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ABSTRACT

Multiple Creditors and Information Rights: Theory and Evidence from US Firms*

We analyse how a firm allocates information rights across its multiple banks. By differentiating information disclosed, a firm prevents its banks from continuing projects (possibly unsound) solely in order to use their superior information and seize assets during the reorganization. Informational diversity can also lead to the premature liquidation of sound projects, however. We derive the optimal allocation of information as a function of the redeployability and the heterogeneity of the firm's assets, and of the costs of restructuring the firm in distress. Using a sample of US firms, we find evidence that supports the empirical predictions of the model.

JEL Classification: G21, G33 and G34
Keywords: bank relationships, firms financing and multiple banking

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1 Introduction

In the last two decades, a number of studies have documented the redistribution of claims that can occur in the reorganization of firms in distress. A typical finding is that shareholders can receive value even when creditors are not paid in full, violating the absolute priority of claims (Weiss, 1990). More recently, based on the experience of countries in which many restructurings take place out of court, some legal and case studies (for example, Penati and Zingales, 1997; Levmore, 1982) have shown that large, concentrated creditors leading private, out-of-court reorganizations can appropriate resources at the expense of small stakeholders. Analyzing the major restructuring of the Italian Ferruzzi Group (19.9 billion dollars of total indebtedness), Penati and Zingales (1997, p. 3) argue that "the bank restructuring committee gained a net Lit. 1,952 billion ($1.3 billion) from the (reorganization) plan, with respect to an equally feasible break-up alternative" and argue that, during private reorganizations, "the desire to increase their payoff leads the "controlling" creditors to choices that are inefficient (p. 29)".

In this paper, we show that the costs associated with creditors' misconduct during reorganizations can explain important features of firms' debt structure. When firms borrow from multiple concentrated lenders, such as banks, they appear to differentiate the informational depth of their credit links, according to such parameters as the share of loans granted by the lender, the length of the relationship or the geographical distance from the lender. In fact, firms choose their borrowing pattern in such a way as to distribute information on the firm differentially across creditors. In other words they allocate "information rights" heterogeneously, mixing relationship funding (more informed) and transactional (less informed). Such a pattern can be observed even in countries where credit relationships are widespread, as in Germany and Japan (Aoki and Patrick, 1994; Edwards and Fisher, 1994). Despite a growing interest in firms' debt structure and in the implications of the costs of financial distress, the literature seems to neglect this issue. As we argue below, previous studies have generally focussed on endogenizing the optimal number of creditors or on deriving the optimal contractual links between firms and their multiple lenders. No attention has been paid to explaining the different role that multiple lenders appear to play.

Here, we construct and test a model in which, by borrowing from both relationship and transactional banks (differentiated borrowing), a firm can discipline its banks during a private reorganization, preventing them from extracting resources. However, differentiated borrowing can be costly because it can induce the premature liquidation of sound projects. We derive endogenously the firm's optimal allocation of information across its banks as a function of observable characteristics of the firm. We then test the predictions of the model using data drawn from a sample of US firms.

The intuition of the theoretical analysis is as follows. In the model, a relationship bank differs from a transactional bank for having better quality information on the firm. The information a bank has plays a dual role during a reorganization. On the one hand, a relationship bank can more readily recognize the assets that are more easily redeployable. To make this dimension of information relevant, we assume that the assets have different redeployability. Therefore, being better able to seize valuable assets, a relationship bank has greater ability to extract resources during a private reorganization.[1] On the other hand, an informed bank can more easily tell good projects, worth being restructured, from bad ones, that should be liquidated. Therefore, it has a stronger restructuring ability.

We show that banks could elect to keep an unsound firm going for the sole purpose of seizing assets during its reorganization. By creating an asymmetry in the information - and thus in the capacity seize - of relationship and transactional banks, differentiated borrowing prevents this opportunistic continuation of bad projects. In fact, transactional banks active in the reorganization anticipate that, because of their poorer information, they will be the losers in the seizure of assets and veto the continuation of bad projects. However, by allowing these less informed banks to participate in the reorganization, differentiated borrowing hinders the restructuring of good projects, possibly leading to their premature liquidation.

The model relates the degree of diversity of the firm-bank links to the value, redeployability and heterogeneity of the firm's assets, and to the costs of restructuring. We test these predictions using data from a sample of small US firms. Our focus on small firms is inspired by the theoretical model. Heterogeneity in the information of the banks is likely to be relevant when information on the firm is not public, and small firms are generally supposed to be more opaque than large ones.

Consistent with the predictions of the model, we find that firms with more valuable and redeployable assets engage in greater differentiation of information rights across their banks. Intuitively, when the assets of a firm have high value or can be easily redeployed, a bank has a strong incentive to continue in order to seize these assets. This requires generating greater

[1] An analogous assumption can be found in Diamond and Rajan (2001), who argue that a bank is more efficient than dispersed investors in selling assets.

asymmetry in information, in order to induce the less well informed banks to liquidate bad projects. Consistent with the model, we also find evidence that the degree of diversity is inversely related to the heterogeneity in the redeployability of the assets. In particular, this result holds if we focus on heterogeneous redeployability due to different geographical location of the assets. Intuitively, when the assets of the firm are heterogenous, even a small asymmetry in information can imply a significant disadvantage of transactional banks in seizing assets, inducing them to stop bad projects. Finally, we find some evidence that the degree of diversity is inversely related to restructuring costs. This is also intuitive, since by themselves higher costs for restructuring discourage banks from continuing bad projects, hence reducing the degree of informational diversity necessary to trigger liquidation.

The theoretical analysis builds on Minetti (2002). By specializing and applying that framework, we can derive the optimal degree of diversity of the firm-banks link as a function of characteristics of the firm and test empirical implications. Besides being linked to the literature on the redistribution of claims during reorganizations, the paper is related to the analyses of the implications for firms' debt structure of the costs of financial distress. Bolton and Sharfstein (1996) endogenize the optimal number of creditors, showing that a larger number of creditors reduces entrepreneurs' incentive to default strategically but increases the costs of liquidity defaults.[2] Hart and Moore (1995) derive the optimal distribution of priority of claims among creditors, showing that by combining classes of debt with different priorities a firm can commit not to overinvest (empire building) without incurring debt-overhang.[3] Neither of these papers analyzes how the costs of financial distress affect the allocation of information between banks. Rajan (1992) analyses the "hold-up cost" of banks' information and derives a rationale for a firm to diversify away from the financing of a close bank.[4] In Rajan (1992), borrowing from arm's length, dispersed investors reduces the hold-up problem of the firm and the better informed the alternative sources of finance the smaller are the rents that a close bank can extract. In the limit, borrowing from multiple relationship (i.e. equally informed) banks eliminates rent extraction by inducing banks to compete à la Bertrand in

[2] In related work, Bris and Welch (2002) develop a model in which creditors' coordination ability is lower, the larger the number of creditors. An entrepreneur with a large number of creditors has more bargaining power against creditors ex-post but has to pay a higher interest rate on her debt ex-ante.

[3] In a related vein, see also Levmore (1982) and Diamond (1993).

[4] For a model describing a hold-up problem on the part of informed financiers, see also Sharpe (1990).

credit provision. Thus, no rationale arises for differentiated bank funding.

On the empirical side, the paper is related to the literature that tests the determinants of multiple bank relationships. Detragiache, Garella and Guiso (2000) construct and test a model in which relationship banks may be unable to extend liquidity because of internal problems. By borrowing from multiple banks, a firm has higher transaction costs but reduces the risk of being denied funds. Using a dataset spanning twenty European countries, Ongena and Smith (2000) relate the number of bank relationships to firm and country characteristics. These papers do not draw out any implications for the optimal nature of the multiple creditors of a firm, which are assumed to be symmetric (in contrasty with observed reality).[5]

The rest of the paper proceeds as follows: in Section 2 we present the theoretical model. In Section 3, we draw empirical implications from the theoretical analysis. In Section 4, we describe the data and the empirical tests. Section 5 presents the main empirical results and Section 6 discusses extensions and robustness. Section 7 concludes. Lengthy proofs of the theoretical model are given in Appendix.

2 The Model

2.1 Setup

Environment and Technology Consider a three-date economy (t=0,1,2). At date 1, a "good" or a "distress" state is realized, with probability ℓ and $1-\ell$ respectively. At date 2, the distress state can become "bad" with probability γ or "very bad" with probability $1-\gamma$. The state of nature is common knowledge at each date.

There is initially only the final good, while assets can be produced. There is one entrepreneur and two bankers. The entrepreneur has no endowment while each banker initially has an amount $I/2$ of final good. Agents' utility function is $u(C_2, L_1, L_2) = C_2 - L_1 - L_2$, where C_2 is the amount of final good or assets that the agent consumes at date 2 and L_t is the non-monetary restructuring cost that the agent sustains at date t.

Agents can store. At date 0, the entrepreneur can also invest an amount I of final good and start one indivisible project. We assume there is interbank lending, so that both banks are needed to fund the project (multiple bank financing). The project is of high quality with probability π_h and low quality

[5] Other studies, such as Petersen and Rajan (1994), use the number of bank relationships as a proxy for the intensity of bank competition but do not explain the sources of multiple bank relationships.

with probability $1 - \pi_h$. No one observes the quality of the project at date 0.

At date 1, if the good state is realized, the project, regardless of its quality, returns an amount A of verifiable assets and an amount Y of non-verifiable final good accruing privately to the entrepreneur. If the distress state is realized, the entrepreneur and the bankers can liquidate or reorganize the firm over dates 1 and 2.

The reorganization proceeds as follows. At date 1 and at date 2, the entrepreneur and the banks decide simultaneously whether to continue or liquidate.[6] At both dates, if and only if they all choose continuation, the project is continued and they bear their restructuring cost (or enjoy its benefit).[7] At date 1, the entrepreneur has a continuation cost $L_1^E = 0$. Each bank has a continuation cost L_1^B, where $L_1^B = \underline{L}_1^B < 0$ with probability δ and $L_1^B = \overline{L}_1^B > 0$ with probability $1-\delta$. At date 2, the entrepreneur (each bank) has a continuation cost $L_2^E > 0$ ($L_2^B > 0$). Figure 1 visualizes the timing and shows the restructuring costs and the total assets and (non-verifiable) final good that arise at date 2 from the reorganization depending on the quality of the project and the state of nature that is realized (bad or very bad).

To complete the description of the returns, we have to the specify the nature of the assets produced by the firm. A firm's assets consist of N indivisible tools, each of size A/N. If the good state is realized or the distress state is realized but the project is reorganized over dates 1 and 2 and is of good quality, each tool can be consumed. If the distress state turns bad and the project is reorganized over dates 1 and 2 but is of bad quality, the tools must be redeployed outside the firm, generating a lower level of consumption.[8] We assume that $N/2$ tools have high redeployability $\lambda^H < 1$; that is, if redeployed they return $\lambda^H A/N$ units of final good; the remaining $N/2$ tools have low redeployability $\lambda^L < \lambda^H$. In the model, $\lambda = (\lambda^H + \lambda^L)/2$ denotes the average asset redeployability.

[6] The restructuring games between entrepreneur and bankers are simultaneous moves games of incomplete information and the resulting equilibrium is a Bayesian-Nash equilibrium.

[7] The assumption that a lender can enjoy a benefit from restructuring a good project can capture the significant reputational gains that creditors appear to derive from the decision to reorganize. Edwards and Fisher (1994) report that, in their interviews with German banks a consideration frequently mentioned as affecting the decision whether to reorganize a firm in financial distress is the effect on the image. Such image effects have a positive impact on the willingness to reorganize rather than liquidate.

[8] This assumption captures the fact that assets are generally worth more inside the firm than outside.

We impose the following restrictions on the parameters:

$$A\ell > I \tag{1}$$

$$Y > L_2^E > \frac{\pi_h}{\pi_h + \delta^2(1-\pi_h)} Y \tag{2}$$

$$\lambda\frac{A}{2} > L_2^B > (\lambda^L + \lambda)\frac{A}{4} \tag{3}$$

Assumption (1) guarantees the feasibility of lending. Assumption (2) implies that at date 2 the entrepreneur continues if and only if he or she is confident enough that the project is good if continued. Assumption (3) implies that at date 2, in the bad state, a bank continues a bad project if and only if it expects to recover enough assets with high redeployability. Assumptions (2) and (3) render the entrepreneur's funding choice non-trivial.

Financing The crucial feature of the model is that the entrepreneur can control the amount of information obtained by the banks. In particular, at date 0 the entrepreneur can establish either a relational or a transactional link with a bank (henceforth denoted with subscripts R and L respectively). A transactional link conveys to a bank less precise information than a relational link. The noise of the signals observed by the transactional bank, which captures the information gap between the two types of bank, is chosen by the entrepreneur at date 0 (see details below).

At date 0, after choosing the type of funding, the entrepreneur writes a credit contract with the banks. We specify the structure of the contract in accordance with the previous literature. We assume that the agents cannot commit to continuation and liquidation decisions. Therefore the contract specifies only the allocation of the verifiable returns (assets). We also restrict ourselves to the case in which this allocation cannot be contingent on the state of nature, on the quality of the project or on the redeployability of the assets. Our specification of contractual incompleteness resembles that of several other studies (see Rajan, 1992, for analogous assumptions and Hart, 2001, for an extensive survey on financial contracts in the presence of contractual incompleteness). We assume that at the contractual stage the entrepreneur has zero bargaining power and the banks have equal bargaining power. In what follows, we consider an equilibrium in which both banks are allocated $N/2$ tools in the date 0 contract. In lemma 2, we will prove that in equilibrium this necessarily holds. If the assets must be redeployed and both banks claim (or do not claim) a tool, each bank will get half of the proceeds from its redeployment.

Timing and Information Disclosure Below we summarize the timing of events and the process of information revelation. In Figure 1 we report the game tree with the total monetary returns and outlays and the non-monetary restructuring costs or benefits at each stage.

Date 0. (*Funding choice*). The entrepreneur chooses pure relationship funding (two relationship banks) or differentiated funding (one relationship and one transactional bank). In the latter case, the entrepreneur also chooses the noise of the signals observed by the transactional bank.[9]

(*Contract*). The entrepreneur writes a contract with the banks and starts the project.

Date 1. (*Continuation*). If the distress state is realized, a relationship bank observes the quality of the project while a transactional bank observes a noisy signal on it. The entrepreneur and the banks decide whether to continue or liquidate.

Date 2. (*Continuation*). Both banks observe the quality of the project. The entrepreneur and the banks decide whether to continue or liquidate.

(*Restructuring*). A relationship bank observes the redeployability of the tools, while a transactional bank observes noisy signals on it. The returns from the restructuring are realized and the agents consume.

We conclude the description of our framework with details on the signals observed by a transactional bank. At date 1, a transactional bank observes a signal $\varphi(p)$ on the quality of the project. Analogously, at date 2, a transactional bank observes a signal $\psi_i(p)$ on the redeployability of each tool i, with $i = 1, ..., N$. The noisiness p of these signals is chosen by the entrepreneur at date 0. At date 1, conditional on $\varphi = \varphi^H$, the project will be good with probability $p+(1-p)\pi_h$ and bad with probability $(1-p)(1-\pi_h)$; conditional on $\varphi = \varphi^L$, the project will be good with probability $(1-p)\pi_h$and bad with probability $p+(1-p)(1-\pi_h)$. For any p the unconditional probabilities of φ^H and φ^L are $\pi_h$and $(1-\pi_h)$. Analogously, at date 2, conditional on $\psi_i = \psi_i^H$, the redeployability of tool i will be high with probability $p + (1-p)/2$ and low with probability $(1-p)/2$ (and conversely if $\psi_i = \psi_i^L$). For any p the unconditional probability of ψ_i^H and ψ_i^L is 1/2.

2.2 Equilibrium

To solve for the equilibrium, we proceed by backward induction. First, we determine banks' expected returns if the project is continued at date 2 and

[9] Our analysis makes it clear that pure transactional funding (two transactional banks) is always dominated.

the continuation decision at that date. Then, we determine the continuation decision at date 1. Finally, we solve for the entrepreneur' s choice of funding at date 0.

We rule out equilibria in which agents play weakly dominated strategies. We also assume for simplicity that when agents are indifferent between continuation and liquidation, they choose liquidation.

Date 2: Continuation The only non-trivial allocation of returns is realized when the project is bad and the bad state occurs. Since a relationship bank has perfect information on the redeployability of the tools, it will always claim those with high redeployability. The transactional bank will always claim the tools for which the observed value of ψ_i is ψ_i^H. In Lemma 1, we solve for the banks' expected return from the continuation of a project at date 2.

LEMMA 1: *With differentiated funding, the expected return A_T to the transactional bank if a bad project is continued in the bad state is*

$$A_T = \frac{A}{2}\left\{[p + (1-p)\frac{1}{2}]\lambda + (1-p)\frac{1}{2}\lambda^L\right\} \tag{4}$$

and, correspondingly, for the relationship bank $A_R = A - A_T$. With pure relationship funding, the expected return of both relationship banks if a bad project is continued in the bad state is $\lambda A/2$.

PROOF: see Appendix.

Lemma 1 shows that a transactional bank has less to gain from the continuation of a bad project in the bad state ($A_T < \lambda A/2 < A_R$). Intuitively, since its information on the redeployability of the tools is noisy, the transactional bank expects to claim some tools with low redeployability and to leave some generic tools to the relationship bank.

We now solve for the continuation decision at date 2.

LEMMA 2: *Let*

$$\widehat{p} = \frac{4L_2^B - (\lambda + \lambda^L)A}{A(\lambda - \lambda^L)} \tag{5}$$

At date 2, in the bad state, if p=1, that is with pure relationship funding, the project will always be liquidated. If $p = \widehat{p}$, the project will be liquidated if and only if bad. In the very bad state, for any p, the project will be liquidated if and only if bad.[10]

[10] It is easy to see that any $p < \hat{p}$ and any p between $\hat{p}$ and 1 are dominated.

PROOF: see Appendix.

With differentiated funding, when $p = \widehat{p}$ the entrepreneur knows that a bad project will always be liquidated by the transactional bank, since the latter expects a low return A_T from its continuation and the redeployment of the assets. Therefore, by contrast with pure relationship funding the entrepreneur chooses continuation. Lemma 2 also vindicates the claim that each bank is initially allocated $N/2$ tools. In fact, the only asymmetry in the banks' expected returns could derive from the continuation of a bad project in the bad state, which thus lemma rules out.

Date 1: Continuation and Funding Choice In lemma 3 we solve for the agents' continuation decision at date 1.

LEMMA 3: *Assume that*

$$(1-\widehat{p})\pi_h < \frac{2\overline{L}_1^B}{A - 2L_2^B} < \min\left[1-\gamma,\ \widehat{p} + (1-\widehat{p})\pi_h\right] \tag{6}$$

At date 1, if $p = 1$, a good project will never be liquidated; if $p = \widehat{p}$ a good project will be liquidated with probability $\pi_h(1-\widehat{p})(1-\delta)$.

PROOF: see Appendix.

Lemma 3 shows that with differentiated funding, when $p = \widehat{p}$ with some probability a good project will be prematurely liquidated at date 1. In fact, the transactional bank may observe a bad signal φ^L at date 1 even if the project is good and, if its restructuring cost L_1^B is high ($L_1^B = \overline{L}_1^B$), opt for liquidation. Conversely, when $p = 1$, i.e. with pure relationship funding, no good project will be prematurely liquidated at date 1 because both banks have full information on the quality of the project.

We can finally solve for the entrepreneur's choice of funding at date 0.

PROPOSITION 1: *At date 0, the entrepreneur will choose pure relationship funding, that is $p = 1$, if and only if $\pi_h(1-\widehat{p})(1-\delta) \geq \gamma$. Otherwise, he will choose a degree of diversity $\widehat{p}$.*

PROOF: With pure relationship funding the entrepreneur expects that at date 2, in the bad state, a good project will always be liquidated with an expected loss of $\gamma\pi_h(1-\ell)(Y-L_2^E)$. With differentiated funding the entrepreneur expects that a good project will be liquidated at date 1 with probability $\pi_h(1-\hat{p})(1-\delta)$ with an expected loss of $(1-\ell)(1-\hat{p})\pi_h(1-\delta)\pi_h(Y-L_2^E)$. Comparing the two losses, we obtain the result of the proposition.

Proposition 1 characterizes the condition under which a firm prefers differentiated funding. Under relationship funding the entrepreneur expects a loss due from liquidation at date 2 of a good project in the bad state (lemma 2). This happens because, regardless of its quality, both banks have the incentive to continue the project to seize assets. Moreover, from assumption 2, the entrepreneur prefers liquidation in case of uncertainty. In lemma 3 we have shown that, under differentiated funding, a good project can be prematurely liquidation at date 1. In fact, a transactional bank can observe only a noisy signal on quality at this date. In choosing the type of funding, the entrepreneur weighs her expected loss in the two scenarios. Proposition 1 formalizes the selection criterion that arises from this trade-off.

3 Empirical Implications

The model carries a number of implications suitable for empirical scrutiny. In the model, $\widehat{p}$ is a proxy for the (endogenous) degree of diversity of the links between the firm and its banks. *We interpret (the inverse of) $\widehat{p}$ as an index of diversity of information rights across banks.* The closer $\widehat{p}$ is to 1, the less the information rights are differentiated and the closer the debt structure is to pure relationship funding, i.e. to borrowing from banks with exactly the same information. Using the expression for $\widehat{p}$, we can then relate the degree of diversity to several characteristics of the firm. The value of $\widehat{p}$ depends on the value of the assets of the firm A, on their average redeployability λ and on the banks' restructuring cost L_2^B. It also depends on the heterogeneity in the redeployability of the assets, as measured by $\lambda - \lambda^L = (\lambda^H - \lambda^L)/2$. In what follows, we summarize the model's empirical implications.

Degree of diversity. Given the decision of a firm to choose differentiated bank funding, the degree of diversity (the inverse of $\widehat{p}$) depends on the above characteristics of the firm as follows.

Asset value. The degree of diversity is positively related to the value of the assets A. Intuitively, the greater the value of seizable assets, the greater is the diversity necessary to prevent the continuation of bad projects. In fact, the greater the value of the assets, the greater the incentive of a bank to continue a bad project simply to seize assets.

Assets redeployability. The degree of diversity is positively related to the average redeployability λ of the assets. In fact, the greater the average redeployability, the greater the incentive of a bank to continue a bad project only to seize assets.

Assets heterogeneity. The degree of diversity is inversely related to the heterogeneity of the assets. To assess how heterogeneity affects $\widehat{p}$, other things being equal, consider the derivative $\frac{\partial \widehat{p}}{\partial \lambda^L} \mid_{\lambda=\overline{\lambda}}$. Operating algebraic manipulations, we get $\frac{\partial \widehat{p}}{\partial \lambda^L} \mid_{\lambda=\overline{\lambda}}= \frac{4L_2^B-2\lambda A}{A(\lambda-\lambda^L)}$ which is negative by Assumption (3).[11] Intuitively, more heterogeneity of the assets reduces the amount of diversity in banks' information necessary to induce a conflict between the transactional and the relationship bank. In fact, when the assets have heterogeneous redeployability, for the transactional bank even a small informational disadvantage implies significantly lower expected return from the continuation of a bad project.

Restructuring costs. The degree of diversity is inversely related to banks' restructuring cost L_2^B. In fact, a higher restructuring cost implies a lower incentive for the banks to continue a bad project only to seize assets.

Choice of Differentiated Funding Proposition 1 predicts that when $\mu = \pi_h(1-\widehat{p})(1-\delta) < \gamma$, differentiated funding will be preferred to pure relationship funding. Whether a firm chooses differentiated funding depends on $\widehat{p}$, and hence on all the variables that affect $\widehat{p}$. In particular, a sufficiently high value of $\widehat{p}$ implies that differentiated funding will be chosen, other things being equal. The decision also depends on the quality of the project π_h and on the probability γ that the bad state is realized, conditional on the realization of the distress state. These variables, which do not affect the optimal degree of diversity, will play a key role in the identification of the empirical model.[12]

4 Empirical Evidence

4.1 Data Description and Estimation Strategy

We test the above implications on US data drawn from the National Survey of Small Business Finance (NSSBF), which is conducted by the Board of Governors of the Federal Reserve System and the Small Business Administration. We pool information from two survey waves, 1993 and 1998. The NSSBF is a stratified random sample of for-profit firms with fewer than 500 employees. The survey includes data on financial conditions, drawn from

[11] The derivative is calculated by holding the average redeployability of the assets λ constant.

[12] The choice also depends on the probability δ that the bank faces a negative continuation cost, which we will treat as given in the empirical analysis.

balance sheets and income statements, and detailed information about relationships with financial institutions. It also collects information on firm demographics. The survey gives data for 4,589 firms in 1993 and 3,431 in 1998, for a total of 8,020 firms. Firms in the pooled sample have on average 29.9 employees. The small size of the firms in the survey appears suitable for our analysis. A crucial feature of the model is that (concentrated) lenders can have heterogeneous information on the assets of the firm. This feature is particularly relevant if the firm is opaque, and opacity is supposed to be a characteristic of small firms. Of the firms in the sample, 2,773 declare they have no lending institutions, 2,694 have one and 2,553 have more than one. We will focus on the sub sample of 5,247 firms with at least one lending institution.

Letting D be an indicator variable that takes value one if the firm chooses differentiated borrowing and zero otherwise, the model solution can be expressed as follows:

$$D = 1 \text{ if } \mu = \pi_h(1-\widehat{p})(1-\delta) < \gamma \tag{7}$$

$$\widehat{p} = \frac{4L_2^B - (\lambda + \lambda^L)A}{A(\lambda - \lambda^L)} \quad \text{if } \; D = 1 \tag{8}$$

The first condition determines whether the firm chooses differentiated funding and allocates information rights unequally across lenders, or rather relies on pure relationship funding and provides equal information to all its banks. The second condition defines the optimal degree of diversity of information rights conditional on choosing differentiated funding. The form of the optimal solution suggests a two-step estimator, in the first stage estimating a probability model for whether the firm chooses differentiated funding and in the second stage estimating the degree of diversity conditional on having chosen differentiated funding.

Even though in our model a firm always borrows from two banks, we can interpret pure relationship funding - that is zero degree of diversity - as borrowing from just one bank. In fact, in our context pure relationship funding is equivalent to borrowing from banks that have exactly the same information. In the day-to-day practice of firms, this is tantamount to borrowing from one bank only. Given this approach, the model predicts, for example, that an increase in asset redeployability negatively affects the probability of borrowing from more than one bank. Interestingly, this prediction is observationally different from that of Bolton and Sharfstein (1996), where borrowing from multiple banks acts as a discipline device for the managers of a firm, discouraging them from defaulting strategically for the sole purpose of renegotiating ex-post.[13] In their analysis, an increase in asset aggravates exacerbates the risk of strategic default, requiring more extensive resort to multiple funding.

In order to implement our estimation strategy, we need a measure of the diversity of information precision across lenders. We proxy the precision of the information of a bank with its share of total credit to the firm. In fact, a substantial amount of the information a bank acquires about a firm comes through its operations with the firm. Observing how a credit line evolves, whether a ceiling is exceeded and how often, whether installments on loans are regularly paid etc., conveys excellent information on the financial and economic condition of a firm.[14] The smaller the bank's share of the total credit extended to a firm, the less precise the information the bank has on the firm relative to the other lenders.

Using the bank's share of lending to a given firm as a proxy of its information, a natural measure for the diversity of banks' information (inverse of $\widehat{p}$) is the concentration of loans across creditors. The more credit is concentrated in the hands of a subset of lenders, the greater the heterogeneity of information across the firm's lenders. We measure loan concentration using the Herfindahl index, H , with $H = 1$ when $\widehat{p} = 0$ (maximum concentration-diversity) and $H'(\widehat{p}) < 0$, i.e. the index is monotonically decreasing in $\widehat{p}$.

Table 1 shows the structure of borrowing relations for the sample of firms that use outside finance. Half the firms that have at least one bank have differentiated finance, as witnessed by the heterogeneous shares of the banks in total loans. For instance, among firms with two banks, the first bank provides on average 76.5 percent of total credit.

To implement our test, we estimate a Heckman selection model. In the first stage, we estimate a probit for the probability of the firm choosing differentiated funding, i.e. borrowing from more than one bank. In the second stage, we estimate the degree of diversity as a function of observables correcting for selection.

The model presents a natural exclusion restriction, which enables identification. While all the variables that affect the degree of diversity (inverse of $\widehat{p}$) also affect the decision to borrow from differentiated sources, the probability of the project being good, π_h, and the probability γ of the bad state being realized conditional on the realization of the distress state affect only the decision to rely on differentiated funding, but not the degree of diversity.

[13] Bolton and Sharfstein (1996) show that borrowing from multiple lenders increases the price that the manager has to pay to buy back the assets.

[14] This is consistent with banks' practice of computing "internal scores", that is scores based on information derived solely from how the credit relation evolves.

Thus, identification can be obtained by inserting proxies for these variables in the probit and excluding them from the second-stage regression.

4.2 Measurement

We now provide details on the measurement of the dependent and explanatory variables.

Our dependent variable is the Herfindahl index of loans, defined as $H_j = \Sigma_i (Loan_{ij}/TotalLoans_j)^2$. $Loan_{ij}$ stands for the value of the credit (possibly belonging to different categories) extended by bank i to firm j and $TotalLoans_j$ stands for the total credit extended to the firm.[15]

Among the explanatory variables, we include the total value of the assets of the firm. We use different indicators to proxy for the average redeployability of the firm's assets. The redeployability of an asset depends both on the liquidity of its secondary market and on the intrinsic nature of the asset. As a measure of the liquidity of the secondary market, which we take as our main measure of redeployability, we use the degree of co-movement between the sales of the firm and the sales of other firms in the same industry. As Shleifer and Vishny (1992) argue, when the conditions of the firms in an industry are positively correlated, the redeployability of the assets of the firms in that industry is likely to be low. In fact, the best second-hand users of the assets of a firm are probably the firms in its same industry, since they have the experience and know how to use these assets effectively. If these second-hand users themselves have financial problems when the firm is in distress, they will buy, if at all, only at low prices; otherwise, the firm will have to sell to less efficient, out-of-industry users whose willingness to pay is low. To compute the co-movement of sales, we use data from Compustat firms over the period 1950-2000 for a total of 251,782 firm-year observations. We classify firms into sixty-four industries using a two-digit classification and then, for each industry, regress the standardized annual rate of growth of firms' sales on a full set of year dummies. If firms within an industry co-move significantly, the year dummies will explain a large part of sales variability. We thus retain the R^2 of these regressions and use it as a measure of comovement of firms in the industry. Industries with high R^2 will be high co-movement industries. We then impute this measure to the firms in our sample using the industry code.[16]

[15] Categories of loans include: credit lines, mortgages, motor vehicle loans, equipment loans and other loans.

[16] The number of observations on which the co-movement measure is based varies with industry; the mean is 7,292, the lowest 402.

As a second control for the average redeployability of assets, we use location (rural or urban) setting a dummy equal to one if the firm has a rural location, zero otherwise. This proxy is aimed at capturing structural aspects that affect the liquidity of the secondary market. In particular, firms that operate in urban areas presumably have easier access to efficient resale markets. Helsley and Strange (1992), for example, develop a model of a statistical agglomeration economy in the capital market of an urban area. In their model, the resale value of collateralized assets is higher in cities because the density of possible second-hand uses is greater. Habib and Johnsen (1998) also argue that redeployablity is likely to be greater in urban areas.[17] Finally, as a last proxy for redeployability that arises from asset characteristics, we use the share of illiquid, either intangible or fixed, assets. In fact, it is generally agreed that intangible and fixed assets are less easily redeployable than inventories or cash.

We now turn to variables capturing the heterogeneity of assets. In our context, what matters is heterogeneity in redeployability. Differences in redeployability can arise from heterogeneity in the nature of the assets, stemming, for example, from functional diversity in the activities of the firm. Unfortunately, we have no information on whether the firm produces one or multiple products. Heterogeneity in redeployability can also stem from differences in the location of the assets, when the firm operates plants in different places. Geographical location and the liquidity of local asset markets is likely to matter whenever assets are non-tradable, as in construction, or where transportation costs are high. Since we do not have details on the nature and location of the assets used by the firm, to capture heterogeneity in redeployability we use various proxies. As a gauge of functional diversity, we include the number of trade creditors normalized by the size (sales) of the firm. Given size of the firm, a higher number of suppliers may reflect the presence of different lines of production and, therefore, the heterogenous nature of pledgeable, productive assets. To capture geographical dispersion, we include a dummy for the number of sites of the firm, set at one if the firm has only one site, i.e. is geographically homogeneous.[18]

[17] The model predicts therefore that firms located in rural areas have more incentives to borrow from more than one bank. Interestingly, this prediction is the inverse of what one would derive from the argument that in rural areas the offer of financial services is more limited than in cities.

[18] If we focus on the first-stage regression, the model predicts that firms with more than one site borrow from more than one bank. In principle, one could argue that this is because a firm wants to minimize the distance between plants and creditors. In particular, a firm with multiple plants could have an advantage in borrowing from multiple creditors, each close to a plant and with particular expertise in assessing production in that plant.

We use two indicators to proxy for restructuring costs. One is the average length of the relationship between the banks and the firm. The shorter the banks' experience with the firm, the greater their effort, hence the larger the cost of reorganizing. The second is the share of the firm owned by its principal owner. When ownership is concentrated, stakeholders supposedly have lower costs in coordinating actions, including direct costs for organizing meetings, transmitting information and so forth (see Hart, 2001, for a discussion of this issue). Ownership concentration, through the opacity effect may influence the financial decision of the firm. As Petersen and Rajan (2002) argue, when owners are dispersed, the firm needs a better informational structure to inform the various stakeholders. Since our theory applies especially to opaque firms, we would expect more concentrated firms to have a higher probability of choosing differentiated funding and, given the choice of differentiated funding, a higher degree of diversity. Therefore, the expected sign on ownership concentration is the same whether we consider it as a proxy for restructuring costs or for informational opacity.

Finally, in the model the probability of observing differentiated funding depends negatively on the probability of the project being good and positively on the probability γ of the distress state not becoming very bad. Separating these two dimensions in the data is difficult. We limit ourselves to finding proxies for the quality of the firm that can capture both features. The survey asks the firm about its credit history, and we use this information to proxy for firm quality. More specifically, the NSSBF asks firms several questions: *Within the past seven years, has the firm or its principal owner declared bankruptcy*? we set a dummy variable for bankruptcy equal to 1 if the firm answers "yes". *Within the past three years, on how many different personal obligations has the principal owner been 60 or more days delinquent*? possible answers are: none, one, two, three or more. We set the variable "delinquent on personal obligations" equal to 1 if it has never been delinquent, to 2, 3 and 4 if it has been delinquent once, twice or three or more times. The third proxy for firm quality is obtained from the question: *Within the past three years, on how many different business obligations has the firm been 60 or more days delinquent? Please include trade credit, or credit from suppliers*. Possible answers are: none, one, two, three or more. We set the variable "delinquent on business obligations" equal to 1 if it has never been delinquent, to 2, 3 or 4 if it has been delinquent once, twice,

However, Petersen and Rajan (2002) find that, at least for US firms, thanks to computers and communication equipment, hard information about a firm is now also available at a distance, and distance itself has become a far less important factor than in the past.

three or more times.

Table 2 reports summary statistics for the variables used. Panel A refers to all the firms in the pooled NSSBF sample; panel B refers to the sample of firms with at least one lender on which we run our estimates. There appear to be three main differences between the two groups. Firms with at least one lender are larger (an average of about 40 employees against 30 for the whole sample). Consistently, the total value of the assets of these firms is also greater. Firms that borrow from financial intermediaries also have fewer trade creditors on average, which is reasonable as they exploit other sources of funding. Finally, these firms exhibit less concentrated ownership. This could be due to their larger size and the reluctance of small businessmen to share ownership and control.

5 Results

To facilitate the interpretation of our estimates, in Table 3 we summarize the expected signs of the explanatory variables on the probability of differentiated funding (borrowing from more than one lender) and on the dispersion of information across lenders, measured by the concentration of lending. As is made clear by equation (7), for the variables in the probit that are also in the intensive margin regression, the model predicts opposite signs of their coefficients in the two stages. For example, the degree of a firm's co-movement is predicted to have a *negative* effect on the degree of diversity conditional on borrowing from more than one bank, and hence to have a *positive* effect on the probability of resorting to differentiated funding. Thus, we can also check the validity of the model's predictions by assessing the consistency of the pattern of the signs of the coefficients in the probit with those in the second stage regression.

Table 4, panel A, shows the results of the estimates. To stick to the theoretical model, we run our regressions on the sub-sample of firms with up to two lenders and disregard all firms that borrow from three or more sources (1,161 observations). We also drop the very small firms (fewer than five employees, 1,798 observations) as their borrowing patterns may be dictated by the presence of fixed borrowing costs[19]; in the next section we check the robustness of our results to these exclusions. After these exclusions and the

[19] Moreover, the financing of some assets could exhibit some indivisibility and this could bias the results towards concentrated funding. If present, these indivisibilities are likely to be relatively more significant for firms with a small volume of activity and to be washed out for bigger firms. This suggests dropping very small firms.

loss of some observations due to missing values in the explanatory variables, the final sample comprises 2,302 firms of which 913 borrowed from multiple lenders and 1,389 had only relationship finance.

Consider the first-stage regression, whose estimate is shown in the first column. As is argued in Section 4, a nice feature of the model is that it delivers exclusion restrictions that help to achieve identification and separate the choice of differentiated borrowing from its intensity. In particular, measures of the quality of the firm's project and its exposure to bankruptcy risk should affect the decision whether resort to differentiated finance but not the degree of diversity. Accordingly, we include three indicators of the firm's credit history (a dummy for going bankrupt plus indicators of delinquency on business or personal obligations) in the probit but not in the second-stage regression. Since these variables are likely to proxy both for the probability π_h of the project being good and for the probability γ of the distress state not becoming very bad, and since π_h and γ have opposite effects on the probability of differentiated funding, their effect will in general be ambiguous. If the project quality effect prevails, it will be positive, while if the risk of bankruptcy dominates it will be negative.

Firms with a past personal or business delinquency are more likely to borrow from multiple banks and differentiate information rights among their lenders, suggesting that the project-quality effect prevails. Both indicators of firm quality are statistically significant, reassuring us about the power of the instruments. Compared with firms that have never been delinquent on business obligations, those that have been delinquent three or more times are 6.6 percentage points more likely to borrow from multiple lenders, and those that have been delinquent three or more times on personal obligations 10.4 percentage points more likely (about 25 percent of the sample mean). However, the indicator for bankruptcy over the past seven years has no effect on the probability of differentiated borrowing; one interpretation consistent with our model is that this variable is a better proxy for the risk of bankruptcy, and that this effect offsets the firm-quality effect.[20]

The probability of differentiated funding is positively correlated with the value of assets. As we see in Table 3, this contradicts the predictions of the model, since asset value increases the optimal degree of diversity conditional on choosing differentiated borrowing, but should have a negative effect on the

[20] Since one exclusion restriction is sufficient to achieve identification, we can test the validity of our instruments by inserting in the second-stage regression the three indicators of firm quality one at a time. If the exclusion restrictions are valid, they should be statistically insignificant. And in fact, inserting in turn the indicators of personal delinquency, of business delinquency and of bankruptucy none is statistically significant.

probability of differentiated funding. However, models of multiple banking predict a positive correlation between firm size and multiple borrowing (e.g. Detragiache, Garella and Guiso, 2000), and our finding is likely to reflect these effects. To check this possibility further, we add the firm workforce (in logs) as a proxy for size. The coefficient on assets decreases considerably and loses precision but remains positive and statistically significant.[21]

The effects of the other variables, however, are consistent with the predictions of our theoretical model. In particular, the degree of firm's co-movement - our main proxy for ease of asset redeployment - has a negative and statistically significant (at the 9 percent) effect on the probability of differentiated borrowing. Raising co-movement from the 10^{th} to the 90^{th} percentile of the distribution increases the probability of differentiated borrowing by 5 percentage points, about 12.5 percent of the sample mean. Both the dummy variables for the rural/urban location and the share of illiquid assets have the expected positive sign, but neither is statistically significant. Of the two proxies for asset heterogeneity, the number of trade creditors of the firm is never statistically significant either in the probit or in the intensity regressions and has thus been dropped in the final regressions; the indicator for single plant has the expected negative sign and is statistically significant at the 8 percent level. Finally, the proxies for the costs of restructuring behave as predicted; in particular, the probability of multiple borrowing is affected negatively by the average duration of the relationships between the firm and its banks and the effect is highly significant: a one standard deviation increase in the average length of the relations lowers the probability of differentiated funding by 7.8 percentage points. Finally, the degree of ownership concentration enters the probit with the expected positive sign and is statistically significant at the 3.5% level.

The estimates of the degree of diversity across lenders are reported in the second column of Table 4. Consistent with the model, the degree of diversity increases with the value of assets, even after controlling for firm size, as measured by number of employees. This is remarkable, since it means that a firm with more assets that borrows from two banks will tend to allocate information rights in a more asymmetric way(borrowing, say 80 percent from the first and 20 from the second) than a firm with less assets, which will tend to divide its borrowing more evenly. Increasing assets by one standard deviation raises the degree of diversity by 4.3 percentage points - about 10

[21] The positive correlation between the probability of differentiated funding and asset value could also stem from financial imperfections and supply side effects. In particular, if some minimum collateral is required, a firm with low asset value could be unable to borrow from more than one bank.

percent of the sample mean. As predicted by the model, firm co-movement has a negative and statistically significant effect on the degree of information dispersion; economically, increasing comovement from the 10^{th} to the 90^{th} percentile lowers the Herfindahl on loans by 3.3 percentage points (8.25 percent of the sample mean). The dummies for rural location and the share of illiquid assets also have the expected negative sign, and are significant at the 4.6% and at the 5.4% level respectively. The geographical indicator for asset complexity has a positive and significant effect, as predicted by Table 3, while the proxies for restructuring costs (the average length of the relationships with the lenders and the degree of ownership concentration), are both estimated with a high standard error.

Overall, the results of the estimates support the model's explanation of the pattern of funding among firms that borrow from multiple sources. This conclusion is reinforced by the observation that the signs of the coefficients in the second-stage and in the first-stage regressions (with the exception of asset value and firm size) tend to be opposite, as the model implies.

6 Robustness

The results in panel A of Table 4 are based on a selected sample that excludes firms borrowing from more than two sources; since firms choose the number of lenders, our estimates may be affected by selection bias. To account for this, in panel B of Table 4, we re-estimate by including firms that borrow from more than two banks. The sample size increases to 2,756 firms, but the size and significance of the parameters estimated are essentially unchanged. In Table 5, panel A, we expand the sample to include also firms with at least two employees, while retaining only those that borrow from just two lenders. Again, results are essentially unchanged; the only coefficient that becomes lower and loses significance is that of the degree of co-movement in the probit equation; the other parameters are basically unaffected. Finally, in panel B of Table 5 we estimate the model on the whole sample; results are robust to this extension too, confirming that they are not driven by sample selection.

7 Conclusion

We have examined how a firm allocates what we have dubbed "information rights" - i.e. the ability to obtain precise information on the firm - across multiple creditors. Building on growing evidence on the distortions that the informational advantage of concentrated creditors can induce during private reorganizations, we have shown that differentiating information rights across creditors can serve as a discipline device for the restructuring pool. We have tested the empirical predictions of the model using data from a sample of small US firms, finding supportive evidence. As the model implies, firms with more valuable and more redeployable assets tend to differentiate information rights more sharply. Consistent with the theoretical predictions, we have also found that firms with assets that are more heterogeneous in their redeployability and that have higher restructuring costs choose to have less differentiated links with their creditors.

A Appendix

PROOF OF LEMMA 1:

For each tool i the transactional bank expects to observe ψ_i^H (or ψ_i^L) with probability $1/2$. The probability that the redeployability of tool i, conditional on $\psi_i = \psi_i^H$, is actually high (λ^H) is $p^* + (1-p^*)/2$, while the probability that is low (λ^L) is $(1-p)/2$. The transactional bank knows that if a tool is actually highly redeployable, it will be claimed also by the relationship bank and the two banks will get $\lambda^H A/2N$ each; if, instead, it has low redeployability it will not be claimed by the relationship bank and the transactional bank will get $\lambda^L A/N$. Finally, a tool that is not claimed by the transactional bank will not be claimed by the relationship bank if and only if it actually has low redeployability. This happens with probability $p + (1-p)/2$ and in this case each bank will get $\lambda^L \frac{A}{2N}$ from its redeployment. Combining these steps the expected return of a transactional bank is $A_T = \frac{A}{2}\left\{\left[(p+(1-p)\frac{1}{2})\frac{1}{2}\lambda^H + (1-p)\frac{1}{2}\lambda^L\right] + \left[(p+(1-p)\frac{1}{2})\frac{1}{2}\lambda^L\right]\right\} =$
$= \frac{A}{2}\left[(p+(1-p)\frac{1}{2})\lambda + (1-p)\frac{1}{2}\lambda^L\right]$.

PROOF OF LEMMA 2:

1st case: p=$\widehat{p}$. Banks' decision. At date 2: i) In the bad state, since $L_2^B = A\left[\widehat{p}\lambda + (1-\widehat{p})\lambda^L\right]/2$, a transactional bank will always choose to liquidate a bad project; ii) In the bad state, a relationship bank will always choose to continue a bad project since, from assumption 3, $L_2^B < \lambda A/2$; iii) In the very bad state, both banks will choose to liquidate a bad project since $L_2^B > 0$; iv) In both states, both banks will choose to continue a good project since $L_2^B < A/2$.

Entrepreneur's decision. Unlike the banks, the entrepreneur does not know the quality of the project at date 2. However, he knows there is a positive probability of it being bad (see the proof of Lemma 3 for a vindication of this claim) but that the transactional bank will always liquidate a bad project. Since, from assumption (2), $L_2^E < Y$, the entrepreneur will always continue the project.

2nd case: p=1. Banks' decision. i) In the bad state, both a relationship and a transactional bank will choose to continue a bad project since, from assumption (3), $L_2^B < \lambda A/2$; ii) In the very bad state, both banks will choose to liquidate a bad project since $L_2^B > 0$; iii) In both states, both banks will choose to continue a good project since, from assumption (2), $L_2^B < A/2$.

Entrepreneur's decision. The entrepreneur knows that with probability greater than $\pi_h/\left[\pi_h + \delta^2(1-\pi_h)\right]$ the project is bad (see the proof of Lemma 3) and that the banks will want to continue a bad project. Since, from assumption 3, $L_2^E > \pi_h Y/\left[\pi_h + \delta^2(1-\pi_h)\right]$, the entrepreneur will always liquidate the project.

PROOF OF LEMMA 3:

Entrepreneur' s decision. The entrepreneur will always choose to continue at this stage since continuation cost is 0.

Banks' decision. 1st case: $p^*=\widehat{p}$.

The project is good. For a relationship bank the expected return from continuing is

$$(\frac{A}{2}-L_2^B)\gamma+(\frac{A}{2}-L_2^B)(1-\gamma)=\frac{A}{2}-L_2^B>\overline{L}_1^B$$

In fact, the relationship bank expects that at date 2, in both states, only a good project will be continued with a return of $A/2-L_2$. For a transactional bank that has observed φ^H the expected return from continuing is

$$(\frac{A}{2}-L_2^B)(\widehat{p}+(1-\widehat{p})\pi_h)>\overline{L}_1^B$$

Thus a transactional bank observing φ^H will always want to continue. For a transactional bank that has observed φ^L the expected return is

$$(\frac{A}{2}-L_2^B)(1-\widehat{p})\pi_h<\overline{L}_1^B$$

If $L_1^B>(1-\widehat{p})\pi_h(A/2-L_2^B)$ a transactional bank observing φ^L will liquidate. The probability that $L_1^B>(1-\widehat{p})\pi_h(A/2-L_2^B)$ is $1-\delta$. Conditional on the project being good, the transactional bank will observe φ^H with probability $\hat{p}+(1-\hat{p})\pi_h$ and φ^L with probability $(1-\hat{p})\pi_h$. Hence, at date 1 a good project will be liquidated with probability $(1-\delta)(1-\hat{p})\pi_h$.

The project is bad. Since for a relationship bank the net expected return from continuing a bad project is $0-L_1^B$, with probability δ a relationship bank will choose to continue. For a transactional bank, the expected returns conditional on the value of the signal φ have already been described in the previous subsection. Now, conditional on the project being bad, the transactional bank will observe φ^H with probability $(1-\widehat{p})\pi_h$ and φ^L with probability $\widehat{p}+(1-\widehat{p})\pi_h$. Overall this implies that with probability greater than δ^2 a bad project will be continued, vindicating the claim in Lemma 2.

Banks' decision. 2nd case: $p^*=1$

The project is good. In this case, at date 1, both banks share full information on the quality of the project. Moreover, they rationally expect that at date 2 in the bad state the entrepreneur will always liquidate. Hence both for the relationship and the transactional bank the return from continuing will be

$$(\frac{A}{2}-L_2^B)(1-\gamma)>\overline{L}_1^B$$

The project is bad. With probability δ^2 a bad project will be continued. In fact if both banks have $L_1^B < 0$ the project will be continued.

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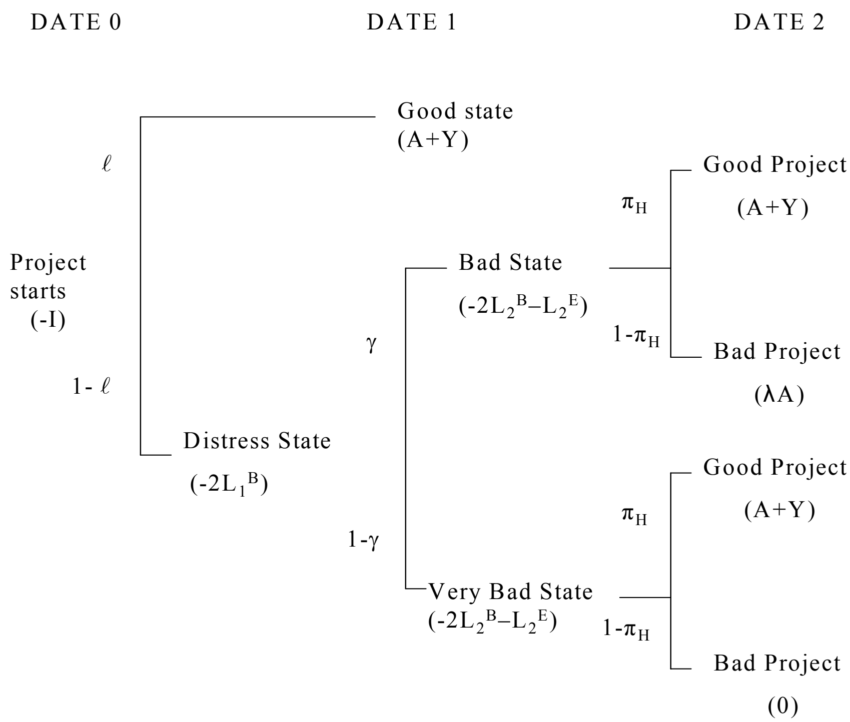

Figure 1: Game Tree and Returns

Table 1: The Structure of Lending Relations

The table summarizes the structure of lending relations. The second column reports the share of firms in the sample that have n (=1, 2, 3, >3) lenders. The other columns report the share of loans from each lender ranked from highest to lowest.

Number of lenders	Share of firms with n lenders	Share of loans from x^{th} lender			
		1st	2nd	3rd	other
No lenders	0.334	-	-	-	-
1 lender	0.339	1.00	-	-	-
2 lenders	0.180	0.765	0.235	-	-
3 lenders	0.080	0.651	0.181	0.168	-
4 or more lenders	0.067	0.538	0.174	0.065	0.229

Table 2: Descriptive Statistics
The table reports summary statistics for the variables used in estimation. Panel A refers to the whole sample; Panel B to the sample of firms with at least one lender. In each panel, the second column reports the mean of the variables while columns three to five report the quartiles of the distribution. Assets are in current dollars; the length of relations is expressed in months.

Variable	**Panel A:All firms**			
	Mean	25%	50%	75%
Loans concentration	0.813	0.580	1	1
Assets	1,243,267	28,000	127,040	731,966
Comovement	0.051	0.019	0.037	0.078
Rural location	-	0	0	1
Illiquid assets (share)	0.383	0.08	0.333	0.645
N. employees	29.870	2	6	27
N. suppliers/sales	8.01e-05	3.16e-06	1.61e-05	0.000496
One site	-	0	1	1
Length of Relations	84.414	32	60	112
Main owner share (%)	77.631	50	100	100
Business delinquency	1.402	1	1	1
Personal delinquency	1.330	1	1	1
Bankruptcy	0.027	0	0	0

Variable	**Panel B:Firms with at least 1 lender**			
	Mean	25%	50%	75%
Loans concentration	0.813	0.580	1	1
Assets	1,732,056	62,959	273,658	1,492,000
Comovement	0.053	0.02	0.037	0.08
Rural location	-	0	0	0
Illiquid assets	0.403	0.12	0.359	0.662
N. employees	39.790	4	10	50
N. suppliers/sales	5.96e-05	4.41e-06	1.52e-05	4.17e-05
One site	-	0	1	1
Length of Relations	84.414	32	60	112
Main owner share (%)	74.081	50	92	100
Business delinquency	1.458	1	1	1
Personal delinquency	1.367	1	1	1
Bankruptcy	0.025	0	0	0

Table 3: Expected Signs of the Effect of the Explanatory Variables

The table summarizes the expected effects of the explanatory variables used in estimation on the decision to rely on differentiated lending (i.e. borrow from multiple lenders, the extensive margin) and on the extent of differentiation conditional on differentiating (the intensive margin). In the extensive margin the dependent variable is an indicator variable equal to 1 if the firm has more than one lender. In the intensive margin the dependent variable is the degree of concentration of the loans obtained from the firm's multiple lenders, as measured by the Herfindahl index.

Variable	**Effect on**	
	Probability of differentiation	**Loans' concentration** (Herfindahl index)
Firm's quality	Ambiguous	-
Assets	Negative	Positive
Comovement	Positive	Negative
Rural location	Positive	Negative
Illiquid assets	Positive	Negative
One site	Negative	Positive
N. of suppliers /sales	Negative	Positive
Length of relations	Negative	Positive
Ownership share	Negative	Positive

Table 4: Estimating the Choice of Differentiated Finance and the Degree of Differentiation

The table reports estimation results for the subsample of firms with up to two lenders (Panel A) and for all firms with at least one lender (Panel B); firms with less than 5 employees are excluded. In both panels, the first column reports estimates for the first-stage probit for the decision of borrowing from differentiated sources; the second column reports the estimates for the second-stage decision of the degree of differentiation. In the probit, the dependent variable is an indicator variable equal to 1 if the firm borrows from more than one lender. In the intensive margin, the dependent variable is the degree of concentration of the loans obtained from the firm's multiple lenders, as measured by the Herfindahl index. t-values are in parenthesis. All regressions include a constant term and a dummy for 1998; ***, **, * denote significance at 1%, 5% and 10%.

	Panel A (firms with up to 2 lenders)		**Panel B** (all firms)	
	First stage	Degree of differentiation	First stage	Degree of differentiation
Business delinquencies	0.057^{***} (1.90)	–	0.083^{***} (3.07)	–
Personal delinquencies	0.087^{**} (2.49)	–	0.098^{**} (3.11)	–
Bankruptcy	-0.012 (-0.07)	–	-0.099 (-0.61)	–
Log(Assets)	0.051^{***} (2.52)	0.023^{***} (4.97)	0.064^{***} (3.41)	0.026^{***} (5.86)
Comovement	1.137^{*} (1.69)	-0.329^{**} (-2.28)	1.126^{*} (1.86)	-0.254^{**} (-1.98)
Rural	0.046 (0.75)	-0.026^{**} (-2.00)	0.068 (1.23)	-0.026^{**} (-2.24)
Illiquid assets	0.085 (0.92)	-0.039^{*} (-1.93)	0.146^{*} (1.73)	-0.054^{***} (-2.94)
Log(Employees)	0.057^{*} (1.79)	0.009 (1.33)	0.059^{**} (2.00)	0.012^{*} (1.81)
One site	-0.103^{*} (-1.75)	0.024^{**} (1.90)	-0.133^{**} (-2.50)	0.028^{**} (2.36)
Length of relations	-0.002^{***} (-6.21)	$-0.8e-4$ (-0.77)	-0.002^{***} (-8.04)	$-0.1e-3$ (-0.94)
Ownership share	0.002^{**} (2.11)	$0.2e-4$ (0.07)	0.002^{*} (1.71)	$0.1e-3$ (0.59)
N. obs.	2,302		2,756	
N. uncensored	913		1,367	
Pseudo R^2				

Table 5: Robustness

The table reports estimation results for the subsample of firms with up to two lenders (Panel A) and for all firms with at least one lender (Panel B) including the very small businesses. In both panels, the first column reports estimates for the first-stage probit for the decision of borrowing from differentiated sources; the second column reports the estimates for the second-stage decision of the degree of differentiation. In the probit, the dependent variable is an indicator variable equal to 1 if the firm borrows from more than one lender. In the intensive margin the dependent variable is the degree of concentration of the loans obtained from the firm's multiple lenders, as measured by the Herfindahl index. t-values are in parenthesis. All regressions include a constant term and a dummy for 1998; ***, **, * denote significance at 1%, 5% and 10%.

	Panel A (firms with up to 2 lenders)		**Panel B** (all firms)	
	First stage	Degree of differentiation	First stage	Degree of differentiation
Business delinquencies	0.054*** (2.06)	–	0.073*** (3.07)	–
Personal delinquencies	0.075** (2.58)	–	0.085** (3.20)	–
Bankruptcy	0.075 (0.53)	–	−0.004 (−0.03)	–
Log(Assets)	0.071*** (4.07)	0.018*** (4.47)	0.086*** (5.37)	0.021*** (5.12)
Comovement	0.641 (1.31)	−0.243** (−1.95)	0.529* (1.86)	−0.182 (−1.63)
Rural	0.066 (1.43)	−0.020** (−1.76)	0.101 (2.10)	−0.019* (−1.84)
Illiquid assets	0.099 (1.26)	−0.027 (−1.54)	0.187*** (1.73)	−0.051*** (−3.13)
Log(Employees)	0.062* (2.38)	0.011** (1.96)	0.064*** (2.67)	0.012** (2.13)
One site	−0.059* (−1.08)	0.019** (1.63)	−0.102** (−2.07)	0.025** (2.32)
Length of relations	−0.002*** (−6.90)	$-0.6e-4$ (−0.62)	−0.002*** (−8.75)	$-0.8e-4$ (−0.81)
Ownership share	0.002** (2.00)	$0.8e-7$ (0.04)	0.001 (1.54)	$0.1e-3$ (0.59)
N. obs.	3,085		3,628	
Uncensored	1,149		1,692	
Pseudo R^2				