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# Political connections, informational asymmetry, and the efficient resolution of financial distress☆

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ABSTRACT

We show that securities issued by a distressed firm, often through exchange offers, provide the most efficient resolution of financial restructuring. Information asymmetry between the firm-bank coalition and small bondholders gives rise to other forms of distress resolution such as refinancing, public workout, and the inefficiency of liquidation. We find that political lobbying by the firm-bank adds to these inefficiencies and inhibits the development of a private market for distressed securities. Cross-country evidence is consistent with this and indicates that improved creditor rights, and the depth of information available to creditors reduce the likelihood of inefficient distress resolution.

## 1. Introduction

A large literature has documented inefficiencies in the bankruptcy procedures of many emerging economies, which consume time and entail large costs for stakeholders. While the average time for resolution in court supervised bankruptcy is 20 months in the US, it ranges from 3 to 7 years in countries such as Peru, Mexico, and Thailand.[1] The literature on debt enforcement attributes long delays and high costs of resolution to macro factors such as poor creditor's rights, legal origins, state of economic development, and lack of developed financial markets.[2]

Recent work on bankruptcy and financial distress links these macro factors to the political connection of firms in many of these countries. Politicians often sit on the board of directors, receive campaign financing and gifts, and in return favor their patron firms. Corruption in the judicial system is also reportedly rampant.[3] These connected firms, as this literature documents, spend resources to capture politicians and the judiciary. They use political connections to by-pass laws and obtain bailouts, and receive other special treatment such as cheap financing, deferred repayments, etc. Numerous country specific and cross country studies have confirmed widespread prevalence of such phenomena, especially in many emerging market economies with weak legal regimes.[4]

The literature treats political connections as an instrument for rent seeking in generic circumstances, including in financial distress. However, financially distressed firms and their creditors routinely renegotiate debt privately and this renegotiation is subject to ratification by

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[1] According to the World Bank survey of Doing Business (2012), it takes 1.9 years on an average for the OECD countries to resolve the process of bankruptcy, and the rest of the world average is 2.9 years. See Claessens and Klapper (2003) for insolvency in a large number of countries.

[2] See, Claessens et al. (2003), Claessens and Klapper (2003), and Djankov et al. (2008) among many others.

[3] See Agrawal and Knoeber (2001), Claessens et al. (2006), and Shleifer and Vishny (1994).

[4] See Brown and Sedar Dinç (2005), Faccio et al. (2002), Faccio et al. (2006), Faccio (2006), Fisman (2001), Johnson and Todd (2003), Khwaja and Mian (2005), La Porta, Silanes, and Shleifer (2002), Sapienza (2004), and Shleifer and Vishny (1994) among many others for the link between political connections and favoritism, including bail outs in financial distress.

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bankruptcy courts.[5] The possibility of rent seeking during bankruptcy under a public workout, may have substantial implications on the efficiency and the distribution of surplus between the stakeholders during private workout.[6]

We model a firm that has defaulted on current outstanding obligations to dispersed public bondholders and to a large debt holder (bank). The firm also has a potential project with positive NPV, which can be initiated only after disputes regarding payments of public debts are settled.[7] The firm-bank coalition renegotiates the unpaid debt with diffused bondholders and offers alternatives to bankruptcy.

The firm-bank coalition can (a) either refinance public debt or (b) issue new securities in exchange of the public debt, known as an exchange offer,[8] which offers a lower payment to bondholders but makes the new claims senior to the bank debt. The bondholders (i) either tender their old security and subscribe to the new one or (ii) resort to public workout, which is a restructuring process supervised by the court. We model the latter as a process that can be influenced through lobbying.[9]

We find that exchange offers are the preferred mode of restructuring the firm's debt since they reduce the amount of funds currently needed by the firm to pay for short term obligations. Moreover the exchange offer emerges as the unique equilibrium restructuring outcome when all parties have symmetric information. Although the distribution of surplus tilts towards the party with greater political connections, the mode of restructuring is unaffected.

Asymmetry of information arises when the probability of success for the new project is observed privately by the firm-bank coalition but not by the bondholders. This leads to bargaining under incomplete information where the bondholders (the uninformed party) do not accurately observe their own outside option, which is the expected payoff from public workout. As a result negotiations can sometimes fail. The game has two pure equilibria where negotiations succeed – (a) pooling equilibrium where both high and low prospect firm makes the same exchange offer and (b) a separating equilibrium where the high type makes an exchange offer and low type resorts to refinancing. In addition to these equilibria there is also the possibility of the negotiations failing, which triggers inefficient public workout with lobbying.

Our paper is related to the literature that explores the emergence of different kinds of bankruptcy systems in response to informational or contracting frictions. Povel (1999) models "tough" or "soft" bankruptcy code as a mechanism to elicit interim information from the entrepreneur about the continuation value of the firm. Ayotte and Yun (2009) discuss the emergence of creditor friendly bankruptcy when judicial expertise is imperfect in an incomplete contract environment. While these papers address the particular form of bankruptcy system in response to information frictions or incomplete contracting, our goal is to explore how such systems affect the outcome of private workout.

The paper makes three contributions to the literature. First, the connection between lobbying and (under) development of the market for distressed securities is new to the literature.[10] In particular, we show that in addition to increasing the relative payoff of the firm-bank coalition, political connections impede the development of market based resolution of distress under asymmetric information. Our results show that lobbying through political or judicial connections magnify the inefficiencies associated with informational asymmetry. This is in sharp contrast to the argument that such form of corruption may in fact increase efficiency in a second best world.[11] Our results complement the existing literature, which shows how free riding among the creditors, or coercive exchange offers by the distressed firms, or asymmetric information act as barriers to successful resolution under bankruptcy.[12]

Second, much of the current literature focuses on the decision of the stakeholders to use either private negotiations or private workout (Hotchkiss et al., 2007) but recent empirical work shows that parties in dispute use both forums (Gilson, 2012). We show that the two methods of restructuring are related because the public workout system acts as an outside option to bondholders who resort to the judiciary when private negotiations fail. The act of lobbying in our model serves as an instrument employed by the parties in a dispute to increase their pay-off from this outside option, and is new to the literature.

Third, we provide new testable implications and find that our hypotheses are also consistent with correlations we observe in the World Bank's "Doing Business" dataset. In line with the model we observe that the likelihood of inefficient piecemeal liquidation in the event of distress is decreasing in credit rights and the degree to which information on firms is available in a country.[13]

The paper is organized as follows: In Section 2, we outline the basic model. We introduce lobbying and its impact on the resolution of financial distress under symmetric information in Section 3. In Section 4, the same analysis is extended to asymmetric information. We analyse the inefficiency that arises with asymmetric information and link it to political lobbying, judicial inefficiencies and the strength of a country's disclosure laws. In Section 5, we take some of our testable hypothesis to data. The final section concludes.

[5] See, Altman and Hotchkiss (2006), Hotchkiss et al. (2007), and Senbet and Seward (1995), for the details on the private negotiations under the supervision of courts. In the US this is known as pre-pack or prepackaged bankruptcy (Baird and Rasmussen, 2003). Although there is cross country variation, intervention by courts in private negotiations are more frequent in other countries than in the US. See Djankov et al. (2008) for the experiences in other countries. For more recent references, see Banerji et al. (2018) on lobbying for bailout, Blau et al. (2013) its impact on bailing out of financial institutions, Friedman and Heinle (2019), on free-riding issues and co-ordination problems and Thakor (2021) on political influence and its impact on the allocation of credit and capital structure.

[6] This is supported by the results in Bose et al. (2021) who examine the reforms to public workout in the form of a new bankruptcy code that came into effect in India in 2016. They find that this expanded credit availability and lowered the cost of financing for distressed firms.

[7] In most countries, the law prohibits carrying out new projects without settling the dues of the public debt holders. For example, in the US, the Trust Indenture Act of 1939 explicitly prohibits this practice.

[8] Exchange offers of various types are widely used in practice because they act as powerful tools in liability management. They reduce immediate liability of cash strapped firms, allow the firms to continue, and secure a deal for the bondholders that is preferred over public workout. A large number of academic studies discuss exchange offers in the context of successful restructuring of financial distress. See surveys by Hotchkiss et al. (2007), and Senbet and Tracy (2010) for detailed empirical studies on exchange offers and Gilson (2012) for a very recent experiences.

[9] We will use the term "lobbying" to refer to the effort exerted to influence political institutions, and/or the legal process related to matters of bankruptcy, to obtain a more favorable outcome.

[10] Bebchuk and Neeman (2010) is an exception. They develop a model that shows how entrepreneurs, intermediaries and insiders of firms lobby for lower investor protection to extract rents in the context of raising capital. Our paper is complementary to this as we investigate the effect of lobbying in the context of debt renegotiations under bankruptcies in contrast to their paper focuses on raising capital. There are related works on rent-seeking activities and political lobbying and its impact on resource allocation, group formation, and the macroeconomy. See for example Ho (2007) Kim and Kim (2012) Neyapti and Arasil (2016).

[11] See Bardhan (1997) for a discussion of the argument in favor of corruption based on the theory of the second best.

[12] See Bruche (2011), Bris and Welch (2005), Chatterjee et al. (1995), Gertner and Scharfstein (1991), and Giammarino (1989) among others. For good surveys see Hotchkiss et al. (2007), and Senbet and Seward (1995) for the early literature.

[13] Additional empirical support for this comes from Djankov et al. (2008), and Hotchkiss et al. (2007).

## 2. Model

The firm currently, in period 1, is in financial distress. The face value of the bank debt is $B$, which is due in period 1. The total volume of public debt is $D$, of which $\lambda D$ is due currently at period 1 and the rest matures in the next period. The current assets of the firm of liquidation value $L$ is strictly less than the current liabilities $B + \lambda D$.[14] For simplicity we normalize $L = 0$.[15]

The firm may be reorganized with the bank playing a governing role.[16] We abstract away from any agency issues that may arise between the firm and the bank and treat the firm-bank as a single entity for our analysis. The process of reorganization consists of the initiation of a new project, and (a) either full payment of current dues to the public debt holders (hereinafter referred to as bondholders), or (b) a new payment plan offered by the firm-bank coalition and accepted by the bondholders. This continuation project yields a stochastic return. There are three possible states[17] that yield $y_2, y_1$, and 0 with probability $tp_2, p_1$ and $1 - p_1 - tp_2$ and $y_2 > y_1 > 0$. To begin with we assume that the bondholders and the firm-bank have symmetric information about returns. In Section 4, we will assume that $t$ is a realization of a random variable $T$ and this will become the source of informational asymmetry as the firm-bank will know $t$ whereas the bondholders will not.

The continuation of the firm with the new project hinges on the successful private workout between the firm-bank, and the bondholders and it involves one of two alternatives: either (i) the bank refinances the current financial liabilities of the firm by repaying $\lambda D$ to the public debt holders, and rolling over its own debt $B$, or (ii) the firm-bank coalition restructures the public debt by making an exchange offer that will be described in the following sections in detail. For expositional convenience, we assume that the continuation project does not require any new investment and that all other assets of the firm, except the return $y_i$, atrophy to zero by the end of the second period.

The process of reorganization is risky as the new project pays off both public and private debt in case of the realization of $y_2$ but in all other scenarios, the cash-flow from the project is only sufficient to cover the debt to the bondholders. To specify this inadequacy of $y_1$, we assume that

$$0 < (1 - \lambda)D < y_1 < (1 - \lambda)D + B < y_2. \tag{1}$$

This assumption implies that if the bank refinances and rolls over its own debt to the next period, the firm defaults in discharging its debt obligations if continuation yields $y_1$. We assume that, in this case, the return is split between the firm-bank and the bondholders, with the share of the latter being $\sigma \in (0, 1)$. In our model this is the parameter that captures the degree to which the bondholders are politically connected. Conversely $1 - \sigma$ represents the relative political connectedness of the firm-bank.[18] If the bondholders and the firm are equally politically connected, we will have $\sigma = 1/2$. Whenever the firm-bank is relatively more politically connected than the bondholders we will have $\sigma < 1/2$. This formulation captures the idea that political connections increase the bargaining power of the politically connected party leading to a larger share of the value of the firm in the event of distress. This may result in the violation of the APR (absolute priority rule) in a weak legal regime where judiciary is vulnerable to political pressures. We assume that $\sigma y_1 < (1 - \lambda)D$ to focus on the interesting case when the share of bondholders in the project returns in state $y_1$ are not sufficient to cover their dues.

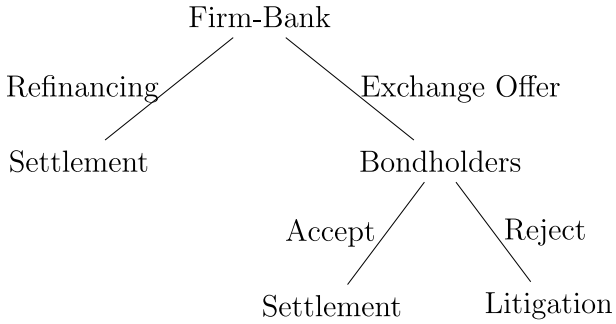


**Fig. 1.** Timing.

## 3. Benchmark model with symmetric information

In this section all parties have symmetric information and a common prior about the cash flow $y_i$ of the new project, and the bank opts for continuation of the firm. The firm-bank can initiate such a process only if it successfully restructures the public debt via one of the following methods: 1. The firm-banks can offer a new security of lower payments but of higher seniority in exchange for the existing bonds, or 2. It can repay the outstanding short term debt of the bondholders and in each case, the bank rolls over its own debt to the next period. The former is known as an 'exchange offer'[19] and the latter is 'refinancing'. In this section, we find out which of these two methods is more efficient and chosen by the firm-bank coalition. We also examine whether this choice is influenced by each stakeholder's bid for a higher share of the pie in litigation. The timeline of events, drawn in Fig. 1, is as follows:

### 3.1. Timing

1. The firm-bank either refinances the short term public debt or makes an exchange offer to the bondholders.
2. If an exchange offer is made, bondholders decide whether to accept or reject.
3. If the bondholders reject an exchange offer, litigation is triggered and parties choose their effort to influence the pay-off in future bankruptcy.
4. If the offer is accepted, the parties settle.
5. The returns from period two are realized and divided between the bank and the bondholders. The division is either determined by the court if litigation was triggered at stage 3 or according to the agreement reached at an earlier stage.

The time line of events above explicitly illustrates the occurrence of litigation and use of political connections. This happens in stage 3 when bondholders reject the terms of the exchange offer. In our model, political connections are used during litigation. We elaborate this below.

[14] We could have made bank debt the senior most in liquidation (see Houston and James, 1996; Welch, 1997), while granting the bondholders the residual. Our analysis does not depend on this priority of claims.

[15] This is without any loss in generality because we assume that the NPV of the firm's future project exceeds liquidation value so that it is in everyone's interest to restructure the firm. Our results will hold as long as the expected pay-off in continuation exceeds the same under liquidation.

[16] The empirical literature documents the leading role played by banks during financial distress when a firm is reorganized with a new project. They often bring in a new management team, have their representatives in the board and closely monitor activities. See Gilson et al. (1990), James (1996), and Gilson (2012).

[17] We need at least three possible states of nature to introduce seniority in debt renegotiation explained below.

[18] During public workout parties can influence judges and politicians to grab the higher share by violating the priority rules written in the original debt contracts. In this sense, $1 - \sigma$ captures the political or judicial influence of the firm-bank.

[19] Gertner and Scharfstein (1991), and Hotchkiss et al. (2007) for empirical and legal details.

The model can be solved backwards. First, in Section 3.2, we derive the payoffs from public workout (litigation). Using these, we can analyze the firm-bank's choice of private workout between refinancing and making an exchange offer.

### 3.2. Litigation

Our key innovation is to link private workout to the judicial and political environment, which each party could try to influence by spending resources. In case private workout fails, bondholders ($B$) resort to both legal recourse, such as a class action law suit or winding up proceedings, and also non legal means, such as lobbying through political connections. The firm-bank ($F$) coalition does the same.[20] The expected pay-off of bondholders is

$$tp_2D + p_1y_1\Gamma(x_B, x_F) - x_B, \tag{2}$$

and that of the firm-bank is

$$p_2t(y_2 - D) + p_1y_1(1 - \Gamma(x_B, x_F)) - x_F, \tag{3}$$

where

$$\Gamma(x_B, x_F) = \begin{cases} \sigma & \text{if } x_B = x_F = 0 \\ \dfrac{\sigma x_B{}^{\gamma}}{\sigma x_B{}^{\gamma} + (1-\sigma)x_F{}^{\gamma}} & \text{otherwise, where } \gamma \in (0,1) \end{cases} \tag{4}$$

The expected payoffs of both parties have two components. The second part is affected by the function $\Gamma(x_B, x_F)$, which is the standard "Tullock" contest function commonly used in the law and economics, conflict, and political lobbying literature.[21] Bondholders collectively spend effort $x_B$ and firm-bank spends $x_F$, in order to influence judges or politicians.[22] When $x_B = x_F$, the probability of winning (or equivalently the share they are awarded) is $\sigma$ and $1 - \sigma$. Our treatment of bias in the contest function by introducing the parameter $\sigma$ follows the literature that extends the symmetric Tullock contest to "unfair" contests as axiomatised in Clark and Riis (1998).[23] Mapping this to our set up, $\sigma > 1/2$ captures stronger political connections for the bondholders relative to the firm-bank. With stronger political connections, the bondholders will have a higher likelihood of winning when efforts are equal. Moreover, $\sigma > 1/2$ also implies that the marginal impact of additional effort is greater for the bondholders relative to the firm-bank. The opposite happens when $\sigma < 1/2$. In case the two parties are equally well connected, we will have $\sigma = 1/2$.

Note, while $\sigma$ stands for political connections, $\gamma$ captures the effectiveness of legal and lobbying expenditure. In the context of rent seeking, Nitzan (1994) describes this parameter as the "marginal return to lobbying outlay". It captures the extent to which the judiciary is sensitive to effort; an increased value of $\gamma$ forces both parties to spend more resources to obtain the same outcome. On the other hand, when $\gamma$ is zero, the judicial process is totally immune to lobbying effort, and consequently the parties will not dissipate any effort in equilibrium. In this case litigation is no longer inefficient.

The contest function determines the payoffs only in $y_1$ where the new project has insufficient cash flow to pay everyone. The first component is the pay-off when the new project is successful. In this case the project has generated enough cash flow and bondholders receive full payments (both short and long term). This specification of payoffs is consistent with the insolvency procedures of most of the countries that order full payments due to bondholders when the project makes a turnaround.[24]

We can find $x_F^*$ and $x_B^*$, the equilibrium efforts in court/connections by maximizing the two objective functions. The first order conditions for bondholders and firm-bank are

$$p_1(1-\sigma)\sigma\gamma y_1 \frac{x_B^{*\gamma} x_F^{*\gamma}}{(\sigma x_B^{*\gamma} + (1-\sigma)x_F^{*\gamma})^2} = x_B^* \text{and} \tag{5}$$

$$p_1(1-\sigma)\sigma\gamma y_1 \frac{x_B^{*\gamma} x_F^{*\gamma}}{(\sigma x_B^{*\gamma} + (1-\sigma)x_F^{*\gamma})^2} = x_F^*. \tag{6}$$

respectively. This yields

$$x_F^* = x_B^* = p_1(1-\sigma)\sigma\gamma y_1. \tag{7}$$

The second order condition is satisfied since $\gamma \in (0,1)$. Note that $x_B^* = x_F^*$ is unrealistic since the firm-bank and bondholders may differ in availability of resources. This can be relaxed through appropriate parmeterisation: One way to ensure differences in equilibrium effort is to allow the marginal cost of effort to be different across the firm-bank and bondholders. However, we simplify this and instead assume that the cost of effort is identical as our object here is to obtain indicative results. By substituting the equilibrium efforts $x_F^*$ and $x_B^*$ from equation (7) into the litigation payoffs in equations (2) and (3), we find that the equilibrium litigation payoffs for the bondholders and firm-bank are

$$v_B^L = p_2tD + p_1\sigma(1-(1-\sigma)\gamma)y_1 \qquad \text{and} \tag{8}$$

$$v_F^L = p_2t(y_2 - D) + p_1(1-\sigma)(1-\sigma\gamma)y_1, \tag{9}$$

respectively. With this set up, we compare the firm-bank's expected pay-off under both refinancing and exchange offer to find out its preferred mode of private workout.

### 3.3. Private workout

Given the payoffs from litigation, the firm bank decides between making an exchange offer and refinancing the loan.

#### 3.3.1. Refinancing

If the bank offers to refinance the firm's debt, the firm-bank must pay the bondholders $\lambda D$ in the first period. All parties are paid after the realization of cash flows from the new project in the next period. Hence the expected payoffs for the firm-bank and bondholders are

$$v_F^R = p_2t(y_2 - (1-\lambda)D) + p_1y_1(1-\sigma) - \lambda D \text{and} \tag{10}$$

$$v_B^R = \lambda D + p_2t(1-\lambda)D + p_1\sigma y_1. \tag{11}$$

#### 3.3.2. Exchange offer

If the firm-bank chooses to make an exchange offer, it issues a new security whereby bondholders receive $\alpha\lambda D$ in the first period and $\alpha(1-\lambda)D$ in the second period (with $\alpha < 1$) in all but the worst contingency where the cash flow is zero. Thus, in exchange of reducing a part of their total debt, bondholders are made senior to the existing securities. The bank pays the promised amount in the current period.

[20] The law suit is one example but parties could also spend resources to lobby their case by other means including political pressure or bribing or engaging some other forms of corruptions such as bribery of judges or campaign financing of politicians. See Dinç (2005), Krueger (1974), and Rose-Ackerman (1999) among other examples cited earlier.

[21] See also Cooter and Rubinfeld (1989), and Hay and Spier (1998) for surveys.

[22] We assume that the fragmented bondholders are united by a class action law suit and abstract away from free riding issues of the kind famously highlighted in Olson (1965). The presence of the free rider problem would, in our context, lead to an even lower payoff for the bondholders.

[23] See Farmer and Pecorino (1999) for an example of where litigation is modelled as a contest with bias when the players are asymmetric.

[24] It is natural to assume that in the event of success, debt is paid in full and the firm keeps the residual. See Altman and Hotchkiss (2006), and Djankov et al. (2008) for the informal description of bankruptcy processes around the world.

The respective expected payoffs of the firm-bank ($v_F^E$) and the bondholders ($v_B^E$) from the exchange offer are:

$$v_F^E = tp_2(y_2 - \alpha(1-\lambda)D) + p_1(y_1 - \alpha(1-\lambda)D) - \alpha\lambda D \tag{12}$$

$$= tp_2y_2 + p_1y_1 - \alpha D(\lambda + (1-\lambda)(p_2t + p_1)) \tag{13}$$

$$v_B^E = \alpha D(\lambda + (1-\lambda)(p_2t + p_1)). \tag{14}$$

The firm-bank coalition offers $\alpha$ of senior debt for \$1 of the existing debt of both maturities, and postpones repayment of bank debt till period 2. Thus, in return for tendering their old bonds, bondholders receive a package of new securities that enjoy *more* seniority in their *future* pay-off but receive a lower cash payout in the *current and future* period.[25] Hence, it relieves the distressed firm of the liquidity problem (to the extent current payments to bondholders get reduced) and such an exchange offer will not violate the terms of laws such as the Trust Indenture Act in the US if the new bonds are offered without extinguishing the old bonds. However, the success of an exchange offer depends on its acceptability to bondholders, which in turn, depends on the terms of the offer captured by $\alpha$, which is determined endogenously.

**Proposition 1.** *The firm-bank strictly prefers restructuring of the public debt via an exchange offer to direct refinancing.*

**Proof of Proposition 1.** The outside option of bondholders if they reject an exchange offer is $v_B^L$. Since the firm-bank makes a take it or leave it offer, the bondholders are pushed to their outside option and thus in equilibrium,

$$v_B^L = \alpha D(\lambda + (1-\lambda)(p_2t + p_1)) \Longrightarrow \alpha(t)D = \frac{p_2tD + p_1\sigma(1-(1-\sigma)\gamma)y_1}{\lambda + (1-\lambda)(p_2t + p_1)} \tag{15}$$

Plugging back $\alpha(t)$ we find

$$v_F^E = p_2t(y_2 - D) + p_1(1-\sigma)(1+\sigma\gamma)y_1. \tag{16}$$

For the firm-bank to strictly prefer an exchange offer we must have $v_F^E > v_F^R$ defined in equation (10). Using these expressions and comparing them, we have:

$$v_F^E > v_F^R \tag{17}$$

$$\Leftrightarrow p_1y_1\sigma(1-\sigma)\gamma + D\lambda(1-p_2t) > 0 \tag{18}$$

From the inequality in (18) we find that an exchange offer dominates refinancing. This is because it lowers the overall expected payment to the bondholders as it allows the firm-bank to squeeze the bondholders to the least possible payment that makes them indifferent between accepting and rejecting the offer. The bondholders' gains depend on their reservation payoff from litigation, which is decreasing in $1-\sigma$, the degree of political connection of the firm-bank. With complete information, an increase in $\sigma$ increases the equilibrium payoff of the bondholders. However, there is no impact on the choice of the restructuring method.

Note that

$$\frac{\partial\alpha(t)}{\partial t} = \frac{p_2(1-\alpha(t)(1-\lambda))}{\lambda + (1-\lambda)(tp_2 + p_1)} > 0. \tag{19}$$

This implies that the size of $\alpha$ is increasing in the productivity of the firm. As $t$ increases, the litigation payoffs of the bondholders increases, and this in turn improves what the firm-bank must offer them to induce them to accept an exchange offer.

**Remark 1.** The unique equilibrium with complete information is efficient.

The exchange offer made by the firm-bank is always accepted by the bondholders and therefore litigation, the only source of inefficiency in our model, never materializes. As we will see in Section 4, this is no longer the case when the firm-bank and bondholders are asymmetrically informed.

## 4. Asymmetric information

This section analyzes how the choice of restructuring is affected by lobbying efforts when the firm-bank has more information about the project's prospects than the bondholders. The situation is worth exploring for two reasons: First, the bank being the large creditor, monitors the firm closely and may gather information key to the project's success which the dispersed bondholders might lack.[26] Second, it is well known that informational asymmetry of this type may lead to failure of efficient bargaining, and in our context this may cause more expensive methods to displace alternative cheaper methods of restructuring. We find that this is indeed the case and that lobbying exacerbates the inefficiency by increasing the likelihood of the failure of private workout. Hence, our plan in this section is (a) to characterize the set of pure equilibria[27] and the conditions under which the efficient ones are likely to prevail, and (b) to find out how lobbying affects the inefficiency under asymmetric information.

The asymmetry of information is introduced in the model by allowing the firm-bank to privately observe the realization of the random variable $T$ at the start of the game, whereas the bondholders are uninformed. To simplify things assume that the $T$ takes only two values: It takes value $t = \tau$ where $0 \le \tau < 1$ with probability $1-\theta$ and value $t = 1$ with probability $\theta$. Hence

$$\mathrm{E}(T) = \tau(1-\theta) + \theta \qquad \text{and} \qquad \mathrm{E}(T) \in (0,1). \tag{20}$$

$E(T)$ is the prior belief of the bondholders about the state of the world. This may change in equilibrium as the bondholders update their beliefs based on the offer made by the firm-bank.

We focus on perfect Bayesian equilibria: The firm-bank observes the realization of $T$ and chooses between refinancing and an exchange offer. If it chooses to make an exchange offer, it also decides on the size. Observing the firm-bank's choice, the bondholders update their beliefs to $\widehat{T}$, and choose their response. In general, the bondholders' posterior belief will take some value $\widehat{T} \in [\tau, 1]$. However, in our characterisation result that will follow in Proposition 2, we focus on pure strategy equilibria. This narrows our analysis to pooling and separating equilibria. The posterior beliefs of the bondholders in these equilibria are straightforward: In a pooling equilibrium the posterior $\widehat{T} = \mathrm{E}(T)$, whereas in a separating equilibrium, depending on the action of the firm-bank, the belief updates to either $\widehat{T} = 1$ or $\widehat{T} = \tau$.

If the debt is refinanced, the bank pays off the current obligation of the firm towards the bondholders. In this case the payoffs of the firm-bank and bondholders are

$$v_F^R(t) = p_2t(y_2 - (1-\lambda)D) + p_1y_1(1-\sigma) - \lambda D \tag{21}$$

$$v_B^R(\widehat{T}) = \lambda D + p_2\widehat{T}(1-\lambda)D + p_1\sigma y_1. \tag{22}$$

[25] We make it clear that our results do not depend on the exact specification of the exchange offer described above. We could proceed with an optimal design of this new security where current bondholders receive a smaller amount of cash today in exchange for a higher amount in securities designed optimally by the firm-bank coalition. Instead the current specification follows from widely prevalent practice in bankruptcy. See Altman and Hotchkiss (2006), Hotchkiss et al. (2007), and Senbet and Tracy (2010)

[26] See, Hotchkiss et al. (2007) or Senbet and Seward (1995) for a very good review of asymmetric information under financial distress.

[27] For simplicity we focus only on pure strategy equilibria.

Equation (21) represents the pay-off to the firm-bank from refinancing. This is the residual cash flow after making full payment to bondholders if $y = y_2$, and $y_1(1 - \sigma)$ when cash flow available is less than payments due to bondholders. The bank's offer to refinance the debt may signal something about the true state to the bondholders. The bondholders update their belief to $\hat{T}$. Note that $v_B^R(\hat{T})$, the expected payoff of the bondholders when the debt is refinanced, is a function of their belief $\hat{T}$ whereas the payoff of the bank is expressed as function of the true state since the bank observes the realization of $t$.

If on the other hand the firm-bank makes an exchange offer of size $\alpha$, the payoffs are

$$v_F^E(\alpha, t) = tp_2y_2 + p_1y_1 - \alpha D(\lambda + (1 - \lambda)(p_2t + p_1)) \tag{23}$$

$$v_B^E(\alpha, \hat{T}) = \alpha D(\lambda + (1 - \lambda)(p_2\hat{T} + p_1)). \tag{24}$$

In equation (23) $\alpha D(\lambda + (1 - \lambda)(p_2t + p_1)$ is the expected payment to bondholders from the firm-bank's point of view because it can observe its type. In equation (24), this expected payments to bondholders take the form of $\alpha D\Big(\lambda + (1 - \lambda)(p_2\hat{T} + p_1)$ where the term reflects the updated belief $\hat{T}$ by the bondholders on firm-bank's type upon observing the exchange offer. That is, the bondholders observe $\alpha$, compute their posterior belief $\hat{T}$ and decide whether to accept or reject the offer based on whether the offer is greater than $v_B^L(\hat{T})$. An offer is accepted by the bondholders as long as

$$\alpha D \geq \frac{v_B^L(\hat{T})}{\lambda + (1 - \lambda)(\hat{T}p_2 + p_1)} \tag{25}$$

$$\Leftrightarrow \alpha D \geq \frac{p_2\hat{T}D + p_1\sigma(1 - (1 - \sigma)\gamma)y_1}{\lambda + (1 - \lambda)(\hat{T}p_2 + p_1)} \tag{26}$$

This shows that for $\alpha$ to be accepted by the bondholders it must be larger than their expected payoff with litigation under the beliefs that are induced by the offer.

If the bank makes an offer that is rejected by the bondholders their payoffs are

$$v_F^L(t) = p_2t(y_2 - D) + p_1(1 - \sigma)(1 - \sigma\gamma)y_1 \tag{27}$$

$$v_B^L(\hat{T}) = p_2\hat{T}D + \sigma(1 - (1 - \sigma)\gamma)p_1y_1. \tag{28}$$

### 4.1. Characterizing the equilibria

The following lemma will be useful in characterizing the set of equilibria.

**Lemma 1.** *In any perfect Bayesian equilibrium, a high type firm-bank must make an exchange offer that is accepted by the bondholders.*

**Proof.** Proof in Appendix A.

Using this lemma we can restrict our attention to equilibria where the high type-firm bank makes an exchange offer. We are now ready to state our characterization result.

**Proposition 2.** *The pure strategy perfect Bayesian equilibria can be characterized as follows.*

1. *If* $v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(\mathrm{E}(T)), \tau)\}$ *then there exists a separating equilibrium where the high type makes an exchange offer that is accepted and low type refinances the debt.*
2. *If* $v_F^E(\alpha(\mathrm{E}(T)) \geq \max\{v_F^L(\tau), v_F^R(\tau)\}$, *then there exists a continuum of pooling equilibria where both high and low types make the same exchange offer that is accepted.*
3. *If* $v_F^L(\tau) \geq \max\{v_F^R(\tau), v_F^E(\alpha(\mathrm{E}(T)), \tau)\}$, *then there exists a separating equilibrium where high type makes an exchange offer that is accepted and low type makes an exchange offer that is rejected.*

**proof.** See Appendix A for the full description of the three types of equilibria and the proof of existence.

First, the separating equilibrium where the low type offers refinancing and the high type makes an exchange offer. Second, a class of pooling equilibria where both types make the same exchange offer that is accepted by the bondholders. And third, the inefficient separating equilibrium where a high type makes an exchange offer that is accepted and a low type makes a low exchange offer that is rejected by bondholders triggering litigation. The separating equilibria emerge when a low type firm needs to make too high an exchange offer that they prefer refinancing or litigation. The opposite situation arises when high and low type make a pooling offer that is accepted by the bondholders.

**Remark 2.** Refinancing is preferred over exchange offers only when there is asymmetry of information between the firm-bank and the bondholders.

Unlike the game of complete information, we find that refinancing arises in equilibrium with incomplete information. Consequently we are more likely to observe exchange offers in countries with mechanisms to ensure symmetry of information between borrowers and lenders. This proposition is consistent with the stylized fact that exchange offers are typically observed only in advanced jurisdictions such as the US where strength of disclosure laws is greater.[28]

Next we look at how these equilibria compare in terms of efficiency and how a change in the underlying parameter $\sigma$ affects the existence of these equilibria. Note that the equilibrium efforts that the bank and bondholders exert in court are uncontaminated by informational asymmetry on $T$. This is because the probability with which output $y_1$ arises is independent of $T$. Hence we still have $x_F^* = x_B^* = p_1(1 - \sigma)\sigma\gamma y_1$. Consequently the sufficient statistic for inefficiency of an equilibrium in our model is simply the probability with which litigation arises.

**Remark 3.** Litigation only arises with incomplete information.

This remark shows that it is possible to rank the equilibria in terms of the sum of the payoffs for the two players. All equilibria where private workout succeeds are equally efficient – they differ only in how surplus is distributed between the firm-bank and the bondholders. Inefficiency only arises when private workout fails triggering litigation, and the parties resort to lobbying. This only happens when the bondholders are asymmetrically informed about the continuation prospects of the firm.

One point of consideration is the possibility of side payments between the firm-bank and bondholders. Since litigation is inefficient, is it possible for the players to coordinate through side payments in a way that this inefficiency is avoided? The results derived here naturally depend on the specific game played between the firm-bank and bondholders as captured in the extensive form in Fig. 1. Consequently, the revelation of information by the firm-bank is constrained to come about only through their actions – whether they choose refinancing or exchange offer, and in case of the latter, the size of the exchange offer.

Nonetheless, we conjecture that the possibility of side payments may not fully resolve the inefficiency here. Litigation acts as a mechanism to ensure the separation of types by imposing a cost on the low type. The asymmetry between the firm-bank and bondholders arises from information about the future profitability of the firm. Such information is assumed to be observable by the firm-bank but it may not be verifiable to the bondholders. Consequently, the firm-bank may lack a credible instrument to transmit this information.

Note that litigation arises only in the equilibrium where the firm-bank makes separating exchange offers (Case 3 Proposition 2). Consider the case (analogous to the full information equilibrium in Proposition 1)

[28] See See Altman and Hotchkiss (2006), Hotchkiss et al. (2007), Senbet and Tracy (2010)

where the firm-bank makes an exchange offer conditional on the realisation of $T$ that is always accepted by the bondholders. In this case, a high type ($T = 1$) firm-bank has an incentive to pretend to be a low type and make a lower exchange offer. This will increase the payoff of the firm-bank without triggering litigation. Therefore, unless the information on $T$ is verifiable, it may be impossible for bondholders to fully trust a firm-bank that claims that $T = \tau$. Since the possibility of litigation ensures truth-telling by the firm-bank, it may be impossible to fully eliminate it. Any side payment offered by the bondholders would be met by the same declaration by the firm bank – that $T = \tau$. In absence of verifiability, the side payment will not be effective in revealing information.

### 4.2. Lobbying, incomplete information, and inefficiency

The next two proposition connects the political connectedness of the firm-bank, and the project prospects to the efficiency of the equilibrium that arises under incomplete information.

**Proposition 3.** *There exists a* $\hat{\sigma} \in (0, 1/2)$ *such that* $v_F^L(\tau) \geq \max\{v_F^R(\tau), v_F^E(\alpha(\mathrm{E}(T)), \tau)\}$ *if* $\sigma < \hat{\sigma}$.

**Proof.** Proof in Appendix A.

Focusing on the incomplete information setting, proposition 3 analyses the parametric region in which the inefficient litigation equilibrium exists. In particular it states that the likelihood of observing the inefficient equilibrium where bondholders reject some exchange offers, is decreasing in $\sigma$, the extent to which bondholders are protected, in case litigation is triggered. We have assumed that $\sigma \in (0, 1/2)$ where $1 - \sigma$ captures the political connections or judicial bias in favor of the firm-bank. If $\sigma = 1/2$ the law treats the firm-bank and the bondholders equally. This proposition implies that as we move to a regime where bondholder rights are protected, the likelihood of observing the more efficient equilibria, namely the pooling exchange offer equilibrium and separating equilibrium with refinancing, increases.

Assume that the bank privately observes the realization of $T$ with probability $1 - q$ and with probability $q$, both the bank and the bondholders observe the realization of $T$.

**Proposition 4.** *Assume that the firm gets liquidated with some probability if it goes into litigation yielding a payoff that is normalized to 0 for all parties. The likelihood of liquidation is weakly decreasing in q.*

**Proof.** Proof in Appendix A.

We find that the probability with which the firm is inefficiently liquidated is lower with complete information compared to the pooling or separating equilibria under incomplete information. This is because, knowing the exact litigation payoff of the bondholders the firm-bank coalition can make the lowest possible exchange offer that is always accepted. Since $q$ is the probability with which the bondholders are informed, and consequently the game is one of complete information, it follows that the probability liquidation is declining in $q$. We interpret $q$ as the degree to which information about firm prospects is available to the bondholder. In Section 5 we attempt to investigate whether this prediction is supported by data.

**Remark 4.** Incomplete information causes inefficiency as it increases the likelihood of liquidation. Similarly, the likelihood of liquidation is weakly increasing in the political connections of the firm-bank.

Remark 4 summarizes the results in this section. Inefficient public workout in form of liquidation is more likely when bondholders are asymmetrically informed. Moreover, with incomplete information the likelihood of liquidation is larger when bondholder rights are not protected against the possibility of the firm-bank lobbying through its political connections or through influencing the judicial outcome. In Section 5 we attempt to investigate whether this prediction is supported by data.

## 5. Empirics

We have linked the probability of liquidation to political lobbying captured by $\sigma$, and the degree of asymmetric information $1 - q$. The likelihood of inefficient liquidation is decreasing in $\sigma$ and $1 - q$. Moreover, we also predict that in addition to these direct effects, there is an additional effect of the interaction of the two factors. In particular, as seen in remark 4, the model predicts that the likelihood of liquidation is even greater when firms are politically connected *and* the asymmetry of information between the firm-bank and bondholders is large. We use the most recent round of the World Bank Doing Business Dataset,[29] which comprises of cross section of 190 countries. We emphasize that this analysis is correlational and merely suggestive of the fact that the key predictions of our model are consistent with the data.

We regress

$$Y_i = \beta_1 + \beta_2 \text{ Creditor Bureau} + \beta_3 \text{ Creditor Participation} + \mathbf{X}'\Lambda + \varepsilon \tag{29}$$

where $Y_i$ is outcome of bankruptcy. This variable takes value 0 in case of liquidation and 1 in case where the firm is allowed to continue into the second period. We use the resolving insolvency outcome from the doing business dataset, which takes value 0 in case of piecemeal sale and 1 in case the firm is sold as a going concern.[30]

We use the depth of credit information index as our proxy for $q$. Recall that $q$ is the probability with the prospects of the firm are common knowledge. Credit information index measures the coverage, scope and accessibility of credit information available through credit reporting service providers such as credit bureaus or credit registries. Greater values on this index is likely to be associated with the bondholders having greater access to information about firm's past performance and consequently its productivity.

We use creditor participation at the insolvency stage as our proxy for $\sigma$. This index takes values between 0 and 4 with higher values associated with more creditor rights at the insolvency stage. These rights include the right to participate in selecting an insolvency representative, veto rights in approval of sale of substantial debtor assets, right to access official records in insolvency proceedings, and the right to object to the decision of the court or insolvency representative. A higher score on this index would mean that the litigation game is not as biased in favor of the firm-bank.

From proposition 4 we expect $\beta_2 > 0$ since reduction in informational asymmetry should lead to less liquidation. From proposition 3 we expect $\beta_3 > 0$ as an increase in $\sigma$ would lead to a decrease in probability of observing liquidation. In addition to these two independent variables, we control for Log GDP per capita in 2018 and its square in an attempt to account for cross country factors that could affect our dependent variable and be correlated with our independent variables of interest.

Our regression result are presented in Table 2 in Appendix B. To begin with in column (1) we regress on the resolving insolvency outcome on the depth of credit information index and find a positive and significant relationship. In column (2) we run the bivariate regression with the creditor participation index and find a positive and significant correlation. Next, in column three we include the two variables together and finally in column (4) we also include linear and squared log GDP per capita. We observe that our partial correlation coefficients of interest remain positive and significant. In columns (5) and (6) we further include the interaction between the creditor participation index and the depth of credit information index. We do so to test whether

[29] See Table 1 for summary statistics. This dataset can be downloaded at http://www.doingbusiness.org.

[30] The dataset presents this variable at the country level and consequently we can view it as the average firm level outcome at the country level.

the two factors complement each other in generating the inefficiency of liquidation. However, the coefficient of interaction is insignificant.

On the whole these results suggest that the lack of creditor rights and the lack of information contribute to an increased likelihood of liquidation. These correlations are consistent with our model and give us hope that a deeper firm-level analysis would yield similar results.

## 6. Conclusion

Several empirical papers, newspaper reports, and anecdotal evidence suggest that political lobbying for extracting rents takes up resources, particularly in emerging market economies with underdeveloped legal and information facilitating institutions. In this paper, we examine a very specific issue: the impact of political connections on the legal process of bankruptcy and we find that it inhibits the financial market for distressed securities. First, it reduces the relative payoff of small debt holders, and second, it amplifies inefficiencies associated with asymmetry of information. In our model we have only focused on resolution of distress. An interesting question for future work would be to trace the impact of distress resolution in the face of lobbying, and informational asymmetries, on the depth of the debt market that emerges.

## Declaration of competing interest

We have not received any funding from any agency and do not have any conflict of interests with any parties to the best of our knowledge.

## A. Proofs

**Proof of Lemma 1.** Consider an exchange offer $\alpha(1) + \epsilon$ where $\epsilon > 0$. First consider the bondholders. For any belief $\widehat{T} \in [0,1]$, their best response to an exchange offer of $\alpha(1) + \epsilon$ is to accept. This is because their payoff from rejection is $v_B^L(\widehat{T}) < v_B^E(\alpha(1)+\epsilon, \widehat{T})$. Hence in any equilibrium bondholders must have the strategy of accepting an exchange offer of $\alpha(1) + \epsilon$.

Now consider the high type firm-bank. Note that $v_F^E(\alpha(1),1) > v_F^R(1)$ always holds by proposition 1. Moreover $v_F^E(\alpha(1),1) > v_F^L(1)$ is also true due to the inefficiency of litigation. This implies that there exists an $\epsilon$ such that $\alpha(1) + \epsilon$ is preferred by the firm-bank over refinancing, and also over any exchange offer that is rejected by the bondholders.

**Proof of proposition 2.** A perfect Bayesian equilibrium must have three ingredients. First, the firm-bank's offer must be optimal given the actions and beliefs of the bondholders. Second, the bondholders must update their belief using Bayes rule. And finally, the strategy of the bondholders must be optimal given their beliefs and the action of the firm-bank. We will now go through each of these. We first fully specify the three equilibria and then prove their existence.

1. If $v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(\mathrm{E}(T)),\tau)\}$ then there exists a separating equilibrium where
   - The firm-bank refinances the loan if $t = \tau$ and makes an exchange offer of

$$\alpha(1) = \frac{p_2 D + p_1\sigma(1-(1-\sigma)\gamma)y_1}{D(\lambda+(1-\lambda)(p_2+p_1))} \tag{30}$$

if $t = 1$.

$$\alpha(\mathrm{E}(T)) = \frac{\mathrm{E}(T)p_2 D + p_1\sigma(1-(1-\sigma)\gamma)y_1}{D(\lambda+(1-\lambda)(\mathrm{E}(T)p_2+p_1))} \tag{31}$$

   - Bondholders update their belief to $\widehat{T}=1$ if in case of an exchange offer and update their belief to $\widehat{T}=\tau$ in the event of refinancing
   - Bondholders accept $\alpha \geq \alpha(1)$ and reject all other exchange offers.
2. If $v_F^E(\alpha(\mathrm{E}(T)) \geq \max\{v_F^L(\tau), v_F^R(\tau)\}$, then there exists a pooling equilibrium where{{\spmathrm{E}}}
   - The bank always makes an exchange offer of
   - Bondholders update to $\widehat{T}=\mathrm{E}(T)$ on observing an exchange offer and $\widehat{T}=\tau$ in the event of refinancing (off-equilibrium).
   - Bondholders accept any exchange offer of $\alpha \geq \alpha(E(T))$ and reject otherwise.
3. If $v_F^L(\tau) \geq \max\{v_F^R(\tau), v_F^E(\alpha(\mathrm{E}(T)),\tau)\}$, then there exists a separating equilibrium where
   - the firm-bank makes an exchange offer of $\alpha(1)$ when $t = 1$, and an exchange offer of $\alpha(\tau)$ when $t = \tau$,
   - Bondholders update their belief to $\widehat{T}=1$ in case of any exchange $\alpha > \alpha(\tau)$, and update their belief to $\widehat{T}=\tau$ in case of $\alpha = \alpha(\tau)$ or refinancing.
   - Bondholders accept the exchange offer of $\alpha(1)$ and reject all other exchange offers.

**Case 1**. $v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(\mathrm{E}(T)),\tau)\}$ Separating equilibrium with refinancing.

We will show that the separating equilibrium with refinancing exists as long as $v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(1),\tau)\}$. Since the size of the exchange offer is increasing in $t$ we have $\alpha(1) > \alpha(E(T))$ and consequently, $v_F^E(\alpha(\mathrm{E}(T)),\tau) > v_F^E(\alpha(1),\tau)$. Hence $v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(\mathrm{E}(T)),\tau)\} \implies v_F^R(\tau) \geq \max\{v_F^L(\tau), v_F^E(\alpha(1),\tau)\}$.

1. We first focus on deriving the optimal strategy of the bank for a given belief and strategy of the bondholders. Assume that the bondholders always update to $\widehat{T}=1$ when they observe an exchange offer and $\widehat{T}=\tau$ when the bank refinances the loan. Consider the strategy for the bondholders where they reject any $\alpha < \alpha(1)$ triggering litigation and accept an offer of $\alpha \geq \alpha(1)$. Given this strategy and belief of the bondholders consider the bank's decision.
   (a) When $t = 1$ the bank prefers to make an exchange offer of $\alpha = \alpha(1)$ to a lower exchange offer since all offers less than $\alpha(1)$ are rejected triggering the litigation payoff of $v_F^L(t=1)$, which is dominated since

$$v_F^E(\widehat{T}=1|t=1) \geq v_F^L(t=1) \tag{32}$$

$$\Leftrightarrow 2p_1 y_1 \sigma(1-\sigma)\gamma \geq 0. \tag{33}$$

Also note that any offer $\alpha > \alpha(1)$ leads to a strictly lower payoff for the bank and is therefore strictly dominated by the offer of $\alpha(1)$. Moreover the payoff from making an exchange offer of $\alpha(1)$ is greater than the payoff from refinancing the loan due to proposition 1.

(b) When $t = \tau$ the bank receives a payoff of $v_F^R(\tau)$ when it refinances the loan as opposed $v_F^E(\alpha(1), \tau)$ which is the payoff from imitating a high type bank and making the exchange offer of $\alpha(1)$. Since $v_F^R(\tau) \geq v_F^E(\alpha(\mathrm{E}(T)), \tau) > v_F^E(\alpha(1), \tau)$, this is dominated. Moreover by $v_F^R(\tau) \geq v_F^L(\tau)$ we know that the bank prefers to refinance the loan rather than make any exchange offer $\alpha < \alpha(1)$ when $t = \tau$ and face litigation.

2. Next we examine what the equilibrium beliefs of the bondholders must be. The banks makes an exchange offer of $\alpha(1)$ when $t = 1$ and refinances the loan when $t = \tau$. Hence the bondholders must update to $\widehat{T} = 1$ when the observe an exchange offer of $\alpha(1)$ and $\widehat{T} = \tau$ when the bank refinances the loan. Beliefs for any exchange offer $\alpha \neq \alpha(1)$ are for situations that are off-equilibrium and we are free to specify them. We adopt the off-equilibrium belief where bondholders update to $\widehat{T} = 1$ when the bank makes any exchange offer.
3. Next we derive the optimal strategy of the bondholders given their beliefs and the strategy of the bank. The bank makes an exchange offer of $\alpha(1)$ when $t = 1$ and refinances the loan when $t = \tau$. It is an optimal response to accept the offer of $\alpha \geq \alpha(1)$ since rejection would lead to $v_B^L(1)$ and $v_B^E(\alpha(1)) = v_B^L(1)$. It is optimal to reject any exchange offer $\alpha < \alpha(1)$ since rejection would lead the bondholders to update to $\widehat{T} = 1$ and a litigation payoff of $v_B^L(1) > v_F^E(\alpha)$.

**Case 2**. $v_F^E(\alpha(\mathrm{E}(T)), \tau) \geq \max\{v_F^L(\tau), v_F^R(\tau)\}$ Pooling equilibria with only exchange offers.

1. Assume that bondholders accept any exchange offer of $\alpha \geq \alpha(E(T))$ and reject any offer less than $\alpha(E(T))$. They update to $\widehat{T} = \mathrm{E}(T)$ when they receive an exchange offer and $\widehat{T} = \tau$ when the bank refinances the debt. Since $\alpha(t)$ is decreasing in $t$, as long as banks prefer to make the pooling exchange offer when $t = \tau$, they will prefer the same when $t = 1$. For $t = \tau$, banks must prefer to make the offer of $\alpha(E(T))$ any offer $\alpha < \alpha(E(T))$ that bondholders reject since $v_F^E(\alpha(\mathrm{E}(T)), \tau) \geq v_F^L(\tau)$. Moreover at $t = \tau$ banks must prefer exchange offer of $\alpha(E(T))$ over making a refinancing offer since$v_F^E(\alpha(\mathrm{E}(T)), \tau) \geq v_F^R(\tau)$. Finally an offer of $\alpha(E(T))$ dominates any higher offer.
2. In equilibrium only exchange offers are made and bondholders correctly update to $\widehat{T} = \mathrm{E}(T)$. Off equilibrium bondholders update to $\widehat{T} = \mathrm{E}(T)$ when they receive an exchange offer of $\alpha \neq \alpha(E(T))$ and $\widehat{T} = \tau$ when the bank refinances the loan.
3. When the bondholders receive an offer of $\alpha \geq \alpha(E(T))$ it is optimal to accept since rejection induces the belief $\widehat{T} = \mathrm{E}(T)$ and a payoff of $v_B^L(\mathrm{E}(T)) = v_B^E(\alpha(\mathrm{E}(T)))$. Finally, it is optimal to reject any $\alpha < \alpha(E(T))$ since it induces the belief $\widehat{T} = \mathrm{E}(T)$ and leads to a litigation payoff of $v_B^L(\mathrm{E}(T)) > v_B^E(\alpha)$.

Let $\overline{\alpha} \coloneqq v_F^E(\overline{\alpha}, \tau) = \max\{v_F^L(\tau), v_F^R(\tau)\}$. Any offer $\alpha$ such that $\alpha \in [\alpha(\mathrm{E}(T)), \overline{\alpha}]$ can be sustained as a pooling equilibrium. This happens with the following off-equilibrium play – the bondholders reject any $\alpha' < \alpha$ and update to $\widehat{T} = \tau$. Hence there is a continuum of pooling equilibria supported by different off-equilibrium beliefs.

**Case 3**. $v_F^L(\tau) \geq \max\{v_F^R(\tau), v_F^E(\alpha(\mathrm{E}(T)), \tau)\}$ Separating equilibrium with exchange offers and litigation.

1. Assume that the bondholders always update to $\widehat{T} = 1$ when they observe an exchange offer $\alpha > \alpha(\tau)$ and $\widehat{T} = \tau$ otherwise. Consider the strategy for the bondholders where they reject any $\alpha < \alpha(1)$ triggering litigation and accept an offer of $\alpha \geq \alpha(1)$. Given this strategy and belief of the bondholders consider the bank's decision.
   (a) When $t = 1$ the bank prefers to make an exchange offer of $\alpha = \alpha(1)$ to a lower exchange offer since all offers less than $\alpha(1)$ are rejected triggering the litigation payoff of $v_F^L(t = 1)$ which is dominated since

$$v_F^E(\widehat{T} = 1 | t = 1) \geq v_F^L(t = 1) \tag{34}$$

$$\Leftrightarrow 2p_1 y_1 \sigma(1 - \sigma)\gamma \geq 0. \tag{35}$$

Moreover the payoff from making an exchange offer of $\alpha(1)$ is greater than the payoff from refinancing the loan due to proposition 1.

(b) When $t = \tau$ the bank makes an exchange offer of $\alpha(\tau)$ and receives a payoff of $v_F^L(\tau)$. Any exchange offer $\alpha \in (\alpha(\tau), \alpha(1))$ is rejected and yields the same payoff of $v_F^L(\tau)$ to the bank. An exchange offer of $\alpha(1)$ yields a payoff of $v_F^E(\alpha(1), \tau)$ and refinancing yields a payoff of $v_F^R(\tau)$, both of which are lower than $v_F^L(\tau)$.

2. Next we examine what the equilibrium beliefs of the bondholders must be. The banks makes an exchange offer of $\alpha(1)$ when $t = 1$ and an offer of $\alpha(\tau)$ when $t = \tau$. Hence the bondholders must update to $\widehat{T} = 1$ when the observe an exchange offer of $\alpha(1)$ and $\widehat{T} = \tau$ when they observe $\alpha = \alpha(\tau)$. The off-equilibrium beliefs for an exchange offer of $\alpha > \alpha(\tau)$ are assumed to be $\widehat{T} = 1$, for any refinancing offer are assumed to be $\widehat{T} = \tau$.
3. Next we derive the optimal strategy of the bondholders given their beliefs and the strategy of the bank. The bank makes an exchange offer of $\alpha(1)$ when $t = 1$ and $\alpha(\tau)$ when $t = \tau$. It is an optimal response to accept the offer of $\alpha \geq \alpha(1)$ since rejection would lead to $v_B^L(1)$ and $v_B^E(\alpha(1)) = v_B^L(1)$. It is optimal to reject the offer $\alpha(\tau)$ since rejection would lead the litigation payoff of $v_B^L(\tau) = v_B^E(\alpha(\tau))$.

Now we show that these are the only three pure perfect Bayesian equilibria in the model. To see this note that given Lemma 1 we can restrict our attention to equilibria where the strategy of the high type is to make an exchange offer, and the strategy of the bondholders is to accept. This allows for three possible pure strategies for a low type firm-bank – refinancing, pooling exchange offers, and separating exchange offers.

**Proof of proposition 3.** We can prove this by proving the two separate cases –

$$\frac{\partial v_F^R(\tau)}{\partial \sigma} > \frac{\partial v_F^L(\tau)}{\partial \sigma} \tag{36}$$

$$\Leftrightarrow -p_1 y_1 > -p_1 y_1 (1 + \gamma(1 - 2\sigma)),$$

since $\sigma < 1/2$.

1. $v_F^E(\mathrm{E}(T), \tau) \leq v_F^R(\tau)$. In this case it is sufficient to show that the payoff from refinancing decreases less for an increase in $\sigma$ that than the payoff from litigation. To see this note that

2. $v_F^E(\mathrm{E}(T),\tau) > v_F^R(\tau)$.

To see whether the $v_F^E(\alpha(\mathrm{E}(T)),\tau) - v_F^L(\tau)$ is increasing in $\sigma$ we differentiate with respect to $\sigma$ and find

$$\frac{\partial v_F^E(\alpha(\mathrm{E}(T)),\tau)}{\partial\sigma} > \frac{\partial v_F^L(\tau)}{\partial\sigma}$$
$$\Leftrightarrow p_1 y_1(1+\gamma(1-2\sigma)) > p_1 y_1(1-\gamma(1-2\sigma))\frac{\lambda+(1-\lambda)(p_2\tau+p_1)}{\lambda+(1-\lambda)(p_2\mathrm{E}(T)+p_1)}. \tag{37}$$

The inequality in (37) always holds.

The monotonicity of the difference in payoffs in $\sigma$ ensure that there's a $\hat{\sigma} \in (0, 1/2)$ such that the statement of the proposition holds.

**Proof of Proposition 4.** If the true $t$ is revealed (this happens with probability $1 - q$), the bondholders play a game of complete information with the firm that has a unique equilibrium where they are made an exchange offer that they accept (proposition 1). If the bondholders do not observe $t$ (this happens with probability $q$), the game is one of incomplete information. Since offers are only rejected in the incomplete information environment, leading to liquidation, the probability of liquidation is weakly increasing in $q$.

## B. Empirical results

**Table 1**
Summary statistics

| | N | Mean | SD | Min | Max |
|---|---|---|---|---|---|
| Restructuring outcome: Piecemeal(0) or going concern(1) | 190 | 0.242 | 0.429 | 0 | 1 |
| Depth of credit information index | 190 | 5.184 | 3.090 | 0 | 8 |
| Creditor participation index | 190 | 1.547 | 1.026 | 0 | 4 |
| Ln GDP per capita 2018 in USD | 186 | 8.722 | 1.438 | 5.605 | 12.103 |
| Observations | 190 | | | | |

Country level cross section based on the "Doing Business" dataset of the World Bank. This was the most recent data (2019) available at the time this analysis was conducted. GDP data for 2018 also comes from the World Bank.

**Table 2**
Effect of creditor rights and credit information on restructuring outcomes

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| Depth of credit information index | 0.0346*** | | 0.0276*** | 0.0188** | 0.0288*** | 0.0194** |
| | (0.00982) | | (0.00997) | (0.00943) | (0.0102) | (0.00955) |
| Creditor participation index | | 0.105*** | 0.0835*** | 0.0483* | 0.0818*** | 0.0468* |
| | | (0.0296) | (0.0300) | (0.0275) | (0.0302) | (0.0277) |
| Depth of credit information index × Creditor participation index | | | | | 0.00613 | 0.00444 |
| | | | | | (0.0102) | (0.00912) |
| Ln GDP per cap quadratic | No | No | No | Yes | No | Yes |
| Observations | 190 | 190 | 190 | 186 | 190 | 186 |

The dependent variable an indicator for restructuring outcomes: Piecemeal(0) or going concern(1). Standard errors reported in the parentheses. $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$.

## References


Agrawal, Anup, Knoeber, Charles R., 2001. Do some outside directors play a political role? J.Law Econ. 44, 179–198.

Altman, Edward I., Hotchkiss, Edith S., 2006. Corporate Financial Distress and Bankruptcy, third ed. John Wiley & Sons, Hoboken, NJ.

Ayotte, Kenneth, Yun, Hayong, 2009. Matching bankruptcy laws to legal environments. J. Law Econ. Org. 25, 2–30.

Baird, Douglas G., Rasmussen, Robert K., 2003. Chapter 11 at twilight. Stanford Law Rev. 56, 673–699.

Banerji, Sanjay, Duygun, M., Shaban, M., 2018. Political connections, bailout in financial markets and firm value. J.Corporate Finan. 50, 388–401.

Bardhan, Pranab, 1997. Corruption and development: a review of issues. J. Econ. Literat. 35, 1320–1346.

Bebchuk, Lucian, Neeman, Z., 2010. Investor protection and interest group politics. Rev. Financ. Stud. 23 (3), 1089–1119.

Blau, Benjamin M., Brough, Tyler J., Thomas, Diana W., 2013. Corporate lobbying, political connections, and the bailout of banks. J. Bank. Financ. 37 (8), 3007–3017.

Bose, Udichibarna, Filomeni, Stefano, Mallick, Sushanta, 2021. Does bankruptcy law improve the fate of distressed forms? The role of credit channels. J. Corporate Financ. 68, 101836.

Bris, Arturo, Welch, Ivo, 2005. The optimal concentration of creditors. J. Financ. 60, 2193–2212.

Brown, Craig O'Neil, Serdar Din_c, I., 2005. The politics of bank failures: evidence from emerging markets. Quart. J. Econ. 120, 1413–1444.

Bruche, Max, 2011. Creditor coordination, liquidation timing, and debt valuation. J. Financ. Quantitative Analy. 46 (5), 1407–1436.

Chatterjee, Sris, Dhillon, Upinder S., Ramirez, Gabriel G., 1995. Coercive tender and exchange offers in distressed high-yield debt restructurings: an empirical analysis. J. Financ. Econ. 38, 333–360.

Claessens, Stijn, Djankov, Simeon, Klapper, Leora, 2003. Resolution of corporate distress in east asia. J. Empiric. Financ. 10, 199–216.

Claessens, Stijn, Feijen, Erik, Laeven, Luc, 2006. Political connections and preferential access to finance: the role of campaign contributions. J. Financ. Econ. 88 (3), 554–580.

Claessens, Stijn, Klapper, Leora, 2003. Bankruptcy around the world: explanations of its relative use. Am. Law Econ. Rev. 7 (1), 253–283.

Clark, Derek J., Riis, Christian, 1998. Contest success functions: an extension. Econ. Theor. 11 201–201.

Cooter, Robert D., Rubinfeld, Daniel L., 1989. Economic analysis of legal disputes and their resolution. J. Econ. Literat. 27.

Dinç, I. Serdar, 2005. Politicians and banks: political influences on government-owned banks in emerging countries. J. Financ. Econ. 77, 453–479.

Djankov, Simeon, et al., 2008. Debt enforcement around the world. J. Politic. Econ. 116, 1105–1149.

Faccio, Mara, 2006. Politically Connected Firms", vol. 96. American Economic Review, pp. 369–386.

Faccio, Mara, Larry, H., Lang, P., 2002. The ultimate ownership of western European corporations. J. Financial Econ. 65, 365–395.
Faccio, Mara, Masulis, Ronald, McConnel, John J., 2006. Political connections and corporate bailouts. J. Financ. 61 (6), 2595–2635.
Farmer, Amy, Paul, Pecorino, 1999. Legal expenditure as a rent seeking game. Public Choice 100, 271–288.
Fisman, Raymond, 2001. Estimating the value of political connections. Am. Econ. Rev. 91, 1095–1102.
Friedman, Henry L., Heinle, Mirko S., 2019. Influence activities, coalitions, and uniform policies: implications for the regulation of financial institutions. Manag. Sci. 66 (9), 4336–4358.
Gertner, Robert, Scharfstein, David, 1991. A theory of workouts and the effects of reorganization law. J. Financ. 46, 1189–1222.
Giammarino, Ronald M., 1989. The resolution of financial distress. Rev. Financ. Stud. 2, 25–47.
Gilson, Stuart, 2012. Coming through in a crisis: how chapter 11 and the debt restructuring industry are helping to revive the U.S. Economy. J. Appl. Corporate Financ. 24 (4), 23–35.
Gilson, Stuart, John, Kose, Larry, H., Lang, P., 1990. Troubled debt restructurings: an empirical study of private reorganization of firms in default. J. Financ. Econ. 27 (2), 315–353.
Hay, Bruce L., Spier, Kathryn E., 1998. Litigation and settlement. In: Newman, Peter (Ed.), New Palgrave Dictionary of Economics and Law. Palgrave MacMillan.
Ho, Shirley J., 2007. Impacts of interest groups: endogenous interaction and lobbying limits. Econ. Model. 24 (3), 506–522.
Hotchkiss, Edith S., et al., 2007. Bankruptcy and resolution of financial distress. In: Eckbo, Espen (Ed.), Handbook of Empirical Finance North Holland. Chap. 14.
Houston, Joel, James, Christopher, 1996. Bank information monopolies and the mix of private and public debt claims. J. Financ. 51 (5), 1863–1889.
James, Christopher, 1996. bank debt restructurings and the composition of exchange offers in financial distress. J. Financ. 51 (2), 711–727.
Johnson, Simon, Todd, Mitton, 2003. Cronyism and capital controls: evidence from Malaysia. J. Financ. Econ. 67, 351–382.
Khwaja, Asim Ijaz, Mian, Atif, 2005. Do lenders favor politically connected firms? Rent provision in an emerging financial market. Quart. J. Econ. 120, 1391–1411.
Kim, Young-Han, Kim, Sang-Kee, 2012. Welfare effects of competitive lobbying efforts in international oligopoly markets. Econ. Model. 29 (3), 614–620.
Krueger, Anne O., 1974. The political economy of the rent-seeking society. Am. Econ. Rev. 64, 291–303.
La Porta, Rafael, Florencio Lopez de Silanes, Shleifer, Andrei, 2002. Government ownership of banks. J. Financ. 57, 265–301.
Neyapti, Bilin, Arasil, Yavuz, 2016. The nexus of economic and institutional evolution. Econ. Model. 52, 574–582.
Nitzan, Shmuel, 1994. Modelling rent-seeking contests. Eur. J. Politic. Econ. 10 (1), 41–60.
Olson, Mancur, 1965. The Logic of Collective Action. Harvard University Press.
Povel, P., 1999. Optimal soft or tough bankruptcy procedures. J. Law Econ. Org. 15, 659–684.
Rose-Ackerman, Susan, 1999. Corruption and Government: Causes, Consequences, and Reform. Cambridge University Press.
Sapienza, Paola, 2004. The effects of government ownership on bank lending. J. Financ. Econ. 72, 357–384.
Senbet, L., Seward, J., 1995. Financial distress, bankruptcy and reorganization. In: Maksimovic, Jarrow, Ziemba (Eds.), Finance, vol. 9. Elsevier. Chap. 28.
Senbet, L., Tracy, YueWang, 2010. Corporate financial distress and bankruptcy: a survey. Found. Trends Financ. 5 (4).
Shleifer, Andrei, Vishny, Robert W., 1994. Politicians and FIrms. Quart. J. Econ. 109, 995–99102w.
Thakor, Anjan V., 2021. Politics, credit allocation and bank capital requirements. J. Financ. Intermed. 45, 100820.
Welch, Ivo, 1997. Why is bank debt senior? A theory of asymmetry and claim priority based on influence costs. Rev. Financ. Stud. 10 (4), 1203–1236.