

Leader Reputation and Default in Sovereign Debt

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# Leader Reputation and Default in Sovereign Debt\*

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## **Abstract**

This paper compares default incentives in competitive sovereign debt markets when leaders can be either democratically elected or dictators. When leaders can be replaced as in democracies, the incentives for repayment are mainly the ego rents from office and the possibility of getting a corrupt leader from replacement. In a dictatorship, on the other hand, the cost of not repaying loans is the permanent loss of reputation and the loss of future access to credit. There is a trade off between repayment and risk sharing. We show, counter-intuitively, that when ego rents are low, and value of reputation to dictators is high, then democracies repay more often and have lower risk premia than dictatorships.

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# 1 Introduction

The question of whether reputational concerns are sufficient to sustain repayment incentives for sovereign borrowers is a long standing one. Eaton and Gersovitz (1981), Bulow and Rogoff (1989), Cole and Kehoe (1992) were seminal papers on the debate of whether reputational incentives were sufficient to prevent strategic default in the absence of an external enforcement mechanism. The Main conclusion from this literature was that either incomplete information was needed to build reputation to prevent default or lenders have limited commitment and limited ability to offer deposit contracts (Kletzer and Wright, 2000). A basic assumption of the reputational models is that there is one leader who is essentially "the country" and reputation always attaches to the country and incentives to repay come from the need to have access to lending in the future. However, if lenders willing to lend even after default if leader is replaced, then the efficacy of the reputational mechanism is in question once again. What happens when leaders can be replaced? Are democracies and autocracies different in their incentives to default? Does it matter? Our paper addresses this issue.

There is much evidence to suggest that indeed lenders care about the leader than the country and so do rating agencies, e.g the following quotes taken from the Economist illustrate this:

*"The prospect of a Lula victory has terrified the financial markets. Brazils currency, the real, has fallen sharply against the American dollar and the risk premium on Brazilian government bonds –the amount by which rates exceed those on American Treasury bonds–has soared."*

*"Mr da Silva insists that once his victory is assured the financial crisis will subside: that would require the risk premium on government bonds to drop back, and the real to stabilise, or appreciate. That may happen, but it seems highly unlikely. Like many left-wing leaders, who tend to be regarded*

*with suspicion by the markets, Mr da Silva is likely to have to work hard to establish his credibility.*” – “Running out of Time,”

The Economist, October 3, 2002.

”When assessing a country’s willingness and ability to service its debt, rating agencies will generally take into consideration a country’s political risk and economic risk. Political risk assessment evaluates a country’s underlying political and social stability, which impacts the central government’s willingness to meet its debt obligations. The main criteria used include the characteristics of a political system, executive leadership, government institutions, social coalitions, social indicators, and external relations.” (Pukthuanthong-Lea, Elayan and Rose, Global Finance, 2007)

A recent and emerging empirical literature recognizes the fact that there may be a link between political turnover and default incentives e.g Brewer and Rivoli (1990)) show that perception of creditworthiness is negatively correlated with the frequency of regime change. Bordo and Oosterlink (2005) analyze the gold standard period (1880-1913) for 29 countries and study whether defaults are linked to political turnover. They find that average (over 33 years) political instability in defaulting countries is not much higher than non defaulting countries. Saiegh (2004), (2005) studies 43 countries from 1971-1997, but concludes that being a democracy is insufficient to predict default. He compares countries which have multi-party coalitional governments with single party governments and finds that the former have lower default rates. His theory is that multi party coalitions prevent redistributive transfers from asset holders to tax payers (assuming that if international debt is repudiated then at some point it induces a transfer among the domestic agents). McGillivray and Smith (2003) (henceforth MS) compare democracies and autocracies for default risk and fluctuations in bond prices. They find higher fluctuations in non democracies. The Political Science literature (e.g. Shultz and Weingast (2003)) suggests that democrats can commit themselves more easily: democracies get larger loans at lower rates of interest than

autocracies: this is because of better accountability. Other theoretical papers (Amador (2003), MS (2003)) come out in favour of democracies. So: overall conclusion in theory comes out in favour of democracies: higher turnover associated theoretically with lower default, lower risk premia, lower volatility. Empirically on the other hand, results on turnover and default seems to be mixed.

In this paper, we build on MS (2005), who focus on the accountability in democracies that comes from turnover. Our main question is: Given a competitive credit market where reputation attaches to leaders, types of leaders are unknown to creditors, and state contingent contracts are impossible due to moral hazard, what is the most efficient feasible contract in democracies vs autocracies? Our results highlight the moral hazard problem that arises in democracies due to leader replacement: we show in contrast to previous results that democracy is not always good for repayment relative to dictators. However this is good: democracies are able to implement more efficient contracts: they are able to shift risk between periods. Secondly, in contrast to MS (2005) we show that increasing incentives to stay in office (higher ego rents) may not imply lower default but rather higher default if contracts have to be feasible and incentive compatible. Third, autocracies repay because of the value of reputation rather than ego rents.

Our results depend on comparisons between autocracies and democracies are more nuanced and depend on parameters: this is in keeping with the mixed empirical results. Our results may also explain the relatively loose empirical connection between default and output shocks as pointed out recently by Wright and Tomz (2004). Our paper speaks to the debate on whether to forgive defaults when economic conditions are hard: we show democracies have an in built mechanism to do this which dictatorships do not.

## 2 The Model

The Model is the simplest one that captures the differential incentives (between democracies and autocracies) to build a reputation for repaying debt to ensure future access to credit in the presence of moral hazard. We assume that state contingent contracts are not possible because of the moral hazard problem. Without moral hazard the optimal contract would allow the debtor to repay nothing in the first period when there are bad shocks and just increase the premium in the second period. However, when there are foreign creditors the government has an incentive not to repay even in good states – good type only cares about own citizens. We also assume in the first part of the paper that no re-negotiation is allowed, so either the borrower gives full payment or not at all. So, the difference between democracies and autocracies is captured in the differential probabilities of repayment when there is a bad shock. The inefficiency comes from the repayment in bad times.

### 2.1 Democracy

There is one borrower country with a set of identical citizens normalized to size one. The leader of the country is a politician who is chosen from among the citizens. With high probability, the politician is a “good” type whose interests are aligned with the representative agent in the economy, but who also get Ego rents  $E$  from being in office. With a small probability  $\varepsilon > 0$ , the politician is a “bad” type who never repays any loan.<sup>1</sup> The types are indistinguishable before coming to office. The existence of “bad” types makes reputation building possible: by repaying, the politician proves that

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<sup>1</sup>One possible justification of bad leaders is to assume that they use government revenue for targeted benefits to their core supporters, who are assumed to be poor and against repayment of debt in every period. Hence the difference between good and bad types is essentially that one is interested in the representative agent while the other is interested only in core supporters.

he is not the bad type. However, the reputation building is more effective in a dictatorship where the leader is long run than in a democracy with (potentially) short-run leaders.

There are two periods. In each period, the leader has access to an investment project. The size of the period  $t$  project is denoted  $q_t$ . We normalize so that the dollar cost of a project equals its size. A project of size  $q_t$  generates income  $(1 + \rho)q_t$  for the representative citizen. For now we assume the size  $q_t$  is exogenously fixed. Thus, in period  $t$ , the leader either implements a project of fixed size  $q_t$ , or implements no project.

At the beginning of period 1, the representative citizen receives an endowment  $w_1$ . To simplify the calculations, assume  $w_1 = 0$  so that the citizen has no loanable funds, and the first period project must be financed completely by a loan of  $q_1$  dollars from foreign lenders. (Nothing changes if  $w_1 > 0$ , as long as  $w_1 < q_1$  there is still need to borrow from abroad). The interest rate is  $r_1$ , so that the government debt including interest is  $(1 + r_1)q_1$ . After the project is implemented, there is a stochastic shock  $\lambda \in [0, 1]$  which impacts the shadow value of money for the government. In state  $\lambda$ , a dollar tax revenue to the government costs the representative citizen  $1 + \lambda$  dollars. Higher values of  $\lambda$  are interpreted as worse shocks to the economy. The shock is unobserved by foreigners but is observed by the representative citizen of the borrower country. After observing  $\lambda$ , the incumbent leader decides whether to either (a) raise  $(1 + r_1)q_1$  dollar tax revenue, at a cost  $(1 + \lambda)(1 + r_1)q_1$  to the representative citizen, and repay the loan; or (b) default and repay nothing.

At the end of period 1, elections are held and the leader either stays on or is replaced by a politician drawn from the pool.

At the beginning of period 2, the representative citizen receives an endowment  $w_2$ . Again to simplify, we assume  $w_2 \geq q_2$  so that it is feasible to finance the second-period project by borrowing from the representative citizen. The interest rate is  $r_2$ , so that the government debt including interest is  $(1 + r_2)q_2$ .

We will assume for simplicity that there are no shocks in period 2, and the cost of raising a dollar tax revenue in period 2 is one (equivalently,  $\lambda = 0$ ). Because all the bonds in the second period are held by the representative agent there is no commitment problem in period 2: the “good” government is willing to repay in period 2. We look for equilibria with thresholds: if

the shock is sufficiently bad then the good type does not repay.  $F(\hat{\lambda})$  is the probability that the good type repays. Citizens can observe  $\lambda$  hence they know that if  $\lambda \leq \hat{\lambda}$  the good type always repays (and is re-elected), while bad type never repays and is replaced.

The beliefs are given by a separating equilibrium when  $\lambda \leq \hat{\lambda}$  and a pooling equilibrium when  $\lambda > \hat{\lambda}$ .

We now look for the conditions under which such a Perfect Bayesian Equilibrium exists with a threshold  $\hat{\lambda}$  such that the good type repays if  $\lambda \leq \hat{\lambda}$  and defaults if  $\lambda > \hat{\lambda}$ . The bad type always defaults by definition. To give the good leader an incentive to repay, if the incumbent defaults in the first period, he is replaced in the elections at the end of period 1<sup>2</sup>.

It is efficient for the country to repay when  $\lambda$  is small, and to default when  $\lambda$  is high (risk sharing). Indeed, the smaller is  $\hat{\lambda}$ , the more efficient is the risk-sharing since the country is repaying only in states where it is very cheap to do so. On the other hand, if  $\hat{\lambda}$  is too small, then the country cannot borrow money in period 1, because it defaults too often.

Formally, the following has to be true in equilibrium. First, the foreign lenders expect zero profit in period 1. The lenders lend  $q_1$  in period one

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<sup>2</sup>The good leader may care about what happens in the future: with a small probability  $\epsilon$  he will be replaced by the bad type, and in this case it depends on our assumptions on what happens: if the bad type is a populist who defaults and pays only his core supporters then the net transfer is zero. Moreover the risk premium in the next period is higher because there may be a bad leader but on average the repayment in the second period is always  $q_2$  so this does not matter. If the bad type causes a net loss then this may give an extra incentive to repay for the good type.



and the leader repays when he is good and  $\lambda \leq \hat{\lambda}$ , i.e., with probability  $(1 - \varepsilon)F(\hat{\lambda})$ . Assuming no discounting of future income, the interest rate  $r_1$  must satisfy

$$(1 - \varepsilon)F(\hat{\lambda})(1 + r_1)q_1 - q_1 = 0$$

The higher is  $\hat{\lambda}$ , the more likely it is that the country repays, so the risk premium is lower. Therefore,  $r_1$  is decreasing in  $\hat{\lambda}$ .

$$1 + r_1 = \frac{1}{(1 - \varepsilon)F(\hat{\lambda})} \quad (1)$$

For example suppose  $\lambda$  is uniformly distributed on  $[0, 1]$ , so  $F(\lambda) = \lambda$ . Using the uniform distribution, we can solve for the interest rate as a function of  $\hat{\lambda}$ :

$$1 + r_1 = \frac{1}{(1 - \varepsilon)\hat{\lambda}} \quad (2)$$

Secondly, the representative agent's first-period income must be big enough that the government can raise enough taxes to repay the loan. The government needs to raise  $(1 + r_1)q_1$  dollars, which in the state  $\lambda$  costs the representative citizen  $(1 + \lambda)(1 + r_1)q_1$  for all  $\lambda \leq \hat{\lambda}$ . Since the citizen's first period income is  $(1 + \rho)q_1$ , the constraint is

$$(1 + \hat{\lambda})(1 + r_1)q_1 \leq (1 + \rho)q_1$$

which using (1) is equivalent to

$$\frac{F(\hat{\lambda})}{1 + \hat{\lambda}} \geq \frac{1}{(1 - \varepsilon)(1 + \rho)} \quad (3)$$

This constraint must hold, or else there is no lending in period one.

**Assumption 1.**  $f(\lambda) > \frac{F(\lambda)}{1 + \lambda}$ ,  $F(0) = 0$ .

Observe that  $\frac{F(\hat{\lambda})}{1 + \hat{\lambda}}$  is increasing in  $\hat{\lambda}$  given Assumption 1. Hence, the left hand side can be at most  $\frac{1}{2}$ , so feasibility requires  $\rho > 1$  (we assume  $\varepsilon$  is very small).

Third, the good leader must be willing to repay whenever  $\lambda \leq \hat{\lambda}$ . If he repays the first period loan, he stays in office, and (since he internalizes the representative agent's payoff) his payoff is

$$(1 + \rho)q_1 - (1 + \lambda)(1 + r_1)q_1 + E + (1 + \rho)q_2 - (1 + r_2)q_2 \quad (4)$$

Since the state is observed by citizens, whenever  $\lambda \leq \hat{\lambda}$  there is a separating equilibrium since the good type always repays and the bad type never does. Hence given repayment, the probability that the incumbent is a good type is 1. Hence  $r_2 = 0$ . So the payoff (4) can be re-written as:

$$(1 + \rho)q_1 - (1 + \lambda)(1 + r_1)q_1 + E + \rho q_2 \quad (5)$$

If he defaults, he must leave office and is replaced and the new leader gets a loan at the rate of interest  $1 + r_2 = \frac{1}{1-\varepsilon}$ . Therefore, he is willing to repay if

$$(1 + \rho)q_1 - (1 + \lambda)(1 + r_1)q_1 + E + \rho q_2 \geq (1 + \rho)q_1 + (1 + \rho)q_2 - (1 - \varepsilon)(1 + r_2)q_2 \quad (6)$$

It is sufficient that equation (6) is satisfied for  $\lambda = \hat{\lambda}$ . Notice that foreign creditors do not observe the state so, in the rate of interest in period 1 is given by 1. Plugging this into the equation 6 above we get:

$$-(1 + \hat{\lambda}) \left( \frac{1}{(1 - \varepsilon)F(\hat{\lambda})} \right) q_1 + E \geq 0 \quad (7)$$

This constraint must hold, or else the good leader will not repay as he should in period one, and hence he cannot get any loans. Again, since the left hand side is at most  $1/2$ , feasibility requires  $E > 2q_1$ .

For the uniform distribution this inequality is obtained as:

$$\frac{\hat{\lambda}}{1 + \hat{\lambda}} \geq \frac{q_1}{(1 - \varepsilon)(E)} \quad (8)$$

Hence both  $\rho > 1$  and  $E > 2q_1$  must hold, or there is no equilibrium with positive lending:

If the right hand side of (8) is smaller than the right hand side of (3), i.e. if

$$E \geq (1 + \rho)q_1$$

then (3) is the binding constraint. The ego rents are large enough that the good leader's IC constraint is not binding. The best option from the point of view of risk sharing is to set  $\hat{\lambda}$  so (3) holds with equality. For the uniform distribution this is equivalent to the following:

$$\hat{\lambda} = \frac{1}{(1 - \varepsilon)(1 + \rho) - 1} \quad (9)$$

which is less than 1 as long as  $\varepsilon$  is small and Assumption 1 holds. The interest rate satisfies, from (2) and (9),

$$r_1 = \rho - \frac{1}{1 - \varepsilon}$$

This is, in effect, the highest interest rate the representative citizen can afford to pay. He only pays it in “good” states where  $\lambda \leq \hat{\lambda}$ . If  $\lambda > \hat{\lambda}$  the leader defaults.

We summarize this result.

**Proposition 1** *Suppose  $E \geq (1 + \rho)q_1$ ,  $\rho > 1$ ,  $E > 2q_1$  and  $F(\lambda)$  satisfies Assumption 1. There exists a unique  $\hat{\lambda} \in (0, 1)$  such that in the most efficient equilibrium for the democracy, the good type repays whenever  $\lambda \leq \hat{\lambda}$  and defaults otherwise. The interest rate is  $r_1 = \frac{\rho - \hat{\lambda}}{1 + \hat{\lambda}}$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

**Proof.** Observe that the RHS of equation (9) is strictly positive, and for  $\varepsilon$  sufficiently small, it is strictly less than 1 (recall that  $\rho > 1$ ).

By Assumption 1, the function  $g(\lambda) = \frac{F(\lambda)}{1 + \lambda}$  is increasing in  $\lambda$ ,  $F(0) = 0$  and  $F(1) = 1$  since  $\lambda \in [0, 1]$ . Hence the RHS and LHS have a unique intersection at  $\hat{\lambda}$ . ■

We can provide a closed form solution for the uniform distribution:

**Proposition 2** *Suppose  $E \geq (1 + \rho)q_1$ , If  $\rho > 1$ ,  $E > 2q_1$  and  $\lambda$  is distributed uniformly over  $[0, 1]$ . In the most efficient equilibrium for the democracy, the good type repays whenever  $\lambda \leq \frac{1}{(1-\varepsilon)(1+\rho)-1}$ . The interest rate is  $r_1 = \rho - \frac{1}{1-\varepsilon}$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

Suppose now that ego rents are low,  $E < (1 + \rho)q_1$ . In this case, (8) is the binding constraint. It is then optimal for equation (8) to hold with equality:

$$\frac{F(\hat{\lambda})}{1 + \hat{\lambda}} = \frac{q_1}{(1 - \varepsilon)E} \quad (10)$$

We summarize:

**Proposition 3** *Suppose  $E < (1 + \rho)q_1$ ,  $\rho > 1$ ,  $E > 2q_1$  and  $F(\lambda)$  satisfies Assumption 1. In the most efficient equilibrium for the democracy, there exists a unique  $\hat{\lambda} \in (0, 1)$ , such that the good type repays whenever  $\lambda \leq \hat{\lambda}$ . The rate of interest is  $\frac{E}{q_1(1-\hat{\lambda})} - 1$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

For the uniform distribution (10) the same as

$$\hat{\lambda} = \frac{q_1}{(1 - \varepsilon)E - q_1}$$

which is between 0 and 1 as long as  $\varepsilon$  is small and Assumption 1 holds. Hence we get the following solution for the uniform distribution:

**Proposition 4** *Suppose  $E < (1 + \rho)q_1$ ,  $\rho > 1$ ,  $E > 2q_1$  and  $F(\lambda)$  is uniform on  $[0, 1]$ . In the most efficient equilibrium for the democracy, the good type repays whenever  $\lambda \leq \frac{q_1}{(1-\varepsilon)E-q_1}$ . The rate of interest is  $\frac{(1-\varepsilon)(E-q_1)-q_1}{q_1(1-\varepsilon)}$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

## 2.2 Autocracy

Consider dictatorship, where the leader cannot be ousted at all. The leader can still be good or bad with probability  $1 - \varepsilon$  and  $\varepsilon$ .

Consider the good dictator's problem. We look for threshold strategies again such that he defaults only if  $\lambda \geq \hat{\lambda}$ . Since the dictator is long-lived (here, lives for two periods), he cares about his reputation. In fact, the only incentive for the dictator to repay the first-period loan (conditional on  $\lambda \leq \hat{\lambda}$ ) is that if he doesn't, he will be considered the bad type, and will not be able to get a loan in period 2.

The cost of cancelling the second period project is  $(1 + \rho)q_2 - (1 + r_2)q_2$ . Since  $r_2 = 0$  in the second period conditional on his continuing in office, the net loss is  $\rho q_2$ . Therefore, the IC constraint (corresponding to (7) in a democracy) is

$$\rho q_2 - (1 + \lambda)(1 + r_1)q_1 \geq 0$$

In words, the dictator does not lose any ego rents by defaulting, but he does lose his reputation. (In a democracy, in contrast, the loss of reputation has little cost as the leader can be easily replaced in the election). Therefore, using (2), corresponding to (8) we have

$$\frac{F(\hat{\lambda})}{1 + \hat{\lambda}} \geq \frac{q_1}{(1 - \varepsilon)(\rho)q_2} \quad (11)$$

Since the left hand side is at most  $1/2$  we must have  $2q_1 < \rho q_2$ , for  $\varepsilon$  very small. Otherwise there is no equilibrium with positive lending.

The constraint (3) must still hold:

$$\frac{F(\hat{\lambda})}{1 + \hat{\lambda}} \geq \frac{1}{(1 - \varepsilon)(1 + \rho)} \quad (12)$$

If the size of the project is increasing,  $q_1 \leq q_2$ , then (12) is the binding constraint. The value of the good reputation is then large enough that the good dictator will be well behaved. The best option is to set  $\hat{\lambda}$  so (12) holds with equality.

We summarize this result.

**Proposition 5** *Suppose  $q_1 \leq q_2$ ,  $2q_1 < \rho q_2$ ,  $\rho > 1$ , and  $F$  satisfies Assumption 1. In the most efficient equilibrium for the dictatorship, the good type repays whenever  $\lambda \leq \hat{\lambda}$ . The interest rate is  $r_1 = \frac{\rho - \hat{\lambda}}{1 + \hat{\lambda}}$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

For the uniform distribution we have:

$$\hat{\lambda} = \frac{1}{(1 - \varepsilon)(1 + \rho) - 1} \quad (13)$$

which is less than 1 as long as  $\varepsilon$  is small and Assumption 1 holds. The interest rate satisfies, from (2) and (9),

$$r_1 = \rho - \frac{1}{1 - \varepsilon}$$

We summarize this result for the uniform distribution:

**Proposition 6** *Suppose  $q_1 \leq q_2$ ,  $2q_1 < \rho q_2$ ,  $\rho > 1$ , and  $F$  is uniform on  $[0, 1]$ . In the most efficient equilibrium for the dictatorship, the good type repays whenever  $\lambda \leq \frac{1}{(1 - \varepsilon)(1 + \rho) - 1}$ . The interest rate  $r_1 = \rho - \frac{1}{1 - \varepsilon}$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

Suppose instead that  $q_1 > q_2$ . Then, the value of the reputation is not high. The binding constraint is (11), it is efficient to set  $\hat{\lambda}$  so (11) holds with equality.

We summarize this result.

**Proposition 7** *Suppose  $q_1 > q_2$ ,  $2q_1 < \rho q_2$ ,  $\rho > 1$ , and  $F$  satisfies Assumption 1. In the most efficient equilibrium for the dictatorship, the good type repays whenever  $\lambda \leq \hat{\lambda}$ . The rate of interest satisfies  $r_1 = \frac{\rho q_2}{(1 + \hat{\lambda})q_1} - 1$ . If  $\rho < 1$ , or  $E < 2q_1$  there is no equilibrium with positive lending.*

For the uniform distribution we have:

$$\hat{\lambda} = \frac{q_1}{(1 - \varepsilon)\rho q_2 - q_1}$$

which is between 0 and 1 as long as

We summarize this result.

**Proposition 8** *Suppose  $q_1 > q_2$ ,  $2q_1 < \rho q_2$ ,  $\rho > 1$ , and  $F$  is distributed uniformly on  $[0, 1]$ . In the most efficient equilibrium for the dictatorship, the good type repays whenever  $\lambda \leq \frac{q_1}{(1 - \varepsilon)\rho q_2 - q_1}$ , and the rate of interest is  $r_1 = \frac{\rho q_2 - 2q_1}{q_1}$ . If  $2q_1 > \rho q_2$ , or  $\rho < 1$ , there does not exist any equilibrium with positive lending.*

Therefore, we have four possibilities.

If  $E \geq (1 + \rho)q_1$  and  $q_1 \leq q_2$  the dictatorship and democratic country default the same amount at the same interest rate. (But the welfare is not the same once the “bad leader” is taken into account. For, in the democracy the bad leader defaults in the first period and is replaced, while in the dictatorship he stays in power and gets no loan in period 2. Therefore, the welfare in a democracy is higher.) The driving force in a democracy therefore is not so much loss of reputation but rather the benefits of being in office. When ego rents are high and the project size is increasing over time then democracies are Pareto superior to dictatorships: there is more risk sharing, at the same time the probability of default and the rate of interest is the same.

If  $E \geq (1 + \rho)q_1$  and  $q_1 > q_2$ ,  $\hat{\lambda}$  is lower in a democracy than in an autocracy, since  $\frac{1}{(1 - \varepsilon)(1 + \rho)} < \frac{q_1}{(1 - \varepsilon)\rho q_2}$  whenever  $\rho q_2 < (1 + \rho)q_1$  which is true since  $\rho q_2 < \rho q_1 < (1 + \rho)q_1$ . With the uniform distribution, the democracy repays with probability  $\frac{1}{(1 - \varepsilon)(1 + \rho) - 1}$  and the dictatorship with probability  $\frac{q_1}{(1 - \varepsilon)(1 + \rho)q_2 - q_1}$ . Since  $q_1 > q_2$  the latter probability is greater.

Thus, when ego rents are high and the project size shrinking over time, the dictator defaults less often and pays a lower interest rate than the democratic leader.

If  $E < (1 + \rho)q_1$  and  $q_1 < q_2$  the democracy repays with probability  $\frac{q_1}{(1-\varepsilon)E-q_1}$  and the dictatorship with probability  $\frac{1}{(1-\varepsilon)(1+\rho)-1}$ . Since  $E < q_1(1 + \rho)$  the former probability is higher.

Thus, when ego rents are low and the project size increasing over time, the dictator defaults more often and pays a higher interest rate.

If  $E < (1 + \rho)q_1$  and  $q_1 > q_2$  the democracy repays with a higher probability if  $\rho q_2 < E$ . Thus for the uniform distribution, the democracy repays with probability  $\frac{q_1}{(1-\varepsilon)E-q_1}$  and the dictatorship with probability  $\frac{q_1}{(1-\varepsilon)(\rho)q_2-q_1}$ . The latter is bigger if  $\rho q_2 < E$ , otherwise the former is bigger.

To summarize, the dictatorship pays a higher risk-premium (and is more likely to default) than the democracy if ego rents in the democracy are low, and the dictator's value of reputation is high. This sounds counter intuitive but has a simple intuition. If ego rents are low, then the democratically elected leader has a strong temptation to default on the debt, since all he loses are his ego rents. The country can still borrow money in period 2, with a new leader. Therefore, if period-one interest rates are high, the temptation to default will be overwhelming. To give the leader the incentive to repay in period 1, the interest rate must be low. This requires that the rate of default is low, which is costly to the country. They must repay even in bad states (poor risk sharing). Analogously, if the dictator's value of reputation is high, he has no incentive to default even if interest rates are high. High interest rates means frequent default, which is good for the country (good risk sharing).

### 3 Conclusion and Extensions

In this paper we considered the problem of repayment of sovereign debt akin to the usual Principal Agent problem with moral hazard. The optimal contract takes the form of punishing the agent by firing him when the observed



output is low (e.g. Efficiency wages, Shapiro and Stiglitz, 1984). In democracies this punishment entails a re-election where the leader is replaced. The punishment therefore takes the form of a loss of Ego rents. When leaders also care about the welfare of citizens they may repay in order to prevent bad leaders from taking office. The higher turnover in a democracy compared to a dictatorship implies that the repayment incentives are blunt especially when ego rents are low: there is a moral hazard problem created by the possibility that you could be replaced and get access to future credit because reputation attaches to a leader and not the country.

Shleifer (2003) suggests that the problem with sovereign debt is that lenders have too few rights: he gives the example of corporate bankruptcy law where Chapter 11 allows to fire a manager if he cannot propose a plan that is acceptable to them. We see democracies as offering a similar implicit contract where some alignment between the payoffs of citizens and lenders provides a similar mechanism to discipline leaders to repay. The punishment mechanism for non-repayment is usually the freezing of credit by lenders. When reputation attaches to the country rather than the leader there is no difference between democracies and dictatorships. However when reputation is leader specific, then this creates a wedge between the two. We get an unambiguous result independent of the parameters: inter-temporal risk allocation is better in democracies. Hence our paper speaks to the debate on whether to forgive defaults (IMF) when economic conditions are hard. In democracies defaults are forgiven by lenders because democracies allow replacement of leaders. Tomz and Wright (2007): find a weak relationship between default and bad output shocks than predicted by the theory. Our paper offers an explanation: if the sovereign debt market is characterized by competitive lending and heterogenous creditors then state contingent contracts (even implicit ones) may not be possible. So, default is a costly way to ensure partial insurance. However, in democracies, default is not that costly because leaders can be replaced. Hence default may occur even when shocks are not that bad. We predict that the relationship is tighter for dictatorships.

Finally we would like to extend to allow partial default or renegotiation and to investigate further the volume of debt that a democracy has access to relative to an autocracy.

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