Public Debt Indexation and Denomination, The Case of Brazil: A Comment*

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February 6, 2007

Abstract
In this work I analyze the model proposed by Goldfajn (2000) to study the choice of the denomination of the public debt. The main purpose of the analysis is to point out possible reasons why new empirical evidence provided by Bevilacqua et al. (2004), regarding a more recent time period, gives less empirical support to the model. I also provide a measure of the overestimation of welfare gains from hedging the debt caused by the simplified time frame of Goldfajn’s model. Assuming a time-preference parameter of 0.9, for instance, consumption gains associated with a hedge to the debt that reduces by half a one-time 20%-of-GDP shock to government spending run around 1.43% under the no-tax-smoothing structure of the model. Under a Ramsey allocation, though, consumption increases by just 0.05%.

1 Introduction
Among the different approaches used by economic theorists regarding the management of public debt, there are those which concentrate on time-consistency (e.g., Calvo (1978) and Lucas and Stokey (1983)), those which

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*I thank Ilan Goldfajn and Carlos E. da Costa for their comments on a previous version of this work. The usual disclaimer applies. JEL: E40, E60. Keywords: Inflation, Debt, Denomination, Indexation, Brazil.

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focus on exogenous (government-led) tax smoothing (Barro (1979) being the seminal contribution in this group) and those which focus on endogenous (covariance-led) tax smoothing (e.g., Bohn (1988, 1990a, 1990b), Goldfajn (1996, 2000) and Miller (1997)).

On the one side (Barro’s work left aside), the time-consistency approach argues that indexing the debt to domestic price indexes has the advantage of avoiding the temptation for future governments to reduce the real value of the public sector liabilities by increasing the cost of living.

On the other side, the endogenous (covariance-led) tax-smoothing approach calls for issuing securities with returns that are negatively correlated with the tax needs of the government. This side makes a point for nominal debt, for instance, if government expenditures are positively correlated with the rate of inflation; and/or a point for foreign-currency indexed debt, if the real exchange rate happens to be negatively correlated with government spending.

The original argument of the hedging approach can be found in Bohn (1988), who argues:

"Intuitively, if government does not hedge, it has to vary taxes depending on the state of nature. But because of increasing marginal cost, welfare gains in good states (that allow tax cuts) are more than offset by welfare losses in bad states (that require tax increases). Nominal debt allows the government to hedge against bad states of the world at (close to) fair odds and to change taxes very little."

In a meaningful contribution to this type of literature, Goldfajn (1996, 2000) presents empirical evaluations and an original and easily readable two-period model\(^1\) which delivers the type of result detailed in the paragraph above. Goldfajn tests his model using monthly data for Brazil covering the period from 1980 to 1997. The main empirical issue is investigating if the relative shares of each one of the components of the public debt (nominal, indexed to the price level and indexed to the exchange rate) followed the pattern suggested by the model. More recently, the same model and the same empirical methodology suggested by Goldfajn has been used by Goldfajn and

\(^1\)Although, in the model, government budget constraint and the distortions caused by taxes and inflation are considered in only one period.
de Paula (2000) and by Bevilacqua et al. (2004) to analyze the Brazilian experience with indexed debt.

Goldfajn’s analysis is not concerned with questions related to the costs of the debt, but solely with the variability of taxes\(^2\). A higher variance of tax rates reduces welfare. By these means, hedging against shocks to the budget can be welfare improving.

This work is divided as follows. Section 2 shows how Goldfajn’s model determines the share of each type of debt.

Section 3 uses two distinct frameworks to investigate possible theoretical reasons for the low empirical support of Goldfajn’s model found by Bevilacqua et al. (2004). Both take into consideration the fact that in the real world administrations of the debt work with horizons longer than that considered in Goldfajn’s model.

Section 4 deals with a distinct consequence of the simplified time frame of the original model: the overestimation of possible welfare gains associated with debt hedging. The possibility of distributing taxes optimally over future periods reduces the welfare losses of taxation and, consequently, the possible welfare gains of hedging. Some quantitative assessments comparing a balanced-budget rule (which takes place in Goldfajn’s model) with Ramsey’s allocations are then provided.

Section 5 interprets the hedging argument as a move towards completion of the markets and discusses whether that could provide some support for this line of reasoning.

Section 6 gives a conclusion.

2 The Model And The Empirical Evidence

Goldfajn (2000) aims at modeling the optimal strategy concerning the denomination of the government debt. For the purposes of this comment, describing the case in which there is full commitment will suffice.

\(^2\)As the author writes on page 51: "In reality, governments claim that they manage debt to ‘minimize the borrowing cost’. However, if markets work efficiently and there is no free lunch, any gains from shifting to cheaper securities should imply higher risks to the government. Since higher risks to the government imply, ultimately, higher risks to the society (for example with a higher probability of raising taxes to close the budget), it is not clear that there are any gains from this strategy."
The government is assumed to minimize the expected value of the distortions originated from taxes ($\tau$) and from inflation ($\pi$). The loss function is quadratic in these variables:

$$\text{Min} \ E \left[ \frac{A\tau^2}{2} + \frac{\pi^2}{2} \right]$$

Above, $A > 0$ and $E$ denotes the expectation operator. Equation (1) can be interpreted in terms of deviations of taxes from a previous level $\bar{\tau}$, with $\bar{\tau}$ normalized to be equal to zero (see, e.g., equation (1) in Barro (1997)). As pointed out by Barro (1997), the meaning of the term $\tau^2$ in (1) is that variations in taxes over time cause distortions that the government would like to avoid.

Since the government budget equation is not explicitly derived in the original paper, I do it here. Government spending, real exchange rate and inflation are stochastic variables to be determined in a second period. In the first period, the government chooses the composition of the debt that it sells to the public and that matures in period 2.

Debt can be nominal (with pre-agreed fixed nominal interest rates), indexed to the price level or indexed to the exchange rate. Make $i$ denote the nominal interest rate, $r$ the real interest rate, $e$ the depreciation of the exchange rate and $\pi$ the rate of inflation. The real rates paid by each type of debt, including the principal, are, respectively, $(1 + i)/(1 + \pi)$, $1 + r$ and $(1 + i^*)(1 + e)/(1 + \pi)$. Following the original notation, make the superscript ‘$e$’ denote expected value, $\tau$ the real amount of taxes the government has to raise in the second (and final) period, $G$ the real primary expenditures, $B$ the total amount of outstanding debt, $\theta$ the share of the debt allocated in nominal bonds and $\theta^*$ the amount of debt allocated in exchange-rate denominated debt. The budget equation for the second period then reads:

$$\tau = G + (1 + r)(1 - \theta - \theta^*)B + \frac{(1 + i^*)(1 + e)}{1 + \pi}\theta^*B + \frac{1 + i}{1 + \pi}\theta B$$

(2)

The model assumes the validity of Fischer’s equation:

$$1 + i = (1 + \pi^e)(1 + r)$$

(3)

and uncovered interest rate parity:

$$1 + i^* = (1 + i)/(1 + e^e)$$

(4)
Using (3) and (4):

\[
\frac{(1 + i^*)(1 + e)}{1 + \pi} = (1 + r) \frac{(1 + \pi^e)(1 + e)}{(1 + e^*)(1 + \pi)}
\]

Using (3):

\[
\frac{1 + i}{1 + \pi} = (1 + r) \frac{1 + \pi^e}{1 + \pi}
\]

The government budget equation can then be expressed by:

\[
\tau = G + (1 + r)B \left[ (1 - \theta - \theta^*) + \frac{(1 + \pi^e)(1 + e)}{(1 + e^*)(1 + \pi)}\theta^* + \frac{1 + \pi^e}{1 + \pi}\theta \right]
\]

Make \( q = \pi - e \) denote the real appreciation of the exchange rate. Linearize\(^3\) the terms multiplying \( \theta \) and \( \theta^* \) to obtain the government budget equation of Goldfajn’s model\(^4\):

\[
\tau = G + (1 + r)B \left[ 1 - \theta(\pi - \pi^e) - \theta^*(q - q^e) \right]
\]

The main point of this equation is that unexpected inflation and unexpected appreciation of the real exchange rate decrease the service of the government’s debt in period 2.

The (constrained) minimization problem given by (1) and (5) leads to the optimal shares of nominal (\( \theta \)) and exchange-rate-denominated (\( \theta^* \)) debt:

\[
\theta = \frac{\sigma_{\pi\pi} \sigma_q^2 - \sigma_{\pi q} \sigma_{q\pi}}{(1 + r)B(\sigma_q^2 \sigma_q^2 - \sigma_{q\pi}^2)}
\]

\[
\theta^* = \frac{\sigma_{q\pi} \sigma_q^2 - \sigma_{q q} \sigma_{q\pi}}{(1 + r)B(\sigma_q^2 \sigma_q^2 - \sigma_{q\pi}^2)}
\]

where, for any generic variables \( x \) and \( y \), \( \sigma_x^2 \) stands for the variance of \( x \) and \( \sigma_{xy} \) for the covariance of \( x \) and \( y \).\(^5\)

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\(^3\)For low enough values of \( \pi^e, \pi, e, e^e \) and \( \pi^e - e^e + e - \pi \), \( (1+\pi^e)(1+e) = \exp((1+\pi^e)(1+e)) \approx \exp(\pi^e - e^e + e - \pi) \approx 1 + \pi^e - e^e + e - \pi \).

\(^4\)The budget constraint (5) does not contain, as it should, the inflation-tax term on the right side. This point is acknowledged by the author in footnote 8 of the paper. As noted by Calvo and Guidotti (1992), the inclusion of the inflation tax modifies the conclusions of the model even when there is full commitment, since in this case it is not straightforward that \( \pi = 0 \).

\(^5\)To keep the original notation, \( g \) replaces \( G \) for the variance/covariance terms.
Since $\sigma_q^2 \sigma_g^2 - \sigma_{qg}^2 \geq 0$, the optimal proportion of the nominal ($\theta$) debt increases with the covariance of inflation and government spending ($\sigma_{qg}$) and decreases with the variance of inflation. Symmetrically, the share of foreign-exchange denominated debt increases with the covariance of the real exchange rate and government spending ($\sigma_{qg}$) and decreases with the variance of the real exchange rate ($\sigma_q^2$).

- Empirical Evidence With Brazilian Data


Goldfajn (2000) offers his model as an explanation of the fact that, in the aftermath of the Real Plan, a period in which inflation was sharply reduced, the share of public indexed debt in Brazil has dropped from 70 to 30% of total debt, while both nominal and foreign denominated debt shares have increased. His empirical findings are summarized on page 56 in the following way:

"the evidence from ordinary least-squares (OLS) regressions confirms that the variance of inflation, the size of the public debt and the correlations of inflation with spending are important determinants of public debt indexation in Brazil."

New evidence provided by Bevilacqua et al. (2004), concerning a more recent period, presents less empirical support for Goldfajn’s model. In particular, Table 3 in Bevilacqua et al., where regressions have the share of the nominal public debt as the dependent variable, shows a statistically non-significant coefficient for the variance of inflation and a negative value (this one statistically significant) for the covariance between inflation and government spending. These authors conclude that other factors should be considered if the data is to be explained by the model. Among such factors is the maturity of the debt, one of the points on which I shall be concerned with in the next section.

3 Debt Management and Planning Horizon

By endowing the model with a government-budget equation which is considered for only one period, the author is compelled to assume that equation
(5) necessarily has to close without resort to the issuance of new debt; and that all debt has a one period maturity. The purpose of this Section is to show that two usual features of a more comprehensive planning horizon, tax smoothing and an extended debt maturity, can lead to severe shortcomings of the model in its attempt to explain the data.

3.1 Tax Smoothing

In this subsection I show that the introduction of a crucial feature of debt existence and administration, tax smoothing, can lead to strong dissociations between observed data and the predictions of Goldfajn’s model, as well as to a practical indetermination of the parameters \( \theta \) and \( \theta^* \) introduced in Section 2.

Consider an administration of the public debt modelled with an infinite number of periods. Assume that the government is not borrowing constrained, and that administrators minimize the expected present value of distortions using a discounting rate \( \alpha \) (\( 0 < \alpha < 1 \)). Make \( V \) stand for the discounted value of distortions and \( E_t \) for the conditional expectation at time \( t \):

\[
V(\tau_t) = E_t \sum_{j=1}^{\infty} \alpha^j \left( A \left( \frac{\tau_{t+j} - \bar{\tau}_{t+j}}{2} \right)^2 + \frac{\pi^2_{t+j}}{2} \right)
\]

Assume that the economy departs from a steady state until period \( t \) in which equation (5) holds:

\[
\tau = G + (1 + r)B(1 - \theta(\pi - \pi^e) - \theta^*(q - q^e))
\]

and that this economy, as of period \( t+1 \), follows the equation of motion:

\[
\tau_{t+1} - \tau_t = G_{t+1} + (1 + r_t)B_t(1 - \theta_t(\pi_t - \pi^e_t) - \theta^*_t(q_t - q^e_t)) - \tau_t - \Delta_{t+1}
\]

with \( \Delta_{t+1} \) now denoting the issuance of new debt to match, partially or totally, the increase of primary expenditures \( G_{t+1} - G_t \).

Suppose a situation in which government expenditures previously forecasted to be incurred in two periods are now forecasted to be incurred in one period. To simplify, assume that an adequate discount rate is used to transform the respective values. By definition, this operation does not change the present value of government spending and, in a dynamic optimizing setting, should not lead to any change of taxation. The new one-period-ahead
positive shock to the government spending is completely offset in the next period.

In this case, the dynamic minimization of (8) under commitment leads in all periods to $\pi_t = 0$ and $\tau_t = \bar{\tau}$, by simply having the government make, once the shock is known, in period $t + 1$, $\Delta_{t+1} = (G_{t+1} - G_t)$. A negatively symmetric operation in period $t + 2$ allows the debt to remain payable in the long run, with no changes in taxation being necessary. The government can, therefore, keep taxes unchanged in this case. The administration of the public debt, acting optimally, would have no incentive to change its composition in an attempt to reduce the variations of tax rates, for the simple reason that tax rates would not have to change. This would be what the data would show.

However, any model focusing on only one-period ahead only would predict an increase in taxes and, by these means, an (incorrect) incentive for administration of the debt to devise a hedging action. Assuming a negative correlation between inflation and government spending, Goldfajn’s model in this case would predict the share of nominal debt to increase in period $t$, whereas a deeper analysis of the situation, as we have seen, shows that such an action would not be optimal.

This point can be formally immersed in the optimization framework devised by the author to derive (6) and (7). To simplify, suppose that in period $t$ the government plans to issue new debt in period $t + 1$, in order to accommodate, partially or totally, possible increases of current expenditures:

$$\Delta_{t+1} = \delta(G_{t+1} - G_t) \quad (11)$$

In general, $\delta$ can be understood as a random variable taking values in $(0, 1]$. The one-period-ahead-only minimization of (1) with constraint (5) replaced by (10) now implies the normal equations:

$$E_t([G_{t+1} + (1 + r_t)B_t(1 - \theta_t(\pi_t - \pi_t^c) - \theta_t^*(q_t - q_t^c) - \Delta_{t+1})][\pi_t - \pi_t^c]) = 0 \quad (12)$$

and

$$E_t([G_{t+1} + (1 + r_t)B_t(1 - \theta_t(\pi_t - \pi_t^c) - \theta_t^*(q_t - q_t^c) - \Delta_{t+1})][q_t - q_t^c]) = 0 \quad (13a)$$

These equations lead to expressions of the same form as (6) and (7), but with $\sigma_{(g-\Delta)^\pi}$ and $\sigma_{(g-\Delta)^q}$ replacing, respectively, $\sigma_{g\pi}$ and $\sigma_{gq}$. Since these
covariances can be influenced by government policies of the type given by (11), $\theta$ and $\theta^*$ can actually assume any value. Note, in particular, that if $\delta$ is assumed to be deterministic (known with certainty in the planning period) and equal to one, the new solutions to $\theta$ and $\theta^*$ given by (12) and (13a), when government expenditures have increased from $G_t$ to $G_{t+1}$, are exactly equal to those determined in the steady state (which run till period $t$) by (9).

3.2 Planning Horizon and Debt Maturity

In the real world, government planning is composed of several periods and assets have different maturities. This subsection uses a VAR analysis to show that such usual features of debt planning can make the practical administration of public debt very distant from the one implied by Goldfajn’s model. The main point is that in an $n$-period horizon ($n > 1$), any minimization of the unexpected variance of tax revenues based on the hedging argument would necessarily have to depend not only on the covariance matrix estimated using the residuals of a VAR (the main source of data used in the empirical verifications of the model), but also on its companion coefficient matrix.

Assume that the variables under consideration can be represented by an invertible stochastic process, the standard AR(1) form of which being given by:

$$x_t = Ax_{t-1} + Cw_{t-1} \text{ with } E(v_tv'_t) = I \quad (14)$$

with a corresponding MA($\infty$) form:

$$x_t = \sum_{j=0}^{\infty} A^jCv_{t-j}$$

Optimal forecasts at date $t$ are given by $E_t(x_{t+k}) = A^kx_t$.

To understand the hedging approach to the denomination of the public debt under this framework, assume for instance that the only variables considered are government expenditures ($g$) and inflation ($\pi$), and that these two variables ($x = (g, \pi)$) are positively correlated. To simplify, assume that $C$ is already a diagonal matrix such that $CC'$ can be regarded as the Cholesky decomposition of the variance/covariance matrix $CC'$ of a AR(1) describing the evolution of $x$. Suppose that $g$ has a contemporaneous effect over $\pi$, but not vice-versa. By writing:
one can easily see that an orthogonal shock $\eta_{gt}$ to $g$ leads to a contemporaneous response of inflation given by $E_t \pi_t - E_{t-1} \pi_t = c_{g\pi} v_{gt}$. Since $c_{g\pi}$ is supposed to be positive, when government spending increases so does the rate of inflation. This unexpectedly reduces the real value of the debt to be paid next period and, therefore, the tax needs of the government. This is the impulse-response version of the leitmotiv behind the covariance argument for nominal debt originally devised by Bohn (1988) and incorporated by Goldfajn in his model.

In terms of the general model (14), if one considers only one period ahead:

$$x_{t+1} - E_t(x_{t+1}) = Cv_{t+1}, \quad (15)$$

This implies that the conditional variance/covariance matrix of $x_{t+1}$ in time $t$ depends only on matrix $C$ ($var_t(x_{t+1}) = CC'$), the same happening with the unpredictable component of taxes (which can be thought as one of many additional possible elements of the vector of variables $x$).

Administrators of the public debt, though, usually work with more encompassing time horizons. In this case, any attempt to change the denomination of the public debt in order to minimize $var_t(\pi_{t+j} - E_t \pi_{t+j})$, for $j > 1$, would have to take into consideration matrix $A$, the companion matrix of the VAR. This makes such a process much more complicated and subject to statistical uncertainties than predicted by Goldfajn's model.

To show this point formally, suppose the debt maturity is of $n$ periods, $n > 1$. For our purposes, it suffices to calculate the forecasts error variances two periods ahead (the extension to $n$ periods is straightforward):

$$x_{t+2} - E_t(x_{t+2}) = Cv_{t+2} + ACv_{t+1} \implies var_t(x_{t+2}) = CC' + ACC' A \quad (16)$$

It follows trivially from (16) that any minimization that takes into consideration not only the one-period-ahead tax needs of the government, but also other future periods, will have to be based not only on the variance-covariance matrix $CC'$, as one concludes from Goldfajn's model, but also on the companion matrix $A$.

It is difficult to imagine an administration of the public debt changing its whole composition each month, or even a $1/n$ fraction of it, based on such
statistically uncertain calculations. This is what the covariance argument would require in a world in which facts beyond just those that will happen next month were to be considered.

4 Overestimated Welfare Gains

In Goldfajn’s model there is no possibility of intertemporal tax smoothing. For this reason, the optimal determination of the structure of the debt tends to have a higher impact on welfare gains than another one in which taxes are allowed to be optimally distributed over time. Since in the real world there is always the possibility of tax smoothing, welfare gains associated with Goldfajn’s one-period model tend to be highly upward biased.

In this section I draw upon Lucas and Stokey (1983) to illustrate this point quantitatively. To simplify the calculations, the utility function is supposed to be quadratic and symmetric regarding consumption \( c \) and leisure \( x \). The representative consumer order preferences based on consumption \( c \) and leisure \( x \) based on:

\[
\max \sum_{t=0}^{\infty} \beta^t U(c_t, x_t) = \sum_{t=0}^{\infty} \beta^t (c_t + x_t - \frac{1}{2} c_t^2 - \frac{1}{2} x_t^2) \]  

(17)

In each period the economy is endowed with one unit of time. Hence:

\[
1 = c_t + x_t + g_t \]  

(18)

where \( g_t \) denotes government spending at time \( t \).

I want to investigate the case in which the economy faces one single shock in public spending in period zero. After the shock, spending resumes its previous level, equal to zero. Hence:

\[
g_t = \bar{g} > 0, \quad t = 0 \]

\[
g_t = 0, \quad t > 0 \]

\[\text{Note, though, that providing estimates of welfare gains is not among the objectives of Goldfajn’s work.}\]

\[\text{Note that Lucas and Stokey’s economy is an economy with complete markets, in which the type of hedging argument considered by Bohn (1988) and his followers does not apply. This point, though, does not affect the calculations here, since their purpose aims solely at illustrating the welfare consequences of the absence of an optimal tax smoothing.}\]
The purpose of the exercise is to determine the respective percentage fall in consumption under two different alternatives. The first one, which I associate with Goldfajn’s one-period-budget-equation model, is based on the assumption of a continuously balanced budget (B.B.). The second one, used as a reference, is based on the Ramsey allocation, in which taxes are optimally chosen by the government subject to the compatibility constraint

\[ \sum_{t=0}^{\infty} \beta^t (U_c(t)c_t - U_x(t)(1 - x_t)) = 0. \]

Since the algebra concerning this problem is well known and standard in the literature (see e.g., Appendix A in Lucas and Stokey (1983), which deals with quadratic utilities as (17)) I omit the details here. The results of the calculations for \( \beta = .9 \) and \( \beta = .98 \) are displayed in Table 1:

<table>
<thead>
<tr>
<th>Beta=.98</th>
<th>Beta=.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumption Loss (%)</td>
<td>Consumption Loss (%)</td>
</tr>
<tr>
<td>( \bar{g} )</td>
<td>B.B.</td>
</tr>
<tr>
<td>.2</td>
<td>0.32</td>
</tr>
<tr>
<td>.15</td>
<td>0.98 \times 10^{-1}</td>
</tr>
<tr>
<td>.10</td>
<td>0.32 \times 10^{-1}</td>
</tr>
</tbody>
</table>

As one can notice from the table, welfare losses are much higher in the balanced-budget model than in the Ramsey model.

Welfare gains derived from the covariance argument turn out to be over-estimated when one works under the assumption, as in the case of Goldfajn’s model, that the budget is always balanced.

To make this point clearer, suppose for instance that, due to the covariance argument associated with the optimum denomination of the public debt, government expenditures in period zero happen to be (generously) reduced from 20% to just 10% of GDP. For \( beta = 0.98 \), consumption gains accrued to hedging the debt are found to be just 0.0019% in the case of Ramsey’s allocation, but 0.288% in the case of the balanced-budget allocation. When \( beta = 0.9 \) these values turn out to be 0.05% and 1.43%, showing a large discrepancy as well.
5 Insurance Provision and Market Completion

Complete-market economies, such as those contemplated by Lucas and Stokey (1983), allow for a complete hedging under the realization of any state of nature. Shocks happen and taxes remain the same, there being no need to change them. This is a well known characteristic of such economies.

An usual view among administrators of the debt is that a more diversified asset structure allows for more risk sharing and moves towards the completion of markets.

By the same token, the main argument of Bohn (1988) and his followers is that optimal structure of government debt must include some liabilities that are state contingent in real terms. The hedging argument, therefore, can be understood as a move towards market completion.

Would such views imply that allowing for different types of debt would always increase welfare? Unfortunately, that is not the case. This type of argument has already been shown not to be valid in economies with two or more consumption goods. Though not directly related to the denomination of government debt, a point which I make here, a sequence of papers in the literature covers this issue.

Hart (1975) first constructed an example of a competitive economy in which the allocation with one single asset was Pareto dominated by the allocation obtained with no assets at all. Newberry and Stiglitz (1984) provided new examples in the context of international trade. Zame (1993) demonstrated that, unless one allows for default, having the number of assets tend towards infinity in economies with countably-infinite states does not guarantee Pareto optimality. Later work by Elul (1994) has shown that the type of phenomenon illustrated by Hart’s example was indeed very general. In almost every incomplete-market economy with more than one consumption good and with sufficiently-many uninsured states of nature, all agents could be made worse off by the introduction of an appropriate asset⁸. Cass and Citanna (1998) arrived at basically the same conclusions as Elul (1994).

What all this line of reasoning shows is that optimality characterized by (1) and (5) can be very myopic, in the sense that improving government hedging may not be an outcome that enhances consumer welfare.

⁸Elul (1994) also shows that in the same economies another asset can be found that makes all agents better off.
6 Conclusions

In this work I have analyzed the model proposed by Goldfajn (2000) to study the choice of the composition of the public debt. The main conclusion of the analysis is that the simplified one-period-ahead-only time frame adopted by Goldfajn’s model leads to serious shortcomings when the purpose is understanding the management of public debt. Issues related to tax smoothing, planning horizon and debt maturity cannot be properly addressed, facts which may explain why the model has not been supported by more recent evidences.

References


