

THE FINANCIAL FRAGILITY HIPOTHESIS APPLIED TO THE PUBLIC SECTOR: AN ANALYSIS FOR BRAZIL'S ECONOMY FROM 2000 TO 2007

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Abstract: On the one hand, this paper builds on Hyman Minsky's Financial Fragility Hypothesis to develop a Financial Fragility Index for public sector financial structure. On the other, it applies the Financial Fragility Index for public sector financial structure to analyze Brazil's public sector financial structure from 2000 to 2007. It concludes that Brazil's financial structure was *speculative* during the 2000s. As a result, public debt increased during this period and the public sector was unable to adopt counter-cyclical fiscal policies.

Key words: Financial Fragility Hypothesis; Brazilian Economy; Public Sector Economy.

JEL Classification: E62, H62 and H63.

1. Introduction

Times of economic crisis such as experienced at present highlight the analytical vigor of Hyman Minsky's work, as reiterated so often by the Keynesian theory. His concern with cyclic instability and the perversity of "financialization", which has worsened severely in recent years, are now showing dramatically the appropriateness and density of his theories. In this regard, Minsky shows that the granting of credit and the consequent creation of debts are fundamental to the dynamics of capitalism. Financing makes it possible for investments to become effective demand and also for debts to be surmounted with time. In one way or another, the various economic units (agents, government and firms) need to incur debts, even if intermittently or occasionally, in order to cope with adversity – whether caused by faulty cash flow management or deriving from inherent future uncertainties – or in order to invest while not maintaining all the necessary funds on hand.

Broadening John Maynard Keynes' original view, Minsky saw the economic cycle as caused both by private investments and their expectations of return and –

fundamentally – by their relationship with the granting of financing that makes them possible and which is constrained by the movement of expansion or recession of capitalist economies. That is the scenario in which Minsky posed his Financial Fragility Hypothesis (FFH).

However, although Minsky theorized about the financial behavior of the firm, the theoretical framework he developed can be adapted to other analytical settings: for example, Paula & Alves Jr. (2000) apply Minsky's theory to the external trade and finance sector, while Galbraith (2008) adapts Minsky's ideas to analyze the financial structure of the Nation-State, comprising both its domestic and external finances. Given that context, the purpose of this paper is twofold: on the one hand, it builds on Minsky to develop an analytical frame for the structure of public sector finances; and on the other, it analyzes that financial structure in terms of the public accounts of the Brazilian economy, post 2000. Although not concerned to examine the effects of the current crisis on Brazil, this analysis of Minsky's hypothesis does endeavor to contribute to understanding the kind of State action undertaken in Brazil's economy since the turn of the century.

For those purposes, the paper is organized into four sections in addition to this introduction. The second section describes Minsky's FFH briefly on the basis of his 1986 and 1992 studies. The third section applies Minsky's theory to the behavior of public sector finances. The fourth examines the theoretical application of section three to the case of Brazil's public sector from 2000-2007. Lastly, section five offers some brief final remarks.

2. A brief analysis of Minsky's FFH

Minsky's theory draws on the main propositions on monetary economy presented in John Maynard Keynes' *The General Theory of Employment, Interest and*

Money (Keynes, 1964) in order to show that investment, a key variable for increasing accumulation of wealth in a capitalist economy, is conditional on the dynamics of financing, and especially on the financial market¹. Accordingly, investment decisions relate to the composition of capital and financial asset portfolios, which are tailored to economic units' strategies for accumulating wealth (Carvalho, 1987).

It is largely the financial system² that enables such investment decisions to materialize by granting financing, given that “[t]he capital development of a capitalist economy is accompanied by exchanges of present money for future money” (Minsky, 1992: 2). That is, as an economic unit builds an asset portfolio, so it forms a structure of indebtedness (liability structure).

However, at the moment the financing is obtained, the monetary profits deriving from the composition of the asset portfolio are no more than expectations, while the financing is debt that the borrower is obliged to pay. A relationship is thus established between the revenues expected from the investments and the obligatory expenditures (both operating expenditures and interest and amortization expense) resulting from the credits granted; the former, it is expected, will yield the funds necessary to cover the latter (Paula & Alves Jr., 2003).

In this way, monetary economies are exposed to financial fragility determined by institutional factors (relating to the organization and development of the financial system) and conjunctural factors (the state of expectations among both investors and creditors).

The difference between economic units' expected revenues and their financial payments defines the concept of safety margin³. According to Minsky (1986), depending on the way the relationship is established between expected future revenue flows – which, for the economic units, become cash flows – and their contractual

financial obligations (which incidentally are an intrinsic link between the industrial and financial sectors), those economic units' financial positions may be of the *hedge*, *speculative* and *Ponzi* types.

Units with *hedge* positions are those whose expected revenues, when converted into cash flows, are sufficient "to meet contractual payment commitments now and in the future" (Minsky, 1986: 207). *Hedge* units are those with good safety margins, whose cash flows enable them to honor both the amortization of their liability structure and the interest payments on that structure.

The *speculative* unit's revenue flows are "less than the cash payment commitments in some ... periods" (Minsky, 1986: 207). Bahry & Gabriel (2008) add that *speculative* units manage to raise revenue sufficient to meet only the interest payments on their liability structures, but insufficient to cover the debt principals. As a result, such units achieve little margin of safety. This leads *speculative* units, at least in the short term, to resort to refinancing their debts on the basis of future yields which, calculated at present values, should be greater than the current long-term value of their financial commitments (Paula & Alves Jr., 2003).

Lastly, *Ponzi* units are extreme cases of speculative units. *Ponzi* units are not in a position, on the basis of expected revenues, to meet either principal payments on their liability structures, nor the interest on them. In order to continue operating, *Ponzi* units can be expected to refinance their liability structures, either by selling off assets or by new borrowing to restructure their liabilities. *Ponzi* units do not maintain safety margins in their monetary and financial flows (Minsky, 1992).

The financial fragility of an economy, meanwhile, results from economic units' ability to move between the financial positions described above. As Minsky shows, in times of expansion in the economic system, the expectations of investors and their

financiers grow such that “speculation upon and experimentation with liability structures and novel financial assets will lead the economy to an investment boom” (Minsky, 1986: 178).

In such a scenario, as investment plans are constantly validated by the financial system (i.e., in an optimistic economic environment), economic units will move from *hedge* towards *speculative* positions and from those towards *Ponzi* positions, inherently heightening their financial fragility (Silva, 2008). In such situations, occurrences endogenous to the capitalist system – such as rising inflation, interest rate hikes, volatility in financial system expectations etc. – lead from financial fragility to financial crisis and to the economic cycle (Minsky, 1992). Overall, the expanding pace of economic activity and the “leverage” from financing heighten the degree of financial fragility and ultimately lead the economic system into crisis.

Once in crisis, it is up to *Big Government* and the *Big Bank* to take action automatically to stabilize the economic system. Government, by way of fiscal imbalances, maintains profits, employment and current production, and the Central Bank, as the lender of last resort, stabilizes the value of monetary and financial assets and, as a result, stabilizes the markets for such assets (Minsky, 1986). However, public sector action to mitigate economic crises may be delimited by the financial positions of government itself when crisis breaks. Thus, “in the modern world, analyses of financial relations and their implications for system behavior cannot be restricted to the liability structure of businesses” (Minsky, 1992: 4).

3. Public sector financial behavior in the light of Minsky

Although neither Keynes (1964) nor Minsky (1986 and 1992) see the public sector as leading the economic cycle, both authors do stress the – particularly central –

government's role as the leading counter-cyclic agent⁴. In this regard, the public sector's stabilizing action depends on its financial capacity.

Firstly, following Aktinson & Stiglitz (1980), there is a degree of arbitrariness to any definition of the public sector, in view of the methodological and analytical differences that exist among countries in this regard. For the purposes of this article, and with a view to constructing an analysis most appropriate to the case of Brazil, the definition used is taken from Além & Giambiagi (2000), in which the public sector comprises “the direct and indirect administration of the federal government (including social security), direct and indirect administration of the regional (state and municipal) governments, the Central Bank of Brazil and the non-financial state enterprises at the three levels of government”⁵.

That definition encompasses all the spheres of government and thus all public sector revenues and expenditures – whether current, capital or real property-related. The analysis thus includes, throughout, all the public sector's various revenue sources and also its various expenditures. Working with the variable “total revenue” also bundles into one variable all the possible manners of building a safety margin signaled by Minsky (1986).

It can thus be assumed that the public sector's financial position will be established on the basis of its cash flow, i.e., of the relationship between its total revenue and total expenditure, which can be discriminated into current and financial expenditures. Current expenditure aggregates all public sector spending except interest payments and debt amortization, which will be defined as financial expenditure.

Adapting Minsky's taxonomy to the public sector, the *hedge* position relates to the scenario where total sector revenues exceed both current and financial expenditure. That is to say, there is a safety margin of cash in hand that assures the public sector's

solvency against unforeseen shocks that may come to alter its expenditure. This indicates that there is no need to either incur or refinance debt. Schematically, the public sector *hedge* position can be expressed by the following relationship:

$$(1) \quad (T + Rk + Rof) - G > Ga + Gi,$$

– where T is taxes, Rk is capital revenue, Rof is revenue from other sources, G is current public sector expense, Ga is financial amortization expense, and Gi is financial interest payment expense.

In other words, relationship (1) states that:

$$(2) \quad \text{Total Revenue} - \text{Current Expense} > \text{Financial Expense}$$

Meanwhile, the public sector *speculative* financial position occurs when total revenues exceed only current expense, but are less than financial expense. In that situation, the public sector does not produce a safety margin, only a surplus over current expense, which does not ensure solvency against unforeseen crises. The *speculative* position entails resorting to financial markets to raise the necessary debt rollover financing.

In order to move out of this situation the public sector must at some point enable total revenue to expand more than the increase in current expense. That can be achieved by increasing the tax burden and/or by growth in tax revenues at times of expanding production⁶. Schematically, the *speculative* position can be represented by the following relationship:

$$(3) \quad (T + Rk + Rof) - G < Ga + Gi.$$

Or equally:

$$(4) \quad \text{Total Revenue} - \text{Current Expense} < \text{Financial Expense}$$

Lastly, in a *Ponzi* position, the public sector is unable to meet even its current expenses, failing to cover part of the amortization and interest payments due. Such a

financial position is insolvent even as regards budget obligations and entails continuous borrowing and refinancing of accumulated debt stock. In such a position, not only financial expense has to be restructured, but also current expense and even revenue gathering.

Without restructuring, the public sector in a *Ponzi* position will induce disturbances in the growth of the country's product to the extent that displacement of private revenue to finance the public sector will prevent productive investments, which will in turn hinder any increase in taxation and tax revenues. A *Ponzi* position offers no safety margin and extremely limited scope for economic policy action. The cash flows relating to such a position can be seen in the relationship below:

$$(5) \quad (T + R_k + R_{of}) - (p)G < (1 - p)G + G_a + G_i,$$

– where p is the percentage of current expenses covered by total revenues.

That relationship (5) can be rewritten as:

$$(6) \quad \textbf{Total Revenue} - (p) \textbf{Current Expense} < (1-p) \textbf{Current Expense} + \textbf{Financial Expense}$$

Therefore, in terms of Minsky (1986), these are the financial positions taken by the public sector, and financial fragility derives from any movement from a *hedge* position to a *speculative* position and thence to a *Ponzi* position. Such a scenario may arise unexpectedly in the course of the economic cycle, as a result of both precarious management of public finances and the emergence of a financial crisis, and also from the a slowing in the rate of economic activity as a result of decreasing private investment, which lessens revenue.

In this regard, as the public sector's financial safety margin is narrowed by causes endogenous to the economic system, so its financial position becomes more fragile and its scope for intervening to stabilize the system is reduced, at the same time

as it becomes more and more strongly conditioned by the impositions of the financial market. In such a situation, new financing is granted only when the financial sector validates the public sector's expectations that its fragile position will improve.

4. The FFH applied to the public sector: the analytical frame of reference for the case of Brazil

Using the analytical framework developed in the previous section, this section will analyze the financial positions taken by Brazil's public sector⁷ over the period 2000-2007.

However, before actually examining the financial fragility of Brazil's public sector, certain clarifications are in order as regards the period selected.

On the one hand, the initial idea of this paper was to analyze Brazil's public accounts from 1999 onwards, for the following reasons: (i) in 1999 the regime of primary surplus targets was implemented under a 1998 agreement with the International Monetary Fund, binding all spheres of the public sector from then on, which had not been the case in previous years, when only the central government had eliminated its primary deficits⁸; (ii) early in 1999, the floating exchange regime was introduced in Brazil's economy; and (iii) in June 1999 the inflation targeting monetary regime was adopted⁹. However, the consolidated public accounts figures (*Consolidação das Contas Públicas*) reported by national treasury department (*Secretária do Tesouro Nacional*) – which are used in this article by virtue of their being the most detailed series published on Brazil's public finances – are available only from 2000 onwards, thus defining the timeframe for this study.

On the other hand, in the course of the period in question, the Brazilian and world economies went through at least two quite different moments. To begin with, from 2000 to late 2002, the world economic system suffered considerable disturbances

arising from the crisis caused by the events of September 11, 2001, as well as by the economic crisis in Argentina from late 2001 to early 2002. In the same period, the Brazilian economy also experienced an energy sector crisis in 2001 and, in 2002, strong speculative attacks as a result of uncertainties over the presidential elections. From 2003 to 2007, the world economic system entered a strong cycle of expansion, which was only interrupted in late 2007 by financial problems connected with the United States subprime market. Meanwhile, Brazil showed signs of economic recovery, although at a slower pace than economic expansion at the world level.

To begin the analysis, a Financial Fragility Index is developed for the Brazilian public sector, with reference to the behavioral relationships stated in section 3, which differentiate theoretically among the *hedge*, *speculative* and *Ponzi* financial positions. Starting from a position of equilibrium, we have:

$$(1') (T + Rk + Rof) - G = Ga + Gi,$$

– where total public sector revenues, less current expenses, are exactly equal to financial expenses.

Dividing both sides of equation (1') by the ratio $1/(Ga + Gi)$, gives the fragility index:

$$(1'') \frac{(T + Rk + Rof) - G}{(Ga + Gi)} = 1$$

From that equilibrium situation, the following positions can be derived:

$$\frac{(T + Rk + Rof) - G}{(Ga + Gi)} > 1 \text{ characterizes a } \textit{hedge} \text{ financial position;}$$

$$0 < \frac{(T + Rk + Rof) - G}{(Ga + Gi)} < 1 \text{ characterizes a } \textit{speculative} \text{ financial position;}$$

$$\frac{(T + Rk + Rof) - G}{(Ga - Gi)} < 0 \text{ characterizes a } \textit{Ponzi} \text{ financial position.}$$

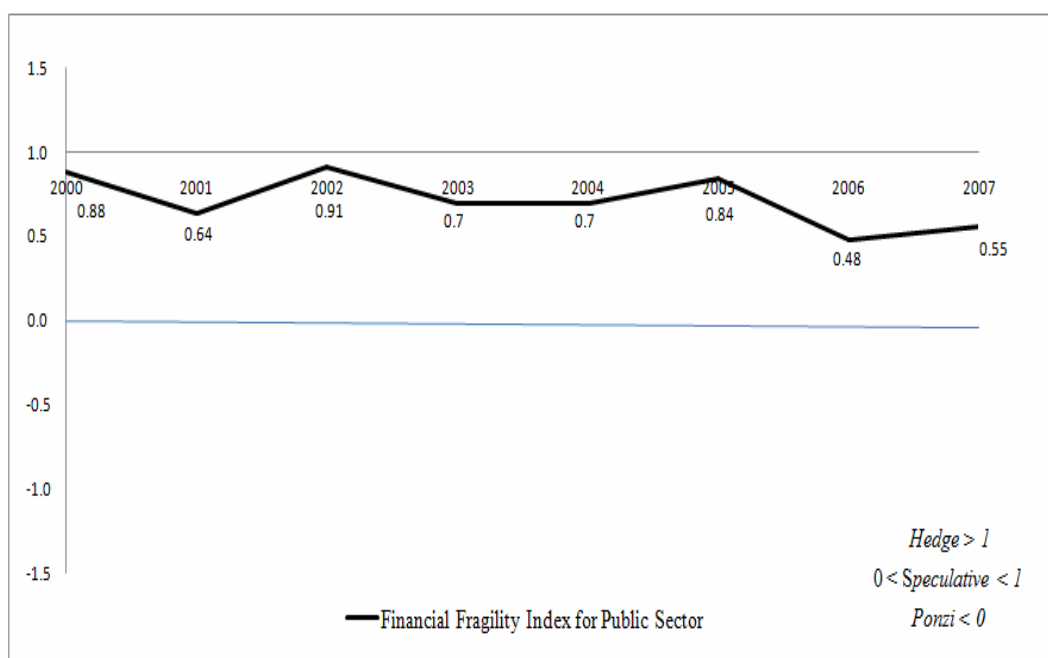
The figures used in constructing the Financial Fragility Index for Brazil – taken from the national treasury department’s consolidated public accounts data (*Consolidação das Contas Públicas, Secretária do Tesouro Nacional, 2009*) – were total public sector revenue¹⁰ (sourced from taxes, capital revenues and other revenue sources), which is reported on a cash basis, and public sector current and financial expense, reported on an accrual basis.

Graph 1 shows the Financial Fragility Index for Brazil’s public sector. As can be seen, during the entire 2000-2007 period, Brazil’s public sector was situated in the *speculative* financial position, indicating that throughout the period the public sector was obliged in one way or another to refinance its debts.

Despite the upturn in the world economy from 2003-2007, the Index shows that it was during this very period that Brazil’s public sector showed the worst signs of fragility, particularly in 2006 (0.46) and 2007 (0.55). From 2003 to 2005, the Index held fairly stable, and 2005 stands out when acceleration in the Brazilian economy is reflected in revenue increases more than proportional to the increases in expense (Table 1).

Conversely, in 2002, a time of turbulence in Brazil’s economy, the public sector returned its best Financial Fragility Index (0.91). In this regard, in 2000, barely a year after the 1999 crisis in Brazil’s economy, which forced it to change its exchange and monetary regimes, the Financial Fragility Index for the Brazilian public sector reached its best result (0.88). This suggests that in times of crisis, contractive economic policies arise, intended at any rate to ensure the public sector’s solvency with regard to its future payment commitments.

Graph 1 – Financial Fragility Index for Brazil’s Public Sector, 2000 to 2007



Note: Index elaborated by the authors.

Source: Secretaria do Tesouro Nacional (2009).

From Table 1, it can also be inferred that between 2001 and 2002 public sector revenue grew more than expense, resulting in the best Financial Fragility Index at any point in the period occurring in 2002, even though it was a time of crisis. From 2003 to 2005 revenue and expense grew at equivalent rates until, in 2006, expense outgrew revenue by a considerable margin.

TABLE 1
Rates of variation (%) of total public sector expense and revenue, 2000 to 2007

Item/ year	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007
Revenue	11	21	9	11	14	13	14
Expense	17	15	15	10	11	25	9

Source: Secretaria do Tesouro Nacional (2009).

In 2006, expense outgrew revenue more than in other years of the series. This resulted, on the one hand, from Brazil’s bringing forward payment of both its restructured debt to the Paris Club and debt renegotiated as part of the Brady Plan, by withdrawing Brady bonds from the market; both were concentrated in 2006, as noted by the Treasury Department (Secretaria do Tesouro Nacional, 2006) and Brazilian Central

Bank (BCB, 2006a and 2006b). On the other hand, to these amortizations were added, in 2006 and 2007, exchange swaps unfavorable to public sector financial expenditures and, in 2006, nominal interest incurred by net public sector debt, in an amount equivalent to 6.6% of GDP, as shown by BCB (2009).

In this way, although public revenues grew in those years, driven by improved economic activity, public sector expenses expanded at a substantially higher rate. This increase in financial expenses caused the results generated by the Financial Fragility Index for the Brazilian public sector to reflect greater fragility in 2006 and 2007. Once again, as mentioned above, the Index warrants the suggestion that the economic policies carried out from 2000-2007 accompanied the economic cycle, worsening the values returned by the Index in times of moderate economic expansion.

The empirical analysis shows that the public sector has always maintained a *speculative* position, which explains its ever-growing need for borrowing¹¹. By its very dynamics, that growing indebtedness entails increasingly costly rollover, tending to generate greater financial costs, which, in turn, contribute to aggravating the *speculative* position. In an economy like Brazil's where that basic interest rate level remained high throughout the study period¹², recourse to borrowing, which is typical of a *speculative* position, tends to increase financial expenses periodically, leading the public sector into a *speculative* circle. In that way, the Financial Fragility Index for Brazil's public sector grows over time, signaling that the public sector is sliding towards financial positions closer to the *Ponzi* type (see Graph 2, in annex).

It can also be argued that Brazil's public sector fiscal policy is more and more constrained. In that it has increasingly to meet greater financial expenses, its scope for action to stabilize the economy – the *Big Government* of Minsky (1986) – is reduced and the effects of a financial crisis may be extremely harmful. Such a situation tends to

worsen under an inflation targeting regime, which serves as a monetary anchor and a brake on using monetary policy as another automatic cycle damper – Minsky’s *Big Bank*¹³.

Fiscal policy is straight-jacketed by the fact that it is the primary surplus that intermediates in efforts to stabilize net public sector indebtedness in relation to GDP. From this it can be inferred that the fiscal policy focus from 2000-2007 was far removed from the anti-cyclic stabilizing policies prescribed by Keynesian and post-Keynesian approaches.

Indeed, what can be seen is that economic policy measures were pro-cyclic and corroborated the arguments of Hermann (2002) that fiscal policy action in Brazil approximates to so-called “Ricardian equivalence”¹⁴. For example, in 2002, the year of the crisis of confidence over the presidential elections, when according to BCB (2009) GDP growth was 1.93%, the Financial Fragility Index for Brazil’s public sector achieved its best result of 0.91, indicating a major squeeze on public spending. By contrast, in 2007, when Brazil grew by 5.4%, the best result in terms of GDP expansion in the period 2000-2007, the Index reached its second-lowest value of 0.55.

In short, the empirical analysis framed by the Financial Fragility Index for Brazil’s public sector shows that the sector is in a fragile financial position, anchored in obtaining primary surpluses and constant borrowing to refinance existing debt stock. Accordingly, the scope for the Brazilian public sector’s automatic stabilizers to operate are constrained by fiscal and monetary policy.

5. Final Remarks

Although Minsky did not use the public sector as a unit of analysis, his FFH is fully applicable to the sector. Development of a Financial Fragility Index for the Brazilian public sector informs the conclusion that the sector has rested on a *speculative*

position throughout the decade after 2000. The direct consequences of this are mounting indebtedness and diminishing degrees of freedom for stabilizing action by the public sector.

It is strongly hoped that, inverting the logic of increasing fragility followed in recent years, the public sector's financial conditions can be restructured in such a way as to enable it to return better fragility indicators. Proposals for such changes should be based above all on containment of financial expenses, which are subject to the kind of untimely alterations that occurred in 2006.

Otherwise, given the financial fragility of the Brazilian public sector's accounts, the financial system will demand increasingly burdensome efforts from it in order to validate expectations of future improvements in its financial conditions. Only if it is engaged in such efforts will the financial system grant loans to enable public finances to be restructured, making it necessary for Brazil to resort constantly to refinancing its liability structure.

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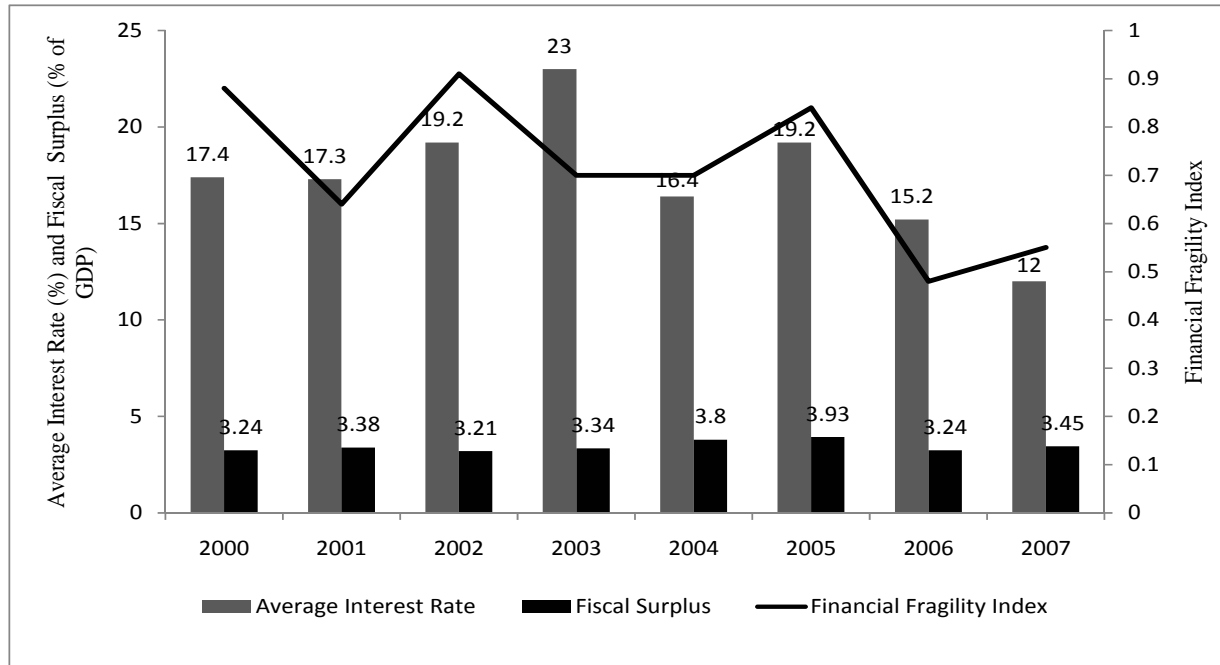
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Annex

Graph 2 – Average Interest Rate, Fiscal Surplus and Financial Fragility Index for Brazil's Public Sector, 2000 to 2007



Note: Average interest rate and Index elaborated by the authors.
Source: Banco Central do Brasil (2009) and Secretaria do Tesouro Nacional (2009).

TABLE 2
Consolidated Public Accounts – Total Revenues and Expenses
(Current and Financial), 2000 to 2007 in R\$ billion

Item/Year	2000	2001	2002	2003	2004	2005	2006	2007
Current expense (1)	435.4	503.1	575.0	671.5	753.8	863.9	1,026.2	1,141.5
Interest and debt service (2)	47.4	63.3	66.9	79.4	88.6	105.9	168.6	158.6
Capital expense (3)	27.4	33.4	34.1	29.7	37.9	45.4	57.2	72.9
Amortization (4)	51.9	61.2	76.8	87.9	80.2	58.6	132.3	109.5
Financial investment (5)	16.8	24.5	26.7	27.4	26.6	28.1	33.4	38.3
Current expense (1-2+3+5)	432.2	497.6	568.8	649.2	729.7	831.4	948.2	1,094.1
Financial expense (2+4)	99.3	124.5	143.7	167.3	168.8	164.6	300.9	268.2
Total expense (1+2+3+4+5)	531.5	622.1	712.5	816.5	898.6	996.0	1,249.1	1,362.2
Total revenue*	519.9	576.9	700.2	765.5	847.9	970.2	1,092.0	1,242.5

Note: (*) Total revenue comprises tax revenue, capital revenue and revenue from other sources.

Source: Secretaria do Tesouro Nacional (2009).

Notes

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¹ Investment may be financed from the investor's own funds or third party funds, such as bank loans or debt and share issues.

² According to Minsky (1992: 6), the components of the financial system are any economic unit that acts as a financial intermediary, i.e., loans to third parties in exchange for remuneration in the form of interest.

³ Although safety margin is not determined solely by this, that concept – which in this case refers to cash flows – is sufficient for the analytical purposes of this paper. According to Minsky (1986: 335) “the cash flow, capital value [of expected financial revenues and expenditures] and balance-sheet characteristics” are able to offer a margin of safety to an economic unit. For a precise discussion of what safety margin involves, see: Minsky (1986, Appendix A: 335-341).

⁴ According to Keynes, private investment is what causes the economic cycle. Minsky (1986) sees it caused by the relationship between private investment, on the one hand, and the financial system, on the other.

⁵ Authors’ translation of original Portuguese (2000: 66).

⁶ In this article, the public sector was considered not to be financed by monetary expansion. According to Keynesian theory, such an expedient should be used only as an automatic counter-cyclical stabilizing mechanism (Keynes, 1964).

⁷ The concept of public sector used in this section is based on DEPEC/BCB (2006: 4), which is exactly equivalent to the definition in Além & Giambiagi (2000).

⁸ For in-depth analysis of Brazilian public sector fiscal behavior in the period prior to adoption of fiscal targets, see Giambiagi (2006).

⁹ For more information on monetary regimes, especially the inflation targeting adopted in Brazil after introduction of the Real Plan in 1994, see Modenesi (2005).

¹⁰ Mainly because it includes capital revenue, total revenue is different from primary revenue, a variable often used as an index to determine public sector default. For further details, see Biage *et alii* (2006).

¹¹ In monetary terms, net public debt was almost R\$ 1.1 trillion in December 2006 and around R\$ 1.2 trillion in December 2007 (BCB, 2009).

¹² From 2000 to 2007, Brazil’s annual average basic interest rate was 17.5% (BCB, 2009).

¹³ Public debt costs are very high because of high interest rates, as shown by national treasury figures (Secretaria do Tesouro Nacional, 2009).

¹⁴ For more information on “Ricardian equivalence” see, for instance, Hermann (2002) and Barro (1974).