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INFLATIONARY BIAS AND STATE OWNED FINANCIAL INSTITUTIONS

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Inflationary Bias and State Owned Financial Institutions

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This article explains why the existence of state owned financial institutions makes it more difficult for a country to balance its budget. We show that states can use their financial institutions to transfer their deficits to the federal government. As a result, there is a bias towards large deficits and high inflation rates. Our model also predicts that state owned financial institutions should underperform the market, mainly because they concentrate their portfolios on non-performing loans to their own shareholders, that is, the states. Brazil and Argentina are two countries with a history of high inflation that confirm our predictions.

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In a Federation, the political units (from now on called states) frequently face situations that require collective actions. In these instances, chances are that the states will find themselves trapped in a costly bargaining process. One of the reasons for the existence of a Congress is to assure efficient collective actions by providing a forum for political coordination.

The main insight of this paper is that the existence of state owned financial institutions weakens the coordination value of a Congress. We shall show that state owned financial institutions induce higher deficits at a state level, resulting in an inefficiently high inflation rate.

The intuition is very simple. As it is well known, one of the roles of a Central Bank is to be a lender of last resort. In theory, a Central Bank should rescue a financial institution whenever there is a run that is not caused by poor performance. However, the risk of a bank's portfolio is not verifiable. Therefore, there is enough room for state representatives to put political pressure on the Central Bank to bail out a financial institution, even when there is a case for liquidation.

The problem is that the possibility of a bail out provides perverse incentives to state politicians. Ex-post, they have incentives to always try a bail out because, in case of success, the state transfers part of its deficit to the federal government, which is the residual claimant on the Central Bank’s profits. Ex-ante, they have incentives to increase expenditures by borrowing from the state's financial institution beyond its financial capability. This is so because the bail out shares the cost of the increased expenditure with the other states through the federal government. The Federation ends up trapped in a high inflation rate caused by the large deficits run by the states.

In short, the existence of state owned financial institutions breaks the coordination role exerted by a Congress by making budget decisions a non-cooperative game. This is the source of the inflationary bias.

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1 Diamond and Dybvig (1983) explained how asymmetric information can cause runs to healthy banks that honor withdraws in a sequential basis.

2 Moreover, in many countries the federal government is also liable to any lack of funds of the agency that insures depositors.
Having laid out the problem, we argue why the federal government cannot avoid the inflationary bias by increasing the current fiscal surplus to finance future bail-outs. The problem is that, as shown by Alesina and Tabellini (1990), incumbent policy-makers actually favor larger deficits if they fear not being reelected. The idea is that incumbents prefer an increase in current government expenditures at the expense of future expenditures, which with some probability will be of a pattern that is different from the one that the incumbent political party favors. This incentive plays against an strategy that imposes sacrifices in the present to finance the future rescue of state owned financial institutions.

Privatization of the state owned financial institutions is a natural candidate to solve the inflationary bias. However, one could still argue that privatization alone cannot solve our problem because state politicians have incentives to bail out a private financial institution that is largely concentrated in their state. Nevertheless, there is a major difference between the ex-ante incentives of a private and a state owned financial institution. A healthy private financial institution does not have incentives to finance a bankrupt state, for it internalizes any loss in its equity value. On the contrary, a politician in control of a state owned financial institution does not internalize an equity loss if it is used to increase the state's expenditures. A state owned financial institution is unique in the sense that its depositors and its main controller act as being fully protected from bankruptcy.

In summary, it is certainly true that the inefficient incentives that arise when a financial institution fails are not unique to the state-owned ones. However, contrary to the latter, healthy private financial institutions do not have incentives to finance a bankrupt state. Privatization is a way to avoid large deficits at state level.

Our paper suggests two main testable implications. Countries that allow their states to own financial institutions should have a stronger inflationary bias. Moreover, a large share of a state owned bank's portfolio should be concentrated on loans to the main shareholder, that

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3Indeed, in 1990 5 US senators were accused of having received US$ 1.3 million to convince the Savings and Loan (S&L) regulatory agency to bail out a private financial institution, Lincoln, in 1987. The senators denied any wrong doing but they confirmed that they talked to the Chairman of the S&L regulatory agency about the company's problems. Lincoln continued operating until 1989, when its failure cost US$ 2.5 billion to American tax payers. The owner of Lincoln, Charles Keating, was convicted in 1992 on several fraud counts.
is the state. Indeed, state owned financial institutions have been subject to various criticisms for their poor performance in at least two countries with a record of high inflation rates: Brazil and Argentina. In both cases, state owned financial institutions concentrate their portfolios on loans to their own state governments.

Our paper is related to the literature on inefficiency due to fiscal federalism. However, instead of focusing on the conflicting policies at federal and state levels, we provide insights on the mechanisms used by the states to transfer their deficits to the federal level. On doing this, we strongly rely on the recent political economy literature that views government as formed by self interested agents, instead of a welfare maximizing institution. As in Alesina (1987), the federal government may fail to pursue welfare maximizing strategies because the incumbent political party internalizes the chance of not being re-elected. However, contrary to most of this literature, we focus on the inefficient incentives at state levels as opposed to the mechanisms that lead federal governments to act inefficiently.

The closest paper to ours is Werlang and Fraga (1992). In that paper they point out that, in a Federation, states overspend if the federal government passively bails them out. Our paper explains why the overspending persists despite the subsequent inflationary bias and the federal government’s ability to save.

The paper proceeds as follows. In Section 1 we describe the model. Section 2 shows the bias towards higher inflation under the presence of state owned financial institutions. In Section 3 we provide some evidence through the cases of Brazil and Argentina, and we discuss some alternative ways of solving the inflationary bias. Finally, in the last section we conclude and summarize our results.

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5 A recent World Bank report (1990) recommended the privatization of state owned banks in Brazil, so as to make their administration independent from political pressure. However, as in Werlang and Fraga (1992), it is not clear why the overspending persists once you allow some coordination through Congress.
1 The Model

We consider a country politically organized as a Federation, with \( n \) political units, which we call states, and a central authority, which we call the federal government.

The \( n \) states have the same preferences on inflation and consumption. The representative consumer dislikes inflation and deflation, but it likes consumption. The per period utility function is given by

\[
U(G, \Pi) = V(G) - T(\Pi),
\]

where \( G \) is the consumption of the single good of our economy, and \( \Pi \) is the inflation rate.

We make the standard assumptions on \( V(.) \). The marginal utility of consumption is positive, but decreasing in \( G \), achieving zero asymptotically, that is, \( V' > 0, V'' < 0 \), with \( \lim_{G \to \infty} V'(G) = 0 \). To assure an interior solution we also assume that the marginal utility of consumption is infinity when consumption approaches zero: \( \lim_{G \to 0} V'(G) = \infty \).

The representative consumer dislikes inflation and deflation. Therefore, \( T(\Pi) \geq 0 \) for any \( \Pi \), with equality only when \( \Pi = 0 \). We also make the standard assumptions on the marginal disutilities of inflation and deflation. The marginal disutility of inflation is positive and increasing, approaching infinity asymptotically: \( T'(\Pi) \geq 0 \) and \( T''(\Pi) \geq 0 \) for any \( \Pi \geq 0 \), with equality only when \( \Pi = 0 \), and \( \lim_{\Pi \to \infty} T'(\Pi) = \infty \). As well, the marginal disutility of deflation is positive, decreasing with \( \Pi \) (i.e. increasing with deflation), and approaching infinity asymptotically: \( T'(\Pi) < 0 \) and \( T''(\Pi) > 0 \) for any \( \Pi < 0 \), with \( \lim_{\Pi \to \infty} T'(\Pi) = \infty \).

The federal government is summarized by the political party in power. It is not important for our purposes to specify the differences between the political parties. It suffices to make sure that they alternate in power with positive probability.\(^6\) Accordingly, we consider a two period economy with two identical political parties, which alternate in power in an exogenous way.

More precisely, as in Persson and Svensson (1989), we assume that the incumbent political

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\(^6\)This is enough to generate a short horizon problem that prevents the federal government from assuring efficiency in any situation. We could have formalized the differences between the political parties by adding two public goods to the consumption set, and assuming that the parties have different preferences on them. However, this would complicate the model without adding any new insight.
party at time $0$ knows that it will not be reelected with probability $1$, and that it does not care to the utility of the states when the rival party is in power at time $1$.

It then follows that the utility function of any political party at any time $t \in \{0, 1\}$ is a weighted average of the states’ per period utility functions:

$$U(G^1_t, G^2_t, ..., G^n_t, \Pi_t) = \sum_{i=1}^{n} \lambda^i [V(G^i_t) - T(\Pi_t)],$$  \hspace{1cm} (1)$$

where the subscript, $t$, indexes the period, the superscript, $i$, indexes the state, and $\lambda^i$ is the weight that the political parties assign to state $i$, with $\lambda^i > 0$ for any $i$, and $\sum_{i=1}^{n} \lambda^i = 1$.

We assume that the federal government cannot borrow, therefore its deficit must be financed by inflationary tax. Hence, inflation increases with the Federation’s fiscal deficit as follows:

$$\Pi_t = G_t - W_t,$$  \hspace{1cm} (2)$$

where $W_t$ is the endowment of the Federation at time $t$, and $G_t = \sum_{i=1}^{n} G^i_t$ is the total expenditure of the states at time $t$.

Equation (2) implies that there is no deflation in equilibrium. This is so because the states can be made strictly better off by eliminating any deflation through an increase in expenditures. Therefore, from now on we shall concentrate on the trade-off between inflation and expenditure.

We now describe how the Federation solves the trade-off between expenditure and inflation. At each period the states transfer their resources, $W > 0$, to the federal government. The assumptions are not so restrictive. As Alesina and Tabellini (1990) showed, we can generalize the model to a situation where the incumbent political party internalizes the states’ future utility, allowing it to stay in power with some positive probability.

We can allow the federal government to borrow if we assume that it internalizes at least part of the states’ welfare when the political rival is in power. In such case, the federal government at time $0$ would choose a positive debt level but this would be below the second period’s endowment. Therefore, there would be some scope for a second period bail-out.

The linear specification is not important. All results survive if we assume that inflation is an increasing function of the fiscal deficit.

Of course, in the real world the states can levy taxes on their citizens to finance their expenditures. However, the very existence of a Federation implies a commitment from the states to transfer some resources.
latter then chooses the total amount of expenditures, which the states cooperatively split among themselves. We assume that the Congress is the mechanism that allows the states to delegate the total expenditure decision to the federal government, keeping the control on how to allocate the federal budget at state level.

Consider that the states cannot own financial institutions. Thus, the federal budget is the states’ only source of consumption since they do not have any wealth left to finance their expenditures.\(^{11}\) The problem of the federal government at time \(t\) is to choose the pair \((G_t, \Pi_t)\), knowing that \(G_t\) will be allocated to the states according to the cooperative outcome \(\{a^i\}_{i \in \{1,n\}}\), where \(a^i > 0\) for any \(i\), and \(\sum_{i=1}^{n} a^i = 1\). That is, an incumbent federal government at any time \(t\) solves

\[
\max_{\{G_t, \Pi_t\}} \sum_{i=1}^{n} \lambda^i [V(G^i_t) - T(\Pi_t)]
\]

\[\text{s.t.} \quad G^i_t = a^i G_t,\]

\[\Pi_t = G_t - W,\]

\[G_t \geq 0.\]

Now, consider that the states are allowed to own financial institutions. Suppose further that lenders know that any banking deposit will be honored by the federal government at time 1, or that state politicians will surely convince the federal government to bail out their financial institution. In both cases, depositors should be willing to lend to a state owned financial institution for the risk free real interest rate (which we assume to be zero). Hence, state \(i\) can increase its consumption at time 0 by borrowing \(a^i\) from its own financial institution. Therefore, one could interpret our paper as an analysis of the consumption decisions based on resources that are committed to the Federation.

\(^{11}\)Remember that the states transfer all resources to the federal government.
Of course, the federal government anticipates this possibility. Therefore, its program at time 0 becomes:

\[
\max_{\{G_0, \Pi_0\}} \sum_{i=1}^{n} \lambda^i [V(G_0^i + d^i) - T(\Pi_0)]
\]  \hspace{1cm} (7)

\[s.t. \quad G_0^i = a^i G_0,
\] \hspace{1cm} (8)

\[\Pi_0 = G_0 - W,
\] \hspace{1cm} (9)

\[G_0 \geq 0.
\] \hspace{1cm} (10)

There is no scope for borrowing in the last period. Nevertheless, the federal government at time 1 is also affected by the existence of state owned financial institutions because it actually pays any debt that the states take at time 0. The objective function of the federal government at time 1 becomes

\[
\max_{\{G_1, \Pi_1\}} \sum_{i=1}^{n} \lambda^i [V(G_1^i) - T(\Pi_1)]
\]  \hspace{1cm} (11)

\[s.t. \quad G_1^i = a^i G_1,
\] \hspace{1cm} (12)

\[\Pi_1 = G_1 - (W - \sum_{i=1}^{n} d^i),
\] \hspace{1cm} (13)

\[G_1 \geq 0.
\] \hspace{1cm} (14)

It should be clear that the major difference between Programs (7) and (11) is a transfer of resources from time 1 to time 0. As we shall show, this transfer is the source of the inflationary bias induced by state owned financial institutions.
The inflationary bias also explains why the states do not borrow an infinite amount at time 0. In fact, the states internalize at time 0 the increase in inflation at time 1 due to their borrowing decisions. More precisely, a state decides how much to borrow at time 0 by solving

\[ \max_{4, 2, 0} [V(a^i G_0^* + d^i) - T(\Pi_0^*]) + [V(a^i G_1^*) - T(\Pi_1^*]], \]  \tag{15} \]

where \((G_t^*, \Pi_t^*)\) is the optimal choice of the federal government at \(t\).

In the next section we characterize the equilibrium strategies with and without state owned financial institutions. We shall show that, despite a myopic federal government, the solution of Program (3), is Pareto efficient. Thus, Congress assures efficiency in the absence of state-owned financial institutions. On the contrary, state-owned financial institutions induce their states to overspend at time 0, leading to an inefficiently high inflation level at time 1.

2 The Inflationary Bias

In this section we show the inflationary bias caused by state-owned financial institutions. We do this in two steps. First we characterize the set of efficient allocations, and we show that it includes the allocation obtained by Congress in the absence of state-owned financial institutions (Program (3)). Then we show that the allocation obtained by Congress with state-owned financial institutions implies an inefficiently high inflation level.

2.1 Pareto Efficient Allocation

Consider a social planner that, at each time \(t\), faces a trade-off between inflation and consumption. We can think of the social planner's problem as a two stage one. In the first stage it decides the optimal expenditure-inflation bundle given the resources available in each period. In the second stage it decides how much resources to transfer from one generation to another.

\[\text{Note that we do not assume that politicians at state level are myopic. Indeed, all we need is that politicians should fear political turnovers at national level more strongly than at state levels. This seems consistent with casual observation in Brazil and the US, where in most states the same party usually wins state and local elections.}\]
Call this transfer $S$. We assume that the social planner does not prefer one generation over another, neither one state over another. Therefore, it solves

$$\max_{\{G_i, \Pi_i, S\}} \sum_{t=0}^{1} \sum_{i=1}^{n} V(G_i^t) - T(\Pi_t)$$

subject to

$$\Pi_0 = \sum_{i=1}^{n} G_0^i - W + S,$$

$$\Pi_1 = \sum_{i=1}^{n} G_1^i - W - S,$$

$$G_i^t \geq 0, \forall i, t.$$  \hspace{1cm} (16)

(17)

(18)

(19)

The objective function is the sum of the states' utility at each period. Constraints (17) and (18) determine, respectively, the time 0 and time 1 inflation levels given each period's expenditures and the transfer $S$.\textsuperscript{13}

Any meaningful comparison between the allocation of our social planner and the one determined by the political parties must assume that the latter do not prefer one state over another. We accomplish this by assuming that the states are symmetric, that is, $a^i = \lambda^i = \frac{1}{n}$.\textsuperscript{14}

We shall show that, in the absence of state owned financial institutions, Congress obtains an efficient allocation in a symmetric economy. In other words, any solution of Program (3) solves Program (16).

The intuition is fairly simple. The social planner might be willing to transfer resources from one generation to another, that is $S \neq 0$, only if the marginal cost of one generation is more than compensated by the marginal benefit of the other. However, in our economy there is no difference in marginal costs or marginal benefits between the two generations. Therefore, there are no transfers, and the social planner's program boils down to two separable optimization

\textsuperscript{13}For example, if $S < 0$, then the social planner transfers resources from time 1 to time 0. This would be equivalent to allowing the time 0 federal government to borrow, using the next period resources to pay the debt. If $S > 0$, then the transfer is from time 0 to time 1.

\textsuperscript{14}Note that, in principle, the political parties might still pursue inefficient policies at time 0 because they do not internalize the states' utility at time 1.
programs, which are equivalent to the myopic optimization of Program (3). The following proposition states this result, which is formally proved in the appendix.

**Proposition 1** There is no intergeneration transfer in the solution of the social planner's problem. Moreover, Congress assures an efficient allocation in a symmetric economy without state-owned financial institutions.

**Proof:** See the appendix.

Proposition (1) captures the efficiency role of Congress as a coordination mechanism. Now we show how the existence of state owned financial institutions breaks the efficient equilibrium obtained by Congress.

### 2.2 Equilibrium with State Owned Financial Institutions

In this subsection we characterize the equilibrium debt and federal government strategies. We do this in two steps. First we compute the optimal choices of consumption and inflation at time 1 as a function of the economy's endowment and the total debt to be rescued. Then we look for the optimal choices of the states and the federal government at time 0, taking into account the optimal policy at time 1. In other words, we look for a subgame perfect equilibrium.

We can simplify our task by looking for a narrower set of subgame perfect equilibria. We will restrict our attention to symmetric subgame perfect equilibria in pure strategies, assuming that all states are identical, that is, \( a^i = \lambda^i = \frac{1}{n} \) for any \( i \). As usual, we solve the equilibrium by backwards induction.

At time 1, the incumbent federal government chooses \((\Pi^*_i, G^*_i)\) to maximize the states' weighted average utility given \( \{(\Pi^*_0, G^*_0), (d')_{i=1}^n\} \):\(^{16}\)

\(^{15}\)The strict optimality of no transfers between generations follows from our concavity assumptions on \( V \) and \( T \). See the proof of Proposition (1) for the details.

\(^{16}\)Note that in Programs (20) and (23) we have already replaced the states' shares of \( G_t \) in their utility functions. Furthermore, we did not write the non-negativity constraint on \( G_t \), for the assumptions on \( V(.) \) assure that they are not binding.
\[
(\Pi_t^*, G_t^*) \in \text{argmax}_{(G_t, \Pi_t)} \sum_{i=1}^{n} \lambda^i [V(a^i G_1) - T(\Pi_t)]
\] (20)

s.t. \quad \Pi_t = G_t - (W - \sum_{i=1}^{n} d_i^t + \text{Max}\{W - G_0^*, 0\}). (21)

Note that the constraint that relates expenditures with inflation takes into account that the federal government will actually pay the debt of the state-owned financial institutions. Therefore, everything happens as if the second period's endowment were reduced by \(\sum_{i=1}^{n} d_i^t\). Note also that, in principle, the previous federal government might have spent less than its endowment at time 0 to help rescuing the state banks. Nevertheless, we shall prove that this is not an optimal strategy for the previous federal government. The point is that savings would decrease the incumbent's utility at time 0, while another party would enjoy the benefits at time 1.\(^{17}\) Therefore, we can drop the last term of constraint (21). This is formally proved in the following proposition.

**Proposition 2** The federal government does not save at time 0, that is, \(G_0^* > W\). Moreover, expenditure at time 0 increases with \(W\) in any equilibrium in pure strategies.

**Proof:** See the appendix.

Given Proposition (2), the first order condition (FOC), which is also sufficient, for Program (20) is

\[
\sum_{i=1}^{n} \lambda^i [V'(a^i G_1) a^i - T'(G_t - (W - \sum_{i=1}^{n} d_i^t))] = 0.
\] (22)

The FOC implies that \(G_t^*\) and \(\Pi_t^*\) are functions of the second period's net wealth \(W - \sum_{i=1}^{n} d_i^t\). Thus we write the optimal second period policies as \(G_t^* = G_t^*(W - \sum_{i=1}^{n} d_i^t)\), and \(\Pi_t^* = G_t^*(W - \sum_{i=1}^{n} d_i^t) - (W - \sum_{i=1}^{n} d_i^t)\).

Economic intuition suggests that \(G_t^*\) and \(\Pi_t^*\) should increase and decrease with net wealth respectively.\(^{18}\) We also expect that the second period utility increases with wealth. Indeed, the following proposition shows that these conjectures are all true.

\(^{17}\)This is the major insight of the recent political economy literature, i.e., the risk of a political turnover leads to inefficient acts.

\(^{18}\)That is, expenditures and disinflation are normal goods.
Proposition 3  The second period expenditures increase when net wealth increases, while the second period inflation decreases. Moreover, the second period utility increases with wealth.

Proof:

(i) $\frac{dg_1}{d\bar{w}} > 0$: Call $\bar{W} = W - \sum_{i=1}^{n} d^i$. Applying the Implicit Function Theorem to the FOC (equation 22) and using $T'' > 0$ and $V'' < 0$ as in the proof of Proposition (2), we obtain

$$G_1^{\ast}(\bar{W}) = -\frac{\sum_{i=1}^{n} \lambda^i T''(G_1^i - \bar{W})}{\sum_{i=1}^{n} \lambda^i [V''(a^i G_1^i)(a^i)^2 - T''(G_1^i - \bar{W})]} > 0.$$  

(ii) $\frac{dn_1}{d\bar{w}} < 0$: $\Pi_1^* = G_1^i - \bar{W} \Rightarrow \frac{dn_1}{d\bar{W}} = -\frac{\sum_{i=1}^{n} \lambda^i V''(a^i G_1^i)(a^i)^2}{\sum_{i=1}^{n} \lambda^i [V''(a^i G_1^i)(a^i)^2 - T''(G_1^i - \bar{W})]} < 0.$

(iii) Define $U(\bar{W}) = \max_{G_1} \sum_{i=1}^{n} \lambda^i [V(a^i G_1^i) - T(G_1^i)]$. Then, by the Envelope Theorem, $U'(\bar{W}) = \sum_{i=1}^{n} \lambda^i T''(G_1^i - \bar{W}) > 0.$

Proposition (3) delivers our main intuition. Suppose that the states borrow from their financial institutions at time 0 (as we shall shortly prove). Thus $\sum_{i=1}^{n} d^i > 0$, implying a reduction in the federal government's net endowment at time 1. From Proposition (3) we conclude that the second period inflation rate will be higher.

We now move back to time 0. The federal government chooses the consumption-inflation bundle at the same time that the states choose their debt levels. Moreover, they all anticipate the time 1 federal government's optimal strategy. We look for a Nash equilibrium at time 0, that is, the time 0 government's strategy maximizes its utility given the equilibrium debt strategies of the states, and the states' debt strategies are optimal given the optimal government strategies at times 0 and 1. 19

The federal government's strategy at time 0, $(\Pi_0^*, G_0^i)$, must solve

$$\max_{(G_0, \Pi_0)} \sum_{i=1}^{n} \lambda^i [V(a^i G_0 + d^i) - T(\Pi_0)]$$

19 In general, we would also require the federal government's strategy at time 0 to be optimal given the time 1 equilibrium strategy. Nevertheless, we do not need to impose this additional constraint because the federal government's utility at time 0 does not depend on the states' utility at time 1.
\[ s.t. \quad \Pi_0 = G_0 - W. \] (24)

The FOC, which is also sufficient, is
\[ \sum_{i=1}^{n} \lambda^i [V'(a^iG_0 + d^i) a^i - T'(G_0 - W)] = 0. \] (25)

We can then write the time 0 optimal expenditure, \( G^*_0 \), as
\[ G^*_0 = G^*_0(W, \{d_i\}_{i=1}^{n}). \]

On the other hand, the optimal debt strategy of state \( i \), \( d^i \), solves
\[ \max_{d_i \geq 0} [V(a^iG_0 + d^i) - T(G_0 - W)] + [V(a^iG^*_1) - T(G^*_1 - (W - d_i - \sum_{j \neq i} d_j))]. \] (26)

The FOC for \( d^i \), in the case of an interior solution, is
\[ V'(a^iG_0 + d^i) - a^i V'(a^iG^*_1) G^*_1 - T'(G^*_1 - (W - \sum_{j=1}^{n} d^j))(1 - G^*_1) = 0. \] (27)

Equation (27) summarizes the trade-offs involved in the choice of debt. The first term captures the time 0 gains due to the increase in consumption that can be financed by an additional unit of debt. However, the increase in debt reduces net wealth in the next period, implying a decrease in expenditures and an increase in inflation at time 1. The second term in the FOC captures the reduction in utility due to the decrease in the second-period expenditure, while the last term captures the increase in inflation.

The following Proposition shows that the benefits from an increase in current consumption are strong enough to assure that the states will borrow a strictly positive debt level.

**Proposition 4** The debt strategies are strictly positive in any symmetric equilibrium in pure strategies.

**Proof:** See the appendix.
In short, the states borrow at time 0 beyond their financial capabilities.\textsuperscript{20} This reduces the net resources available to the federal government at time 1, because the latter is committed to rescue the failed state owned financial institutions. By Proposition (3), the decrease of resources forces the federal government to accept a higher level of inflation.

In the following proposition we show our main result: the economy is actually trapped in an efficient equilibrium, with a high inflation rate. The states would be better off if they could commit not to borrow at time 0, say, by privatizing their financial institutions. In such case, the Pareto efficient allocation would be obtained by Congress.

**Proposition 5** Suppose that the states own financial institutions, then in a symmetric subgame perfect equilibrium they will borrow at time 0 beyond their financial capabilities. Moreover, the subsequent bail out will lead the economy to an inefficiently high inflation level.

**Proof:** Proposition (4) proved that the states' debt level is strictly positive. Hence, the endowment of the federal government at time 1 is reduced by $\sum_{i=1}^{n} d^i > 0$. By Proposition (3), the second period inflation is higher than the level that would prevail in the absence of state owned financial institutions. Moreover, in Proposition (1) we showed that an efficient allocation does not transfer resources from one generation to another. Since borrowing at time 0 is equivalent to transferring resources from time 1 to time 0, we conclude that the increase in inflation is inefficient.

\[ \square \]

### 3 Evidence and Discussion

Our model suggests two main testable implications. First, countries that allow their political units to own financial institutions should face high inflation rates. Moreover, the portfolio of these financial institutions should be concentrated on loans to their main shareholders, that

\textsuperscript{20}Remember that the states transfer their resources to the federal government, therefore they cannot afford any debt.
is the states. This happens because the state governments use their financial institutions to increase current consumption with the hope of a future bail out.

In this section we argue that the recent cases of Brazil and Argentina support our predictions. Moreover, we also discuss some alternatives ways of solving the inflationary bias besides privatization.

3.1 The Case of Brazil

Brazil is an interesting case to test our predictions because it has recently moved from a very centralized government under military rule to a decentralized Federation. In this process, the average inflation rate jumped from 49.3% a year in the 10 year span before the revival of democratic elections in 1982 to 609.5% a year in the decade after 1982.21

Nowadays, Brazil is a Federation formed by 27 political units called states. As of February 1993, 25 out of 27 states owned at least one financial institution. Moreover, the only two states that did not own one have been recently granted the status of a state (Tocantins and Mato Grosso do Sul). Our model predicts that, following the democratic revival, the state owned banks should face poor economic results as a consequence of non-performing loans to their own states.

Indeed, the revival of democratic elections at state level was followed by a steady deterioration of the state owned financial institutions. Since 1982, the Brazilian Central Bank has supplied more than US$ 2.3 billion to the state banks in financial assistance (BACEN, 1993). As of March 1993, there were 87 state owned financial institutions, from which 60 (69%) have been under some kind of intervention from the Brazilian Central Bank due to financial problems.

The financial problems of the state owned financial institutions cannot be attributed to a crisis in the financial industry. On the contrary, the Brazilian private financial institutions have had a record of high profitability since 1982, in part due to the high inflation levels. Table 1 shows the net worth of private and state owned banks in June 1992 after adjusting

21Inflation measured by the GDP deflator.
for non-performing loans. The aggregate net worth of the state owned banks drops from US$ 2.9 billion to US$ -1.9 billion when we deduct the non-performing loans. This represents a likely loss of 165% of the state banks’ net worth. On the other hand, the net worth of the private banks drops from US$ 7.5 to US$ 6.7 billion after the adjustment for potential losses, that accounts for only 10.6% of their net worth.

Our model also predicts that most of the problems of the state owned financial institutions should originate from non performing loans to the states, which use them to finance their deficits. In fact, table 2 shows that, in June 1992, 72% of their loans were concentrated on state and local governments. On the other hand, only 1.4% of the loans of the private financial institutions benefited state and local governments.

In summary, the Brazilian experience fits our main predictions. Anticipating a future bail-out, the state-owned financial institutions end up financing their states' deficit beyond their financial capability. As a result, the country is trapped in an inefficient equilibrium with a large deficit, and a high inflation rate. Moreover, the participation of private financial institutions on the financing of the states' deficit is very small. This is consistent with our assertion that healthy private financial institutions would not be willing to lose equity value financing bankrupt states. Therefore, the inflationary bias is not likely to persist without state owned financial institutions.

The Brazilian case is also interesting to assess alternative solutions to the inflationary bias. In recent years the Brazilian Central Bank has been trying to introduce risk based insurance premiums. These contracts reduce a state's incentives to overspend because they charge upfront the expected costs of a bail out. However, the state owned financial institutions have been fiercely lobbying in the Congress against these attempts. Despite their poor economic performance, the state banks argue that they should not pay any premium because businesses run by a state are risk free. This resistance is not surprising, incumbent politicians are likely

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22These are loans that the Brazilian Central Bank does not expect to be paid.
24Of course, the Brazilian Central Bank does not agree with this rosy view. Nevertheless, the political interests represented by the state banks have been stronger so far.
to fight measures that penalize them in the short run, even if they increase efficiency in the long run. This is exactly the case of risk based insurance premiums.

A second and seemingly simpler solution is to forbid the state owned financial institutions to give loans to their own states. In fact, the Brazilian Central Bank already forbids banks to finance their own shareholders. Therefore, the state owned banks are openly breaching existing regulations. Since 1988, the Brazilian Central Bank has unsuccessfully demanded the state banks to eliminate all loans to their states at least twice. However, in both instances the state representatives argued in Congress against such “unjustified” intervention of a federal agency in the states’ affairs. The Central Bank did not carry through any of their threats, and the state owned banks kept the loans to their states.

Perhaps surprisingly, the inflationary bias may not be entirely solved even if the Central Bank can actually prevent the state banks from giving loans to their states. It turns out that the state banks can indirectly finance their states by giving loans to the states’ suppliers, which would then extend the credit to the state governments. This mechanism was extensively used in Brazil in the 1980’s to finance the construction of roads in states that had already reached the maximum debt level allowed by their own constitutions.25

In short, loopholes and political pressure from self-interested groups related to the state owned financial institutions suggest that privatization may be the safest way out of the inflationary bias.

3.2 The Case of Argentina

Argentina is a second example of a Federation where the political units (which are called provincias) own financial institutions. In the 1980’s these state owned banks have showed the same pattern of their Brazilian counterparts. Portfolios concentrated on non-performing loans to their own states, which used them to finance their deficits.26 Consistent with our model.

25 Nevertheless, this indirect financing imposes some risk on the suppliers because they must rely on an implicit agreement with the state bank, where the latter promises not to call the debt contract if the state government fails to pay the supplier.

Argentina has also faced huge inflation rates in the 1980's.

Nevertheless, in March 1990 Argentina implemented a stabilization plan were the Central Bank was forbidden to print money without an increase in the country's reserves of foreign currency. This plan gave the Central Bank the authority (or the political will) to stop financing the state's banks.

This case shows that a monetary authority can break the transfer of deficits to the federal government. Indeed, someone could point out that an independent Central Bank is the answer to our problem. We certainly agree that policy makers should seek institutional arrangements to assure such independence. However, we believe that our main point is still valid. The existence of state owned banks makes it more difficult for policy makers to balance the budget. To say the least, it requires a stronger effort to resist the political pressure exerted by self-interested groups aligned to failed state owned financial institutions.

4 Conclusion

The political units of a Federation democratically bargain in Congress for a share of the federal budget. In this paper, we showed that the existence of state owned financial institutions weakens the coordination value of a Congress. A state owned financial institution allows its state to transfer its deficits to the federal government without bargaining in Congress. In this case, the choice between inflation and expenditure moves from a coordinated game to a non-cooperative one.

Our paper delivers two main implications. The first one predicts that countries that allow their states to own financial institutions should have higher inflation levels. Moreover, these state owned financial institutions should underperform the market, mostly because of non-performing loans to their own states. The recent inflationary experiences of Brazil and Argentina are consistent with our predictions.

We also argued that private financial institutions are not likely to sustain the inflationary bias because, contrary to politicians, shareholders internalize an equity loss. In this sense,
state owned financial institutions are unique. Neither the main controllers nor their depositors fear bankruptcy when they finance their own state.

Our model also delivers a policy implication for economic blocks such as Mercosur or the European Community. Suppose that a block decides to establish a Monetary Authority to provide financial help to the members whenever it is necessary. In this case, the block should not allow Regional Central Banks. Otherwise, the latter might end up acting as state owned financial institutions, financing consumption at the cost of an inefficiently high inflation rate.
References


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Appendix

Proof of Proposition 1

$S^* = 0$: One can easily check that we can relax the non-negativity constraints on $G^i$ because of our assumptions on $V$ and $T$. Therefore, we can rewrite the social planner's program as

$$\max_{\{G_0, G_1, S\}} \sum_{i=1}^{n} [V(G_0) - T(\sum_{i=1}^{n} G_0 - W + S)] + \sum_{i=1}^{n} [V(G_1) - T(\sum_{i=1}^{n} G_1 - W - S)].$$

The FOCs for any $G_i^i$ and $G_i^j$ with $i \neq j$ are $V'(G_i^i) - nT'(\sum_{i=1}^{n} G_i^i - W + S) = 0$ and $V'(G_i^j) - nT'(\sum_{i=1}^{n} G_i^j - W + S) = 0$, respectively. These two equations imply that $V'(G_i^i) = V'(G_i^j)$. Strict concavity of $V$ then implies that $G_i^i = G_i^j$ for any $i$. The social planner's program then becomes

$$\max_{\{G_0, G_1, S\}} \sum_{i=1}^{n} [V(G_0) - T(nG_0 - W + S)] + [V(G_1) - T(nG_1 - W - S)]$$

(28)

The FOCs for $G_0$, $G_1$, and $S$ are

$$G_0: V'(G_0) - nT'(nG_0 - W + S) = 0,$$

(29)

$$G_1: V'(G_1) - nT'(nG_1 - W - S) = 0,$$

(30)

$$S: -T'(nG_0 - W + S) + T'(nG_1 - W - S) = 0.$$  

(31)

From equation (31) and strict convexity of $T$ we obtain

$$nG_0 + S = nG_1 - S.$$  

(32)

Replacing equation (32) in equation (29) gives us $V'(G_0) = nT'(nG_1 - W - S)$. Replacing this last equation in the FOC for $G_1$ and using strict concavity of $V$ we get $G_0 = G_1$. Finally, replacing this equality in equation (32) we obtain $nG_0 + S = nG_0 - S \Rightarrow S = 0$, as we wanted to prove.

Efficiency of Program (3): In a symmetric equilibrium: $a^i = \lambda^i = \frac{1}{n}$. In this case, we can re-write Program 3 as

$$\max_{\{G_0, G_1\}} [V(G_0) - T(G_0 - W)] + [V(G_1) - T(G_1 - W)].$$

22
Note that any solution, \((G_0^*, G_1^*)\), of the above program gives us the total expenditure of the federal government at times 0 and 1. The corresponding expenditures of each state in a symmetric economy are \((\frac{G_0^*}{n}, \frac{G_1^*}{n})\). To prove that the latter solves Program (28) when \(S = 0\), suppose not. Then there is an efficient solution \((\tilde{G}_0, \tilde{G}_1, S^* = 0)\) such that \([V(\tilde{G}_0) - T(n\tilde{G}_0 - W)] + [V(\tilde{G}_1) - T(n\tilde{G}_1 - W)] > [V(\frac{G_0^*}{n}) - T(n\frac{G_0^*}{n} - W)] + [V(\frac{G_1^*}{n}) - T(n\frac{G_1^*}{n} - W)]\). But then \((n\tilde{G}_0, n\tilde{G}_1)\) would be a strictly better choice than \((G_0^*, G_1^*)\) for Program (3). Contradiction.

\[\square\]

**Proof of Proposition 2**

Consider the optimization problem of the federal government at time 0 (program (23)) after replacing the constraint in the objective function:

\[\max_{G_0} \sum_{i=1}^{n} \lambda^i [V(a^iG_0 + d^i) - T(G_0 - W)]\]

The first order condition (FOC) which is also sufficient is

\[\sum_{i=1}^{n} \lambda^i [V'(a^iG_0 + d^i)a^i - T'(G_0 - W)] = 0.\]

Recall that \(T'(0) = 0\) and \(V'(G) > 0\), then if we evaluate the FOC at \(G_0 = W\) we obtain

\[\sum_{i=1}^{n} \lambda^i [V'(a^iW + d^i)a^i - T'(0)] = \sum_{i=1}^{n} \lambda^i [V'(a^iW + d^i)a^i] > 0.\]

From concavity of \(V\) and convexity of \(T\), it follows that the FOC is also positive for any \(G_0 < W\). Therefore, \(G_0^* > W\). To prove that \(\frac{aG_0^*(W)}{dW} \equiv G_0^*(W) > 0\) use the implicit function theorem on the FOC to obtain

\[G_0^*(W) = -\frac{\sum_{i=1}^{n} \lambda^i T''(G_0^* - W)}{\sum_{i=1}^{n} \lambda^i [V''(a^iG_0^*)(a^i)^2 - T''(G_0^* - W)]} > 0,\]

where the positive sign comes from \(T'' > 0\) when \(G_0^* > W\), and \(V'' < 0\).

\[\square\]

**Proof of Proposition 4**

We show that the FOC (equation (27)) is strictly positive if \(d_i = 0\) for any \(i\). To see this, set \(a^i = \frac{1}{n}\) and \(d_i = 0\) for all \(i\) in the left hand side of equation (27): \(V'(\frac{1}{n}G_0^*(W)) = \)
\[ \frac{1}{n} V'(\frac{1}{n} G_1^*(W)) G_1^*(W) - T'(G_1^*(W) - W)[1 - G_1^*(W)] \Rightarrow V'(\frac{1}{n} G_0(W)) - G_1^*(W)\left[ \frac{1}{n} V'(\frac{1}{n} G_1(W)) - T'(G_1^*(W) - W) \right] - T'(G_1^*(W) - W). \]

However, the term in brackets in the previous equation vanishes. To see this take the FOC for \( G_1^* \) (equation (22)) when \( a^i = \frac{1}{n} \) and \( \sum_{i=1}^{n} d^i = 0 \):

\[ \sum_{i=1}^{n} \lambda^i [V'(\frac{1}{n} G_1^*)] \frac{1}{n} - T'(G_i^* - W)] = 0 \Rightarrow \left[ V'(\frac{1}{n} G_1^*) \frac{1}{n} - T'(G_1^* - W) \right] \sum_{i=1}^{n} \lambda^i = 0 \Rightarrow \]

\[ V'(\frac{1}{n} G_1^*) \frac{1}{n} - T'(G_1^* - W) = 0. \] (33)

Therefore, the FOC for \( d^i = 0 \) reduces to \( V'(\frac{1}{n} G_0^*(W)) - T'(G_1^*(W) - W) \). However, one can easily check by looking at the FOCs of \( G_1^* \) and \( G_0^* \) that \( G_1^*(W) = G_0^*(W) \) when \( \sum_{i=1}^{n} d^i = 0 \).

Using this last observation and equation (33) we obtain \( V'(\frac{1}{n} G_0(W)) - T'(G_1^*(W) - W) = (\frac{n-1}{n}) V'(\frac{1}{n} G_1(W)) > 0 \), for any \( n > 1 \).

\[ \square \]
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Net worth of state and private banks consolidates, respectively, the net worth of all state and private banks in Brazil.

Adjusted net worth deducts from the net worth loans that the Brazilian Central Bank classifies as potential losses.

*Source:* Brazilian Central Bank, BACEN (1993)
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Source: Brazilian Central Bank, BACEN (1993)
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