Shareholder Protection and Outside Blockholders: Substitutes or Complements?

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Abstract

This paper joins the literature examining connections between legal protection of shareholders and finance. Driven by the need to attract funds a manager tries to reduce agency costs by selling a fraction of equity to a large investor (the outside blockholder). Monitoring by the blockholder can serve as a commitment device limiting inefficient private benefits extraction. However, the threat of collusion between the blockholder and the manager hampers raising funds from dispersed shareholders. We examine how the manager's choice of the ownership structure is affected by the legal protection of shareholders. Our main finding is that, contrary to the widespread view, there can be a U-shape dependence of the outside ownership concentration on the quality of shareholder protection. At the same time our result on the total ownership concentration is consistent with recent research.

JEL classification: G32, K22

Keywords: corporate governance, shareholder protection, blockholder monitoring, collusion, ownership structure.

1   Introduction

Recent empirical research documents substantial differences in the patterns of ownership and control of public companies around the world. While public firms in the Anglo-Saxon countries have dispersed ownership with significant managerial control, companies in the rest of the world feature ownership and control concentrated normally in the hands of few large owners (Barca and Becht (2001), Becht and Röell (1999), La Porta, Lopez-de-Silanes, and Shleifer (1999)). A number of studies argue that legal shareholder protection is one of the key determinants of the ownership and control distribution (La Porta, Lopez-de-Silanes, and Shleifer (1999), La Porta et al (1998), Himmelberg, Hubbard, and Love (2004)).[1]

We present a model that provides an interesting prediction about the effect of legal protection of shareholders on *outside* ownership concentration in companies. Specifically, contrary to the widespread view, we find a non-monotonic relationship between legal protection and outside ownership concentration. At the same time our model is consistent with the empirical evidence on the link between the law and the *total* ownership concentration.

Empirical studies document a negative relationship between the strength of shareholder protection and ownership concentration (see e.g. La Porta et al (1998), Himmelberg, Hubbard, and Love (2004)). Now there also exist a number of theoretical models that rationalize this effect, e.g. Himmelberg, Hubbard, and Love (2004), Shleifer and Wolfenzon (2002). These models have one large controlling shareholder - the *insider* - and they find a negative relationship between the quality of the law and the insider ownership. Therefore, strictly speaking, they study the effect of law on insider or managerial ownership, without allowing for a presence of a large outside shareholder, whose interests could coincide with those of dispersed shareholders. If it were true that all large shareholders (blockholders) and the managers of a company had the same information and cooperatively participate in control, their coalition could be treated as one insider. However, it does not seem to be always the case, as different large owners and the managers often have different information and the level of involvement in the company affairs, and at times they conflict each other.

We draw a distinction between insiders and outsiders by the information parties have *ex-ante*, i.e. prior to monitoring by a less informed party. To put it in an extreme way, an insider is an ex-ante informed party, while an outsider is an ex-ante uninformed party. Of course, in case when an ex-ante uninformed party successfully learns the information of an ex-ante informed party, it essentially becomes an insider, but only *ex-post*.

Researchers have recognized both positive and negative sides of having outside blockholders (see e.g. Becht, Bolton and Röell (2002), section 5.1). Their frequently emphasized role is monitoring of insiders (managers hereafter). By monitoring and exercising their control outside blockholders (blockholders hereafter) restrict managerial opportunism.[2] However, there is a

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[1]Surveys by La Porta et al (2000b) and Denis and McConnell (2003) summarize this strand of research.

[2]When a blockholder serves the interests of other outside shareholders, i.e. shareholder value maximization, she can be considered as one more mechanism of corporate governance, in addition to managerial compensation

danger that the blockholder, once informed, will use her information and control rights to expropriate other shareholders.

These reasoning naturally leads to the question about the optimal ownership structure of a company with an outside blockholder, in particular, how it should depend on the legal environment. Given certain laws and enforcement practices an ownership allocation determines both the incentives of the blockholder to monitor the manager and the incentives to expropriate other shareholders. The optimal ownership structure should minimize the agency costs, defined as the combination of the ex-post costs of monitoring and expropriation and the ex-ante cost of underinvestment (or underpricing) that reflects the fear of future expropriation. Changes in the law change the incentives of the parties for a given ownership structure; consequently, the optimal ownership structure is likely to differ depending on the legal environment.

Our paper aims at analyzing this issue. We look at the problem of corporate governance as a problem of the conflict of interest in the "triangle" of a manager, an outside blockholder and a continuum of dispersed shareholders. The model combines an optimal monitoring analysis a la Pagano and Röell (1998) with an analysis of the effect of collusion between the informed outside blockholder and the manager. We model legal shareholder protection through the cost for the manager of deriving private benefits at the expense of the shareholders. This cost is a deadweight loss, reflecting the difficulty of expropriation under given quality of the law. An increase in this cost is associated with strengthening shareholder protection.

A widespread view on outside blockholders as a mechanism of corporate governance is that they are particularly important when legal shareholder protection is weak (Berglöf and Pajuste (2003), Berglöf and von Thadden (2000), Shleifer and Vishny (1997)). When legal protection is good, outside blockholders are not needed because shareholders are already well protected by the law, and, since blocks are costly due to the lack of diversification or liquidity reasons, the optimal ownership structure should be dispersed. On the contrary, when legal protection is bad, a large outside shareholder is a very important (if not the only) instrument of restricting managerial opportunism.

This reasoning might lead one to the conclusion that the law and outside ownership concentration are substitutes. Looking at this issue in a finer way we argue that it does not have to be necessarily true. When legal protection is very strong, an outside blockholder is not needed indeed, because an equity compensation scheme is enough to discipline the manager. Our focus, however, is on the regimes with not so good legal protection, where blockholder monitoring is crucial to ensure firm financing. We show that in these regimes the size of the block depends *non-monotonically* on the quality of the law. Taking into account interdependence between the law and both the monitoring and the collusion incentive of the blockholder we obtain that under very bad legal protection the blockholder's share goes down as the law improves, but after certain quality of the law it starts increasing until the law becomes so good that a blockholder

schemes, a board of directors, the market for corporate control, etc. For a recent review of the corporate governance mechanisms see Becht, Bolton and Röell (2002).

is not needed anymore.

Our story goes as follows. The manager, who has no money, is trying to raise external funds from outside investors in exchange for future security benefits. However, after the injection of funds has been made he has an incentive to derive private benefits instead of maximizing shareholder value. This creates the classical agency problem as in Jensen and Meckling (1976). In order to get financed the manager attempts to reduce the agency problem by exposing himself to monitoring by a blockholder. However, there is a possibility that the informed blockholder can collude with the manager at the expense of the dispersed shareholders – the anticipation of such collusion reduces the dispersed shareholders' willingness to provide funds.

The manager eventually bears both the cost of monitoring and the cost of private benefit extraction. Hence, his aim is to choose the ownership structure that would minimize the combination of these costs subject to the investors' participation constraint. While doing that the manager is concerned with two things. First, by setting the right blockholder's share he wants to induce the optimal level of monitoring, i.e. the one that achieves the optimal balance between costly monitoring, which ensures certain positive shareholder value, and the inefficient private benefit extraction. Second, he wants to credibly commit to avoid collusion by choosing the sum of his own share and the blockholder's share large enough such that the two parties jointly prefer profit maximization. These two goals, however, may be in conflict. In our model they are not when shareholder protection is relatively good and they are when it is bad.

When legal protection is relatively good (the cost of the private benefit extraction is relatively high) there exists an ownership structure that both produces the optimal monitoring and is collusion proof. Like in Pagano and Röell (1998), the manager optimally trades off inefficiency of expropriation against the monitoring cost. When the law becomes worse private benefits become more valuable for the manager. Hence, it becomes optimal to reduce monitoring in order to increase expected private benefit extraction. As a result, the optimal outside block decreases as the law deteriorates.

When legal protection becomes sufficiently bad, i.e. private benefits become sufficiently valuable, collusion with the manager becomes very attractive for the blockholder and its threat starts driving the result. The blockholder's share that would induce optimal monitoring under no threat of collusion violates the collusion proofness constraint. Therefore, a larger share has to be allocated to the blockholder in order to kill the incentive to collude, which comes at the cost of excessive monitoring. As legal protection worsens further, collusion becomes more difficult to avoid and the blockholder's share has to be increased in order to preserve the "no collusion" incentive.

Overall, we obtain a *U-shape dependence* of the outside blockholder's share on the quality of the law as measured by the cost of private benefit extraction. The fact that the outside blockholder's share is non-monotonic in the quality of the law does not imply that the same is true for the aggregate ownership concentration. Our model is consistent with an inverse relationship between the aggregate ownership concentration and shareholder protection found

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empirically by La Porta et al (1998) and Himmelberg, Hubbard, and Love (2004) and modelled theoretically by Himmelberg, Hubbard, and Love (2004) and Shleifer and Wolfenzon (2002).

Our model is closely related to two recent papers: Burkart and Panunzi (2006) and Burkart, Panunzi and Shleifer (2003). Like us, these papers incorporate both the effect of blockholder monitoring and the effect of collusion between the blockholder and the manager. Burkart, Panunzi and Shleifer (2003) obtain a negative dependence of the outside blockholder's share on the strength of shareholder protection.[3] Burkart and Panunzi (2006), however, show that this link can be both positive and negative, depending on the character of interdependence between the law and monitoring.

While the finding of Burkart and Panunzi (2006) parallels ours in that strengthening legal protection does not necessarily lead to lower outside ownership concentration, there are important differences between the two papers. In particular, collusion does not qualitatively change the effect of the law in Burkart and Panunzi (2006)[4], while in our paper it does. Moreover, in Burkart and Panunzi (2006), while the blockholder's share may or may not go up, monitoring always goes up as legal protection weakens. In our paper, on the contrary, monitoring may decrease when legal protection becomes weaker.

Importantly, our paper and Burkart and Panunzi (2006) have rather different setups and mechanisms that determine the link between the law and the ownership structure. This fact reinforces the validity of both papers' claim that outside ownership concentration is not necessarily a substitute for legal protection.

In section 5 we will discuss the differences between our paper and both Burkart and Panunzi (2006) and Burkart, Panunzi and Shleifer (2003) in detail. In short, we think that our analysis is concerned with a different type of firms. In the two mentioned paper the initial owner maximizes her own welfare subject to either the manager's participation constraint (Burkart, Panunzi and Shleifer (2003)) or the manager's initiative constraint (Burkart and Panunzi (2006)). The interaction between the law, monitoring and these constraints determines the effects of legal protection. Therefore, we think that their setups better fit large, initially close firms, in no need for new investment, the owners of which want to hire a professional manager and sell a fraction of equity to dispersed shareholders in order to commit not to monitor the manager too much. When legal protection raises the blockholder's monitoring incentive, her share has to be decreased in order to ensure either managerial participation or initiative.[5] However, when better legal protection makes monitoring less attractive for the blockholder, her share may have to be increased in order to restore necessary monitoring incentives (Burkart and Panunzi (2006)).

Our analysis is rather about entrepreneurial firms in which there is no question of hiring a

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[3]The paper also looks at the decision of a company founder to delegate the management to a professional manager. The authors show that at sufficiently low levels of legal protection the founder prefers to manage the firm himself.

[4]Collusion does not qualitatively change the effect of legal protection in Burkart, Panunzi and Shleifer (2003) either.

[5]The interaction between blockholder monitoring and managerial initiative was first examined in Burkart, Gromb and Panunzi (1997). Too much monitoring reduces the initiative. Because the initiative is valuable for shareholders, a blockholder's share must not be too large in order to credibly avoid overmonitoring.

manager, but which instead seek external finance to realize their investment opportunities, and there is no question of either managerial participation or initiative.

The paper is organized as follows. Section 2 sets up the model. In section 3 we solve the model. Section 4 analyses the effects of legal protection on the ownership structure. In section 5 we discuss the results and compare them with those of the related papers. Section 6 concludes the paper.

2 The model

All the agents are risk-neutral in the model. There is an entrepreneur (whom we will call the manager) who has necessary managerial skills and information about available projects but does not have funds. Performing any of the projects requires the investment outlay I which the manager has to raise from outside investors.[6]

We assume that due to high competition between potential investors the manager has full bargaining power at the financing stage, i.e. he will maximize his payoff subject to the investors' participation constraint. We assume also that all funds are raised by selling equity. The manager retains fraction α_m of the shares for himself, sells part α_b of the shares as a block to a large shareholder (the blockholder), and the remaining part α_d as dispersed equity. The funds can be used by the manager both for creating verifiable profit and for deriving a non-verifiable private benefit. Lack of commitment to abstain from the private benefit extraction will reduce the shareholders' willingness to provide finance in the first place. However, the shareholders can limit managerial opportunism through monitoring. The role of the blockholder will be to solve a collective action problem in monitoring. The blockholder, however, may sometimes be tempted to collude with the manager for sharing the private benefit instead of pursuing shareholder interests. The following subsection sets up the game formally.

2.1 The game

The game is illustrated in Figure 1. The sequence of the events is as follows:

Time 0. The manager decides on the ownership structure of the firm (α_d, α_b) and share α_m of the cash flow rights he retains. The manager also sets the prices of the block and the dispersed equity subject to the investors' participation constraint. The investors (both the dispersed shareholders and the blockholder) decide whether to provide funds.

We assume that investing more than I in the firm is unproductive. However, in principle, the manager can raise more than I in exchange for more equity and simply pocket the excess funds. Such possibility does not qualitatively affect our analysis – as we will see it will just

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[6]Alternatively we could assume that the manager initially is a sole owner of a firm which runs with zero profit. He receives zero private benefits and has no cash. He can raise outside funds for restructuring which would increase the firm's profitability.

give the manager greater freedom in choosing α_d, which would be potentially beneficial, had we introduced any cost of large shareholdings.

Time 1. The raised funds, I, can be used for either of the two purposes: creating a verifiable profit, which is distributed among the shareholders proportionally to their shares, or deriving a non-verifiable private benefit (self-dealing). For simplicity, we assume that the manager has a choice between two options only: either he derives B (for simplicity non-random) and then the profit is zero with probability one, or he maximizes the profit, in which case the profit is R with probability $(1-q)$ and 0 with probability q. Let us denote the expected profit in this case, $(1-q)R$, by Π.[7]

We assume that $q > 0$. Thus, zero profit cannot be a proof of managerial self-dealing. Moreover, a binary distribution of the profit with zero being one of the two possible realizations implies that an equity contract is optimal in our model (though it is indistinguishable from a debt contract with limited liability). Since it is only the expected profit that will matter in our model, we we will conduct our analysis in terms of Π.

The blockholder can monitor the manager's actions. Monitoring means the following. The blockholder chooses how much to invest in monitoring – the monitoring cost c, which is born solely by the her. With probability $p(c)$ she becomes "informed". Being informed means that in case the manager chooses the private benefit extraction, the blockholder identifies the ways of the managerial self-dealing and can force the manager to maximize profits instead. In case the manager has chosen profit maximization, the blockholder realizes that no self-dealing is taking place. With probability $1 - p(c)$ the blockholder stays uninformed – even if the manager is self-dealing and the blockholder rationally expects that, she does not see how this self-dealing is taking place. We assume that in this case she is unable to stop self-dealing.

Function $p(\cdot)$ is defined on $[0, \infty)$, everywhere increasing and strictly concave, $p(0) = 0$, $p(\infty) = 1$, $p'(0) = \infty$, $p'(\infty) = 0$. We assume that the dispersed shareholders cannot coordinate for monitoring, and since each of them is of measure zero no one of them will monitor.[8]

Time 2. A number of situations are possible.

If the blockholder is uninformed the firm goes on operating according to the manager's choice. In this case, if the manager has chosen self-dealing he obtains $M = B$ and the shareholders get a gross (without taking into account the monitoring cost and the investment) return of zero.

If the blockholder is informed and the manager has chosen to maximize profits, the firm goes on operating according to the manager's choice. Everybody receives his share of the final

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[7]Such simple choice structure facilitates the exposition. A more general model, in which the manager is allowed to choose any convex combination of the pure profit maximization and pure self-dealing, i.e. any $x \in [0, 1]$ such that the expected profit is $x\Pi$ and the private benefit is $(1-x)B$, delivers exactly the same results as our simplified model.

[8]If we had introduced a small fixed cost of monitoring, then "no monitoring" would be a dominant strategy for each of the dispersed shareholders.

profit, i.e. $\alpha_i \Pi$ in expected terms.

If the blockholder is informed and the manager has chosen the private benefit extraction, the blockholder has two options:

1. She can force the manager to switch to profit maximization.[9] Then the payoffs are exactly as if the manager had chosen to maximize profits from $t = 2$, i.e. the private benefit is 0 and the final profit is distributed among all the parties, including the manager, proportionally to their shares.

2. She can collude with the manager for sharing the private benefit B. The outside option in bargaining is profit maximization. The surplus from the collusion is $\Sigma \equiv B - (1 - \alpha_d)\Pi$. In this case, the manager's and the blockholder's payoffs are respectively $M_c = \alpha_m \Pi + \mu\Sigma$ and $S_{bc} = \alpha_b \Pi + (1 - \mu)\Sigma$, where subscript c stands for "collusion". The managerial share μ of the surplus is determined by the bargaining powers of the parties and is exogenous.

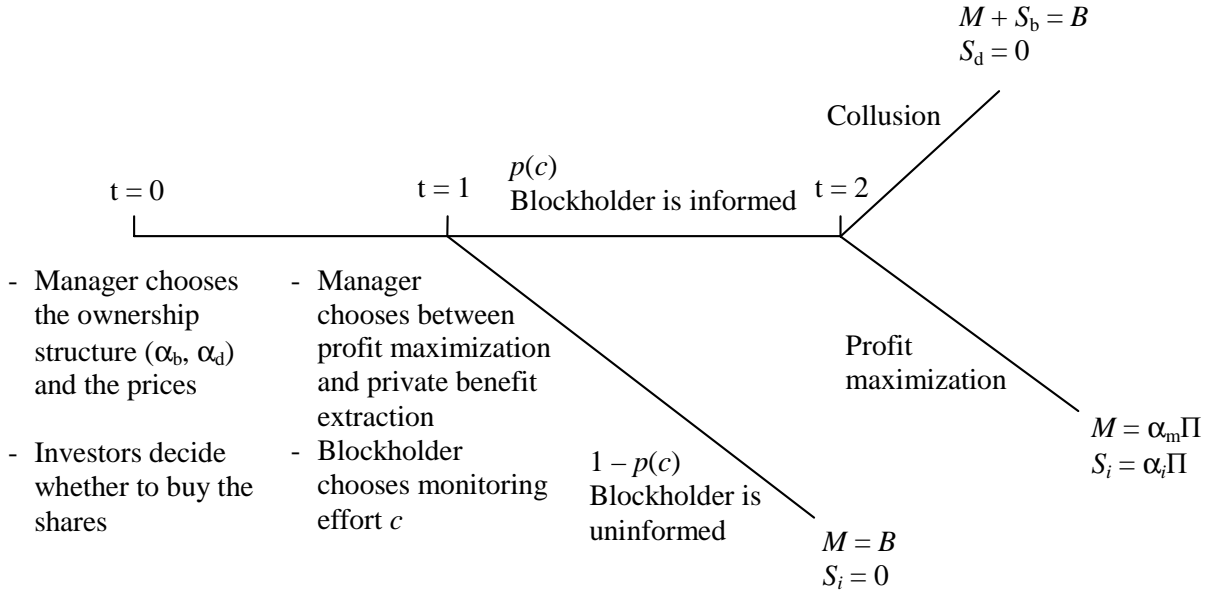In case there is no financing at $t = 0$, all the parties get a zero payoff.

Figure 1: The game.

Before discussing the legal system we make the following crucial assumption:

Assumption 1. $B < \Pi$.

This assumptions says that the private benefit extraction is inefficient. The cost for the manager of extracting the private benefit is a deadweight loss and is $1 - B/\Pi$. Assumption 1 implies that the first-best solution is to invest I only in creating the expected profit Π.

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[9]For example, she can call a shareholder meeting, disclose her information there and put the change in the firm's strategy to the vote.

2.2 Legal protection

We assume that legal shareholder protection determines the value of B. Lower B means a higher cost $1 - B/\Pi$ of the private benefit extraction (and a higher deadweight loss associated with it). We associate lower B with better legal protection. The magnitude of B reflects the restraints that both the contents of the law and its enforcement put on expropriating shareholders. Better law makes finding self-dealing opportunities more difficult and forces a manager to search for complicated, and thus costly, ways of expropriation (e.g. via establishing complex and non-transparent control structures with intermediary companies). Stronger legal protection also imposes higher expected penalties on wrongdoers (e.g. because of a higher probability of being caught and found guilty).

While it is common to assume that the law determines the cost function of private benefit extraction (La Porta et al (2002), Shleifer and Wolfenzon (2002), Himmelberg, Hubbard, and Love (2004), Burkart and Panunzi (2006), Burkart, Panunzi and Shleifer (2003)) it is not obvious what the exact relationship between the law and the cost function should be. The only feature that seems unquestionable is that better law should increase (at least weakly) the cost of expropriating shareholders of a share of the security benefits for any such share. Our model obviously satisfies this requirement.

Since the manager's choice consists of only two options, our model produces exactly the same outcomes as if the cost of self-dealing were a linear function of the profit diverted (that would lead to a "bang-bang" solution, which our model yields by construction). The law increases the *slope* of this function. La Porta et al (2002), Shleifer and Wolfenzon (2002) and Himmelberg, Hubbard, and Love (2004) share the latter feature as well. However, in those papers the cost is a convex function, which results in an interior solution for expropriation. We will briefly discuss the robustness of our results with respect to the form of the cost function at the end of section 4.

In Burkart, Panunzi and Shleifer (2003) and for the most part of Burkart and Panunzi (2006) expropriation does not involve ex-post inefficiency, i.e. there is no ex-post cost of transferring wealth from the shareholders to the manager, and legal protection just sets an *upper bound* on the amount of the profit that can be diverted. This implies that, regardless of the joint equity share of the controlling parties, they would always want to divert the maximum amount of the profit, allowed by the law, unless it is exogenously assumed that the blockholder pursues the small shareholders' interests and cannot (or does not want to) collude with the manager.[10]

In our model, the choice between expropriation and profit maximization depends on the equity share of the controlling parties, which is more realistic. Both better legal protection

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[10] The authors consider two scenarios: one in which the blockholder's interests are assumed to be perfectly aligned with those of small shareholders (e.g. because private benefits are not transferable), and one in which there is no assumption of alignment. In the latter case, due to the ex-post efficiency of expropriation, the blockholder will always collude with the manager and they will divert the maximum possible amount of the profit.

In Section 5.2 of Burkart and Panunzi (2006) the authors allow for partial alignment by introducing a convex cost of expropriation. In that case an interior solution for expropriation is possible.

and a higher equity share of the manager-blockholder coalition increase the chance of the "no expropriation" outcome.

The aim of our analysis is to examine how the legal parameter B affects the choice of the ownership structure (α_d, α_b). Before proceeding with the solution we are going to make an assumption that ensures the need for blockholder monitoring.

2.3   Legal protection and the need for a blockholder

It is easy to see that when legal protection is sufficiently strong, specifically when $B < \Pi - I$, the first-best (profit maximization) can be guaranteed by the manager simply via keeping a sufficiently large equity share. Specifically, any α_m that satisfies $B/\Pi < \alpha_m < (\Pi - I)/\Pi$ makes the manager better off from maximizing profits than from self-dealing at $t = 1$ (because $\alpha_m \Pi > B$) and satisfies the investors' participation constraint $(1 - \alpha_m)\Pi > I$. Thus, indeed, in line with the widespread view, when the law protects shareholders well enough, blockholder monitoring is not needed and the manager can be disciplined through an equity compensation scheme.

Our focus, however, is on the situations when a blockholder is needed, i.e. when legal protection is not good enough. Therefore, we make the following crucial assumption:

Assumption 2. $B > \Pi - I$.

This assumption says that legal protection is not strong enough for the parties to write a contract on the firm's profit that would prevent expropriation and satisfy the investors' participation constraint at the same time. In other words, Assumption 2 says that the agency problem is serious enough that the managerial equity share he needs to keep in order to credibly commit not to expropriate the shareholders is too large to raise the required funds. That is, under Assumption 2 the first-best is not achievable. In the terminology of Tirole (2001) it is called the "dearth of pledgeable income" problem. The manager prefers to self-deal for any α_m that would be consistent with the investors' participation constraint under no possibility of expropriation.

Although Assumption 2 rules out the alignment of the manager's and the shareholders' interests, it does not rule out the alignment of the interests of the manager-blockholder coalition with those of the dispersed shareholders – for a given quality of the law there is a threshold share of the manager-blockholder coalition, above which the parties jointly prefer profit maximization. Thus, as we will see, the presence of the blockholder who monitors the manager and abstains from collusion with him is crucial for restricting managerial opportunism and ensuring financing by the dispersed shareholders.

Throughout our subsequent analysis, when we will speak about B, we will use terms "good" and "bad" legal shareholder protection (or law), having in mind that we are in the world restricted by Assumption 2. That is, the values of B that correspond to "good" legal protection will be the ones that are not much above $\Pi - I$. In other words, the law can be "good" in our model but not "too good".

3 Solution

We are looking for a subgame perfect equilibrium of the game, determined by:

    - the pair (α_d, α_b),

    - the decisions of the dispersed shareholders and the blockholder whether to provide funds or not,

    - the manager's choice between self-dealing and maximizing profits,

    - the choice of c by the blockholder,

    - if the manager has not followed the profit maximizing strategy and the blockholder is informed, the decision of the manager and the blockholder whether to collude or not.

There will be three relevant constraints in the analysis: collusion proofness, optimal monitoring and participation constraints. We will derive them now when solving the game. It will turn out that there is never collusion in equilibrium and the blockholder's share is such that the optimal balance between the inefficient private benefit extraction and costly monitoring is achieved, given the collusion proofness constraint.

3.1 Formal solution

First of all, notice that self-dealing is a strictly dominant strategy for the manager. It can be seen from the following reasoning. The necessary condition for financing requires that $(1-\alpha_m)\Pi \geq I$, otherwise the investors would never provide funds. This condition, combined with Assumption 2, implies that $\alpha_m\Pi < B$. It means that when the blockholder is uninformed, the manager is better off deriving B than maximizing the profit. If the blockholder becomes informed, either profit maximization or collusion follows at $t = 2$. If there is profit maximization, then the manager has not lost anything from having chosen to self-deal. If there is collusion, the manager gets $M_c = \alpha_m\Pi + \mu\Sigma > \alpha_m\Pi$.

Now the analysis is simplified and we can start solving the game by backward induction. At $t = 2$ the manager and the blockholder abstain from collusion whenever they jointly gain more from the profit maximization than from deriving private benefits. We call it the *collusion proofness constraint*:

$$(1 - \alpha_d)\Pi \geq B$$

    or

$$\alpha_d \leq 1 - B/\Pi \tag{CP}$$

Assume that at time $t = 2$ collusion is not optimal for the coalition of the manager and the informed blockholder, that is (CP) holds. At time $t = 1$ the blockholder chooses how much to invest in monitoring. She maximizes her expected utility net of the monitoring cost $S_b - c = p(c)\alpha_b\Pi - c$. Due to our assumptions about $p(c)$ the solution is always interior, the

first order condition yields the blockholder's choice of c, which we denote $c^*(\alpha_b)$:

$$p'(c^*) = \frac{1}{\alpha_b \Pi} \quad \text{(M)}$$

We call this constraint the *monitoring constraint.* It is easy to see that since $p''(\cdot) < 0$, c^* is increasing in α_b. This result is very natural and common for papers that examine blockholder monitoring – the higher the blockholder's stake the more she is concerned with the equity value and the more she monitors.

Hence, provided that (CP) holds, the *participation constraint* (P) of the investors is:

$$p(c^*(\alpha_b))(\alpha_b + \alpha_d)\Pi \geq c^*(\alpha_b) + I$$

or

$$\alpha_b + \alpha_d \geq \frac{c^*(\alpha_b) + I}{\Pi p(c^*(\alpha_b))} \quad \text{(P)}$$

To sum up, if after period $t = 0$ the values of α_d and α_b are such that constraints (P) and (CP) hold then in the subgame perfect equilibrium of the subgame that starts at $t = 1$:

- the manager tries to self-deal,
- the blockholder monitors with intensity $c^*(\alpha_b)$,
- if the blockholder gets informed there is no collusion and the firm's strategy is changed to the profit maximization.

Will the manager at $t = 0$ want to choose an ownership structure that guarantees the absence of collusion, i.e. such that (CP) holds? The answer is "yes".

Lemma 1 *Collusion never happens in equilibrium of the entire game.*
Proof. *See the Appendix.* ∎

The intuition behind this lemma is rather simple. Since the manager always extracts all the expected surplus from the relationships with the investors, and extracting the private benefit is inefficient, he prefers to establish a commitment that would assure that all the investors get their money back and collusion does not happen.

Thus, if it is feasible to satisfy jointly constraints (CP), (P) and $\alpha_b + \alpha_d \leq 1$, then indeed in equilibrium the manager will do so. Otherwise no financing takes place at $t = 0$. The necessary and sufficient condition for such ownership structure to exist is that the ownership structure with $\alpha_b = 1$ satisfies (P). Such allocation of ownership obviously ensures the absence of collusion. At the same time it induces monitoring that maximizes the net investors' payoff – when all the equity belongs to one shareholder, she will maximize the shareholder value net of the monitoring cost. Thus, if $\alpha_b = 1$ does not satisfy (P), no other ownership structure does. Hence, we make the following assumption:

Assumption 3. $\Pi p(c^*(1)) - c^*(1) - I \geq 0$

The manager can always choose α_d such that (P) becomes binding. Since the utilities of the parties are transferable, it means that when choosing the ownership structure the manager maximizes the aggregate welfare subject to (P), (M), (CP) and $\alpha_b + \alpha_d \leq 1$:

$$\max_{\alpha_b, \alpha_d} \{ V(\alpha_b) = p(c^*(\alpha_b))\Pi + [1 - p(c^*(\alpha_b))]B - c^*(\alpha_b) - I \}$$

s.t.:

$$\alpha_b + \alpha_d \leq 1 \qquad \text{(feasibility constraint)}$$

$$\alpha_b + \alpha_d = \frac{c^*(\alpha_b) + I}{\Pi p(c^*(\alpha_b))} \qquad \text{(P)}$$

$$c^*(\alpha_b) \text{ is determined by } p'(c^*) = \frac{1}{\alpha_b \Pi} \qquad \text{(M)}$$

$$\alpha_d \leq 1 - \frac{B}{\Pi} \qquad \text{(CP)}$$

Assume that the unconstrained maximization of $V(\alpha_b)$ results in some $\alpha_b = \overline{\alpha}_b$. Then, if there can be found α_d, such that $(\alpha_d, \overline{\alpha}_b)$ satisfies all the constraints, the unconstrained maximization of $V(\alpha_b)$ solves the original problem with respect to α_b. Assume that such α_d can be found. Since $V(\alpha_b)$ depends only on $c^*(\alpha_b)$ we can maximize V with respect to c^* and then derive what the optimal α_b is. The first order condition yields:

$$p'(c^*) = \frac{1}{\Pi - B} \qquad (1)$$

This is the condition for the optimal monitoring. The optimal block $\overline{\alpha}_b$ is the one that equalizes the blockholder's choice of monitoring with the optimal monitoring, i.e. using (M) we can write:

$$\frac{1}{\overline{\alpha}_b \Pi} = \frac{1}{\Pi - B}, \text{ i.e. } \overline{\alpha}_b = 1 - \frac{B}{\Pi} \qquad \text{(OM)}$$

We will call it the *optimal monitoring* condition.

Remember, that this solution is valid only if we can find $\alpha_d \leq 1 - \overline{\alpha}_b$, such that (CP) and (P) are satisfied. If such α_d does not exist, α_b will be inevitably larger than $\overline{\alpha}_b$ and there will be too much monitoring with respect to the optimal level, determined by (2). In this case the solution will be at the intersection of (CP) and (P) because such ownership structure produces monitoring as close to the optimal level as possible, given (CP), i.e. α_b will be determined by $\alpha_b + 1 - \frac{B}{\Pi} = \frac{c^*(\alpha_b) + I}{\Pi p(c^*(\alpha_b))}$. Let us denote this value by α_b^c, where c indicates that the collusion proofness constraint is binding.

Thus, the equilibrium is:

At $t = 0$ the manager chooses $\alpha_b^* = \min\{1 - \frac{B}{\Pi}, \alpha_b^c\}$, $\alpha_d^* \in [\frac{c^*(\alpha_b^*) + I}{\Pi p(c^*(\alpha_b^*))} - \alpha_b^*, 1 - \frac{B}{\Pi}]$. The investors provide at least I.

At $t = 1$ the manager tries to self-deal, the blockholder monitors with intensity $c^*(\alpha_b)$,

At $t = 2$ if the blockholder gets informed there is no collusion and the firm's strategy is changed to the profit maximization. Otherwise the private benefit extraction occurs.

Notice that whenever $\alpha_b^* = \overline{\alpha}_b$ the ownership structure is not uniquely determined with respect to α_d (except when $\overline{\alpha}_b = \alpha_b^c$). The reason is that the manager is only concerned with setting the blockholder's share optimally. Once it is set, the dispersed equity share can be varied (as we mentioned at the beginning, the manager can raise more than I in exchange for more equity and simply pocket the excess funds). Neither the shareholders' nor the manager's expected welfare changes, only the composition of the manager's share and the dispersed equity share changes. If there were some benefits from having more dispersed equity, e.g. because of liquidity or risk aversion considerations, the solution would likely be unique and somewhere close to $\dfrac{c^*(\alpha_b^*) + I}{\Pi p(c^*(\alpha_b^*))} - \alpha_b^*$, because the manager would want to sell as much equity as possible do dispersed shareholders. However, formally, our model does not allow to make such a refinement.

Even though we have not explicitly introduced the prices of shares, it is easy to see that the block is priced at a discount, because the blockholder has to be compensated for his monitoring effort. At first sight it seems at odds with the widespread evidence that blocks are traded at a premium. However, Barclay, Holderness, and Sheehan (2001) document that private placements of blocks, which is exactly our case, are priced at a *discount*, in contrast to block trades.[11]

3.2 Graphical interpretation

A graphical interpretation of the problem is a convenient way to understand the solution. Figure 2 depicts all the constraints in space (α_d, α_b). Lines (P) and (CP) are the corresponding constraints taken as equalities. The collusion proofness constraint (CP) is just a vertical line at $\alpha_d = 1 - B/\Pi$, and the optimal monitoring line, (OM), is a horizontal line at $\alpha_b = 1 - B/\Pi$. The most difficult thing is to understand how (P) looks like. Lemma 2 establishes the properties of (P) that are relevant for our analysis.

Lemma 2 *Given Assumption 3, the constraint (P) in space*
$(\alpha_d, \ \alpha_b)$ has the following properties:
- it is downward sloping,
- $\alpha_b = 0$ when $\alpha_d = \infty$,
- it intersects the line $\alpha_b + \alpha_d = 1$, and there is only one intersection point in the north-eastern quadrant (i.e. satisfying $\alpha_d \geq 0, \ \alpha_b \geq 0$)

Proof. See the appendix. ■

Though in Figure 2 constraint (P) is depicted convex, it is ambiguous whether it is necessarily convex for the general form of $p(\cdot)$. However, for our purposes we do need to know that.

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[11] It is fare to say that they do find evidence that the discount is a compensation for monitoring. Instead, the authors argue, it is a compensation for helping the manager to entrench himself.

So, the set of the ownership structures that allows to attract finance without collusion is bounded by (P), (CP) and $\alpha_b + \alpha_d = 1$. If (CP) is far enough on the right, optimality further requires to set $\alpha_b = \overline{\alpha}_b$, hence it reduces this set to the set of the optimal allocations, which is segment CD. If (CP) is too much on the left (dashed line), the solution is unique – it is point B, at which $\alpha_b^* = \alpha_b^c$ and $\alpha_d^* = 1 - B/\Pi$.
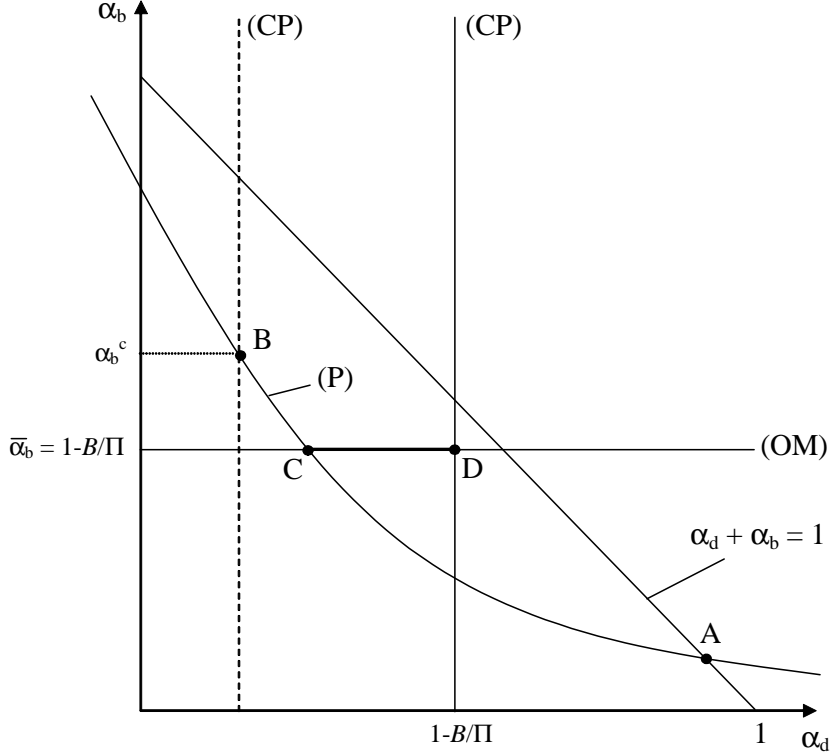

Figure 2: Graphical solution.

4 The effects of legal protection

Now we are ready to examine how the parameter of the law B affects the choice of the ownership structure by the manager. Look at Figure 3. When B is low enough (CP) is rather far on the right, while (OM) is rather high. So, we are in the situation when point D is above point B. In this case, the goal of achieving the optimal monitoring does not conflict with the goal of avoiding collusion, because the manager can choose the optimal outside block size $\overline{\alpha}_b$ and then simply keep his share large enough to ensure no collusion. Hence, the collusion proofness constraint (CP) is not binding. The solution is segment CD, a bold line in Figure 3. The equilibrium blockholder's share α_b^* is the one that induces optimal monitoring: $\alpha_b^* = \overline{\alpha}_b$.

As B goes up (OM) moves down and (CP) moves to the left. Hence, $\overline{\alpha}_b$ goes down, i.e. the optimal outside block decreases when the cost of the private benefit extraction falls. The segment CD shrinks, we denote the new segment by C'D'.

Since higher B means weaker shareholder protection in our model, this result is contrary to the widely-held view that weaker legal protection should be associated with higher outside

ownership concentration. However, it parallels the one in Pagano in Röell (1998), who argued that a lower dead-weigh cost of the private benefit extraction should be associated with a lower optimal outside blockholder's share.
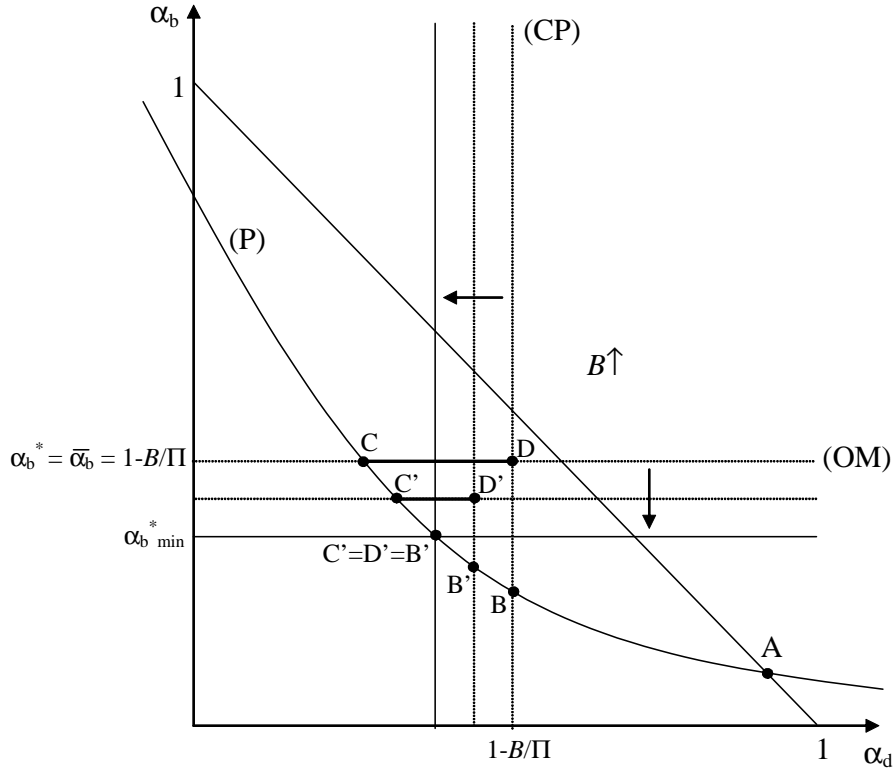

Figure 3: Effects of an increase in B when B is low.

At some value of B points B', D' and C' coincide, we will denote this value by $\widehat{B}$. For $B = \widehat{B}$ there is a unique equilibrium ownership structure, this is the highest value of B when (CP) constraint is not yet binding for the choice of α_b. The corresponding α_b is denoted by $\alpha^*_{b\,\min}$.

For $B > \widehat{B}$ the necessity to avoid collusion drives the choice of the ownership structure. Look at Figure 4 now. As B goes up further the manager cannot anymore choose $\overline{\alpha}_b$ as the solution, because that would lead to collusion for any α_d that satisfies (P). The manager still wants to ensure the monitoring intensity as close to the optimal one as possible. Therefore, he chooses the blockholder's share as small as possible, which corresponds to the intersection of (P) and (CP). In Figure 4 the solution is at point B" and this point goes up along constraint (P) as B rises further. The outside block gets larger and the dispersed equity share becomes smaller.

In fact, in our model, if the blockholder becomes informed he can be treated as an insider *ex-post*. The collusion proofness constraint then can be viewed as the constraint on the insider ownership that requires the alignment of the insiders' and outsiders' interests. Under a good law the alignment is achieved even for a small joint insiders' share and is not a concern – the only concern is the optimal monitoring. Under a bad law the alignment consideration becomes

the driving force – the insider ownership has to increase with a decrease in the quality of the law in order to keep the alignment. This reasoning parallels the one in Shleifer and Wolfenzon (2002) who argue that a lower quality of legal protection requires higher insider ownership to credibly abstain from expropriation.

One may still wonder why the blockholder's share has to be increased when the joint share goes up. Why not keep it optimal and just increase the manager's share to preserve the alignment? The answer is simple – the participation constraint must hold. If only the manager's share is increased then the investors will not break even.
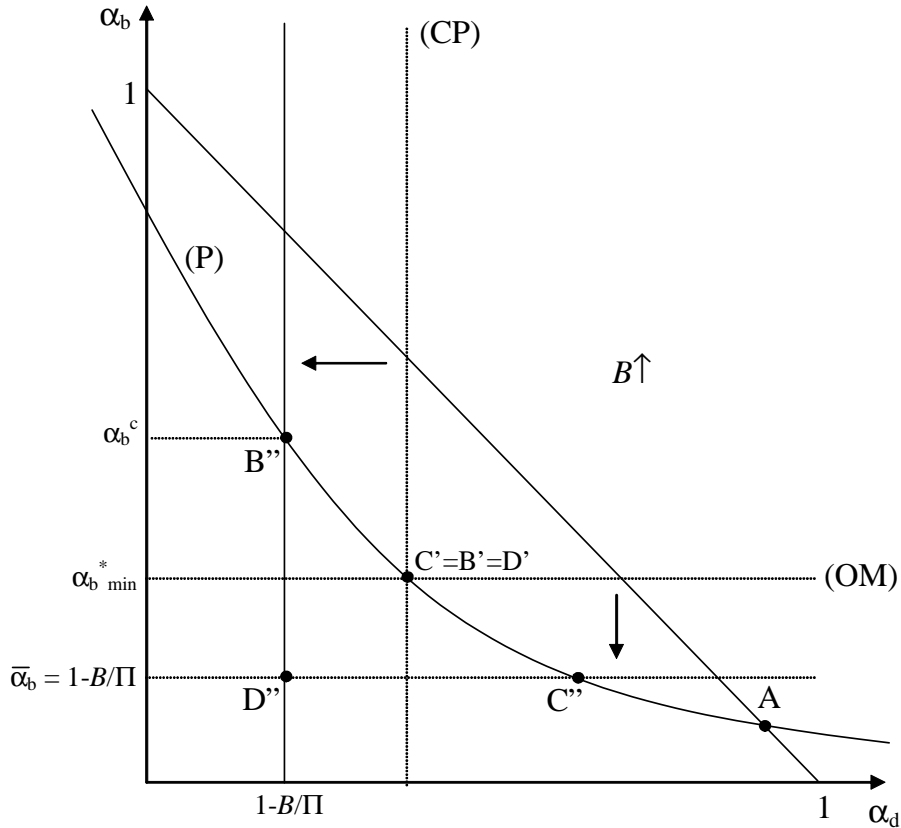

Figure 4: Effects of an increase in B when B is high

So, we obtain a U-shape dependence of the outside ownership concentration on B with the minimum value $\alpha^*_{b\min}$ which is reached at $\widehat{B}$. Or, in other words, we obtain a U-shape dependence of the outside ownership concentration on the quality of shareholder protection. The result is illustrated by Figure 5.

The above analysis can be summarized in a proposition.

Proposition 1 *Legal protection of shareholders has a non-monotonic effect on the optimal blockholder's share. When legal protection is weak (i.e. the cost of the private benefit extraction is low), the optimal blockholder's share is decreasing in the quality of legal protection; while when legal protection is strong (i.e. the cost of the private benefit extraction is high), the optimal blockholder's share is increasing in the quality of legal protection.*
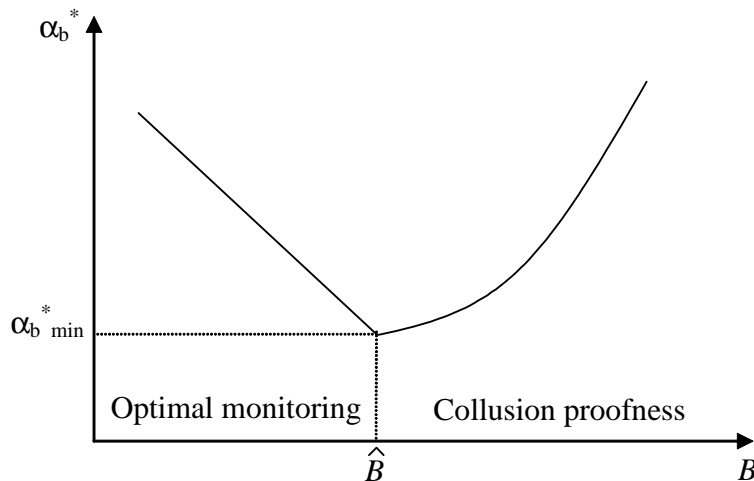
17

Figure 5: Legal protection and the size of the outside block.

To conclude our analysis let us also state the result about the effect of law on the dispersed equity share that follows from our analysis. In figure 4 the ownership structure is determined uniquely and it is clear from the picture that an improvement in legal protection (a decrease in B) leads to an increase in the dispersed equity share. However, in figure 3 the equilibrium dispersed equity share is not unique, and strengthening legal protection gives the manager a wider choice of the dispersed equity share (e.g. consider a move from C'D' to CD) and increases the *upper bound* for the dispersed equity (point D instead of D'). Introducing even slight benefits from having more dispersed equity (which we have mentioned earlier) would eliminate the indeterminacy in the solution and a decrease in B would unambiguously lead to more dispersed financing. Hence, our proposition 2.

Proposition 2 *Improvements in legal protection (a decrease in the cost of the private benefit extraction) unambiguously raise the dispersed equity share when legal protection is weak, and raise the upper bound for the dispersed equity share (i.e. decrease the lower bound for the total ownership concentration) when legal protection is strong.*

This result is consistent with the empirical findings by La Porta et al (1998) and the theoretical work by Shleifer and Wolfenzon (2002) that firms in countries with weaker shareholder protection have smaller stock markets and higher ownership concentration.

It is fare to say that the result of Proposition 1 may not be robust to the choice of the self-dealing technology (i.e. the form of the cost-of-expropriation function). While for Proposition 1 to hold the cost of self-dealing does not have to be linear (as essentially is in our setup) and can be convex, some constraints on its form are anyway necessary. Without formalizing them, we can say that the critical condition for our non-monotonicity result is that for a given manager's share his incentives are not too sensitive to changes in the law within the bounds set by Assumption 2. In this case, strengthening legal protection does not lead to a sufficient reduction in the expropriation, but still increases its deadweight loss for a given amount of the

private benefit. Hence, the overall result is a raise in the deadweight loss. This effect needs to be offset by an increase in monitoring, which is provided through raising the blockholder's share. In such a case, our Proposition 1 is valid.

5   Discussion of the results

One way to view our results is through the trade-off between the *ex-ante* optimality for the initial owner (the manager) and the *ex-post* optimality for the participants of the game (the blockholder and the manager). Ex-ante the manager is concerned with two things. First, he wants to credibly induce the optimal level of monitoring, i.e. the one that achieves the optimal balance between costly monitoring, that ensures certain positive shareholder value, and the inefficient private benefit extraction. Second, he wants to credibly commit to refrain from collusion. On top of that the manager needs to satisfy the investor's participation constraint, i.e. he cannot retain a too large share of equity. Ex-post, however, the monitoring intensity is determined by the blockholder's share and the decision whether to collude or not is determined by the joint share of the manager and the blockholder.

The right ownership structure is to induce the ex-ante optimal decisions ex-post. The problem is, however, that it is not always possible. Specifically, it is possible when legal protection is good and it is not when legal protection is bad. This is the source of a U-shape link between legal protection and the optimal blockholder's share.

When the law is good, collusion can be avoided even through relatively small ownership concentration. Hence, there exists the ownership structure such that the optimal monitoring is induced, collusion does not happen and the outside shareholders' equity share is large enough to satisfy their participation constraint. The ex-ante optimality requires to increase managerial opportunism when the law worsens (but not too much) and expropriation becomes more valuable (similarly to Pagano and Röell (1998)). The fact that collusion is unattractive for a wide range of ownership structures provides the manager with enough freedom to adjust the outside block optimally to changes in the law.

When the law becomes too bad, the ex-ante optimal behavior cannot be ensured by the choice of the ownership structure, because of the conflict between the provision of the optimal monitoring incentive and the incentive not to collude. This conflict arises because collusion becomes too attractive ex-post. To credibly avoid it the total ownership concentration (the joint share of the manager and the blockholder) has to be large enough. The investors' participation constraint restrains the manager from achieving this task by simply choosing his own share large enough and setting the outside block size optimally. As a result, the outside block is inevitably too large to produce the ex-ante optimal monitoring. To put it another way, in order to attract finance the optimal monitoring has to be sacrificed for the commitment not to collude. As legal protection worsens further, the size of the "collusion pie" goes up and both the total ownership concentration and the blockholder's share increase correspondingly. If we think that,

once informed, the blockholder essentially becomes an insider, we can notice that this result parallels the one, derived in Shleifer and Wolfenzon (2002), who argue that lower quality of legal protection requires higher insider ownership to credibly abstain from expropriation.

Proposition 1 can potentially be tested empirically. Existing studies frequently find a negative link between law and total ownership concentration, which is consistent with our Proposition 2. However, it is very difficult to obtain good evidence on the effect of legal protection on *outside* ownership concentration. The problem is that empirically it is hard to distinguish between real outsiders, who reduce managerial opportunism through monitoring, and those blockholders that actively participate in extracting private benefits themselves. Trying to disentangle these two types of blockholders and performing an empirical analysis are the goals for future research.

Our model is closely related to two recent papers that looked at the same problem but provided different results: Burkart and Panunzi (2006) and Burkart, Panunzi and Shleifer (2003). Burkart, Panunzi and Shleifer (2003) propose a model that delivers a negative relationship between the quality of the law and outside ownership concentration in professionally managed companies. Burkart and Panunzi (2006), however, show that a positive relationship can be possible as well, depending on the character of interdependence between the law and monitoring.

Like us, these papers incorporate both the effect of blockholder monitoring and the effect of collusion between the blockholder and the manager. The principal proposition in Burkart and Panunzi (2006) states the following: *when legal protection and monitoring are either complements or independent for the blockholder, the optimal outside ownership concentration decreases when the law improves, while when they are substitutes, the effect of the law is ambiguous.*[12] The result in Burkart, Panunzi and Shleifer (2003) that concerns professionally managed companies is a direct consequence of the proposition: legal protection and monitoring are independent for the blockholder in that paper, and, therefore, outside ownership concentration decreases with the quality of the law.[13] Introducing exogenously the possibility of collusion between the manager and the blockholder does not qualitatively change the predictions of their models. In our model the law and monitoring are independent for the blockholder, which is clear from the form of the blockholder's net utility $S_b - c = p(c)\alpha_b \Pi - c$. This expression does not depend on B, hence its cross derivative with respect to B and c is zero. However, in contrast to Burkart, Panunzi and Shleifer (2003), we obtain a U-shape dependence.

There are important differences in the setups between our paper and theirs that drive the difference in the results. We do not intend to say that one setup better fits the real world than the other one. Rather we think that their models and ours analyze different types of companies.

The setups of Burkart, Panunzi and Shleifer (2003) and Burkart and Panunzi (2006), in our view, better fit large, initially close firms, in no need for new investment, the owners of which want to hire a professional manager in order to raise the performance. Indeed, in their models the

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[12]See Proposition 3 in Burkart and Panunzi (2006). We have slightly rephrased it for the sake of comparison between our model and theirs.

[13]In Burkart and Panunzi (2006) the authors provide an example where legal protection and monitoring are substitutes for the blockholder, and the outside ownership concentration is a hump-shape function of the law.

initial owner sells a fraction of equity to dispersed shareholders and hires a professional manager with the purpose to maximize her own wealth subject to either the manager's participation constraint (Burkart, Panunzi and Shleifer (2003)) or the initiative constraint (Burkart and Panunzi (2006)).[14] The initial owner then stays as an outside blockholder who monitors the manager. It is the interaction between the law, monitoring and these constraints that drives the effect of legal protection on the outside ownership concentration.

Both stronger legal protection and more monitoring make these constraints less likely to hold, i.e. they reduce either the willingness to accept the job or the managerial initiative. Therefore, better law requires less monitoring. Thus, the law and monitoring are *ex-ante substitutes* for the *initial owner*. At the same time, better law can induce either less or more monitoring for a given monitor's share, depending on whether better law makes monitoring less or more attractive for the monitor. Hence, the proposition in Burkart and Panunzi (2006), cited above, follows. When better legal protection makes monitoring more attractive for the monitor (or at least does not reduce the monitoring incentive), an improvement in the law must be compensated by a proper decrease in the monitor's share in order to preserve the managerial initiative (participation): Burkart, Panunzi and Shleifer (2003) illustrates such effect. When better legal protection makes monitoring less attractive for the monitor, the effect of the law is ambiguous and depends on how strongly legal protection reduces the monitoring incentive. If this effect is large enough, the block size has to be raised in order to restore efficient monitoring. Otherwise, it has to be reduced to preserve managerial initiative (participation).

Our analysis, on the contrary, better fits initially manager owned companies, in which there is no question of hiring a new manager, but which seek external finance to realize their investment opportunities, for example, entrepreneurial firms or firms going public. In our model the initial owner is the manager. For him the law and monitoring are *ex-ante complements* when collusion is not a danger (i.e. under strong legal protection). It is easy to see by differentiating $V(\alpha_b)$ from subsection 3.1 with respect to c and B and remembering that an increase in B corresponds to a decrease in the quality of legal protection: $\partial V/\partial c \partial B = -p'(c) < 0$. This is in contrasts to the two discussed papers, in which the law and monitoring were ex-ante substitutes for the initial owner. Therefore, in our model, efficiency requires that an improvement in the law be complemented with an increase in monitoring. Since better law alone does not change the blockholder's monitoring incentive, her share has to be raised to induce more monitoring. Thus, due to the different character of interdependence between the law and monitoring for the initial owner, our result is opposite to the one in Burkart, Panunzi and Shleifer (2003), despite the fact that the law has no effect on the willingness to monitor in both our and their paper.

If we turn to the role of collusion, it plays very different role in our paper and the discussed two papers. The results in Burkart, Panunzi and Shleifer (2003) and Burkart and Panunzi (2006) are robust to the introduction of the possibility of collusion. Due to the fact that ex-post

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[14]His wealth consists of the proceeds from selling dispersed equity and his own security and private benefits (he gets the latter if he colludes with the manager).

the private benefit extraction does not involve a cost, no ownership concentration can make the manager-blockholder coalition abstain from collusion. Thus, collusion avoidance consideration is absent from their papers.[15] In our paper, however, such consideration plays a very important role and collusion completely reverses the effect of law when legal protection becomes bad enough (the above reasoning about interdependence of law and monitoring plays no role in the collusion zone).

To sum up, the difference in the setups between our paper and the two discussed papers translates into the different character of *ex-ante interdependence between the law and monitoring for the initial owner* and in the different *role of collusion*. As a result, the effects of legal protection on the optimal ownership structure differ.

At the same time, the fact that both our paper and Burkart and Panunzi (2006), despite different setups, obtain that the blockholder's share does not have to decrease with the quality of the law *reinforces* both papers' claim that outside ownership concentration is not necessarily a substitute for legal protection.

One lesson we can learn from the above comparison is that one should look on the character of interdependence between the law and monitoring not only for the monitor (as in Burkart and Panunzi (2006)), but also for the initial owner (from the ex-ante point of view), because future monitoring decisions, as well as the quality of the law, affect her/his ex-ante welfare. If we leave aside the issue of collusion, there is a natural way to generalize the proposition in Burkart and Panunzi (2006), taking into account both the character of ex-post interdependence between the law and monitoring for the outside blockholder, and the character of ex-ante interdependence for the initial owner. In the Appendix, part A3, we propose such generalization for the case when the initial owner's and the monitor's welfare functions are differentiable with respect to the law and monitoring.

6 Conclusion

The main point of this paper was to show that outside ownership concentration can be both a substitute and a complement for legal protection of shareholders. Under very good legal protection an outside blockholder is not needed at all. However, we have focused on the situations when legal protection is not so good and blockholder monitoring is crucial to ensure firm financing. We looked at the link between the law and the ownership structure in a detailed way, treating differently the firm's insider (the manager) and the outside blockholder. Legal protection affects both the incentives of the manager-blockholder coalition to expropriate outside shareholders and the monitoring incentives of the blockholder.

Under relatively good legal protection collusion between the manager and the blockholder is not a concern as even small ownership concentration is sufficient to align the interests of

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[15] At the end of Burkart and Panunzi (2006) the authors just briefly discuss what can happen if private benefit extraction is inefficient and thus higher ownership concentration reduces the incentive to expropriate dispersed shareholders.

the coalition and the dispersed shareholders. The optimal block size is the one that ensures the optimal balance between costly monitoring and inefficient expropriation. A decrease in the quality of shareholder protection makes expropriation easier, i.e. less costly and, therefore, more efficient ex-post. Hence, monitoring has to be decreased in the optimum and so does the blockholder's share.

Once the quality of the law falls below certain threshold, collusion becomes too attractive. As a consequence, the blockholder has to be given a very large share and the optimal monitoring has to be sacrificed for the commitment to abstain from collusion. As the law worsens further, collusion becomes more attractive and the outside block size needs to be increased in order to credibly preserve the "no collusion" incentive.

Overall, the link between the outside ownership concentration and legal protection has a U-shape. We should also note that the total ownership concentration (its lower bound, strictly speaking), defined as the joint share of the manager and the blockholder, decreases as the law improves independently of the quality of the law. Thus, our model does not contradict the empirically observed relationship between the law and the ownership concentration. At the same time, more empirical work is needed to verify our prediction about the link between the law and outside ownership concentration.

We acknowledge that the specific form of relationship we have found does not have to be general for all types of companies. In particular, works by Burkart and Panunzi (2006) and Burkart, Panunzi and Shleifer (2003) show that other patterns can be possible. We think that our model is rather suitable for entrepreneurial firms that search finance for investing in new projects and go public for this purpose, while their models are mostly applicable to large, initially closely held firms that seek to increase performance by hiring a professional manager. We have also suggested some generalization of our analysis and that of Burkart and Panunzi (2006). Though it is done at an abstract level, we hope that it adds some value in understanding how the effects of a legal system on the ownership structure may depend on a particular real world setting.

APPENDIX

A1. Proof of Lemma 1. Assume that the manager chooses (α_d, α_b) such that (CP) does not hold. Then collusion will occur at $t = 2$. Consequently, the dispersed shareholders will provide no finance at $t = 0$ and all the finance can come only from the blockholder. The manager will obviously go for private benefit extraction. The surplus of the colluding parties is $\Sigma \equiv B(1 - m) - (1 - \alpha_d)\Pi > 0$. If the blockholder becomes informed, her stake in collusion is $S_{bc} = \alpha_b \Pi + (1 - \mu)\Sigma$, the manager's stake in collusion is $M_c = \alpha_m \Pi + \mu\Sigma = B(1 - m) - S_{bc}$, where subscript c stands for "collusion" and parameter μ reflects the bargaining power of the manager.

The blockholder's monitoring effort is then: $c_c = \arg\max_c p(c)(\alpha_b \Pi + (1 - \mu)\Sigma) - c$ and

satisfies the first order condition:

$$p'(c_c) = \frac{1}{\alpha_b \Pi + (1 - \mu)\Sigma} \tag{M$_c$}$$

We are going to show now that the manager can make himself better off by selling no equity to dispersed shareholders ($\alpha_d = 0$), which ensures the absence of collusion, and picking the blockholder's share such that her monitoring effort under no prospect of collusion equals c_c and her welfare is unchanged.

To ensure that under no prospect of collusion the blockholder's monitoring effort is c_c the manager should set her share $\widehat{\alpha}_b$ such that $\widehat{\alpha}_b \Pi = \alpha_b \Pi + (1 - \mu)\Sigma \equiv S_{bc}$, i.e. $\widehat{\alpha}_b = \frac{S_{bc}}{\Pi}$. Since $S_{bc} < \Pi$, share $\widehat{\alpha}_b$ is below 1, i.e. it exists. The manager's share is $\widehat{\alpha}_m \equiv 1 - \widehat{\alpha}_b$. The blockholder's welfare is obviously unchanged since he is still the only one who provides funds. The manager is better off because the probability that the blockholder is informed has not changed and, in the event when the blockholder is informed, he gets $(1 - \widehat{\alpha}_b)\Pi \equiv \Pi - S_{bc}$ instead of $B - S_{bc}$ as before.

Hence, we have proved that the manager will always prefer to choose the ownership structure that ensures the absence of collusion at $t = 2$. ∎

A2. Proof of Lemma 2. 1. Let us prove that (P) is downward sloping. It is easy to see if we rewrite it as $[p(c^*(\alpha_b))\alpha_b \Pi - c^*(\alpha_b)] + \alpha_d p(c^*(\alpha_b))\Pi - I = 0$. The term in square brackets is the blockholder's utility when she optimally chooses her monitoring effort. This term is obviously increasing in α_b, since the blockholder gets more from an increase in her share even if she does not optimally adjust her monitoring effort. The function $p(c^*(\alpha_b))$ is increasing in α_b as well since $c^*(\cdot)$ and $p(\cdot)$ are increasing functions. Therefore, if we want to keep (P) binding an increase in α_b must be compensated by an appropriate decrease in α_d.

2. Just looking at (P) it is straightforward to see that $\alpha_d = \infty$ when $\alpha_b = 0$.

3. First, let us show that (P) either intersects the line $\alpha_b + \alpha_d = 1$ twice, is tangent to it, or does not intersect it at all. It can be seen from the following reasoning. When $\alpha_b + \alpha_d = 1$ (P) becomes:

$$\Pi p(c^*(\alpha_b)) - I = c^*(\alpha_b)$$

In terms of c, the left-hand side is a concave function of c, equal to $-I$ at $c = 0$ and having an infinite first derivative at $c = 0$, while the right-hand side is a 45° line. The left-hand side can either intersect the 45° line twice, be tangent to it, or not intersect it at all. Since $c^*(\alpha_b)$ is a strictly increasing and continuous function we get the result, stated few lines above.

Furthermore, Assumption 3 says:

$$\Pi p(c^*(1)) - c^*(1) - I > 0$$

It means that point $(0, 1)$ lies above (P), that is (P) passes below $(0, 1)$. Since $\alpha_b = 0$ when $\alpha_d = \infty$, and (P) is a continuous function, then (P) intersects $\alpha_b + \alpha_d = 1$. Furthermore, since,

as we have just shown, (P) can intersect $\alpha_b + \alpha_d = 1$ at most twice, there is only one intersection point for non-negative values of α_d and α_b. ∎

A3. Interdependence between the law and monitoring and the effect of the law on the outside blockholder's share.

Assume that the welfare of the initial owner from the ex-ante perspective, $V(\lambda, c)$, depends only on some parameter λ of legal protection of shareholders and intensity c of future monitoring of the manager by the outside blockholder. Assume that the blockholder's welfare, $S(\beta, \lambda, c)$, depends only on λ, c and her share β.

We define the initial owner as the one who chooses the ownership structure of the company at the initial moment. We do not specify precisely who the initial owner and the blockholder are. The initial owner can be the manager, as in our paper, or the founder of the company who sells it (partly or completely) and steps out from the management, as in Burkart, Panunzi and Shleifer (2003). The outside blockholder can be a completely new large shareholder, as in our model, or the same person as the initial owner if she steps out from the management.

Assume that $V(\lambda, c)$ and $S(\beta, \lambda, c)$ are everywhere differentiable with respect to all arguments, and V_{cc}, S_{cc}, $V_{c\lambda}$, $S_{c\lambda}$ and $S_{\lambda\beta}$ exist everywhere as well. Assume also that both functions are concave and have interior maximum. Let us denote by $\overline{c}(\lambda) \equiv \arg\max_{c} V(\lambda, c)$ the optimal monitoring intensity for the initial owner for given λ, and by $c^*(\beta, \lambda) \equiv \arg\max_{c} S(\beta, \lambda, c)$ the blockholder's choice of monitoring given β and λ.

Assumption: For any λ the blockholder's marginal return to monitoring increases (weakly) with her share, i.e. $\partial S(\beta, \lambda, c)/\partial\beta\partial c \geq 0$, at any β and c.

This assumption implies that $c^*_\beta(\beta, \lambda) \geq 0$, i.e. the blockholder's choice of monitoring increases (weakly) with the blockholder's share.

The optimal blockholder's share $\overline{\beta}(\lambda)$ for given λ is the one that equalizes the blockholder's choice of monitoring with the optimal monitoring: $\overline{c}(\lambda) = c^*(\overline{\beta}(\lambda), \lambda)$. We assume that for any λ such $\overline{\beta}(\lambda)$ exists.

Definition:

Legal protection and monitoring are complements (substitutes) for the blockholder for some β *if* $\partial S(\beta, \lambda, c)/\partial c \partial \lambda > 0$ *(*$\partial S(\beta, \lambda, c)/\partial c \partial \lambda < 0$*).*

Legal protection and monitoring are complements (substitutes) for the initial owner if $\partial V(\lambda, c)/\partial c \partial \lambda > 0$ *(*$\partial V(\lambda, c)/\partial c \partial \lambda < 0$*).*

Proposition 3

If $S_{c\lambda}(\beta, \lambda, c)/|S_{cc}(\beta, \lambda, c)| > V_{c\lambda}(\lambda, c)/|V_{cc}(\beta, \lambda, c)|$ *at* $\beta = \overline{\beta}, c = \overline{c}$ *then* $d\overline{\beta}/d\lambda < 0$, *i.e. the optimal block decreases with the quality of the law,*

If $S_{c\lambda}(\beta, \lambda, c)/|S_{cc}(\beta, \lambda, c)| < V_{c\lambda}(\lambda, c)/|V_{cc}(\beta, \lambda, c)|$ *at* $\beta = \overline{\beta}, c = \overline{c}$ *then* $d\overline{\beta}/d\lambda > 0$, *i.e. the optimal block increases with the quality of the law.*

Proof. As λ goes up both $c^*(\overline{\beta}, \lambda)$ and $\overline{c}(\lambda)$ move. If for given $\overline{\beta}$ a marginal increase (decrease) in $c^*(\overline{\beta}, \lambda)$ is larger (smaller) than a marginal increase (decrease) in $\overline{c}(\lambda)$ then $\overline{\beta}$ has to be reduced in order to equalize $c^*(\overline{\beta}, \lambda)$ and $\overline{c}(\lambda)$ again, and vice versa. Formally:

$$\text{if } \partial c^*(\overline{\beta}, \lambda)/\partial \lambda > d\overline{c}(\lambda)/d\lambda \text{ then } d\overline{\beta}/d\lambda < 0$$
$$\text{if } \partial c^*(\overline{\beta}, \lambda)/\partial \lambda < d\overline{c}(\lambda)/d\lambda \text{ then } d\overline{\beta}/d\lambda > 0$$

Using the implicit function theorem, this result can be restated as:

$$\text{if } -S_{c\lambda}(\beta, \lambda, c)/S_{cc}(\beta, \lambda, c) > -V_{c\lambda}(\lambda, c)/V_{cc}(\beta, \lambda, c) \text{ at } \beta = \overline{\beta}, c = \overline{c}$$
$$\text{then } d\overline{\beta}/d\lambda < 0$$
$$\text{if } -S_{c\lambda}(\beta, \lambda, c)/S_{cc}(\beta, \lambda, c) < -V_{c\lambda}(\lambda, c)/V_{cc}(\beta, \lambda, c) \text{ at } \beta = \overline{\beta}, c = \overline{c}$$
$$\text{then } d\overline{\beta}/d\lambda > 0$$

Taking into account that $S_{cc}(\beta, \lambda, c) < 0$, $V_{cc}(\beta, \lambda, c) < 0$ we obtain the result. ∎

It can be interpreted in the following way: when the law and monitoring are sufficiently more complementary for the blockholder than for the initial owner the optimal blockholder's share decreases with the quality of the law, and when the law and monitoring are sufficiently less complementary for the blockholder than for the initial owner the optimal blockholder's share is increases with the quality of the law.

In our model, in the zone where collusion is not a danger, $S_{c\lambda}(\beta, \lambda, c) = 0$ and $V_{c\lambda}(\lambda, c) > 0$ and, hence, the optimal outside block increases as the law improves. In Burkart and Panunzi (2006) $V_{c\lambda}(\lambda, c) < 0$.[16] Hence, if $S_{c\lambda}(\beta, \lambda, c) \geq 0$ the optimal outside block decreases with the quality of the law, like in Burkart, Panunzi and Shleifer (2003). If $S_{c\lambda}(\beta, \lambda, c) < 0$ the result is ambiguous and depends on relative magnitudes of $S_{c\lambda}(\beta, \lambda, c)/|S_{cc}(\beta, \lambda, c)|$ and

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[16]To be rigorous, in the original paper Burkart and Panunzi (2006) the initial owner's welfare is not everywhere differentiable in c given λ and vise versa due to the assumption of discrete managerial effort. For our analysis to be applicable to their model it has to be modified in such a way that the effort affects the firm value in a continuous manner (like e.g. in Burkart, Gromb and Panunzi (1997)).

$V_{c\lambda}(\lambda, c)/|V_{cc}(\beta, \lambda, c)|$. This is what Proposition 3 of Burkart and Panunzi (2006) essentially says.

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