Ownership Structure, Banks, and Private Benefits of Control

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Abstract

Banks may play a corporate governance role by reducing managerial discretion and thus limiting managerial abuses. Whether or not an entrepreneur allows banks to have influence in his company (by borrowing from concentrated rather than dispersed banks) depends on the value of the private benefits of control. Bank monitoring is less valuable in countries with weaker protection for investors (and greater opportunities for self-dealing), because private benefits of control are less costly there. Cross-country evidence is shown to be consistent with this prediction and difficult to reconcile with alternative explanations.


Keywords: relationship financing, corporate governance, ownership structure, investor protection.

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1. Introduction

The common view is that firms in countries with low investor protection encounter difficulty raising external funds through arm’s-length contracts and therefore maintain relations with a small number of long-term investors who are willing to screen the firm’s investment opportunities and monitor its management (Rajan and Zingales, 1998). Banks are ideal as such investors because of their skills as delegated monitors (Diamond, 1984) and as producers of information (Ramakrishnan and Thakor, 1984; Allen, 1990).

For banks to have the best incentives to monitor and screen, single-bank relationships should be optimal, and the use of collateral should be kept to a minimum. In fact, multiple banks may lead to duplication of costly effort (Diamond, 1984), “free-riding” in monitoring (Gershenkron, 1962; Mayer, 1988), and “winner’s curse” in screening (Broecker, 1990); and collateral will make banks lazy (Manove et al., 2001).

However, this hardly squares with the evidence. In the three cross-country studies produced to date, Ongena and Smith (2000), Esty and Megginson (2003), and Qian and Strahan (2006) consistently find that the number of banks and the use of collateral are negatively correlated with investor protection. In contrast with the view above described, companies in countries with poorer investor protection borrow from a larger number of banks and are more likely to give collateral to their banks.

To explain this evidence, this paper develops a simple model of the choice of the number of banks and the level of collateral. The model can be decomposed into two parts. The first shows that an entrepreneur can indirectly select the amount of bank monitoring by appropriately choosing the number of lending banks and the level of collateral. The reasons are that (i) with a larger number of banks there is more free-riding among banks and thus less aggregate monitoring; and (ii) with more collateral banks have less incentive to monitor because they can rely on the collateral in case of default.

The second part of the model characterizes the trade-off between the costs and benefits of bank monitoring. Investors can monitor the manager to decrease the probability of inefficient diversion of resources. While the cost of bank monitoring is likely to be similar across countries (because of little differences in monitoring technologies), there are cross-country differences in
the benefits of bank monitoring. Specifically, the extraction of private benefits is more inefficient in countries with better investor protection (and particularly so in countries with better protection for minority shareholders and stricter rules against self-dealing), because managers need to adopt more complicated and costly techniques to circumvent stricter laws. Hence, the founder optimally chooses to have more bank monitoring in countries with better investor protection, because the benefits of bank monitoring is greater in those countries.

This model delivers two testable implications. Companies in countries with weaker protection for investors should have relations with a greater number of banks and use more collateral. These two predictions are tested using the only two comprehensive, cross-country data sets on bank relationships available: the data from a survey of some of the largest European companies called GlobalCash-Europe96, also used in Ongena and Smith (2000), and the data on syndicated loans from LPC’s Dealscan, also used in Esty and Megginson (2003) and Qian and Strahan (2006). Both data sets indicate a very strong negative correlation between the number of banks and the use of collateral on one hand and the degree of protection for minority shareholders (and the protection against self-dealing) on the other hand.

This finding is difficult to reconcile with the view that financing relations are particularly important in countries with low investor protection, which is a typical implication of the literature on the monitoring role of banks (Diamond, 1984; Von Thadden, 1992; and Carletti, 2004). However, it is consistent with the literature on strategic default. According to Bolton and Scharfstein (1996) and Dewatripont and Maskin (1995), many creditors harden the budget constraint for managers, thus decreasing the risk of strategic default. In a cross-country setting, investor protection may decrease the opportunity for strategic default. If so, the strategic default literature would predict a larger number of banks in countries with lower investor protection, as found in the data.

To disentangle between the explanation proposed in this paper and the strategic default literature, I test secondary predictions of the competing explanations. Against the explanations based on strategic default, investor protection is not significantly correlated with the frequency of bankruptcy. In support of the theory presented in this paper, the number of bank relations is found to be positively correlated with the block premium.
The model is most closely related to the literature on the optimal ownership structure of firms (Pagano and Roell, 1998; Holmström and Tirole, 1997; Burkart et al., 1997; 1998), but departs from these papers because it links the choice of ownership structure to the nature of bank–firm relationships. It is also related to contributions that study the interaction between financing and ownership structure (Berglöf and Von Thadden, 1994; Berkovitch and Israel, 1996; Fluck, 1998; Mahrt-Smith, 2005).

In an extension, the paper explores the case in which both banks and outside blockholders can monitor the entrepreneur. This part of the paper effectively extends the model by Pagano and Roell (1998) by allowing the entrepreneur to raise both debt and outside equity. Unless outside blockholders are significantly better monitors than banks, the prediction is that the entrepreneur will only issue debt. In fact, the combination of outside equity and debt generate free-riding and duplication of monitoring costs.

The structure of the paper is as follows. Section 2 presents the basic model, which predicts a negative relation between investor protection and the number of bank relationships. Section 3 explores two interesting extensions. First, it examines the role of collateral. Assigning collateral to banks is a way to reduce their incentive to monitor. Hence, the model predicts a negative relation between investor protection and the use of collateral. Second, it explores the case in which both banks and outside shareholders can monitor the entrepreneur. Section 4 contains the cross-country evidence supporting the model. The main result is that anti-director rights explain most of the cross-country variability in the number of bank relationships and in the frequency of collateralized loans. Section 5 concludes.

2. Basic model

At $t = 0$, an entrepreneur needs to raise an amount of capital $I$ to set up a firm. Doing so forces the choice of firm ownership and capital structure. This involves two decisions. First, the entrepreneur chooses the fraction $\alpha \in [0,1]$ of the equity to retain (and consequently the fraction $1-\alpha$ to sell). The second decision point is how much debt $D$ to raise and the number of banks $n$ from which to raise it. The firm borrows the same amount at the same conditions from each bank: $P$ is the aggregate promised payment, and debt is unsecured (the option of giving collateral to banks and the role of lead banks are considered in extensions in Section 3). The equity market
and the banking sectors are competitive and demand a return on capital, which is normalized to zero, \( r = 0 \).

At \( t = 1 \), the banks invest in monitoring. Each bank \( j = 1, \ldots, n \) chooses independently and noncooperatively to monitor at the level \( m_j \in [0,1] \), bearing the cost \( c m_j / 2 \). The impact on the firm is the aggregated amount of bank monitoring: \( m_B = \sqrt{\sum_j m_j} \). Notice that the total monitoring cost (obtained by summing the monitoring costs of all banks) is \( \sum_j c m_j / 2 = c m_B^2 / 2 \).

At \( t = 2 \), the firm’s output is produced. The firm produces a stochastic output \( \tilde{V} + \tilde{B} \), where \( \tilde{V} \) is always verifiable (\( V = \tilde{V} \) with probability \( \pi \), and \( \tilde{V} = 0 \) otherwise) and \( \tilde{B} \) is verifiable only with probability \( m_B \) (\( B = \tilde{B} \) with probability \( \gamma \), and \( \tilde{B} = 0 \) otherwise). \( \tilde{V} \) and \( \tilde{B} \) are independently random variables.

At \( t = 3 \), if the output \( B \) is not verifiable (which happens with probability \( 1 - m_B \)), the entrepreneur can divert it. Diversion is inefficient: the entrepreneur can pocket only \( $(1 - x)$ \) of each \$1 diverted, with \( x \in [0,1] \). The parameter \( x \) represents the quality of investor protection in the economy (primarily the strictness of anti-self-dealing legislation). With better investor protection, diverting resources becomes more inefficient, because the entrepreneur needs to set up a more complicated (and expensive) scheme to tunnel the corporate resources.

Some assumptions on the parameters are needed: First, \( c > \pi B \) ensures that the choice of monitoring has an internal solution. Second, \( \pi \tilde{V} + \gamma \tilde{B} > I \geq \pi \tilde{V} \). The first inequality ensures that the project exhibits a positive net present value (i.e., there is enough output to recover the project cost). The second rules out the trivial case where there is no possible agency problem by assuming that the verifiable cash flows are insufficient to repay investors fully. A third assumption is useful to simplify the analysis: \( \tilde{V} > (1 - \gamma) \tilde{B} \), which requires that the verifiable output is greater than the nonverifiable output. Finally, I assume that the entrepreneur enjoys a large private benefit from setting up a firm (which is not derived from the expropriation of investors). In this way, I can ignore the participation constraint of the entrepreneur, because it will be always met.
The solution is found by backwards induction, starting from the expropriation of investors at \( t = 3 \).

2.1. Extraction of private benefits of control

Conditional on a specific realization of \((V, B)\), the entrepreneur chooses to divert the nonverifiable output \( B \) if the payoff from diversion, \( \alpha \max\{V - P, 0\} + (1 - x)B \), exceeds the payoff from no diversion, \( \alpha \max\{V + B - P, 0\} \). Comparing the two payoffs for different values of \((V, B)\), one can derive the following result:

**Result 1.** The decision to divert resources depends on the ownership and capital structures as represented by the parameters \((\alpha, P)\):

(A) If \( \alpha \geq (1 - x)\frac{B}{(\bar{B} - P)} \), there is never expropriation of resources;

(B) if \( (1 - x)\max\left(1, \frac{\bar{B}}{V + \bar{B} - P}\right) \leq \alpha < (1 - x)\frac{B}{(\bar{B} - P)} \), there is expropriation of resources only if \( V = 0 \); and

(C) there is always expropriation of resources otherwise.

Figure 1 provides a graphical description of Result 1 in the space \((\alpha, P)\). The area is bounded by the constraints that \( \alpha \in [0, 1] \) and \( P \in [0, \bar{V} + \bar{B}] \) (in fact \( \bar{V} + \bar{B} \) is the maximum output produced by the firm). Region A (upper left corner) represents the area with no expropriation. For this set of parameters, the entrepreneur has no incentive to tunnel. In region B (top), the entrepreneur owns a large fraction of the equity and thus expropriates investors only when the company defaults. In the remainder, region C, the entrepreneur owns a small fraction of the equity (\( \alpha < 1 - x \)), and/or the company is highly levered, and will thus always expropriate investors. Region C is further subdivided, because banks’ incentives to monitor will differ depending on whether \( P \) is less than \( \bar{V} \) (region C1) or greater than \( \bar{V} \) (region C2).

It is interesting to notice that the governance problem is not restricted to the cases where the entrepreneur has a small equity stake (\( \alpha < 1 - x \)), but extends to cases where the entrepreneur has a large equity stake and the company is highly levered. This suggests that the emphasis on
ownership structure in the corporate governance debate may overlook situations in which the expropriation happens at creditors’ expenses (like Parmalat).

2.2. Investment in monitoring by banks

Returning to the monitoring choice by banks, it is obvious that there will be no investment in monitoring if \((\alpha, P)\) lies in region A of Figure 1. No monitoring is needed in this case, because the company is already perfectly governed (there is no expropriation). I will thus focus on the two remaining regions.

In region B, the entrepreneur expropriates investors only in the bad state of the world (when \(V = 0\)). Hence, each of the \(n\) banks chooses a monitoring intensity to maximize its utility:

\[
\max_{m_j \in [0, 1]} \frac{1}{n} (1 - \pi) \gamma \sqrt{\sum \hat{m}_j \min(B, P)} - \frac{1}{2} \hat{c} m_j.
\]  

(1)

From the first order conditions (necessary and sufficient because (1) is concave in \(m_j\)),

\[
\frac{1}{2 n} (1 - \pi) \gamma \min(B, P) \frac{1}{m^*_B} - \frac{1}{2} \hat{c} = 0.
\]  

(2)

Assuming that the ex-ante symmetry among banks leads to a symmetric equilibrium, all banks will monitor at the same level, such that in aggregate

\[
m_B = \frac{(1 - \pi) \gamma \min(B, P)}{nc}.
\]  

(3)

Banks’ incentives to monitor decreases with the number of lending banks (\(m_B\) is decreasing in \(n\)) and is (weakly) increasing with leverage (\(m_B\) is increasing in \(P\)).

It is immediate to see that in region C1, the banks will monitor at the same level obtained in expression (3): Although the entrepreneur expropriates investors also in the good state of the world, the banks only internalize the benefits from monitoring in the bad state of the world.

Things are different in region C2, because debt is then so high that the company defaults also in the good state of the world. In that case banks choose

\[
\max_{m_j \in [0, 1]} \frac{1}{n} \gamma \left[ (1 - \pi) \hat{B} + \pi (P - \hat{V}) \right] \sqrt{\sum \hat{m}_j} - \frac{1}{2} \hat{c} m_j.
\]  

(4)

From the first-order conditions,
\[ m_B = \frac{\gamma [(1-\pi)\bar{B} + \pi(P - \bar{V})]}{nc} \]  

Result 2. The decision to monitor depends on the ownership and capital structures \((\alpha, P)\):

1. If \( \alpha \geq (1-x)\bar{B}/(\bar{B} - P) \), there is no investment in monitoring;
2. If \( P > \bar{V} \) and \( \alpha < (1-x)\bar{B}/(\bar{V} + \bar{B} - P) \), the chosen level of monitoring is 
   \[ m_B = \gamma [(1-\pi)\bar{B} + \pi(P - \bar{V})]/(nc) \]; and
3. in all other cases, bank monitoring is 
   \[ m_B = (1-\pi)\gamma \min(\bar{B}, P)/(nc) \].

2.3. Capital and ownership structure

Because the capital markets are competitive, the entrepreneur is the residual claimant at \( t = 1 \) and internalizes the costs and benefits of monitoring. Consider first region A in Figure 1. In this case, there is no agency problem. The entrepreneur can raise capital up to the following upper bound:
\[ I = \pi\bar{V} + \gamma \bar{B} - (1-x)\bar{B}(\pi\bar{V} + \gamma \bar{B} - [\pi + (1-\pi)\gamma]P) \]. This upper bound is derived by imposing the constraint \( \alpha \geq (1-x)\bar{B}/(\bar{B} - P) \). By taking the first derivative of \( I \) with respect to \( P \) one can see
that \( I \) is maximized at \( P = 0 \). Notice that the assumption that \( \bar{V} > (1-\gamma)\bar{B} \) is necessary and sufficient to establish this result. Hence if \( I \leq x(\pi\bar{V} + \gamma \bar{B}) \), there is no agency problem and thus no need for monitoring. As long as the entrepreneur is able to finance the project, the capital structure is indeterminate. However, ownership will be highly concentrated and the company will be relatively unlevered. The utility for the entrepreneur is at the first-best: 
\[ U = \pi\bar{V} + \gamma \bar{B} - I \equiv U_A \].

Consider next region B: The entrepreneur will expropriate investors only if \( \bar{V} = 0 \). The entrepreneur thus uses the relation between \( m_B \) and \( n \) given in (3) to choose \( m_B \) and maximize utility:
\[ \max_{m_B \in [0,1]} \pi\bar{V} + \gamma \bar{B} - x(1-\pi)\gamma \bar{B}(1-m_B) - I - cm_B^2/2 \]. 

From the first-order condition,
\[ m_B = x(1-\pi)\gamma \bar{B} / c \equiv m^* \].
Using expression (3), one can easily see that this level of monitoring can be obtained by selecting a number of banks

\[ n = \frac{1}{x} = n^* , \]

(8)

where I have assumed without loss of generality that \( P \geq \bar{B} \). As before, the capital structure is indeterminate. However, ownership will be concentrated and the company will have relatively more leverage. The corresponding level of utility for the entrepreneur is

\[ U = \pi \bar{V} + (1-x)\gamma \bar{B} + x\pi \gamma \bar{B} - I + [x(1-\pi)\gamma \bar{B}]^2 / (2c) \equiv U_\beta . \]

(9)

Using the constraints defining region B and Eq. (7), it is simple to see that the entrepreneur can raise capital \( I \leq \pi \bar{V} + \pi \gamma \bar{B} + (1-x/2)x[(1-\pi)\gamma \bar{B}]^2 / c \) in this case.

Finally, consider region C: The entrepreneur will expropriate investors in both states of the world and thus chooses \( m_\beta \) such that

\[ \max_{m_\beta \in [0,1]} \pi \bar{V} + \gamma \bar{B} - x\gamma \bar{B}(1-m_\beta) - I - cm_\beta^2 / 2 . \]

(10)

From the first-order condition,

\[ m_\beta = x\gamma \bar{B} / c = m^{**} . \]

(11)

If \((\alpha, P)\) belongs to region C1, this level of monitoring can be obtained by setting \( P \geq \bar{B} \) and \( n = (1-\pi) / x \). If \( x > 1 - \pi \), the desired level of monitoring can only be reached by choosing \((\alpha, P)\) in region C2. In that case, using Eq. (5) and setting (without loss of generality) \( P = \bar{V} + \bar{B} \),

\[ n = \frac{1}{x} = n^* . \]

As before, the capital structure is indeterminate within this region. Notice that, because expropriation is more likely, the entrepreneur optimally chooses to have more bank monitoring than in region B: \( m^{**} > m^* \).

However, in comparison with the other cases, ownership will diffuse and the company will have relatively more leverage. The corresponding level of utility for the entrepreneur is

\[ U = \pi \bar{V} + (1-x)\gamma \bar{B} + (x\gamma \bar{B})^2 / 2c - I \equiv U_c . \]

(12)

In this case, the maximum capital that the company can raise is \( \pi \bar{V} + (1-x/2)x(\gamma \bar{B})^2 / c \).
It is important to notice that the three regions are ranked—the entrepreneur’s utility is greatest in region A, followed by region B and then region C—because the entrepreneur is the residual claimant at $t = 1$ and thus internalizes the costs of expropriating investors.

**Result 3.** The optimal capital and ownership structures are as follows:

(i) If $I \leq x(\pi \bar{V} + \gamma \bar{B})$, leverage should be low ($P < x \bar{B}$), ownership should be concentrated ($\alpha \geq (1-x)\bar{B}/(\bar{B}-P)$), and the number of banks is indeterminate;

(ii) If $x(\pi \bar{V} + \gamma \bar{B}) < I \leq \pi \bar{V} + \pi \gamma \bar{B} + (1-x/2)x[(1-\pi)\gamma \bar{B}]^2/c$, leverage should be relatively higher ($P \geq \bar{B}$), ownership should be concentrated ($\alpha \geq (1-x)\max\{1, \bar{B}/(\bar{V} + \bar{B}-P)\}$), and the number of banks should be $n = 1/x$; and

(iii) If $\pi \bar{V} + \pi \gamma \bar{B} + (1-x/2)x[(1-\pi)\gamma \bar{B}]^2/c < I \leq \pi \bar{V} + (1-x/2)x(\gamma \bar{B})^2/c$, leverage is very high ($P \geq \bar{V}$), ownership is indeterminate, and the number of banks should be $n = 1/x$.

(iv) In all other cases, the company cannot be set up.

This result delivers one main empirical prediction: There should be a positive correlation between the number of banks and investor (shareholder) protection. Quite interestingly, no other variable affects the choice of number of banks.

**Prediction 1:** The optimal number of banks is decreasing in shareholder protection.

More predictions can be derived if one is willing to assume that case (ii) is the more likely scenario. In that case, the model predicts a negative correlation between inside ownership and investor (shareholder) protection. Such prediction is consistent with the evidence in La Porta et al. (2000) and others.

3. Extensions

In this section, I will consider three extensions. First, I will examine the role of collateral and show that collateral can be used to reduce banks’ incentive to monitor. Second, I will consider
the role of lead banks. Third, I will explore the case of an additional monitor: the outside shareholder.

3.1. Secured debt

I will assume that the set of parameters is such that the firm is in region B. Assume that at \( t = 1 \) the entrepreneur raises debt \( D \) (with a promised payment \( P > B \)) from one bank and gives collateral \( K \) to the bank. Collateral cannot be diverted by the manager. Hence, in the bad state of the world (when \( V = 0 \)), the bank’s payoff is \( K + m_B (B - K) \).

The bank chooses monitoring intensity so as to trade off the costs and benefits of monitoring:

\[
\max_{m_B \in [0, 1]} \left( K + m_B \gamma (B - K) \right) - \frac{1}{2} cm_B^2 .
\]  

(13)

From the first-order conditions,

\[
m_B = \frac{(1 - \pi) \gamma (B - K)}{c}.
\]  

(14)

Eq. (14) indicates a monotonic and negative relation between collateral and level of monitoring. Hence, the entrepreneur can induce the desired level of monitoring \( m^* \) by choosing

\[
K = B - \frac{cm^*}{(1 - \pi) \gamma} = B - \frac{c}{(1 - \pi) \gamma} \frac{x(1 - \pi) \gamma B}{c} = (1 - x)B .
\]  

(15)

Prediction 2. The optimal level of collateral is decreasing in shareholder protection.

3.2. Lead banks

The basic model of Section 2 assumes that each of the \( n \) banks lends an equal amount to the firm. It is easy to remove this assumption and consider instead the case of a lead bank that lends more than the others. Without loss of generality, consider the set of parameters is such that the firm is in region B and assume that the entrepreneur borrows a fraction \( \delta \) of the total bank debt from the lead bank (where for simplicity I assume that the promised payment \( P > B \)).

All smaller banks will optimally free-ride on the lead bank and choose \( m_j = 0 \). The lead bank instead chooses monitoring intensity so as to trade off the costs and benefits of monitoring:
\[
\max_{n \in [0,1]} \delta (1-\pi) \sqrt{mL \tilde{B} - \frac{1}{2} cmL}.
\]  
(16)

From the first-order conditions,
\[
m_B = \sqrt{m_L} = \delta (1-\pi) \gamma \tilde{B} / c.
\]  
(17)

Eq. (17) indicates a positive relation between the degree of concentration of banks debt \( \delta \) and the level of monitoring. Hence, the entrepreneur can induce the desired level of monitoring \( m^* \) by choosing
\[
\delta = \frac{cm^*}{(1-\pi) \gamma \tilde{B}} = \frac{c}{(1-\pi) \gamma \tilde{B}} x(1-\pi) \gamma \tilde{B} = \frac{1}{2} x.
\]  
(18)

**Result 4.** Debt should be more concentrated in countries with better shareholder protection.

### 3.3. Monitoring by a large outside shareholder

Consider now the case in which at \( t = 0 \), an entrepreneur can sell a fraction of external equity \( \beta \in [0,1-\alpha] \) to a large shareholder who may later monitor him. The large shareholder chooses \( m_s \in [0,1] \) at a cost \( cm_s^2 / 2 \). Notice that there is perfect symmetry in monitoring skills between banks and large shareholders. The parameters \( (m_B, m_s) \) indicate the probability that the banks and the large shareholder, respectively, receive verifiable information on the value of the nonverifiable cash flows. I assume that banks and large shareholders share the information, so that the probability of becoming informed is \( m = 1 - (1-m_B)(1-m_s) \).

#### 3.3.1. All-equity firm

I begin with the special case in which the entrepreneur does not issue debt (\( P = 0 \)). This case corresponds in Figure 1 to the vertical line at \( P = 0 \). Since diversion is inefficient (and monitoring is costly), the entrepreneur would like to keep a fraction \( \alpha \geq 1 - x \) of the equity. The value of the firm would then be maximized \((\pi \tilde{V} + \gamma \tilde{B})\) and there would be no need to monitor (\( m = 0 \)).

However, the entrepreneur could only sell a fraction \( x \) of the equity and thus raise \( x(\pi \tilde{V} + \gamma \tilde{B}) \). If \( I > x(\pi \tilde{V} + \gamma \tilde{B}) \), this would not be enough to set up the firm. Hence, the
entrepreneur can finance the firm only by retaining a fraction $\alpha < 1 - \beta$ of the equity. For these values of $\alpha$, the entrepreneur has the ex-post incentive to expropriate investors.

Hence, the large shareholder chooses $m_s$ to achieve

$$\max_{m_s} \beta(\pi \bar{V} + \gamma m \bar{B}) - cm_s^2 / 2. \quad (19)$$

From the first-order conditions,

$$m_s = \beta \gamma \bar{B} / c. \quad (20)$$

Because of the monotonic relation between $\beta$ and $m_s$, the entrepreneur can (indirectly) choose the monitoring intensity.

$$\max_{m_s \in [0, 1]} \pi \bar{V} + \gamma \bar{B} - \gamma x \bar{B}(1 - m_s) - I - cm_s^2 / 2. \quad (21)$$

From the first-order condition, the optimal level of monitoring is $m^{**}$. This monitoring level can be obtained by choosing the ownership structure appropriately. Given (20), the entrepreneur can induce the optimal level of monitoring by choosing $\beta^* = \beta$.

**Result 5.** The optimal outside ownership stake is increasing in shareholder protection.

This is the same result obtained by Pagano and Roell (1998). The corresponding level of utility for the entrepreneur is $\pi \bar{V} + (1 - x)\gamma \bar{B} - I + (\gamma \bar{B})^2 / (2c)$, which is the same as in region C described in Section 2.3. Thus, result 3 already shows that, if the set of parameters is such that $x(\pi \bar{V} + \gamma \bar{B}) < I \leq \pi \bar{V} + \pi x \bar{B} + (1 - x / 2)x[(1 - \pi)\gamma \bar{B}]^2 / c$, the entrepreneur can do better by issuing debt. A similar argument can be used against raising debt from bondholders or other creditors who do not monitor. Hence, raising no debt from banks is suboptimal.

**3.3.2 Debt and outside equity**

Consider next the case in which the company issues debt to banks (that monitor) and sells equity to a large shareholder (who also monitors), that is, $\beta > 0$ and $P > 0$. To simplify notations, in what follows, I assume that $P \in [\bar{B}, \bar{V}]$.

Using Figure 1, there are two regions to explore. In region B, where the entrepreneur expropriates investors only in the bad state of the world (when $V = 0$), only banks have the
incentive to monitor. In fact, the large shareholder chooses monitoring by maximizing his expected utility \( \beta \pi (\bar{V} + \gamma \bar{B} - P) - cm_s^2 / 2 \), which is strictly decreasing in \( m_s \). Hence \( m_s = 0 \).

Given this, each of the \( n \) banks chooses the monitoring intensity as in Section 2, so as to maximize its utility (1). Hence, the aggregate monitoring is \( m = (1 - \pi) \gamma \bar{B} / nc \), and the entrepreneur uses the number of banks to set the desired level of monitoring.

In region \( C \), the entrepreneur always expropriates investors. The large shareholder cares only about the good state of the world and therefore chooses \( m_S \) to achieve

\[
\max_{m_S} \beta [\pi (\bar{V} - P) + \pi \gamma m \bar{B}] - cm_s^2 / 2 .
\]

From the first-order conditions,

\[
m_S = \beta (1 - m_B) \gamma \pi \bar{B} / c .
\]

(23)

Shareholder monitoring increases with \( \beta \) and is negatively affected by the presence of monitoring banks (\( m_S \) is decreasing in \( m_B \)).

The banks care only about the bad state, so that they strive toward

\[
\max_{m_B \in [0, 1]} \frac{1}{n} \left( 1 - (1 - \pi) \gamma (1 - \sum m_j)(1 - m_s) \bar{B} + \frac{1}{2} cm_j .
\]

(24)

From the first-order conditions, assuming a symmetric equilibrium,

\[
m_B = \frac{(1 - \pi) \gamma (1 - m_S) \bar{B}}{nc} .
\]

(25)

Banks’ incentives to monitor decrease with the shareholder’s monitoring (\( m_S \) is decreasing in \( m_B \)), decreases with the number of lending banks (\( m_B \) is decreasing in \( n \)), and is (weakly) increasing with leverage (\( m_B \) is increasing in \( P \)).

Combining eqs. (23) and (25), one obtains, respectively, the following monitoring activity by banks and large shareholders:

\[
m_B = \frac{A_1 (1 - A_1)}{1 - A_1 A_2} \quad \text{and} \quad m_S = \frac{A_2 (1 - A_1)}{1 - A_1 A_2} ,
\]

(26)

where \( A_1 = (1 - \pi) \gamma \bar{B} / (nc) \) and \( A_2 = \beta \pi \gamma \bar{B} / c \).

Notice that, as before, \( m_B \) is strictly decreasing in \( n \), and \( m_S \) is strictly increasing in \( \beta \).

Hence, the entrepreneur can (indirectly) choose the level of monitoring provided by banks and
the large shareholder via the choice of number of bank relations and ownership structure. From the analysis in Section 2, the entrepreneur prefers to be in region B than in region C when only banks monitor. To show that this is true also when large shareholders monitor requires a demonstration that the monitoring costs do not decrease when there are two monitors.

Intuitively, the answer should be no, because two monitors generate extra costs. In this case: (i) there is costly duplication of monitoring costs because, with probability $m_s m_b$, both sets of investors acquire the information; and (ii) there are free-riding opportunities for one set of investors that can free ride on the other.

The proof is equally simple. The entrepreneur’s objective is to minimize the costs of monitoring $c(m_y^2 + m_s^2)/2$ subject to obtaining a desired level of monitoring $\hat{m}$, that is subject to the constraint that $1 - (1 - m_y)(1 - m_s) = \hat{m}$. There are three candidates for a solution: a symmetric equilibrium $m_y = m_s = 1 - \sqrt{1 - \hat{m}}$, and two that are asymmetric ($m_y = m > 0 = m_s$ and $m_s = m > 0 = m_y$). The costs associated with the first solution are $c(1 - \sqrt{1 - \hat{m}})^2$, while the cost of the other solutions is $c\hat{m}^2 / 2$. With some steps of algebra, one can show that the costs of the first solution are larger than the cost of the other solutions.1

Thus, one can conclude with the following:

Result 6. The optimal capital ownership structures are as follows:

(i) If $I \leq x(\pi \hat{V} + \gamma \hat{B})$, leverage should be low ($P < x \hat{B}$), ownership should be concentrated ($\alpha \geq (1 - x) \hat{B} / (\hat{B} - P)$): outside ownership and the number of banks are indeterminate;

(ii) if $x(\pi \hat{V} + \gamma \hat{B}) < I \leq \pi \hat{V} + \pi \gamma \hat{B} + (1 - x/2) x[(1 - \pi) \gamma \hat{B}]^2 / c$, leverage should be relatively high ($P \geq \hat{B}$), ownership should be concentrated

1 Taking the square root of the two costs, one compares $1 - \sqrt{1 - \hat{m}}$ and $\hat{m} / \sqrt{2}$. With further manipulations, the relevant comparison is between $1 - \sqrt{2 \hat{m} + \hat{m}^2} / 2$ and $1 - 2 \hat{m} + \hat{m}^2$, which further simplifies to the comparison between $2 - \sqrt{2}$ and $\hat{m} / 2$. The former term is clearly greater than the latter, because $\hat{m} \in [0, 1]$. 
\[(\alpha \geq (1-x)\max\{1, \frac{\bar{B}}{\bar{V} + \bar{B} - P}\}\)\), the number of banks should be \(n = 1/x\), and \(\beta = 0\);

(iii) if \(\pi \bar{V} + \pi \bar{B} + (1-x/2)x[(1-\pi)y\bar{B}]^2/c < 1 \leq \pi \bar{V} + (1-x/2)x(y\bar{B})^2/c\), ownership and leverage are indeterminate: leverage can be very high \((P \geq \bar{V})\), in which case the number of banks should be \(n = 1/x\), or should equal zero, in which case \(\beta = x\); and

(iv) in all other cases, the company cannot be set up.

4. Cross-country empirical analysis

The two predictions derived from the model are tested using the only two available cross-country data sets on the number of bank relationships and degree of collateral. The first data set is from Qian and Strahan (2006). It is based on LPC-Dealscan, which covers over 80,000 syndicated loans from more than 60 countries. The focus will be on the average number of banks participating in the loan syndicate and the fraction of secured loans per country.

The second data set is from Ongena and Smith (2000). It is based on a survey of European companies called GlobalCash-Europe96, in which cash managers and treasurers from 5800 among the largest companies in Europe were asked to complete a detailed questionnaire on their company’s cash management practices. The number of bank relationships is the number of banks used for domestic cash management, as disclosed by the 1129 companies that returned the questionnaires.

I employ several proxies for investor protection and measures of the development of the capital market to explain the cross-country variability in the number of bank relations and in the use of collateral. The focus is on the following: (i) judicial efficiency and creditor rights (as measures of the effective rights of creditors in default); (ii) anti-self-dealing index and anti-director rights (as measures of the rights of minority shareholders); and (iii) the size of the equity market and of the private bond market, and the concentration of the banking sector (as controls for the structure of the capital market).
4.1 Results using country-level data from LPC-Dealscan

In this section, I use data from Qian and Strahan (2006) as the average number of bank relations and the average use of collateral across countries. The purpose of Table 1 is to establish the relation between number of banks and several measures of investor protection. The results show that anti-director rights is the single most important determinant of the number of banks, explaining approximately 13 percent of the cross-country variability. Companies in countries with worse protection for minority shareholders have, on average, more bank relations. The indexes of creditor rights and anti-self-dealing are negatively correlated with the number of banks, but are not statistically significant after controlling for anti-director rights. The efficiency of the judicial system, the degree of concentration of the banking system, and the size of the stock market are not statistically significant.

Table 2 studies the relation between the use of collateral and several proxies for investor protection. Also in this case, the index of anti-director rights is the single most important determinant of the number of banks, explaining roughly 22 percent of the cross-country variability. Companies in countries with better protection for minority shareholders are less likely to use secured loans. The index of anti-self-dealing is negatively correlated with the number of banks, but is not statistically significant after controlling for anti-director rights. The efficiency of the judicial system, the quality of creditor rights, the degree of concentration of the banking system, and the size of the stock market are not statistically significant.

The results from Tables 1 and 2 confirm the findings in the literature and point to a negative correlation between number of banks and secured loans and investor protection. Moreover, they provide new details on the features of investor protection that are more correlated with the nature of the bank–firm relation. Quite interestingly, the results indicate that the protection of minority shareholders is the single most important explanatory variable. This is consistent with the model presented in this paper and, as discussed later, is more difficult to reconcile with other theoretical explanations.

One problem with the data used in this section is that it is based on loan syndicates. Because these are typically used by a special type of firm (e.g., loan syndicates are commonly used in project financing), the findings in Tables 1 and 2 may lack generality. As a robustness check, I
now turn to the analysis of the number of bank relations using a second, more representative data set.

4.2 Results using firm-level data from GlobalCash-Europe96

In this case, the data is at the level of the company. It covers 1129 companies from 16 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The number of bank relationships is the number of banks used for domestic cash management, as disclosed by the survey. The approach is to run a regression with random effects at the country level, with controls for firm-level characteristics and country-level variables. Firm characteristics are domestic and foreign sales, industry dummies, and the nature of relationship financing (importance and scope, as described by the respondents to the questionnaire). The reader should refer to Ongena and Smith (2000) for a description of the firm-level variables.²

Table 3 presents the basic results. The results in columns (1) to (4) show that anti-director rights, judicial efficiency and anti-self-dealing index are negatively correlated with the number of bank relationships. Surprisingly, the index of creditor rights is not significantly correlated with the number of bank relationships.

To find the relative importance of the five variables, column (5) shows the results of a regression with the four country-level variables together. The coefficients of this regression can be interpreted as partial correlations between the number of bank relationships and each country-level variable. In this regression only judicial efficiency and anti-director rights are statistically significant and negative. In column (6), three control variables are added, the size of the equity market and of the private bond market, and the concentration of the banking sector. The coefficients of judicial efficiency and shareholder protection are unaffected by the control variables, none of which are statistically significant.

² The number of groups is 18, as in Ongena and Smith (2000), rather than 16, which is the number of countries, because the survey separates Belgian and Irish companies into two subsets: for Belgium, the survey distinguishes firms that belong to the Belgian Coordination Centres (92 observations) from the others (8 observations); for Ireland, it separates firms belonging to the Irish Financial Service Centre (18) from the others (63).
The results confirm the findings in Table 1, indicating that the protection of minority shareholders is highly correlated with the number of bank relations. How do these results square with the theoretical literature?

4.3 Interpretation of the results and further analysis

The explanations for the existence of multiple bank relationships can be classified into three groups. The first set of papers emphasizes that lending banks acquire preferred information on borrowers that enables them to accrue rents (Sharpe, 1990). These rents have negative effects on entrepreneurs’ incentives to invest (Rajan, 1992) and on their decision to undertake long-term rather than short-term projects (Von Thadden, 1995). In this context, multiple banks, and therefore interim competition among banks, may be efficient because they reduce the rents at the expense of cost duplication (Von Thadden, 1992) or a reduction in monitoring (Carletti, 2004).

A second set of papers suggests that multiple creditors (and secured lending) may reduce the probability and the costs associated with default. Many creditors harden the budget constraint for managers, thus decreasing the risk of strategic default (Bolton and Scharfstein, 1996; Dewatripont and Maskin, 1995), and reduce the inefficient haggling over resources following a default (Bris and Welch, 2004). Also, a company may choose many bank relationships to insure itself against the risk that a liquidity crisis of one bank makes refinancing impossible and forces the firm to seek more costly funding from nonrelationship banks (Detragiache et al., 2000).

Finally, multiple bank relationships (and secured lending) may be the result of decisions made by lending banks rather than by the firms that borrow. As argued by Boot and Thakor (2000), banks can choose (if they want) to keep an arm’s-length relation with the company they are lending to. In this setting, banks may choose multiple relationships and secured lending to “enjoy an easy life” (Manove et al., 2001) or diversify their risk exposure (Carletti et al., 2004).

The results I have presented are inconsistent with the first group of explanations. In fact, bank monitoring should be more valuable in countries with weaker investor protection. Hence, the

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3 The empirical evidence on bank relationships is also not conclusive. On the one hand, Petersen and Rajan (1994) find that in small firms credit availability decreases with multiple banks. On the other hand, Hoshi et al. (1993) and Weinstein and Yafeh (1998) provide evidence of the costs of single-bank relationships.
number of bank relationships (and the use of secured loans) should be lower in those countries, rather than higher.

The second set of explanations instead fares better. Bolton and Scharfstein (1996) and the other papers in this group argue that many creditors reduce the likelihood of a successful debt restructuring and increase the chance of liquidation. Thus, maintaining many banks (and using secured loans) has a disciplining effect on the entrepreneurs by preventing strategic defaults. In a cross-country setting, one expects that investor protection decreases the opportunity for strategic default. If so, Bolton and Scharfstein (1996) & Co. would predict a larger number of banks (and more secured loans) in countries with lower investor protection. My findings are consistent with this view, with the only, minor exception that the protection of minority shareholders seems to be a more important explanatory variable than creditor rights.

The third set of papers has no obvious predictions on the relation between the number of banks (and secured lending) and investor protection. However, a bank’s decision to specialize in relationship lending is likely to be affected by the degree of competition in the banking industry and the threat posed by the stock market. If the banking sector is very competitive, individual banks have less incentive to invest in relationship lending (because many banks can do it). If so, one would expect the number of bank relationships (and the use of collateral) to be positively correlated with the degree of banking concentration. If instead the capital markets (stock and bond market) are more developed, banks are better off if they invest in relationship lending (to differentiate themselves from the bond and stock market). If so, one would expect the number of bank relationships (and the use of collateral) to be negatively correlated with stock market development. The results are inconsistent with these predictions.

The results presented thus far are consistent with the theory presented in this paper and the explanation proposed by Bolton and Scharfstein (1996) and company. How robust are these findings? And, can one disentangle between the two explanations? Table 4 attempts to address these questions.

I first address the robustness of the finding. Column (1) reproduces the specification estimated by Ongena and Smith (2000). All coefficients have similar magnitude, the same sign, and the same statistical significance, with the small differences being explained by small differences in the estimation procedure.
In column (2), the index of anti-director right is added to the specification proposed by Ongena and Smith (2000). The results are quite dramatic: only the coefficients on judicial efficiency, anti-director rights, and the size of the bond market are statistically different from zero at a 10 percent confidence level. As shown in column (3), the size of the bond market is not statistically significant when one controls for anti-director rights and judicial efficiency. Hence, in column (4), only two variables, anti-director rights and judicial efficiency, explain 80 percent of the variability across countries (that is, the between $R^2$). This finding suggests that shareholder protection is an important variable to explain the cross-country variation in the number of bank relationships.

An important prediction of the model is that the number of banks should be positively correlated with the size of the private benefits of control. For this purpose, column (5) uses a direct proxy for the size of the private benefits of control. As suggested first by Barclay and Holderness (1991), the premium paid on block trades may be a good measure of the private benefits of control. Hence, the country-level block premium, measured by Dyck and Zingales (2004), is used as an alternative for shareholder protection. Notwithstanding the loss of one third of the observation because of lack of data on the block premium, there is a positive and significant correlation between the number of bank relationships and the block premium.

One way to disentangle the explanation proposed in this paper from the explanations based on strategic default is to test a prediction that is unique to one of the two theories. One specific and testable prediction of the models on strategic default is that better investor protection should be associated with better ex-post renegotiation and therefore less frequent filing for bankruptcy. The reason is that better investor protection should reduce the incentives for strategic default and thus should allow for a softer budget constraint. With fewer lenders, ex-post renegotiation should be easier and therefore filing for bankruptcy should be less frequent. I test this prediction using the ratio of the number of bankruptcies to the number of firms from Claessens and Klapper (2005). The correlation between anti-director rights and bankruptcy ratio across 31 countries is only 12.4 percent and is not statistically different from zero. This result is inconsistent with the models based on strategic default.
5. Conclusion

This paper provides evidence of a negative relation between the number of bank relationships (and the use of secured loans) and the degree of protection afforded to minority shareholders by the law. In a sample of 16 European countries, judicial efficiency and anti-director rights explain 80 percent of the cross-country variability in the number of bank relationships. Similar results are found using a data set on syndicated loans (from LPC Dealscan) for 39 countries. Moreover, in this larger sample, I show that the use of collateral is negatively correlated with shareholder protection.

A simple theoretical model is proposed to explain this finding. Banks act as monitors: they increase the value of the firm by limiting the inefficient extraction of private benefits of control. In countries where private benefits of control are relatively more valuable (those with lower protection for minority shareholders and greater opportunities for self-dealing), the founder optimally chooses to have less bank monitoring by choosing more bank relationships (and affording to the banks more collateral).

The theoretical explanation is tested against the alternative view that multiple bank relationships harden the budget constraints of companies and thus reduce the frequency of strategic default. In support of the theory presented in this paper, the number of bank relationships is found to be positively correlated with the block premium. Against the explanations based on strategic default, investor protection is not significantly correlated with the frequency of bankruptcy.
References


Table 1 – Number of banks participating in loan syndicates

The dependent variable is the average number of banks participating in a loan syndicate during the 1994–2003 interval, as reported by Qian and Strahan (2006). Anti-Director rights is an index of the degree of legal protection for minority shareholders as first developed by La Porta et al. (1998) and corrected by Spamann (2006). Anti-Self-Dealing index measures the strictness of the regulation against self-dealing, from Djankov et al. (2006). Creditor rights is an index of the degree of legal protection for creditors, as defined in La Porta et al. (1998): Table 4. Judicial efficiency is an index of the quality of the legal environment as it affects business from La Porta et al. (1998): Table 5. Banking concentration is the percentage of the assets held by the three largest banks in 1993 over the total assets owned by the banking system, from Cetorelli and Gambera (2001). Equity market is the ratio of the stock market capitalization over GDP in 1995, from Beck et al (1999). Standard errors (in parenthesis) are corrected for heteroskedasticity. * indicates coefficients that are significant at a 10 percent level, ** significance at 5 percent, and *** significance at 1 percent level.

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Table 2 – Fraction of secured loans

The dependent variable is the fraction of secured loans in loan syndicates during the 1994–2003 interval, as reported by Qian and Strahan (2006). See Table 1 for definitions. Standard errors (in parenthesis) are corrected for heteroskedasticity. * indicates coefficients that are significant at a 10 percent level, ** significance at 5 percent, and *** significance at 1 percent level.

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Table 3 – Number of bank relationships from GlobalCash-Europe96

The dependent variable is the number of bank relationships at company level, as reported in the survey GlobalCash-Europe96. The firm level variables are domestic and foreign sales, industry dummies, and indices of the importance and scope of the relationship financing, as described the respondents to the questionnaire. The coefficients of the firm-level variables are not reported. Country-level variables are as defined in Table 1. All regressions have random effects at group (country) level. Standard errors are in parenthesis. * indicates coefficients that are significant at a 10 percent level, ** significance at 5 percent, and *** significance at 1 percent level.

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<td>$R^2$ within groups</td>
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Table 4 – Robustness checks

The dependent variable is the number of bank relationships at company level, as reported in the survey GlobalCashEurope96. Bond market is the ratio of private bond market capitalization over GDP in 1995, from Beck, et al. (1999). Bank fragility is the average credit rating of tracked banks within a country, where the scaling is inverted so that higher score indicates higher risk, from FT Financial Publishing, Credit ratings international. Block premium is the country-fixed effect of a regression of the premium paid on block trades on firm characteristics, as computed in Dyck and Zingales (2004): Table 6. Remaining firm-level and country-level variables are as specified in Tables 1 and 3. All regressions have random effects at group (country) level. Standard errors are in parenthesis. * indicates coefficients that are significant at a 10 percent level, ** significance at 5 percent, and *** significance at 1 percent level.

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<td>(1.257)</td>
<td>(1.287)</td>
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<td>Block premium</td>
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Figure 1 - Decision to expropriate investors