

Debt Bailouts and Constitutions

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No 862

**WARWICK ECONOMIC RESEARCH PAPERS**

**DEPARTMENT OF ECONOMICS**

THE UNIVERSITY OF  
**WARWICK**

# Debt Bailouts and Constitutions

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## Abstract

A demand based theory of sub-national debt bailouts is presented. It is shown that revenue sharing (RS) arrangements alter the demand for bailouts among politicians with regional constituencies as a bailout usually implies a shift of taxation to the federal tier. Automatic RS may lead to the formation of pro-bailout coalitions formed by indebted states and states that are net recipients of the RS arrangement. Also, RS can act as a commitment device for compensating payments among state representatives, making a bailout politically rational. The model shows that the state debt bailouts approved by the Brazilian Senate prior to the enactment of the Fiscal Responsibility Act were fully consistent with politicians that maximize the proceeds accruing to their constituencies.

*Keywords:* bailout; commitment; Constitutions; debt; federalism; revenue sharing; soft budget constraints

*JEL code:* H70

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<sup>‡</sup>I am grateful for very useful comments and suggestions from two anonymous referees and seminar or conference participants in Cartagena, Puebla, Rome, Stockholm and Trondheim. Financial support from an ESRC grant under the World Economy and Finance Programme is gratefully acknowledged.

# 1 Introduction

A number of countries have undergone several rounds of bailouts of subnational government debts in the last decade. The Brazilian government, for instance, assumed the debts of the federated states in 1989, 1993 and 1997. Also in its southern neighbor, Argentina, the line that separates provincial and federal budgets has become blurred a number of times. Seven provinces were granted a debt bailout between 1992 and 1994 and the central government took over deficit-ridden public pension funds of 11 provinces between 1994 and 1996. Bailout operations also occurred in 1995 and 2001. Such operations are not always explicit however, and, in some instances, hyperinflation may have been the ultimate bailout that eroded debt stocks.<sup>1 2</sup> While bailouts of subnational entities could be efficient ex post, the above mentioned recurrence of episodes could undermine efforts of the center to achieve fiscal discipline.

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<sup>1</sup>An indication in this direction is the fact that the total deficit of Mexican states has exceeded the sum of increases in indebtedness and changes in liquid assets for each and every year since 1989 (Giugale et al.(2001)).

<sup>2</sup>Bailouts are not restricted to the developing world. Section 105 of the Australian Constitution explicitly gives the Parliament the prerogative to assume state debts. State liabilities were in fact centralized in 1927, when the Loan Council was established (Courchene (1999)). In Germany, the Länder of Saarland and Bremen had a bailout commanded by the Constitutional Court in 1992. Seitz (1999) argues that the Länder were *too small to fail*, in the sense that their political support was cheap given their political over representation.

In an attempt to strengthen the credibility of budget separations between the different tiers of government, several countries have changed the institutional setting for subnational borrowing in the last years. After the financial meltdown at the end of 2001, Argentina's Congress approved a law containing a commitment to the creation of a federal fiscal body and coordination mechanisms for provincial indebtedness.<sup>3</sup> Brazil and Mexico have enacted legislation containing explicit no bailout provisions.<sup>4</sup>

This paper explores the interrelation between bailouts of subnational governments and Constitutional tax revenue sharing arrangements (henceforth RS). It argues that RS mechanisms, that have typically been engraved into Constitutions, might change incentives for demand driven bailouts and possibly widen political support for bailout to units that have little to gain from the direct transfer of debt. A subnational debt bailout implies that, unless the federal government has the flexibility and willingness to cut back on its expenditures to *fully* absorb the cost, taxation is shifted from the state to the national level. When the Constitution mandates that a fraction of federal revenues be automatically distributed to the states, federal revenues must be increased by more than the stock of debts shifted to the Union. These excess revenues accrue to member states according to the formula set in the Con-

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<sup>3</sup>Article 7 of Ley 25.570, enacted on May 3rd, 2002.

<sup>4</sup>Brazil's *Lei de Responsabilidade Fiscal*, enacted in 2000, precluded any further credit operation between units of the federation. State banks were also privatized or had their credit relations with subnational governments curtailed. Brazilian states are now required to submit new bond issuances to the sequential approval of the Ministry of Finance and the Senate. *Golden rule* limits of indebtedness for states and municipalities were defined.

stitution acting as side payments conditioned on a bailout being approved. As transfers are a direct function of federal revenues, states with low debts - that would naturally oppose a shift of the repayment burden of subnational sovereign debt to the central government - might not do so, as this shift ultimately increases their source of income. Hence, in the presence of federal RS, a debt/GDP distribution that is skewed to the right is no longer a *sine qua non* condition for a bailout to be supported by a majority of states. The reason a bailout occurs then is not driven by an externality arising from financial market interdependencies (as in Inman(2003)), but from the fact that the failure to bailout indebted states generates a negative externality on states that are net recipients of the revenue-sharing arrangement. Politicians of remote states that have constituencies which rely heavily on transfers of a pre-determined share of federal revenues will probably not oppose measures that increase 'the size of the pot'. Therefore policies and institutional arrangements aimed at reducing regional income disparities should be carefully designed so as to not soften perceived budget constraints.

The implications of the model go well beyond Latin American federations. Rodden(2003a) gives an account of the failed attempt of a group of US states to shift its debts to the central government in the early 1840s. He concludes that *..., one of the best explanations for the defeat of the assumption movement may simply be in the numbers-the majority of states did not have large debts, and outside of Maryland and Pennsylvania, most of the*

*debtor states had small populations.* With no constitutional RS mechanism, the interested parties may have found themselves unable to set up the sizable compensations to less indebted states that would have been needed to make the proposal politically feasible (see Wibbels(2003) for a detailed discussion of the episode). The issue should also be of interest to European policymakers seeking to setup an institutional arrangement that makes the no-bailout provision in the Constitution of the European Central Bank time-consistent.

*Relation to the literature*

This study relates to a growing body of literature that links fiscal institutions to fiscal performance. An interesting set of studies can be found in the Poterba and von Hagen(1999) volume. However, the formal treatments have chosen to treat the bailout issue as being separate from tax RS arrangements. This is hardly surprising given that in most OECD countries the rules for national RS are sufficiently complex by themselves. I shall refer to each strand of the literature in turn.

The literature on soft budget constraints has developed drawing heavily on experiences of (formerly) centrally planned economies. A comprehensive survey of this literature can be found in Kornai et al.(2003). Within this strand, Qian and Roland(1998) studied the problem of bailouts in a federation with three types of agents: entrepreneurs, local governments and the central government. Their model highlights the role of fiscal competition among subnational governments in hardening budget constraints for

entrepreneurs. An accommodating central government controlling monetary policy may react to the strategic underprovision of public goods by local governments with money creation and distribution of seigniorage. In their model, however, a bailout is extended by the central government even if  $n - 1$  federation units would lose from it, i.e., the political incentives for providing a bailout are not considered.

Another strand of the literature has analyzed interregional transfers in federations. Boadway and Flatters(1982) provide a discussion of the equity and efficiency aspects of a tax equalization system. Although in many countries the primary motivation for RS seems to be based on equity considerations, most of the literature highlights its potential for efficiency gains via risk sharing (Persson and Tabellini(1996a), Bucovetsky(1998), Aronsson and Wikström(2003) among others). However, as Persson and Tabellini(1996b) point out, risk-sharing may not be perfectly separable from redistributive aspects if fiscal instruments are limited. Also Dixit and Londegran(1998) have looked at redistributive aspects at play within a federation.

The aim of this study is to explore the intersection of these two strands. Specifically, we look at the bailout problem in an economy with federal tax RS, finding that the mechanism affects the outcome in important ways. The effects of federal RS on borrowing are analysed in the absence of a credible no-bailout commitment and on the credibility of such a pledge itself. The credibility is endogenously conditioned by the demand for such action among

federation units. An application of the theory to the institutional setup of the Brazilian federation is shown. It is shown that the revenue-sharing mechanism engraved in the 1988 Constitution was a sufficient condition for the successive approvals of generalized debt bailouts in the Federal Senate.

### *Outline*

Section 2 presents a model where even benevolent politicians with subnational constituencies may decide to transfer state debts to the federal level by a simple majority vote. The effects of this expectation on borrowing are analyzed. Furthermore, the conditions for a pro-default vote for each state are nailed down, highlighting the effect of the RS mechanism. Section 3 provides a brief overview of the federal tax RS arrangement in Brazil and a brief account of the negotiations leading to the comprehensive Brazilian bailout of state debts in 1997. Section 4 shows that the model can explain the approval of the bailout operations by the Brazilian Senate in 1989, 1993 and 1997 in spite of the fact that the vast majority of states would be net losers if one looked only at the direct transfers of debt that were involved in the first and the latter case. Section 5 shows that the predictions are robust to a number of changes in specification and discusses where alternative explanations are unsatisfactory. The paper closes with a brief discussion of the implications and directions for further research.



## 2 A Model with Bailout Risk

### 2.1 The Model

The purpose of this section is to provide an analytical model in which political actors with state level constituencies have a decisive role in the provision of a bailout. Specifically, it is assumed that the decision to extend a bailout is taken by a simple majority vote by state governors. This may be seen as an approximation of agreements reached within the informal forum of a governor meeting or a Senate, where each state/province has the same number of representatives. As Senators and Governors have the same political constituency their interests are likely to overlap to a great extent. In the case of Brazil, to which I will refer in the empirical section, any decision involving state debts has to be approved by the Federal Senate.

Consider a two-period economy in which a federal government, henceforth called the Union, and  $n$  states coexist. The utility function of the governor (or, alternatively, the representative citizen) is assumed to be (weakly) concave in consumption.

The governor of province  $i$  thus maximizes the welfare function  $u(c_1^i) + \beta Eu(c_2^i)$ , where  $c_t^i$  represents the consumption of state  $i$  at time  $t$  and  $\beta$  the rate at which future utility is weighted. In each period, state  $i$  receives a state specific endowment  $y_t^i$ , which is taken from an ergodic distribution represented by  $F[\underline{y}, \bar{y}]$ . In period 1, states may issue  $b_2^i$  one period non-contingent

bonds that are promises to repay 1 unit in period 2 in a competitive credit market at a price  $q$  (which is just the inverse of the gross market interest rate). The number of bonds issued is such that it does not exceed the lowest endowment  $\underline{y}$ . Bonds are redeemed with the proceeds accruing from a proportional taxation on the endowment in period 2. Taxation might be either federal (in which case the rate is represented by  $\tau$ ) or state specific ( $\tau^i$ ). It is important to stress that it is not important in the model whether proceeds from debt issuance are transferred to the population of the state or not. There is no debt at the beginning of period 1.

Assume that a share  $\mu$  of national revenues are pooled in a tax sharing fund. State  $i$  has a claim on a fixed share, denoted  $\sigma^i$ , of the fund, where  $\sum_{i=1}^n \sigma^i = 1$ . In period 2, states may have a window of opportunity to shift their liabilities to the federal level as long as it is approved by a binding simple majority referendum among state governors. The occurrence or not of this window of opportunity is determined by exogenous factors. All that is known in period 1 is that it occurs with probability  $\pi$ . Hence, a perfectly credible *ex ante* no bailout commitment is represented by the particular case where  $\pi = 0$ .

The timing within a period is as follows

- nature determines the realization of endowments for each state;
- (in period 2 only) a binding referendum to decide whether state debts will be shifted to the Union or not occurs with probability  $\pi$ ;

- endowments are taxed and outstanding debt and transfers are paid out;
- (in period 1 only) bonds are issued;
- consumption takes place.

## 2.2 (Soft) Budget Constraints

Let the binary variable  $z$  be an indicator of whether there is a bailout in period 2. The Union's expenditures are given by the possible repayment of bonds taken over from states and transfers to states that are a direct function of federal revenues. Its revenues accrue from the levy of a uniform tax rate  $\tau_2$  on output. Hence its budget constraint in period 2 will be given by

$$z \left( \sum_{i=1}^n b_2^i + \sum_{j=1}^n \sigma^j \mu \tau_2 \sum_{i=1}^n y_2^i \right) = z \tau_2 \sum_{i=1}^n y_2^i$$

If there is no bailout forthcoming in period 2 the left hand side is zero and the Union has no reason to tax, hence the federal tax rate will be zero. Also, if a bailout is forthcoming the RS fund implies that the Union can only use a fraction  $(1 - \mu)$  of the tax proceeds to honor its debts.<sup>5</sup>

By its turn, in period 2 state  $i$  will collect state specific taxes over its endowment at the rate  $\tau_2^i$  if and only if debts are not transferred to the federal level. Thus, its budget constraint is  $(1 - z) b_2^i = (1 - z) \tau_2^i y_2^i$ . Note that  $\mu$  does not appear in the subnational budget constraints as RS does not apply for state specific taxes. In period 2 individuals pay state and federal

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<sup>5</sup>To see this note that the above expression can be rewritten as  $z \sum_{i=1}^n b_2^i = z (1 - \mu) \tau_2 \sum_{i=1}^n y_2^i$ .

taxes on their incomes and receive transfers. Hence, their consumption in period 2 will be given by  $c_2^i = (1 - z\tau_2 - (1 - z)\tau_2^i) y_2^i + \sigma^i \mu \tau_2 \sum_{i=1}^n y_2^i$ . Since the economy is starting with no debts, there are no taxes in the first period. This is to say that consumption in period 1 is given by  $c_1^i = y_1^i + qb_2^i$ , where  $q$  represents the price at which bonds were sold.

### 2.3 The Optimal Borrowing Strategy

Let  $\lambda$  denote the prior probability of a bailout happening in period 2 (that will itself be a function of  $\pi$ ).  $\lambda$  is taken as parametric since one governor alone cannot affect the outcome. In period 1, a state governor solves

$$\max_{b_2^i} u(y_1^i + qb_2^i) + (1 - \lambda) \beta E u[(1 - \tau_2^i) y_2^i] + \lambda \beta E u \left[ (1 - \tau_2) y_2^i + \sigma^i \mu \tau_2 \sum_{i=1}^n y_2^i \right]$$

, knowing that taxes are determined by the local and national budget constraints. To derive predictions on period 1 state borrowing, we need to specify the utility function. One possibility is to use the quadratic utility function  $u(c_t) = c_t - \frac{\gamma}{2} c_t^2$  where  $0 \leq \gamma < \frac{1}{c_t}$  so that the utility function is (weakly) concave in the relevant range. Note that only the results of this subsection hinge on this specific functional form.

Under risk neutrality ( $\gamma = 0$ ) we have

$$\text{sgn} \left[ \frac{\partial U_i}{\partial b_i} \right] = \text{sgn} \left[ 1 - E \left[ \frac{y_2^i}{\sum_{i=1}^n y_2^i} \right] - \mu (1 - \sigma^i) + \frac{(1 - \mu)(q - \beta)}{\beta \lambda} \right]$$

If there are no risk premia  $q$  equals  $\beta$  so that the last term is eliminated. In the absence of RS (i.e. when  $\mu = 0$ ) the derivative is necessarily positive as the

first term in the expression on the right hand side is less than 1 and all *risk-neutral* states will borrow up to their credit ceiling. This is the manifestation of the well known common-pool problem, as the window of opportunity for bailouts diminishes the effective cost of borrowing. RS could revert the sign of the derivative for large states, reducing their optimal level of borrowing. For this to be the case  $\mu$  has to be sufficiently high and the participation rate of the state in the RS fund,  $\sigma^i$ , is small. Under this conditions the costs of borrowing for state  $i$  are raised as a bailout would impose the extra burden of side payments to states that are beneficiaries of the RS fund.

What predictions can be derived in the more realistic case when state governors are risk averse? Substituting the quadratic utility function in the first order condition and assuming that  $y_2$  is i.i.d., so that  $E \sum_{i=1}^n y_2^i = nEy$ , we find that the optimal amount of borrowing in period 1 is given by an expression that includes the degree of risk-aversion.<sup>6</sup> In the particular case where an ex ante no bailout commitment is perceived as credible ( $\lambda = 0$ ) and  $q = \beta$ , the amount of borrowing reduces to

$$b_2^i = (1 + \beta)^{-1} [Ey - y_1^i]$$

In other words, the amount borrowed will be a function of the steepness of

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$$b_2^i = \frac{C - qy_1^i + \beta\lambda \left(\frac{\frac{1}{\mu} - \sigma^i \mu}{1 - \mu}\right)^2 E \sum_{j \neq i} b_2^j}{q^2 + \beta - \beta\lambda \left(1 - \left(\frac{\frac{1}{\mu} - \sigma^i \mu}{1 - \mu}\right)^2\right)} \quad (1)$$

, where  $C$  is the constant  $C = \frac{q}{\gamma} - \beta \left(\frac{1}{\gamma} - Ey\right) \left(1 - \lambda \left(1 - \frac{\frac{1}{\mu} - \sigma^i \mu}{1 - \mu}\right)\right)$ . The degree of risk aversion clearly affects the amount that is borrowed.

the expected income profile and the patience of the state. States expecting a high growth rate and impatient states borrow more.<sup>7</sup> Moreover, when the no-bailout commitment is perceived as credible, RS has no effect on state borrowing.

If the promise not to bailout is not credible however ( $\lambda > 0$ ), the situation changes: from the optimal borrowing expression we can conclude that state borrowing will be affected by the participation of the state in the RS mechanism ( $\sigma^i$ ). Also note that in contrast to the risk neutral case, state borrowing now also depends on expected aggregate borrowing. The expectation of a bailout in period 2 generates two effects: a common-pool problem that puts upward pressure on the amount borrowed and a contention effect that comes from the fact that states anticipate that they might have to bear the burden of other states in case of a bailout.

## 2.4 To Bailout or Not to Bailout

In the previous subsection we took the prior probability of a bailout ( $\lambda$ ) as parametric. We now endogeneize it. Note that here we do not need to specify the utility function. Rational state governors in period 1 know that in period 2 each benevolent governor will prefer  $z$  such that  $(1 - z\tau_2 - (1 - z)\tau_2^i)y_2^i + z\sigma^i\mu\tau_2\sum_{i=1}^n y_2^i$  is maximized. After plugging in the budget constraints for the two levels of government we find that the optimal strategy will be to

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<sup>7</sup>Note that if the condition  $q = \beta$  is relaxed, borrowing will also be a function of the relative risk aversion in the case where  $\lambda = 0$ .

favor a bailout if and only if the condition below is expected to be satisfied:

$$\frac{b_2^i}{y_2^i} > \frac{1 - \mu R^i \sum_{i=1}^n b_2^i}{1 - \mu \sum_{i=1}^n y_2^i} \quad (2)$$

where  $R^i$  denotes the state-specific *representation ratio*  $R^i = \frac{\sigma^i}{y_2^i / \sum_{i=1}^n y_2^i}$ . According to this expression, demand for a bailout comes from states with a relatively high *indebtness* and a high *participation rate in the distribution of federal revenues relative to their share in expected income*. Once  $\mu$  has been set (written in the Constitution) and overall subnational indebtness is known, the above expression says that these two state specific statistics are sufficient to define the optimal vote of a state. Note that states with a representation ratio exceeding  $1/\mu$  would support debt bailouts even if they had no debt!

It is easy to see that, in the absence of RS, expression (2) reduces to

$$\frac{b_2^i}{y_2^i} > \frac{\sum_{i=1}^n b_2^i}{\sum_{i=1}^n y_2^i}$$

, so that a governor votes for a bailout if and only if the relative indebtness of his state is above average. In other words, without RS, a bailout would only occur if borrowing states are in majority and the debt/GDP distribution is skewed to the right (i.e., the median is to the right of the mean). Furthermore, from (2) one sees that a governors' demand for a bailout increases if there is RS ( $\mu > 0$ ) and his share in it exceeds his participation in expected income.

It is noteworthy that there are two aspects making bailout uncertain, so that small states are not automatically led to borrow up to their credit

ceiling in period 1. First, there is the risk of there being no window of opportunity to shift debts to the federal tier in period 2. This possibility could for instance be a function of the varying political clout of a central government that has an interest in avoiding bailouts. Second, even if the window of opportunity does occur in period 2, there is the possibility that the expected distribution of the tax base is such that a bailout proposal would be rejected by a simple majority vote. Hence, it is straightforward that the endogenous prior probability of a bailout,  $\lambda$ , will be given by the product of the probability of a referendum occurring,  $\pi$ , by the probability that condition (2) will be expected to be satisfied in more than half of the  $n$  states. As  $b_2^i$  and  $\sigma^i$  are already given at the beginning of period 2, the occurrence of a bailout will critically depend on the expected distribution of income (the tax base) in period 2. The following sections discuss the applicability of this stylized model to the case of the Brazilian federation.

### **3 Taking the Model to the Data: Revenue Sharing and Debt Bailouts in the Brazilian Federation**

Since RS is the central piece of the paper, a few lines on its implementation should be worthwhile. After having set up a federal RS mechanism in its 1967 Constitution, the Brazilian federation re-assured transfers mainly to its



poorer regions by writing the rules of the transfers of federal revenues to the states in its 1988 Constitution. 44% of the revenues of the income and the industrial product tax go to a fund where 85% are earmarked for states and municipalities of the relatively poorer North, Northeast and Midwestern regions. Within each group, the share of each state is defined by a formula based on per capita GDP, population and area. Tax revenues in Brazil exceed 38% of GDP and state governments respond for 54% of public consumption.

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Following the enactment of the 1988 Constitution, local governments found themselves spending increasing shares of their budget on wage and pension bills. The majority of states soon found themselves in financial straits. They knocked on the same door as they had in the previous situations of financial distress in 1989 and 1993. Initially the central government responded by extending a credit line to the financially distressed states through one of its financial institutions. This proved to be a short term solution though. In April 1996, 25 state governors, with heterogeneous agendas, went to Brasília to request the renegotiation of their debts. The initial response of the central government to a general bailout was negative. Eventually the central government did engage in talks with the most indebted states and several Senators and Governors of poorer states voiced their demand for a generalization of

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<sup>8</sup>Wage bills of public servants are the largest component of state budgets. The approval of Leviathanic constitutions by democratically elected legislatures could easily be rationalized within the framework of a principal-agent model in which the agent obtains disproportionate benefits from a large budget.

the bailout. Pressure grew six months later when Governors met, this time in São Paulo, and threatened to bypass the Ministry of Finance and take the issue directly to the Senate, where they expected to obtain more concessionary terms. The central government eventually gave in, throwing its weight on long term fiscal adjustment, the compliance with golden rules and reining in the activities of state banks. This set the stage for a major institutional overhaul that culminated with the enactment of the *Lei de Responsabilidade Fiscal* in 2000.

Agreement protocols were signed by the states and the Ministry of Finance throughout 1997. However, the Brazilian Constitution mandates that the Federal Senate shall "*establish total limits and conditions for the entire amount of the debt of the states, the Federal District and the municipalities*" (Article 52, §IX). In fact, Governors had been eager to remind the federal government of the Senate's jurisdiction over the issue at a very early stage. Therefore, the agreements required the Senate's approval as well as the approval of state legislatures to be sanctioned. The protocols typically established that the Union would swap the state's obligations for a 30 year loan made to the state by the National Treasury at a subsidized rate. Assets to be privatized by states were given as guarantees. Bevilaqua(2000) computes that the 1989, 1993 and 1997 bailout operations amounted to respectively 10.5, 39.4 and 89.3 bn Reais at December 1998 values (1 US\$ = 1.23 R\$). Under the agreement protocols states would also commit to comply with fis-

cal targets that would later be incorporated in the *Lei de Responsabilidade Fiscal*. The state of São Paulo held 59% of the debt to be renegotiated and was therefore widely perceived as the pivotal case.

After six months going back and forth between the Senate's floor and its *Comissão de Assuntos Econômicos*, the agreement allowing the state of São Paulo to renegotiate its debt with the Union was approved in November 1997 by acclamation, setting the precedent for other states that would follow. Two Senators however recorded their dissent from the bill in the Federal Senate.

## 4 Politically Rational Bailouts

Due to space limits I shall constrain myself to discussing the data of the 1997 bailout. It is important to note, however, that the same state-specific statistics that are used to analyze this case would also have predicted the approval of the two previous generalized bailouts in 1989 and 1993 (Table 1). Furthermore, the episodes of 1989 and 1997 would not have been approved by Senators, had they not taken the effects of bailouts that are channeled through the RS mechanism into account.

The accumulation of debts leading to the 1997 bailout was not driven by market forces: a Constitutional Amendment that had been approved in 1993 restricted new borrowing. The amendment prohibited the issuance of new state bonds until 1999, with the major exception of bonds issued to pay judicial claims. Other limitations on new debts were also introduced by the

Central Bank in 1993 and 1994 (for a detailed account see Bevilaqua(2000)). As the debt levels were being driven by exogenous factors as the high interest rates and the ruling of courts, and the amount of borrowing hinges on the unobservable degree of risk aversion of governors - the analysis will focus on the decision to extend a bailout taking debt stocks as given. Figure 1 shows that in the case of Argentina, where such borrowing restrictions were not in place, there is indeed a significant positive relation between the participation of provinces in the RS fund and the amount of borrowing.

The key expression is the bailout vote condition given by equation (2). In other words, once we have the overall state indebtedness as a fraction of the aggregate tax base and the share of federal taxes that goes to the RS fund,  $\mu$ , the optimal voting strategy for a representative maximizing the welfare of state  $i$  will be completely determined by the debt to tax base ratio of the state and its *expected* share in the RS fund relative to its share in the national tax base. The latter is referred to as the *representation ratio*.

To analyze the 1997 bailout only state debts that were effectively renegotiated are considered. They represented over 90% of outstanding state debts at the time and were equivalent to 10.3% of GDP. To estimate  $\mu$  I considered that in 1996, 18.8 billion Reais were pooled in the participation fund of states and municipalities. Federal revenues in the same year reached 91.7 billion Reais net of contributions to social security and FGTS, a state managed severance payment fund whose contributions are linked to wages. Based on

this, the approximate share of federal taxes that were pooled into the RS fund was 20.49%. While this share is well below the 56.66% in the case of the Argentine federation, it is larger than for instance Canada's equalization system that involves only 6% of the federal budget.<sup>9</sup>

Figure 2 gives a scatter plot of proxies for the two state specific statistics mentioned above. The largest states of the federation were also the most indebted ones. In the model,  $y$  is meant to capture taxable rather than total income. The states' contribution to federal revenues in 1996 is used to obtain the *representation ratio* (which is projected on the horizontal axis). States with a ratio below 1 are under represented in the fund while states with a ratio above unity are over represented (i.e. are net beneficiaries of the RS mechanism).

Taking the cross sectional picture in 1996, we are implicitly making the assumption that state politicians did not expect a major regional reshuffle of the tax base relative to the prevailing situation at the time. The contribution shares to federal revenues increased for only five states: the Federal District (64.1%), Roraima (16%), Paraná (9.3%), Rio de Janeiro (5.7%) and Amapá (4.5%). It turns out that the changes in the period following the bailout were insufficient to change the picture presented in Figures 2.

The horizontal dotted lines in Figure 2 represent the average renegotiated

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<sup>9</sup>The interested reader is referred to Saiegh and Tommasi (1998), that provide an account of the gradual increase of the fraction of federal revenues that automatically accrue to provinces according to the fixed shares written in the *Ley de Coparticipaciones*.

debt/state GDP in the respective federations.<sup>10</sup> In the absence of RS, states below the dotted line would lose from a generalized bailout. As a bailout required the approval of politicians with subnational constituencies, a general bailout would have seemed extremely unlikely in 1997, as it would only have been supported by three states. RS brings a new dimension into the analysis. Using the estimates of  $\mu$  and overall state indebtedness we obtain the diagonal indifference line of Figure 2. Only states within the triangle formed by the intercepts of this line and the origin are predicted to oppose a generalized bailout. Instead of 24 out of 27 states opposing a bailout, as would have been the prediction in the absence of RS, there are only 7 states that are net losers from a bailout. These 7 states together held only 25.9% of the seats in Senate, 27.9% of the seats in the Lower Chamber and 26.5% of the total population. The theoretical prediction then is that the bill should easily pass in the Federal Senate. Table 1 shows that this was also the case in the generalized bailouts of 1989 and 1993.

Judging from statements of Senators, there seems to be an understanding that there is little to gain in the chamber from casting a dissenting vote in measures that favour other states of the federation when the outcome is clear.<sup>11</sup> Nevertheless, two Senators did express their negative votes during

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<sup>10</sup>Note that it is not important if the debt is immediately redeemed by the federal government. Any subsidy proportional to the renegotiated amount implies nothing more than a rescaling of the vertical axis. Such rescaling does not affect the political support for a bailout. To be more accurate the expected evolution of the representation ratios (that are primarily driven by the state specific expected growth rates) should be considered, with horizons given by the expected repayment stream of the federal debt.

<sup>11</sup>Following another vote related to the debt of Sao Paulo, a Senator of Santa Catarina

the session that led to the approval of the precedent-setting debt agreement with São Paulo state when it reached the voting floor of the Brazilian Federal Senate in November 1997. They represented the state of Parana and the Federal District. The theory presented predicts that these were exactly the two most likely states to oppose a bailout at the time: they are identified by the crosses in Figure 2. These are the states furthest away from the indifference line, i.e., those whose support for a bailout would be most expensive to buy through compensating deals. States with such a locus are the least likely to take part in a *pro-bailout coalition* as they do not benefit from a bailout in either dimension: neither via debt relief nor via increased income through constitutionally mandated transfers. The likelihood of two randomly selected Senators belonging to the two most bailout adverse states is just 0.46%. These states were also among the few that saw their contribution to federal revenues increase in the period 1997-2001.

The consideration of the RS arrangement gave correct predictions. Moreover these are fully consistent with the idea that rational politicians vote individually in the best interest of their constituencies (which includes themselves) in all three bailout episodes. In the next section alternative explanations are discussed.

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commented: *I did not oppose it so that people won't say I am against governor Mario Covas [of Sao Paulo].*

## 5 Alternative Explanations and Sensitivity

### 5.1 Was São Paulo "too big to fail"?

Some authors have argued that the state of São Paulo may have been too large to fail. Models like Wildasin(1997) provide a theoretical underpinning for such argument. This prediction is not unambiguous however. The model of Sanguinetti and Tommasi(2004) for instance implies the contrary.<sup>12</sup> Furthermore it is often the case that small federation units are politically overrepresented.<sup>13</sup> To address this concern, consider the alternative hypothesis that it was common knowledge that a share of the debt of São Paulo - of which part was owed to its arguably beleaguered state bank Banespa - would have to be assumed by the federal government either way. Table 2 shows the proportion of the 27 states that would have been predicted by the theory to oppose the 1997 bailout if we considered that all Senators took it for granted that  $x\%$  of São Paulo's debt would have to be assumed by the federal government. By taking the RS mechanism into consideration, the opposition to a bailout decreases from between 21-24 to 6-7 states. Hence, even if the state of São Paulo was widely perceived as being *too large to fail*, we would still not have a plausible explanation for the approval of the general bailout by the Senate.

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<sup>12</sup>Wildasin's model focuses on positive externalities produced by local public goods. Sanguinetti and Tommasi emphasize that smaller units internalize a smaller fraction of the cost, thus being more prone to overspending and bailouts.

<sup>13</sup>Seitz(1999) argues that, in Germany, two *Laender* were *too small to fail* in 1992.



## 5.2 Partisan Considerations and Interest Groups

Another possible explanation for the observed pattern could in principle come from the partisanship of elected governors. National parties may internalize cross-state spillover effects. Therefore, party discipline may have important consequences in the discussion of wide ranging bailouts. However, it appears unlikely that the partisan alignment was decisive in the case of Brazil. The striking feature of the political process in Brazil is the lack of party loyalty (see Rodden(2003b)). A recent event illustrates this: in September 2003, a recommendation of the leadership of the main opposition party to oppose a tax bill being proposed by the incoming government was largely ignored. 24 Senators voted yes and 26 no. Commenting on the outcome, the president of the party explained that *...representatives responded to the appeals of state governors*, while a governor of the same party added that *It is natural that there is no unanimity. There are many regional aspects at play.*<sup>14</sup> In the case of the 1997 bailout mentioned earlier, the dissenting votes were cast by representatives of opposing parties: one of the party of the federal government (PSDB) and one of the main opposition party at the time (PT).

Still another possibility is that shifting state liabilities to the federal sphere would bring benefits to bondholders. This would create incentives for lobbying activities upon state representatives as analyzed in Grossman and Helpman(2000). Such explanation however does not seem to apply to the

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<sup>14</sup>Folha de Sao Paulo, Sept 2003.

case highlighted in the preceding sections. First, if a bailout were the result of lobbying activities, the cost minimizing strategy for lobbyists would be to ensure a minimum winning coalition containing just 41 of the 81 Senators. This was clearly not the case. Moreover, as the bailout carries considerable cost for some states (direct debt transfers alone exceeded 10% of Brazil's GDP), incentives to expose such lobbying activities would be very strong. Second, the point of this paper is that such lobbying activities or compensation payments would be redundant.

### **5.3 Revenue Sharing Avoidance**

Another objection might come from the fact that not all federal revenues are shared with states. This creates an incentive for the federal government to tilt taxation towards non-shared taxes (which, arguably, are more distortive). Indeed, members of the Constitutional Assembly had already thought of this possibility and included an article that establishes that 20% of revenues of any federal tax that was not previewed in the Constitution at the time of enactment would be directed to the RS fund. This figure lies quite close to the estimated value of  $\mu$  (20.49%). The analysis presented was performed under the assumption that states expected the central government to resort to non-shared taxes in the future in the same proportion as it did at the time. A sensitivity analysis reveals that the predicted support for a bailout would still have assured a comfortable winning margin for bailout supporters even

if  $\mu$  were expected to be halved. A bailout would only be rejected if  $\mu$  were expected to fall below 7.8%. This was certainly not the case. Finally, the formal specification assumed that increased federal debt service expenditures have to be met by an increase in taxation. This assumption was made due to downward rigidities in federal government expenditures, as the bulk of federal tax revenues are earmarked for specific uses. Figure 3 shows that this was in fact the case: contrary to the revenues of subnational governments, federal revenues as a share of GDP did increase markedly between 96 and 99.

## 6 Concluding Remarks

There is more than simple debt transfer in a bailout when a RS mechanism is in place. A federal RS mechanism might in principle scale back the amount borrowed by states, since they anticipate costly transfers to other states in case of a bailout. However, the political support for a bailout may increase in the presence of RS, since the mechanism provides side payments to those that would otherwise be the natural opponents of a bailout.

The paper provided evidence that this highly stylized model is consistent with the observations in the Brazilian Federation. In particular, it rationalizes the approval of the state debt bailouts by the Brazilian Senate with Senators individually maximizing the proceeds accruing to their political constituencies. It could also explain the historical slackness of the Brazil-

ian Senate borrowing authorizations without the necessity of vote trading. Moreover, the mechanism is not plagued by the typical enforcement problems involved in vote trading. Indeed, the Constitution can be interpreted as being the commitment device for side payments that are conditioned on a bailout being approved.

By having a national constituency, the central government internalizes the externalities induced by the expectation of a bailout. In principle, it could try to induce states to more cooperative borrowing behavior. Arguably, this has been done with the enactment of the *Lei de Responsabilidade Fiscal* in Brazil or the Stability and Growth Pact in the European Monetary Union. To make no-bailout commitments time-consistent, controlling the level of indebtedness of federation units is not the only policy instrument however. As suggested in Section 3, the distribution of state debt to the expected tax base ratios and the ratio of the participation in RS to the share in taxable income statistics could in principle be instrumental in curtailing political support for a bailout. Specifically, one would like to have as many states as possible within the boundaries of the "no bailout triangles".

An obvious way of eliminating the effects of the side payments conditioned on bailout is to make them unconditional by extending the coverage of RS so as to include local tax revenues. It is important to note, however, that some form of side payments conditioned on bailouts will always be present if local and federal taxes are not shared at exactly the same rate (and do not apply

to the same tax base).

The model of this paper is highly stylized and abstracted from a number of considerations focusing on redistributive aspects and emphasizing the demand side for a bailout. The principles are general, however, and the conditions derived are easily adaptable to evaluate the political support for a bailout in any country with RS. The decision structure can be adapted to country specific institutions. Local authorities might be weighted by the size of their electorate (if bailout decisions are taken by politicians with national constituencies) or the number of seats in the parliament.

A number of extensions could be possible. One that might be worth considering is the case where the central government has its own incentives to supply a bailout. Such extension would introduce strategic behavior and moral hazard type considerations into the setting. Another line that might be pursued would be to introduce a principal-agent problem. Shifting debt to the federal level leads to an increase in overall taxation due to RS. If state politicians obtain disproportional benefits from larger budgets, a bailout may be a way of achieving over taxation relative to the preferred tax rate of voters.

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**Table 1**

		% Participation FPE & FPM 1996 (A)	% Constitutional Transfers in State Disposable Revenues	% Contribution to Federal Revenues		Representation ratio (A)/(B)	Amount Renegotiated 1997 (% of State GDP)
				1996 (B)	1997-2001		
Acre	AC	2.00	86.1	0.06	0.05	34.70	0.00
Alagoas	AL	3.26	54.4	0.33	0.24	9.86	0.00
Amazonas	AM	2.04	22.0	1.25	1.09	1.63	1.17
Amapá	AP	1.91	86.3	0.06	0.06	33.03	0.00
Bahia	BA	9.03	29.9	2.25	2.12	4.01	2.77
Ceará	CE	6.48	40.9	1.22	0.99	5.29	0.84
Distrito Federal	DF	0.61	6.0	5.21	8.55	0.12	0.00
Espírito Santo	ES	1.65	10.6	2.27	1.80	0.72	3.28
Goiás	GO	3.30	18.4	1.04	0.97	3.17	7.57
Maranhão	MA	5.61	65.0	0.40	0.30	13.96	2.89
Minas Gerais	MG	8.68	8.4	6.86	5.50	1.26	15.95
Mato Grosso do Sul	MS	1.46	18.8	0.36	0.28	4.12	9.78
Mato Grosso	MT	2.12	22.0	0.43	0.38	4.88	9.65
Pará	PA	4.87	46.2	0.68	0.55	7.13	1.56
Paraíba	PB	4.02	53.4	0.45	0.37	8.90	4.43
Pernambuco	PE	6.03	33.0	1.57	1.36	3.84	0.92
Piauí	PI	3.43	62.3	0.31	0.22	11.08	6.23
Paraná	PR	4.82	10.1	4.14	4.53	1.16	1.19
Rio de Janeiro	RJ	2.38	3.1	14.55	15.39	0.16	9.81
Rio Grande do Norte	RN	3.29	51.1	0.39	0.32	8.49	0.73
Rondônia	RO	1.82	40.1	0.18	0.17	9.94	2.48
Roraima	RR	1.39	84.9	0.04	0.05	33.65	0.63
Rio Grande do Sul	RS	4.55	6.0	5.51	4.99	0.82	17.77
Santa Catarina	SC	2.56	6.6	2.38	1.98	1.07	6.54
Sergipe	SE	2.72	57.7	0.28	0.25	9.60	6.22
São Paulo	SP	7.03	0.5	47.69	47.43	0.15	18.75
Tocantins	TO	2.97	77.9	0.06	0.06	47.58	0.00

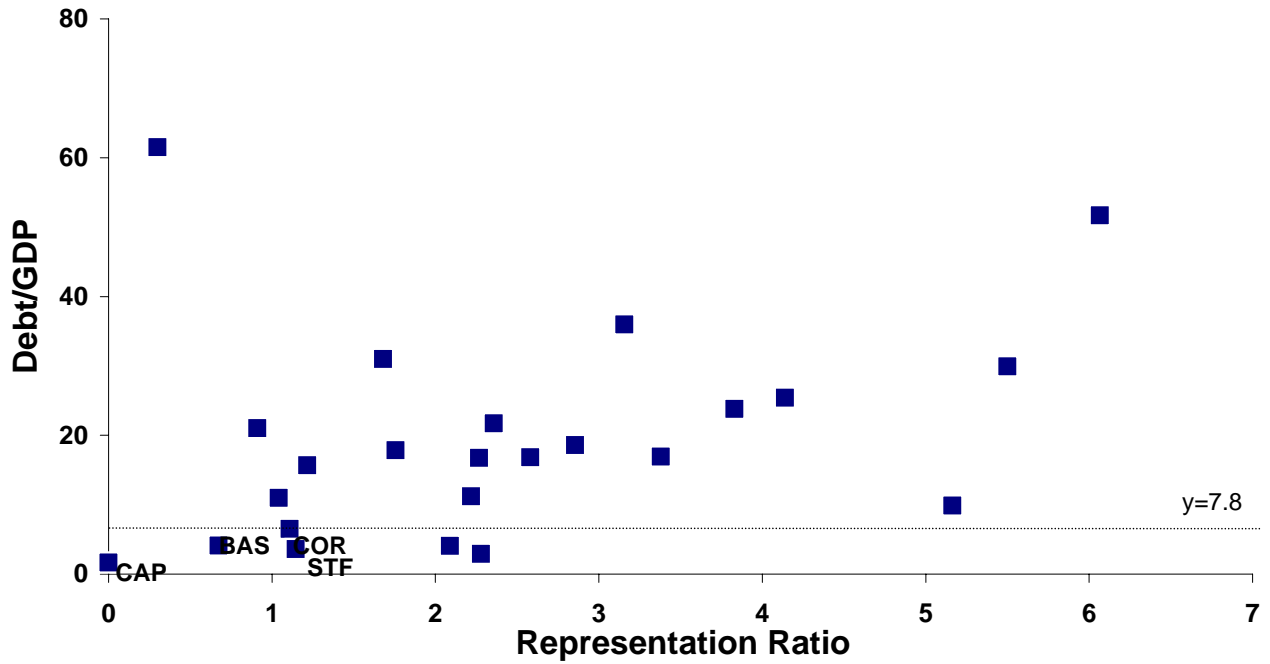
Sources: IBGE, Secretaria do Tesouro Nacional, Secretaria de Receita Federal and Bevilaqua (2000).

Federal revenues collected by Secretaria de Receita Federal in 1996 amounted to R\$ 91.7 billion (excludes Social Security and FGTS).

R\$ 18.8 billion were redistributed through FPE and FPM.

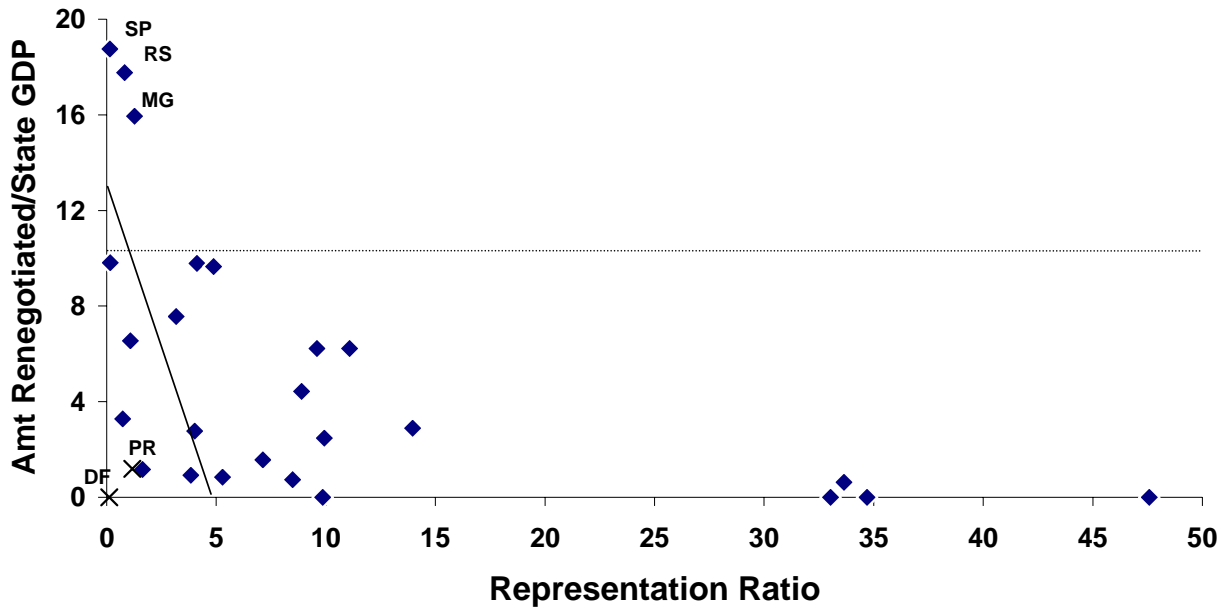


Figure 1. Argentina 2000



Data source: MEcon. Debt/GDP estimates are for 2000. (CAP, BAS, COR and STF hold 51% of seats in Congress.)

Figure 2. Brazil: The 1997 Bailout



**Table 2 - Predicted proportion of states opposing a bailout (%)**

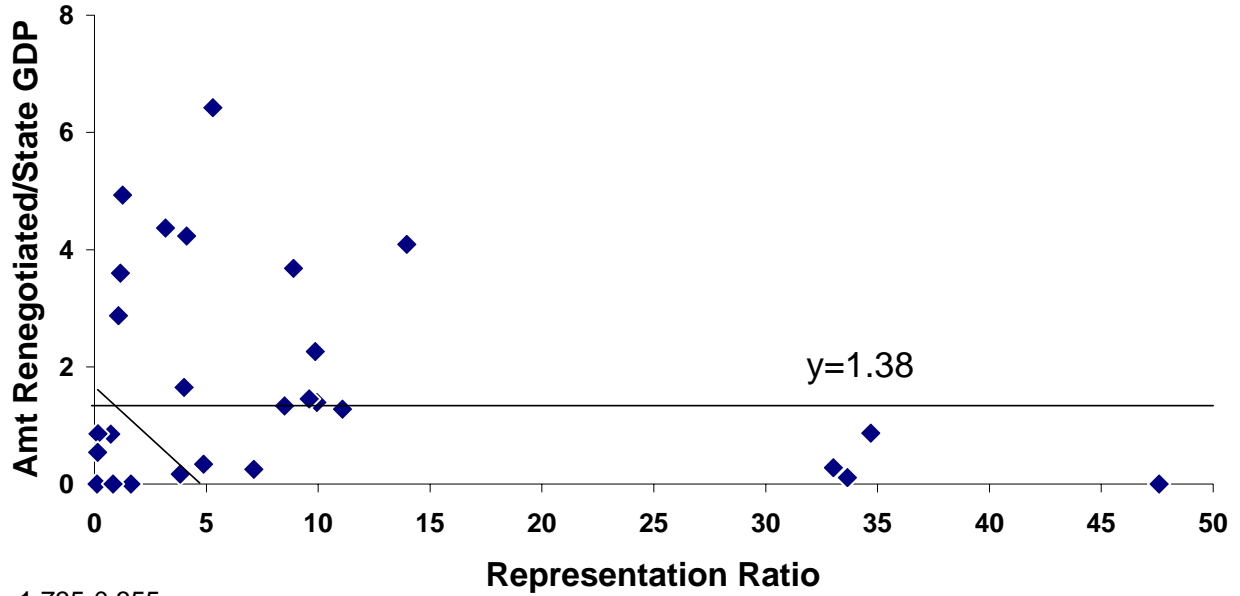
	without RS	with RS
1989	blocked by 51.9%	25.9
1993	37.0	18.5
1997	blocked by 88.9%	25.9

**Table 3 - Predicted proportion of states opposing a bailout (%)**

x	without RS	with RS
0	blocked by 88.9%	25.9
25	blocked by 88.9%	25.9
50	blocked by 77.8%	22.2
75	blocked by 77.8%	22.2

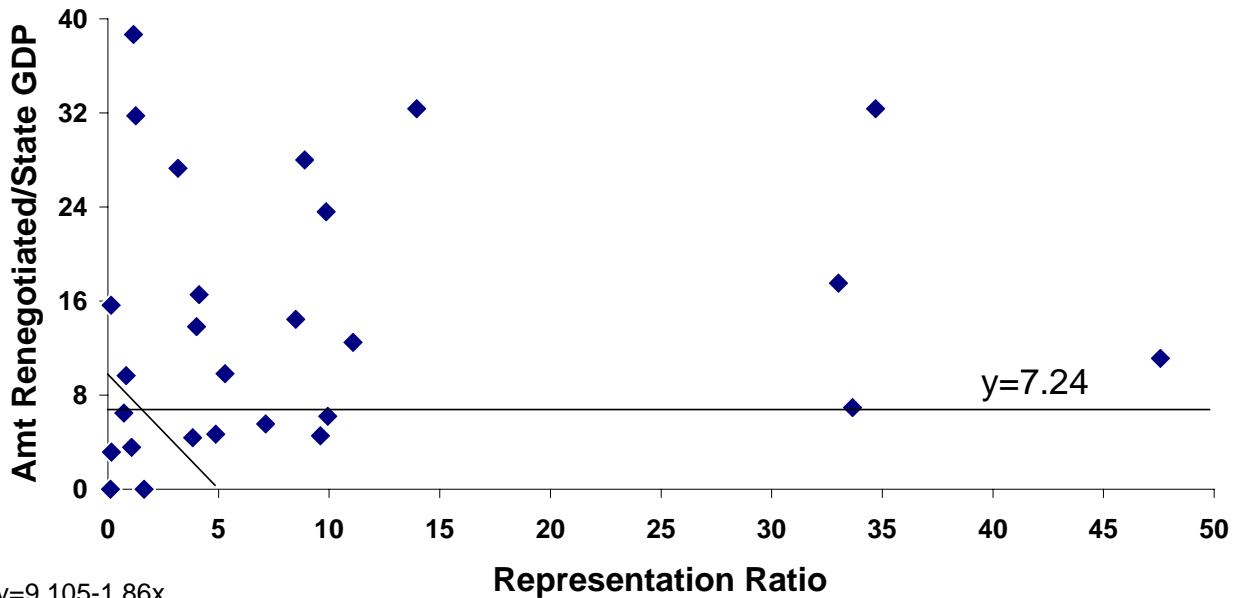


### Appendix A. Brazil: The 1989 Bailout



$y=1.735-0.355x$

### Appendix B. Brazil: The 1993 Bailout



$y=9.105-1.86x$