-term securities in the current period. Alternatively, a responsible fiscal policy could signal the state's ability to generate multiplier effects on income, and stimulate private investment:

“In short, the Keynesian theory does not propose the irrelevance of fiscal balance. In contrast, Keynes advocated a fiscal policy that, in its most benign form, would even prescind public spending if private expectations responded favorably to the public sector's willingness (and ability) to intervene when the economy were under-utilizing its resources. If this, say, psychological effect were insufficient, public spending should indeed be realized, but in such a way as to minimize its collateral impacts on the economy, especially on the interest rate, if inappropriate forms of financing were adopted. (Carvalho, 2008, p. 19).

In short, the post-Keynesian analysis emphasizes the fiscal policy role for achieving full employment, accepting fiscal imbalances if necessary, preferably associated to a capital budget for public investment projects. A Brazilian approach (Carvalho, 2008) identifies primary deficits financed with bond issuance with a possible rise in interest rates in case the profile of these bonds is inadequate. In an economic downturn, for example, selling long-term bonds could put pressure on interest rates, given the greater preference for liquidity in these periods.

1.1.3. Functional Finance and Modern Monetary Theory (MMT)

MMT was originally inspired by Smith, Knapp and Keynes for the currency view, and also by Mosler, Minsky, Lerner and Godley for the monetary and fiscal economy. The theory seeks to show the validity of the analytical framework of Functional Finance - originally developed by Abba Lerner in contemporary economics, paying attention to the elements of modern monetary systems. Before we get into the details of our theoretical object - the relationship between public expenditure and debt with long interest rates and debt cost - we will address two important assumptions in this theory that will help us get into our object. They are: i) the interest rate is exogenous and fixed by the Monetary Authority; ii) The state does not default its own currency. Let's look at each one of these statements .

The first, maintains that the short 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 determined by the Central Bank, 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, 2014, 2015, Bell 2000, Rezende 2009, Fiebiger 2012). 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 tax revenues or bond sales in order to spend, 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 to increase 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).

Hence, 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 outlays, 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.

Considering the above process, public debt issuance is related to the management of interest rates as well as portfolio allocation decisions, and not to the need of 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.

“The size of the stock of money as well as the size of the national debt are results of the actions that will have to be undertaken to prevent inflation and deflation and are never considerations that should prevent the government buying and selling, giving and taking, and borrowing and lending that are indicated by the objective of functional finance – the prevention of inflation and of deflation.” (LERNER, 1951, Pp. 133-4)

And in regards to the size of the public deficit :

“... The adequate value for the full capacity public deficit must be large enough to offset the sum of the external current account deficit, perceived as sustainable or desirable, with the private sector surplus - that is, the difference between private savings and private investment - when the economy operates at full capacity. ” (SERRANO, 2001, p. 154, free translation)

Thus, based on the fundamentals of Functional Finance and MMT, the government should prevent inflation and control aggregate spending to avoid insufficient effective demand. As “the perversity of private actions makes social action necessary” (Lerner, 1951, p. 125, free translation), government must always act to improve social welfare. 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 as long as necessary. 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 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 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 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 examples¹). 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 reducing their 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

¹ See also Tymoigne & Wray (2015), Fullwiller, Kelton and Wray (2015), Wray (2015), and, in Brazil, Santiago (2012).

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.

Actually, Aidar & Braga (2019) find that country-risk premium in the periphery are subjected to international financial cycles (global liquidity and interest rates) and not by country-specific domestic factors, such as domestic debt denominated in local currency. They researched a set of peripheral countries, using the methodology of Principal Components Analysis, from 1999 to 2019.

Considering that country-risk premium are related to external factors more than domestics, and, if external conditions are more favorable – which is the case of Brazil during the first two decades of the XXIth century, 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. Next chapters will provide more arguments to prove this point.

1.2. Domestic Public Debt and Interest rates

1.2.1. “Benchmark” literature

There is a vast literature on debt management developed by IMF Guidelines, World Bank studies, national treasuries and rating agencies reports. They suggest that debt management should pursuit the so-called “benchmark”, defined as a powerful tool for representing the debt structure which the government would like to achieve, based on their risk and expected cost preferences. The benchmark is considered a long-term goal that represents the "preferences of society" (STN, 2009, p. 186).

According to the IMF Guidelines for public debt management:

The main objective of public debt management is to ensure that the government's financing needs and its payment obligations are met at the lowest possible cost over the medium to long run, consistent with a prudent degree of risk. (IMF, 2014, p. 7)

This literature shows great concern about short-term and floating debt, considering it increases the risk of refinancing. Although this concern is correct in regards to debt in external currency, the literature also consider it a risk to debt in domestic currency:

For example, irrespective of the exchange rate regime, or whether domestic or foreign currency debt is involved, crises have often arisen because of an excessive focus by governments on possible cost savings associated with short-term or floating rate debt. Issuance of large volumes of such debt instruments has left government budgets seriously exposed to changing growth and financial market conditions, including changes in the country's creditworthiness, when this debt has to be refinanced. (IMF, 2014, p. 6).

The risk of refinancing debt is defined as "the possibility of the National Treasury having to bear high costs in order to finance itself in the short term or, in the limit, not being able to raise the necessary resources" (STN, 2009, p. 13, free translation). This risk would be expressed in terms of debt concentration in certain short term maturities, reducing the average maturity of the stock and the cash flow. Too short debt terms could erode investor confidence, leading them to demand higher risk premiums and thereby increasing the cost of debt. In the worst case scenario, the concentration of volumes to be rolled-over in the short term could create difficulties for the Treasury to finance itself. Note here the causality from debt management to the interest rate and to the government's financing "ability", assuming implicitly the idea that the government needs to "borrow" from the market in order to spend, therefore, government is subjected to "bond vigilantes".

The "benchmark" that public debt managers should pursue, therefore, is lengthening debt structure and increasing the share of fixed rate bonds. Firstly, debt lengthening is seen as a positive aspect because if the government must roll over the debt frequently in short periods of time, it can become a hostage to issues that may go beyond government autonomy, such as international interest rates, exchange rate pressure due to external events, or institutional rules that cannot be changed in the short term. It doesn't

mean that the Treasury will not be able to issue bonds, but that bond vigilantes are able to impose the interest rates they desire, and as there is a bigger volume to roll-over, the total debt cost in those conditions will be higher. Moreover, as the term structure of interest rates is what really matters for the real capital, and not the short term interest rate target by Central Bank, public debt should be reference for capital markets and private credit rates in the long term. Finally, in the presence of a long term benchmark on public debt, monetary policy tends to mostly affect the long curve of interest rates of the economy, with a stronger influence in private investment.

In regards to fixing public debt rates, the argument of benchmark literature is that it decreases payment volatility and the cash flow at risk, making it easier for debt managers to forecast the future debt cost. The predictability of future debt cost would give more flexibility for debt managers to plan the issuance strategies. Also, in the presence of shocks in the economy, when there are large variations in exchange rates and short-term interest rates, the impact over debt cost will reach a smaller share of the stock. Both factors would increase the confidence of the market and the attractiveness of public bonds.

Fixing public debt rates would also distinguish the public debt market from monetary policy. That means that monetary tightening doesn't have direct fiscal effect in terms of interest payments, which could impose limitations on other public expenditures. Also, a debt profile with mostly fixed rates would increase the monetary policy efficacy because of the "wealth effect" of bonds who lose value when interest rates increase.

In conclusion to the arguments described above, the "benchmark" is defined by stochastic risk indicators, and models such as Cash-Flow at Risk, Cost-a-Risk and Budget-at-Risk. Note that these are models used by the private sector, which in fact face risk of non-payment. The use of these models for the public sector, which cannot default in its own currency as we have seen, seems totally inadequate.

1.2.2. Theories of yield curve

As the term structure of interest rates is important for the literature related to bond vigilantes, this section present theories for their determination. At the end of the chapter we are going to relate them to our discussion of government spending, public debt and

interest rates. To begin with, the concept of “term structure of interest rates” can be described as the relation between interest rates of debt instruments with different maturities, and can be graphically referred as “yield curve” (Smithin, 2003).

There are four theories to explain the term structure of interest rates: i) the expectation theory; ii) the segmented markets theory; iii) the liquidity premium theory and (iv) the preferred habitat theory. We are going present all of them, but it should be noticed that the third and fourth theories incorporated components of the first two and attempted to amend their weaknesses, and, therefore, are considered better to explain the determinants of a yield curve (Mishkin, 2010).

For the expectation theory, bonds with different maturities have different rates due to the expectation of short-term interest rates at future dates. A bond of two years maturity should provide an equivalent return of a one-year bond hold to maturity and reinvested in another one-year bond, so that the two-year bond will incorporate the investor’s expectation of the future interest rate. According to this theory, investors don’t have any preference for specific maturities, because they should provide the same return on average on time, as perfect substitutes.

As a consequence, according to the expectation theory the yield curve have an upward-sloping when short-term interest rates are expected to rise in the future, and a downward-sloping when the average of future short-term interest rates is expected to be below the current short-term rate, also known as “inverted yield curve”.

The segmented markets theory supposes that the interest rate of bond with different maturities is determined by the supply of and demand for that maturity. This means that bonds with different maturities are not substitutes and the expected return from holding a bond with short maturity has no effect on the expected return of bonds with long maturities, cause they are offered and demanded by investors with different preferences. Money market funds, for example, would prefer assets of short maturity due to the immediate redeemability of shares, while pension funds would prefer long maturity bonds as they can carry assets for longer periods with less risk.

For the segmented markets theory, as the demand for long-term bonds is relatively lower than the demand for short-term bonds, the yield curve tends to have an upward-sloping.

The liquidity premium theory combines elements of the previous theories. The interest rate of a long-term bond will be the average of short-term interest rates expected for the maturity period plus a *liquidity premium* influenced by supply and demand

conditions. Because long-term bonds can have capital losses due to interest rate variations not well incorporated in expectations, they should provide a liquidity premium to induce investors to hold them.

Finally, the preferred habitat theory also incorporate the assumption that investors have a preference for specific maturities (a preferred habitat), but, in addition, they will be willing to buy bonds with different maturities if they provide higher returns. Therefore, bonds are substitutes, but not in a perfect way as in the expectation theory.

For both liquidity premium and habitat theories, the yield curve tend to slope upward but, depending on expectations of short-term rates at future dates it can bend downward. In this case, the short-term interest rates are expected to fall so much that the average of future expected short-term rates is below the current short-term rate, even after the addition of the liquidity premium to this average. That means that the effect of the expectation that the rate is going to fall in the future is bigger than the liquidity preference. Combined, those theories provide a reasonable explanation for term structure interest rates determination.

Note that the term structure of interest rates theories provide explanations for the interest rates of bonds with different maturities, or, as pointed in the beginning of the section, for the determination of the yield curve. So, what determines the short term interest rate, or the vertical intercept of the yield curve?

This is one of the main subjects of the Economic Science since its origins, and this chapter does not aim to focus on this discussion. We adopt the Endogenous Money approach where the short interest rates is a policy variable determined by the Central Bank, and not by a process of market clearing in the loanable funds market equilibrated by a “natural” rate². In the theoretical view of this paper, the short interest rate is exogenous, settled in a level that reflect the monetary policy choices in regards to inflation, balance of payments and income distribution³.

Given an exogenous short-term interest rate determined by the monetary policy, we believe that the long-term interest rates are determined by the expectations of the short interest rates in future dates, plus a liquidity premium that embodies possible mistakes of forecast (causing capital losses) and supply and demand market conditions (such as the

² For a literature review of the determinants of interest rates, see Smithin (2003), chapter 6.

³ A vast literature on the Endogenous Money approach can be found in Arestis & Sawyer (2006), chapters 1 to 3, and Lavoie (2014), chapter 4.

movement of pension funds). Demand conditions can be relativized, because, even if, for example, a big movement of pension funds buying securities tend to affect prices, these securities are not going to be bought if they are not profitable in relation to the expected future interest rates. Anyway, depending on those variables, mainly determined by expectations of the interest rate in the future, the yield curve can be upward or downward sloping, with its intercept determined exogenously by the Central Bank and the current monetary policy pursued.

1.2.3. Debt management and cost in MMT

As pointed by Eric Tymoigne in the very beginning of his paper, “one of the main contributions of modern money theory (MMT) has been to explain why monetarily sovereign governments have a very flexible policy space” (Tymoigne 2014, p. 641). MMT provides a clear framework to understand the debt management debate, as it shows how institutional self-imposed restrictions and specificities of developing countries might reduce policy space, as already discussed, but do not eliminate the government’s control over the interest rate it pays on its debt.

The foundation of the “bond vigilantes” argument relies in the view that in order to spend or roll over its debt, the government needs to “borrow” from the market and accept its conditions. As the Central Bank is usually prohibited from buying Treasury bonds in the Primary Auctions, it seem that the private market has a bargaining power to impose risk premiums on the Treasury, therefore eliminating the autonomy to set interest rates.

However, MMT shows that this is not correct in real the case. 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. If the market participants reacts against budget deficits demand higher interest rates, the Treasury can stop selling bonds and leave the reserves in the banks instead (Wray, 2014). As there is no reason for market participants to prefer to accumulate reserves paying no interest, since at some point in time they will settle their expectations and stop “losing” revenue. Moreover, the fact that 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.

Besides the fact that the government doesn't need to "borrow" from the market to finance its outlays, self-imposed restrictions are easily "bypassed" in order for the government to roll-over its debt or issue new one, mainly due to four reasons (Tymoigne, 2014).

The first one is the Primary Dealer system, as is the case of Brazil. Dealers are financial institutions that are **obliged** to make bids in the Primary Treasury Auctions. Therefore, there will always be an offer which the Treasury can accept or not. Maybe the rate is not interesting for the Treasury, and he can wait to issue in a better condition, but there will never be a case where government bonds are not "accepted". Dealers can't refuse to make the bids. And if the rate is too high, the bid might be not accepted **by the Treasury**, not by the market. In Brazil, in case a dealer persistently doesn't give reasonable prices and does not perform, it can be substituted by other institution⁴.

As noted by Tymoigne (2014):

"The Primary Dealer system has created a very stable and dependable demand for treasuries because the Federal reserve ensures primary dealers always have sufficient funds to participate in auctions by accepting treasuries as collateral for repos or by buying treasuries outright. (...) While the Federal Reserve is not directly buying treasuries from the Treasury, the end result is exactly the same as if it did." (Tymoigne 2014, p. 656).

This is the exactly the same case in Brazil, as Brazilian Central Bank must provide funds as soon as there is pressure in the open market in order to maintain the interest rate target. This fact actually leads to the second reason why Treasury is not subjected to market power bargain. Although the Central Bank cannot participate in the Primary Auctions, its operations in the secondary market influence the yield curve by buying and selling long-term treasuries and by influencing expectations about short term rates in future dates, exactly how highlighted by liquidity premium and habitat theories of term structure interest rates. The interest-rate policy of the Central Bank, therefore, plays a crucial role in determining both the level and slope of the yield curve on Treasuries.

⁴ The rules and criteria of the Brazilian Primary Dealer System is defined by the "Portaria n. 90", since 7th February 2018.

The second reason is that, in order to maintain a reasonable volume in its portfolio for monetary policy purpose, the Central Bank is allowed to buy treasuries in Primary Auctions⁵. This not only guarantee that Central Bank can operate in the secondary market as mentioned above but also “helps to ensure smooth refinancing operations for the Treasury” (Tymoigne 2014, p. 656). This also ensure that, if bids are not reasonable and Treasury deficit spends without selling bonds, the Central Bank can drain liquidity through operations in the secondary market, to maintain interest rate target.

Finally, the Treasury may improve the control over the cost of its debt by managing the maturity of bonds offered in the Auctions. If conditions are such that few financial institutions want to buy long-term treasuries (and therefore bids are going to incorporate high premiums and be unfavorable for the Treasury), the Treasury may decide to issue only short-term bonds. The same applies to bonds with fixed rates or indexed to inflation. If participants request high rates for these conventional bonds, the Treasury can decide to offer only floating ones. In that case, the cost of the public debt will be totally under the control of the Central Bank. MMT reaches the correct conclusion in regards to the cost of public debt: “Thus, if cost is the only consideration, it is possible for the Treasury to be less subject to potential volatility in some segment of the treasuries market by changing the maturity structure of its outstanding debt.” (Tymoigne 2014, p. 659).

Note how this is different from the benchmark literature, which assumes that a long and fixed profile is better by definition due to “refinancing risks” and market bargaining power in setting premiums. Alternatively, MMT correctly explains that it is the Treasury which has the power and control over the cost of its debt and the conditions of issuance. There is no rigid benchmark that should be pursued due to “bond vigilantes” that can threaten Treasury from affording spends by debt issue.

Finally, we want to highlight what is mistakenly understood as a “difficulty” to debt refinancing. We saw that not being able to issue bonds is not a possibility due to several reasons. Firstly the existence of a primary dealer system, secondly the profitability for financial institutions to buy any asset that pays any rate higher the interbank reserve market and, finally, the cooperation between Treasury and Central Bank. So, any problem with “refinancing” (meaning the rate of public bonds issued, not the occurrence of issue), will be related to inflation or international capital flows, this last

⁵ In Brazil, this is garanteed by Law n. 11.803/2008, as will be discussed in Chapter 2.

one related to external factors such as global liquidity, and not the domestic debt in local currency. There is no situation when the government cannot issue bonds even in adverse conditions. The Brazilian case is going to be discussed in chapter 3.

1.3. Government spending, public debt and interest rates: an MMT perspective

By adopting the Functional Finance approach and the Modern Money Theory, we intend to cover the topics explored in the previous sections giving an encompassing and interconnected explanation from them. In the conclusion of this chapter we will also criticize the benchmark literature and relate it, as well as the yield curve theories, to our discussion.

1.3.1. How Government really spends

MMT seeks to detail the coordination of operations between the Treasury and the Central Bank, a process that can shed light on how the government actually spends and finances itself (Wray 2015, p. 2). The relationship between these two public sector entities contributes to reach an understanding of why governments don't have a financing restriction in their own currency and what means a public debt market in the modern monetary economy.

As mentioned before, public expenditures are made by keystrokes that credit reserves in the commercial banks accounts of the system, and governments can always afford larger keystrokes. It was also mentioned that in everyday public activity, public spending does not necessarily coincide with the collection of tax revenues or revenues from the sale of government securities. There is no fine adjustment between spending and prior revenue collection. In daily public accounting, when the government needs to make an expense, as purchase an equipment, for example, the amount is debited from the Treasury account in the Central Bank, and credited to the commercial bank in which the company has an account. If various payments are made by the government during a certain period of time, therefore increasing the liquidity in the bank reserve market, without intervention by the Central Bank, the result will be lower interest rates.

For this process to work, three assumptions seem to be necessary, namely that there is a positive balance in the Treasury Account, that this balance can be used for any purpose, and that the Central Bank has sufficient treasuries in its portfolio to operate in the secondary for monetary policy purposes. The first seems to have been a result not only of previous historical fiscal surpluses but also of the ability of sovereign states to impose taxes and issue securities. The second depends on institutional rules that restrict the destination of the revenues collected by taxes. The third also depends on institutional rules regarding the relation between Treasury and Central Bank. The Eurozone would be an example of rules that strongly prohibit or discourage the European Central Bank to buy securities from national treasuries both in primary and secondary markets.

In the case when it is institutionally allowed for the Central Bank to buy public bonds, at least in the secondary market, in order to drain reserves generated by keystrokes from the Treasury, then the Central Bank must have these assets in its portfolio. This is precisely a point of criticism of some authors, such as Lavoie (2013), who says this is an important step skipped by MMT. This step, in his opinion, would mean that MMT is incorrect to say that government spending doesn't need to be financed, even considering that they are made by keystrokes. If the Central Bank has to act in the secondary market through repo operations, that means that at some point the Central Bank had to buy public bonds from the Treasury to ensure a portfolio big enough for its purposes, thus, the Treasury needs to be financed.

This criticism is extended for the T-accounts that MMT uses to show how government really spends, which usually consolidate Treasury and Central Bank in one balance, a "government" balance, evidencing its interpretation that both institutions should work together in coordinated actions to ensure full employment, with price stability, for the society. In the next section we are going to present the T-accounts used by MMT to show how government spends and we are going to see that deconsolidation doesn't change the final results, as Lavoie recognizes. However, we also believe that it doesn't change the main interpretation of MMT, that government doesn't need financing, as we shall see.

Finally, we are going to see that the rule that government spend must have a simultaneous debit in its account at Central Bank, which in turn is "fed" by taxes and bond sales revenues, also doesn't change the conclusions. Although it seems that expenditures depend on these receipts, the final result is just the same. Actually:

“The rule itself and the added complexity can be counterproductive if they influence policymakers’ decisions regarding options available in times of macroeconomic difficulty” Wray 2015, p. 1000.

Next section will provide a more detailed analysis on the relation between Treasury and Central Bank in order to develop and clarify these issues, very common in the debate in Brazil, as we will be discussed in chapters 2 and 3.

1.3.2. An analysis of Treasury and Central Bank balances

The T-accounts used by MMT are very useful to understand how a government actually spends in real modern monetary economies. By showing step by step of government spending, we will show that restrictions are all self-imposed and make no difference in the final position of Treasury and Central Bank Balances after all the spending operations. Based on Wray (2015), we will show the case when *Treasury collects taxes and then spends ($G=T$)*, the case when *Treasury previously issues a bond to the private bank sector and then spends ($G>T$)*; and, finally, when *Treasury deficit spends without previous tax liability or bond issue ($G>T$)*. As mentioned in the quote above, we’ll show how the self-imposed restriction only creates burdensome for the government to be able to use fiscal policy as a tool for social and economic development, but doesn’t change the fact that government can always afford its expenditures in its own currency.

CASE 1: Treasury collects taxes and then spends ($G=T$)

First, the Treasury imposes a tax liability on the Private Nonbank Sector. Note that the tax liability reduces the taxpayer net worth and increases the Treasury. As argued by Wray (2015), that is exactly the purpose of taxes, enable the government to move resources from the private sector.

Treasury imposes a tax liability:

Treasury	
Asset	Liability
+Tax Liability	+Net Worth

Private Nonbank Sector	
Asset	Liability
	+Tax Liability -Net Worth

Now the tax is paid by debiting the taxpayer's deposit and the bank reserves. The taxpayer is referred by "household". Following Wray (2015), we are also assuming that the private banking sector has no extra reserves to be debited, hence the Central Bank lend reserves.

Taxes are paid and Treasury moves deposit to Central Bank:

Treasury		Central Bank	
Asset	Liability	Asset	Liability
-Tax Liability	+Net Worth	+Loaned Reserves	+Deposit Treasury
+Deposit Central Bank			

Private Banks		Private Nonbank Sector	
Asset	Liability	Asset	Liability
	-Deposit household	-Deposit household	-Tax Liability
	+ Borrowed Reserves		

With a deposit in its account at the Central Bank, now the Treasury can buy a good from the private nonbank sector (the purchase of a "good" could be substituted by a payment for a civil servant for example). The Treasury spends by crediting bank account reserves and debiting its account at the Central Bank. Finally, the private bank credits the good seller's account.

Tresury spends by crediting bank accounts

Treasury		Central Bank	
Asset	Liability	Asset	Liability
+Good			-Deposit Treasury
-Deposit Central Bank			+Reserves

Private Banks		Private Nonbank Sector	
Asset	Liability	Asset	Liability
+Reserves	+Deposit household	-Good	
		+Deposit household	

Note that the act of providing reserves to the Private banking sector allows the lending operation from Central Bank to be reversed. The credit of reserves in the private bank asset side will be simultaneously debited with the borrowed reserves in its liability sided showed in the previous balance. Likewise the credit of reserves in Central Bank's liability side will be debited by the Loaned Reserves in its previous asset side.

Summing all assets and liabilities, the final position will be:

FINAL POSITION, case 1.			
Treasury		Central Bank	
Asset	Liabilty	Asset	Liabilty
+Good	+Net Worth		
Private Bank Sector		Private Nonbank Sector	
Asset	Liabilty	Asset	Liabilty
		-Good	-Net Worth

As we can see above, the result of a government balanced budget - taxing equal to spending - was to move a good (or service) from the private sector to the government, reducing the private sector's net worth. There was no change in the private bank sector portfolio, but the nonbank sector, as pays the taxes, "destroys" deposits received by the selling operation. It changes a real asset (good) by a financial asset (deposit), but loses deposit to pay the tax. So, at the end, private sector has its net worth reduced. The idea is that, as pointed by Wray (2015), the government uses the monetary system to accomplish the "public purpose" of getting resources produced by the private sector (Wray 2015, p. 92).

CASE 2: Treasury issues a bond to the private bank sector and then spends ($G > T$)

Now we will assume that, in order to be able to write a check in its account at the Central Bank, the Treasury will generate a deposit in that account by issuing a bond. Note that, as no tax liability is imposed, we have a government deficit spending ($G > T$).

So, first the Treasury issues a bond.

<i>Treasury sells a bond to a private bank</i>			
Treasury		Private Banks	
Asset	Liabilty	Asset	Liabilty
+Deposit Private bank	+Bond	+Bond	+Deposit Treasury

Now the Treasury generated a deposit that can be moved to its Central Bank account. Again, we will assume that the private bank sector has no extra reserves to debit in order to pay for the bond, hence the Central Bank will lend reserves.

Treasury moves deposit to Central Bank Account

Treasury	
Asset	Liability
-Deposit Private Bank	
+Deposit Central Bank	

Central Bank	
Asset	Liability
+Loaned Reserves	+Deposit Treasury

Private Bank Sector	
Asset	Liability
	-Deposit Treasury
	+Borrowed Reserves

With the deposit in its account in CB, now the Treasury can buy a good from the private nonbank sector. The Treasury spends by crediting reserves in the private bank account, and as a counterpoint there is a debit in the Treasury account in BCB. Finally, the private bank credits the good's seller account generating a “household” deposit.

Treasury spends by crediting bank accounts

Treasury	
Asset	Liability
-Deposit Central Bank	+ Bond
+Good	

Central Bank	
Asset	Liability
	-Deposit Treasury
	+Reserves

Private Bank Sector	
Asset	Liability
+Reserves	+Deposit Household

Private Nonbank Sector	
Asset	Liability
-Good	
+Deposit Household	

When the private bank receives a credit to their reserves originated by Treasury’s outlays, the lending reserve operation by the Central Bank is reversed. That means that the last credit in the Private Bank Sector asset side is simultaneously debited with the borrowed reserves from Central Bank.

Summing all assets and liabilities, the final position is presented below. The private nonbank sector modifies its asset portfolio (from a real asset, the good, to a financial asset, the deposit), with no change in its final net worth. This good is transferred to the government, which has, as its final position, a bond as liability, held by the private bank sector. The private bank, in turn, has a bond as an asset, but has a deposit to the household as a liability, resulting in no change in its net worth as well.

FINAL POSITION, Case 2.			
Treasury		Central Bank	
Asset	Liability	Asset	Liability
+Good	+ Bond		
Private Bank Sector		Non-financial Private Sector	
Asset	Liability	Asset	Liability
+Bond	+Deposit Household	-Good	+Deposit Household

Differently from case 1, in case 2 there is no decrease of net worth for private sector, but only a change in its portfolio. As there was no tax liability, the Treasury executed a deficit purchase. This was done by debiting its account in the Central Bank, which, in turn, was previously credited by the Treasury's bond sale. On the other hand, when the government taxes before it spends and thus has a balanced budget, as we saw in case 1, there is a decrease in total net worth of private sector.

In both cases governments spends when the Treasury can debit its account in Central Bank, therefore, Treasury must collect taxes or issue bonds before it spends. This is exactly the Brazilian case, as well as the United States. Now we will relax this hypothesis to prove that this is a self-imposed restriction that make no difference for the final results. This confirms the MMT argument that governments don't need or depend to "finance" their expenditures with taxes receipts or bond issues in a modern monetary system.

CASE 3: Treasury deficit spends without previous tax liability or bond issue (no debit in Central Bank account when Treasury spends)

Although this case is not allowed in most governments, such as the Brazilian, we are going to present it to show that the results and interpretation are the same.

First the Treasury spends by creating reserves in the bank system. This is a keystroke with no debit in the Treasury account on Central Bank. When the Private Bank has its reserves credited, it simultaneously credits the good seller's account, generating a deposit to the household that sold the good.

Treasury spends by crediting bank accounts

Treasury	
Asset	Liabilty
+Good	

Private Bank Sector	
Asset	Liabilty
+Reserves	+Deposit household

Central Bank	
Asset	Liabilty
	+Reserves

Private Nonbank Sector	
Asset	Liabilty
-Good +Deposit household	

However, the private bank sector is holding more reserves than desired, resulting in a downward pressure on open market interest rates. Therefore, the Central Bank responds by selling a bond, to drain these excess reserves and maintain the overnight interest rate target.

Central Bank drains the excess reserves

Central Bank	
Asset	Liabilty
	-Reserves +Bond

Private Bank	
Asset	Liabilty
+Bond -Reserves	

Summing all assets and liabilities, we have the final position:

FINAL POSITION, Case 3.

Treasury	
Asset	Liabilty
+Good	

Private Bank Sector	
Asset	Liabilty
+Bond	+Deposit household

Central Bank	
Asset	Liabilty
	+Bond

Private Nonbank Sector	
Asset	Liabilty
-Good +Deposit household	

Now we are going to stress some critical arguments to this whole process of government expenditure.

Firstly, one should note that the final position of the case 3 – when Treasury spends with no previous receipts from taxes or bond sale – is exactly the same as the case 2, when the Treasury sold the bond *before* the spend. The impact in the monetary system is the same. Central Bank, as part of monetary policy, has to maintain the overnight interest rate target and thus must cooperate with the Treasury. How do we know that this coordination happens? Because the overnight interest rate target has always been achieved and Treasury checks have never bounced. Even when the tax receipts are lower

than foreseen by policy makers, public servants wages are being paid and spends like social security are made.

Secondly, we want to highlight the discussion in regards consolidating Treasury and Central Bank balances (Lavoie, 2013). Here, all three cases were shown through deconsolidated balances for the government, and the conclusions were the same as if they were consolidated. Deconsolidating only adds more steps and it is a matter of analytic systematization. MMT argues that, as fiscal and monetary policy should be used as a mix of policy in order to achieve full employment, consolidating Treasury and Central Bank balances in a “Government” one just evidence that in democratic society both institutions should work together to achieve its goals.

Now we will discuss maybe the most polemic point: the step where Treasury sells a bond to the Central Bank and or the Central Bank lends reserves for the private sector for it to buy public bonds, in other words, the “ex ni-hilo” credit creation that origins all the process.

The step which shows the case when the Treasury sells a bond to the Central Bank, has, according to Lavoie (2013), makes it unrealistic and hides that the Central Bank is financing the Treasury, allowing it to “print” money through the keystrokes. In Brazil, as well as in United States, the Treasury is prohibited to sell bonds to Central Bank in the Primary Auctions, unless there is a necessity for the Central Bank to adjust its portfolio for monetary policy’s purposes (in Brazil, Law 11.803/2008). When it happens, there is no financial counterpart, in other words, Treasury issues a bond to Central Bank and there is no credit in the Treasury account at Central Bank. We do not consider that this institutional feature nullifies MMT’s argument that government can always afford larger keystrokes. Again, the inexistence of a rule to ensure Central Bank of making monetary policy would be a self-imposed restriction with the purpose of weakening fiscal policy and government intervention. But not a symptom that governments can’t afford their spends in their own currency. Treasury and Central Bank cooperation is necessary for the system to work, and self-imposed restrictions to avoid that are political choices.

In regards to the creation of reserves to the private sector to buy the public bonds – the aggregate ex-nihilo credit creation –, we can link the issue with others discussed in previous sections. If it is possible for a commercial bank to buy treasuries in a Primary Auction that offers any interest rate higher than the interbank reserve market base rate, it is going to be profitable for the bank to make it. The bank will look for reserves in the open market, generating an upward pressure on interest rate, and the Central Bank will

have to act, offering reserves, in order to maintain the target rate⁶. Also, there are the advantages of being a Primary Dealer and making reasonable bids, as we discussed in previous section, which stimulates private sector to buy the treasuries.

Finally, in regards to the rule that Treasury can only write checks on its account at Central Bank, MMT argues that as it makes no difference in the final result, being this rule a self-imposed restriction that doesn't change the nature of government spending. In a modern monetary system, where the Central Bank has to achieve the overnight interest rate target, the result is the same if the Treasury sells a bond before it spends, or if the Central Bank buy it in the secondary market as part of monetary policy. There is cooperation between Treasury and Central Bank and, again, that's why monetary policy targets the interest rate and government checks do not "bounce". Also, that's why MMT argues that tax and bonds don't "finance" government spending, as the government spends by crediting reserves in the banking system through keystrokes. Take out this self-imposed constrain (case 3), which is a matter of legislation/regulation, and we have the same point (case 2).

Actually, besides this aforementioned rule, the United States has also the debt ceiling rule. Every time value is reached, the Congress approves an increase in this ceiling, cause it makes no sense that the spends approved by the same Congress (in a yearly budget) will fail due to constrain imposed by themselves. There might be tension in the Congress for the approval, and this is certainly a political powerful bargaining instrument, but it has always been achieved.

Finally, it could be argued that, considering the existence of the rule that the Treasury must write checks only in its account at Central Bank, one could argue that government is a hostage of the market to "feed" this account with deposits from bond sales, in case tax receipts face a drastic decrease due to economic cycles (or in case G is systematically bigger than T). If the Treasury expenditures always have a counterpart in its account at Central Bank, then this spending is, by rule, backed by a tax or bond sale receipts. As the Single Account cannot be debited forever, under the risk of vanishing its balance, this institutional feature confuses the understanding of how the government spends and functions, even among economists. It gives the impression that, in order to spend, the government depends on being financed, if not by taxes, necessarily by bond issuance, in order for a credit to be generated in the Single Account.

⁶ See how even private sector recognizes it in a Standard & Poors publication: Sheard, P. (2013) "Repeat after me: banks cannot and do not "lend out" reserves".

Why is this incorrect? Because the return of cash to the Single Account might not be simultaneous or automatic, but is guaranteed, even if there is a primary fiscal deficit. MMT provides the correct reasons: public bonds are an alternative asset for reserves that don't earn any interest rate; there is a legal framework to guarantee that the Central Bank will always have an adequate portfolio of public bonds for monetary policy purposes, and thus, the Central Bank provides infinite liquidity for public bonds in the open market reinforcing public bonds as a desired and profitable asset; and finally, the Primary Dealer System.

Considering that MMT is sustained in the face of all these counter arguments, next table systematizes the 3 cases presented of how government really spends.

Table 1: Systematization of government expenditure

Spend Nature	Operacional Procedure	Budget Result	Private Net Worth	Impact on Monetary base		
				Treasury	Central Bank	Final (Government)
Treasury collect taxes before it spends	debit in Single Account	$G=T$ (balanced budget)	↓	Destroys reserves when collects taxes and creates reserves when it spends	None	Constant
Treasury sells bonds before it spends	debit in Single Account	$G>T=0$ (deficit)	Constant	Destroys reserves with bond sale and creates reserves when it spends	None	Constant
Treasury spends with no previous tax liability or bond sale	keystroke with no debit at Single Account as counterpart	$G>T=0$ (deficit)	Constant	Creates reserves when it spends	Drains the liquidity in the secondary market to maintain interest rate target	Constant

To conclude, we quote Wray 2015:

“This means that treasury can always sell securities and can always get deposits at the Fed in order to spend. The self-imposed “constraints” are not a constraint. There are no “bond vigilantes” who might prevent Uncle Sam from spending by refusing to lend to him.” (Wray 2015, p. 102)

This is precisely the same for Brazilian government spends in the local currency, the Real. Next chapters are dedicated to provide data and arguments corroborating this thesis for Brazil.

1.4. Final remarks

We saw in this chapter that a government can always finance its spending in its own currency, and should do so to bring the economy to full employment. Even in neoclassical economics there is no possibility of default in public debt denominated in local currency, only a risk of hyperinflation associated with monetization.

The benchmark literature, by suggesting that public debt should pursue long maturity and fixed rates, ignores the ultimate aspect that, no matter what the debt profile, a government can always finance its spending in local currency. Moreover, this literature does not emphasize the main determination of a yield curve, which is the expectation of the future interest rate, as we have seen in the section on the term interest rate structure theories. Therefore, pursuing a benchmark may be positive from the debt manager's bureaucratic point of view, and also to minimize debt costs, but it has nothing to do with maintaining a profile that release an alleged hostage position of the Treasury with respect to the market. As we defended here, this situation cannot exist.

Finally, using MMT framework we have shown how a sovereign government really spends (in local currency) on a modern capitalist economy and why the government does not default into its own currency, and still has much power to influence the cost of its debt in the short and long term, due to the coordination of the National Treasury and the Central Bank.

Now we will present empirical data from Brazil that corroborates all these issues.

CHAPTER 2: THE INSTITUTIONALITY OF BRAZILIAN GOVERNMENT SPENDING AND AN ANALYSIS OF PUBLIC PRIMARY AUCTIONS IN THE 2000s

As highlighted in the last chapter, an important point stressed by the heterodox literature that share the basic tenets of the MMT approach (see Lavoie 2013 and Cesaratto 2016), is the way the Government spends, or, in other words, the way credit creation occurs, which takes into account the relationship between the Central Bank and Treasury. There is no divergence among authors that the final result, in terms of Treasury, Central Bank, and private financial sector balance sheets, is equivalent whether the analysis separates the Central Bank from the Treasury, as we have seen, resulting in no financial constraint for the government. However, the institutional setting behind the nexus between these two institutions is an important policy variable, as well as the rules and laws concerning the fiscal-monetary nexus. Therefore, before proceeding in our analysis we must present the basic institutional characteristics of how the Brazilian Government spends, issue bonds and the relation between the Central Bank and Treasury. Afterwards, the Primary Auctions in the 2000s will be analyzed in order to empirically support the theoretical claims of this thesis.

2.1. Budget legislation

The Brazilian budget legislation for government spending is based in three pillars: Pluriannual Plan (PPA⁷), Budget Guidelines Law (LDO⁴), and the Annual Budget Law (LOA⁴).

The PPA is a general plan for a four-year period, submitted by the Executive to the Congress by August 31th of the first year of a government term, and this proposal, should last until the end of the first year of the next government term. This rule is meant to promote administrative continuity, avoiding abrupt changes after a new administration takes office. Based on the approved PPA, the federal government submits to Congress a law, the LDO, that will define priorities and guidelines for the annual budget, which, in

⁷ In Portuguese: PPA – Plano Plurianual; LDO – Lei de Diretrizes Orçamentárias; LOA – Lei Orçamentária Anual.

turn, is going to result in another law, the LOA. The first is presented and voted in the beginning of the year and the second in the second semester.

This budget legislation is first elaborated by the Executive and, at the National Congress, they are amended and voted by the Joint Commission on Plans, Public Budget and Supervision⁸, constituted by deputies and senators. After that, the projects are voted in a Congress' plenary session. Once approved, the draft budget returns to the Executive for sanction by the President, becoming law. Note how many phases and conflicts take place in order to accommodate different interests and social demands. There is a political and institutional dispute around the budget resources allocation but not in terms of economic resources. Those laws create constraints for government expenditure, but it is not because the government is financially constrained, as discussed in the chapter 1, but because of the institutional constraints, as will be discussed in this chapter.

Once approved the LOA, which defines the annual budget, all the information regarding the planned and approved expenditure is released in “Sistema Integrado de Administração Financeira do Governo Federal” (SIAFI), the online federal system for financial management, and the budget credits are created. From there, the process of execution of the budget begins, which means carrying out the public expenditures authorized by the Congress, strictly following the stages defined by the Law N. 4320/64: commitment, settlement and payment. As will be described in the next section, Management Units (UGs) command keystrokes and the payments are made by Bank Orders, crediting the beneficiary account, with the Banco do Brasil as the intermediate financial agent between the government and the beneficiary.

2.2. The Treasury Single Account in Brazilian Central Bank

The Brazilian National Treasury (BNT) maintains an account in the Brazilian Central Bank (BCB), called “Single Account”, which concentrates all the availabilities of the State, meaning Union, state funds and autarchies. These availabilities are remunerated by the interest of federal government securities held on BCB's portfolio⁹, which, in practice, is very close to the Selic rate.

⁸ In Portuguese: Comissão Mista de Planejamento, Orçamento e Supervisão.

⁹ This rule is defined by the “Medida Provisória” n. 2.179-36, from 2001.

The origin of the Brazilian Treasury Single Account in Central Bank of Brazil dates back to 1967, with the Decree-Law N. 200, which established the guidelines for an administrative reform, and ordered the Ministry of Finance to implement the unification of resources handled by the National Treasury. The goal was to promote the organization of the Federal Administration and to optimize the procedures for the implementation of disbursement financial programming.

However, this legal determination was only in strict compliance when the Constitution was promulgated in 1988. Every Treasury fund deposited in all financial agents became centralized in one Single Account at the Brazilian Central Bank. This centralization represented the end of more than 5 thousand governmental bank accounts and streamlined the process of financial transfer and payments to third parties. Banco do Brasil became the only financial agent of the Government.

The Single Account is divided into three subaccounts: i) National Treasury, for receipts and payments of the Federal Public Administration in general; ii) Public Debt: for payments and revenues from public bond auctions; iii) Social Security Fund¹⁰, for payments of benefits granted by social security and managed by the National Institute for Social Security¹¹.

The subaccount National Treasury is mostly comprised of revenues imposed by law to specific purposes, which do not have flexibility in regard to destination. They are the so called “stamped” resources, as shown in the table below.

Table 2: National Treasury Account in Central Bank - subaccounts

Subaccount National Treasury - By destination
Ordinary Resources
"Stamped" Resources
Education
Social Security
Pension Fund Regime (RPPS)
General Pension Fund Regime (RGPS)
Financial receipts
Credit Operations
Disposal of Goods and Rights
Legal and Constitutional Transfers
Donations
Other resources destined to Programs or Entities
Other resources destined to Funds
Other Resources
Resources to be transferred to the Public Debt subaccount

¹⁰ In Portuguese, Regime Geral de Previdência Social – RGPS.

¹¹ In Portuguese, Instituto Nacional de Previdência Social – INSS.

Table 1 shows that the balance in the subaccount National Treasury cannot be used for any purpose, as there are institutional restrictions that must be attended to. The Ordinary Resources are the only ones without a specific destination. Financial receipts include the transfer from Central Bank positive results (from its balance) and should be destined exclusively to amortize public debt. The resources coming from Central Bank positive result should, preferably, be destined to amortize bonds held in its portfolio.

The subaccount FRGPS concentrate balances for social security purposes, and was created as required by the Federal Constitution of 1988, art. 177, item XI, which prohibits the use of resources from social contributions for expenditure other than payment benefits of the General Social Security Scheme (RGPS). This subaccount receives transfers of INSS resources collected by Federal Revenue Documents (DARF) and Social Security Guide (GPS).

Finally, the subaccount Public Debt concentrates the resources raised by public bonds issuance, destined mainly for the payment of public debt – redemption, roll-over and amortization of securities, in addition to payment of interest, following the strategies defined by the “Plano Anual de Financiamento¹²” (PAF). Part of this subaccount resources can be allocated to cover other public budget expenditures, which is more common in times of primary fiscal deficits, but this allocation depends on a previous approval by the budget law of the year. As a strategy of the Brazilian National Treasury, this balance is aimed to contain enough resources to pay the totality of the Federal Public Debt service (principal and interest) maturing within 3-6 months. This is the so-called federal debt liquidity cushion, which provides flexibility to the National Treasury to not issue bonds during periods of turbulence, when financing costs may be distorted. This is going to be discussed in more details later.

2.3. How Brazilian government spends and collect taxes

When the government spends, a debit is generated on the Treasury Single Account in the Central Bank and a credit is generated at a reserve account of “Banco do Brasil”, which is a partially owned state bank and financial agent of the Union. Banco do Brasil,

¹² Annual Public Debt Financing Plan, published by the Brazilian National Treasury: <http://www.tesouro.fazenda.gov.br/plano-anual-definanciamento>

in its turn, transfers these resources to the reserve account of the bank where the beneficiary holds an account. Every commercial bank has a reserve account, which is mandatory for institutions with short-term deposits and optional for multiple banks without a commercial portfolio.

Those transfers are made through the “Sistema de Transferência de Reservas¹³” (STR), integrated by the Central Bank, the National Treasury and financial institutions. As one bank cannot have an account at another bank, all payments have final settlement in the reserve accounts in STR. The System was created in 2002 and reduced the period between inflows and outflows of resources in the Treasury account in BCB, as well as the time for the beneficiary to be credited.

The inflows and outflows on the Single Account are generated by the federal system for financial management “SIAFI – Sistema Integrado de Administração Financeira do Governo Federal”. In the context of MMT, SIAFI is the system through which keystrokes are registered. The keystrokes in SIAFI are commanded online by a federal “Management Unit”, in Portuguese, “Unidade Gestora – UG”. There are 4.420 UGs scattered all over the country, and they are institutions permitted to make payments on behalf of the government. Examples of UGs are state enterprises, public schools, foundations, agencies, institutes, universities, and ministries.

Outputs (debits) of the Single Account, are generated by an order of payment, or “Bank Order”, commanded by the UGs. As a general rule, if the bank order is issued on day t_0 , resources leave the Single Account in BCB in the next day t_{+1} ; and the recipient will receive the funds in the following day t_{+2} , that is, two days after the issuance of the Bank Order. Banks earn remuneration by housing the funds during this one day period. One exception is when the Bank order is due to wage payroll, as banks are prohibited to earn remuneration in this case and are obliged to transfer the funds in the following day right after the issuance of the order (t_{+1}).

Inputs (credits) in the Single Account are generated when taxes are paid, through different documents or keystrokes. One example is the tax payment through the “GRU - Guia de Recolhimento da União”, a federal tax collection guidance that generates a bar code billet that can be paid by the citizen in any commercial bank. The resources are transferred to Banco do Brasil that, in turn, transfers them to the Single Account of the

¹³ Reserves Transfer System.

Treasury at Central Bank. The table below summarizes the keystrokes that can be generated by the UGs for government payment or tax purposes.

Table 3: Brazilian government keystrokes

Document (or keystroke)	Finality	Single Account
OBC	Bank Order by Credit	Debit (output of resources)
OBP	Bank Order by Payment	
OBB	Bank Order for Bank	
OBA	Bank Order for Asset Investment	
OBK	Bank Order for Exchange Rate	
OBJ	Bank Order for Judicial Deposit	
OBSTN	Bank Order for Treasury Payments	
OBR	Bank Order for Credit of Reserves	
OB Cartão	Bank Order though a Card	
OBH	Bank Order for Judicial Process	
OBF	Bank Order for Wage Payroll	
OB SPB	Bank Order for the Brazilian Payment System	
OBD	Invoice Bank Order	
GRU	Federal taxes, non managed by the Federal Receipt Secretary	Credit (input of resources)
DARF	Federal taxes, managed by the Federal Receipt Secretary	
GPS	Social Security Taxes	
DAR	State or Municipal Taxes	
GSE	Education Payroll Taxes	
GFIP	Labor Social Security taxes	
NL	Complementary releases of Single Account	Debit / credit

The different types of keystrokes for Bank Orders in the SIAFI system reflects the diversity of government payments and, ultimately, the role of fiscal policy through expenditure, which directly creates purchase power in the economy, increasing aggregate demand. Let's examine the different types of documents, or keystrokes, through which the government can spend.

The OBC is used when the payment is made through a credit in the recipient's current account in a commercial bank, and it is the most common type of keystroke. When the beneficiary doesn't have a current account, the payment is made through an OBP, and the amount can be withdrawn in any agency of Banco do Brasil in the country. This type of order cannot be used for payments for legal entities. It is only designated for individuals. The OBB is used when there are more than one beneficiary and a list of bank accounts that are going to be credited by Banco do Brasil.

The OBA refers to the possibility for UGs to invest their available resources – until they are not destined to a payment – to earn interest. Public funds, municipalities or

foundations can allocate their resources in the Single Account, to earn the Selic rate, and state enterprises can allocate their resources in the Banco do Brasil Investment Fund Extra Market.

Foreign exchange operations for payments of expenses abroad are generated by an OBK and the purchase of foreign currency is made with any bank authorized to operate in foreign exchange. For payments arising from court decisions which require immediate enforcement, the Managing Unit in charge of the operation in the system SIAFI should use the OBJ. When the payment is related to precatory proceedings, petitions or actions pending in Special Courts, the OBH is the proper channel.

An OBR is used when the amount of payment is high, and the transfer is made directly to the reserve account of the bank. OBCard is used when the beneficiary receives a card that will be used for expenditures by debit or withdrawals. Legal entities cannot receive this card, only individuals. The OBF is used for payment of public servant wages and expenditures correlated to this type of activity. Finally, when there is a bar code bill, the payment is made by an OBD, for example, energy, phone and water bills of public buildings.

As can be seen, there are several procedures for the Brazilian Government to spend and collect taxes. To sum up, the Brazilian Central Bank is the sole depository of the National Treasury. The management of the National Treasury account in the Central Bank – the Single Account, is carried out through the Management Units (Unidades Gestoras - UGs), which are members of the Federal Government Financial Management System (SIAFI). Through this system, in the form of online access, the UGs make keystrokes that command payments from the government. The financial agent, both for payments and tax receipts, is the Banco do Brasil, which receives and transfer the reserves to the Single Account through the Reserve Transfer System (STR).

2.4. Central Bank Balance Sheet and the fiscal-monetary nexus

The Brazilian Central Bank asset balance sheet is composed of international reserves, domestic public bonds held for monetary purpose, and loans to the private sector¹⁴. On the other hand, the liabilities are constituted by “currency in circulation

¹⁴ Such as intra-day loans, rediscount transactions, etc.

issued by the government¹⁵, commercial bank reserves, and the Treasury deposits in the Single Account. Therefore, the result of the BCB will be the difference between the interest earned within the assets and interest paid in liabilities. Regarding the international reserves, there is a positive effect in the result if there is a devaluation of the national currency, the Real, because the value of the asset (reserves) increases in domestic currency in such a situation.

In the Brazilian institutional framework, BCB's result is divided in two components: (i) the result of operations with foreign exchange reserves and foreign exchange derivatives carried out by it in the domestic market, known as "foreign exchange equalization" and (ii) the result of other balance sheet items, called "other operations".

Up to 2019, under the Law LRF and 11.803/2008, both results had the same treatment. If positive, the corresponding amount should be transferred to the Treasury, and destined exclusively for the payment of Federal Public Debt, to amortize, primarily, bonds held by BCB. If negative, the amount becomes an obligation of the Treasury with the BCB, which must be paid by issuance of Treasury securities in favor of BCB. Currently, under the Law N. 13.820/2019, only the result of "other operations", if positive, should be transferred to the Treasury, and the positive result of "foreign exchange equalization" will constitute a reserve to be used to cover negative results in future period. This is because the accumulation of international reserves during the commodity boom was causing large amounts of transfers every time the Real became devalued. The new Law intended to diminish the flow between the institutions. However, the Law is another self-imposed restriction on government spending, because, in the case of a positive result for BCB, the transfer of the corresponding amount to the Treasury used to "open space" for the Treasury to spend ordinary resources with new primary expenditure (the result from the Central Bank would be destined to the subaccount Debt, which must be destined to debt payments, but at the same time, this would liberate receipts in the Treasury Account, which could be destined to primary expenditure). Interestingly, the law creates more difficulty for compliance with the golden rule, which states that the government cannot borrow to pay current expenses. If there are less resources in the Single Account that could be destined to current expenses, the new rule is another self-imposed restriction for the government to have less space to spend.

¹⁵ In Portuguese: papel moeda emitido.

Besides the transfer of Treasury bonds to the BCB when the result of “other operations” of BCB’s balance sheet is a negative, there are two other ways through which the Treasury can issue bonds for the Brazilian Central Bank. The first is to refinance the principal of securities maturing in the BCB's portfolio, a rolling over operation without intermediates between Treasury and BCB that doesn't interfere in the market price formation neither in money market liquidity. There is a non-competitive issuance to the Central Bank, based on the average market offering rates for the securities. It should be noted that only the principal, adjusted by a price index, is allowed to be rolled over. The “real interest” portion of the debt is excluded from this mechanism and should be paid by the Treasury to the Central Bank. For that portion, the Treasury might have to call on issues for the market.

Finally, the last possibility which the Treasury can issue bonds to the Central Bank is to recompose the “minimum level” to ensure that the BCB has sufficient public bonds in its portfolio for the operationalization of monetary policy. The new Law N° 13.820/2019 also changed the definition of the “minimum level”. Before that, the Treasury was authorized to issue bonds to BCB every time its portfolio was not engaged to repurchase agreements that were less than R\$ 20 billion. With the new law, the issuance will occur when the portfolio not engaged to repos is less than 4% of Central's Bank total assets.

2.5. Domestic public bonds issuance and degrees of flexibility for Brazilian National Treasury

This section aims to give some details about domestic public bonds issuance in order to connect the theoretical issues discussed to the Brazilian institutional framework.

As already mentioned, in Brazil, the amount of public bonds to be issued is defined by the “Annual Financing Plan (PAF)”. It consists of the maturing volume of the Federal Government Debt projected for the following year (including both principal and interest payments of internal and external debt), added to the primary fiscal deficit that will be covered by debt issuance, in case a fiscal deficit occurs. This leads to the “Gross Financing Need”, the term officially used by the Brazilian Treasury, following the international pattern for public finance statistics. The Gross result, subtracted by the

budget receipts destined to pay the debt, leads to the “Net Financing Need”. This result will guide the total volume projected to be issued in the year, defined in the PAF.

One should note that the volume of issue doesn't depend necessarily on the existence of a primary fiscal deficit. In fact, in Brazil the primary fiscal result has been positive from 1999 to 2013 and the Treasury kept issuing public bonds the whole period. The conditioning factors of issuance of public debt are beyond the fiscal primary result, such as level of interest rates, inflation, government contracts such as agreements between federal and local governments, and the amount of the budget receipts institutionally designated to pay the debt (roll over), which is a political variable dependent on laws and power of different groups of society – the political economy conflict of the budget.

In regards to the Primary Dealer system engaged to the Primary auctions, currently, the National Treasury has 12 dealers, of which nine are banks and three are independent brokers or distributors. The performance of each institution is assessed every six months and those with the worst performance are replaced. The selection is made through an evaluation, based mainly on the participation in public offers and the secondary market for public securities.

The Primary Auctions are carried out through competitive processes. Institutions regularly qualified in the electronic system provided by the Central Bank, the SELIC, can participate directly in the auctions by submitting proposals. Other legal entities and individuals may participate in public offers only through these institutions.

There are two types of auctions, the “traditional” and the “hybrid”. In the first one, the lot offered by the Treasury is disclosed in a specific manner for each specific maturity. This modality is adopted in LTN (fixed rate bond), NTN-F (fixed bonds with payments semiannual payments) and LFT (indexed to Selic rate) sales auctions. In hybrid actions, the maximum volume of the lot offered to a group of maturities is defined by the National Treasury, which has the prerogative to accept the proposals received, until reaching the maximum volume previously announced. This modality is adopted in the NTN-B (indexed to inflation) and NTN-F purchase auctions (fixed bonds with payments semiannual payments).

From the analysis above, we can conclude that the Primary Dealer System, reinforced the Central Bank purchasing Treasuries in the secondary market and providing infinite liquidity for them, guarantees an elastic demand in primary auctions. Now we are going to discuss the degrees of flexibility on which the Treasury can rely to build its strategies and not be a hostage of bond vigilantes.

First, the strategy of bond issuance by the National Treasury announced in the Annual Financing Plan (AFP) contemplates alternative scenarios for the economic situation that help in defining the reference intervals for the debt stock, composition and maturity structure indicators. These alternative scenarios, including optimistic and pessimistic hypotheses, allow higher degrees of flexibility for the Treasury to operate.

In addition, the Treasury publishes an Annual Auction Schedule that informs the expected dates and types of securities that will be traded, including their maturities. However, the debt manager continuously observes the conditions prevailing in the economy and in the financial market and, at specific times, is completely free to make adjustments in this planning. The Treasury may choose not to hold auctions or hold them and not accept any offers, in order to avoid increasing the cost of debt. The Treasury may also choose to carry out unforeseen auctions to buy or sell public bonds, to guarantee public securities markets are functioning smoothly. (AFP 2019, p. 13)

The Treasury's flexibility to adjust its emissions strategy also refers to the total volume of emissions planned for the year. AFP references are organized at intervals, to, exactly, allow for adjustments. In the context of greater economic instability, it is possible to carry out formal reviews of the Plan and adjust the indicative intervals.

The rules governing the AFP are the Internal Regulation of the National Treasury¹⁶ and the decree that establishes the Federal Public Debt Management Committee¹⁷. Both regulations do not mention that the strategies and limits defined in AFP are mandatory, nor do they establish sanctions in case of non-compliance. They only establish that changes made during quarterly reviews must be disclosed and justified. Besides promoting a more transparent management of public debt, it definitely gives more degrees of freedom for the debt manager, precisely for the cost of debt not to be a hostage by market winds.

Another degree of freedom for the National Treasury is a liquidity reserve, called “debt cushion”, with cash deposited in Reais in the Single Account, which are kept separated to pay the debt and allow the National Treasury to anticipate periods of greater

¹⁶ Portaria MF N° 285/ 2018 - <http://www.tesouro.fazenda.gov.br/documents/10180/337275/Regimento+Interno+STN+2018/b984b6c1-0a2c-4899-ae4b-e424132fdb67>

¹⁷ Portaria STN N° 426/ 2019 - <http://www.in.gov.br/web/dou/-/portaria-n-426-de-25-de-junho-de-2019-173015835>.

concentration of maturities, giving policy space to not sanction high risk premiums demanded by the market in times of instability and repayment of eventual contingent liabilities. According to PAF 2019, the “debt cushion” would be sufficient to pay at least the next six months of debt maturities. This reserve ensures to debt management flexibility to act in the event of adverse conditions and excessive volatility in public securities market (AFP 2019, p. 10).

We can conclude that in fact there are some self-imposed restrictions that limit the government's spending capacity, but not debt issuance. Actually, the last is restricted only by the Golden rule, already mentioned. Besides that, currently we have the Constitutional Amendment no. 95, the so-called “spending cap rule”, which states that current year's spending should be the same as the previous year's, adjusted only for inflation. This means freezing spending per capita on all items, a rule with no international parallel. This is certainly the most draconian self-imposed restriction in Brazilian fiscal history, which reflects a view of a minimalist state, that is more radical than other mainstream policies around the world. The rule makes more difficult the compliance of the golden rule, because as there are mandatory spends in the areas of education, health and social security that must be executed, the cuts must occur in the discretionary spends, including public investment. If the golden rule establishes that current spends can't be higher than debt issuance, but if those spends cannot be cut, than the golden rule is not accomplished. But again, this is more related to budget restrictions than to debt issuance rules, which in Brazil, can be considered very correct to assure flexibility for the Treasury.

However, rules can be modified, and the repeal of EC 95 will probably become a hot topic in the political debate once its impacts on the population become harsh.

Even so, it cannot be denied that, with regard to the Treasury's performance, the discourse of “capture” by the market should be dismissed in the face of the degrees of freedom of this institution to face the market winds. Even with all the restrictions on the expenditure side, the rules described above for the issuance of securities reflects the view that the Treasury has bargaining power and a real ability to define the direction of the market, whether through extraordinary auctions, the option to not hold auctions, the possibility of official strategy review and the use of a liquidity cushion.

In regard to the use of the liquidity cushion, one could argue that it cannot be used indefinitely, that one day it might run out of resources. But first, currently the cushion corresponds to six months of maturity. Let us remember that in any modern monetary economy, government bonds are an extremely important asset for the operation of the

financial sector. There are no capital markets without a public securities market. Imagining any scenario in which the Treasury does not realize auctions for more than months would be a catastrophe for the financial sector in terms of profitability, benchmark and functioning. It would also represent a failure for the achievement of the interest rate target by the Central Bank. Even if the cushion diminishes for instance, 3 months, it would still guarantee flexibility for the Treasury. Therefore, the debt cushion, as well as all of the other aspects raised, gives the Treasury a strong bargaining power position, of course much stronger than the private sector power to set prices in the public debt market.

Next section will examine the results of the Brazilian National Treasury and provide strong evidence that the MMT framework helps to understand why there are concrete conditions to rely on fiscal policy and public debt as an instrument to achieve economic and social development.

2.5.1. Primary 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 any veto power for government bond issuance, or even persistent upward pressure on interest rates as the result of the change in fiscal variables, by “bond vigilantes”¹⁸. Additionally, downgrades of international agencies *did not* cause a persistent pressure on auction rates 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 the bargaining power to reject 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.

¹⁸ We should stress that the expression “bond vigilantes” refer to the idea that bond buyers (mainly private financial sector) can react to the deterioration of fiscal variables, pressuring to not finance the government or to corner the Treasury and impinge long term interest terms hikes. As mentioned before there is no substitute for Treasury bonds in terms of combination of liquidity and remuneration. However, it is not the same to say that the definition of the basic interest rate by the Central Bank, and hence the interest rate of treasury bonds, has no structural constraints. In a developing country there is a floor given by the Federal Fund Rate plus country risk and expected rate of devaluation. Interest rates also play an important role through capital inflows and exchange rate control to curb inflation. Besides that, as we mention in footnote 6 the literature suggests that rentiers use their political clout to influence interest rate policies. It is completely different from a market pressure on Treasury auctions.

The present analysis concentrates on the auctions where the 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.

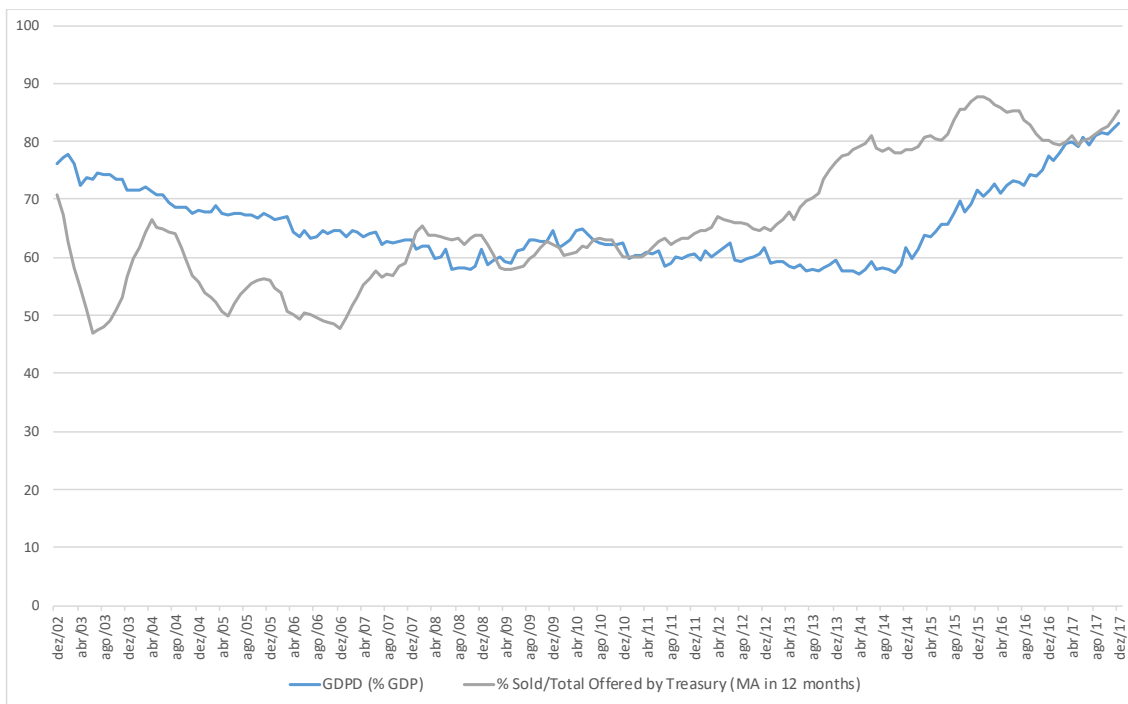
Firstly, we want to note that our goal is to verify if there is a persistent relationship between changes in fiscal variables and both the ability of government to sell its treasury bonds as well as to accept higher spreads in these same bonds. We are not discussing the level of the short-term interest rate set by the Central Bank for the purpose of monetary policy. Brazil has a well-known history of high interest rates in comparison to other developing countries, since the middle of the 1990's, in spite of the recent lower levels¹⁹. Of course, Brazil's basic interest rate floor is given by the Federal Funds Rate plus country risk and the expected rate of devaluation. This already sets a higher basic rate, but does not explain why Brazilian rates are on average higher than other developing countries. Reis (2018) analyzes such "outlier" behavior of Brazil's interest rate and show that the usual orthodox explanations such as "... low saving rates, the default history of the country, strong capital controls, and jurisdictional uncertainty ..[and also heterodox approach that] discuss the importance of the exchange rate volatility and the inappropriateness of monetary policy to control inflation in Brazil due to indexed prices and the exchange rate pass-through" (p. 94) are not supported by empirical evidence. She then suggests that rentiers have a strong political influence on Central Bank's basic interest rate setting. Ferrari Filho and Milan (2018), do a similar analysis and reach a similar conclusion, but suggesting that this political influence is reflected in the way inflation expectations are considered by the Central Bank. It should be noted that both articles refer to the historical level of basic interest rates and that, in 2019, this level is very close to the floor mentioned above.

Beginning with the empirical analysis, 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 fact indicates that there is no sign of "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 percentage sold in relation to the total offered by the Treasury, which could be a proxy of

¹⁹ The interest rate target by Brazilian Central Bank, Selic, was on average 14,1% p.y. in 2016, and dropped to 10,1% p.y. in 2017 and to 6,5% p.y. in 2018.

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 leads to a distrust in the Treasury by the market in the form of refusing to buy its bonds at issue.

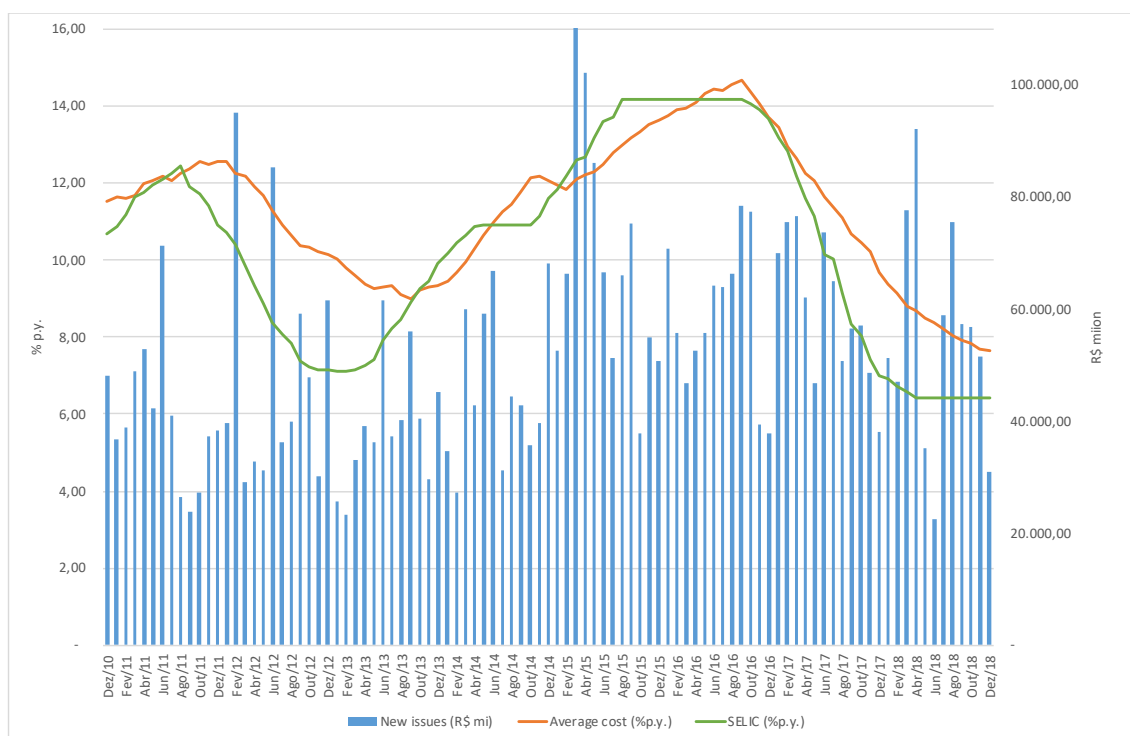
Graph 1: Gross Domestic Public Debt and Amount Sold in Treasury Auctions



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, starting in 2016, following the trajectory of the Selic. Therefore, the argument that an increasing size of the debt stock creates pressure for “risk premium” or hampers the ability to sell bonds doesn't correlate with the data.

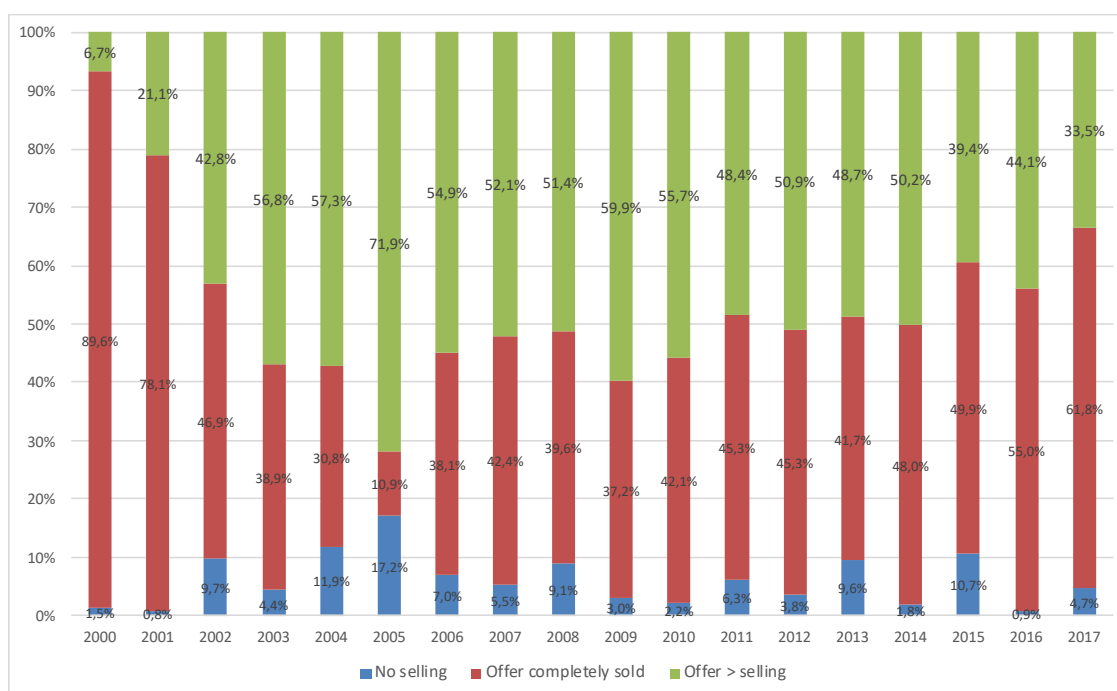
Graph 2: New Issues of Brazilian Public Debt – Average cost (% p.y.) and average volume issued in 12 months (R\$ million)



Source: Brazilian National Treasury and Brazilian Central Bank.

Reinforcing the argument that the Treasury is not “captured” by the market, we can see, in 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. Even in this situation, one can argue that instead of a “rejection” by the market, the Treasury was the one who rejected the prices offered by the market for they could have raised the cost of the public debt considerably. In addition, the share of auctions in which the Treasury sold all the bonds it offered was relatively high, more than 45%, for the majority of the time.

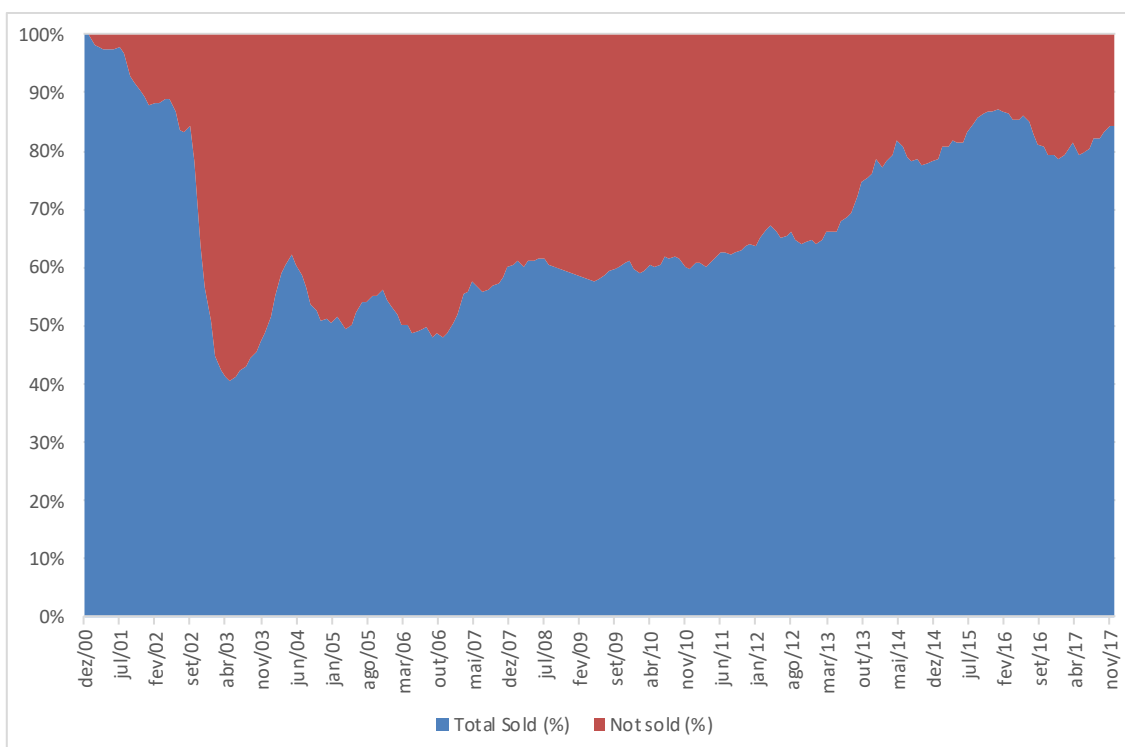
Graph 3: Results of Brazilian National Treasury Auctions



Source: Brazilian National Treasury and Brazilian Central Bank.

If we examine 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. Particularly, this pattern didn't change despite the increasing stock of debt to GDP beginning in 2014, as shown in Graph 1. Again, there is no sign of difficulty of selling bonds by the Brazilian National Treasury or more important any relationship, following the "expected" causation by "bond vigilantes" theorists: the smaller is the demand for bonds the greater is the public debt.

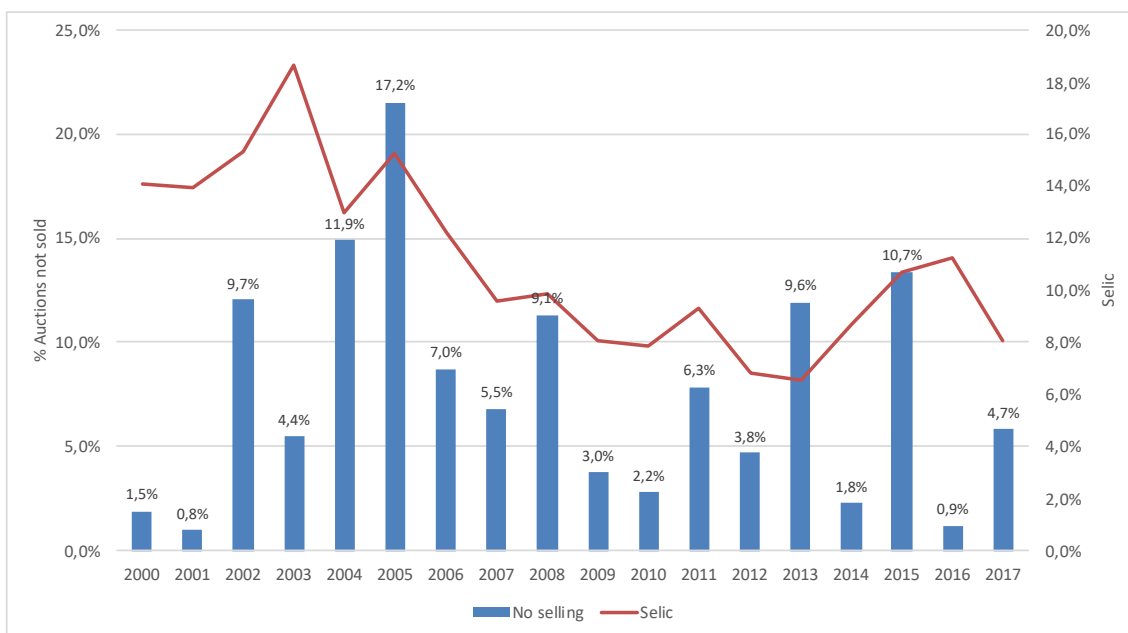
Graph 4: Total sold in relation to total offered in Treasury Auctions (%)



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 (Luiz Inácio Lula da Silva presidential election), 2008 (global financial crisis), 2013 and 2015 (domestic political crisis) which has been previously mentioned. These events show there might be periods of great economic uncertainty as a consequence of a political crisis, but they are not connected with the size of the public deficit or debt. It is normal during periods of uncertain political times, which might be followed by some radical change of policy orientation (especially monetary policy), private agents tend to assume a defensive position, waiting for the solution of such political crises to make any decision about long-term portfolio allocation. Furthermore, the pattern of auctions in relation to 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 the premiums required by the agents (which might be high in relation to the expectation of an interest trajectory rise). This was most likely the case in 2004 and 2005.

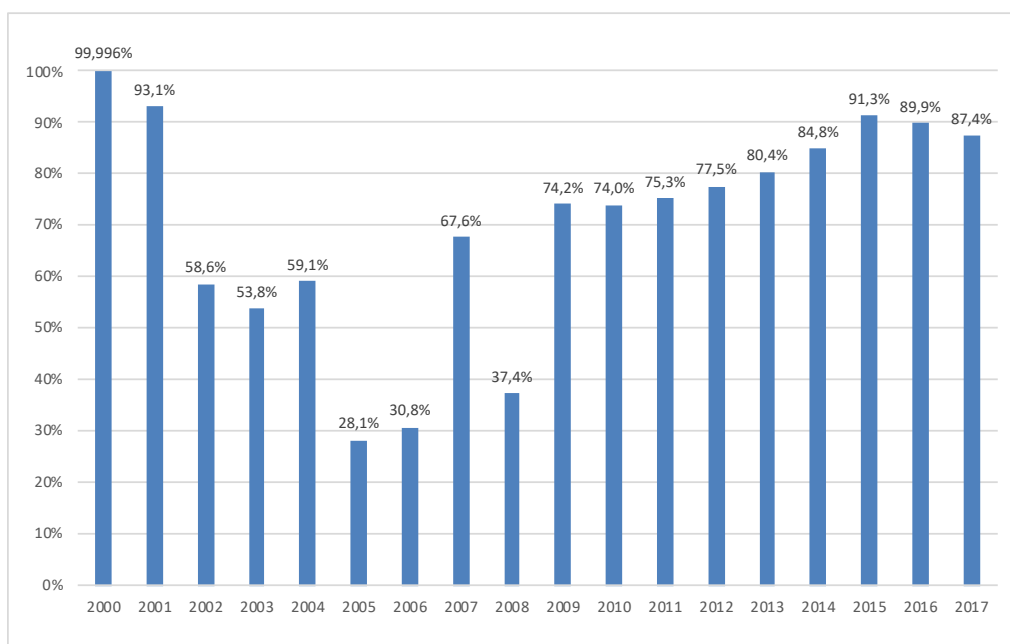
Graph 5: Selic Rate (% p. y.) and Brazilian Treasury Auctions with no selling in relation to total number of auctions (%)



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: Quantity of bonds sold in relation to total offered by Treasury (%)



Source: Brazilian National Treasury and Brazilian Central Bank.

2.5.2. Impact of downgrades on the Brazilian National Treasury Auctions

To simplify the analysis, we will adopt a methodology similar to Canuto & Fonseca dos Santos (2003), assigning 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 based in the US and other European countries do not allow them to invest in assets of countries without this rating.

Table 4: Brazilian Ratings of International Agencies

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

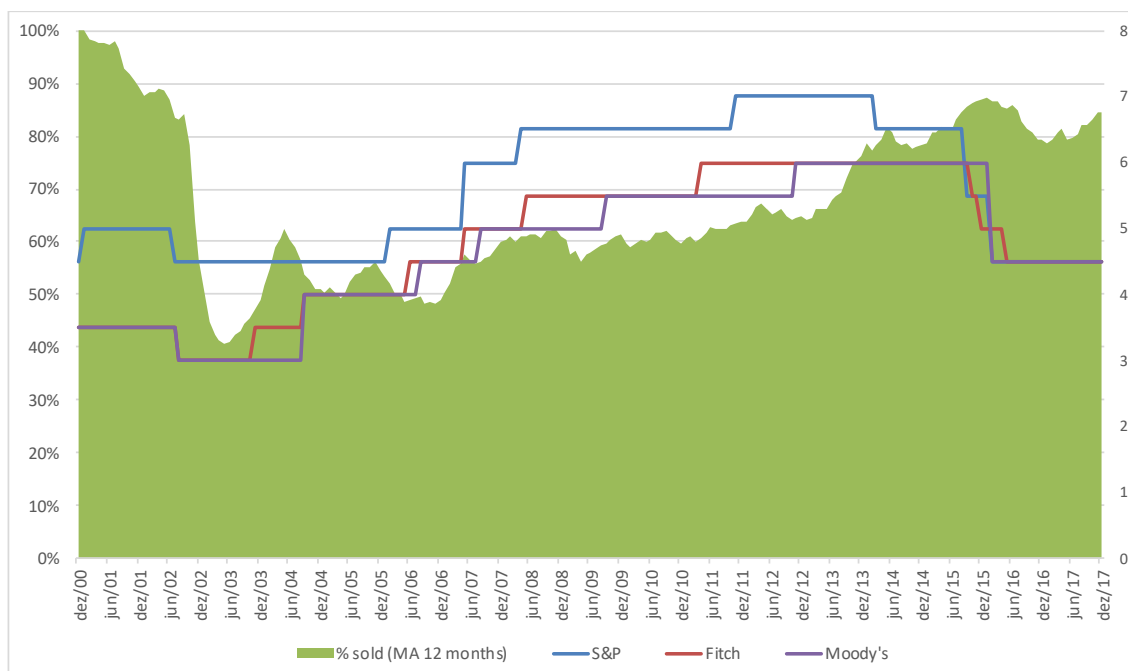
In Brazil, there was a loss of "investment grade" in assets denominated in the local currency at the end of 2015 and early 2016, a movement initiated by Standard & Poor's and followed by Fitch and Moody's.

Table 5: Brazilian downgrades for long-term debt

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 rating agencies assigned downgrades. 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 impacts on 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 the 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: Ratings and the volume of bonds sold in relation to total offered by Brazilian Treasury in primary auctions (%)



Source: Brazilian National Treasury.

Beside the year of 2002, there was a decrease in the amount sold by the Treasury in late 2015 and early 2016, when the downgrade was accompanied by a loss of the "investment grade" rating. We will examine these periods in more detail, by first analyzing issues per type of bond and maturity, then external capital flows and foreign holdings of public bonds, and finally, the interest rates on 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, which means portfolio managers chose to “lock-in” their position in secure indexed bonds instead of speculating as to the direction of interest rates. The lengthening of debt structure, as it should be, resulted not from a “virtuous” cycle of the economy nor of debt management efficiency, but followed a rational calculation of market operators that was sanctioned by treasury operators trying to stabilize debt operations under unstable conditions. The maximum maturity of LTNs issued after the downgrade of 2015 did not change in relation to previous years – 4 years maturity.

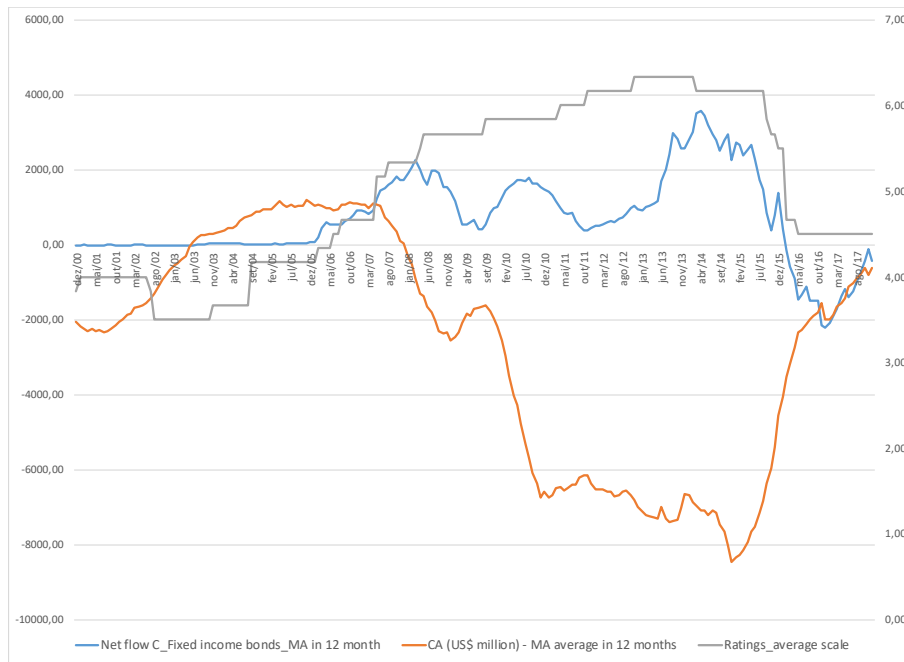
Table 6: Debt structure by type of bonds and maturity

	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%	3 to 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 foreign capital flows, it can be seen in graph 8 the net inflow to buy fixed income bonds (both public and private) started decreasing *before* the downgrades, probably due to the perception of an oncoming crisis and the deterioration of the external situation which triggers the fear of exchange rate devaluation. 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 would require the immediate liquidation of their positions.

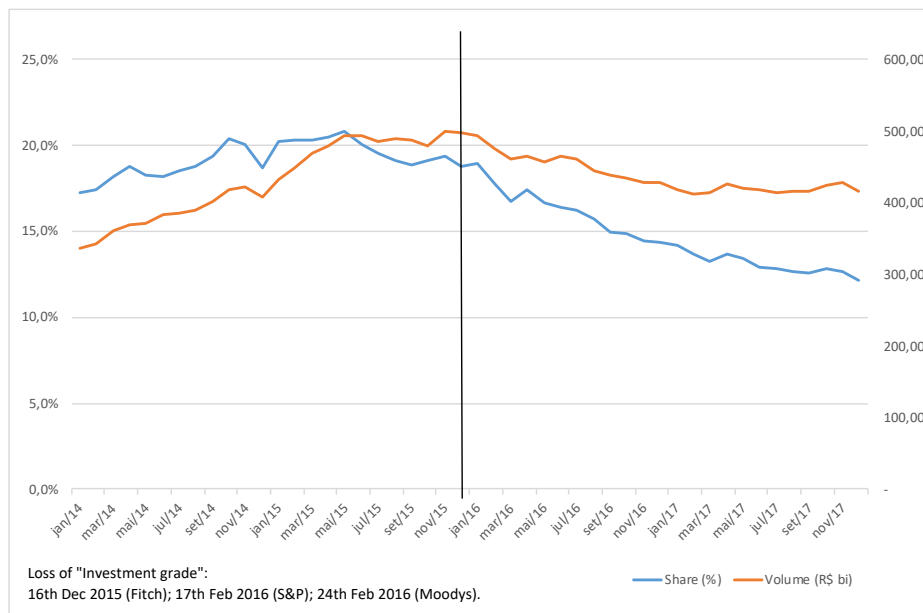
Graph 8: Net flow of capital to fixed income bonds, current account and ratings



Source: Brazilian Central Bank and International Rating Agencies.

However, if we examine the total outstanding domestic public debt in Reais, we find both the share and volume of foreign investors holdings were not strongly affected. We cannot claim 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: Foreign investors holdings in the total outstanding Brazilian Public Debt

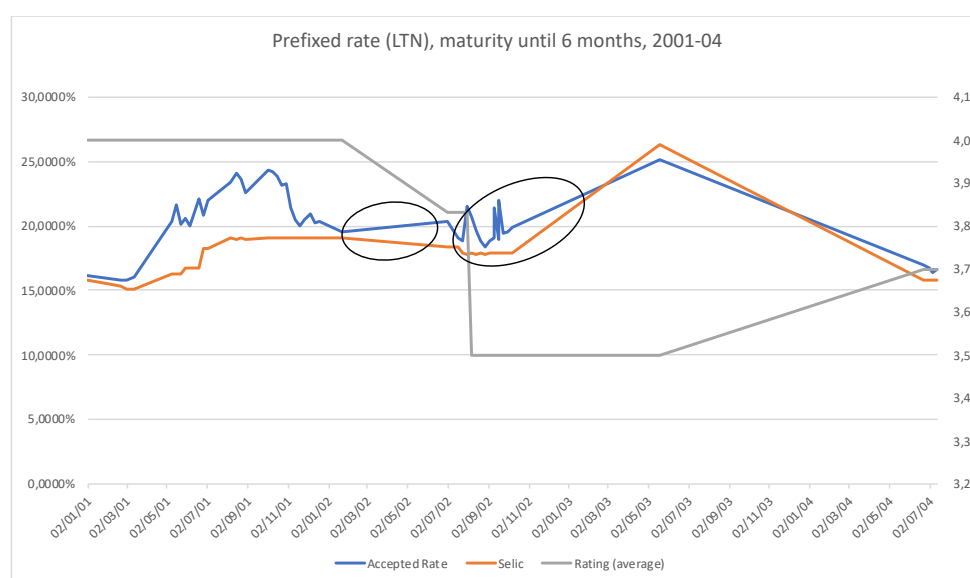


Source: Brazilian National Treasury.

Finally, we are going to analyze the behavior of 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 2002 case, when there was only one downgrade, and moving to the 2015-16 case, when the downgrade represented a loss of investment grade. To facilitate the graph interpretations, we built an average rate with rating values 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 announced by Fitch in June 2002, there was a small increase in auctions rates, 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 future 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 instability effect on the rates, which did not persist.

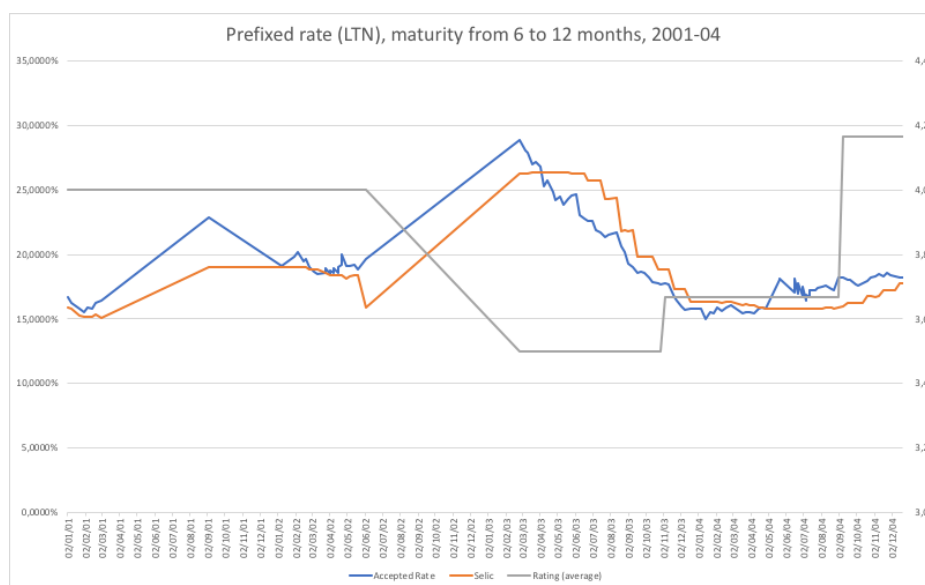
Graph 10: Selic and rates of LTN with maturity until 6 months – 2001 to 2004



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 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 the future declining trajectory of the Selic into their expectations (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: Selic and rates of LTN with maturity from 6 o 12 months – 2001 to 2004



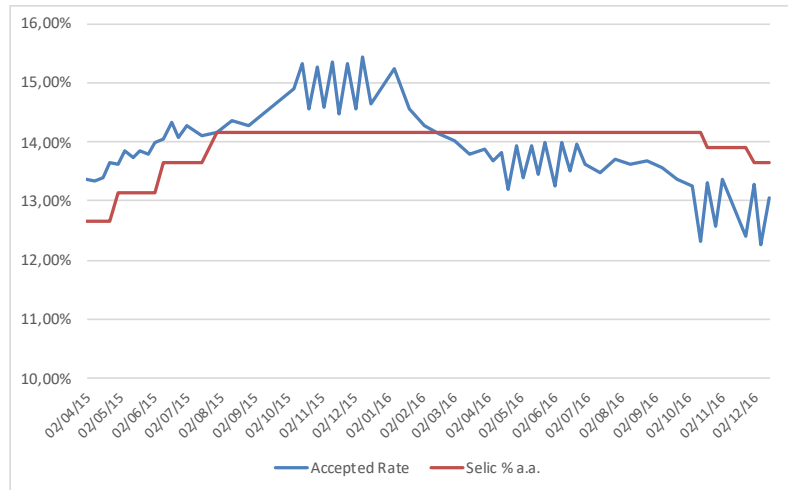
Source: Brazilian National Treasury and Central Bank, and International Rating Agencies.

In summary, the LTN rates in the primary auctions of BNT showed some oscillation after the downgrades (especially in short bonds of maturity 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.

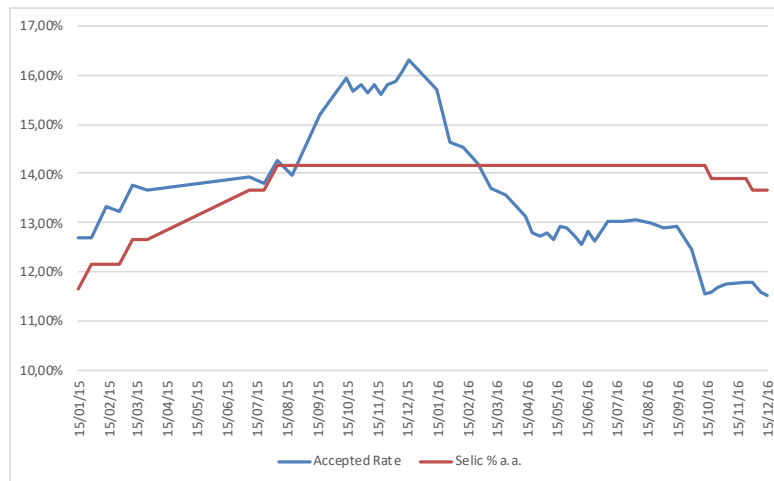
We move on to the analysis of the rates in the period of 2015 and 2016, when the downgrade was accompanied by a loss of the "investment grade" rating. The spread over Selic increased right after the downgrade but then declined and became negative (Selic higher than the LTN rate), also reflecting, as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

rate of interest as signaled by monetary policy. The same behavior was observed in all maturities.

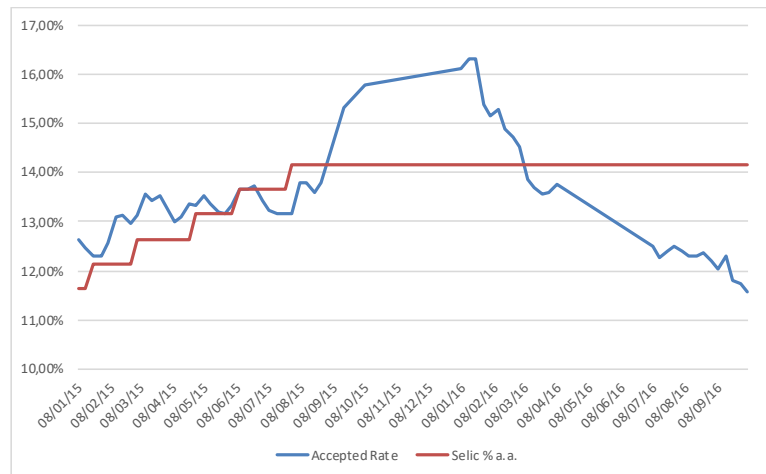
Graph 12: Selic and rates of LTN with maturity until 12 months – 2015 to 2016



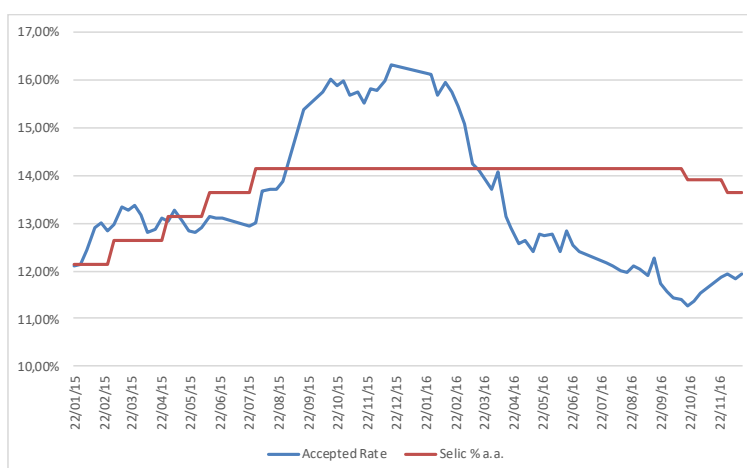
Graph 13: Selic and rates of LTN with maturity from 1 to 2 years– 2015 to 2016



Graph 14: Selic and rates of LTN with maturity from 2 to 3 years– 2015 to 2016



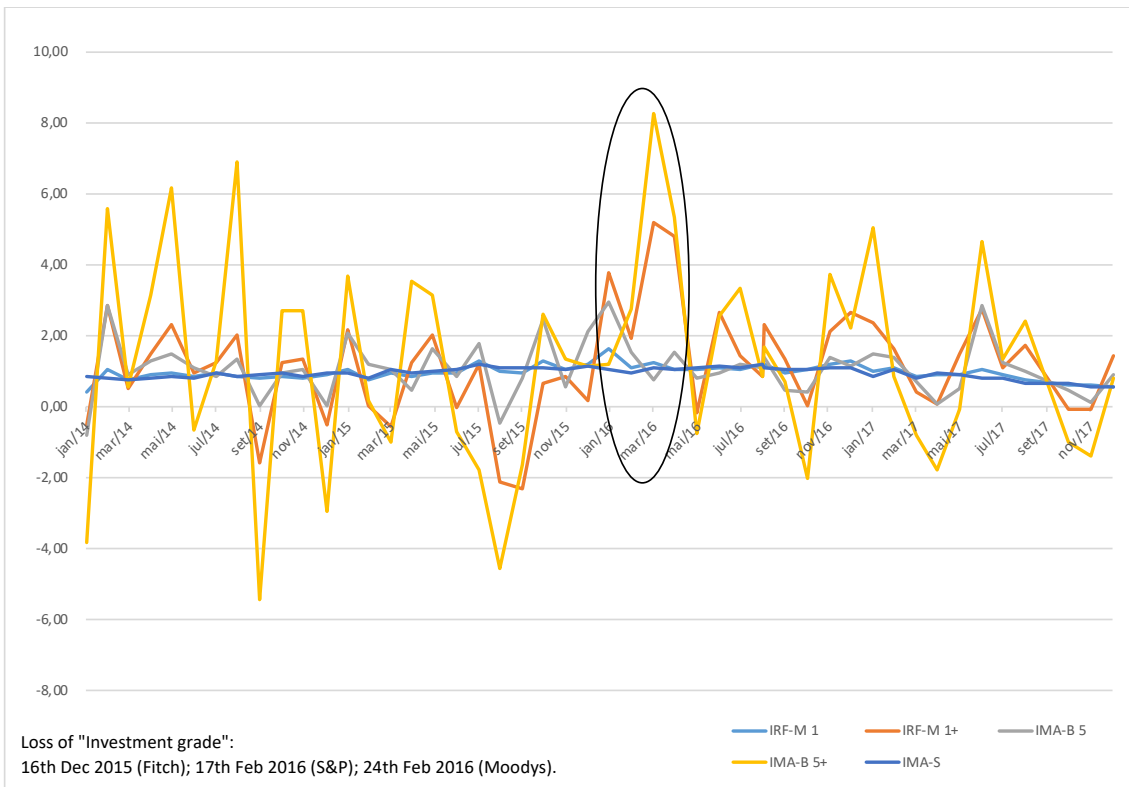
Graph 15: Selic and rates of LTN with maturity from 4 to 5 years – 2015 to 2016



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, therefore, not affected. Note that IMA-S and IRF-M 1 remain almost stable.

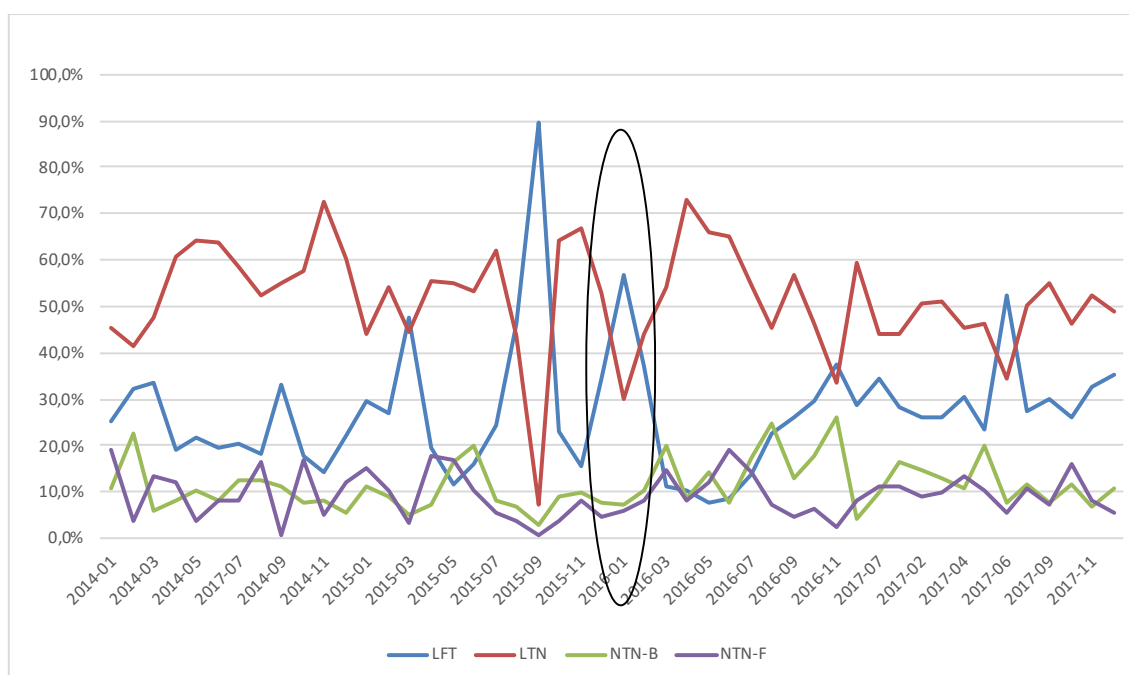
Graph 16: Price variation of public bonds



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 in 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: Share of bonds per type issued in primary auctions



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 a stronger perception of external instability with potential depreciation of the 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).

2.6. Final remarks

In this chapter we showed that first and foremost, the stock of Brazilian domestic federal public debt in Reais as a percentage of 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 is a reference for the other rates, mainly due to the expected future interest rate effect signaled by monetary policy.

With regard to the primary auctions of BNT, the increase in the stock of debt does not necessarily coincide with an increase in the rates accepted by the Treasury. The volume of bonds sold in the auctions also does not reflect any difficult conditions 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%. Furthermore, the quantity of bonds in relation to the total offered by the Treasury was high through the whole period.

These indicators oscillated in moments of political uncertainty and volatility in the financial market, such as 2002 (Lula presidential election), 2008 (global financial crisis) and 2015-16 (domestic political crisis and downgrade with a loss of investment grade). During 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, besides being expected as a rational decision of portfolio managers and positive in terms of financial costs to the Treasury, these 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.

CHAPTER 3: PUBLIC DEBT STRUCTURE AND INTEREST RATES IN BRAZIL IN THE 2000s

3.1. Introduction

The structure of the Brazilian domestic public debt denominated in domestic currency is commonly criticized for being too concentrated in short-term and floating-rate bonds. Some economists argue the Brazilian domestic public bond market has idiosyncratic characteristics which create an upward pressure on Brazilian interest rates and prevents debt structure lengthening. This argument hinges on the alleged existence of “bond vigilantes” whom, concerned with the future capacity of government to pay the debt, would accept public bonds only with high and floating interest rates and short maturity. These “bond vigilantes” would determine the dynamics of the public bond market, by requiring high premiums for “conventional” bonds (fixed rates) and by preventing debt lengthening.

The main purpose of this chapter is to criticize this interpretation by showing empirical evidence which proves that the debt profile is not a result of the action of “bond vigilantes”, but primarily, the result of policy decisions by the Treasury and Central Bank. Therefore, we are going to show that the market cannot persistently demand (and determine) high risk premiums or dictate the dynamics of public bond issuance, through any kind of threat or persistent imposition. There is no doubt that debt profile might influence the costs for the National Treasury, especially in moments of stress, but the Treasury, even in those critical moments, is able to influence the selling conditions to the market, especially considering its coordination with the Central Bank. The Treasury cannot be captured by “bond vigilantes” unless it wants to, but not because it has to do so. Considering that the Treasury and Central Bank are less powerful than the market is an inappropriate view of how modern monetary markets actually function, because the market cannot persistently bet against those institutions and dictate the conditions of bond issuance by the Treasury.

We are assuming the MMT interpretation, as already discussed in chapter 1, that public bond issuance is not a financing operation for the government in the same sense of the private sector financing needs. Domestic public debt issue (and management) is a

policy instrument to control reserves, influence interest rates, and offer alternative assets for the private sector.

As we have seen in chapter 1, literature concerning the public debt profile advocates that managers should pursue a “benchmark” focused on **fixed rates** and **long term maturity** bonds. The main argument for fixing debt rates is that it decreases payment volatility and the cash flow at risk, making it easier for Treasury debt managers to forecast the future debt cost. Besides, pressures on the cost of debt in the presence of shocks in the economy, when there are large variations in exchange rates and short-term interest rates (stressful situations), would be reduced. Secondly, it would separate the public debt market from monetary policy. That means monetary tightening doesn't have direct fiscal effect in terms of interest payments, which would impose the necessity of cuts in other public expenditures. Also, a debt profile composed mostly by fixed rate bonds would increase the monetary policy efficacy because of the “wealth effect” on bonds holders, once their assets lose value when interest rates increase.

In regard to pursuing a longer maturity on debt, this literature, also seen in chapter 1, argues that, as the term structure of interest rates is what really matters for real capital, and not the short term interest rate target by Central Bank, public debt should be a reference for capital markets and private credit rates in the long term. Also, in the presence of a long-term benchmark on public debt, monetary policy tends to mostly affect the long-run curve of interest rates of the economy, with a stronger influence on private investment.

Building on our theoretical position in regard to those arguments as already discussed in chapter 1, we are going to present, in this chapter, specificities of the Brazilian case and how some Brazilian economists approach this issue. The literature on Brazilian public debt structure is very concentrated on criticisms against the existence of this specific bond called “Letra Financeira do Tesouro (LFT),” indexed to the overnight rate target by the Brazilian Central Bank (BCB), the Selic rate.

Besides the LFT, the debate on debt structure in Brazil sometimes confuses theoretical issues with institutional and even “cultural” factors. Some economists, self-proclaimed post-Keynesians seem to use a neoclassical theoretical framework to achieve some conclusions, and other arguments are not supported by empirical evidence.

After the discussion pertaining to the Brazilian specificities on debt profile, the chapter will provide data on the structure of Brazilian domestic public debt in the 2000s – maturity, type of bonds, indexers, debt holders and interest rates both in short- and long-term bonds. Adopting the Functional Finance approach and Modern Monetary Theory, we will provide a critical conclusion on the issue.

3.2. The debate on Brazilian domestic public debt profile

This section covers several issues that are at the center of the Brazilian debate on debt structure in terms of maturity, indexers and costs. We will present the arguments regarding firstly, the existence of the LFT, mistakenly considered an “anomaly” which creates a perverse cycle of a short-term structure and high interest rates. Then we will present views that emphasize the regulatory framework of the Brazilian economy as reasons for the “bad” Brazilian domestic public debt structure with harmful results in term of debt cost and yield curve.

3.2.1. LFT as a Brazilian anomaly that reinforces a short term perverse circuit

The origin of the LFTs dates back to the late 1980s, when Brazil was facing a process of hyperinflation that forced the implementation of several economic policies (stabilization shock therapy plans like Cruzado Plan or Plano Cruzado), that among its measures included price controls (in fact a price freeze) and very high interest rates²⁰. In order to overcome the end of the price freeze period, tightening monetary policy signaled to the coordination of the new pricing system. In that context, the issuance of bonds with fixed rates would imply extraordinary losses for financial markets, as their prices, or the nominal interest rate, couldn't incorporate the correct price expectations, which were very unstable²¹. To establish a very high interest rate that could incorporate pessimistic expectations about future inflation would also be very costly for the government.

²⁰ Actually, in the beginning of the Plan interest rates were low: for more details see Bastos (2002).

²¹ Capital account was not liberalized for international capital flows, but there could be a pressure in the exchange rate parallel market, therefore, in conjunction to monetary policy, the end of price freeze implied an adoption of a crawling peg policy.

Given the macroeconomic scenario of high and volatile interest rates and chronic inflation, multiple measures were taken by the Central Bank in order to buy conventional bonds with fixed rates and more than 1 year maturity from the financial market to avoid a systemic crisis (Resende, 2007, p. 220-221). The “Letras do Banco Central” (LBCs), indexed to Selic rate and, therefore, were not influenced by future nominal fluctuation, nor were an efficient solution created in 1986 to reduce drastically the carry trade costs of public debt, both for the market and the government. Later, in 1987, the bond “Letras Financeiras do Tesouro” (LFTs), was created by the Treasury as the Central Bank was prohibited to issue bonds. The LFTs kept the same characteristic of LBCs and were also indexed to the basic rate Selic.

It is important to note that during this period the Central Bank guaranteed the demand for public debt issued by the National Treasury through repurchase agreements within the banking system and informal buyback auctions. By ensuring liquidity in the open market, the Central Bank was able to secure demand from the financial system in Treasury primary auctions at acceptable prices despite high inflation. The LFTs, indexed to the Selic helped this process, because these bonds do not lose value in the face of increases in interest rates (Resende, 2006).

Arida (2006) also highlights the role of LFTs:

“Predictably, sooner or later there would be a sharp rise in interest rates. The monetary tightening would lead to a fall in the market value of domestic public debt, funded at the time with conventional securities only. The creation of LFTs in this context sought to halt what appeared to be an almost inescapable process of loss socialization.” (Arida 2006, P. 232)

This historical period shows the role of the Central Bank to avoid systemic risk associated with large equity losses for financial institutions, thereby ensuring a permanent demand for government securities by them and the success of Treasury auctions, even under adverse macroeconomic conditions. The period of high inflation has shown that the Central Bank, in the event of major negative surprises, is driven to repurchase longer-term securities (and fixed-rate bonds) and incur costs to prevent the collapse of the financial system. This is certainly a costly situation, but it shows that there shouldn't be an unquestionable truth in regard to the debt profile and benchmark. If the debt is mostly long and prefixed, in moments of stress, the Central Bank will have to repurchase these bonds in order to avoid losses in the financial system and guarantee stability.

Also, it should be highlighted that even in adverse conditions such as high inflation, the coordination between the Treasury and Central Bank is capable of guaranteeing the issuance of bonds by the former. Benchmark literature argues it is positive for the debt profile to be long and with fixed-rates, but in times of paramount uncertainty when financial intermediaries turn long-term fixed-income securities into short-term investments, the Central Bank and Treasury usually act in order to prevent the collapse of the system, mitigating damage to the entire economy. The “rescue” from the Brazilian Central Bank in the savings and loans crisis in the 1980s (Black 2005) and the interventions during the period of hyperinflation in the 1990s are examples (Resende, 2006). This doesn’t mean that Central Banks are captured by the market, this just means that in a modern capitalist monetary system, where the Central Bank has to guarantee stability, the debt profile is not as relevant as expected by this literature, because bonds that are losing value will be repurchased in order to prevent massive losses and to ameliorate financial instability. The long-term bonds purchased are going to be substituted by short and post fixed rate bonds, and the Treasury will maintain its auctions normally.

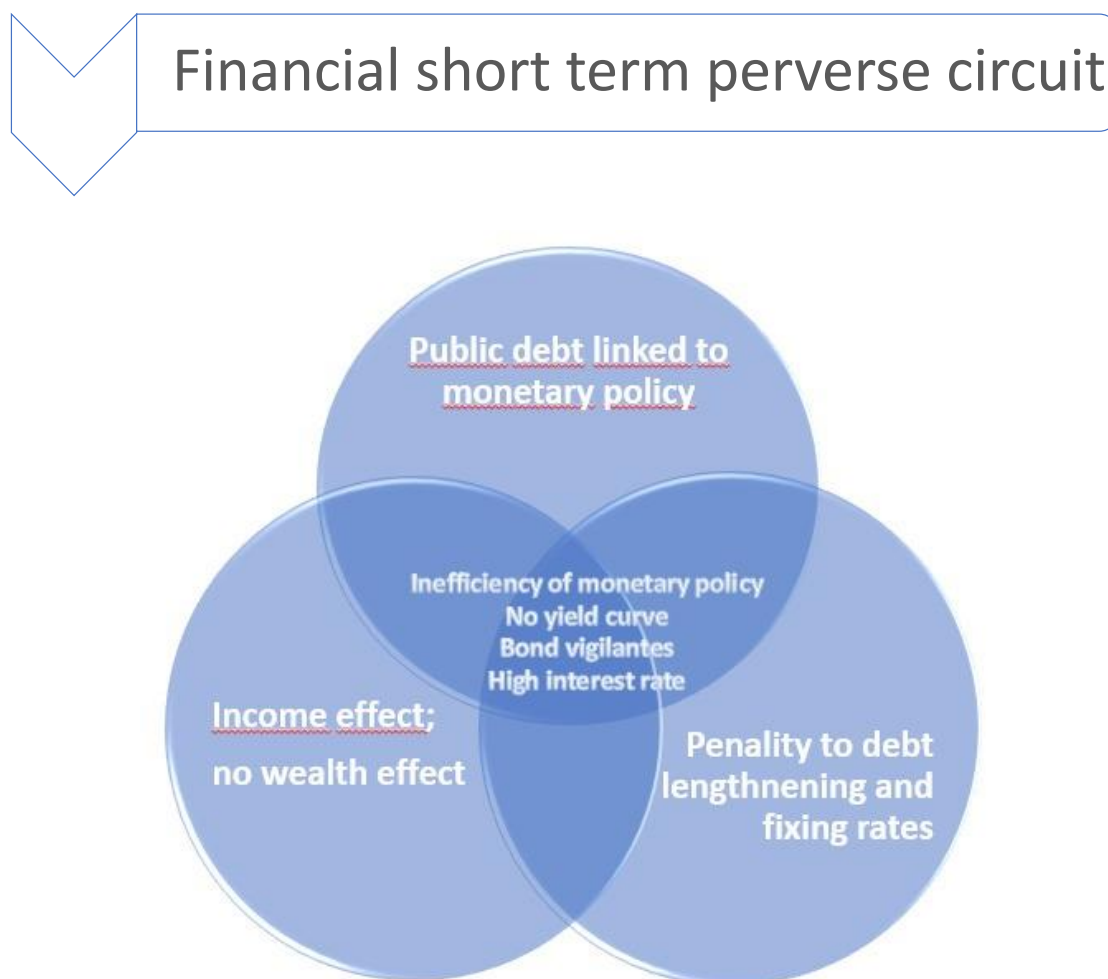
Despite the role played by LFT during volatile times, several Brazilian economists consider the existence of these bonds presently (or in a non-hyperinflation environment) an “anomaly” that creates “a financial short-term perverse circuit”, pushing short term rates to high levels. There would be three reasons behind this alleged bullish tendency i) floating cost of debt and fiscal consequences; ii) ineffectiveness of monetary policy; and iii) difficulty to lengthen debt and fix rates. We divide the arguments into three groups in order to organize the debate, but as we are going to see, they are all related and, in the end, they all boil down to the activity of “bond vigilantes” able to bid up public debt costs and, as consequence, to hamper the ability of the Central Bank to establish the yield curve.

Before proceeding, it’s important to highlight that LFTs have zero duration, because they are indexed to the fund rate and, therefore, are not submitted to capital losses²². However, its average maturity is not necessarily short. There are LFTs with 5

²² In Brazilian history there was only one episode where LFTs faced significant capital losses, in 2002, when investment funds highly increased the demand for this bonds as a consequence of a new regulation that established that their portfolio should be marked to market on daily basis. See Mori, Tavares & Bueno (2006).

years average maturity, longer than conventional bonds with fixed rates, as we shall see in the empirical section.

Figure 1: LFT's diagram



Author's elaboration.

i) *Public debt market linked to monetary policy*

The first group of reasons pointed to by some authors for LFTs to create a short-term perverse financial circuit of high interest rates is that public debt market become linked to the monetary policy (Lopreato 2008, Figueiredo & Megale 2007; Arida 2006; Franco 2007, Levy 2007).

According to Lopreato (2008), for example, LFTs are responsible for the fact that a transitional *modus operandi* at the time of radical uncertainty eventually turn into a monetary policy permanent feature, which would lead to the connection between money and government securities markets and the confusion of what is currency and financial savings. This confusion would harm the private credit/investment market because, on the one hand, investors see no reason to look for alternatives if the gain is small compared to the risk to be faced buying private assets, and, on the other hand, it is difficult to lengthen private securities terms due to the possibility of wealth losses if interest rates increase, which does not happen with indexed public bonds. The separation between the money market and the government debt market necessarily requires the elimination of the LFT, which, according to him, represents the synthesis and central pillar of the current situation (Lopreato 2008, p. 29-30).

In regard to the link between monetary policy and floating debt cost, Figueiredo & Megale (2006) mention the fiscal dominance that occurs through this directly from an increase in the interest rate, as the result of monetary policy tightening, to the debt cost and then fiscal policy. For the authors this would cause not only high-risk premiums, but also induce currency devaluation and inflation. According to the authors:

“The high share of the short term public debt (specially the share indexed, with zero duration) causes, at minimum, unpleasant side effects that require an extra fiscal effort to keep the public debt in reasonable path.” (Figueiredo & Megale, 2006, p. 158. Free translation)”.

The authors don't mention what is considered a “reasonable” level, though.

Also related to fiscal aspects, Franco (2006) believes that LFTs contribute strongly to the crowding-out effect as they are very profitable and low-risk assets. These features crowd out the private sector from national savings, which favors government funding by purchasing LFTs. Therefore, for this author, LFTs contribute to the elimination of the competitiveness of private securities in a wide range of asset offerings (Franco 2006, p. 278).

Beside the crowding out effect, Franco (2006) also argues that the existence of LFTs masks the "very serious fiscal problem" in Brazil, with high public deficits and a high level of public debt. According to him, the Brazilian authorities for decades have been dedicated to reassuring international investors and young analysts about the limited risks of rolling over the domestic public debt. The author in fact is talking about the domestic debt denominated in the domestic currency, the “Real”, which, as we saw in

previous chapters, entails no risk of default and/or roll over at all. However, for the author, LFTs are a “sin” that cover the real fiscal problem:

If issuing debt denominated in foreign currency is a sin that could theoretically be avoided, LFTs should be viewed as another sin, **possibly more serious**, which, according to the same thesis, could or should also be avoided. (...) It is curious, however, that from 1999 onwards the sin represented by exchange indexed securities was considered to be much more serious than that represented by the LFTs. (Franco, 2006, p. 283, free translation, emphasis added)

The “sin” promoted by the LFTs is to create a culture of short-termism and concentrate the financial wealth in the overnight turn over. The existence of this bond stimulates in the public a desire for daily liquidity, and “forced” the investment funds to demand them. Also, LFTs “hide” the fiscal problems of the government and ensure that debt can be rolled over. The author doesn’t explicit a possibility of default, but mention that Treasury has no difficult to roll over public debt, so it’s implicit that he believes that such a situation could exist:

The public demands daily liquidity, the regulator sanctions it, invoking even "investor protection", the funds are obliged to carry LFTs or repo operations remunerated overnight, **and the Treasury and the Central Bank have no difficulty to roll over the public debt.** (Franco, 2006, p. 288-289, free translation, emphasis added)

Also, the existence of LFTs that diminish the desire of investors for other bonds would prevent the Treasury to build a yield curve in the long-term, with a debt structure with different interest rates and maturity. The non-existence of a yield curve, according to him, is extremely damaging for capital markets and, consequently, for financing private investment projects, as there is no reference for pricing long term assets and loans. Note that nothing is mentioned with respect to the “level” of the interest rate target by Central Bank, the cause for the financial wealth to be concentrated in short-term is the existence of LFT. In fact, the high level of interest rates is considered a consequence of the fiscal situation and a “standoff” with lenders, which is hidden by LFTs. We should keep this frame of thought in mind when discussing it in the concluding section of this chapter.

On the other hand, Resende (2006) makes a counterpoint to this argument that monetary tightening imposes a high cost to the public coffers and generates fiscal disequilibrium. The author reminds the readers that this analysis doesn’t consider the cost

of the numerous secondary debt repurchase auctions that the Central Bank has been continuously forced to make in the face of drastic increases of the interest rate. In the context of high interest rate volatility and chronic inflation, the implicit insurance contract between the Central Bank and the financial intermediaries introduced a costly asymmetry for the government. The introduction of financial indexation securities drastically and immediately reduced the cost of carrying a significant portion of debt (Resende 2006, p. 222). Arguing against the view of LFTs as destabilizing due to monetary and fiscal bidding, he concludes:

“Compared to the Central Bank bailout alternative to avoid a systemic crisis, daily financial indexation securities are less costly and therefore relatively stabilizing.” (Resende 2006, 226)

Although the author is referring to the period of high inflation, we can extend the defense of LFTs to an environment of decreasing inflation and interest rates. As we are going to see in the empirical section later, the cost of public debt fixed in a past higher interest rate would also impose a cost for the government. This should also be considered in the debate over LFTs.

ii) *Income and wealth effect*

The second reason why LFT would be an anomaly – that contributes to high interest rates – is that they decrease the effectiveness of monetary policy, as their debt holders are not subject to the wealth effect as LFT holders. Instead, LFTs would generate an income effect.

Firstly, a clarification should be made about the conceptual misunderstanding between the wealth effect and income effect. It should be noted that the wealth effect refers to the loss of present value suffered by holders of fixed-rate bonds when interest rates rise. Every time monetary policy tightens, there is a decrease in the market value of financial wealth. It makes monetary policy more effective in cyclical adjustments, as it reinforces the transmission channel of diminishing aggregate demand. The longer the duration of the paper, the greater the wealth effect resulting from a given change in the interest rate.

LFTs are characterized by the immunity to the wealth effect regarding monetary tightening because they are indexed daily to the fund and therefore have zero duration. There is no risk of capital loss for LFT holders, i.e., there is no loss of present value in the face of an increase in interest rates. This undermines one of the transmission channels of monetary policy, making it less effective in its cyclical adjustments. Consequently, the larger the share of LFTs in the financial assets stock, the smaller the wealth effect of monetary policy on the economy (Loyo, 2006, p. 299).

Resende (2006) gives the same explanation:

“Since daily financial indexation securities, regardless of their issuance term, have a duration of one day, there is no capital loss associated with higher interest on the LFTs stock. Thus, the higher the proportion of daily financial index securities in the country's stock of financial assets, the lower the wealth effect associated with monetary policy and the lower their relative effectiveness.” (Resende 2006, p. 223, free translation)

The wealth effect should not be confused with the income effect, sometimes referred in the Brazilian literature as the “reverse wealth effect” (Modenesi & Modenesi 2012). It refers to the effect that an increase in interest rates by the Central Bank has on LFT holders in terms of additional yield for them. As they are indexed to the fund rate, monetary tightening raises their revenue, or interest rate income. Depending on the marginal propensity to consume, this additional income related to LFT yield, it is possible there could be an increase in consumption and aggregate demand, which could nullify monetary policy tightening. In other words, LFTs contribute to the ineffectiveness of monetary policy because of the absence of the wealth effect and the existence of the income effect. Therefore, LFTs should be replaced by fixed-rate bonds, preferably with long maturity, a fundamental step in restoring the monetary policy transmission mechanism (Loyo 2006, p. 300).

Figueiredo & Megale (2006) also highlight the monetary policy inefficiency caused by the LFT's income effect, which must be compensated by higher interest rates:

Despite all the effort made over the past decade, Brazil maintains an extremely short-term debt, especially as most government bonds are indexed to the Special Settlement and Custody System (Selic) rate and therefore have a maturity of almost zero. This causes monetary tightening tends to have a perverse side effect: it increases the earnings of national treasury creditors, primarily domestic

consumers, and promotes an expansion of aggregate demand, not the other way around. (Figueiredo & Megale 2006, p. 156)

On the other hand, there are some authors strongly against the existence of an income effect or “reverse wealth effect”. For example, Loyo (2006, p. 300), affirms that “the wealth effect has no quantitative importance as the debate in Brazil seems to assume”. According to him, in Brazil there is no strong evidence such as in United States, where the stock of wealth as a proportion of GDP is higher and the income distribution is less concentrated. Resende (2015) also points out that it is a mistake to attribute to LFTs the low efficiency of monetary policy in Brazil. He focuses more in the theme of debt lengthening though, as we are going to see in the next section.

It should be noted that in order for the additional yield (arising from higher interest rates) to increase consumption, in a way to impair the efficiency of monetary policy, two premises must occur: i) the marginal propensity to consume from LFT yields is sufficiently high and ; ii) inflation is demand-led (not cost-push), that is, that the gap between current and potential output is already sufficiently pressured so that an increase in consumption turns into higher inflation. The simultaneous occurrence of both promises seems unlikely and there are no empirical studies proving them.

Moura (2006) is precise when questioning the empirical relevance of the income effect:

For example, if the increase in income in the hands of investors, as seems to have been the Italian experience some years ago, is intended primarily for increased savings rather than consumption, the effect on aggregate demand may be minimal. (Moura 2006, p. 249).

Given the lack of empirical research in this area, it seems a baseless exaggeration to attribute to the LFTs the cause of a perverse financial circuit of short-term and high interest rates. There is no evidence of demand-push inflation, and no evidence that LFTs holders have a propensity to consume the yield coming from these bonds high enough to cause income or wealth effects.

iii) Penalty to debt lengthening and fixing rates.

The third and final argument against LFTs is the supposed difficulty they cause for lengthening debt and fixing rates. And here the argument is in regard to maturity, and not duration. There are LFTs with 5-year maturity, but they have a duration of zero as they are indexed to the Selic, as we already explained. So, for debt lengthening, these authors are referring to the redemption period of the bond, the period of maturity that they are rescued by the Treasury. As the Brazilian overnight rate has mostly been very high in comparison to the international level, LFTs not only provide a high return for investors, but also low risk of capital loss due to zero duration, as already discussed. These characteristics would result in a lack of appetite for “conventional” bonds, with long-term maturity and fixed rates, which in turn would be expressed by high premium requests from investors to “accept” buying them. In other words, the existence of LFT in a context of high overnight interest rates would create a “penalty” for the government to be able to sell long-term bonds or bonds at fixed rates. It would be more secure to stay in the short-term with floating bonds, than risking holding long-term bonds and fixed rates.

We can say that, for these authors, the existence of LFTs results in greater bargaining power for investors at Treasury auctions. Using a term from Modern Money Theory, they would be “bond vigilantes” that would require interest rates to move higher in the long-run component of the yield curve or even reject lengthening maturity or conventional bonds with fixed rates. In other words, according to these authors, there is a perverse vicious cycle of short-term debt which creates a “penalty” for the government to be able to sell long-term maturity and fixed-rate bonds. We are going to present some arguments and quotes of economists who share this view.

In regard to debt lengthening, Figueiredo & Megale (2006) affirm that LFTs creates a comfortable zone of high return and low risk, which discourages the desire for long-term bonds with fixed rates. Investors would not have incentive to lengthen their portfolio, as long-term bonds offer a small premium over short-term bonds (with duration zero, like LFTs). They argue that the discouragement for debt holders of long-term maturity and fixed rates would harm the formation of a yield curve. The author uses as an example the high macroeconomic volatility registered during the 1990s in Brazil, when it was more favorable to accept a gain of 19.5% investing in post-fixed bonds than to risk buying a fixed-rate bond to earn additional 2% (Figueiredo & Megale, 2006, p. 162).

Lopes (2006) affirms that a country with a public debt concentrated, mainly, in short-term terms, mistakenly signalizes for some economists that there is no credibility to issue long-term bonds. As a consequence, investors would require high risk premiums in order to accept these bonds, which in turn will force the government to avoid this kind of issuance. This would create a vicious circle where “the issuer has a bad rating because its debt is short and cannot lengthen its debt because its rating is bad” (Lopes 2006, p. 330, free translation).

For Lopes, the capacity of the market to reject debt lengthening is clear in this part:

"The financial system ultimately has the capacity to simply reject an unwanted offer of government bonds. If the government decides that it will only offer three-year prefixed securities to the market, such a rejection is likely to occur and instead of buying these LTNs, institutions will zero their positions in repo operations with the Central Bank, which ultimately corresponds to the purchase of LFTs. Conclusion: The lengthening of public debt can only take place if there is demand for lengthened public debt." (Lopes, 2006, p. 331, free translation)

Although talking about a “rejection” from the market, in the excerpt below, Lopes also mentions that it is not possible for the government to not be able to roll over the debt, highlighting the perception of the “risk of default” is, actually, false or inexistent. This is interesting because it shows that the term “rejection”, is not accurate, as it doesn’t suggest that the government cannot make issues. The coordination between the Central Bank and Treasury makes them much more powerful than the market, in the sense that they are able to determine the conditions of bonds sales²³. As he said in the previous excerpt, financial institutions zero their positions in the open market.

"The possibility of the government being forced into an internal moratorium because of its inability to roll over its debt is what some less enlightened international investors (and some local analysts) immediately think. Of course we know this will never happen because the central bank can always reset the financial system on an overnight basis using DEMAB²⁴ operations (or equivalent). There will never be a moratorium because of the impossibility of

²³Again, we are assuming, as extensively defended by MMT, that the government does not need to finance its expenditure, as argued in the Chapter 1.

²⁴ DEMAB is the Department of Open Market Operations of Central Bank, in Portuguese: “Departamento de Operações de Mercado Aberto”.

rolling over public debt. Yet, many analysts and investors seem to be confused with this issue, and the fact that the perception of risk of scrolling exists, despite its complete absence of real foundation.” (Lopes, 2006, p. 334-5, free translation).

Of course, as the author states, large auctions will bring difficulty for the Treasury in times of instability. Hence the need for debt management to avoid the concentration of maturities on certain vertices (dates). But still, there is no risk of default.

Although the risk of default does not exist, lengthening of the public debt structure would have a positive effect on private credit markets. Such structure would create a benchmark for the issuance of private long-term bonds, providing long-term public interest rates as a reference for its private sector “counterparts”. The mortgage market would benefit from such a benchmark, which would be an incentive to the residential construction sector. Lopes also states that as the Central Bank operates in the short part of the curve, longer-term rates are more stable and less subject to intervention from the monetary authority, and this stability would be positive for the capital markets. (Lopes 2006, p. 334)

Although mentioning the demand side problem, Lopes also notices a problem from the supply side of LFTs. Its existence allows the government to extend the term of the paper without affecting its duration and is the cause of the non-lengthening in terms of maturity (not duration) of the Brazilian public debt. From the demand side, it is expensive to lengthen the portfolio when one is already satisfied with the level of short-term returns. Despite mentioning this supply side problem, the author concludes: “Therefore, the debt lengthening would occur as a result of both the Selic rate and interest rate volatility reduction.” Therefore, it is not because of extinguishing LFTs. (Lopes, 2006, p. 333).

This is not the case of a group of “LFT elimination advocates”, believing that these bonds are the cause for all the problems described. The elimination of LFTs would contribute to the “financial normalcy, characterized by structured operations of all segments of the credit market, and supported by a balanced and reasonably stabilized forward structure” (Dias Carneiro, 2005, p. 198).

Franco (2006) also advocates the extinction of the LFTs. For him, LFTs were created and developed in a context of hyperinflation, risk of dollarization and major debt rollover problem; furthermore, considering that these conditions have already been

overcome, LFTs should be eliminated. According to him, institutions and habits are displaced from the current context, undermining monetary policy and the public debt market. For example, there would be a mutual dependence between LFT's overnight mechanics and the fund industry, which would correspond to a "wrong equilibrium" based on preserving the status quo. As there is path dependency, the extinction of LFTs should be forced institutionally (Franco, 2006, p. 275).

Lopreato also advocates for the elimination of LFTs, as mentioned above, which would be essential for the end of the short-term culture. The author recognizes that this proposal would imply a loss of monetary autonomy, but he believes that this is positive:

“The risk of triggering a crisis throughout the financial system would limit the power of the BC to promote high interest rates and would require improved efficiency monetary policy transmission channels. On the other hand, the public sector would benefit from the reduction in the cost of debt refinancing, the higher liquidity of secondary market and the redefinition of demand from institutional investors, expanding the possibility of placing securities of different maturities and rates, with direct influence on the construction of the term structure curve of the interest rate and benchmarks, fundamental in the development of the private bond market.” (Lopreato 2008, p. 31)

Dias Carneiro (2006) is another advocate of the extinction of LFTs. He believes they have been created in a context of risk of domestic public debt (in Real) default, i.e., the perception by policy makers that the private sector would not want to keep financing the State, or roll over the public debt. As monetary policy and debt management recently have “overcome” this risk, their existence would not be justifiable anymore. Their elimination would bring back financial normality and a better quality for public debt. However, “the long memory of the Brazilian state financiers cannot be erased, the LFT extinction should be made smoothly and accompanied by decreasing interest rates by Central Bank” (Dias Carneiro, 2006, pp. 213, emphasis added). In this excerpt, we can see that the extinction of LFT has to do with a view that the state needs a bargaining lender (the market).

However, the extinction of LFT is not a consensus as a necessity for debt lengthening and building a yield curve. Actually, as we are going to see later, there are some advocates of its existence as an instrument to mitigate instability.

Firstly, Resende (2006) argues that it is the reduction of macroeconomic risks that induces debt lengthening, not the artificial debt lengthening that will reduce the risks. The author is quite clear about this point:

Since LFTs last for one day, it is inferred that they are the cause of the difficulties in extending debt and, consequently, the low efficiency of monetary policy. There is a reversal of the sense of causality. Debt is short and LFTs continue to have significant relative weight because the country's systemic risk or jurisdictional risk is high, not the other way around. (...) It is the reduction of uncertainty that leads to stretching rather than stretching - especially if artificially induced - that leads to the reduction of uncertainty. (Resende 2006, P. 225.)

Later, he concludes:

The lengthening of the debt and its operational and fiscal advantages are the consequence of a good policy, that is, the reduction of risk and uncertainty. The lower share of LFTs in debt should therefore naturally result from the softening of perception of risk and uncertainty rather than regulatory imposition. (Resende 2006, p. 227).

Wu (2006) affirms that the cause for the difficulties in debt lengthening is the systemic risk of Brazilian economy related to the fiscal and monetary fundamentals, and the author reinforces that it is important not to confuse this causality. Short maturity would be a symptom of the systemic risk and therefore, public debt lengthening comes naturally with time as macroeconomic volatility decreases. However, the author mentions the possibility of government default, even in domestic debt denominated in national currency, the Real. According to him, the probability of default and the variance of the inflation rate would be higher in the Brazilian economy – and high share of LFTs in total debt would be a signal of this, debt lengthening is a matter of time and depends only on the insistence on fiscal and monetary efforts been made in recent years (Wu, 2006, p. 187-188).

Even Levy (2006), a neoclassical economist, understands that the increase in the fixed-rates portion of debt in 2005 in Brazil occurred when the Brazilian Central Bank was increasing its interest rate target and the market was confident that inflation would be controlled (Levy 2006, p. 184). Therefore, we can see that the author grasps the causality running from the macroeconomic environment to the debt profile, and not in the

opposite direction, as the authors who say that the existence of LFT deteriorate the debt profile and the macroeconomic condition (of creating a term structure curve).

Moura (2006), despite mentioning the term “acceptance”, which in our theoretical perspective is not very correct as seen in chapter 1, is another “advocate” of LFTs:

The key role of this bond has been to allow domestic public debt to roll over in times of stress, when inflationary or exchange rate shocks, and changes in investors' attitude towards risk make it difficult for any issuer to accept any reasonably priced bond. Hence comes the sense of a "last resort bond" (Moura 2005), as it is used by the public debt administrator to get through periods of turmoil such as the Mexican shock, the Asian crisis, the Russian default, the Brazilian currency change, the energy crisis, Argentine default and Brazil's electoral uncertainty during the second half of 2002. (Moura 2006, p. 247).

His view of “last resort bond” reinforces the view that LFTs can be stabilizing in times of crisis. We are now going to present some regulatory discussions before giving our interpretation, based on Function Finance and MMT.

3.2.2. Regulatory framework that discourages long-term asset demand

The discouragement to carry long-term assets is also related, in the Brazilian literature, to the regulatory framework. For example, Figueiredo & Megale (2006) point out the fact that pension funds are obliged to value their assets at market prices. Considering that the volatility of those prices could deviate from their actuarial goal, there would appear a preference to maintain a large portion of assets with low duration. The high liquidity bias of investors in the Brazilian market is associated with the obligation of daily disclosure of the value of the quotas is not an incentive for the fund manager to take risks, because investors tend to make redemptions as soon as the quotas are decreasing in value or the variations in them are too volatile. According to the authors, deep reforms are needed to give more flexibility for managers to look for the best risk-return as possible independently from the rigid daily liquidity requirements. This would increase the demand for long-term bonds, including treasuries, and contribute to the lengthening of the public debt.

Levy (2006) agrees with the argument that the institutional and legal framework inhibits the performance of natural purchasers of longer duration assets such as pension and mutual funds. He mentions the same argument that pension funds are required to determine its assets at market prices, which, given the volatility of these prices in the short term, forces the fund manager to hold a large portion of its assets in short-term securities, so that its fund will not distance themselves from the actuarial goal.

Figueiredo & Megale (2006) also criticize the effect of valuing the asset profile at market prices in multimarket or hedge funds, which should be funds for investors with long-term goals and less concerned with negative returns in short-term investments. They argue that this is worsened by the guarantee of daily liquidity given by some of these funds (redemption of quotas on a daily basis), as managers tend to be more risk averse than this type of fund requires. According to these authors, legislation should be modified in order to create tax distinctions between short- and long-term funds. This would increase their demand for long-term bonds including Treasuries. Lopreato (2008) agree that the daily liquidity guaranteed to investors in the Brazilian fund industry is a key to change the environment where money is confused with savings, preventing a yield curve to be built.

Besides, Figueiredo & Megale (2006) mention the legislation which created a decreasing income tax rate on investment funds and other fixed income investments, according to the average maturity of the portfolio and also to the period of redemption of quotas (Law 11.033/2004). The intention of the legislators was to create tax incentives to stimulate long-term savings in capital markets which would have a positive effect on public debt lengthening. The authors argue, however, that in order to improve the public debt profile, legislation should have targeted the duration instead of the average maturity of the asset portfolio, as it is still possible to have LFTs with longer maturity, but indexed to Selic which has the characteristic of a duration of zero. Therefore, the measure does not help to create demand for other treasuries.

There are also arguments in regard to the taxation framework on foreign investors. Figueiredo & Megale (2006) argue that taxation in Brazil has been historically excessive and ineffective thereby inhibiting the entry of international investors in the national financial market, who usually have more desire for long term bonds. Levy (2006) agrees with this interpretation and explains the role of foreign investors as purchasers of long-term bonds:

“As non-resident investors operating in Brazil have shown a preference for medium and long-term fixed rate securities, it is expected that facilitating their direct access to the Federal

Public Securities Debt will improve the debt profile and reduce the risks and cost, as a function of the dislocation of the demand curve.” (Levy, 2006, p.185)

In 2011, Brazilian legislation reduced the tax on yields for those investors to zero (Law. 11.312/2006). This measure, as expected, increased the share of foreign investors in the domestic public debt, and in fact mainly in fixed-rate and long-term maturity bonds, as we are going to see later in this chapter.

3.2.3. The criticism: a MMT/Functional Finance interpretation for the Brazilian domestic public debt profile debate.

As we have seen in previous sections, there are many arguments against the historical Brazilian Debt Profile, which consider it too concentrated in the short term, and is reinforced by the existence of LFT thereby creating a financial perverse circuit. LFTs are considered harmful as they would impose a floating cost that causes a fiscal constraint attached to monetary tightening, thus turning the cost of debt unpredictable and more expensive because investors would pressure for high risk premiums. The Treasury Bills would also generate an income effect in conjunction with the absence of the wealth effect that that diminishes monetary policy efficiency. Finally, they would enhance difficulty in debt lengthening, generating high risk premiums for conventional bonds and preventing the development of a yield curve. As we have seen in several quotes in the sections above, the establishment of the LFT has to do with specific authors' view that there was an impasse with the creditors and also that the State needs financiers who have bargaining power, ideas totally rejected by our interpretation. As we have seen, the State can always afford to spend in its own currency (or can always “finance” its expenditure in local currency) and LFTs were an instrument used to make this occur in a context of high inflation.

In other words, the origin of the LFT is not about a “bailout” for government funding, but rather as a normalizer and a stabilizer of the financial system. LFT was a solution for a time of uncertainty about future nominal interest rates and inflation, they were not a solution to the government's debt rollover or credit risk problem, which by definition does not exist, as seen in Chapter 1. The market knew that the government would be able to pay the debt, the problem would be the future value of these payments,

given the interest and inflation rates. Hence the solution was reached by creating the LFTs.

The creation of LFTs, as mentioned above, followed Central Bank's repurchase of prefixed long-term bonds to avoid capital losses and systemic crisis and in that sense, LFTs were less costly for both the market and government. Interestingly, this is what still happens in any modern monetary system, where the Central Bank has a crucial role in maintaining stability. If interest rates start rising and causing massive capital losses for financial institutions, the Central Bank will act in the secondary market by repurchasing them. And at the same time, the Treasury issues floating- and short-term bonds, more adequate to the scenario.

This doesn't mean that the Treasury is "captured" by the market. There is no private Financial Market without public debt, because public bonds are desired by the market as an alternative asset that assure profitability and liquidity. The demand for public debt is a natural characteristic of a modern monetary system, and, even considering stressful situations where the Treasury might act to maintain stability, there is no "bond vigilante" capable of threatening and betting persistently against the Treasury and Central Bank. The primary dealer system and the demand for highly liquid and secure assets is more profitable than reserves which is the key for public bond issuance.

In this sense, the existence of LFTs in Brazil should not be considered an anomaly. The problem in Brazil is not the existence of these bonds, which are, actually, stabilizers in moments of uncertainty. The problem and the cause of the financial wealth concentration in the short term is the level of the interest rates and the expectations on their tendency, which has nothing to do with risk perception or bond vigilance (see chapter 1). With lower and more stable interest rates, LFTs high share in the debt stock should naturally decrease, and depending on future expectation for interest rates, debt will lengthen, or in other words, buyers would prefer to lock their positions in, expecting, higher return bonds.

In fact, with short-term interest rates exceptionally high and rather unstable expectations, the investor bids for a premium on long-term bonds, due to the risk of capital losses related to interest rate variation. So, it is cheaper for the Treasury to issue floating short-term bonds. But it is not the existence of LFT that prevents a yield curve, it is the level of interest rates, settled by the Central Bank.

Long debt maturity doesn't matter as a role in and of itself, nor doesn't mean that the government has more or less capacity to finance itself, because there is no such thing. Government (meaning Treasury and Central Bank acting together) can always issue bonds, even in adverse conditions such as high inflation, as we have seen. Long maturity might be a positive for the Treasury officials to forecast a better cost of the debt, and also act as a benchmark for capital markets. But, not as a signal of more or less solvability of the government, or as a determinant of economic growth. Again, in the case of high stress in the market, the Central Bank will in the secondary market, or even the Treasury will make exchange auctions, and long-term debt will not be a "positive" and unquestionable feature in the sense defended by these authors. In a scenario of decreasing interest rates, it should be noted, it wouldn't be advantageous for the Treasury to have long-term maturity debt with fixed rates, as this would mean a higher debt cost.

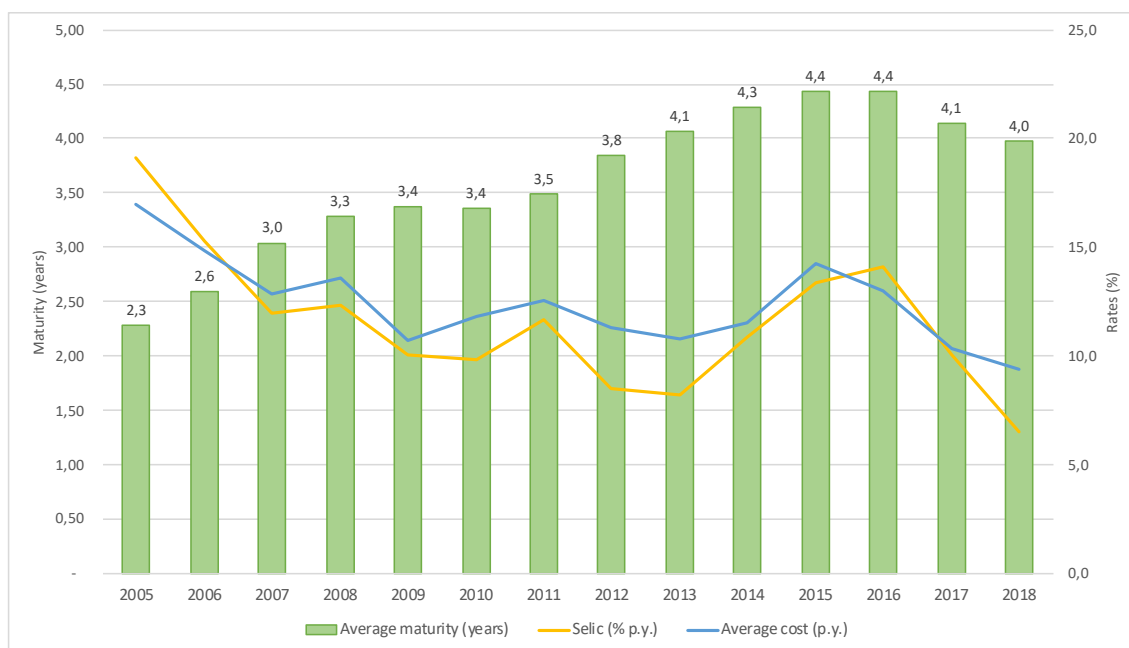
Actually, as we have seen in Chapter 1, the arguments are not endorsed by any of the theories pertaining to the term structure of interest rates, neither by a realistic view of how Treasury and Central Bank operate. The yield curve is determined both by the expectations of short-term rates at future dates as well as supply and demand conditions – in the last case, an example is when pension funds are demanding long-term treasuries and the Treasury decides to sell them in Primary Auctions or the funds buy them in the secondary market causing some price fluctuations. Therefore, the slope of a yield curve can be upward, downward, or even flat, and the vertical intercept depends directly on the Central Bank. Depending on the market conditions and expectations, influenced by the Central Bank, the Treasury can choose to sell specific maturities in better times. The primary dealer system and Central Bank operations in secondary markets also ensure smooth conditions for the Treasury to roll over or issues of new debt. Therefore, there is no "bond vigilantes" nor a threat from the market, neither a pre-conceptualized "benchmark" that should always be pursued (long-term and fixed-rates bonds are not always better). In the next section we proceed to data analysis.

3.3. Empirical analysis of the structure of Brazilian public debt in the 2000s

Having in mind the supposed "perverse short-term circuit" generated by LFTs, firstly we will exam if there is any relation between maturity and debt cost due to a confidence effect and lower risk premiums. We can see that the tendency of debt

lengthening in Brazil since 2005 has not coincided with a systematic tendency of decreasing debt cost. Note in Graph 1 below that while the average maturity of Brazilian Domestic Public Debt increased from 3,3 to 4,4 years between 2008 and 2015, the average cost also increased from 13,6% to 14,2% in the same period. Alternatively, despite the shortening maturity from 2015 to 2017, the cost also decreased. Here we are talking about maturity, not the duration, that in the case of LFT is zero. But, the argument in regard to debt lengthening can be discarded, as those movements do not confirm the argument that maturity and cost have an inverse relation due to any confidence effect. Indeed, the average cost of total debt followed the path of the Selic, firstly because of the share of LFTs which are directly indexed to this rate, and also because of the effect of monetary policy in the expectations of other rates.

Graph 18: Domestic Public Debt - average maturity, average cost and Selic rate



Source: Brazilian National Treasury.

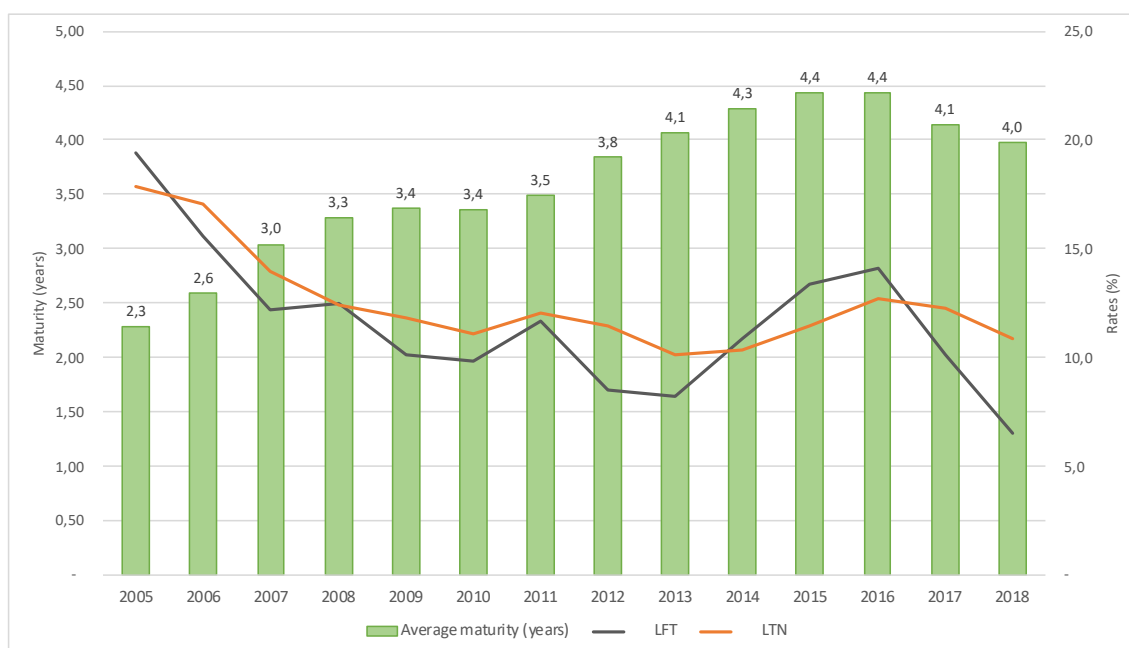
If we expand the data of maturity and interest rates into a more detailed maturity structure, we witness from 2006 to 2014 there was a decrease in the share of bonds with less than two years remaining until maturity, while the share of bonds with more than five years continuously increased. Note how this doesn't coincide necessarily with a decreasing path of the debt-cost. Also, the shortening maturity after 2014 had no effect of pressuring risk premiums, on the contrary, the total average-cost of debt has decreased.

The argument that interest rates tend to fall with debt lengthening due to greater confidence (less premium risk requirements) of the market cannot be confirmed by examining the data.

One could argue that obviously the average debt cost follows closely the Selic Rate because LFTs are indexed to the Selic. Therefore, we undertake the same exercise for the spread between LFT and bonds with fixed-rates and longer maturity: the LTN (Graph 21) and NTN-F (Graph 22).

In regard to the LTN, the spread seems to have increased between 2011 and 2013, a period when the debt was lengthening. From 2016 the spread increased again, and it coincides with debt shortening. One shouldn't forget that it has also been a period of decreasing interest rates. As we advocated, when the Selic is lower, it is natural that the LTNs are going to be sold with a spread.

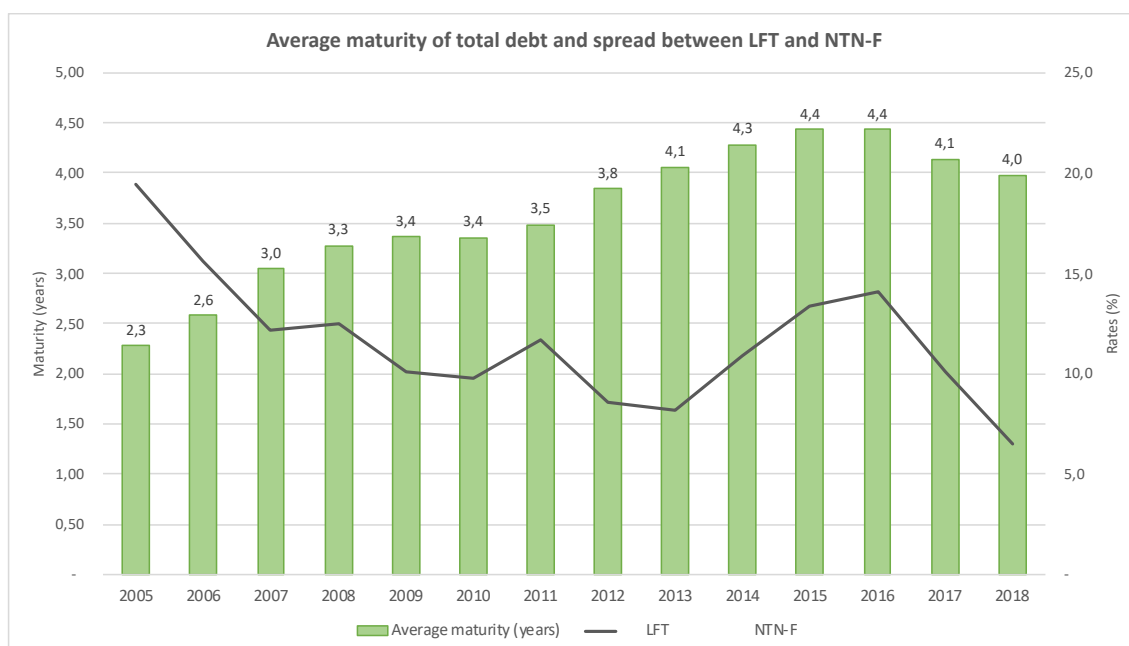
Graph 19: Average maturity of total domestic public debt and spread between LFT and LTN



Source: Brazilian National Treasury.

In regard to NTN-F, the spread has opened and diminished during the debt lengthening period. The numbers – both from LTN and NTN-F – do not suggest the existence of a systematic and strong relation between maturity and spread between LFTs and fixed rate bonds.

Graph 20: Average maturity of total domestic public debt and spread between LFT and NTN-F



Source: Brazilian National Treasury.

Actually, the average cost of debt is closely related to the interest rate defined by the Brazilian Central Bank (Selic), both because of the share of LFTs, directly indexed to the Selic, and because of the effect of the short-term rate defined by monetary policy on expectations of interest rates of bonds with different maturities (Table 7).

Table 7: Domestic Public Debt - maturity (years), average debt cost (%) and Selic (% p.y.)

	Debt Maturity, Selic and Debt Average Cost						Total	Selic (% p.y.)	Average debt-cost (% p.y.)
	Less than 12 months	From 1 to 2 years	From 2 to 3 years	From 3 to 4 years	From 4 to 5 years	More than 5 years			
2006	35,7%	25,4%	15,3%	8,5%	4,7%	10,4%	100,0%	13,19	14,19
2007	30,2%	22,6%	18,3%	6,9%	7,1%	15,0%	100,0%	11,18	14,52
2008	27,3%	24,1%	11,7%	11,8%	5,9%	19,1%	100,0%	13,65	12,32
2009	24,8%	23,1%	13,5%	12,6%	8,3%	17,6%	100,0%	8,65	10,31
2010	24,6%	20,5%	19,5%	11,1%	9,1%	15,2%	100,0%	10,66	12,10
2011	22,3%	24,3%	16,4%	14,1%	3,7%	19,2%	100,0%	10,9	12,03
2012	25,0%	20,6%	15,5%	11,5%	7,3%	20,1%	100,0%	7,14	11,72
2013	25,5%	19,3%	13,6%	11,1%	8,4%	22,2%	100,0%	9,9	12,35
2014	24,6%	17,6%	12,2%	12,9%	5,1%	27,6%	100,0%	11,15	12,64
2015	22,2%	14,1%	12,6%	10,4%	7,9%	32,8%	100,0%	14,15	15,06
2016	17,0%	16,8%	10,9%	12,3%	17,4%	25,6%	100,0%	13,65	11,61
2017 (até set)	17,6%	15,5%	15,5%	18,4%	10,1%	23,0%	100,0%	9,15	10,00

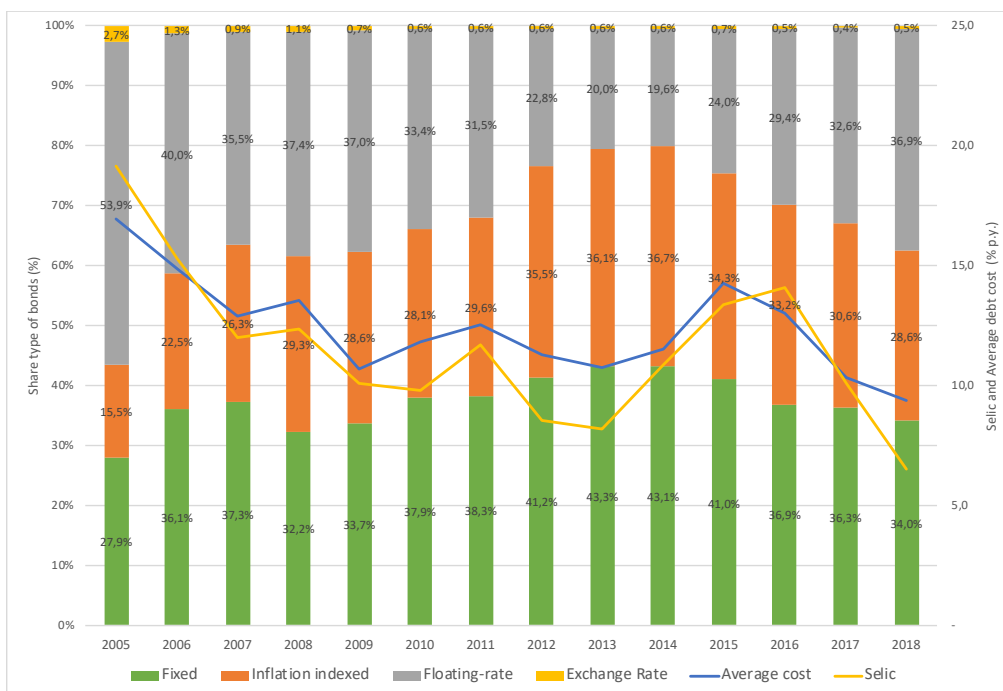
Source: Brazilian National Treasury and Central Bank.

In regard to the composition of the Brazilian Domestic debt per indexers (Graph 4 below), it is important to highlight two factors. The first one, already mentioned, is that the share of floating-rate bonds influences the average cost of the debt, because most of these bonds are LFTs, which are indexed to the Selic, the overnight rate target by the Central Bank. Consequently, when the share of floating bonds increase (decrease), the Selic influences more (less) the average cost of total debt. For example, between 2011 and 2013 the share of floating bonds decreased from 31,5% to 20%, while the spread of the average cost over the Selic increased, because other factors affect the yield of the other bonds, including inflation, which was increasing and being incorporated into the securities price.

Beside the direct effect of the LFTs on the total cost, we also believe that the structure of the debt might respond to the expectation of the Selic's future path. Note how the increasing share of the fixed-rate bonds in the total of the debt (green plus orange areas in Graph 23²⁵) from 2003 to 2014, coincides with a decreasing path of the Selic. Our hypothesis is that, if the market expects that interest rate will continue to decrease, investors tend to prefer fixed-rated bonds, to guarantee the current yield, higher than expected to be in the future. As soon as the Selic started to rise from 2013, the share of floating bonds increased: investors do not want to buy fixed-rate bonds and sustain capital losses in the future due to the higher interest rates. This argument, however, doesn't hold in the period of 2017 and 2018, when the Selic is decreasing but the share of floating-rate bonds increase. Our hypothesis here is that expectations were not anchored, so that the uncertainty in regard to future rates caused investors to prefer floating bonds to mitigate capital losses.

²⁵The inflation indexed bonds, Notas do Tesouro Nacional Série B (NTN-Bs), have also a fixed rate as part of the yield, therefore, we are summing green and orange areas.

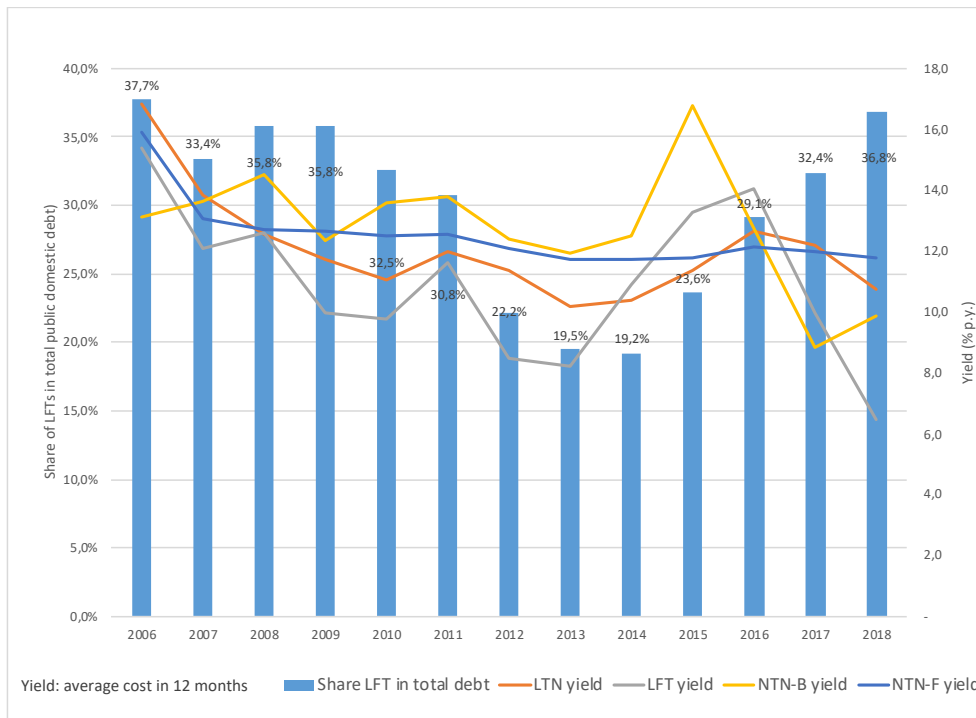
Graph 21: Domestic Debt Composition per Indexer (%), Average Debt Cost (% p.y.) and Selic (% p.y.)



Source: Brazilian National Treasury and Central Bank.

Now we analyze in greater detail what extent the share of LFTs had an effect on the risk premium of other bonds, as argued by some economists presented in section 3.2. As can be seen in Graph 24, the opposite of what they claim occurs. When the share of LFT decreases, the spread of LFT cost (Selic) to other yields actually increases, meaning a higher premium over LFT return. Alternatively, when the share of LFT rises, from 2014 to 2018, the spread decreases. There is no evidence that the share of LFT creates a “perverse vicious circle” which causes investors pressuring for higher interest rates in long- or fixed-rate bonds (such as LTN, NTN-B and NTN-F).

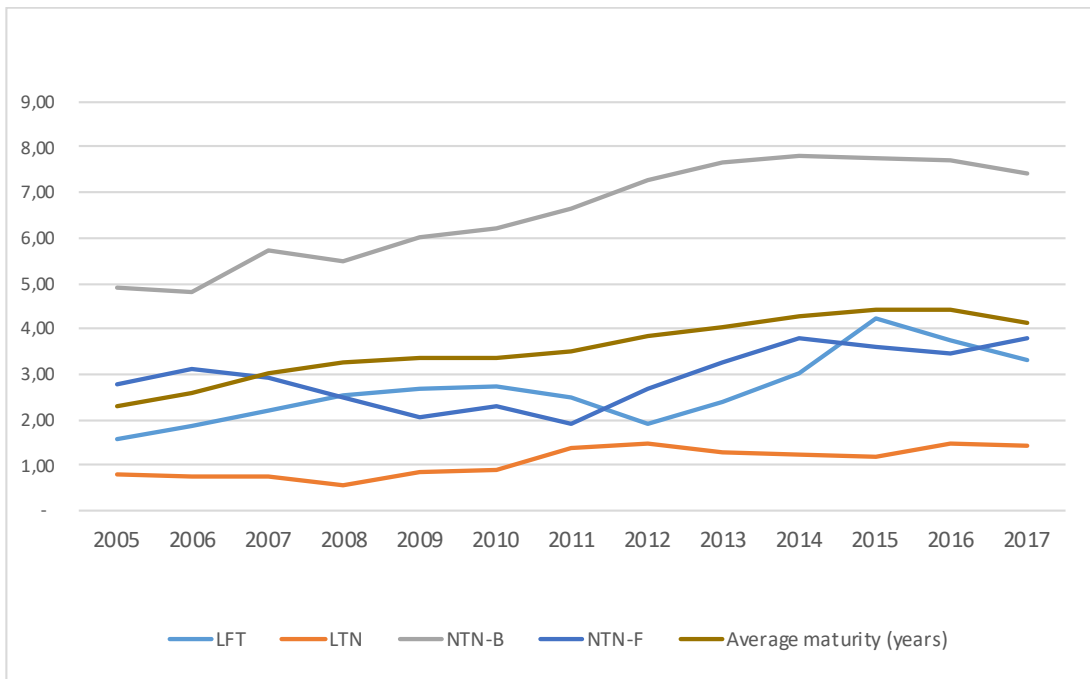
Graph 22: Share of LFTs in total debt (%) and yield of selected bonds (% p.y.)



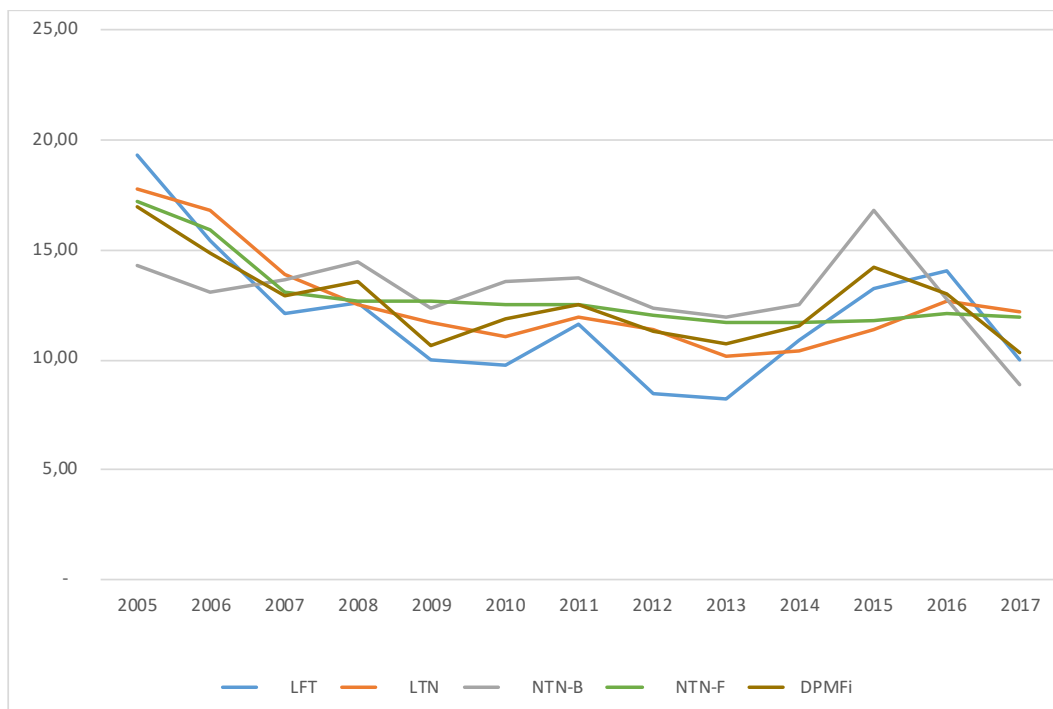
Source: Brazilian National Treasury.

Graphs 25 and 26 below also show that a longer maturity doesn't necessarily mean lower costs. The argument that debt lengthening opens space for decreasing rates due to a lower risk premium, as we have seen, doesn't seem to fit the data. Note despite NTB-S having higher maturity, they don't have the lowest cost, on the contrary, they actually have the highest cost during the majority of the time. The shorter-term bonds (LFT and LTN) remain with lower yields. This is because, as correctly stated by Habitat and Liquidity Premium Theories, other factors influence supply and demand conditions, and mostly expectations of interest rates, affect the yield of bonds with different maturities.

Graph 23: Average maturity of selected bonds (years)



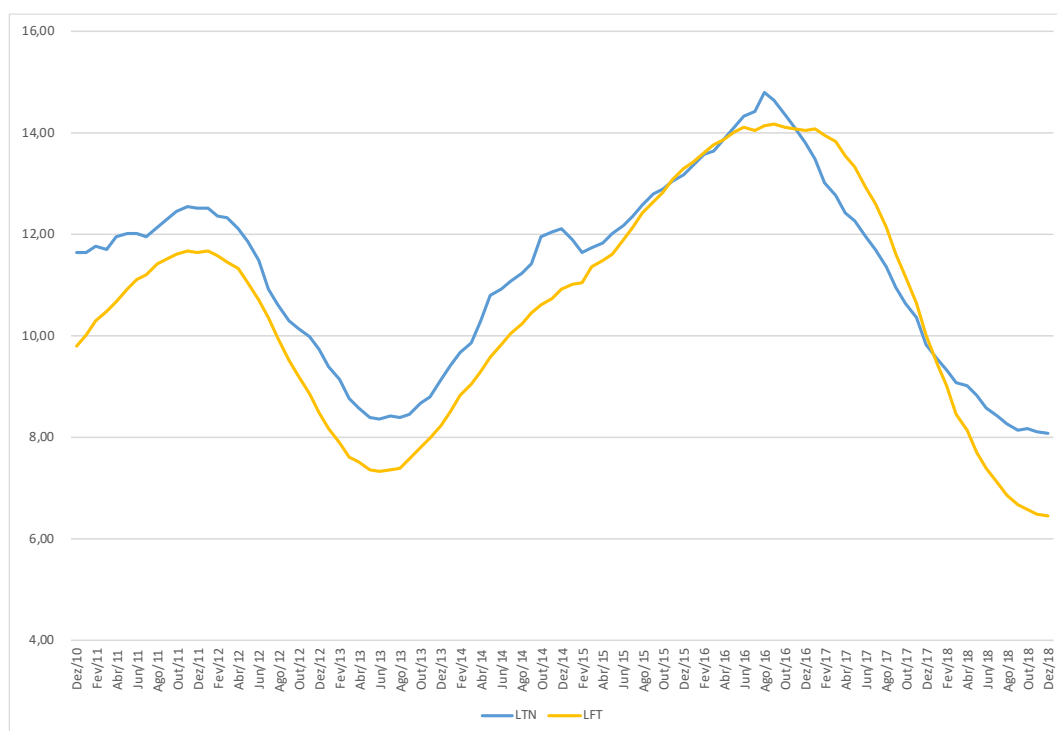
Graph 24: Average cost of selected bonds (% p.y.)



Source: Brazilian National Treasury.

If we examine only LFT and LTN average costs (Graph 27), it is also interesting to note how it is not necessarily so the fixed rate bond, LTN, always exhibits a positive premium over the floating-rate bond LFT. Note that between 2016 and 2017, LTN yield was lower than LFTs, mainly because monetary policy makers were signaling their intentions to reduce interest rates and investors already incorporated this expectation into the price of LTNs.

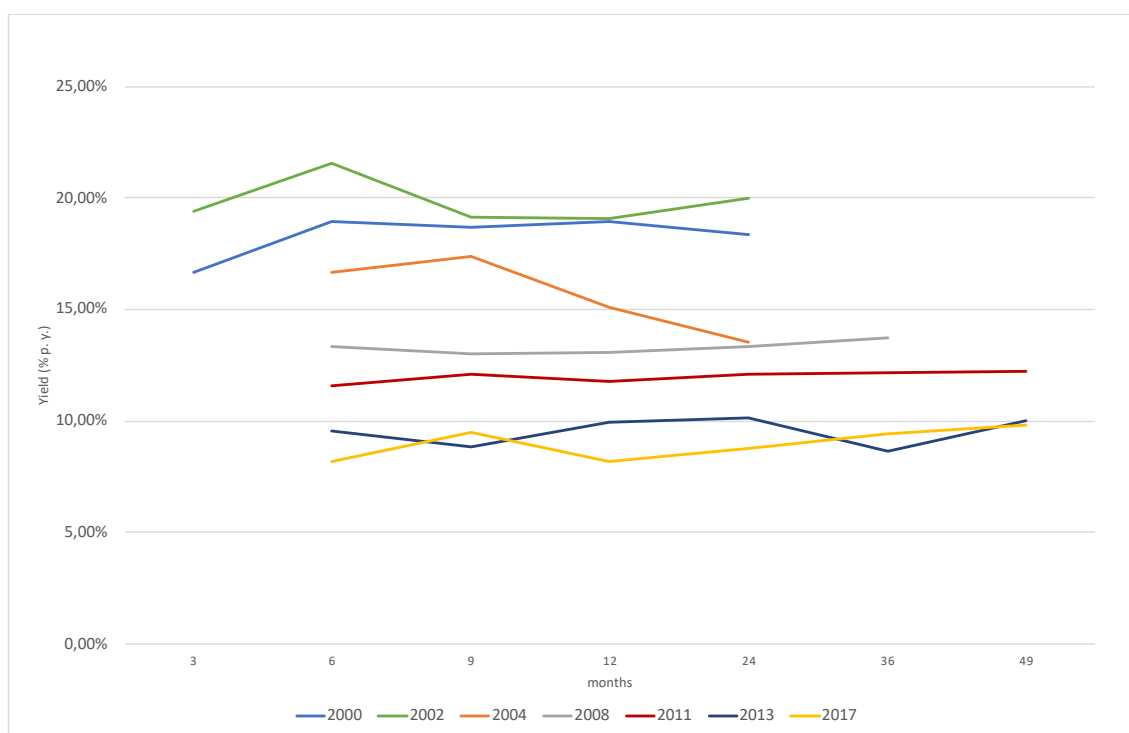
Graph 25: Average cost of LTN and LFT (% p.y.)



Source: Brazilian National Treasury.

In addition, Graph 28 below reinforces our arguments in regard to the term structure of interest rates. There is no reason for the yield curve to be always upward sloping, as implicit in some Brazilian Post Keynesian arguments shown in section 2. LTN is a fixed rate bond and its maturity does not have a positive relation to yield, and its yield curve has been flat in multiple periods. Factors such as the expectation of the interest rate in future dates, the signals of monetary policy, and supply and demand conditions explain the slope of yield curves rather than rigid concepts related to “confidence”, “bond vigilanties” or a “benchmark”.

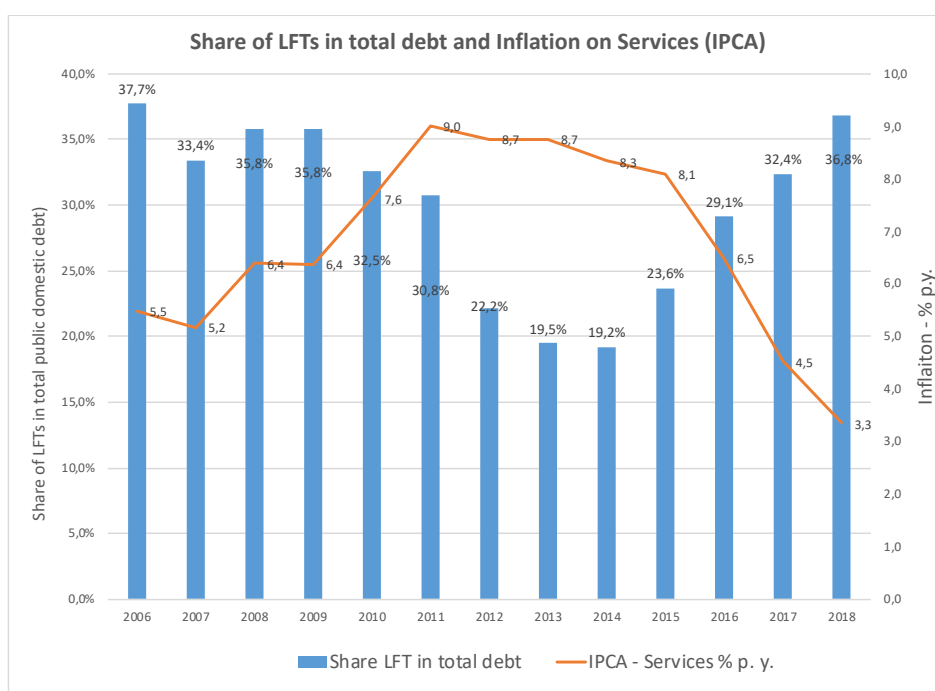
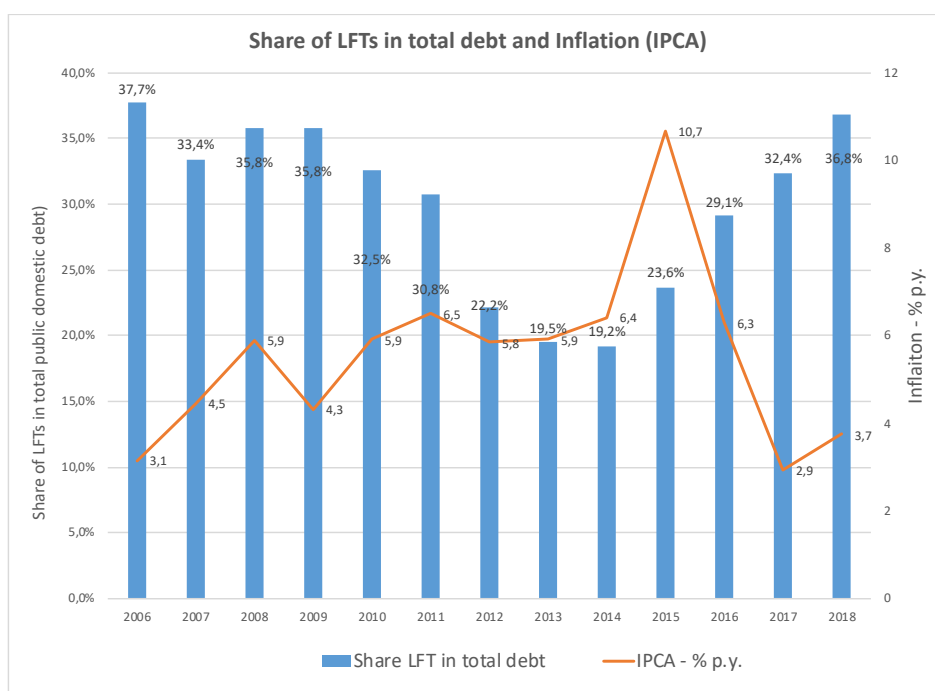
Graph 26: Yield curve for LTN (% p.y.)



Source: Brazilian National Treasury.

As we have seen in previous section, some economists mention the existence of an income effect from LFT holders which diminishes the effectiveness of monetary policy. Graphs 29 and 30 below show that an increase in the stock of LFTs held by the public does not coincide with an increase in the General Consumer Price Index - IPCA, nor the general index, nor the service sector index, where the additional wealth of rentier holders could supposedly be destined. In addition to a lack of empirical work on the subject, a simple comparison with the inflation index does not support the argument.

Graphs 27 and 28: Share of LFTs in total debt (%) and Inflation (IPCA % p.y.)

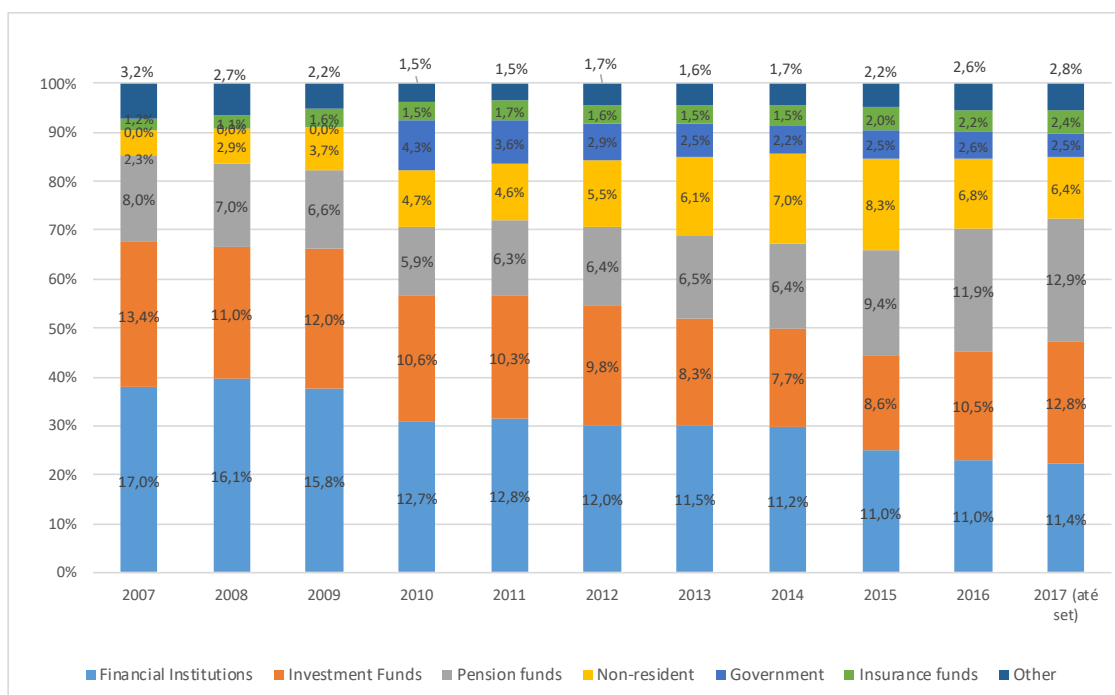


Source: Brazilian National Treasury and Central Bank.

In regard to debt holders, it was argued by some economists that non-resident investors tend to demand longer-term maturities. Below we can notice that, in fact, when non-residents increased their share of holdings in total debt (after 2011 – Graph 31), there was an increase in the average maturity of debt (graph 32). It is also evident that this kind

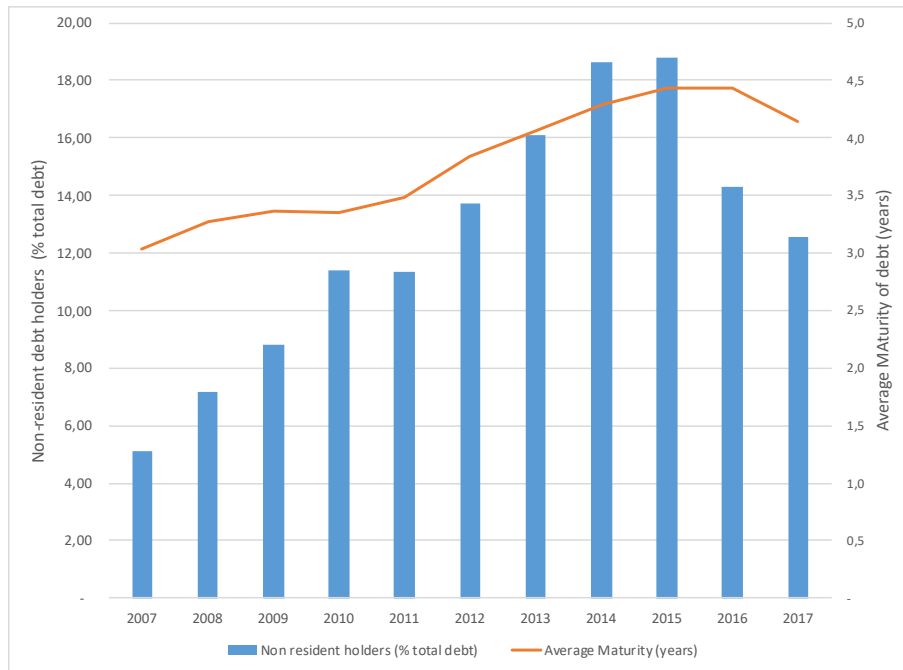
of investor demand more conventional securities, with fixed-rates and longer maturity, such as LTNs and NTN-F, and less LFTs (Graph 33). We do not believe, however, that this means that opening financial markets to foreign investors is desirable to improve the debt profile, as in our interpretation, the debt profile is not considerably relevant in terms of fiscal and monetary policy. Although touching upon another controversial point, foreign investors also bring increased volatility to the exchange rate and might increase external vulnerability.

Graph 29: Public Debt holders (%)

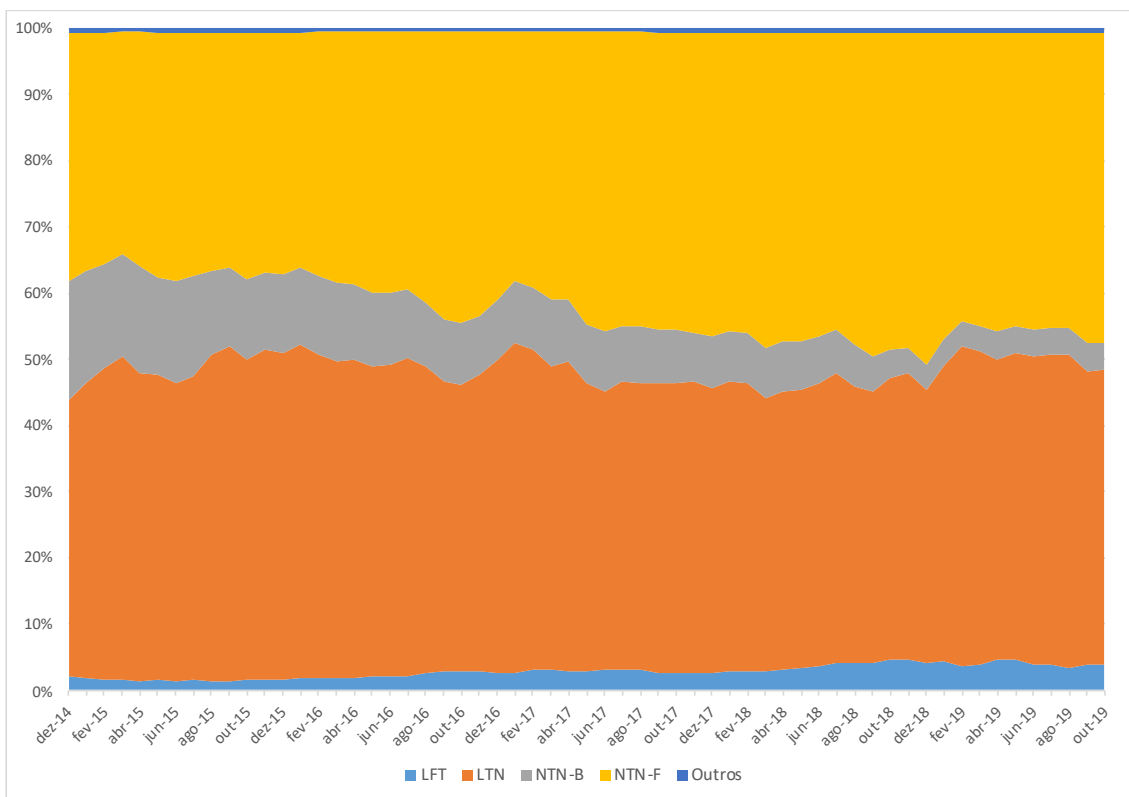


Source: Brazilian Central Bank.

Graph 30: Share of non-resident debt holders (%) and debt average maturity (years)



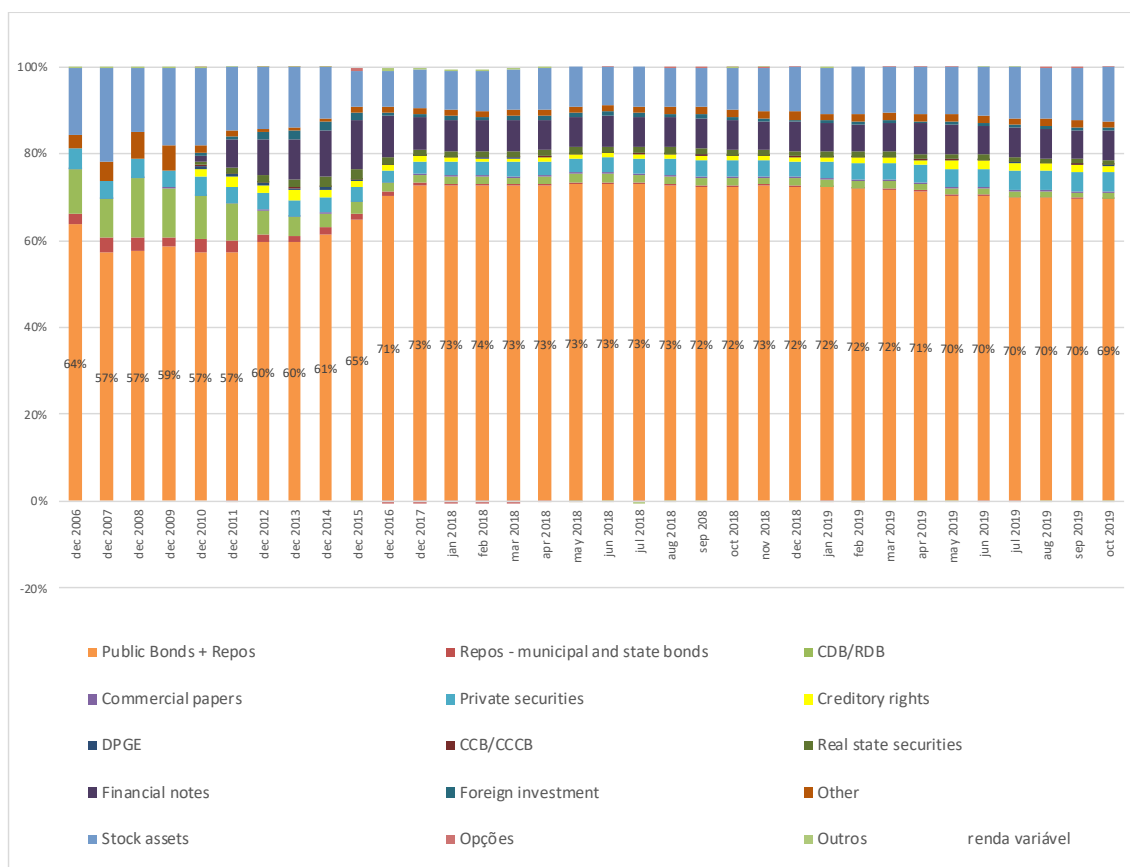
Graph 31: Non residents portfolio on Brazilian public bonds



Source: Brazilian National Treasury.

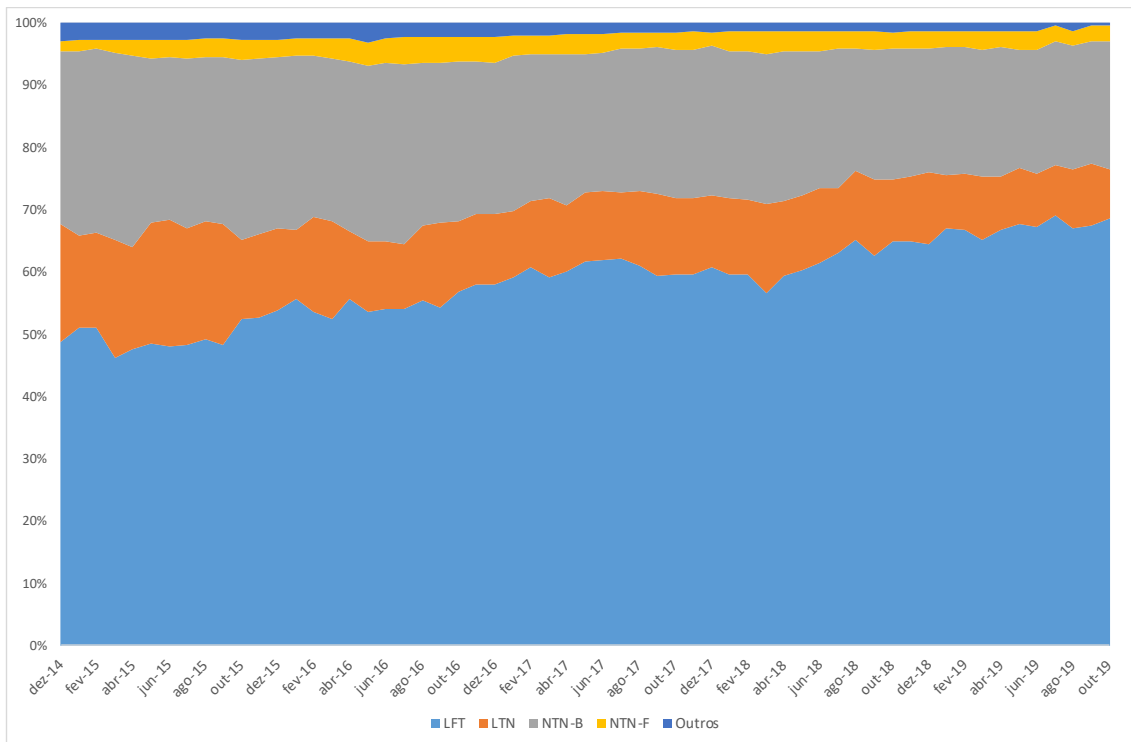
With respect to investment funds regulatory framework which, as mentioned above, tend to reinforce the demand for LFTs and short-term assets, we plot below, a graph of their net wealth and assets allocation. In fact, these funds concentrate the majority of their portfolio in public bonds, instead of other capital market securities. Graph 32 shows that from the total of public bonds held by these funds, LFTs are in fact the majority of their holdings. But we want to reinforce that the problem has been the **high level** of interest rates which prevented the development of a yield curve, and not the **existence per se** of the LFTs. Also, LFTs are not responsible for an upward pressuring in short-term interest rates, as it is determined by the Central Bank as a policy variable. The causality is the opposite, the fact that the short interest rates are high which induces investors to migrate to LFTs, and not the opposite. Also yield curves are built according to the expectation of future interest rates, as we already discussed in the chapter 1, and not by the profile of public debt; therefore, not because of the existence of LFTs. The end of daily liquidity of the quotas might increase the demand for longer securities, but that will not happen without securing interest rates that are in line with the worlds tendency.

Graph 32: Net worth of investment funds in Brazil (%)



Source: ANBIMA.

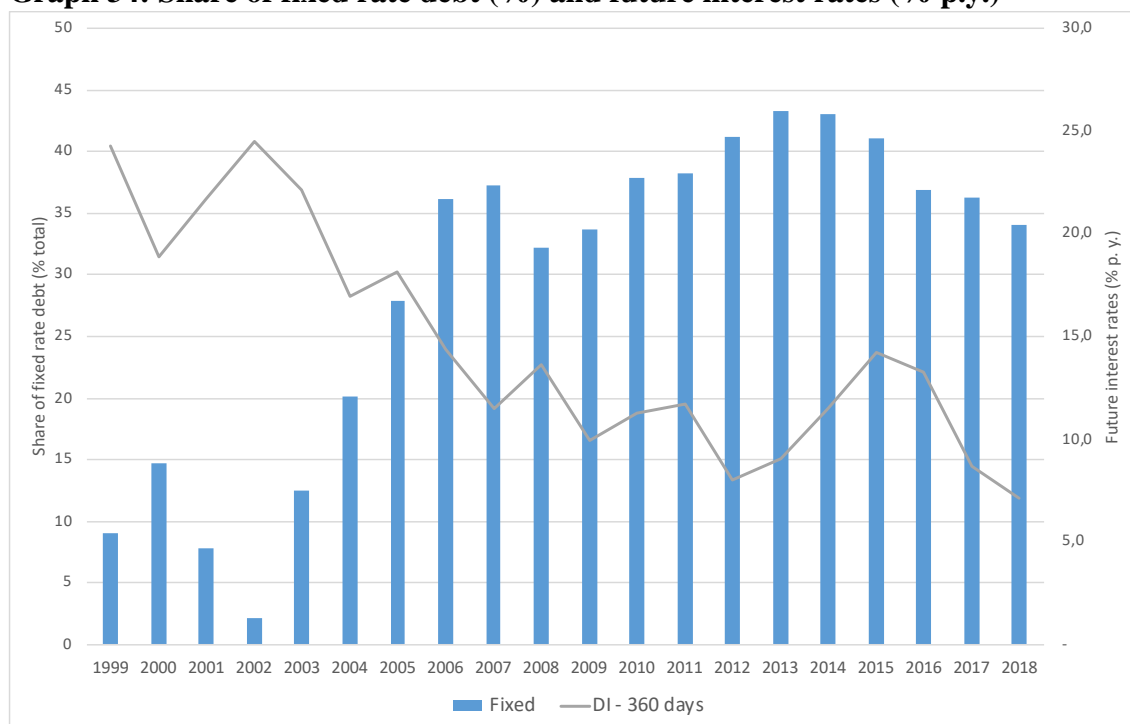
Graph 33: Investment funds portfolio on Brazilian public bonds (%)



Source: Brazilian Central Bank.

Next, we witness that when there is an expectation of an increased future interest rate, financial institutions tend to increase their share of floating-rate bonds. The opposite also happens. When there is an expectation of falling interest rates, institutions tend to increase the share of fixed-rate bonds, because they expect the future values are going to increase. This correlation is not very clear, but if we look at the trend it is.

Graph 34: Share of fixed rate debt (%) and future interest rates (% p.y.)



Source: Brazilian National Treasury and Central Bank.

The low-price variability of LFTs discourages trading in the secondary market, and in fact hinders the formation of a forward interest rate structure. According to Moura (2006) *LFTs and LTN are less traded in the secondary market*, considering only extra-group transactions in order to eliminate trades within the same financial conglomerate. (Moura 2006, p. 250-1).

3.4. Final Remarks

Brazilian Domestic Public Debt in Reais has been commonly criticized for having a profile too concentrated in short-term and floating-rate bonds (Lopes, 2006, Sobreira 2005, Bacha & Crysostomo 2006, Lopreato 2008). This view is endorsed by the literature on a “benchmark”, which considers that a longer- and fixed-rate profile mitigates the risk of refinancing and diminishes the cost of debt (premium requests) (STN 2009, IMF 2014).

In order to criticize this argument, the empirical analysis has shown that there is no evidence the Brazilian profile creates a “perverse vicious circle of short term” that generates “penalties” to issue long- or fixed-rate bonds. Debt lengthening didn’t coincide with lower costs. There was also no evidence suggesting that an increasing the share of

fixed bonds are strongly related to lower costs. The cost is much influenced by the interest rate settle by the Central Bank and expectations about this rate in the future.

Therefore, this chapter provided evidence that the Treasury can establish the selling prices at public auctions given a set of macroeconomic conditions and policy goals and that the private financial sector has limited direct influence on these rates. On one hand, monetary policy determines directly the short-term rate as a policy variable and influences the medium- and long-term rates by affecting expectations and by operations in the secondary market. On the other hand, the Treasury can control the cost of debt by offering the maturities that attend to demand conditions, refusing to sanction high rates required by market participants. There are no “bond vigilantes” capable of threatening the government to finance its expenditures in its own currency due to a supposed inadequate profile of the domestic public debt.

CONCLUSION

Adopting the Functional Finance approach and the Modern Monetary Theory, this dissertation offered a critical analysis of the debate on the Brazilian domestic public debt, denominated in local currency, the Real, during the 2000s. The analysis included the domestic debt structure, mainly indexers, maturity and holders; and debt issuance by National Treasury in Primary Auctions. From the MMT perspective, the theoretical foundation of this critical analysis was the fact that a sovereign government can always afford expenditures denominated in its own currency and should do so to bring the economy to full employment. Concerns with default of public debt denominated in the local currency of a sovereign government are unwarranted. To prove our points the dissertation was divided in three chapters. The first one provided a theoretical overview on Neoclassical and Post-Keynesian approaches (mostly the view of Brazilian post-keynesians) and MMT (which based the whole analysis). The second chapter focused on the institutional aspects of Brazilian Government spending and debt issue, including the relation between Central Bank and National Treasury and an empirical analysis of Primary Auctions. The third chapter presented the Brazilian debt management debate, mainly focused on LFTs, and offered an empirical analysis over the debt profile.

Chapter 1 has shown that, in the neoclassical economic framework, there is no causal connection from debt to interest rate unless fiscal deficits are permanently maintained, which would threaten the sustainability of the government's intertemporal budget constraint. Therefore, the causal relation is from the flow of spending (not debt stock) to the interest rate and debt cost. Also, there is no possibility of default on debt denominated in local currency, only a risk of hyperinflation associated with monetization. In the post-keynesian approach, the interest rate is also not directly related to the size of the debt stock, but can be related to the flow of public spending and the budget outcome, as expectations play a crucial role in this analysis. Fiscal balance should not be a goal in itself and deficits should be pursued in order to achieve full employment. Brazilian post-Keynesians economists, however, there is greater caution, or concern, over fiscal deficits and debt issuance related to what it is supposed to be an “adequate” public bonds structure.

Finally, from the Functional Finance and MMT perspective, which was the theoretical foundation of the dissertation, we discussed that public bond issuance is not a financing operation for the government in the same way that the private sector finances

its expenditures. Domestic public debt issue (and management) is a policy instrument to control reserves, influence interest rates, and offer alternative assets for the private sector. By providing an analysis of the interlinkages between the Treasury and Central Bank, we presented how a sovereign government really spends in its local currency, adding reserves into the banking system, and how the coordination between these two institutions guarantee there is no such thing as “bond vigilantes”, which are able to “refuse to finance” the government, pressuring persistently for higher interest rates or forcing the Treasury to default. The primary dealer system, the interventions in the secondary market by the Central Bank to maintain the interest rate target and ensure stability, and the coordination between Central Bank and Treasury are examples of how a sovereign government has significant power to influence the cost of its debt in the short- and long-term, and cannot default in its own currency in a modern monetary economy.

In regard to domestic public management, we discussed, also in chapter 1, how the benchmark literature, by suggesting that public debt should be lengthened and prefixed, ignores the ultimate aspect that, no matter what the debt profile is, a government will always be able to intervene in the public debt market, especially when capital losses are threatening the stability of financial markets. Debt management might be important to diminish public debt costs, however, this is not the case in avoiding any risk of not being able to finance itself (the so-called refinancing risk), because such a risk, in local currency, does not exist. Moreover, this literature ignores the main determination of a yield curve, which is the expectation of the future interest rate, as we have seen with the term interest rate structure theories. Therefore, pursuing a benchmark may be positive from the debt manager's bureaucratic point of view, and certainly to minimize debt costs, but it has nothing to do with maintaining a profile that removes the Treasury from the hostage position of the market, as this situation cannot exist.

With regard to the analysis of primary auctions of Brazilian National Treasury, in chapter 2, we showed, firstly, that the increase in the stock of debt does not necessarily coincide with an increase in the rates accepted by the Treasury. The volume of bonds sold in the auctions also does not reflect any difficult conditions 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% during the whole period of analysis, and the percentage of auctions with no bonds sales was always low, less than 10%. Furthermore, the quantity

of bonds in relation to the total offered by the Treasury was high throughout the whole period.

These indicators oscillated in moments of political uncertainty and volatility in the financial market, such as 2002 (Lula presidential election), 2008 (global financial crisis) and 2015-16 (domestic political crisis and a downgrade with the loss of an investment grade rating). During these periods, issues of post-fixed and short maturity bonds usually increased at the detriment of the prefixed and long maturity bonds, and the interest rate registered in the auctions also increased. But, besides being expected as a rational decision of portfolio managers and even positive in terms of financial costs to the Treasury, these 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 do not 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, granting the interest rate target.

In chapter 3, we presented the Brazilian debate on domestic public debt profile, mainly focused on the “Letras Financeiras do Tesouro – LFTs. Brazilian Domestic Public Debt in Reais has been commonly criticized for having a profile too concentrated in short-term and floating bonds, and LFTs are considered the cause of a “perverse financial circuit of short-term” (Lopes, 2006, Sobreira 2005, Bacha & Crysostomo 2006, Lopreato 2008). This view is endorsed by the “benchmark” literature, which considers that a longer and fixed rate profile mitigates the risk of refinancing and diminishes the cost of debt (premium bids).

In order to criticize this argument, the empirical analysis provided evidence that debt lengthening did not coincide with lower costs, and showed that the average cost of debt closely follows the Selic, not only because of the direct effect of the LFTs but also because the Selic is a reference for the other rates of other public bonds, mainly due to the expected future interest rate effect signaled by monetary policy. There was also no evidence that increasing the share of fixed bonds was strongly related to lower costs.

Therefore, we provided evidence that the cost of the debt is much more under control of the government than the market. On the one hand, monetary policy determines directly the short-term rate as a policy variable and influences the medium- and long-rates by affecting expectations and by operations in the secondary market. On the other hand, the Treasury can control the debt cost by offering the maturities that satisfy demand conditions and refusing to sanction high rates required by market participants. There are no “bond vigilantes” capable of threatening the government to not finance its expenditure in its own currency due to a supposed inadequate profile of the domestic public debt. Besides, LFTs are not an “inadequate” bond that creates a “perverse financial circuit of short-term”, alternatively, it is an important asset for moments of instability. What causes the financial wealth to be concentrated in short term and public bonds is the level of interest rates. With the recent decreasing trajectory of Selic, LFTs have even played a crucial role in decreasing the average debt cost. If most part of the debt were fixed in past higher interest rates, there would have been losses for the Treasury given the new monetary policy context.

We conclude stressing the main points of this dissertation 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 and issue public debt denominated in Real. The restrictions for the Brazilian government to spend are self-imposed and mostly related to budget constraints, not to debt issuance. Indeed, Brazilian institutionality of National Treasury offers a lot of flexibility for this institution to manage and pursue the best strategies even in stressful economic moments.

Finally, we conclude that Functional Finance and the Modern Monetary Theory provide the best theoretical framework and insights to show that a Government should always use fiscal policy and public debt denominated in its local currency to maintain a level of spending that manages the create aggregate demand that corresponds to the level of full employment and the maximum use of its productive resources, taking into considerations, of course, inflationary and external constraint concerns. 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, or a residual value. Given the multiplier effects of spending on economic growth, the public deficit and the size of the debt become and endogenous variable which plays a subsidiary role in macroeconomic policy making.

REFERENCES

- AFP (2019). “Annual Financing Plan”. In Portuguese: “Plano Anual de Financiamento”. Available in: <https://www.tesourotransparente.gov.br/publicacoes/plano-anual-de-financiamento-paf/2019/114>
- AIDAR, G.; BRAGA, J. (2019) “Country-risk premium in the periphery and the international financial cycle”. 47º Encontro Nacional de Economia, Universidade Estadual de Maringá, 2019.
- ANBIMA (2014), Fomentando o financiamento privado de longo prazo, Texto para Discussão N. 02, Fevereiro de 2014, Marcelo Cidade e Vivian Corradin, Rio de Janeiro, 2014.
- ARESTIS, P. & SAWYER, M. (2006). “A Handbook on Alternative Monetary Economics”. Edward Elgard Publishing, United States,
- ARIDA, P. (2006) As Letras Financeiras do Tesouro em seu vigésimo aniversário. In: Bacha, E; Chrysostomo, L. (Org.) Mercado de Capitais e Dívida Pública. São Paulo: ContraCapa, 2006.
- BACHA, E.; CHRYSOSTOMO, L. (2006). Mercado de Capitais e Dívida Pública – tributação, indexação, alongamento. Rio de Janeiro, Editora Contra Capa, 2006.
- BARRO, Robert J. (1974) Are government bonds net wealth? Journal of Political Monetary Economics, v. 82, p. 1095-1118, 1974.
- BASTOS, C.P. (2002) Price Stabilization in Brazil - a critical review and a classical interpretation for an indexed nominal interest rate economy, Tese de Doutorado, New School for Social research, NSSR, Estados Unidos, 2002.
- BELL, S.A. 2000. “Do Taxes and Bonds Finance Government Spending?” Journal of Economic Issues 34, no. 3 (September): 603–20.
- BLACK, W. (2005) “The best way to rob a bank is to won one. How corporate executives and politicians looted the S&L Industry”. University of Texas Press, 2005.
- BLANCHARD, O. (1990), Jean-Claude Chouraqui, Robert P. Hagemann, and Nicola Sartor. “The Sustainability of Fiscal Policy: New Answers to an Old Question.” OECD Economic Studies 15 (Autumn 1990): 7-36.
- CANUTO, O.; SANTOS, P. FONSECA (2003) “Risco-Soberano e Prêmios de Risco em Economias Emergentes”, Ministério da Fazenda do Brasil, Secretaria de Assuntos Internacionais, Temas de Economia Internacional 01/03, Brasília, October 2003.
- CARDOSO, M. (2012) Limites e procedimentos da política monetária: evidências do Brasil e dos E.U.A. nos anos 2000 / Marcus Cardoso Santiago. Tese de doutorado,

Rio de Janeiro: UFRJ, IE, 2012.

- CARNEIRO, R. (2005). A supremacia dos mercados e a política econômica do governo Lula. *Política Econômica em Foco*, n. 7 – nov. 2005/abr. 2006.
- CARVALHO, F. C. (1992) *Mr Keynes and the post keynesians: principles of macroeconomics for a monetary production economy*. Aldershot: Edward Elgar, 1992.
- CARVALHO, F. C. (2008) Equilíbrio fiscal e política econômica keynesiana. *Revista Análise Econômica*, Porto Alegre, Ano 26, n.50, pp. 7-25, setembro de 2008.
- CESARATTO, S. (2016) “The state spends first: Logic, facts, fictions, open questions” *Journal of Post Keynesian Economics*, 39:1, 44-71, DOI: 10.1080/01603477.2016.1147333
- DAVIDSON, P. *Post keynesian macroeconomic theory*. Aldershot: Edward Elgar, 1994.
- DIAS CARNEIRO, D. (2006) Letras Financeiras do Tesouro e noralidade financeira: haverá um “peso problem”? In: Bacha, E; Chrysostomo, L. (Org.) *Mercado de Capitais e Dívida Pública*. São Paulo: ContraCapa, 2006.
- DORNBUSCH, R.; FISCHER, S. (1982). *Macroeconomia*. 2ª edição, tradução Maria Heloisa Souza Reis; revisão técnica Clarice Pechman Roberto de Rezende Rocha. São Paulo: McGraw-Hill do Brasil, 1982.
- FIEBIGER, B. (2012) ‘A Rejoinder to “Modern Money Theory”: A Response to Critics’. Working Paper Series N. 279, Political Economy Research Institute, University of Massachusetts Amherst.
- FIGUEIREDO, L.F.; MEGALE, C. (2006) O processo de alongamento da dívida pública mobiliária federal. In: Bacha, E; Chrysostomo, L. (Org.) *Mercado de Capitais e Dívida Pública*. São Paulo: ContraCapa, 2006.
- FRANCO, G.H.B., (2006). Notas sobre crowding out, juros altos e LFTs. In: Bacha, E; Chrysostomo, L. (Org.) *Mercado de Capitais e Dívida Pública*. São Paulo: Contra Capa, 2006.
- FULLWILER, Scott T. (2008), Sustainable Fiscal Policy and Interest Rates under Flexible Exchange Rates (July 1, 2008). Available at SSRN: <https://ssrn.com/abstract=1722989> or <http://dx.doi.org/10.2139/ssrn.1722989>
- FULLWILER, S.; KELTON, S.; WRAY, R. (2012). ‘Modern Monetary Theory: A Response to Critics’. Working Paper Series N. 279, Political Economy Research Institute, university of Massachusetts Amherst.

- GALE, William G., and Peter R. Orszag. (2004) “Budget Deficits, National Saving, and Interest Rates.” *Brookings Papers on Economic Activity* 2: 101-211.
- GODLEY, W. (1996) “Money, Finance and National income Determination: An Integrated Approach”, Levy Economics Institute, Working Paper 167, June, www.levy.org.
- IMF (2014) “Revised Guidelines for Public Debt Management”, International Monetary Fund, Washington, D.C., Staff Report, April 2014.
- KEYNES, J. (1936 [1964]) “The general theory of employment, interest and money” London: MacMillan. 14ed.
- KEYNES (1936 [1973]) “The Collected Writings of J. M. Keynes” Londres: Macmillan, 1973, v. 21-22. Em: Moggridge, D., (ed.).
- KNAPP, G. (1924) *The State Theory of Money*. London: Macmillan & Company Limited.
- LERNER, A. (1943) “Functional Finance and the Federal Debt”. *Social Research*, 10(1), p. 38–51.
- LAVOIE, M. (2006) “Endogenous Money: accommodationist” in Arestis, P. & Sawyer, M. (eds.), *A Handbook of Alternative Monetary Economics*, Edward Elgar, 2006.
- _____ (2013) The monetary and fiscal nexus of neo-chartalism: a friendly critique. *Journal of Economic Issues*, 47(1), 1-32, 2013.
- _____ (2014) *Post Keynesian Economics: New Foundations*, Edward Elgar, Cheltenham, UK · Northampton, MA, USA, 2014
- LERNER, A. (1951) “Economics of Employment”, McGraw-Hill, (caps. 1,8,9,13,18) 1961.
- LEVY, J.V.F., (2006) Política econômica e alongamento dos títulos públicos no Brasil. In: Bacha, E., Oliveira, L. (Eds.), *Mercado de Capitais e Dívida Pública*. Contracapa, São Paulo.
- LOPES, F. (2006) A questão do alongamento da dívida pública. In: Bacha, E; Chrysostomo, L. (Org.) *Mercado de Capitais e Dívida Pública*. São Paulo: Contra Capa, 2006.
- LOPREATO, F. (2008) Problemas de gestão da dívida pública brasileira. *Texto de Discussão Instituto de Economia da UNICAMP*. Campinas, n. 139, p. 1-36, janeiro de 2008.
- LOUREIRO, A. & BARBOSA (2003). *Dívida Pública e Prêmio de Risco dos Títulos Públicos no Brasil*. Nota Técnica do Banco Central do Brasil n. 42. Novembro/2003.

- LOYO, E., (2006) Política monetária e alongamento da dívida pública. In: Bacha, E., Oliveira, L.C. (Eds.), Mercado de Capitais e Dívida Pública. Contracapa, São Paulo.
- MENDONÇA, H.F., Silva, R.T., 2008. Administração de dívida pública sob um Regime de Metas de Inflação. *Economia Aplicada* n. 12 (4), 635–657.
- MINSKY, H. (1986) *Stabilizing an Unstable Economy*. London: McGraw-Hill Education.
- MISHKIN, F.S. (2010). *The Economics of Money, Banking, and Financial Markets*, 9th ed. Boston: Addison-Wesley.
- MODENESI, A.; MODENESI, R. (2012) Quinze anos de rigidez monetária no Brasil pós-Plano Real: uma agenda de pesquisa. *Revista de Economia Política*, vol. 32, no 3 (128), pp. 389-411, julho-setembro/2012.
- MORAES, P. (2006) As Letras Financeiras do Tesouro e o alongamento da dívida pública, In: Bacha, E; Chrysostomo, L. (Org.) Mercado de Capitais e Dívida Pública. São Paulo: Contra Capa, 2006.
- MORI, R; TAVARES, G; BUENO, T. (2006) A crise da marcação a mercado em 2002: uma perspectiva histórica, *Revista de Economia e Administração*, 5(3), 263-278, 2006.
- MOURA, A. (2006) Letras Financeiras do Tesouro: quosque tandem? In: Bacha, E; Chrysostomo, L. (Org.) Mercado de Capitais e Dívida Pública. São Paulo: Contra Capa, 2006.
- PALLEY, T. (2014) Money, fiscal policy, and interest rates: a critique of modern monetary theory, *Review of Political Economy*, 27 (1), pp. 1–23. doi:10.1080/09538259.2014.957466
- PASTORE, A.C., 2006. As Letras Financeiras do Tesouro e a eficácia da política monetária. In: Bacha, E., Oliveira, L.C. (Eds.), Mercado de Capitais e Dívida Pública. Contracapa, São Paulo.
- PIMENTEL, K. (2018) Ensaio sobre política fiscal, demanda efetiva e finanças funcionais, Tese de Doutorado em Economia, Universidade Federal do Rio de Janeiro, 2018.
- PIVETTI, M (2006). Distribution, inflation and policy analysis. *Review of Political Economy*. v. 19, n. 2, abril de 2006.

- REIS, T. (2018) ‘Why are policy real interest rates so high in Brazil? An Analysis of the determinants of the Central Bank of Brazil’s real interest rate.’ *International Journal of Political Economy*. 2018 Apr 3; 47(2) : 178-98.
- RESENDE, A. (2006) Em defesa dos títulos de indexação financeira. In: Bacha, E; Chrysostomo, L. (Org.) *Mercado de Capitais e Dívida Pública*. São Paulo: Contra Capa, 2006.
- REZENDE, F. (2009) “The Nature of Government Finance in Brazil”. *International Journal of Political Economy*, vol. 38, no. 1, Spring 2009, pp. 81–104.
- REZENDE, F. (2015) Why does Brazil’s banking sector need public banks? What should BNDES do? Discussion Paper Levy Economics Institute (1/2015)
- SALOMÃO, J. (2005) Alongamento da maturidade de títulos de renda fixa: algumas experiências bem-sucedidas de países emergentes. Monografia de Graduação em Economia, Pontifícia Universidade Católica do Rio de Janeiro, 2005.
- SANTIAGO, M. (2012). Limites e procedimentos da política monetária: evidências do Brasil e dos EUA nos anos 2000. Tese de Doutorado em Economia, Universidade Federal do Rio de Janeiro, 2012.
- SERRANO, F. e PIMENTEL, K. (2016) Financiamento do gasto público e taxas de juros em países de moeda soberana: aspectos teóricos e o caso do Brasil. Rio de Janeiro: IE/UFRJ, 2016. Disponível em <http://www.excedente.org>
- SERRANO, F. (2001) “Finanças Públicas Funcionais, Déficit de Plena Capacidade e a Dívida Interna”, IE-UFRJ, 2001.
- SERRANO, F. (2002) Política Monetária e a Abordagem da Taxa de Juros Exógena, IE-UFRJ, 2002.
- SERRANO, F. & FREITAS, F. (2016) “The Sraffian supermultiplier as an alternative closure for heterodox growth theory”, *European Journal of Economics and Economic Policies*, 2016.
- SERRANO, F, SUMMA, R. Uma sugestão para simplificar a teoria da taxa de juros exógena. *Ensaio FEE*, v. 34, n.2, 2013.
- SERRANO, S. e SUMMA, R. (2014). Mundell-Fleming sem a curva LM: a taxa de juros exógena na Economia Aberta, Anpec, 2014.
- SHEARD, P. (2013). ‘Repeat after me: banks cannot and do not “lend out” reserves’. Ratings Direct, Standard & Poor’s Ratings Services, August 2013.
- SILVA, C; PIRES, M; TERRA, F. (2014) The effects of public debt management on macroeconomic equilibrium: An analysis of the Brazilian economy. *Revista*

Economia 15 (2014) 174–188. Available online at www.sciencedirect.com

SMITHIN, J. (2003) “Controversies in Monetary Economics”, Edward Elgar Publishing, USA, First edition 1994, Revised 2003.

SOBREIRA, R. ‘Dívida Pública Federal Interna: Evolução e Perspectivas de Alongamento’. In: Sobreira, R.; Ruediger, M.A. (orgs.), *Desenvolvimento e Construção Nacional: política econômica*. Ed. FGV, Rio de Janeiro, 2005.

STN (2009). *Dívida Pública: a experiência brasileira* / Anderson Caputo Silva, Lena Oliveira de Carvalho, Otavio Ladeira de Medeiros (organizadores). – Brasília : Secretaria do Tesouro Nacional: Banco Mundial, 2009.

STN (2019). *Relacionamento entre o Tesouro Nacional e o Banco Central. Relatório Especial do Ministério da Economia, da Secretaria Especial da Fazenda e da Secretaria do Tesouro Nacional*, 2019.

SUMMA, R. (2011) “Notas sobre a Política Fiscal na Macroeconomia da Demanda Efetiva”, IE-UFRJ, julho 2001.

TYMOIGNE, E. (2014). “Modern Money Theory, and Interrelations Between the Treasury and Central Bank: The Case of the United States. *Journal of Economic Issues*, 2014, vol. 48, issue 3, 641-662

TYMOIGNE, E. WRAY, L. Randall (2015). “Modern Money Theory: a Reply to Palley”. *Review of Political Economy*, 2015, Vol. 27, No. 1, 24–44, doi: 10.1080/09538259.2014.957471

VERGNHANINI, R.; CONTI, B (2017) “Modern Monetary Theory: a criticism from the periphery”. *Brazilian Keynesian Review*, 3(2), p. 16-31, 2nd Semester 2017.

VERNENGO, M. and CALDENTEY, E. (2019) “Modern Monetary Theory in the Tropics”, 45th Annual Conference of Eastern Economic Association, New York, February 2019.

WRAY, L. Randall (2015) “Modern Money Theory – A Primer on Macroeconomics for Sovereign Monetary Systems.” First Edition 2012, Second Edition 2015, Palgrave Macmillan.

_____ (2014) *From the State Theory of Money to Modern Money Theory: An Alternative to Economic Orthodoxy*. Working Paper No. 792, Levy Economics Institute, 2015.

_____ (1998) *Understanding Modern Money: The Key to Full Employment and Price Stability*, Cheltenham, U.K: Edward Elgar.

- WRAY, L.Randall, and C. Sardoni. 2007. "Fixed and Flexible Exchange Rates and Currency Sovereignty." Jerome Levy Economics Institute, Working Paper no. 489 (January).
- WB & IMF (2003). GUIDELINES FOR PUBLIC DEBT MANAGEMENT. Accompanying document and selected case studies. International Monetary Fund and The World Bank, 2003.
- WU, T. (2006). Preço e maturidade da dívida: por que o Brasil é diferente? In: Bacha, E; Chrysostomo, L. (Org.) Mercado de Capitais e Dívida Pública. São Paulo: ContraCapa, 2006.