REESTIMATING THE BRAZILIAN PUBLIC DEBT/GDP RATIO: "FISCAL SKELETONS" AND "NEW RICARDIAN" BEHAVIOR[*]

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Prepared for the Conference on "Latin America Economies: History and Globalization", 24th and 25th of April 2009, UCLA

April 2009

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ABSTRACT

The present paper offers an estimate of the actualized value of the outstanding stock of the Federal, Municipal and State re-negotiated debt through the Decree-Law 6019/43 of November 25, 1943. This estimate points out to an average increase of about 6.5% in the Brazilian debt-GDP ratio, making evident the presence of important liabilities not recognized by the government, a "fiscal skeleton". In spite of their high amount, the recognition of these liabilities would not alter the decreasing trajectory of the public debt/GDP ratio, which began in 2003, when the present government has opted for giving continuity to the macroeconomic policy that began with the Real Plan. However, the existence itself of underestimations of the public debt would not be coherent with an authentically "Ricardian" behavior of the fiscal policy, in maintaining implicit debt defaults.

1. Introduction

Through all the history of Brazil as an independent country, the fiscal policy has utilized several instruments in order to achieve the intertemporal budget balance. However, the sustainability of the Brazilian fiscal policy has been not always ensured by a "Ricardian" behavior.

In fact, during the imperial period (1822-1889), the Brazilian fiscal policy, as it was demonstrated in Ruiz-de-Gamboa (2006), shown a genuinely

"Ricardian" behavior, realizing fiscal adjustments and utilizing efficiently the internal and external debt as a way to attain the intertemporal balance.

Since the proclamation of the Republic, mainly during 1944-1982, the spread of fiscal decisions, resulting from an excessive autonomy of expenditure and debt from the part of the Brazilian States, led to the utilization of seignoriage as an additional source of tax collection in order to ensure fiscal sustainability.

However, during the same republican regime, the Brazilian government for several times has utilized default and the internal and external debt renegotiation to reach in a "compelled" way the intertemporal balance of the public budget, resulting in what Ruiz-de-Gamboa (Op. Cit.) called the "New Ricardian Equivalence".

The most subtle version of this "New Ricardian" behavior was given by the underestimation of the internal and external public debt. This practice acquired relevance during 1965-1993, when the Brazilian economic authorities used the underindexation of the internal public debt, readjusting it systematically beneath the level of the major inflation that took place in that period of time.

Since the Real Plan, one could have proposed the realization of fiscal reforms, mainly the so-called "Law of Fiscal Responsibility", that imposed limits to expenditure and to debt of States and Municipalities, and the establishment of a primary fiscal surplus target has contributed to a return to an authentically "Ricardian" behavior that avoid the utilization of seignoriage.

However, as we will see, in spite of the previous facts, some kinds of a "New Ricardian" behavior still persist in the interior of the fiscal policy, as long as it is still practiced underestimations of the external public debt. Specifically, we are referring to a series of bonds of external Federal, Municipal and State debt, issued at the end of the 19th century and the beginning of the 20th century, that still have remains in circulation, accounted by the Brazilian Treasury without any kind of monetary correction or capitalization, a fact that therefore

amounts to an underestimation of their true value. The present study intends to estimate the actualized value of this true "fiscal skeleton", recalculating the resulting public debt/GDP ratio and comparing it with the official index.

Thus, in the next section it will be presented the macroeconomic models related to the "Ricardian Equivalence" and to the "New Ricardian Equivalence". The third section will make a brief historical analysis of the sustainability of the Brazilian public debt, pointing out its "Ricardian" and "New Ricardian" aspects, while the fourth section supply details on the origin and the discovery of the "fiscal skeleton" of the external public debt bonds re-negotiated through DL 6019/43. Finally, the fifth section will be dedicated to the description of the economic methodology of bond actualization, while the last section will present the obtained results, realizing a reestimation of the Brazilian public debt/GDP ratio, and the conclusions.

2. Macroeconomic Model[1]

It could be said that, if the fiscal policy is sustainable or the government follows a "Ricardian" behavior, the present value of its expenditures should be lower or equal to the initial wealth added to the present value of the fiscal revenue (net of transfers), which may or may not include seigniorage.

If, on the other hand, the present value of public expenditures added to the initial stock of public debt is higher than the present value of total fiscal revenue, we can say that the government follows a "non-Ricardian" behavior or a "Ponzi Scheme" or that the fiscal policy (public debt) is not sustainable. In this situation the government would never pay the principal of the public debt, financing the payment of interest by assuming new debts.

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[1] This section follows Romer (2001), extending the basic model with the inclusion of seigniorage and the possibility of debt default or renegotiation, and Ruiz-de-Gamboa (Op. Cit.).

However, as proposed by Ruiz-de-Gamboa (Op. Cit.), there might be a third alternative: the possibility that the government attains fiscal sustainability not through fiscal and tax policies (including seigniorage), but rather by utilizing the default or renegotiation of that debt. As we will demonstrate, this artifice excessively utilized by several countries (the so-called "serial defaulters"), among which Brazil holds a position of prominence[2], also allows the present value of the primary fiscal surplus to be enough to finance the stock of initial debt. This new possibility of attaining fiscal sustainability will be referred to as "The New Ricardian Equivalence".

In spite of the utilization of the default strategy or renegotiation of the public debt to achieve intertemporal balance, the public budget also imposes important costs on the "serial defaulters": a weakening of the political institutions; an increase in the likelihood of incurring once again a default or renegotiation situation3 and, mainly, an increase of the country risk with the consequent reduction of the flow of international capitals, which reduces its possibilities of financing economic growth.

In relation to the latter cost, Reinhart and Rogoff (2004) find evidence of an inverse correlation between the real per capita GDP adjusted by the purchasing power parity of the "serial defaulters" and the percentage of years in default since 1946. Thus, the authors conclude that the main explanations for the "paradox" of the lower flow of capitals from developed countries to the developing countries (even though the return of capital is greater in the latter would be the greater risk of default presented by the latter, in addition to the lower development of their capitals markets. In the view of the aforementioned authors, the true "paradox" is why international capitals, mainly those related to

[2] Curiously, contrary to what one might think, Brazil is surpassed in the quantity of defaults and renegotiation of the foreign public debt by developed countries such as Spain (which holds the record with 13 episodes), France, and Germany, among others. However, these "serial defaulters" had default or renegotiation situations concentrated between the 16th and 18th century, whereas in the case of Brazil most of these situations are concentrated in the last century. For an interesting discussion on the relation between sustainability of the external debt and the behavior of default or renegotiation, see Reinhart, Rogoff and Savastano (2003) and Reinhart and Rogoff (2004).

[3] The evidence of the "serial defaulters", according to Reinhart and Rogoff (Op. Cit.), seems to suggest that the cost of the first default is higher than the subsequent ones, because the credibility of the defaulter is already compromised with the first episode of payment cessation.

foreign indebtedness, continue flowing to the "serial defaulters" or "debt intolerant" countries.

The present work has no normative pretensions: it is in no way stating that the strategy of public debt default or renegotiation is a path to be adopted by Brazil or by any other developing country. The viewpoint is, merely, positive: this resource was utilized on several occasions by Brazil, and according to Ruiz-de-Gamboa (Op. Cit.) this was the main reason for the fiscal sustainability throughout much of the republican era, surpassing, indeed, the importance of seigniorage.

Taking into consideration all the above, the general macroeconomic model of fiscal sustainability could be divided into two versions: i) Model where there is no default or renegotiation of the debt or "Ricardian Equivalence" Model – which is traditionally utilized in the analyses of fiscal sustainability and ii) Model where there can exist default, renegotiation or underestimation of the public debt or the "New Ricardian Equivalence" model – which is just the innovation introduced by Ruiz-de-Gamboa (Op. Cit.).

2.1. Ricardian Equivalence Model

In the traditional model, the sustainability of fiscal policy or of the public debt will be ensured if the government maintains the following intertemporal budget restriction:

$$(1) \int_{t=0}^{\infty} e^{-R(t)} G(t) dt \leq -D(0) + \int_{t=0}^{\infty} e^{-R(t)} T(t) dt$$

$$(2) \; R(t) = \int_{\tau=0}^{t} r(\tau) d\tau$$

Where G(t) represents the real total public expenditure (including the interest payment on the stock of the previous public debt); T(t) represents the real fiscal revenue (including the revenues from state-owned companies)4; and r(τ) is the real interest rate at moment τ[5].

Thus, it can be said that if the government maintains a sustainable fiscal policy, the present value of its expenditures on goods and services should be less or equal to the present value of the real fiscal revenue plus the initial value of its wealth, which is, in fact, public debt, reducing the present value of the government revenues.

The previous formula can also be understood as follows: the fiscal policy will be sustainable if the present value of the primary fiscal surplus is sufficient to finance the stock of initial public debt. To visualize this second interpretation, we need only reorganize the terms of (1), which gives us:

$$(3)\int_{t=0}^{\infty} e^{-R(t)}\left[T(t)-G(t)\right]dt \geq D(0)$$

However, in addition to revenue and indebtedness, the government can resort to financing via seigniorage, and that is why the traditional model of sustainability usually includes it as an additional source of fiscal revenue. We can, fairly easily, include seigniorage in formula (3), adding a term S to the real fiscal revenue:

$$(4)\int_{t=0}^{\infty} e^{-R(t)}\left[\{T(t)+S(t)\}-G(t)\right]dt \geq D(0)$$

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[4] The same restriction is also valid if the previous variables are normalized by the GDP or by population.
[5] In the model of traditional sustainability, it is assumed that the real interest rate is constant, which would make R(t) equal to rt, maintaining basically the same restriction (1).

Hence, the government will follow a "Ricardian" behavior if the present value of its fiscal surplus plus the revenues obtained from seigniorage are enough to finance the stock of initial public debt.

Notwithstanding, from the mathematical viewpoint, it is simpler to rewrite the previous condition of fiscal sustainability by utilizing limits. Thus, moving the integral to the right of the inequality and applying limits on the resulting expression we have:

$$(5)\lim_{s\to\infty}\left\{D(0)+\int_{t=0}^{s}e^{-R(t)}\big[G(t)-\{T(t)+S(t)\}\big]dt\right\}\leq 0$$

On the other hand, insomuch as the public expenditure between moments t and s is greater (lower) than the total revenue including seigniorage, the government will increase (reduce) the indebtedness. Thus the amount of the public debt at moment s can be expressed as:

$$(6)D(s)=e^{R(s)}D(0)+\int_{t=0}^{s}e^{R(s)-R(t)}\big[G(t)-\{T(t)+S(t)\}\big]dt$$

The first part of formula (6) is the contribution of the initial public debt to the stock of public debt at s, while the integral shows how the government's disavings vary from moment t to s.

Finally, as we can see, (6) is the same formula within the limit in (5) multiplied by $e^{R(s)}$. Hence, we can rewrite the budget restriction of the government or the condition of fiscal sustainability as:

$$(7)\lim_{s\to\infty}e^{-R(s)}D(s)\leq 0$$

Therefore, we can say that the government conducts a sustainable fiscal policy or, simply, it follows a "Ricardian" behavior, maintaining its budget restriction, if, ultimately, the stock of the public debt is non-positive. This is the equivalent of a "transversality condition", which eliminates the possibility of a "Ponzi Scheme", where the government could go into debt indefinitely, contracting new debt to pay the interest on the previous debts. In this case, we could say that the fiscal policy is not sustainable, or that the public debt is not sustainable.

2.2. <u>"New Ricardian Equivalence" Model</u>

Notwithstanding, the previous model does not consider the possibility that the government defaults on the public debt or simply establishes an agreement with its creditors to renegotiate it. However, we will show that these strategies can be an alternative for achieving fiscal sustainability, in the absence of greater fiscal discipline and in the face of the impossibility of continuing to increase fiscal revenues by means of seigniorage. This occurs because in these events, since it is harder to impose the fulfillment of debt commitments, mainly in the case of sovereign debt, the creditors end up accepting a reduction in the principal, or even a prolongation of the debt amortizations[6].

This new result will be denominated "New Ricardian Equivalence", because it allows the government to maintain its intertemporal balance, dispensing with any fiscal adjustment or increase in seigniorage, as the traditional model of sustainability implies.

To model this situation of "debt intolerance" it will be necessary to make a change in the supposed behavior for the real interest rate during the default or

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[6] The last default realized by the Argentine government is a dramatic example of this. However, in the Brazilian case, there were two episodes of default and five renegotiations of the foreign public debt between 1898-1993.

debt renegotiation period. Hence, we can propose that during this period, which will be called Ψ, as the government loses the possibility of continuing to finance the deficit with debt, the real interest rate tends to the infinite. In formal terms, therefore, we can express the evolution of the interest rate during this period Ψ as follows:

$$(8) \lim_{t \to \psi} R(t) = \lim_{t \to \psi} \int_{t=0}^{\psi} r(t)\,dt \to \infty$$

Thus, we can demonstrate that the time horizon to achieve fiscal balance will coincide with the default or debt renegotiation period and, therefore, this could be achieved in a period less than infinite. For this, the budget restriction defined in (1) will be modified as follows:

$$(9) \int_{t=0}^{\psi} e^{-R(t)} G(t)\,dt \le -D(0) + \int_{t=0}^{\psi} e^{-R(t)} T(t)\,dt$$

Repeating the same mathematical procedures that allowed us to reach condition (7), we obtain the following formula for the fiscal sustainability in the presence of "debt repudiation":

$$(10) \lim_{t \to \psi} e^{-R(\psi)} D(\psi) \le 0$$

Thus, in the presence of a situation of default or debt renegotiation, the government would also end up fulfilling an intertemporal budget restriction and, therefore, within a finite horizon, achieve the sustainability of the fiscal policy or of the public debt. As previously mentioned, the main difference from the "Ricardian Equivalence" model is that the fiscal solvency is attained through the "forced" reduction of the debt principal.

3. Sustainability of Brazilian Public Debt Throughout the Years

3.1. Sustainability of the Public Debt during the Empire

Soon after the declaration of independence in 1822, the fiscal situation in Brazil was rather unfavorable, because the newly independent country had inherited an important public debt from the colonial period, in addition to facing a situation where expenditures surpassed fiscal revenues. The solution to this fiscal imbalance came with the promulgation of the Constitution of 1824 by Dom Pedro I, creating a Parliament with authority over the budget and the public debt.

This important institutional change was responsible for restricting the capacity of the monarch to raise taxes unilaterally, increase the public expenditure, and issue currency. The revolution provoked by this in Brazilian public finances has no parallel in the post-independence history of the other Latin American countries, being indeed compared by Summerhill (2005) to the fiscal consequences of the Glorious Revolution that occurred in England during the 17th century.

Thus, a credible commitment to honor the foreign public debt was generated, which allowed the Brazilian government to receive a total of sixteen foreign loans between 1824-1889, for an amount of approximately 60 million pounds sterling. Additionally, throughout the same period, the Brazilian government also was able to issue domestic public debt by means of two large domestic loans and the issuance of "apólices", long-term debt instruments, which paid interest perpetually. The most notable thing is that during this period the Brazilian government was not once late with the interest payment on its debt[7], paying always in cash and, in some cases, soliciting another loan in order to make the interest payment on time. Indeed, with such a low likelihood of

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[7] With exception of the loan taken by the Portuguese government in 1823, but whose responsibility for payment was divided between Portugal and Brazil.

default, public debt bonds, denominated in national currency, sometimes circulated in the European financial markets.

As a result of this authentic "Ricardian" behavior, the share of long-term bonds issued over the total public debt showed an increasing tread, and the domestic indebtedness began to surpass the foreign. Furthermore, the interest rates of foreign debt showed a reduction over the Imperial period, both in London and in Rio de Janeiro, and the cost of new loans, on average, also showed a declining trend[8]. Thus, we could say that during the entire Imperial period the Brazilian government enjoyed favorable credit conditions, escaping from the problem of the "original sin", so frequent in the case of emergent countries.

3.2. <u>Sustainability of the Public Debt from the Beginning of the Republican Regime up to the Present Days</u> [9]

The fiscal situation changed drastically with the Proclamation of the Republic, because the new Constitution decentralized fiscal decisions, granting autonomy of expenditure and debt to each State, being, therefore, incapable of creating institutional arrangements that guaranteed the payment of the public debt.

Thus, in the mid-1890s, the excessive "monetization" of the fiscal deficit reduced the real value of the public bonds, so that it eliminated what was previously the main source of financing for the State. At the same time, the international markets also visualized this lower commitment to a "Ricardian" behavior, making it impossible for the republican government to issue long-term bonds in the London market, which began to accept only short-run Brazilian public bonds.

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[8] Summerhill (Op. Cit.) estimates the probability of default on the Brazilian public debt at the time of the Empire, which shows a clear decreasing trend until 1889. Further, he utilizes estimates of the ex-ante internal rate of return of the bonds issued in London and in Rio de Janeiro, reaching the conclusion that the cost of new domestic or foreign indebtedness would be relatively similar.

[9] The first part of this subsection is based on Abreu (2001).

The Brazilian fiscal imbalance continued to worsen until it compromised the capacity to service the interest of both the domestic and foreign debt, leading to a renegotiation of its obligations in 1898, with the obtainment of the first "funding loan". This renegotiation foresaw the suspension of the amortizations of all the loans included in the "funding" during a period of thirteen years, when an amortization would begin that would last 50 years.

From that point on, Brazil faced, regularly, fiscal crises, followed by crises in the balance of payments and negotiations of "funding loans" in 1914 and 1931. The second "funding loan" had a maximum nominal capital fixed at 15 million pounds sterling, an amortization deadline of 63 years, initiating the payment in 1927, interest rate of 5% and would be guaranteed by the customs revenues of the Republic.

In its turn, the last "funding loan" began a long sequence of negotiations. In 1937, Getúlio Vargas defaulted on the foreign debt, suspending its payment for a period of three years. In 1940 a new temporary agreement was made (the Souza Costa scheme) and, finally, in 1943 a permanent agreement renegotiated the payment of the principal and the interest of foreign debt that had been contracted by the central government and the Brazilian States and Municipalities between 1883-1931 and 1901-1931, respectively. Thus, through the Decree-Law 6019, enacted in November 23, 1943, the Brazilian government realized this ample renegotiation of the external debt, transforming the external debt of the States and Municipalities into debt of the Federal government.

The payments of this last agreement extended until the beginning of the 80s, where, after the Mexican debt default in 1983, Brazil once again faced a crisis in the balance of payments, culminating with the default in 1987, in the midst of the implementation of the Cruzado Plan. The second long period of renegotiations ended only in 1994 with a new permanent agreement that established payments for the next 30 years.

The growing utilization of seigniorage as an additional source of revenue on the part of the Brazilian government, that was increased during 1944-1982,

resulted in high inflation rates, a fact that made completely unfeasible the existence of an internal market for the public debt.

Thus, the need to ensure new sources of non-inflationary financing for the public expenditure, together with the objective of developing the Brazilian financial market, led to the creation in 1964 of the so-called "Readjustable Obligations of the National Treasury" (ORTNs). These bonds of the internal public debt were indexed to the inflation, according to an official price index.

However, the Brazilian government realized a systematic underindexation of this public debt throughout 1965-1993, modifying arbitrarily the indexation rules, whether from the change of the indexes applicable to the readjustment of public bonds, or from the purge of important price increases from the official indexes.

One of the major occurrences of this underindexation took place in 1990, on the occasion of the Collor Plan I, when almost the total amount of public bonds were blocked by the government, being returned from 1991 on, with a correction much lower from the effective accumulated inflation during the period. This strategy may also be considered as a kind of implicit default of the public debt, by reducing in an important way the financial expenditures of the government.

In short, the previous analysis seems to suggest that the Brazilian government, besides taking advantage of the seignoriage to finance the persistent public deficits, has also utilized the instrument of default, whether from the two external debt defaults or from several renegotiations of the external debt, or from the permanent underindexation of the domestic public debt. In other words, the public sector behavior oscillated during this period between "Ricardian", that included the seignoriage as an additional source of financing, and "New Ricardian", that included repudiation, renegociation or underestimation of the public debt as a way to achieve intertemporal budget balance.

From the Real Plan on, implemented in 1994, the Brazilian government realized a deep fiscal adjustment, increasing the tax burden in almost 10% of the GDP, and reducing public expenditures through privatization and the institutional rearrangement of the fiscal situation of States and Municipalities. The cornerstone of this institutional change was the issue of the "Law of Fiscal Responsibility", which limited the increase of expenditure and the debt capability of States and Municipalities which, moreover, undersigned a restructuration agreement of their debts toward the Union.

Moreover, the last agreement of the Brazilian government with the IMF implemented a target for the primary fiscal surplus, where the surplus produced are aimed at the reduction of the Brazilian public debt, a fact that created progressive reductions of the financial duties of the government and of the nominal fiscal deficits.

Fortunately, the current Brazilian government, against original expectations, in broad lines has ensured continuity to the previous fiscal policy, allowing a reduction of the public debt/GDP ratio and of the nominal public deficit and even the constitution of a creditor external position, basically due to the payment in advance of the debts towards the Paris Club and the IMF, exchange of C-Bonds, re-buying of Bradies and the elongation of public bonds issued. Actually, the trend of the public debt/GDP ratio comes to be decreasing from 2003 on.

The previous analysis would allow to state that, from the Real Plan on, the Brazilian government has turned again to behave in an authentically "Ricardian" way, in avoiding, on one side, to finance through seignoriage and, on the other side, to resource to the repudiation of the external and internal debt.

However, in spite of the previously stated, as it will be seen in the next section, it still persist some versions of a "New Ricardian" behavior in the interior of the fiscal policy, as long as the Brazilian government still seems to practice a more subtle repudiation of the public debt, based on its

underestimation. In the present case, we are facing an important "fiscal skeleton", represented by the outstanding stock of the bonds of the external public debt issued in pound sterling and renegotiated by the Decree-Law 6019/43.

4. Live Bonds of Decree-Law 6019/43: The Discovery of an Important External "Fiscal Skeleton"

4.1 General Aspects

As it has been previously mentioned, in 1943 the Brazilian government worked out an extensive renegotiation of the external public debt issued by the Central Government, States and Municipalities in pound sterling and in dollars during 1883-1931 in the first case, and during 1901-1931 in the second case. This renegotiation was made with two organizations of bondholders of Brazilian external public debt, "The Council of the Corporation of Foreign Bondholders" in London and "Foreign Bondholders Protective Council, Inc.", in New York. The final agreement gave birth to Decree-Law (DL) 6019/43 in November 25, 1943[10], that authorized and determined new rules for the retaking of the Brazilian external payments, which by then had been interrupted.

According to the new rules, from January 1, 1944, the payment of interest and of the amortization of the external debt bonds should be realized in accordance with two forms: Plan A and Plan B. The Decree-Law states that "Plan A keeps the nominal and original value of the bond, fixing new and definitive interest rates and amortization quotas"[11]; while "Plan B establishes a reduction of the original nominal value of the bond, compensated by payments in cash, fixing a uniform interest rate and amortization quotas"[12]. The Decree-

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[10] Federal Senate.
[11] Federal Senate, Op. Cit, Article 1st, paragraph 1. The translation is ours.
[12] Federal Senate, Op. Cit., Article 1st, paragraph 2. The translation is ours.

Law allowed the bondholders to choose between the two previous payment plans. Of course, in both cases, the renegotiation would mean a reduction of the interest rate and, in the case of Plan B, an expressive reduction of the principal value of the external debt, reflecting the "New Ricardian" behavior of the Brazilian fiscal policy.

According to the General Coordination for the Control of the Brazilian Treasure Public Debt (CODIV), that came to be the creditor institution for all those bonds, the greater part of this renegotiated debt through the Decree-Law was redeemed, the bonds issued in dollars being called for redemption, the last calls occurring in 1968 and 1978.

However, in relation to the bonds in pound sterling, according to the same official source, "… there is still in circulation a reduced amount. Several of them had been called for redemption, the available resources being with the respective payment agents waiting presentation in the dates established for each bond"[13]. Moreover, the Brazilian government transferred resources for external payment agents officially appointed, the redemption being realized in the original currency issued, as it was also determined by the original Decree-Law[14].

It is important to remind that bonds issued at the end of the 19th century and the beginning of the 20th century brought coupons attached with nominal value exactly equal to the value of the interest rate charged over the principal. In other words, the coupons represented, in the end, another bond besides that referring to the principal. In general, the interest charged in that way were semiannual, with two specific due dates for each year.

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[13] CODIV. Curiously, even defining external payment agents such as the Bank Rothschild & Sons Ltd., Lloyds and HSBC, the only part of the Treasury web page dedicated to the internal and external public debt having no official translation in English is just the one referring to the outstanding bond stocks of the Decree-Law 6019/43.

[14] Federal Senate, Op. Cit., Article 13th.

At the National Treasury's website, according to CODIV[15], the list of the external Federal, State and Municipal external debt bonds, issued in pounds and renegotiated through the Decree-Law according to Plan A, live from the legal point of view, and that still have stocks due to redeem. However, a deeper analysis of the bonds deemed prescribed and called for payment by this same institution lead to contradictory results.

This is the case, for instance, of some bonds issued by the State of Bahia in 1904, 1913, 1928 and 1915. In the case of the first three, CODIV official list notice that the same bonds were called for payment in 1998 in the case of the first and of the third ones and in 1999 as regards the second. Yet, at the official website of the Financial Services Authority (FSA)[16], a private organization that regulates the financial services industry in United Kingdon, we find the three bonds previously mentioned as still in effect. The same goes for the bond issued in 1915, that appears as prescribed at the CODIV list. The analysis of the Annual Budgetary Law (LOA) of the government of State of Bahia[17] eliminates the possibility that these bonds would have returned to the original issuing agents, as referred in the original contracts of these bonds, after the due date would have been elapsed.

Inconsistencies of the same kind also appear at two bonds issued by the Municipality of Rio de Janeiro Municipality (Federal District) and by the State of Rio de Janeiro in 1904 and 1927 (with interest of 5.5%), respectively. At the CODIV list these bonds appear as having been called for payment in 2002 and 1997, respectively. However, at the Annual Budgetary Laws of 2002 up to 2009 of the government of State of Rio de Janeiro[18] are shown the budgeted

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[15] CODIV, Op. Cit.

[16] http://www.fsa.gov.uk/ukla/officialMainList.do?view=true.

[17] http://www.seplan.ba.gov.br/i_lei_orcamentaria.htm.

[18] www.fazenda.rj.gov.br/portal/ShowBinary/BEA%20Repository/site_fazenda/informacao/controleintern o/relatorio_contas/reldezfinal_2001.pdf;www.fazenda.rj.gov.br/portal/ShowBinary/BEA%20Repository/s ite_fazenda/informacao/contabeis/contadegestao/2002/balancos/002/V2_02.pdf;www.fazenda.rj.gov.br/p ortal/index.portal?_nfpb=true&_pageLabel=contabeis&file=/informacao/contabeis/contadegestao/2003/v olume2/se;www.fazenda.rj.gov.br/portal/index.portal?_nfpb=true&_pageLabel=contabeis&file=/informa cao/contabeis/contadegestao/2005/volume2/secao02;www.fazenda.rj.gov.br/portal/index.portal?_nfpb=tr ue&_pageLabel=contabeis&file=/informacao/contabeis/contadegestao/2006/volume2/secao02;www.faze nda.rj.gov.br/portal/index.portal?_nfpb=true&_pageLabel=contabeis&file=/informacao/contabeis/contade gestao/2007/volume2/secao02;www.planejamento.rj.gov.br/OrcamentoRJ/Livro_LOA_Sancao_2008.pdf;

resources for payment of these two bonds, while in the case of the first one a consultation at the FSA site also confirms its validity.

At the National Treasury's website there is no reference to the criteria utilized for considering the prescription of the bonds, neither there is any information about the destination of those bonds said to having been called for payment. Thus, given the little transparency with which these bonds are handled by CODIV, and since their validity is being certified by the FSA's website and by the Annual Budgetary Laws of the government of the State of Rio de Janeiro, we opted for considering them in the estimates of the "fiscal skeleton" of DL 6019/43, adding them to the bonds of Plan A considered in effect at Table 1.

On the other hand, Table 2 shows the list of bonds being in the same situation, but related to the Plan B of the said Decree. In the case of this second group of renegotiated bonds it has been not found out any inconsistencies between the official lists of prescriptions and redemptions and information obtained in the FSA's website and LOAs of the several original issuing States and Municipalities.

Both tables present, moreover, detailed data for each bond, such as interest rate, issue date, due dates of the principal and the coupons and the total number of coupon.

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www.fazenda.rj.gov.br/portal/index.portal?_nfpb=true&_pageLabel=contabeis&file=/informacao/contabeis/contadegestao/2008/volume2/secao02.

TABLE 1

EXTERNAL DEBT BONDS RENEGOTIATED THROUGH PLAN A OF DECREE-LAW 6019/43 WITH OUTSTANDING STOCKS

Issuer	Year	Interest Rate	Issue Date	Principal Due Date	Cupons Due Date	First Cupon Due Date	Number of Cupons
Central Government	1883	4.5%	01/23/1883	12/31/1921	06/01 and 12/01	06/01/1884	76
Central Government	1888	4.5%	04/10/1888	04/01/1926	04/01 and 10/01	10/01/1888	76
Central Government	1889	4.0%	04/29/1890	04/01/1946	01/01 and 07/01	07/01/1890	112
Central Government	1895	5.0%	07/17/1895	07/01/1925	01/01 and 07/01	01/01/1896	60
Central Government	1898	5.0%	06/15/1898	06/01/1961	01/01; 04/01; 07/01; 10/01	10/01/1901	121
Central Government	1901	4.0%	07/19/1901	07/01/1962	01/01 and 07/01	01/01/1903	120
Central Government	1903	5.0%	05/20/1903	05/01/1933	05/01 and 11/01	11/01/1903	60
Municipality of Porto Alegre	1909	5.0%	06/04/1909	06/04/1944	06/20 and 12/20	06/20/1909	70
Central Government	1910	4.0%	02/03/1910	02/01/1967	02/01 and 08/01	08/01/1910	114
Central Government - Lloyd	1910	4.0%	05/05/1910	03/01/1922	03/01 and 09/01	09/01/1910	24
Central Government - Harbor Works	1911	4.0%	03/27/1911	03/01/1927	03/01 and 09/01	09/01/1911	29
Central Government - V. Cearense	1911	4.0%	03/11/1912	03/01/1972	01/01 and 06/01	06/01/1912	124
Central Government - Port Division	1913	5.0%	05/05/1913	05/01/1953	01/01 and 06/01	01/01/1914	79
Central Government	1914	5.0%	10/19/1914	10/01/1977	05/01 and 11/01	11/01/1914	126
Central Government	1927	6.5%	10/11/1927	10/15/1957	04/15 and 10/15	10/15/1927	61
Central Government - 20 Years	1931	5.0%	03/14/1931	03/01/1951	01/01 and 06/01	06/01/1931	40
Central Government - 40 Years	1931	5.0%	03/14/1932	03/01/1971	01/01 and 06/01	06/01/1931	80
Municipality of Recife	1910	5.0%	10/01/1911	04/21/1960	05/01 and 11/01	05/01/1911	98
Municipality of Santos	1927	7.0%	07/14/1927	07/14/1957	06/01 and 12/01	12/01/1927	60
Municipality of Pelotas	1911	5.0%	05/20/1911	05/20/1961	06/30 and 12/31	06/30/1912	99
State of Minas Gerais	1928	6.5%	03/14/1928	03/01/1958	03/01 and 09/01	09/01/1928	60
Municipality of Rio de Janeiro	1904	5.0%	08/03/1904	10/01/1954	04/01 and 10/01	04/01/1905	100
State of Rio de Janeiro	1927	5.5%	04/28/1927	04/01/1949	04/01 and 10/01	10/01/1927	44
State of Rio de Janeiro	1927	7.0%	04/29/1927	12/15/1964	06/15 and 12/15	12/15/1927	75
Municipality of Niterói	1928	7.0%	02/25/1928	02/25/1968	06/15 and 12/15	06/15/1928	80
State of Bahia	1904	5.0%	12/21/1904	05/01/1955	05/01 and 11/01	05/01/1905	101
State of Bahia	1913	5.0%	04/22/1913	07/01/1963	01/01 and 07/01	07/01/1913	101
State of Bahia	1915	5.0%	01/29/1915	01/01/1944	01/01 and 07/01	07/01/1915	58
State of Bahia	1928	5.0%	01/10/1928	01/01/1962	01/01 and 07/01	07/01/1928	68

Source: Federal Senate, National Treasury (CODIV), Bouças (1932,1942, 1946, 1950) and The Rothschild Archive.

TABLE 2

EXTERNAL DEBT BONDS RENEGOTIATED THROUGH PLAN B OF DECREE-LAW 6019/43 WITH OUTSTANDING STOCKS

Issuer	Year	Interest Rate	Issue Date	Principal Due Date	Cupons Due Date	First Cupon Due Date	Number of Cupons
State of Pará	1901	5.0%	01/11/1901	01/01/1951	01/01 and 07/01	07/01/1902	99
State of Pará	1907	5.0%	03/04/1907	01/01/1943	01/01 and 07/01	07/01/1907	72
State of Pará	1915	5.0%	12/09/1915	01/01/1956	01/01 and 07/01	01/01/1916	81
State of Alagoas	1906	5.0%	03/08/1909	04/05/1958	01/01 and 07/01	07/01/1909	98
Municipality of Manaus	1906	5.0%	04/20/1906	04/20/1956	05/01 and 11/01	11/01/1906	99
Municipality of Belém	1905	5.0%	03/03/1905	03/03/1955	01/01 and 07/01	07/01/1905	100
Municipality of Belém	1906	5.0%	10/03/1906	10/03/1956	01/01 and 07/01	01/01/1907	100
Municipality of Belém	1912	5.0%	02/26/1912	02/26/1962	01/01 and 07/01	07/01/1912	100
Municipality of Belém	1915	5.0%	11/15/1915	01/01/1958	01/01 and 07/01	07/01/1916	84
Municipality of Belém	1919	6.0%	06/30/1919	06/30/1929	01/01 and 07/01	01/01/1920	19
Municipality of Salvador	1931	4.0%	07/30//1931	07/30/1981	02/01 and 08/01	08/01/1931	100
Municipality of Belo Horizon	1905	6.0%	01/01/1905	01/01/1933	01/01 and 07/01	07/01/1905	57

Source: Federal Senate, National Treasury (CODIV), Bouças (1932,1942, 1946, 1950) and The Rothschild Archive.

As it may be seen in both tables, the 41 bonds listed refer in the most part to bonds of the Brazilian federal government external debt, issued between 1883 and 1931, and bonds issued by Brazilian States and Municipalities, with an emphasis for the State of Pará and Belém Municipality, issued between 1901and 1931[19]. Besides, the principal due date of these bonds was foreseen, in general, for the first half of the last century, with yearly interest rates varying in accordance with the bond for Plan A and equal to 3.75% for bonds renegotiated through Plan B.

4.2. <u>Estimate of the Total Outstanding Stock of Bonds Renegotiated through Decree Law 6019/43</u>

A first difficulty for estimate the fair value of the "fiscal skeleton" of Decree Law 6019/43 is the lack of information about the outstanding stock not redeemed of those bonds, for neither the Treasury nor any ther official source of the Brazilian government informs how much the amount of the outstanding stocks of these bonds is. CODIV only informs that "the values of the principal and of eventual coupons of interest listed by article 1st (Plan A) are paid by the respective nominal values registered in the face value. Yet those listed by article 2nd are redeemed by 12% of the value of the principal registered in the face value"[20]. These rules for payment were already present in articles 1st and 2nd of DL 6019/43 previously mentioned, since the bonds renegotiated through Plan A kept the original value of the principal, although they considered important reduction in the original yearly interest rates. In the case of bonds renegotiated through Plan B the reduction of 12% in the principal was already mentioned in the same Decree, in its article 2nd.

The authors of the present study, in the attempt of obtaining the value of the outstanding stock of these debts, made contact with the technical team of

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[19] For a detailed explanation of the reasons of the bond issues by the Federal government, States and Municipalities, see Bouças (1942, 1950). Abreu (1985) also realizes an interesting analysis of the Brazilian external debt occurred during the same period.
[20] CODIV, Op. Cit. The translation is ours.

CODIV, who, having in a first moment assert that the previous bonds had been prescribed, answered afterwards that they did not know if they were officially authorized to reveal their current stock. Following a recommendation made by the same technical team, we sent an e-mail to the Ouvidoria of the National Treasury, its audit organism, that after one week answered that "the information on the stock of the external and internal public debt publicly available may be checked in the internet page of the National Treasury…".

In view of the previous difficulties, the authors made contact with the administrator of these bonds as regards the Rothschild Bank, which is the authorized paying agent of the majority of these bonds abroad, acting on behalf of the Brazilian government. After not having received an answer to the consultation about the outstanding stock of the debt through e-mail, a telephone called was tried, when the administrator asserted he was not acquainted about the current stock of great part of this external debt. Being asked, then, about the amount of resources the English bank would have received from the Brazilian government to redeem the bonds, what would possibly be a proxy of their values, the officer stated he was not authorized to release this information, suggesting that the Brazilian government should be consulted.

Having drained the previous possibilities, the authors resorted to the help of the economic advisers of the Brazilian Senate, since there is an electronic information platform for the Brazilian federal government budget, known as SIGA BRASIL[21]. After consulting the platform, with the competent and efficient help, plenty of the authentic spirit of public service of the Senate economic advisers – to whom the authors avowed their deepest gratitude - it has been found out that it would be impossible to obtain the data wanted. The only existent information for the 2009 public budget referring to the outstanding bond stocks of Decree-Law 60019/43 agglutinates information related to several agreements on the external debt renegotiation, including the agreements with the Paris Club, Brazil Investment Bond (BIB), Bond Exchange Agreement (BEA), among others. Thus, it would be impossible to obtain, separately, the

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[21] www.senado.gov.br/portal/page/portal/orcamento_senado/SigaBrasil.

provision aimed in the federal budget this year for the payment of this particular liability, which would function as a proxy of the current value of the stock of these bonds.

Finally, a research was made on all LOAs of the Federal Government, States and Municipalities that issued the bonds considered in the previous Tables 1 and 2, in an attempt to find some information, in case these liabilities would have returned to its original issuing sources. The consultation to the Federal Government LOA was not particularly enlightening, for, as it has been mentioned in the previous paragraph, in the more recent periods it does not exist an explicit information on the resources allocated for the payment of debts referred to Decree Law 6019/43.

However, the LOA of 2003 informs that the outstanding value not redeemed of these liabilities reached US$ 561,165[22], while the data on the execution of the external federal public debt of 2005[23] and 2006[24] inform that the redeemed amount would correspond to around US$ 43,469 and US$ 67,028[25], respectively. In view of this, and due to the impossibility of obtaining more recent information on the outstanding stocks of the bonds of Decree Law 6019/43, we made the option of estimating the fair value of this "fiscal skeleton" in 2006, by deducing from the outstanding stock registered in 2003, further to the amortization of US$ 67,028 made in 2006, an amount of US$ 86,938, under the assumption that, during 2004 and 2005, the government kept the same pattern of amortization observed in 2005 (a yearly payment of US$ 43,469). In other words, we worked with the assumption that the total outstanding stock of the bonds of the Central Government referred to Decree Law 6019/43 would reach approximately US$ 423,098 (around 238,747 pound sterling).

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[22] www.camara.gov.br/internet/Comissao/index/mista/orca/orcamento/OR2003/info_complem/Inciso%20 07c_Memoria.pdf.
[23] www.tesouro.fazenda.gov.br/hp/downloads/resultado/2006/Nimdez2006.pdf.
[24] www.tesouro.fazenda.gov.br/hp/downloads/resultado/2006/Nimdez2006.pdf.
[25] All the values converted to dollars according to the exchange rate registered in 12/29/2006.

Beside that, a detailed analysis of the LOAs of the States of Rio de Janeiro and Minas Gerais during 2002-2009[26] resulted particularly interesting, for, in the first place, allowed to obtain the precise not redeemed stock of the debt bonds issued in 1904 by the Municipality of Rio de Janeiro (Federal District), in 1927 by the State of Rio de Janeiro (with 7% of interest), in 1905 by the Municipality of Belo Horizonte and in 1928 by the State of Minas Gerais. Another relevant point enhanced by this analysis is that, further to the absence of amortization of the remaining debt since 2002, it has been not applied any type of correction to the value of these outstanding stock during 2002-2009, neither for monetary correction, nor for the application of remuneration and delay interest.

The same would apply to the outstanding stock of the bonds of Decree Law 6019/43 in charge of the Central Government during 2003-2006. In fact, in the CODIV document dedicated to divulge the list of the bonds in effect of the previously mentioned Decree 6019/43, it is clearly stated that "… there is no incidence of any adjustment or correction over the redeeming values of the principal and of the interest coupons of the bonds". In other words, the Treasury is stating that the value of the balance not yet redeemed of these bonds, including their coupons, must not be readjusted in order to compensate the inflation occurred during more than a century, in the majority of the cases, being considered the date of their original issue. Neither one should compensate for the possibility that the holder of these bonds or their coupons could have capitalized the amounts to be received during this same period of time, in case they would have been paid in the original due date.

Thus, according to the previous analysis, one could estimate that the total outstanding stock in 2006 of the bonds referred to Decree Law 6019/43

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[26]www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2001/direta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2002/direta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/relatorio_contabil/balanco_geral/2003/1admdireta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2004/1admdireta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2005/1admdireta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2006/1admdireta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2007/1admdireta.pdf;www.fazenda.mg.gov.br/governo/contadoria_geral/demontracoes_contabeis/balanco_geral/2008/a2008_direta.pdf.

would reach approximately US$ 2,092,460 (513,254 pound sterling), distributed in accordance with Table 3.

TABLE 3

ESTIMATE OF THE TOTAL OUTSTANDING STOCK OF THE EXTERNAL DEBT BONDS RENEGOTIATED THROUGH DECREE LAW 6019/43 (US$)

Central Government	**423,098**
State of Rio de Janeiro	**256,726**
Municipality of Rio de Janeiro - 1904	89,900
State of Rio de Janeiro - 1927 (7%)	166,826
State of Minas Gerais	**229,742**
Municipality of Belo Horizonte - 1905	1,843
State of Minas Gerais - 1928	227,899
TOTAL	**909,567**

Source: Finance Ministry, State of Rio de Janeiro Planning Secretary,

State of Minas Gerais Planning Secretary and authors own estimation.

4.3   Scenarios for the Valuation of the Total Outstanding Stock of Decree Law 6019/43 Bonds

The previously estimated amount could not be considered directly as the fair value of the not redeemed stock of the external debt bonds renegotiated through DL 6019/43, for, most certainly, it would be underestimating the correct value, since, as it has already be previously mentioned, it does not consider interest and monetary correction in its determination. In view of this, we are in front of another liability not recognized by the Brazilian government, a "fiscal

skeleton", whose amount and importance can only be estimated through the correct valuation of this stock.

However, the composition of this outstanding stock in terms of each one of the previous bonds is not available, a fact that makes difficult the application of the monetary correction and interest necessary to estimate the fair value of the "fiscal skeleton". In fact, as it could be visualized in Tables 1 and 2, the bonds renegotiated by the Decree have different issue and due dates for the principal and the coupons, which also may vary in their amount.

Another difficulty inherent to the estimate of the "fiscal skeleton" of Decree Law 6019/43 is the lack of any information referring to the amount of coupons not yet redeemed for each of the considered bond. Neither it is referred if the not redeemed stock presented in the LOAs of the Federal Government and the States of Rio de Janeiro and of Minas Gerais includes the outstanding stock related to the coupons or are referred to the principal only. As a more conservative criterion, we assumed that those outstanding stock include the value of the principal and the total value of the coupons, according to the following formula:

$$(11) \quad S = P + P \times i \times n$$

Where S represents the outstanding stock of the considered Bond; P corresponds to the value of the principal; i is the yearly interest rate applied to each bond and n represents the number of years included between the due dates of the first and the last coupons. In this way, alternative hypothesis about the number of not redeemed coupons and their respective due dates must alter the value of the principal of each one of the considered Bond, according to equation (11), which, in turn, will alter the final valuation of each one of the bonds.

Thus, being considered all these difficulties, the estimate of the fair value in 2006 of the "fiscal skeleton" of Decree Law 6019/43 will entangle the construction of a matrix with forty different scenarios: four hypothesis referring the distribution of the total outstanding stock, combined with ten hypothesis related to the number and the due date of the coupons of interest for each of the 41 bonds.

The four hypotheses regarding the distribution of the total not redeemed stock are the following:

Scenario 1: As the most recent data related to the stocks not redeemed of the Decree Law 6019/43 bonds dates from 1949[27], we have calculated, then, the proportion of the outstanding stock of each one of the previous bonds in relation to the total stock in 1949, assuming in this scenario that this proportion was kept constant throughout the time. The four bonds issued by the Municipality of Rio de Janeiro (Federal District) in 1904, by the State of Rio de Janeiro in 1927 (with 7 % of interest), by the Municipality of Belo Horizonte in 1905 and by the State of Minas Gerais in 1928, respectively, did not participate in this pro-rata, because, as it has been previously mentioned, the resources provisioned for the payment of their outstanding stocks appear explicitly in the LOAs of the Governments of the States of Rio de Janeiro and of Minas Gerais. Afterwards, in applying the previous proportion of each bond over the estimate of the total stock not redeemed, we have obtained the proxy corresponding to its total outstanding stock not redeemed and not readjusted. However, in the case of the four bonds previously mentioned, we applied the information relative to the outstanding stocks informed in the LOAs to estimate their stock not redeemed. Table 4 allows visualizing the proportions of the outstanding stock of each bond in relation to the total in circulation in 1949, as well as the consequent stocks not redeemed and not readjusted estimated in each case.

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[27] Bouças (Op. Cit.).

TABLE 4

PARTICIPATIONS AND ESTIMATED OUTSTANDING STOCK OF BONDS OF DECREE LAW 6019/43 ISSUED IN STERLING - SCENARIO I (%)

Issuer	Year	%	£
Central Government	1883	1.45	3,460
Central Government	1888	2.61	6,221
Central Government	1889	13.43	32,059
Central Government	1895	6.20	14,795
Central Government	1898	6.08	14,504
State of Pará	1901	0.23	542
Central Government	1901	5.96	14,238
Central Government	1903	8.71	20,798
Municipality of Rio de Janeiro	1904	-	50,729
State of Bahia	1904	0.86	2,057
Municipality of Belém	1905	0.39	941
Municipality of Belo Horizonte	1905	-	1,040
State of Alagoas	1906	0.06	136
Municipality of Belém	1906	0.40	944
Municipality of Manaus	1906	0.04	98
State of Pará	1907	0.14	340
Municipality of Porto Alegre	1909	1.05	2,518
Municipality of Recife	1910	0.31	739
Central Government	1910	6.80	16,239
Central Government - Lloyd	1910	0.10	235
Municipality of Pelotas	1911	0.49	1,167
Central Government - Harbor Works	1911	1.22	2,919
Central Government - V. Cearense	1911	1.25	2,990
Municipality of Belém	1912	0.42	1,012
State of Bahia	1913	1.10	2,637
Central Government - Port Division	1913	6.01	14,345
Central Government	1914	13.38	31,946
State of Bahia	1915	0.86	2,058
State of Pará	1915	0.43	1,037
Municipality of Belém	1915	0.31	744
Municipality of Belém	1919	0.18	437
State of Rio de Janeiro	1927	1.76	4,203
State of Rio de Janeiro	1927	-	94,137
Municipality of Santos	1927	2.26	5,397
Central Government	1927	6.75	16,112
State of Minas Gerais	1928	-	128,600
State of Bahia	1928	0.40	963
Municipality of Niterói	1928	0.71	1,698
Municipality of Salvador	1931	0.17	394
Central Government - 20 Years	1931	1.29	3,078
Central Government - 40 Years	1931	6.17	14,736
TOTAL		100.00	513,245

Source: Authors own estimation.

Scenario II: In the case of this scenario, we have assumed that the distribution of the total outstanding stock of the bonds of Decree Law 6019/43 considered in the present work would be concentrated in the bonds where the issue date is more ancient, comprising the period 1883-1907[28]. Thus, we adopted as a premise that the joint participation of bonds issued during this period in relation to the total outstanding stocks reaches 60%, in comparison with 40% in participation of bonds issued after 1907. Of course, as in the previous case, this new pro-rata excluded bonds of which the stock not redeemed are mentioned in the LOAs of the States of Rio de Janeiro and of Minas Gerais for the period 2002-2009, keeping the same stocks for the subsequent valuation. Also in the previous scenario, we applied the proportion calculated for the other bonds over the total stock not redeemed in order to obtain the proxy of their total outstanding and not readjusted stock. Table 5 allows visualizing the participation obtained for each bond and the corresponding estimate for its not redeemed stock.

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[28] The arbitrary choice of the division between relatively "old" and "new" bonds took into consideration the amount immediately before the approximate half of the 41 bonds, the utilization of which was made impossible because it would fall back in a bond issued in 1910, which would imply in separating it from some of the other two with issuing date also of 1910.

TABLE 5

PARTICIPATIONS AND ESTIMATED OUTSTANDING STOCK OF BONDS

OF DECREE LAW 6019/43 ISSUED IN STERLING - SCENARIO II (%)

Issuer	Year	%	£
Central Government	1883	1.87	4,460
Central Government	1888	3.36	8,019
Central Government	1889	17.31	41,321
Central Government	1895	7.99	19,070
Central Government	1898	7.83	18,695
State of Pará	1901	0.29	699
Central Government	1901	7.69	18,352
Central Government	1903	11.23	26,807
Municipality of Rio de Janeiro	1904		50,729
State of Bahia	1904	1.11	2,652
Municipality of Belém	1905	0.51	1,213
Municipality of Belo Horizonte	1905		1,040
State of Alagoas	1906	0.07	176
Municipality of Belém	1906	0.51	1,217
Municipality of Manaus	1906	0.05	126
State of Pará	1907	0.18	439
Municipality of Porto Alegre	1909	0.79	1,885
Municipality of Recife	1910	0.23	553
Central Government	1910	5.09	12,153
Central Government - Lloyd	1910	0.07	176
Municipality of Pelotas	1911	0.37	873
Central Government - Harbor Works	1911	0.91	2,184
Central Government - V. Cearense	1911	0.94	2,238
Municipality of Belém	1912	0.32	758
State of Bahia	1913	0.83	1,974
Central Government - Port Division	1913	4.5	10,736
Central Government	1914	10.01	23,908
State of Bahia	1915	0.64	1,540
State of Pará	1915	0.33	776
Municipality of Belém	1915	0.23	557
Municipality of Belém	1919	0.14	327
State of Rio de Janeiro	1927	1.32	3,145
State of Rio de Janeiro	1927		94,137
Municipality of Santos	1927	1.69	4,039
Central Government	1927	5.05	12,058
State of Minas Gerais	1928		128,600
State of Bahia	1928	0.3	721
Municipality of Niterói	1928	0.53	1,271
Municipality of Salvador	1931	0.12	295
Central Government - 20 Years	1931	0.96	2,304
Central Government - 40 Years	1931	4.62	11,028
TOTAL		100.00	513,254

Source: Authors own estimation.

Scenario III: This scenario is exactly the opposite of the previous one, in assuming that the distribution of the total outstanding stock is concentrated in the relatively "newer" bonds, issued during 1909-1931. Thus, we adopted as premise that the joint participation of these bonds reaches 60% of the total, while bonds issued during 1883-1907 correspond to 40%. Table 6 presents the participations and the outstanding stock estimated for each one of the considered bonds.

TABLE 6

PARTICIPATIONS AND ESTIMATED OUTSTANDING STOCK OF BONDS

OF DECREE LAW 6019/43 ISSUED IN STERLING - SCENARIO III (%)

Issuer	Year	%	£
Central Government	1883	1.25	2,974
Central Government	1888	2.24	5,346
Central Government	1889	11.54	27,547
Central Government	1895	5.32	12,713
Central Government	1898	5.22	12,463
State of Pará	1901	0.20	466
Central Government	1901	5.12	12,235
Central Government	1903	7.49	17,872
Municipality of Rio de Janeiro	1904	0.00	50,729
State of Bahia	1904	0.74	1,768
Municipality of Belém	1905	0.34	809
Municipality of Belo Horizonte	1905	0.00	1,040
State of Alagoas	1906	0.05	117
Municipality of Belém	1906	0.34	812
Municipality of Manaus	1906	0.04	84
State of Pará	1907	0.12	293
Municipality of Porto Alegre	1909	1.18	2,827
Municipality of Recife	1910	0.35	830
Central Government	1910	7.64	18,230
Central Government - Lloyd	1910	0.11	263
Municipality of Pelotas	1911	0.55	1,310
Central Government - Harbor Works	1911	1.37	3,277
Central Government - V. Cearense	1911	1.41	3,357
Municipality of Belém	1912	0.48	1,136
State of Bahia	1913	1.24	2,961
Central Government - Port Division	1913	6.75	16,104
Central Government	1914	15.02	35,862
State of Bahia	1915	0.97	2,310
State of Pará	1915	0.49	1,164
Municipality of Belém	1915	0.35	835
Municipality of Belém	1919	0.21	490
State of Rio de Janeiro	1927	1.98	4,718
State of Rio de Janeiro	1927	0.00	94,137
Municipality of Santos	1927	2.54	6,058
Central Government	1927	7.58	18,087
State of Minas Gerais	1928	0.00	128,600
State of Bahia	1928	0.45	1,081
Municipality of Niterói	1928	0.80	1,907
Municipality of Salvador	1931	0.19	442
Central Government - 20 Years	1931	1.45	3,455
Central Government - 40 Years	1931	6.93	16,543
TOTAL		100.00	513,254

Source: Authors own estimation.

Scenario IV: This fourth scenario is related to the participation of the bonds in the total outstanding stock assumes that the only bonds considered are those bonds whose external paying agent, according to information in the web of the National Treasury, is the Rothschild Bank in London. The justification for so extreme a scenario would lie on the fact that in the Federal government LOA of 2003, from where we have obtained the estimate of the stock not redeemed by the Federal government, appears the Word "Rothschild" as a generic designation for the bonds renegotiated by Decree Law 6019/43. Once again, the authors tried to contact CODIV in order to obtain better information, without obtaining, however, any additional clarification. In the same way, the not redeemed and not readjusted stock of each bond were obtained in applying the calculated proportions in the total estimated outstanding stock, excluding once more the four bonds of which the not redeemed stock may be obtained in the LOAs of the States of Rio de Janeiro and Minas Gerais. This information is presented in Table 7.

TABLE 7

PARTICIPATIONS AND ESTIMATED OUTSTANDING STOCK OF BONDS

OF DECREE LAW 6019/43 ISSUED IN STERLING - SCENARIO IV (%)

Issuer	Year	%	£
Central Government	1883	1.61	3,856
Central Government	1888	2.90	6,932
Central Government	1889	14.96	35,717
Central Government	1895	6.90	16,484
Central Government	1898	6.77	16,160
State of Pará	1901	0.25	604
Central Government	1901	6.64	15,864
Central Government	1903	9.71	23,172
Municipality of Rio de Janeiro	1904	-	50,729
State of Bahia	1904	0.00	0
Municipality of Belém	1905	0.44	1,049
Municipality of Belo Horizonte	1905	-	1,040
State of Alagoas	1906	0.06	152
Municipality of Belém	1906	0.00	0
Municipality of Manaus	1906	0.05	109
State of Pará	1907	0.16	380
Municipality of Porto Alegre	1909	1.18	2,806
Municipality of Recife	1910	0.00	0
Central Government	1910	7.58	18,092
Central Government - Lloyd	1910	0.11	261
Municipality of Pelotas	1911	0.00	0
Central Government - Harbor Works	1911	1.36	3,252
Central Government - V. Cearense	1911	1.4	3,331
Municipality of Belém	1912	0.00	0
State of Bahia	1913	0.00	0
Central Government - Port Division	1913	6.69	15,982
Central Government	1914	14.91	35,591
State of Bahia	1915	0.00	0
State of Pará	1915	0.48	1,156
Municipality of Belém	1915	0.00	0
Municipality of Belém	1919	0.00	0
State of Rio de Janeiro	1927	0.00	0
State of Rio de Janeiro	1927	-	94,137
Municipality of Santos	1927	0.00	0
Central Government	1927	7.52	17,951
State of Minas Gerais	1928	-	128,600
State of Bahia	1928	0.00	0
Municipality of Niterói	1928	0.00	0
Municipality of Salvador	1931	0.00	0
Central Government - 20 Years	1931	1.44	3,429
Central Government - 40 Years	1931	6.88	16,418
TOTAL		100.00	513,254

Source: Authors own estimation.

In relation to the scenarios referring to the number and due dates of the interest coupon of each one of the bonds renegotiated through Decree Law 6019/43, we made the following suppositions: a base scenario, that supposes that the totality of the coupons remain unredeemed; a scenario which assumes that 10% of the coupons due to the beginning of the validity of the contract remains not redeemed; the same previous scenario, with the difference that 10% have a redemption close to the date of the last amortization; a scenario with 33% of coupons not redeemed with due date at the beginning; an identical scenario as regards the amount of coupons, but assuming that their due dates are concentrated towards the end of the period; a scenario that supposes the existence of 50% of outstanding coupons with redeeming dates concentrated close the issuing date of the bonds; a scenario with the same amount of the previous one, supposing that the payment date is concentrated close the due date of the principal of each bond; a scenario with 75% of coupons not redeemed and with due date close the original issuing date of each bond; a scenario with the same amount of coupons, assuming the redeeming of each one is concentrated towards the end of the period; and, finally, a scenario that supposes that the totality of the coupons has been previously redeemed, that is to say, a scenario with zero interest coupons.

The combination of these tem scenarios related to the amount and the term of due date of the coupons for each bond with the four previous hypothesis related to the participation of each bond in relation to the total outstanding stock has meant a great simulation effort: the construction of 1,640 computerized routines of MATLAB and the utilization of 64,000 Excel forms. Table 8 summarizes the implicit matrix of all considered scenarios.

TABLE 8

MATRIX FOR SCENARIOS CONSIDERED FOR THE ESTIMATION OF THE TOTAL OUTSTANDING STOCK OF DECREE LAW 6019/43 BONDS

Scenario I	Scenario II	Scenario III	Scenario IV
10% Cupons Beginning	10% Cupons Beginning	10% Cupons Beginning	10% Cupons Beginning
10% Cupons End	10% Cupons End	10% Cupons End	10% Cupons End
33% Cupons Beginning	33% Cupons Beginning	33% Cupons Beginning	33% Cupons Beginning
33% Cupons End	33% Cupons End	33% Cupons End	33% Cupons End
50% Cupons Beginning	50% Cupons Beginning	50% Cupons Beginning	50% Cupons Beginning
50% Cupons End	50% Cupons End	50% Cupons End	50% Cupons End
75% Cupons Beginning	75% Cupons Beginning	75% Cupons Beginning	75% Cupons Beginning
75% Cupons End	75% Cupons End	75% Cupons End	75% Cupons End
100% Cupons	100% Cupons	100% Cupons	100% Cupons
0% Cupons	0% Cupons	0% Cupons	0% Cupons

Assuming, due to the lack of information, that all these forty scenarios would present the same probability of occurrence, the final fair (expected) value of each bond will be exactly equal to the arithmetic average of the fair value of each bond in each one of the forty scenarios.

As it can be noted, all the complexity entangled in the estimate of the fair value of the bonds of the Brazilian external public debt renegotiated through Decree Law 6019/43 arise from the lack of information about the value of the bonds as well as their amount, due dates and value of the coupons. For this reason, the estimated fair value for each bond in the present study should not serve as a basis for the individual valuation of the bonds, where the value of the principal, the amount, the value, the amount and the due dates of the coupons are known with certainty. Notwithstanding, the methodology utilized in the valuation of each of the 41 considered bonds, that will be described in the next section, may serve the objective of individual valuation of the bonds.

5. Methodology to Estimate the Actualized Value of the External "Fiscal Skeleton"

5.1. Monetary Correction

To realize the valuation of each considered bond, the first step would be to make the monetary correction of the nominal values of the principal, according to the equation (11), and each of the coupons attached to the original bond, since their issue date. The price index utilized for the present valuation was the implicit deflactor of the United Kingdom Gross Domestic Product (GDP), which presents a more general estimate for the inflation occurred during the period considered. For the entire period 1883-2006, it have been applied the estimates of the GDP price deflator of the United Kingdom by Officer (2008a).

5.2. Opportunity cost of the capital

The monetary correction applied to the nominal values of the principal and of the coupons of each bond represented a first step to express them in current values, also having to be considered the possibility of capitalize them at the market rate, from their respective due dates up to the present moment.

Since the principal and the coupons remained in pounds along the whole period, it was opted to suppose their interest gains at the British market long term interest rate for each considered year. The long term nominal interest rate in the United Kingdom for the period 1883-2006 was obtained from the estimates by Officer (2008b). Technically, it was opted to utilize the so-called contemporary rate (contemporary series), that would represent the effective interest rate for each year, in contrast to the so-called consistent rate (consistent series), in which the mentioned author makes the previous interest series compatible with the market rate for 2001.

However, in applying the monetary correction to the nominal values of the principal and of the coupons, one should consider the possibility of interest gains on the resources involved in real terms. By definition, the nominal interest rate considers implicitly the expected rate of inflation. Assuming that the economic agents utilize adaptative and static expectations, the yearly real long term interest rate can, thus, be approached, by deducting from the yearly nominal interest rate the inflation rate of the current year, again measured by the variation of the GDP deflator of the United Kingdom.

Since the long run nominal interest rate is risk-free, one should add to the previous real interest rate the equity risk premium. There is not a sole method to estimate the equity risk premium and, for this, it was opted to utilize the average value of the equity risk premium for the United Kingdom estimated for the period 1900-2000 by Dimson, Marsh and Staunton (2000) and the estimate of Barclays Equity-Gilt Study (2007) for the same period. In this way, the proxy of the equity risk premium during the period 1900-1950 would be 5.41% a year, reaching 7.20% a year during the years 1951-2007.

In this way, the annual real interest rate applicable to the principal and to each coupon, since their respective due date, may be summarized in the following formula:

$$\left(12\right) \quad r = i - \pi^{e} + \rho$$

where:

r is the annual real interest rate;

i is annual long term nominal interest rate;

π^{e} is the annual expected inflation rate;

ρ is the proxy of the annual equity risk premium for the United Kingdom.

Finally, to accomplish the valuation of each bond, it is necessary to consider the diversity of issue and due dates, which in many cases correspond to fractions of a certain month. Besides, the coupons expire on a six-month term, thus requiring to be separated for the effects of application of monetary correction and of the cost of capital opportunity. For that, a computer routine has been created, allowing the valuation of each bond with the previous methodology, taking into consideration the exact number of existing days between its issue and due date, and moreover establishing correctly the valuation of each coupon, according to its precise due date.

6. Results and Conclusions

In applying interest and monetary correction to each of the renegotiated bonds from DL 6019/43 that still present stocks in circulation, we have obtained a total actualized value for 2006 of approximately US$ 69.6 billion. This estimated value exceeds in an important way the value of US$ 2.1 million provisioned in the LOAs of the Federal Government and the Governments of the States of Rio de Janeiro and of Minas Gerais in that year, which clearly establishes the existence of an important "fiscal skeleton". Table 9 presents the fair value of the outstanding stock of all the bonds of external debt considered in the present work.

TABLE 9

ESTIMATED FAIR VALUE OF THE OUTSTANDING STOCK OF

EXTERNAL DEBT BONDS RENEGOTIATED BY DECREE-LAW 6019/43

(US$ Millions of 2006)

Issuer	Year	(US$ Millions)
Central Government	1883	5.464
Central Government	1888	6.010
Central Government	1889	16.317
Central Government	1895	10.511
Central Government	1898	3.838
Central Government	1901	2.152
Central Government	1903	7.447
Municipality of Porto Alegre	1909	368
Central Government	1910	1.117
Central Government - Lloyd	1910	155
Central Government - Harbor Works	1911	1.008
Central Government - V. Cearense	1911	151
Central Government - Port Division	1913	1.115
Central Government	1914	1.793
Central Government	1927	236
Central Government - 20 Years	1931	67
Central Government - 40 Years	1931	120
State of Pará	1901	162
State of Pará	1907	78
State of Pará	1915	72
State of Alagoas	1906	19
Municipality of Manaus	1906	14
Municipality of Belém	1905	207
Municipality of Belém	1906	163,1
Municipality of Belém	1912	85,3
Municipality of Belém	1915	42,6
Municipality of Belém	1919	47,6
Municipality of Salvador	1931	2,3
Municipality of Recife	1910	52,0
Municipality of Santos	1927	77,6
Municipality of Pelotas	1911	71,4
State of Rio de Janeiro	1927	91,6
Municipality of Niterói	1928	14,4
State of Bahia	1904	288,0
State of Bahia	1913	128,7
State of Bahia	1915	189,5
State of Bahia	1928	9,5
Municipality of Rio de Janeiro	1904	6.962
State of Rio de Janeiro	1927	925
State of Minas Gerais	1928	1.708
Municipality of Belo Horizonte	1905	333
TOTAL		**69.612**

Source: Authors own estimation.

In terms of the public debt/GDP ratio, the inclusion of these underestimated liabilities would increase their value, in average, in approximately 6.3% during the period 1994-2006. However, as it may be seen in the next graph, that compares the evolution of the public debt-GDP ratio in this period with the series re-estimated due to the inclusion of the estimated value for this "fiscal skeleton", that recognition would not be capable of changing the decreasing trajectory of the public debt-GDP, beginning from 2003 on. This trajectory is explained by the consolidation of the fiscal reform implemented from 1994 on, since the new government has opted for giving continuity to the macroeconomic policy which began with the Real Plan.

PUBLIC DEBT/GDP RATIO ACTUAL AND REESTIMATED: 1994-2006 (%)
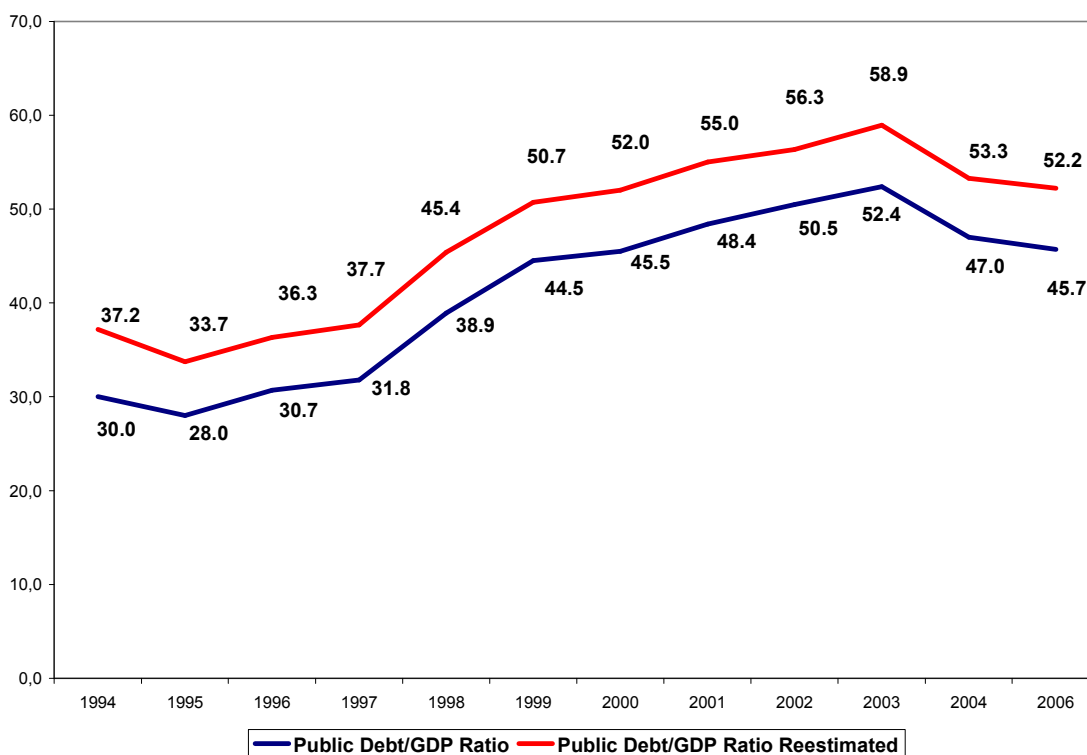
Source: Brazilian Central Bank and the authors own estimation.

Putting in other words, the sustainability of the Brazilian fiscal policy, that after a long period, which began with the imperial regime, would be returning to

a "Ricardian" behavior, would not be seen compromised if the Brazilian government would actualize adequately the value of the outstanding stock of the bonds of the Decree.

Moreover, a crucial aspect associated to the recognition of these "fiscal skeletons" is the increase of the credibility of the fiscal policy, that would allow the reduction of the risk premium of the public debt, decreasing the financial duties of the Treasury. Although the basic interest rate (SELIC) be the main instrument of the Brazilian monetary policy from 1999 on, its value is intrinsically associated with the public bonds attractiveness. As far as the government would recognize all these "hidden" liabilities, producing a real "credibility shock", the Brazilian public bonds would at last be regarded as the ones of lesser level of risk, allowing, then, to be offered at a basic interest rate inferior to other low risk alternatives. The recent proposal of taxation of the earnings of saving accounts, in a context of a decreasing basic interest rate, is a clear demonstration of the present impossibility of converting Brazilian public bonds into instruments of lesser risk level, as it happens in developed countries.

Yet, the results of the estimate of the "fiscal skeleton" would mean that the practice of underestimating the public debt based on several resources that, as previously mentioned, is part of a "New Ricardian" behavior, still persists in the interior of a fiscal policy that in appearance looks like an authentic "Ricardian" behavior.

As an additional reinforcement to the previous conclusion it could be also mentioned another type of "fiscal skeleton", represented by overdue debts of States and Municipalities, resulting from salaries, pensions and retirements, indemnities for expropriations or payments of services due to persons and companies, that have already been granted with a favorable and final judicial sentence, and, nevertheless, must wait for their receipts for years. It is estimated that the total amount of these debts reach US$ 43.5 billion in values of 2006, even surpassing the amount of the "fiscal skeleton" estimated in the present paper.

The Brazilian Senate has just sent a proposal for a constitutional amendment authorizing States and Municipalities to choose either to pay their debt in 15 years or restrict its payment to a small percentage of the yearly net revenues (up to 2% in the case of the States and 1.5% in the case of the Municipalities). Of this total, 40% would be aimed at the payment of these liabilities, to be ordered in an increasing way, and not according to the time elapsed, while 60% would come to creditors who would agree to receive only a fraction of the original debt, preference being given to those who accept greater reduction by means of electronic auctions.

Moreover, the proposition eliminates the seizure of resources that States and Municipalities would contemplate due to the non-payment of these debts, according to the present Brazilian Constitution. Of course, these debts will be underestimated, receiving the same interest rate applicable on the Brazilian saving accounts, which give returns well beneath of the average local market capital return. Thus, again, the logic of the "New Ricardian" behavior of the fiscal policy prevails here.

So, in spite of the undeniable advances in the execution of the Brazilian fiscal policy reached from the Real Plan on, which avoided the utilization of seignioriage as an additional source of fiscal revenue, practices of underestimation of internal and external debts of States, Municipalities and the Federal government prevail. These practices put in doubt the real engagement of the fiscal policy towards an authentically "Ricardian" behavior, that is not seen in the Brazilian economic policy since the Empire time, impairing the quality of the public debt, which remains concentrated in the short term and pays one of the highest basic rates of the world.

Furthermore, this kind of practice ends up damaging the rights of the public bondholders, who at the end run into patrimonial losses, on account of the underestimation of the correct value of the public debt. This "indirect expropriation" of the holder's wealth, as the inflation, much utilized by Brazilian governments to reduce the Treasury liabilities, a kind of "default tax", that at the end provokes regressive distributive effects.

As a final conclusion, we could admit that the final effect of recognizing all the "hidden" liabilities of the government would be, with a high probability, an increase in the sustainability of public accounts, an indispensable requirement, among others, to reach the so desired economic development.

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