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Bank bailouts and political instability

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Abstract

This paper studies bank solvency crises due to macroeconomic shocks in a model where government is prone to bailout because of cronyism. Citizens can dismiss the government and overrule its decision if they believe that a bailout is not economically justified. The results are as follows. First, the probability of a political crisis in equilibrium increases with the scope of the political principal-agent problem. Second, political uncertainty enlarges the set of parameters for which a banking crisis takes place and thereby increases financial instability. Third, politico-financial crises may stem from foreign lenders' loss of confidence.

JEL classifications: F3; G2; D8; C7; H2
Keywords: Banking crisis; Bailout; Political distortion; Dynamic game of incomplete information

1. Introduction

Political uncertainty, due to elections, weakening of government support, or political violence, has been a catalyst for financial crises by the raising doubts about policy continuity, as occurred in the crises in Mexico in 1994, Korea in 1997 or Brazil in 1998 and 2002. Uncertainty about the viability of the Suharto regime in Indonesia fostered economic and financial fragility. Argentina's crisis in 2001 was marked by doubts about the ability of the central government to control budgetary policies of the provinces and a fragile coalition's inability to implement appropriate policies. Turkey's crawling peg collapsed in 2001 after a public feud between the president and the prime minister.

Investors dislike political uncertainty and a credit crunch that entail international capital flow reversals, domestic capital flight, or high-cost loans may follow. Uncertainty means that past policies are no longer necessarily applicable and costly economic adjustment may take place.

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Prospective losers from policy changes can take retaliatory action, which may exacerbate political instability, and may eventually result in dismissal of the government (as in Indonesia in 1998, Ecuador in 2000, Argentina in 2001).

Political instability is further exacerbated due the political principal-agent problems that arise when policymakers' objectives diverge from the public interest. As the public choice school notes (Mueller, 2003), policies chosen often differ from policies that would be implemented by a welfare-maximizing social planner not subject to political constraints. The discrepancy in policies can also be due to limitations on the efficiency of collective decision-making mechanisms and limited information of participants in the political process (Persson and Tabellini, 1994).

In this paper I consider clientelism, or a situation where policymakers favor particular groups. For instance, policymakers may be markedly pro-business (e.g., Corsetti et al., 1999). A variation is crony capitalism, which is an economic system where the allocation of resources and the adjudication of commercial disputes favor those who have a close relationship with political leaders or government officials (Akerlof and Romer, 1993; Cassing, 2000; Robinson et al., 2006).

Political principal-agent problems appear in particular to be present in emerging-market economies in Asia and Latin America. In particular, the Asia crisis of 1997–1998 has been attributed to crony capitalism compounded with financial fragility. As a solution, Navia and Velasco (2003) advocate reduction of institutional biases that favor special interests in Latin America. Likewise, in Vaugirard (2004) I illustrate how corruption may provide policymakers with incentives to service sovereign debt beyond socially optimal levels and I consider reforms to address the supply side of clientelism in the private sector. This involves resolving agency problems between managers and corporate stakeholders. A key element in constraining the ability of economic interests to "capture the state" is good corporate governance.

Political instability can emerge from political principal-agent problems compounded with an informational advantage of policymakers over the public (such as regarding the social cost of a crisis). Citizens can be unsure about policymakers' intentions regarding bailouts of collapsing banks, servicing sovereign debt, or maintaining a currency peg. A political crisis arises when citizens or voters dismiss policymakers and overrule a policy proposal with which they disagree. Rational investors who anticipate this political instability ask to be compensated for risk, which increases the cost of credit or the burden of taxation, and therefore the social cost of policy measures. In turn, this exacerbates the likelihood of financial turmoil and political turbulence.

There is limited literature on the political basis of financial crises. Wei (2001) documents a positive relation between domestic cronyism and the ratio of international bank loans to foreign direct investment (FDI), and highlights the exposure to currency risk associated with fickle international capital flows, in contrast to less volatile FDI. There is evidence that this source of fragility played a major role in the Asia crisis of 1997–1998. Femminis and Ruggerone (2004) show how excessive subsidies of pro-business governments to bank investment may exacerbate bank runs.

The model in this paper follows Chang's (2004) description of debt service with a political dimension. Chang points out how sovereign default and political crisis can arise in equilibrium (as in Argentina in 2001).

The model contrasts with other expositions where government guarantees are at the root of financial crises and moral hazard results in excessive external borrowing and over-investment (as in Corsetti et al., 1999; Irwin and Vines, 2003), or in un-hedged exposure to exchange-rate risk (as in Burnside et al., 2004, who focus on over-investment or other excessive risk exposure). We are more interested here in the strategic interaction between policymakers and the public. As a result, we shall not consider endogenous investment and we also disregard the production side of the economy. Bank investment and borrowing will be exogenous.

To the best of our knowledge, no paper studies the links between banking crises and political instability, and this contribution is intended to fill part of this gap. I show that the possibility of a political crisis in equilibrium increases with political distortions, that political uncertainty increases financial instability, and that politico-financial crises may stem from foreign lenders' loss of confidence.

Section 2 sets up a model of a representative bank that mediates foreign capital to local risky investment and is subject to solvency crises triggered by adverse macroeconomic shocks. The government can bailout a failing bank, which entails guaranteeing foreign lending. The government may benefit from a bailout that is not socially warranted. The government has an informational advantage over the public regarding the social cost of a crisis. The representative agent can dismiss the government and overrule the bailout proposal. The government and the representative agent are involved in a non-cooperative Bayesian game with private information of the government regarding the cost of a crisis.

The outcomes of the agency problem between tax-paying citizens and the possibly biased government are shown in Section 3. The government's problem of conveying its information to the public leads the Perfect Bayesian Equilibria of the game to exhibit political crises. The representative agent's posterior belief that the social cost of a bank crisis is high, conditional upon a bailout proposal by the government, plays a key role in determining which Perfect Bayesian Equilibrium arises. Indeed, the less precise this inference, the greater the incentives to overthrow the government. We then prove that the likelihood of political crises increases with political distortions.

In Section 4, the rational-expectations equilibria of the model are derived taking into account foreign lenders' expectations about the outcome of the political game. Lenders' prophecies are self-fulfilling, through increases in the likelihood of financial turbulence and political turmoil. If lenders hold adverse expectations about the outcome of the political game and thus about the likelihood of being repaid, they require higher interest rates on their loans, which exacerbates the insolvency position of the bank. Higher taxes required to finance a bailout are consistent with the increased likelihood of financial and political crises, thereby validating lenders' beliefs. Therefore, politico-financial crises may stem from foreign lenders' loss of confidence. We then highlight the political uncertainty due to the fact that the government can be removed. A bank default in equilibrium is less likely if voters believe that the probability of the government being biased in favor of crony interests is low. This is somewhat surprising, since biased governments have a higher propensity to bailout in our model, and thus one would expect depositors to be less prone to engage in a bank run with a biased government. However, in equilibrium, agents account for the possibility that the government will be overthrown to assess the likelihood of a bailout.

Section 5 recapitulates the main results and suggests follow-ups. Most proofs are in the Appendix.

2. The model

In this section, we describe a banking sector subject to solvency crises. A government can bailout ailing banks but can be dismissed if this proposal does not suit its citizens.

2.1. The banking sector

Banks are channels of foreign capital to local risky investment and are subject to solvency crises triggered by adverse macroeconomic shocks. The framework takes features from the

seminal paper of Diamond and Dybvig (1983), to which are added international investors as in Vaugirard (in press). The main departure is that bank crises here are due to business cycle risk, as opposed to self-fulfilling depositors' prophecies. This is reminiscent of the model of Allen and Gale (1998).

A small open economy is populated by a large number of *ex ante* identical agents. There are three dates (and thus, two periods) indexed by $t=0, 1, 2$, and only one good, which is freely traded in the world market and can be consumed and invested. The price of consumption in the world market is fixed and normalized to one unit of foreign currency (a "dollar"). Each domestic agent may be forced to consume early, depending on his or her "type", which is discovered at $t=1$. With probability λ, the agent is "impatient" and derives utility only from Date 1 consumption, while with probability $(1-\lambda)$, the agent is "patient" and derives utility only from Date 2 consumption. Type realizations are independently and identically distributed across agents. In addition, the realization of each agent's type is private information to that agent.

There is a banking sector comprising commercial banks. Since banks play a symmetric role in the model, it is useful to refer to them as "the bank": computations are simplified by normalizing the number of consumers–depositors to one. The bank sets demand deposits. The contracts stipulate that, at $t=0$, each agent must surrender to the bank his or her endowment and capacity to borrow abroad in return for the right to withdraw, at the agent's discretion, either x units of consumption at $t=1$ or y units of consumption at $t=2$. The bank borrows abroad an amount, f, at $t=0$, to be repaid at $t=2$. Foreign lenders are assumed risk-neutral, which is compatible with the small size of the economy. The bank uses the proceeds of its borrowing, f, along with the endowment surrendered by home agents, e, to invest an amount, k, in a long-term technology and to invest an amount, b, in a world liquid asset. The risk-free interest rate on the world capital market is zero. We assume that the bank attends to the requests of depositors on a first-come-first-serve basis.

The long-term technology is productive, but risky and illiquid: its yield per dollar invested at $t=0$ is $r<1$ dollars at $t=1$, and R dollars at $t=2$. The r may be thought of as the scrap value of that technology. While r is a constant, R is a random variable of mean $E(R)>1$. For the sake of simplicity, we assume that R follows a Bernoulli distribution that takes a bad value $R_B<1$, with probability p, and a good value $R_G>1$, with probability $(1-p)$. R epitomizes the state of the economy. We also assume that $r<R_B$, which means that it is inefficient to liquidate the long-term asset prematurely even in the bad state of the economy.

Uncertainty over the risky yield in Period 2 is resolved at Date 1, which means that depositors observe a signal (say, a leading economic indicator) that predicts with perfect accuracy the value of R that will be realized at Date 2. This gives rise to the possibility of solvency crises, as depositors will attempt to withdraw their deposits at Date 1 if they learn that the bank may fail at Date 2.

Assumption 1. The bank incurs a solvency crisis if the state of the economy is bad. More precisely, if $R=R_B$, then all depositors run at Date 1 and the bank is forced to liquidate early part of its long-term asset. In this event, all depositors are serviced in the agreed terms whereas foreign lenders are not reimbursed entirely at Date 2. If $R=R_G$, then the bank can service all depositors and lenders in the agreed terms. There are no liquidity crises triggered by self-fulfilling depositors' expectations.

Assumption 1 reflects the business cycle of the onset of a banking crisis. Demand deposit parameters chosen by the bank are such that its liabilities can be fulfilled at both dates if the state of the economy is good, provided that depositors behave according to their true type. The bank

can meet all depositors' withdrawal demands by liquidating its long-term asset prematurely, which rules out self-fulfilling liquidity crises. On the other hand, in the event of a slump, parameters are such that the bank ends up insolvent since it cannot repay entirely foreign lenders.

Those who stand to lose from an economic shock are foreign lenders, since local depositors are assumed to be serviced in the agreed terms under all circumstances. Lenders require compensation for this risk. Determination of the corresponding interest rate is delayed until Section 4.

Appendix A sets out simple conditions for the demand deposit parameters to be in accordance with Assumption 1.

2.2. Political distortions and bailouts

This subsection features a government (or policymakers) with the option to bailout a failing banking sector. When doing so, however, the government may not have the same objective as the representative agent (citizens). Combined with the fact that policymakers have an informational advantage over the public regarding the social cost of a bank crisis, this distortion may lead to the dismissal of policymakers.

We model the propensity of the government to rescue an ailing bank as a tradeoff between the costs of not rescuing the system and the taxation cost of a bailout package. The former involves social costs for the society and an opportunity cost for policymakers if they are not benevolent and benefit from bailing-out a failing bank.

The case in point in this bailout is guaranteeing foreign lending. The government receives at Date 1 an accurate signal of what the risky return R will be at Date 2 (the same as depositors). If the return is good, there is no need to rescue the system. If the return is bad, the bank will fail to reimburse foreign lenders if the government does not intervene. This default involves costs for the country and the government may therefore consider bailing-out the bank. If it does so, the rescue package is financed by taxes, T, levied on citizens.

Not bailing-out a failing banking system would have, as a major consequence, cessation of foreign capital inflow, in addition to the inefficiency costs of early liquidation of the illiquid asset ($r<R_B$). The cost of a solvency crisis, denoted by χ, captures this pitfall. We assume that χ is a Bernoulli random variable, taking a low value χ_L, with probability $q\in]0, 1[$, or a high value $\chi_H>\chi_L$, with probability $(1-q)$, and that χ is independent of R.

Assumption 2. The government has an informational advantage over the public regarding the cost of a bank crisis. More precisely, the true value of χ becomes known to the government at Date 1 upon deciding whether or not to rescue the bank. Citizens and foreign lenders only know its prior distribution.

Indeed, policymakers often obtain information relevant to this cost beforehand, through their political advisors and economic research team, and this information is not generally available to the public until there actually is a crisis. In addition, the information may be costly to gather. This information asymmetry is further exacerbated by crony capitalism.

Assumption 3. The bailout decision is made by the government on behalf of the representative agent, who can overrule the government's decision, in which case society incurs a cost $\phi>0$.

The dismissal of the government constitutes a "political crisis". In practice, a political crisis takes place whenever a government is forced out of office and can take different guises, such as a vote by citizens, a failed vote of confidence by the parliament, or a resignation following social unrest.

In this model, a political crisis is a possible outcome because the representative agent has incomplete information about the cost of a bank default and because the government may not have the same objective as the representative agent.

Assumption 4. There are political distortions. Biased policymakers benefit if they bailout a failing bank, although it might not be socially warranted. In other words, policymakers may incur an opportunity cost if they do not propose to bailout a failing bank, in addition to the social cost of a bank crisis. More precisely, policymakers incur an opportunity cost of either zero or $\gamma\chi$, with probabilities $s \in]0, 1[$ and $(1-s)$ respectively. Therefore, s is the probability that they are "benevolent", and $(1-s)$ the probability that they are "biased". In addition, the opportunity cost incurred by biased policymakers overshadows the social cost of a bank crisis and the public cost of a dismissal, in the following sense:

$$(1+\gamma)\chi_L \geq \chi_H, \tag{1}$$

and

$$\gamma\chi_L > \phi. \tag{2}$$

In a strict interpretation, opportunity costs may translate into the loss of reputation of policymakers or questioning about their abilities, which makes them "self-interested". On a broader register, political distortions capture any discrepancy between the welfare of the average citizen and policymakers' objectives in catering to special groups. Indeed, reluctance to step in may induce fallout with cronies. Being biased or not is assumed independent of the social cost of crisis, whereas the opportunity cost incurred if political decisions are distorted depends on that cost. In addition, the opportunity cost is assumed independent of R.

Condition (1) implies that a biased policymaker will propose a bailout even if the cost of crisis is low, in the case: $\chi_L < T \leq \chi_H$.

Condition (2) indicates that, when proposing an action that does not suit the representative agent, biased policymakers are more concerned about their personal welfare than about the public cost if fired. This condition implies that they will propose a bailout knowing that they will be dismissed for so doing.

At this point, two issues should be clarified, (1) why governments may be willing to propose bailouts knowing that they will be fired (one would expect governments to want to stay in power), and (2) why citizens may be willing to dismiss governments that propose bailouts.

From the policymakers' standpoint, all governments, whether or not benevolent, may propose a bailout knowing they will be dismissed. For the benevolent type, this is merely because there is no cost to being dismissed other than the public cost of a political crisis. For the biased type, it is because they value their private benefits and their connections with cronies more than staying in office.

A benevolent government merely compares the cost from proposing bailout – $T+\phi$ if it acknowledges that it will be fired following such an announcement – to the cost from not proposing bailout — χ_H if it knows that the cost of default is high. Therefore, the benevolent policymaker will propose to bailout if $T+\phi \leq \chi_H$, i.e., if the cost of a political crisis is not too high.

The biased type will also propose to bailout. On the one hand, one would expect such policymakers to want to stay in power, and therefore a "personal cost when dismissed", different from the public cost (of a political crisis, may be considered.[1] On the other hand, non-benevolent governments have been assumed to incur an opportunity cost from not proposing a bailout, rooted

[1] We thank an anonymous referee for raising this point.

in crony capitalism. If we think of the latter as a net cost, and a personal cost when not proposing a bailout net of a personal cost when fired, the question comes down to whether or not this net cost is positive. The net cost is positive because policymakers value their private benefits and their connections with cronies more than staying in office.

Clientelism fosters additional incentives for bailing-out failing banks. The favored elites are better off if banks are rescued because they take advantage of the status quo. They are the main beneficiaries of the economic inefficiencies fostered by the system, such as cheap credit granted to their firms and dubious projects. Saving ailing banks paves the way for the perpetuation of cronyism. A crisis entails subsequent politico-economic reforms, which may result in a system less favorable to business elites and cronies. Policymakers benefit from proposing bailouts even if they are eventually fired, as they maintain good relations with favored groups, and, if they have themselves business interests, personally reap the benefits of bailouts.

Consistently, a primary reasons for the East Asia financial fragility, which eventually led to the 1997–98 crisis, was close ties between banks, firms and government officials that fostered expectations that well-connected banks would not be allowed to fail. In turn this created distorted incentives, with too much borrowing from abroad and too much investment in marginal projects. Indonesia under Suharto's rule is a typical case (see Cassing, 2000).

We now turn to the citizens. Citizens may want to dismiss governments that propose bailouts because they are not the main beneficiaries of bailouts, and to impose a price for not making the right decision. The main beneficiaries of bailouts are indeed foreign lenders and the policymakers' cronies. Recall that local depositors are assumed to be serviced according to the agreed terms under all circumstances so depositors are not direct beneficiaries of bailouts. Lenders are compensated for the risk of default and this is precisely how they determine the interest rate to charge on the bank's debt in the first place. So, citizens question why lenders should be guaranteed for a risk for which they have already been compensated. This point is further exemplified by poor citizens not having banking accounts in many emerging markets. As they are worse off, because of increased taxes, immediately or in the future if the government resorts to foreign borrowing (Argentina in the nineties), or if there are cuts in social spending or due to seigniorage (Mexico and Chile in the eighties), poor citizens have incentives to dismiss a government that proposes a bailout. A topical illustration is the fall of Suharto's regime in Indonesia in 1998, where the government chose to adhere to fiscal authority programs to bailout collapsing banks.

The other significant beneficiaries of bailouts are those persons with close ties to government officials, such as business people granted cheap loans and banks' stockholders and managers. Citizens will be dissatisfied with rescue plans if they suspect that the bailout benefits will go to policymakers' cronies. By the same token, refusing bailout proposals may be viewed by citizens as an opportunity to reform a politico-economic environment plagued by corruption and nepotism, since, conversely, bailouts may help to perpetuate clientelism as stressed above. To illustrate, during the banking crisis of the Dominican Republic in 2003 (Baninter, the second largest bank in the country, defaulted as a result of embezzlement), the government's proposal to guarantee deposits (with a loan from the International Monetary Fund) was not enough to prevent riots and the government was voted out of office in subsequent elections.

Citizens may also want to dismiss governments that propose bailouts to learn the true value of the social cost of crisis and of making the right decision. In this respect, the representative agent trades off the cost of dismissal (ϕ) and the gains from making the right decision. The gains derive from learning the value of the social cost of crisis and from the fact that the society does not incur the opportunity cost of a biased government. In a nutshell, it is as if dismissing the government allows a bailout decision at a lower cost.

Absent strategic considerations, the government proposes a bailout if the overall cost of a bank crisis – that is, including the government's opportunity cost if it is biased – is greater than or equal to the taxation cost of a rescue package, T. Then, if the government is retained, the proposal is implemented. Otherwise, the representative agent would learn the value of χ, and would choose whether to bailout. However, rational agents must account for each other's behavior. For the policymaker, this means determining the conditions under which a rational representative agent will dismiss the government after proposing a bailout; for the representative agent, this involves assessing the likelihood of a high cost of crisis if the policymaker proposes the bailout.

3. Political crises

This section determines the Perfect Bayesian Equilibria of the game between the government and the representative agent and prove that the likelihood of political crises is increasing with the likelihood of political distortions.

3.1. Perfect Bayesian Equilibria

The political distortion compounded with the informational advantage of the government may result in a political crisis. The political stage, namely, the interaction between the government and the representative agent at Date 1, features a non-cooperative Bayesian game with private information of the government. The game is shown in extensive form in Appendix B. The outcomes are Perfect Bayesian Equilibria (PBE). In a two-person dynamic game of incomplete information, a PBE consists of a choice of option and a belief about the opponent's type of every player in every information set belonging to that player, where a belief is expressed as a probability distribution. A PBE must satisfy two conditions: 1) A player's belief about an opponent's type must be updated in each of his information sets using Bayes' rule based on the opponent's choices insofar as the player can observe them; 2) A player's choice of option in each of his or her information sets must maximize expected utility (in this setup, this entails picking the action that involves a minimal expected cost, calculated according to the updated belief about the opponent's type). At this point, the game is the counterpart to bank default of Chang's (2004) model of sovereign debt service, and follows the same lines. The representative agent's posterior belief that the social cost of a bank crisis is high, conditional on a bailout proposal by the government, denoted by z, plays a key role in determining which Perfect Bayesian Equilibrium arises. Indeed, the less precise is this inference, the greater the incentives to overthrow the government. In the following proposition, we set aside the trivial cases where: $T \leq \chi_L$ (both types of policymakers propose bailout and there is never political crisis) and $\chi_H < T$ (neither type of policymakers proposes bailout) to focus on the PBE that are of politico-economic interest.

Proposition 1. *There are three possible perfect Bayesian equilibria*:

Type i: If $\chi_L < T \leq \chi_L + \phi/(1-z)$, a biased government always proposes bailout, whereas a benevolent one proposes bailout if and only if the social cost of bank crisis is high; and the representative agent opts not to dismiss the government. Therefore, the probability of no bailout is sq, and the probability of political crisis is 0.

Type ii: If $\chi_L + \phi/(1-z) < T \leq \chi_H - \phi$, the government follows the same strategy as in Type i, but is overturned unless the proposal is not to bailout. In addition, the representative agent does not bailout when dismissing a biased government and the cost of crisis is low; and bails out in other cases. Therefore, the probability of no bailouts is q and the probability of political crisis is $(1-sq)$.

Type iii: If $\chi_H - \phi < T \leq \chi_H$, a benevolent government proposes not to bailout regardless of χ, which the representative agent accepts, while a biased government proposes to bailout and is dismissed; in the latter case, the representative agent does not bailout if the cost of crisis is low. Hence, the probability of no bailouts is $q + (1-q)\,s$ and the probability of political crisis is $(1-s)$.

In addition, $z = (1-q)/[(1-q)s + (1-s)]$.

Note that the condition for Type *ii* makes sense provided that ϕ and z are sufficiently small relative to the difference $(\chi_H - \chi_L)$, which is assumed.

Proof: See Appendix C.

z captures the probability that the representative agent bails out after overthrowing the government. This probability affects the expected gain from dismissing the government and therefore the decision to retain the government if a bailout is proposed. This mechanism drives the difference between equilibria *i* and *ii*, as we now explain.

The right-hand inequality of PBE Type *i* sheds light on the representative agent's standpoint. In PBE Type *i*, there is no political crisis. The intuition is that the representative agent has no incentive to fire the government if the government proposes bailout, since the cost of dismissal is greater than that of accepting the government's proposal. Indeed, the cost of retaining the government is T, while the expected cost of dismissing the government is $\phi + zT + (1-z)\chi_L$, since the representative agent expects that he or she will bailout with probability z and will not bailout with probability $(1-z)$. Now, $T \leq \phi + zT + (1-z)\chi_L$ reduces to the right-hand inequality of the condition of Type *i*.

Likewise, the probability of bailouts in PBE of Type *i* $(1-qs)$ is higher than the probability of bailouts in the case of no political distortion $(1-q)$. Since a biased government will bailout in the case of a low cost χ_L, whereas the representative agent has no incentive to dismiss the government after such a proposal, as the expected gain from doing so is too small.

The right-hand inequality of PBE Type *ii* highlights the government's standpoint as well as the fact that even benevolent policymakers may propose bailout while acknowledging that they will be fired. If the cost of default is high, the benevolent government's cost from proposing bailout is $T + \phi$, as the government knows that it will be dismissed following such an announcement, after which the representative agent will bailout eventually $(T < \chi_H)$. Conversely, by not proposing a bailout, the cost is χ_H, as the political crisis will be avoided at the price of a bank default. Hence, it is optimal for the benevolent government to propose a bailout if $T \leq \chi_H - \phi$.

By the same token, there is too little bailout in PBE of Type *iii* (probability $(1-s)(1-q)$), as compared to the case of no political distortion $(1-q)$. This stems from the fact that a benevolent government will not propose bailout even though the cost of crisis is high, as the government acknowledges that it would be overthrown after such a proposal while the cost of a political crisis is high.

3.2. Political instability and political distortions

Theorem 1. *The likelihood of a political crisis in equilibrium is increasing with the likelihood of political distortions.*

This broader possibility takes place through two channels: First, within each PBE type where a political crisis arises; second and more interestingly, in the sense that more likely political distortions increase the set of parameters for which a PBE of Type *ii* (with a political crisis) arises — at the expense of Type *i* (with no political crisis).

Proof. First, the probability of a political crisis is increasing in $(1-s)$ in PBE of Types *ii* and *iii*. Second, as s approaches 0, z decreases toward $1-q$, and thus $\chi_L+\phi/(1-z)$ is lower. It follows that a PBE of Type *ii* takes place – at the expense of Type *i* – for lower values of T or higher values of ϕ. □

The economic rationale is as follows. First, the fact that the probability of a political crisis is increasing in $(1-s)$ (the probability of political distortions) stems from the fact that a bailout proposal becomes more likely for either government's strategy of PBE Types *ii* and *iii*. Second, the more likely the government is biased (s approaches 0), the less precise the inference that the cost of crisis is high if the government proposes a bailout (z approaches $1-q$, the prior probability that the cost is χ_H). Therefore, the representative agent dismisses the government so as to learn the true value of the cost of crisis for a larger set of parameters, i.e., a PBE of Type *ii* or *iii* (with a political crisis) arises more often — at the expense of Type *i*.

4. Banking crises and political instability

We now determine the rational-expectations equilibria of the model accounting for foreign lenders' expectations about the outcome of the interaction between the government and the representative agent. We then prove that lenders' prophecies are self-fulfilling and highlight that political uncertainty increases financial instability. In particular, a bank default in equilibrium is less likely if voters believe that the probability of having a biased government is low.

4.1. Foreign lenders and taxation cost of bailout

The tax T levied to fund a bailout package has been exogenous, but results from the insolvency position of the bank and thus from the interest rate asked by lenders for the debt issued by the bank at Date 0. In turn, this rate stems from lenders' expectations about being repaid.

Lemma 1. *Let ω be lenders' subjective probability that the debt will be honored and l the amount of long-term technology that must be liquidated prematurely if all depositors run at Date 1 (i.e., $b+rl=x$). The amount T necessary to bailout a failing bank is:*

$$T = (1-\lambda)y + h - R_B k, \tag{3}$$

with

$$h = [f-(1-\omega)R_B(k-l)]/\omega. \tag{4}$$

Proof. Lenders are repaid f with probability ω and are repaid $R_B(k-l)$ with probability $(1-\omega)$. Therefore, being risk-neutral and incurring an opportunity cost of funds of zero over the two periods, they will request at Date 0 to be repaid at Date 2 the amount h, which is the solution of: $f=\omega h+(1-\omega)\ R_B(k-zl)$, which yields Eq. (4). Now, with providing the amount in Eq. (3), policymakers ensure that all liabilities of Date 2 are duly paid, and all the more so that no runs occur at Date 1. The reader may refer to the comments regarding Condition (A3) of Appendix A for further elaboration. □

4.2. Rational-expectations equilibria

Foreign lenders assess the likelihood of a bank default to determine what interest rate to request on loans they grant. This entails estimating the probabilities of a macroeconomic downfall

and a bailout by the government. The latter appraisal involves that anticipated outcomes of the political game of the previous section.

Proposition 2. *The REE matching the PBE are:*

$$\text{Type } i: \quad \chi_L < (1-\lambda)y + [f - psqR_B(k-l)]/(1-psq) - R_B k \leq \chi_L + \phi(1-z); \tag{5a}$$

$$\text{Type } ii: \quad \chi_L + \phi(1-z) < (1-\lambda)y + [f - pqR_B(k-l)]/(1-pq) - R_B k \leq \chi_H - \phi; \tag{5b}$$

$$\text{Type } iii: \quad \chi_H - \phi < (1-\lambda)y + [f - p(s+(1-s)q)R_B(k-l)]/(1-p[s+(1-s)q]) - R_B k \leq \chi_H. \tag{5c}$$

Proof. Take Type *i* to illustrate. In the corresponding PBE, the probability of no bailout is *sq*. Depositors run if and only if they receive a signal $R=R_B$ and they expect no bailout, hence the probability of a bank failure *psq*, and thus the debt will be honored with probability $(1-psq)$. Lemma 1 gives the corresponding amount to guarantee foreign lending and the resulting taxation cost of rescuing the bank, which yields Eq. (5a). □

We are now in a position to study the determinants of crises.

4.3. Determinants of politico-economic crises

We now show that political uncertainty increases financial instability.

Theorem 2. *Foreign lenders' expectations about the outcomes of the political game (PBE) are self-fulfilling in that they can raise the likelihood of banking crises and lead to political crises.*

Proof. There are multiple equilibria. Any two consecutive equilibria in Proposition 2 can concomitantly stand. To be concrete, take Types *i* and *ii*. If the parameters are such that Condition (5a) is close to equality, then (5b) will hold for the values of *p* and *q* such that the second inequality of Eq. (5b) holds. If so, there are two equilibria, one with no political crises (Type *i*), and one in which a political crisis occurs with positive probability (Type *ii*), and the probabilities of banking crises are *psq* and *pq* ($>psq$) respectively. □

Whenever two equilibria coexist, if lenders hold adverse expectations about the outcome of the political game that will eventually prevail, then they require higher interest rates on their loans, which exacerbate the insolvency position of the bank. In the end, the resulting higher taxation cost of bailout becomes consistent only with the PBE that features more likely financial and political crises, therefore validating lenders' expectations.

Theorem 3. *Political uncertainty increases financial instability as it enlarges the set of parameters for which expectations of financial and political crises make optimal a bank run and the dismissal of the government.*

Proof. As seen in the comments of Theorem 1, a PBE of Type *ii* takes place – at the expense of Type *i* – for lower values of *T* or higher values of ϕ if political uncertainty is higher, i.e., if a political distortion is more likely. Therefore, no bailouts (probability *q* in Type *ii* vs. *sq* in Type *i*) and the dismissal of the government (probability $1-sq$ in Type *ii* vs. 0 in Type *i*) are optimal for a larger set of parameters. This is acknowledged by depositors and foreign lenders. The former run for that larger set of parameters. The latter bid $S=[1-pq]$ (instead of $[1-psq]$) to buy the new

debt issued by the bank, which yields a higher taxation cost of bailout T indeed consistent with the Equilibrium *ii* for that larger set of parameters. □

In particular, a bank default in equilibrium is less likely if voters believe that the probability of having a biased government is low. In equilibrium, agents account for the possibility that the government will be overthrown to assess the likelihood of a bailout. Now, the inference that the cost of crisis is high following a bailout proposal is more precise (z closer to 1) with a lower probability of having a biased government. Therefore, the expected gain from dismissing the government becomes too small, that is, the expected cost of firing the government is too high compared to the cost of retaining her (see comments following Proposition 1). It follows that a bailout proposal is accepted for a larger set of parameters (higher T or lower ϕ), and thus that bank runs are less likely.

Not surprisingly, the probability of a bank default in equilibrium is increasing in q, the probability that the cost of a bank crisis is low. This result straightforwardly follows from Proposition 1. This is reinforced by the fact that z is decreasing in q, which implies that an equilibrium of Type *ii* – with a probability pq of banking crisis – will arise for a larger set of parameters at the expense of Type *i* (psq).

5. Conclusion

The main findings are that political crises arise as a result of political distortions, that political uncertainty increases financial instability, and that politico-financial crises may stem from foreign lenders' loss of confidence. The paper has disregarded policy and normative issues. Financial globalization has the potential to exacerbate political instability, on top of financial turbulence: foreign lending may exacerbate politico-financial instability as emerging markets become vulnerable to foreign investors' volatile beliefs. The answer proposed here to the fundamental question why financial crises are associated with political instability is based on an agency problem between governments and citizens where the former have superior information and there is suspicion of collusion of governments with favored groups. Citizens are then more reluctant than usual to endure economic adjustment policies to maintain the status quo. It follows that increasing transparency may dampen political instability. This involves faster and better dissemination of economic data – so as to reduce the information asymmetry regarding the cost of crisis – and institutional reforms such as more elected veto players in the political decision process (Keefer, 2001); or more transparency in the banking sector, such as better information about the quality of loans, cross-holdings of shares, accounting procedures. To this end, international financial institutions can condition assistance upon the implementation of such reforms.

A follow-up is to consider concomitant drops in securities prices. Indeed, collapses of asset values have often been observed in recent crises. Introducing collateralized borrowing in the model may therefore be interesting. Another extension is to study international contagion of crises by including cross-country correlation of political distortions.

Appendix A

The following conditions on the demand deposit parameters are sufficient for Assumption 1:

$$b + rk > x, \tag{A1}$$

$$R_B k < (1-\lambda)x + f, \tag{A2}$$

and

$$(1-\lambda)y + g < R_G k, \tag{A3}$$

where $g=[f-pR_B(k-l)]/(1-p)$, with $l=(x-b)/r$ (i.e., $b+rl=x$).

In addition, we impose that the following feasibility and incentive-compatibility conditions hold:

$$\lambda x = b, \tag{A4}$$

and

$$y \geq x. \tag{A5}$$

Proof. Condition (A1) rules out liquidity crises triggered by self-fulfilling depositors' expectations. Indeed, if depositors run in fear that other agents will run as well (driven by the sequential service constraint), they cannot cause the bank to go bankrupt at Date 1, since the liquidation value of its assets is sufficient to service all withdrawal demands. In other words, the maturity mismatch between the bank's assets and liabilities is not sufficiently sharp to imply liquidity crises.

Condition (A2) implies that depositors run in the bad state of the economy. We assume that home depositors and foreign creditors cannot receive differential treatment during times of financial distress — at Date 2, for legal or political reasons. Then, even in the most favorable case where international lenders only ask the risk-free interest rate (i.e., are repaid f), late depositors who would await Date 2 to withdraw would receive less than x, whereas they could get x if they misrepresented their type and were early in queue at Date 1. Accordingly, all late depositors run at Date 1. Therefore, the bank is forced to liquidate part of its long-term asset prematurely (its amount of liquid asset is just enough to cover withdrawal of early depositors due to (A4)). In this event, all depositors are fully serviced (Condition (A1)). This early liquidation is costly though, even in the bad state of the economy ($r<R_B$). Foreign lenders are then paid at Date 2 $R_B(k-l)$; in particular, they are not reimbursed entirely.

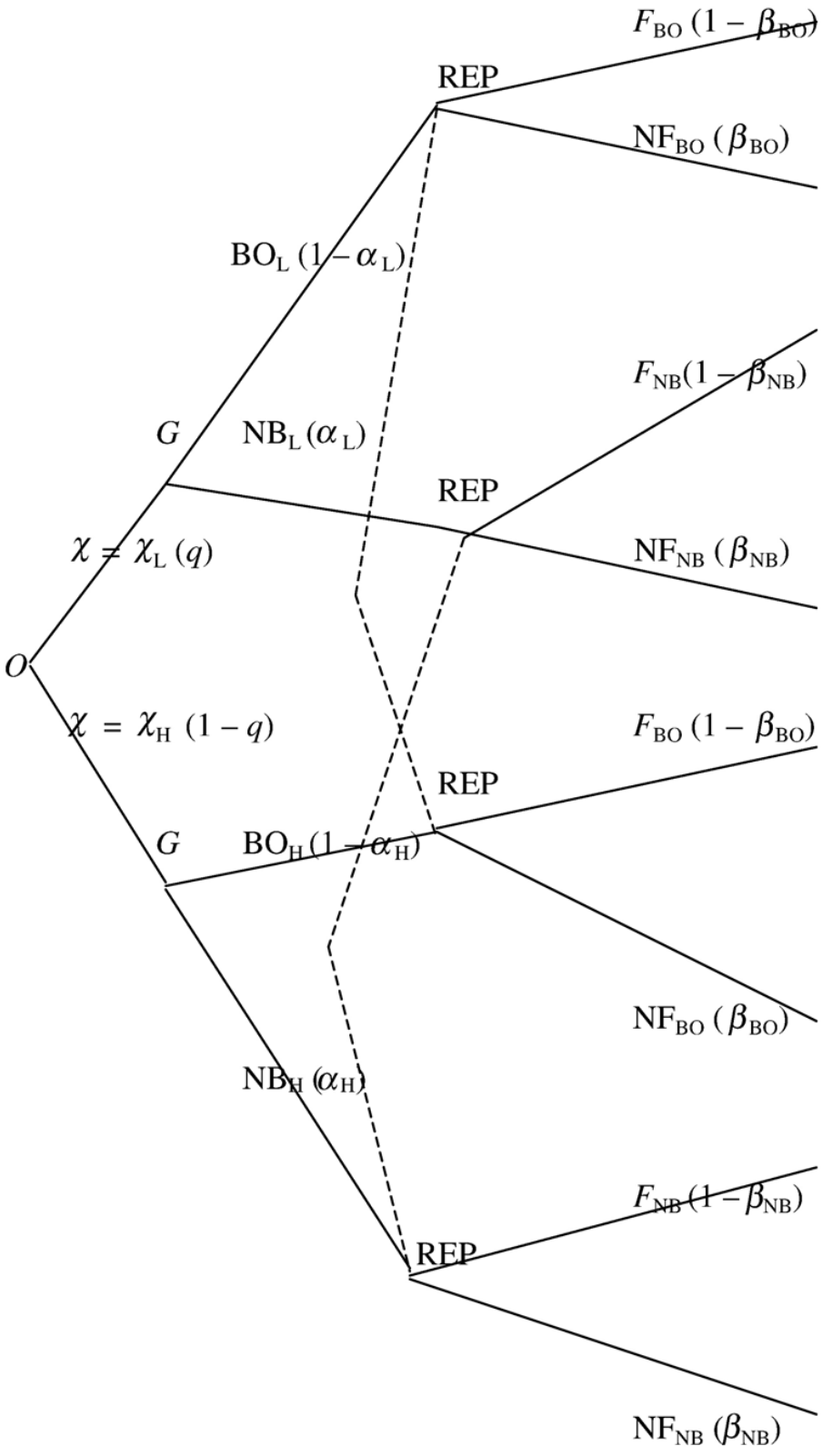
Condition (A3) involves the bank being solvent in the good state of the economy. As a matter of fact, the proceeds of the investment ($R_G\, k$) are sufficient to pay liabilities out at Date 2, as the left-hand side stands for the upper bound of liabilities at Date 2. Indeed, in the (worst) case where no bailout would be expected from the government, lenders would require being repaid the amount g, obtained as follows. Lenders receive $R_B(k-l)$ in the bad state of the economy and are risk-neutral and incur an opportunity cost of funds of zero over the two periods. Therefore, to lend f at Date 0, they request to be repaid at Date 2 the amount g solution of: $f=(1-p)\, g+pR_B(k-l)$; hence $g=[f-pR_B(k-l)]/(1-p)$. It follows that late consumers have no incentives to withdraw early, since in so doing they would get x, which yields x at Date 2 when invested on the world market, whereas they get y ($\geq x$) at Date 2 if they do not misrepresent their type. □

Equality (A4) is a Period-1 feasibility constraint stating that the values of x and b chosen by the bank must be such that its Period-1 liquidities cover the expected withdrawals for consumption by the impatient. Actually, an inequality ($\lambda x \leq b$) would be sufficient, but we impose an equality to simplify computations. Inequality (A5) is a standard truth-telling incentive condition that the bank must respect since agents' types are their private information.

Appendix B

Game tree.

This dynamic game of incomplete information is shown in extensive form in this figure. The characteristics of Player REP, the representative agent, are common knowledge, whereas there is uncertainty about the type of Player *G*, the government, who may be biased and who has an information edge about the cost of crisis χ, which is low (χ_L) with probability q and high (χ_H) with probability $1-q$.



After the policymaker G learns the value of the cost of crisis χ, she chooses to propose bailout (BO) or not to propose bailout (NB). In the diagram, BO_H (BO_L, respectively) means that G chooses to propose bailout after learning that $\chi=\chi_H$ ($\chi=\chi_L$). We denote by α_H (α_L) the probability that G plays NB_H (NB_L).

Having observed whether G plays BO but not knowing G's type, the representative agent REP then chooses whether to overturn G. In the diagram, F_{BO} (NF_{BO}, respectively) means that REP decides to fire (not to fire, respectively) G after G proposes bailout. We denote by β_{BO} (β_{NB}) the probability that REP does not fire G after G proposes to bailout (not to bailout).

At each terminal node of the tree, the cost of the actions of the two players can be specified. We give an example to highlight how a strategic conflict arises in our setup.

First, G's private information (value of χ) is crucial to REP's action cost. For instance, if REP chooses F_{BO} after G plays BO, then the cost for REP is $\phi+T$ if $\chi=\chi_H$ (since REP will himself bailout afterwards) and $\phi+\chi_L$ if $\chi=\chi_L$ (since REP won't bailout afterwards), whereas if REP chooses NF_{BO}, then the cost for REP is T for both values of χ.

Second, G's action cost is determined by REP's choice. For example, if G plays BO_H after learning $\chi=\chi_H$, then the cost of BO_H for G is $\phi+T$ if REP plays F_{BO} (the cost of NB_H is $(1+\gamma)\chi_H$ or χ_H depending on whether G is biased or not, respectively), and the cost of BO_H is T if REP plays NF_{BO} (the cost of NB_H is $(1+\gamma)\chi_H$ or χ_H depending on whether G is biased or not, respectively).

The fundamental strategic conflict is that G wants REP to choose NF_{BO} for either type $\chi=\chi_L$ or χ_H, but REP prefers to play NF_{BO} instead of F_{BO} only if $\chi=\chi_H$. Indeed, in the case $\chi=\chi_H$, the cost of not firing G, T, is less than the cost of firing G, $\phi+T$ (as bailout is justified and REP will himself bailout); whereas in the case $\chi=\chi_L$, the cost of not firing G, T, may be greater than the cost of firing G, $\phi+\chi_L$.

All in all, G cannot convey its private information. Since G always prefers that REP chooses not to fire the government, REP will always wonder whether he should trust G after G's action.

In a Perfect Bayesian Equilibrium, REP makes his or her choice based on the updated probability, according to Bayes' rule, that the information available to G is $\chi=\chi_H$ after G proposes to bailout (not to bailout, respectively).

To avoid a multiplicity of cases, the consequences of being biased are simplified by assuming that a biased government proposes to bailout regardless of the value of χ (Conditions (1) and (2) in the text). As a result, the values of α and β in the diagram are trivial, as will be expounded in Appendix C.

Appendix C

Derivation of Proposition 1.

It is useful to make some preliminary points.

Lemma 2. *In equilibrium:*

1) A biased policymaker always proposes to bailout whether or not he or she acknowledges that dismissal if doing so;

2) A benevolent policymaker proposes to bailout when $\chi=\chi_H$ *if* $\phi+T<\chi_H$*;*

3) A benevolent policymaker never proposes to bailout when $\chi=\chi_L$.

Proof. Point 1 stems from Conditions (1) and (2). If the policymaker believes that he or she will not be dismissed, then the cost of bailout is T, which is less than the cost of no bailout, $(1+\gamma)\chi$, for both values of χ, since $T<\chi_H\leq(1+\gamma)\chi_L<(1+\gamma)\chi_H$.

If the policymaker believes that he or she will be dismissed, then in the case $\chi=\chi_L$, the cost of bailout is $\phi+\chi_L$ (the representative agent won't bailout when in charge), which is less than the cost of no bailout, $(1+\gamma)\chi_L$, since $\phi<\gamma\ \chi_L$; and in the case $\chi=\chi_H$, the cost of bailout is $\phi+T$ (the representative agent will bailout when in charge), which is less than the cost of no bailout, $(1+\gamma)\chi_H$, since $\phi<\gamma\ \chi_H$ and $T<\chi_H$. As for Point 2, the cost of no bailout is $\phi+T$ if the benevolent policymaker is dismissed after proposing to bailout (after which the representative agent will himself bailout), and T if she is not overturned. Therefore the benevolent policymaker proposes to bailout if $\phi+T<\chi_H$, the cost of no bailout. Point 3 follows from that the cost of no bailout, χ_L, is less than the cost of bailout whether the benevolent policymaker expects to be retained ($T>\chi_L$) or fired ($\phi+\chi_L>\chi_L$). This ends the proof of Lemma 2. □

We now derive the PBE. We start with Type *i*. First, the policymaker's strategy is optimal. This follows from Point 1 for a biased policymaker and from Point 2 for a benevolent one, since the inequality $\phi+T<\chi_H$ is satisfied in Type *i*. We now show that the representative agent opts not to dismiss the policymaker after the proposal. First, if the policymaker proposes no bailout, then the representative agent has no incentive to overturn the policymaker. Indeed, the representative agent infers that $\chi=\chi_L$ with probability one (Points 1 to 3). Therefore, no bailout is socially optimal and there is no reason to dismiss the policymaker (on the contrary, dismissing the policymaker would result in a cost ϕ). Second, if the policymaker proposes bailout, then the representative agent has no incentive either to fire the policymaker, since the cost of dismissal is greater than that of accepting the policymaker's proposal. To see that, the cost of retaining the policymaker is T, while the expected cost of firing her is $\phi+zT+(1-z)\chi_L$, with $z=P(\chi=\chi_H \mid$ policymaker proposes bailout). Indeed, the representative agent expects that he will himself bailout with probability z and won't bailout with probability $(1-z)$. Finally, $T\leq\phi+zT+(1-z)\chi_L$ boils down to the right-hand inequality of the condition of Type *i*. Note that using Bayes' rule to compute z makes sense only in the case $\phi+T>\chi_H$. Indeed, if $\phi+T>\chi_H$, then a benevolent policymaker does not bailout regardless of the value χ (Points 2 and 3) and a biased one always bails out (Point 1), and thus $z=P(\chi=\chi_H \mid$ policymaker proposes bailout$)=P(\chi=\chi_H)$.

Using Bayes' rule, we now show that $z=(1-q)/[(1-q)s+(1-s)]$, in the configuration $\phi+T\leq\chi_H$. With standard notation: $z=P(\chi=\chi_H \mid$ bailout$)=P($bailout $\mid \chi=\chi_H)$ * $P(\chi=\chi_H)/P($bailout$)=P$ (bailout $\mid =\chi_H)$ * $P(\chi=\chi_H)/[P($bailout $\mid$ benevolent) (P(benevolent)$+P($bailout $\mid$ biased) * P (biased)]. Now, $P($bailout $\mid$ biased$)=1$ (Point 1 above) and $P($bailout $\mid \chi=\chi_H)=1$ (Points 1 and 2, since $\phi+T\leq\chi_H$). Therefore, $z=P(\chi=\chi_H)/[P($bailout $\mid$ benevolent) * P(benevolent)$+P$(biased)$]=(1-q)/[(1-q)s+(1-s)]$.

In PBE of Type *ii*, a political crisis occurs unless the policymaker is benevolent and the social cost of bank crisis is low. The proof that the policymaker's strategy is optimal is identical to Type *i* above. However, here the representative agent opts to dismiss the policymaker if he or she proposes to bailout, since the cost of accepting the policymaker's proposal is greater than the cost of dismissal: $\chi_L+\phi/(1-z)<T$.

Therefore, in PBE of Type *ii*, a benevolent policymaker ends up fired even though he or she rightfully claimed that $\chi=\chi_H$ and a bailout was necessary. This stems from the fact that it is impossible to convince the representative agent that a bailout is really called for because of the political distortion and information asymmetry. In PBE of Type *iii*, a benevolent policymaker does not propose to bailout when $\chi=\chi_H$. This is Point 2 above. Intuitively, the political cost ϕ is too high: $\chi_H<\phi+T$. This ends the derivation of Proposition 1. □

In the diagram of Appendix B, the properties shown above translate into: $\alpha_L=s$ (a bailout proposal amounts to a biased government if $\chi=\chi_L$); $\alpha_H=0$ if $\phi+T\leq\chi_H$ ($\alpha_H=s$ if

$\phi + T > \chi_H$, respectively); $\beta_{NB} = 1$ (the representative agent will not rationally fire a policymaker who proposes no bailout); $\beta_{BO} = 1$ if $T \leq \chi_L + \phi/(1-z)$ (the representative agent will not overturn a government who proposes bailout in this configuration); and $\beta_{BO} = 0$ if $T > \chi_L + \phi/(1-z)$.

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