

# Tough Private Lenders Competing Against Soft State Banks

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## Abstract

In many economies, small and medium-sized firms have no direct access to the financial markets but depend on bank loans. In the market for bank loans, competition is often distorted by state banks enjoying lower funding costs than private banks due to a state guarantee on their liabilities. In this paper, we argue that if the state bank's guarantee is tied to an obligation to renegotiate loans of firms in financial distress, i.e., the state bank is a 'soft' lender, a private bank can induce firms to separate by self-selection through committing itself to a policy of tough liquidation. This reduces information asymmetries in the market and allows the private bank to lend to high-quality firms at favorable rates. As the result, the borrower pool of the bank improves and it obtains profits in equilibrium.

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# 1 Introduction

Recent theoretical and empirical research suggests that in mature financial systems, firms towards the upper end of the quality spectrum that possess high reputation and transparency tend to prefer directly issued debt while smaller, younger and riskier firms rely largely on bank loans (see, for example, Diamond (1991), Houston and James (1996), Johnson (1997), Bolton and Freixas (2000)). However, these results can only fully be applied to economies with mature financial systems. In economies with less well developed financial markets, e.g., developing countries or countries in transition, firm distribution is biased towards the "high end" of the spectrum, that is, bonds are a funding alternative only for a narrow quantile of blue chip firms. High quality firms of medium and small size (SME) entirely depend on bank loans and are often subject to credit rationing and/or inefficiently high interest rates.<sup>1</sup> Even in developed but traditionally bank-based financial systems like in Germany or France, the development towards higher levels of direct finance is only slowly gaining momentum.

Another observation that motivates this paper is the existence of state-owned banks that possess state guarantees on their liabilities and hence enjoy lower funding costs than their privately-owned competitors.<sup>2</sup> The advantage that arises from these guarantees is frequently blamed to distort competition. However, such guarantees are often tied to an (implicit) obligation to renegotiate loans of financially distressed firms. As we will show, this allows private banks to reduce information asymmetries, overcome cost disadvantages and obtain profits in equilibrium.

We propose a lending strategy for private banks which allows them to overcome problems of asymmetric information by inducing firms to separate by self-selection (see, e.g., Rothschildt and Stiglitz (1976), and Bester (1985) for a description of self-selection). This leads to an improvement of the private banks' borrower pool. Focusing on lower risk clients, private banks are able to profitably lend to small enterprises in spite of the lack of transparency and the cost-disadvantage they face vis-a-vis the state bank. The strategy requires a credible commitment to liquidate firms on the onset of financial distress. With such a reputation for being a "tough" lender, private banks can reduce their interest rates such that the gains from the lower rate out-

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<sup>1</sup>In Russia, for example, corporate bonds listed at the MICEX or MSE include only 9 companies. Most of them are monopolists (Gazprom (natural gas), UES (electricity)) or market leaders (Lukoil (oil), Alrosa (aluminium)).

<sup>2</sup>Examples for such guarantees are i) the "Gewährträgerhaftung" in Germany, according to which a district or municipality guarantees for the deposits and other liabilities of its savings bank and ii) the guarantee of the Russian Federation for the deposits of the Russian savings bank 'Sberbank' (for a more comprehensive analysis of the role of 'Sberbank' in the Russian banking sector see, e.g., Hubert and Matthey (2003)). The spread that such banks pay is only slightly higher than that of their sovereign.

weigh the higher expected costs of inefficient liquidation for low-risk firms, but not for high-risk firms. These banks would then attract a better population of borrowers, which enables them to obtain profits in equilibrium, extend their loan portfolio, and broaden their capital base. Apart from fostering the SME sector, in transition countries this would contribute to the stabilization of the banking sector.

However, the feasibility of such a strategy requires a long-term perspective on the part of the private banks. It depends critically on the overall interest rates, i.e., on the macroeconomic stabilization policy, and the bankruptcy law. We discuss policy implications in section 4.

Our analysis can be related to recent research on the financing decisions of firms that focuses on the role of banks as flexible providers of funds. Berlin and Loeys (1988), Chemmanur and Fulghieri (1994) and Bolton and Freixas (2000), among others, emphasize the advantages that bank loans have over securities in that they lower the probability of inefficient liquidation and reduce the bankruptcy costs of firms. This advantage results, first, from banks being able to monitor borrowers at lower costs than individual bond holders (Diamond, 1984), and second, from the fact that the renegotiation of bank loans is easier than the restructuring of a dispersed bond issue (Lummer and McConnell (1989), Hart and Moore (1995) and others). Chemmanur and Fulghieri (1994) explicitly model the competitive advantage banks can establish over bond markets by building up a reputation for renegotiating loans of firms in financial distress. Our model is developed in the same framework but is different in structure. First, we restrict our focus to bank loans, since issuing bonds or equity is not assumed a feasible source of funding for the majority of small enterprises (see above). Second, when considering loan renegotiation by banks, we focus not only on direct returns but also on returns from reputation effects. In this respect, our approach draws on the work of Chemmanur and Fulghieri, but we obtain the opposite result. Rather than establishing a reputation for renegotiating distressed loans, we will show that under the assumed conditions, private banks have an incentive to establish a reputation for liquidating all firms in financial distress. This effect results mainly from the virtual absence of a bond market and the corresponding different outcome of the self-selection process of firms.<sup>3</sup> Our analysis is also close in spirit to that of Sharpe (1990) in that it draws on the idea of *implicit contracts* based on the reputation of lenders. We will see that similar to Sharpe and the works of Shapiro (1983) and Allen (1984), loan rates must exceed marginal costs in order to make the liquidation policy credible.

The remainder of the paper is organized as follows. Section 2 develops the

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<sup>3</sup>The outcome is also influenced by the assumption of higher funding costs for private banks, which makes tough liquidation their only feasible strategy, as we will show in section 2. However, our argument does not depend on this assumption.

lending strategy, section 3 establishes the framework for separation. Section 4 concludes. Proofs are in the appendix.

## 2 Lending Strategy

### 2.1 Model framework

We analyze lending strategies in a simple model of asymmetric information on borrower riskiness. We assume all borrowers and lenders to be risk neutral and to have rational expectations. There are two types of firms in the market, safe (s) and risky (r) ones. Each firm has a single investment project that requires external finance in  $t = 0$  and produces output  $x_j$  in  $t = 2$ , where index  $j \in \{s, r\}$  denotes firm type (see figure 1 for the sequence of events). Investment is normalized to 1. Safe firms have a lower probability ( $p_s$ ) of entering into financial distress in  $t = 1$  than risky firms ( $p_r$ ),  $p_s < p_r$  and a higher expected output  $(1 - p_s)x_s > (1 - p_r)x_r$ . But their output does not exceed that of risky firms,  $x_s \leq x_r$ . Both projects have non-negative NPV, which can be thought of as the result of a pre-contract audit by banks.

In  $t = 0$ , a state-owned bank and private banks compete for borrowers. Since the state bank holds a guarantee on its liabilities, private banks face higher funding costs,  $r_{st} < r_{pr}$ , where  $r_i$  includes face value and interest;  $i \in \{st, pr\}$  indexes bank-type. Let  $R_i$  denote the repayment on the loan, with  $R_i \geq r_i > 1$ .

Financial distress in  $t = 1$  gives the bank the right to foreclose the loan which is due only in  $t = 2$  (e.g., because the firm defaults on coupon payments). Distress can be caused by two events. First, temporary liquidity shortages can force economically viable firms into distress. These firms recover and produce output in  $t = 2$  if the bank extends the loan instead of liquidating the firm. Second, accumulated losses cause financial distress of unprofitable firms. These firms will default in  $t = 2$  even if their loan is extended, i.e., it is efficient to liquidate them in  $t = 1$ . Note that the a priori quality of a firm (safe or risky) is not related to the probability that a distressed firm is viable.

We assume that if a bank audits a firm, unprofitable firms are revealed with certainty and viable firms with an error margin.  $q$  denotes the conditional probability that an economically viable firm in financial distress is identified as 'viable' and its loan is renegotiated, i.e., the higher  $q$ , the better the quality of the audit.<sup>4</sup> If a distressed firm is revealed as viable, the bank extends its loan but renegotiates the loan terms in a debt-for-equity swap.

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<sup>4</sup>This means that we assume the audit to produce Type II error of  $1 - q$  but no Type I error (see Chemmanur and Fulghieri (1994) for a similar renegotiation outcome). A possible explanation for this assumption is that banks only renegotiate a loan if they



$$J_j^i = (1 - p_i)(x_j - R_i) + p_j p_{v|d} \delta (1 - k) x_j \quad , \quad (1)$$

where  $J_j^i$  denotes the return of firm  $j$  under the loan contract of bank  $i$  and  $p_{v|d}$  denotes the conditional probability that a firm in distress is viable.

With separation, the banks' non-negative-profit constraints are given as

$$\Pi_{st}^{sep0} = (1 - p_r) R_{st}^{sep0} + p_r \pi^{sep(r)} - r_{st} \geq 0 \quad (2)$$

for the state bank, and

$$\Pi_{pr}^{sep0} = (1 - p_s) R_{pr}^{sep0} + p_s y - r_{pr} \geq 0 \quad (3)$$

for the private bank, with  $\pi^{sep(r)} = y + p_{v|d} q (k x_r - y)$  as the expected return from the state bank's decision to audit a risky firm. The corresponding minimum repayments are  $R_{st}^{sep0} = (r_{st} - p_r \pi^{sep(r)}) / (1 - p_r)$  and  $R_{pr}^{sep0} = (r_{pr} - p_s y) / (1 - p_s)$ , respectively.

As safe firms have a lower distress probability than risky firms, for a given decrease in the interest rate they accept a bigger increase in the probability of inefficient liquidation, conditional on distress. One can therefore construct a pair of contracts  $D_{pr}$  and  $D_{st}$ , which fulfills the incentive constraint (1) and yields the separation of firm types. However, since only repayments with non-negative interest rates are feasible a very high audit quality ( $q \approx 1$ ) could prevent separation for any  $R > 1$ . Proposition 1 gives the condition under which separation is achievable:

PROPOSITION 1: *The set of loan contracts inducing self-selection is not empty if*

$$\delta < \frac{(1 - p_s)x_s - (1 - p_r)x_r + p_s - p_r}{p_{v|d}(1 - k)(p_r x_r - p_s x_s)}$$

The proof is in the appendix.

Intuitively, proposition 1 states that the audit quality must not exceed a certain level, which is defined by the quality of safe firms in cases without distress relative to the quality of risky firms in cases of distress. Otherwise, the costs of inefficient liquidation exceed the gains that result from separation for any feasible repayment.

For  $((1 - p_s)x_s - (1 - p_r)x_r) / (p_{v|d}(1 - k)(p_r x_r - p_s x_s)) > 1$ , separation is achievable for all  $\delta \leq 1$ .

We assumed above that there are only two discrete renegotiation policies that the private bank can follow,  $\delta \in \{0, q\}$ . This means that the private bank can not adjust its  $\delta$  arbitrarily but can only decide to audit all distressed firms with a given quality or not to audit at all. As the result, the

costs of inefficient liquidation that firms incur from choosing the contract of the private bank are determined by external parameters. These costs determine the upper bound for the separating repayment, as we will show below.

For a separating equilibrium to exist, the zero-profit repayment that the private bank obtains from a population of safe firms must not exceed the incentive-compatible separation repayment defined by  $\delta = 0$ . Put differently, if the private bank's disadvantage in funding costs is not too high, it achieves separation with non-negative profits. Formally, it must hold that

$$R_{pr}^{sep0} \leq R_{pr}^{max} = R_{st}^{sep0} - \frac{p_s}{1 - p_s} p_{v|d} q (1 - k) x_s \quad (4)$$

Then, the advantage of the private bank that results from the separation of firm types is not overcompensated by the disadvantage in funding costs. This result is formalized in proposition 2.

**PROPOSITION 2:** *A separating equilibrium with non-negative bank profits exists if*

$$(1 - p_r) r_{pr} - (1 - p_s) r_{st} \leq A$$

where  $A = (1 - p_r) p_s [y - p_{v|d} \delta (1 - k) x_s] - (1 - p_s) p_r \pi^{sep(r)}$ .

The proof is in the appendix.

The lower the quality  $q$  of the audit, and, accordingly, the higher the zero-profit repayment of the state bank, the more likely it is that separation can be obtained.

Similarly, to deter the state bank from offering a pooling rate that attracts safe firms and breaks the separating equilibrium,  $R_{st}^{sep0}$  in (4) is replaced by the pooling rate  $R_{st}^{pool0} = (r_{st} - \bar{p}(\phi) \pi^{pool}) / (1 - \bar{p}(\phi))$ , which gives a minimum share of risky firms in the population. See the appendix for details.

**REMARK:** Our assumption of higher funding costs for the private bank is not crucial for the separation of borrowers. If we assume  $r_{pr} \approx r_{st}$ , a tough liquidation policy can still be the optimal strategy for the private bank. In particular, the bank prefers inefficient liquidation over renegotiation if the profits from separation exceed those from lending to the pooled borrower population. However, for the existence of a separating equilibrium in a model as simple as ours the state bank has to be obliged to renegotiate loans in distress.

### 3 Credibility of liquidation strategy

The described self-selection mechanism crucially depends on the credibility of the banks' strategies on the onset of financial distress. Following Sharpe

(1990), we will call these policies *implicit contracts*. The state bank's commitment to renegotiation is public knowledge. Since renegotiation has a higher expected return than liquidation, the implicit contract to audit distressed firms is self-enforcing. However, as the state bank is subject to political pressure, it is also "state-enforced". For the private bank, credibility has to be achieved through reputation building. The bank offers a lower interest rate but threatens liquidation in order to deter risky firms from applying for its loans, i.e., its implicit contract offers higher returns at present at the price of lower (expected) returns in the future.<sup>5</sup> However, sticking to the threat to liquidate distressed firms without an audit leaves both players, bank and viable firm, worse off in the short run. Although the bank can execute the liquidation threat because distress gives it power over the firm, short-term rational behavior would induce it to audit all firms, as the expected return from the audit exceeds the liquidation value. Given rational expectations, risky firms would anticipate the bank's deviation from its liquidation policy and free-ride on the cheaper loan.

To make foregoing short-term profits from renegotiation profitable, and thus credible and self-enforcing, it is crucial that banks develop a long-term horizon. In particular, the discounted profits from lending to safe firms in the future have to exceed the expected losses from inefficient liquidation of economically viable firms today:

$$p_{v|d}\delta(kx_s - y) < \sum_{t=0}^{t_{max}} \frac{1}{(1+i)^t} \Pi_{pr,t}^{sep} \quad , \quad (5)$$

where  $t_{max}$  denotes the planning horizon,<sup>6</sup>  $i$  the discount rate<sup>7</sup> and  $\Pi_{pr,t}^{sep}$  the private bank's profit at date  $t$  if separation is obtained. Equation (5) implies that if the private bank deviates from its liquidation strategy only once, the credibility of the implicit contract is lost. Risky firms would then be attracted by the lower repayment and separation would fail. In other words, if the bank renegotiates the loan of one firm, all other firms assume that liquidation is no longer the bank's efficient strategy and apply for its cheaper

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<sup>5</sup>In this sense, our model is opposite to that of Sharpe (1990). In his model, the bank promises to charge good firms lower rates in the future than its partial information monopoly would permit. In turn, it charges all firms higher rates at present. This means that the implicit contract promises good firms a higher return in the future at the price of a lower return at present.

<sup>6</sup>The planning horizon in our model is not a fixed moment in time but a finite number of periods. This means that the planning horizon moves forward with time passing by. In any period when reputation building/maintaining is considered, the planning horizon is equally far away. A final period is never reached. This is a slightly different presentation of the infinite horizon-concept that is assumed in Sharpe (1990) and others. However, the moving planning horizon (planning period) in our model has the same effect of removing the problem of backward induction from an ex-ante fixed final period. For discounting future profits it is only relevant "how far ahead banks look".

<sup>7</sup>We now drop the assumption that the riskless interest rate is zero.

loans. Condition (5) shows that in order for the separation mechanism to work, three conditions have to be fulfilled. First, the private bank's profits from lending to safe firms in the future have to be sufficiently large. These profits increase when auditing firms is difficult, i.e., when it is costly and yields low precision, since both factors raise the zero-profit repayment of the state bank and hence the incentive compatible separating repayment. Second, the bank's planning horizon has to be sufficiently long, such that the profits of sufficiently many future loan periods are taken into account. Third, the discount rate has to be sufficiently low. In other words, reputation can only be sustained in a competitive environment if the discounted value of economic rents that are earned up to the planning horizon exceeds the loss from inefficient liquidation. If this condition is fulfilled, the bank has an incentive to carry out its threat, which makes this threat credible and deters risky firms from applying for the loan with the lower rate.

## 4 Conclusions

We propose a lending strategy that allows private banks to enter a market that was formerly dominated by a state-owned bank and increase lending to high-quality small and medium-sized firms at comparatively low rates. Through a policy of tough liquidation of all borrowers in financial distress the private bank changes the trade-off that firms face between interest cost and expected loss due to inefficient liquidation. The separation of firm-types by self-selection that follows from this trade-off reduces problems of asymmetric information, improves the private bank's borrower pool and allows it to obtain profits in equilibrium. As the result, the bank's capital base broadens and firms' investments increase. However, the mechanism of self-selection depends on adequate policies in the areas of bankruptcy law, macroeconomic stabilization and interest rates.

Bankruptcy law needs to provide both, a framework for lenders to liquidate borrowers quickly and at reasonable costs, and protection of firms against unwarranted liquidation by lenders eager to take over control of the firm. The former is necessary to make liquidation a realistic and credible alternative to renegotiation, while the latter reduces the probability of inefficient liquidation to cases of actual financial distress, limiting its expected costs. But excessive liquidation appears to be a major problem only in a few countries, e.g., in Russia. However, as our analysis has shown, even liquidations which are inefficient ex-post can be efficient ex-ante as they make self-selection of borrowers possible.

As with any investment, reputation building is only worthwhile if interest rates are not too high. Hence, economic and monetary policy must work towards stable and low real interest rates. Otherwise, banks will value prof-

its only in the very short run. As our analysis shows, high interest rates hurt firms twice. First, they raise capital costs in the usual way. Second, they aggravate incentive problems by destroying the mechanisms by which information problems in credit markets can be overcome.

Our paper focuses on economies where developed financial markets are virtually absent and a state bank dominates the market. Hence we assumed reduced competition among lenders, which is a realistic assumption for many countries in transition. However, it is not crucial for the persistence of our argument. It can be argued that even in countries with developed financial markets there exists a significant segment of high quality firms that (at present) lack the size, reputation, track record or credit rating necessary to approach the bond markets. These firms would be potential clients for a bank that pursues our strategy. This seems an interesting field for future research.

## A Appendix

Proof of proposition 1:

Separating loan contracts exist if firms obtain equal expected returns from the two contracts for a feasible repayment  $R \geq 1$ , where  $R = 1$  is the infimum for  $R \geq r$ .

$$\begin{aligned}
 J_s(\delta, R) &= J_r(\delta, R) \\
 (1 - p_s)(x_s - R) + p_s p_{v|d} \delta (1 - k) x_s &= (1 - p_r)(x_r - R) + p_r p_{v|d} \delta (1 - k) x_r \\
 R &= \frac{(1 - p_s)x_s - (1 - p_r)x_r - p_{v|d} \delta (1 - k)(p_r x_r - p_s x_s)}{p_r - p_s}
 \end{aligned}$$

Since only  $R \geq 1$  is feasible, we obtain

$$\delta < \frac{(1 - p_s)x_s - (1 - p_r)x_r + p_s - p_r}{p_{v|d}(1 - k)(p_r x_r - p_s x_s)}$$

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Proof of Proposition 2:

Solving the separation condition (1) for safe firms for  $R_{pr}$  yields the maximum repayment the private bank can charge in order to attract s-firms, that is, to make self-selection profitable for them:

$$R_{pr}^{max} = R_{st} - \frac{p_s}{1 - p_s} p_{v|d} q (1 - k) x_s \quad . \quad (6)$$

Solving the separation condition for risky firms yields the complementary minimum repayment the private bank has to charge in order to make it unprofitable for r-firms to mimic s-firms:

$$R_{pr}^{min} = R_{st} - \frac{p_r}{1 - p_r} p_{v|d} q (1 - k) x_r \quad . \quad (7)$$

Equations (6) and (7) are general conditions for any repayment  $R_{st}$  of the state bank. With separation,  $R_{st}$  in (6) and (7) equals  $R_{st}^{sep0}$  from equation (2). A separating equilibrium with non-negative profits for the private bank exists if the repayment  $R_{pr}^{sep0}$  from equation (3) does not exceed  $R_{pr}^{max}$  from equation (6), i.e., if

$$\begin{aligned} R_{pr}^{sep0} = \frac{r_{pr} - p_s y}{1 - p_s} &\leq \frac{r_{st} - p_r \pi^{sep(r)}}{1 - p_r} - \frac{p_s}{1 - p_s} p_{v|d} q (1 - k) x_s = R_{pr}^{max} \\ &\Leftrightarrow (1 - p_r) r_{pr} - (1 - p_s) r_{st} \leq A \end{aligned}$$

where  $A = (1 - p_r) p_s [y - p_{v|d} q (1 - k) x_s] - (1 - p_s) p_r \pi^{sep(r)}$ . ■

### Minimum share of risky firms

If the state bank wants to break the separating equilibrium, the lowest rate it can offer results from the non-negative profit constraint for a pooled borrower population:

$$\Pi_{st}^{pool} = (1 - \bar{p}(\phi)) R_{st}^{pool} + \bar{p}(\phi) \pi^{pool} - r_{st} = 0 \quad ,$$

with  $\pi^{pool} = y + p_{v|d} q (k \bar{x} - y)$  as the expected return from the bank's decision to renegotiate a loan,  $\bar{p}(\phi) = \phi p_s + (1 - \phi) p_r$  as the a priori distress probability of firms and  $\bar{x}(\phi)$  as the expected output of a firm in financial distress. This yields a minimum repayment of

$$R_{st}^{pool0} = \frac{r_{st} - \bar{p}(\phi) \pi^{pool}}{1 - \bar{p}(\phi)} \quad . \quad (8)$$

Applying (8) to (6) and (7) yields the corresponding condition for the existence of a separating equilibrium:

$$\begin{aligned} R_{pr}^{sep0} = \frac{r_{pr} - p_s y}{1 - p_s} &\leq \frac{r_{st} - \bar{p}(\phi) \pi^{pool}(\phi)}{1 - \bar{p}(\phi)} - \frac{p_s}{1 - p_s} p_{v|d} q (1 - k) x_s = R_{pr}^{max} \\ &\Leftrightarrow r_{st} - B \leq \bar{p}(\phi) (\pi^{pool}(\phi) - B) \\ \text{where } B &= R_{pr}^{sep0} + \frac{p_s}{1 - p_s} p_{v|d} q (1 - k) x_s \end{aligned}$$

We obtain the upper constraint for  $\phi$  from  $\bar{p}(\phi) \geq \frac{r_{st}-B}{\pi^{pool}(\phi)-B}$  as an implicit parameter condition:

$$\phi \leq \frac{\frac{r_{st}-B}{\pi^{pool}(\phi)-B} - p_r}{p_s - p_r} . \quad (9)$$

Equation (9) implicitly determines the maximum share of good firms in the market such that separation is possible.

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