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A Contractual Approach to Discipline Self-Dealing by Controlling Shareholders

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María Gutiérrez
Universidad Carlos III and ECGI
María Isabel Sáez
Universidad Autónoma de Madrid

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Abstract

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Keywords: Self-dealing, Minority Expropriation, Private Benefits, Corporate Governance, Corporate Law

JEL Classifications: G32, G34, K22

María Gutiérrez Urtiaga*
Associate Professor of Finance
Universidad Carlos III de Madrid-Departamento de Economía de la Empresa
Calle Madrid 126
Getafe, 28903, Spain
phone: +34-91 624 58 40, fax: +34-91 624 96 07
e-mail: maria.gutierrez@uc3m.es

Maria Isabel Sáez Lacave
Assistant Professor
Universidad Autónoma de Madrid, Faculty of Law
C/ Kelsen 1
Madrid, 28049, Spain
e-mail: maribel.saez@uam.es

*Corresponding Author

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María Gutiérrez
Universidad Carlos III and ECGI[*]

María Isabel Sáez
Universidad Autónoma de Madrid[‡]

May 2014

Abstract

We analyze systematically the legal regulations on self-dealing transactions (where controlling shareholders are an interested party to transactions undertaken by the firm) and compare the outcomes produced by these regimes, both in terms of total welfare generated by the firm, and of minority expropriation, with the outcome that can be achieved with a contractual solution. We prove that investment efficiency and welfare can be increased by letting the interested parties enter into long-term contracts regulating private benefit extraction and, as an example, we propose a simple contract based on the use of options that is more efficient than existing regulations.

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[*]maria.gutierrez@uc3m.es

[†]maribel.saez@uam.es

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The chief executive of a small digital rights management (DRM) software group is suing Microsoft and Time Warner on the grounds that their roles as both shareholders and customers of the DRM maker has enabled the two giants to "enrich themselves" at the expense of the company and employee shareowners. The lawsuit was filed by Michael Miron, founder and chief executive of ContentGuard, which makes software to protect digital media against piracy. The suit alleges that as major shareholders, Microsoft and Time Warner have caused ContentGuard to grant them "extremely broad and valuable" technology licences to its intellectual property for a "nominal consideration". Mr. Miron also claims that the two companies sub-license ContentGuard's technology to groups that might otherwise be its customers. The lawsuit alleges that Microsoft and Time Warner have pressured employee shareholders to sell their stake for only $2.098 per share because "the company's valuation has been materially diminished by . . . self-dealing conduct".

Financial Times, March 9 2005

1 Introduction

One of the central challenges in corporate law is to design the right tools to deal with controlling shareholders, especially in publicly traded companies with dispersed minority shareholders. These tools should be aimed at protecting the small shareholders against "expropriation" by the controlling shareholder, without sacrificing the benefits that the presence of the latter may bring to the performance of the company. The controlling shareholder is valuable not only because of his ability to control management but, more importantly, because his relationship with the company generates valuable self-dealing opportunities.

In this paper we present a model of the long-term relationship between a controlling shareholder and dispersed minority shareholders that takes into account the existence of these valuable self-dealing opportunities. In our model private benefits are not a simple transfer

from the minority to the controller. We view different investment projects as offering different levels of both public and private benefits, about which there is asymmetric information between the minority and the controller. Private benefits are therefore an unavoidable feature of the investment decisions that firms with controlling shareholders have to make repeatedly. And controlling shareholders have valuable information about this alternative investment choices.

Adopting this more complex view on how private benefits arise we then show that the current regulation does not provide efficient solutions to this asymmetric information problem. This is not surprising because the current regulation is based on avoiding non pro-rata distributions for a given investment. Therefore it works well when private benefits arise as a mere transfer that it is optimal to forbid, but it is not suited to give the right incentives to the controller to select the best investment opportunities.

Given the current lack of efficient regulatory tools to deal with this conflict of interest, a logical alternative is to make private benefits contractible. We know that, in long term relationships, when enforcement is inefficient, the parties can write a relational self-enforcing contract sustained on the value of future interactions (Klein and Leffer, 1981; MacLeod 2007). Based on this idea, we propose a feasible contractual solution that does not impose significant information, decision or transaction costs on the minority. This contract is based on the use of options that force the controller to increase his stake when the minority is not getting a fair return, and to internalize more of the costs and gains from investment choices. The controller is made to pay for past self-dealing by restricting his access to future self-dealing opportunities.

This particular contract has attractive characteristics that make it well suited to contract with dispersed, uninformed minority shareholders. First, it takes advantage of the repeated nature of the relationship between the controller and the corporation. By doing this we can provide at no cost an additional incentive that aligns the interest of the blockholder and

the small shareholders: obtaining future private benefits requires limiting current private benefits. Second, the contract breaks away from the pro-rata distribution rule because we allow the controller to determine the level of private benefits that he will extract in each period, making use of his superior information, while applying an automatic penalty for excessive levels. However, the minority is now better-off because the contract provides the controller with enough incentives to generate higher public benefits. Third, the changes in ownership compositions that are induced by the penalty will tend to increase efficiency in the following periods, since an increase in the blockholder's stake guarantees that, in the future, his incentives will be better aligned with those of the small shareholders.

We contribute to the literature on minority expropriation by taking a new perspective on the relationship between the controlling shareholders and the minority. Most of the papers dealing with private benefits of control consider these benefits as pure agency costs that reduce total benefits. Pagano and Roëll 1998 and Bennedsen and Wolfenzon 2000 present two interesting studies of this kind. If one accepts this view the regulatory choice is clear: regulation should be aimed at achieving zero private benefits. In legal terms this is achieved through the pro-rata distribution rule. However there are some more recent papers that consider private benefits of control alongside the private costs of monitoring for the controlling shareholder. According with this point of view, private benefits may be the necessary reward for the monitoring activities of the controlling shareholder. If, as Gilson and Schwartz (2012) or Burkart et al. (1999), one takes this perspective, it is no longer clear that a very restrictive regulation is optimal. In fact, as Gilson and Schwartz (2012) point out, the best regulation should enforce some optimal level of private benefits that is unlike to be zero. The complex problem then is how to fix these levels within the current regulation. Along these lines we propose a complementary view by focusing on the process that generates private benefits. We argue that private benefits appear as the result of choices on potential courses of action in a long-term relationship. These choices are made

considering both the public and the private benefits that accrue to each party. Therefore we may have situations where there is no conflict in allowing private benefits, because the decision that produces higher private benefits is also the one that generates higher public benefits. Viewed in this light, private benefits are neither a deadweight agency cost that is subtracted from public benefits, nor a compensation that has to be paid for the monitoring carried out by controlling shareholders. They are simply a given characteristic of all the investment decisions that firms with controlling shareholders have to make. The problem arises when the decision with higher public benefits does not coincide with the decision with higher private benefits. In this case regulation will affect the choice and therefore it will have a large impact on efficiency. Notice that regulation aiming simply at reducing private benefits (such as a strict pro-rata distribution rule), will not do a good job in terms of efficiency for these complex investment decisions. In this paper we study the limits of existing regulation to deal with this problem and compare its outcomes with market solutions.

We also contribute to the legal literature that studies conflict resolution mechanisms among shareholders. This literature deals with the use of big threats, such as redemption rights (Gilson 2003, Yerramilli 2004, Smith 2005) and ostracism (Dammann 2008) to discipline the parties. The problem with these mechanisms is that, because of the high costs involved, they will only act as a credible threat in extreme cases, and therefore they are useful only for preventing very outrageous forms of expropriation. Our contribution here is to provide a self-enforceable mechanism that ameliorates conflicts that arise in day-to-day investment decisions. However our mechanism is flexible enough to allow also for big threats. This would be the case if the penalty imposed on the blockholder for engaging in self-dealing were set as high as to force him to buy 100% of the shares, effectively transforming it into a redemption right.

In terms of policy implications our main conclusion is that regulating self-dealing transactions and preventing minority expropriation without compromising efficiency is difficult,

and that contractual arrangements should be considered as an alternative. Right now this is not feasible because the current regulation is mandatory, but one could think of ways around the current regulation, such as remuneration or insurance contracts. However we do not observe contracting on private benefits between controlling and minority shareholders. In fact contracts are widely used to organize the relationship between managers and shareholders but we do not observe them when we consider controlling shareholders. We believe this happens because of the unequal bargaining power in the relationship between the controller and the minority. A contractual solution is only feasible if the controller wants to opt out of the current regulation. But, as shown by Djankov et al. (2008) regulatory regimes currently observed in most countries allow controllers to obtain large private benefits, and do not induce the controllers to promote contracting. Therefore, we do not claim that contracts can overrule existing regulation. Quite to the contrary, contracts of this type can only arise if the law safeguards effectively the minority shareholders from expropriation, so that the controlling shareholder will have incentives to enter into a contract that allows both parties to profit from self-dealing.

The rest of the paper proceeds as follows. In Section 2 we briefly review the economic and legal literature on controlling shareholders. In Section 3 we present the model. We analyze the results of the model for the existing alternative regulatory regimes in Section 4. Section 5 studies the proposed put option contract and prove this alternative to be an efficient means to control self-dealing. In Section 6 conclude and discuss the policy implications of our model.

2 Literature Review

There are several strands of both the economic and legal literature that are relevant to our paper.

2.1 The economic analysis of self-dealing

In the economic literature self-dealing opportunities are usually comprised within the larger category of private benefits of control. Following the seminal papers by Aghion and Bolton (1992) and Aghion and Tirole (1997), control rights are modeled as the power to choose among alternative actions which cannot be foreseen in incomplete contracts. Each action entails public benefits, which can be shared by all investors, and private benefits of control, which accrue exclusively to the party in control. A blockholder will only exert control if the sum of public and private benefits that he gets from doing so outweigh the private costs of control that he must incur in order to monitor management (Demsetz and Lehn 1985). Many authors model the private benefits accruing to blockholders as a pure transfer of resources that reduces public benefits (e.g. Bebchuk 1999). Other authors model them as inefficient transfers, taking the view that value is lost when public benefits are diverted for private uses (e.g. Pagano and Roëll 1998, Bennedsen and Wolfenzon 2000). Few authors recognize that private benefits need not come at the expense of public benefits. Among them, Burkart, Gromb and Panunzi (1997) present a model where the controller has to choose among two projects, each yielding different public and private benefits. With some probability both the controller and the non-controlling shareholders prefer the same project and with some probability they disagree. This approach seems more adequate for self-dealing transactions which can generate public benefits alongside private benefits of control. For example, Allen and Phillips (2000) present empirical evidence showing that block ownership by corporations has significant benefits in product market relationships, and that a large part of these benefits accrue to minority shareholders.

The second strand of papers related to ours refers to the potential for minority expropriation, i.e. the "unfair" distribution of benefits between the party in control and the non-controlling shareholders. Most of the papers investigate ex-ante expropriation, which occurs when the non-controlling shareholders obtain less than a fair expected rate of return

on their shares. Jensen and Meckling (1976) argue that, when the firm is founded or first sold, the non-controlling shareholders can anticipate the opportunistic behavior of the controller. They will purchase the shares at a discount and earn a fair expected rate of return. Thus, firms where private benefits of control are large will have lower equity values (there will be a price discount reflecting insufficient protection) but the minority shareholders will earn a fair rate of return. However, for the same reasons that make it difficult to write complete contracts, it is unlikely that small shareholders can perfectly foresee the future actions of the controller.

Therefore, it is an empirical question whether small shareholders are good at anticipating ex-ante the degree of expropriation to which they may be subject ex-post. And the available evidence suggests that they are not good at it. Gompers, Ishii and Metric (2003), Giannetti and Koskinen (2005) and Giroud and Mueller (2008) demonstrate that firms where private benefits are likely to be high have lower market values and earn significantly lower stock returns. They interpret this as evidence that the existence of private benefits leads to ex-post minority expropriation whose magnitude is underestimated by investors. Giannetti and Koskinen (2005) offer a theoretical explanation for these results. They show that, even if investors can perfectly anticipate ex-post expropriation, it will not be fully reflected in equity prices. Prices will be too high because they will reflect the joint demand from both controlling and non-controlling shareholders.

The third strand of literature refers to investment efficiency. Overall efficiency requires that the party in control chooses the action that yields the largest sum of public and private benefits. It can be shown that, if the shareholders can freely trade their shares and the attached voting and control rights, the efficient action will be chosen (Burkart and Lee (2008) offer a description of how this would happen). However, because the required conditions for efficient trading are unlikely to be met, it is important to design the ownership structure in a way that ensures that the controller's preferred action will be as efficient as possible.

Zingales (1995); Pagano and Roëll (1998); Burkart et al. (1998) present models where an initial owner decides the optimal ownership structure for a company going public.

Unfortunately, there may be obstacles that impede the implementation of the efficient ownership structure. In particular it may not be stable. Bebchuk and Zingales (2000) and Bebchuk (1999) show that when private benefits of control are large and the optimal ownership structure is disperse, with no controlling shareholder, it may not be possible to implement it. Even if the founder sells to disperse shareholders, they anticipate that posterior trading will result in the emergence of a controlling block. Therefore the founder can only ask the price reflecting a concentrated ownership firm. Because of this he will chose a concentrated ownership structure in the first place.

Moreover, Bebchuk and Roe (1999) and Roe (2005) argue that the existing corporate legal framework determines to a large extend the feasibility of a particular ownership structure. For example, the decision power of the shareholders general meeting is tilted in US corporate law in favor of managers, and this reduces the incidence of blockholders in the US relative to Europe. Even if the optimal capital structure is chosen initially, the controlling party can use its power to push for changes towards inefficient structures and collective action problems can induce small shareholders to accept proposals which are against their best interests (Neeman, 1999). The founder may be unable to guarantee initial shareholders that their voting rights will not be diluted in the future. Thus, we must conclude that investment efficiency is unlikely to be attained in the absence of regulation.

Summing up, from a review of the economic literature, we may conclude that, even if we rule out ex-ante expropriation of the minority, the low price that will be paid for companies with high private benefits of control raises the cost of capital for these firms. This in turn hinders investment and growth at company level and stock market development at country level (Zingales 1995, La Porta et al. 1999, Nenova 2003, Dyck and Zingales 2004, Beck and Levine, 2005). Therefore, legal measures aimed at reducing private benefits of control and,

in particular, at regulating self-dealing transactions may be socially valuable (Gilson, 2006).

2.2 The legal analysis of self-dealing

There are two main types of regulation dealing with controlling blockholders. The first one tries to reduce ex-post expropriation. The second strategy tries to shape ownership structure in order to prevent inefficient decisions. Legal academics have discussed both ways of solving the problem.

The leading papers dealing with the issue of the controlling shareholder and the reduction of ex-post expropriation are Gilson and Gordon (2003), Gilson (2006), and Damman (2008), and from an empirical point of view, Djankov et al. (2005), who construct an anti-self-dealing index. All of them accept that related-party transactions may make economic sense and stress the key role of corporate law in reducing the inefficiencies caused by controlling shareholders. However, unlike La Porta et al. (1999), they do not believe that common law is superior to civil law in warranting investors' protection and efficiency. Surprisingly, even though this is an acute problem of European corporations, European corporate law scholars have not paid much attention to it. The battle against private benefits of control has not been a traditional goal of Corporate Law in European countries. The pressure from corporate governance advocates has produced new rules that deal with the abuses of control by managers, but the protection against other shareholders has not seen much change (Lele and Siems, 2007). The received wisdom among European legal scholars is that minority shareholders already receive extensive protection against majority shareholders by force of mandatory rules in Corporate Law (in occasions, even at the expense of reducing corporate ability to generate value). As we discuss below, this view is shared both by the traditional analysts and also by the new corporate governance legal literature.

The traditional analysis states that existing mandatory rules effectively protect minority interests. The general opinion among European legal scholars is that the level of shareholder legal protection is good. True, the most popular shareholder protection index -La Porta et al.

(1999), anti-director rights index-, shows poor scores for many European jurisdictions, but the index has been subject to many criticisms. In particular, limited and ad hoc selection of variables, coding errors, a U.S. bias, the absence of certain variables, the unsatisfactory definition of many variables, among others, have been raised (Spamann, 2009). The European contributions to this critique have been substantial, all with the shared purpose of making an effort to improve the final scores of European countries, especially of Germany (Braendle, 2006). Besides, new indexes to measure the quality of law have been constructed, more sensitive to those variables which protect minority shareholders against other shareholders, like the "alternative minority protection index" (Berndt, 2002), in which Germany performed better than the U.S.

All these results suggest that the quality of shareholder protection in the European jurisdictions is generally high. It is important to notice that these rules try to protect minority shareholders through collective decision making mechanisms, in order to limit or balance the control powers of the majority. Just to give a hint of the kind of rules we are talking about -and which are conspicuously absent in US Corporate Law: rules granting to minority shareholders the power to call a general meeting through court order following management inaction; rules allocating power between the board and the shareholders, rules on quorums, and supermajority requirements; extensive rights of information, appraisal rights, etc. In many European countries, accordingly, these rules and standards are connected to the doctrine of the abuse of voting rights. Actually, and probably because of path dependence and the traditional inflexible approach to corporate legal entities, these rules operate as rules against exploitation or oppression of the minority (which is a main concern in close corporations, such as limited private corporations or partnerships), but not against expropriation (which should be the main concern in public corporations). In other words, they regulate the political ability of a majority of shareholders to exercise its formal power and limit its abuse, but as long as power is correctly exercised the –economic- substance of the decision taken is

not legally relevant. In fact, expropriation has not been traditionally a working notion for European Corporate Law scholarship. It considered that the economic interests of investors are protected through a different set of rules, most notably the rule of pro-rata distribution of the corporate profit. Therefore, asset diversion has not received much attention from a legal viewpoint.

On the other hand, part of the new corporate and governance literature recognizes the existence of minority expropriation, which should be corrected by the imposition of the pro-rata distribution rule in related-party transactions. This has been a factor behind the recent corporate governance reforms undertaken in many European countries (Enriques and Volpin, 2007; Conac, Enriques and Gelter, 2007, Enriques, Hertig and Kanda 2009). Still, European jurisdictions are reluctant to hold controlling shareholders liable for having engaged in "unfair" self-dealing as long as they are not "formally" part of management (Enriques, 2002; Johnson et al, 2000). Corporate governance reforms have improved Corporate Law tools to deter directors, but not controlling shareholders, who are, in fact, the ones who tend to extract larger private benefits in Europe. The problem has already been addressed by academics: arrangements that enhance investor protection differ in companies with or without a controlling shareholder (Bebchuk and Hamdani, 2009). It is well known that Continental European countries have recently mimicked the corporate governance models from the U.S., where governance problems are different from the ones that are prevalent in European firms. The corollary is clear: European systems legalize a relatively high rate of self-dealing.

The second strategy, shaping the ownership structure, is a hot topic in the literature. The common view is that the high ratio of private benefits of control cannot be substantially reduced if ownership structure is not regulated. Since disperse ownership does not seem to be a real alternative for most European firms, the regulators try to force the controlling shareholder to hold a majority stake in the corporation. In other words, the case of the

"minority" shareholder in control is perceived to be the true problem (Bebchuk et al., 2000). Following this hypothesis, the courses of action against this inefficiency are mainly the following: a) Changes of control under the equal opportunity rule, which lies at the heart of the mandatory bid rule in takeovers. b) Unfailed and continued support for the one share-one vote rule. c) Promotion of shareholders' democracy and improvements in the voting system (these initiatives would not work against a majority shareholder, but would be effective against a minority controlling shareholder). Critical voices against this perspective have been raised: Buckart and Lee (2008), Ferrarini (2006), Ventoruzzo (2008) and Enriques (2004). These authors argue that these "minority-friendly" rules, instead of protecting minorities and foster efficiency, may serve the -not always efficient- interests of the strong blockholders. As a better alternative for the European context (Gilson and Schwartz, 2012) propose the creation of a European Commercial Court, to whose jurisdiction a corporation may opt in. Finally, notice that with this set of policies, the channels of extraction remain untouched.

3 The model

3.1 Agents and payoffs

Consider a two period economy where an entrepreneur has access to an investment project in each period. The project requires a fixed investment I. The entrepreneur has assets that can only fund a fraction α of the cost I. To implement the project the entrepreneur must obtain $(1-\alpha)I$ by selling equity to small, risk neutral, outside investors. Therefore, if the entrepreneur obtains funding, he becomes the blockholder, owning a fraction α of the equity and leaving the remaining $(1-\alpha)$ in the hands of the minority shareholders[1]. All agents are risk neutral and the discount rate is normalized to zero.

[1]We do not consider the possibility of pure debt financing. Obviously, there would be no expropriation if all outside investors are debt holders. Therefore we assume that there is outside equity, for example because the firm already has high leverage and there are high bankruptcy costs. Therefore one can think of I as the financing that is not provided by the debtholders and of the return as the earnings after debt payments have been satisfied.

Every period each firm has access to a risky investment project (the *standard* project). The project requires an investment I and its return can be one, with probability p, or zero, with probability $(1-p)$. The cash-flows from the investment project are paid out as dividends every period and are not reinvested in the company.

Additionally, the blockholder can propose an alternative investment project in each period (the *alternative* project). The projects are mutually exclusive. The *alternative* project also requires an investment I and its return can be one or zero. But this alternative project offers a self-dealing opportunity for the incumbent blockholder that generates private benefits b. Moreover the probability of success of this alternative project is $\widetilde{\delta}p$, where $\widetilde{\delta}$ is a random variable that follows a uniform distribution. The traditional view on private benefits is that they are a (potentially inefficient) transfer from the minority to the controller. This view can be accommodated in our model assuming that $\widetilde{\delta}$ follows a uniform distribution in the $[0,1]$ interval. Therefore the minority is always worst off if the controller engages in self dealing. But our view is that there will be situations when both public and private benefits can go hand in hand. Therefore we will assume that $\widetilde{\delta}$ follows a uniform distribution in the $[0,2]$ interval[2]. This specification allows us to encompass different degrees of conflict between the blockholder and the small shareholders. If $\delta > 1$ the blockholder and the small shareholders have congruent interests. For lower values of δ their interests will diverge depending on the value of b. We will assume that the blockholder observes the realization of δ during the course of his managing or monitoring activities, but it is not observed by the minority shareholders.

This simple setting tries to capture some of the particularities of block ownership that are not present in previous papers. In particular the presence of the blockholder can gener-

[2]To make the problem interesting, in what follows we will assume that the standard project has positive NPV and that both projects have a positive probability of failure, i.e.

$$I < p \leq 1/2$$

ate higher public benefits not because of his monitoring activity, but from the self-dealing opportunities that his presence creates[3]. This is important because it makes the regulation of self-dealing opportunities more complex than the regulation of other types of private benefits, which should be optimally eliminated.

3.2 Contracting on self-dealing and the legal system

If the blockholder proposes the alternative project a decision needs to be made about which project to undertake. This will depend on whether the parties rely on the rules established by the legal system or they set up a contract with specific rules (which is possible only if the legal system allows firms to opt out). Our modelling of the legal system is based on our previous discussion of the legal analysis of self-dealing and it is also consistent with the findings of Djankov et al. (2008), who study the legal protection of minority shareholders against expropriation by corporate insiders in 72 countries and find that enforcement mechanisms are either based on disclosure and approval rules and/or on litigation rules. We will assume that the legal system always requires the blockholder to reveal his interest in the alternative project and that there are two alternative regimes to determine project choice.

- The first one, the **rules-based regime**, requires the approval by disinterested directors. We will assume that disinterested directors' approval has a cost K. This is the cost of information transmission, since the disinterested directors have to learn the realization of δ in order to make an informed decision.

[3]Our model can be easily modified to incorporate an additional monitoring role for the blockholder. Consider an alternative formulation of our model where a manager runs the firm and under the manager's control the probability of success of the investment, given by q, is determined by the manager's quality. The incumbent blockholder can take an active role in managing the company advising and/or monitoring the manager. This increases the probability of success to $p > q$ but it has a cost C for the blockholder. This costs is assumed to be lower than the expected increase in the shareholders' wealth ($C < p - q$). Thus the advisory/monitoring activities of the blockholder are socially valuable. Moreover, we assume that the blockholder's stake is high enough to induce monitoring even in the absence of self-dealing opportunities ($\alpha > \frac{C}{p-q}$). The results for this alternative model are identical to the results of our initial model, with the only difference that the private benefits for the blockholder have to be reduced by the amount of the monitoring costs C.

- The second one, the **standard-based regime**, appears when only board approval is required, but under the duty that decisions must be made in the best interest of the shareholders, who can sue the board if this duty is not complied with. Throughout the paper we will assume that the stake of the blockholder α is high enough to allow him to control the decisions of the board of directors. Thus, we will assume that if the board chooses the alternative project and it fails, the minority can bring a lawsuit against the blockholder and the court will verify the value of δ. Bringing a lawsuit has a cost S for the minority, but if the defendant is found liable (i.e. if the court determines that δ was bellow one) he will pay a damages award D to the minority[4].

3.3 Timing and strategy for the analysis

The timing of the game is the following. The ownership structure of the firm (α) and the legal rules are determined at an initial stage. And then, at every period we have 4 stages:

- In *stage 1* the outside shareholders commit their funds to one firm and, if possible, they bargain with the blockholder on a contract to determine project choice.
- In *stage 2* the blockholder proposes the alternative investment project and the choice is made according to the contract (if there is one) or according to the legal rules. One of the projects (the standard or the alternative project) is undertaken.
- In *stage 3* payoffs from the chosen project are realized.
- In *stage 4,* if the alternative project is chosen and fails, under a standard-based regime we enter a litigation subgame:

[4]The assumption that only the blockholder is sued is made for simplicity, but the results do not change if we assume that the shareholders sue all board members, as long as the blockholder pays at least a part of the damages award.

- In *stage 4.1* the shareholders decide whether to litigate. If they prefer not to litigate the period game ends. Otherwise they pay S and the case proceeds to court.
- In *stage 4.2* the court will determine whether the blockholder is liable after verifying δ.
- In *stage 4.3* damages D are paid and the period game ends.

Even though there are two periods, for the time being, they are completely independent, so we will start by studying the one shot game. Formally, this is a 4 stage dynamic game of complete information. We define $\underline{\delta}_i$ as the minimum probability of success for which the alternative project will be chosen given the prevailing regime ($i = I, R, S, C$) standing respectively for inefficient market outcome, rules-based regime and standard-based regime and contractual outcome). The choice of $\underline{\delta}_i$ determines investment efficiency, which is the main focus of the analysis. However, we will also analyze separately public and private benefits so as to study the effect of regulation on minority expropriation. Finally we compare the value achieved under each regime.

4 Regulatory solutions

In this section, we discuss the regulatory solutions to the self-dealing game. First we study the inefficient unregulated market outcome in the absence of a contract[5]. And then we explain how regulation can improve upon this inefficient market outcome. As we will see regulation can be very effective to induce deterrence but it does not achieve good investment outcomes. Thus regulation does a good job when we consider private benefits as a transfer from the minority to the controller. This happens when we assume $\widetilde{\delta} \rightsquigarrow U[0,1]$, so that

[5]Notice that by unregulated here we refer to the regulation on self-dealing opportunities. We assume that other aspects are regulated. In particular the law mandates and enforces that the public benefits are distributing among the shareholders according to their stake.This may well be the case if verification costs are low for public cash-flows but high for private benefits.

the alternative project always gives lower public benefits. But regulation is a limited tool when we allow for situations where private benefits do not necessarily reduce public benefits, i.e. when we assume that $\widetilde{\delta} \rightsquigarrow U[0,2]$, so that both the controller and the minority may sometimes prefer simultaneously the alternative project.

4.1 Inefficient market outcome (I)

We will first present the equilibrium in an economy where self-dealing opportunities are not regulated or, alternatively, when the regulation only requires the blockholder to have a minimum stake α and contracts are not possible.

For comparison purposes, notice that in this game efficiency requires that the alternative project be chosen when it offers a greater total expected value than the standard project, taking into account both public and private benefits:

$$\delta p + b \geq p. \tag{1}$$

Thus the alternative project should be chosen only for:

$$\underline{\delta}^* = \frac{p-b}{p}. \tag{2}$$

However, in this setting, since the stake of the blockholder α is high enough to allow him to control board decisions, and he has all the relevant information concerning the value of δ, the blockholder will chose his preferred project. The blockholder prefers the alternative project if his expected payoff is higher, taking into account that he gets a fraction α of the public benefits and all of the private benefits b:

$$\alpha\delta p + b \geq \alpha p, \tag{3}$$

thus the blockholder prefers to undertake the alternative project whenever

$$\delta \geq \underline{\delta}_I = \frac{\alpha p - b}{\alpha p}. \tag{4}$$

Total expected wealth in each period will be equal to

$$W_I = -I + \Pr(\widetilde{\delta} \leq \underline{\delta}_I)p + \Pr(\widetilde{\delta} > \underline{\delta}_I)\left[E(\widetilde{\delta}/\widetilde{\delta} > \underline{\delta}_I)p + b\right]. \tag{5}$$

The first term in this expression is equal to the required investment cost. The second term is the probability that the standard project is chosen times its expected return if chosen. The third term is the probability that the alternative project is chosen times is expected return if chosen.

We can now substitute the probabilities, and given $\underline{\delta}_I$ we have two solutions for the previous equation depending on our assumption on the nature of private benefits.

$$W_I^{U[0,1]} = \left[-I + p - \frac{b^2}{2\alpha^2 p}\right] + \left[\frac{b^2}{\alpha p}\right]. \tag{6}$$

$$W_I^{U[0,2]} = \left[-I + p + \frac{\alpha^2 p^2 - b^2}{4\alpha^2 p}\right] + \left[\frac{(\alpha p + b)\, b}{2\alpha p}\right]. \tag{7}$$

The first equation appears when we assume that $\widetilde{\delta} \rightsquigarrow U[0,1]$, so that private benefits always come at the expense of public benefits. The second equation assumes $\widetilde{\delta} \rightsquigarrow U[0,2]$, so that sometimes the alternative project is optimal both for the blockholder and the minority. In both cases, the first term in brackets reflects the net public benefits (PuB_I). The second term in brackets represents the private benefits of control (PrB_I).

If there are no opportunities for self-dealing total wealth is equal to $-I+p$. It then follows that, in the first equation, public benefits are always lower in the presence of self-dealing. Moreover total benefits are also lower unless the controller holds a very large stake.

But if we look at the second equation, the results are very different. Public benefits are higher and small shareholders are better off when there are opportunities for self-dealing. This may seem a surprising result but it is logical given our assumption the alternative project is "neutral", i.e. on average it is as good as the standard project. The blockholder

will not undertake the alternative project for very low values of δ. Therefore, conditional on the project being accepted by the blockholder, the alternative project is on average better than the standard project. Of course, there will still be cases when, ex-post, the minority shareholders would prefer not to undertake the alternative project, in particular whenever $\underline{\delta}_I \leq \delta \leq 1$, i.e. there will be ex-post minority expropriation.

Moreover, in both cases the threshold for deviating to the alternative project is too low ($\underline{\delta}_I < \underline{\delta}^*$). Because of this in the next section we will study how regulation can improve these outcomes.

4.2 Rules-based regime (R)

We are assuming that the stake of the blockholder allows him to control the decisions of the board of directors, therefore only approval by the disinterested directors can guarantee that the investment decision is made in the best interest of the minority[6]. If (i) the disinterested directors have the right to decide; (ii) they know the value of δ; and (iii) their interests are aligned with those of the minority, they will select the alternative project if and only if

$$\delta > \underline{\delta}_R = 1. \tag{8}$$

Notice that since $\underline{\delta}^* < \underline{\delta}_R$, the alternative project will not be chosen often enough to achieve investment efficiency, because the dispersed shareholders do not obtain private benefits. And, depending on our assumption on the nature of private benefits, total expected wealth in each period will be equal to

$$W_R^{U[0,1]} = [-I + p - K]. \tag{9}$$

$$W_R^{U[0,2]} = \left[-I + \frac{5}{4}p - K\right] + \left[\frac{1}{2}b\right]. \tag{10}$$

[6]Moreover, we are assuming that there cannot be side transfers between the blockholder and the disinterested directors, i.e. the blockholder cannot influence their preferred choice. Notice also that we do not consider the alternative rule in which the choice of project has to be approved by the majority of the minority shareholders at the shareholders' meeting. This is because we are assuming that the disinterested board members are perfect agents of the minority shareholders. Agency costs could be interpreted as a higher K.

In both cases the first term in brackets reflects the net public benefits (PuB_R) and the second the private benefits of control (PrB_R). If we compare equations (9) and (10) with equations (6) and (7) we see that, in both cases, relative to the inefficient market outcome, where the blockholder is free to make investment decisions, giving control over investment decisions to the disinterested directors maximizes project returns from the perspective of the minority. However it is necessary to consider the information and collective action costs that reduce public benefits[7].

Interestingly the level of K, and the attractiveness of a rules based regulation of self-dealing may be different depending on the type of private benefits we are assuming.

If the alternative project that offers self-dealing opportunities is never interesting for the minority ($\widetilde{\delta} \rightsquigarrow U[0,1]$), we may assume there are no investigation cots ($K = 0$) so a rules based regulation would maximize the return for the minority. The only risk in this case would be the risk of a captured board that may approve the alternative project because of loyalty towards the controller, i.e. condition (iii) may not hold.

But when self-dealing opportunities may be attractive for the minority ($\widetilde{\delta} \rightsquigarrow U[0,2]$) the rules-based regime will only work well if both conditions (ii) and (iii) are satisfied. Otherwise we fall back into the unregulated market outcome. Therefore, a rules-based regime where directors lack information or incentives will not make a difference with respect to the unregulated market outcome[8]. When the two conditions are satisfied, the attractive ness of

[7]We are assuming that the disinterested directors can commit to apply ex-post the chosen election policy. If K is very high they may prefer to delegate to the blockholder when the alternative investment project appears. If commitment were not possible we would need to verify that $PuB_R \geq PuB_I$.

[8]Notice that it is never optimal to give control of the investment decisions to disinterested directors if they are not well informed. This is because during the investment stage the disinterested directors, not knowing the value of δ, will always select the alternative project, i.e.

$$E(\delta)p \geq p.$$

This happens because the alternative project is "neutral" but the shareholders know that the blockholder will never propose the alternative project for very low values of δ, and this implies that the expected probability of success of the alternative project is greater than one. The only difference with respect to the no regulation base case is that shareholders' expected wealth will be lower than before because of the additional cost of making disinterested shareholders vote. Thus the information costs inherent in a rule-based regime can be

the rules-based regime will depend on the level of the information costs K, that are incurred to solve the asymmetric information problem.

4.3 Standard-based regime (S).

In a standard-based regime, if the alternative project is undertaken the legal system determines who has standing to sue, the liability standard and the damages award that will apply.

Regarding the standing to sue, if the alternative project fails[9], shareholders owning a minimum percentage of the equity θ may derivatively sue the blockholder for the loss that the firm suffered as a result of bad choice of project. Initiating legal proceedings has a cost θL. In derivative actions this cost will be borne by the company, and any proceeds that the firm obtains from litigation will be divided pro-rata among its shareholders (here, without loss of generality, for simplicity we do not include the blockholder).

If taken to court, the blockholder will be held liable if it can be shown that the transaction was unfair or that he acted in bad faith. In our model, this means that he chose the alternative project knowing that it had a low δ[10]. We will assume that the court can observe project choice at no cost but proving bad faith requires the plaintiff to present evidence verifying δ at a cost E. Thus, the total cost of lawsuit is $S = \theta L + E$.

Finally, in a standard-based regime, damages or monetary penalties are to be paid by the blockholder when found guilty[11]. Under a bath faith standard the court needs to find out whether the blockholder chose the alternative project when δ was lower than one. We will assume that the probability that an innocent defendant is found guilty is zero, and the

understood as increasing the value of K. The same is true if the directors do not have incentives to act in the minority's interest.

[9]We do not allow litigation when the return is high.

[10]Most countries impose severe criminal sanctions when a transaction has been approved in violation of formal requirements in the law. Therefore we assume that all disclosure and approval requirements will be met.

[11]The blockholder is guilty (innocent) if he chose the alternative project knowing that δ was lower (higher or equal) than one.

probability that a guilty defendant is found guilty is one. The variable D denotes the damage award to be paid when the blockholder is found guilty[12].

We first look at the litigation strategy of the minority. If the alternative project fails the shareholders will sue only if

$$\Pr(\widetilde{\delta} < 1/\widetilde{\delta} \geq \underline{\delta}_S)D \geq S. \tag{11}$$

Where $\Pr(\widetilde{\delta} < 1/\widetilde{\delta} \geq \underline{\delta}_S)$ is the probability that $\widetilde{\delta}$ is lower than one given that the blockholder chose the alternative project.

Given the litigation strategy of the minority, the optimal project choice for the blockholder, when $\delta < 1$ and he expects to be sued with probability π, is to select the alternative project if and only if

$$\delta p\alpha + b - (1 - \delta p)\pi D \geq \alpha p. \tag{12}$$

Therefore the blockholder prefers to undertake the alternative project whenever

$$\delta \geq \underline{\delta}_S = \min\left\{1, \frac{\alpha p - b + \pi D}{p\left(\alpha + \pi D\right)}\right\}. \tag{13}$$

The equilibrium of this game depends on the relative level of litigation costs and damages award but also on the type of private benefits we are trying to regulate.

When private benefits always come at the expense of public benefits ($\widetilde{\delta} \rightsquigarrow U[0,1]$), both of these two equations can be simplified because for the alternative project $\widetilde{\delta}$ is always lower than one. Therefore the litigation strategy of the minority is simple. If $D > S$ the minority will always sue, and if $D = S$ there exits and equilibrium consistent with a positive probability of litigation $\pi \in [0,1]$. Moreover, because $\widetilde{\delta}$ is always lower than one, the total cost of lawsuit is likely to be low, and we may even assume that there are no verification

[12]It is straight forward to introduce legal errors in this model through a transformation of D. For example if we assume that the probability of a guilty defendant is found guilty is $g < 1$, this is equivalent to setting a lower expected damage award $D' = gD$.

costs $E = 0$. Finally, the blockholder only undertakes the alternative project if

$$\delta \geq \underline{\delta}_S = \frac{\alpha p - b + \pi D}{p\left(\alpha + \pi D\right)}. \tag{14}$$

But for the more complex case when $\widetilde{\delta} \rightsquigarrow U[0,2]$, the interest of the minority and the controller coincide whenever $\delta \geq 1$, so that sometimes the alternative project is optimal both for the blockholder and the minority. This implies that the minority shareholders will sue only when they expect the blockholder to deviate for low values of δ. And equation (22) can be rewritten as

$$\frac{1 - \underline{\delta}_S}{2 - \underline{\delta}_S} D \geq S. \tag{15}$$

The following two propositions present the equilibrium for each of these two cases.

Proposition 1: *When $\widetilde{\delta} \rightsquigarrow U[0,1]$, in the standard-based regime the level of litigation depends on the relative size of the legal fees and damages award, giving rise to three different equilibria:*

1. *Equilibrium with no litigation and no deterrence. When legal fees are high relative to damages awards ($S > D$) there will be no litigation ($\pi = 0$) and the game falls back to the unregulated inefficient equilibrium.*

2. *Equilibrium with some litigation. When legal fees are low relative to damages awards ($S \leq D$) but damages awards are low relative to private benefits $\left(D < \frac{b}{1-p}\right)$ the minority will litigate with probability $\pi > 0$ and the blockholder will choose the alternative project when $\delta \geq \underline{\delta}_S = \frac{\alpha p - b + \pi D}{p(\alpha + \pi D)}$.*

3. *Equilibrium no litigation and deterrence. When legal fees are low relative to damages awards ($S \leq D$) and damages award are high relative to private benefits $\left(D \geq \frac{b}{1-p}\right)$ the minority would litigate if the alternative project were chosen ($\pi > 0$), but the blockholder always prefers the standard project. In this equilibrium deterrence is induced by the fear of litigation but we do not observe ex-post litigation.*

The standard based regime is specially well suited when private benefits are obtained at the expense of public benefits. In this case the total cost of lawsuit is likely to be low, and we may even assume that there are no verification costs $E = 0$, since for the alternative project we know that $\delta \leq 1$, so if we assume $S \leq D$ the fear of litigation will induce the blockholder to deviate less often to the alternative project. This will tend to increase public benefits, but the expected legal fees will tend to reduce public benefits, so the net effect on the wealth of minority shareholders is ambiguous. But a high enough damages award D induces an equilibrium where the controller never deviates to the alternative project and, simultaneously, the minority would litigate if he were to deviate. This regime achieves deterrence at no cost because in equilibrium there will be no litigation. In this case there are no private benefits and total expected wealth in each period is the same as if there where no opportunities for self-dealing, therefore $W_S^{U[0,1]} = -I + p$. Thus, when private benefits are obtained at the expense of public benefits, a standard based regime with high damages awards maximizes public benefits. However things become more complex when we allow private benefits to be independent of public benefits.

Proposition 2: *When $\widetilde{\delta} \rightsquigarrow U[0,2]$, in the standard-based regime the level of litigation depends on the relative size of the legal fees and damages award, giving rise to three different equilibria:*

1. *Equilibrium with no litigation and no deterrence. When legal fees are high relative to damages awards there will be no litigation (π=0) and the game falls back to the unregulated inefficient equilibrium. This happens whenever*

$$S \geq \frac{b}{b + \alpha p} D. \tag{16}$$

2. *Equilibrium with some litigation. For intermediate levels of legal fees relative to damages awards the minority will sue with positive probability*

$$\pi = \frac{b(D - S) - \alpha p S}{\left[(1 - p)D - (1 - 2p)S\right] D} \in (0, 1). \tag{17}$$

In this case the blockholder will choose the alternative project for $\delta \geq \underline{\delta}_S = \frac{D-2S}{D-S}$. *This happens whenever*

$$\frac{b}{b+\alpha p}D > S > \frac{b-(1-p)D}{b+\alpha p-(1-2p)D}D. \tag{18}$$

3. *Equilibrium with maximum litigation. When legal fees are very low relative to damages awards the minority will always sue* (π=1). *In this case the blockholder will choose the alternative project for* $\delta \geq \underline{\delta}_S = \frac{\alpha p-b+D}{p(\alpha+D)}$. *This happens whenever*

$$S \leq \frac{b-(1-p)D}{b+\alpha p-(1-2p)D}D. \tag{19}$$

Thus if the standard based regime induces litigation (last two cases) the expected wealth in each period will be equal to

$$\begin{aligned} W_S^{U[0,2]} &= -I + \Pr(\widetilde{\delta} \leq \underline{\delta}_S)p + \Pr(\widetilde{\delta} > \underline{\delta}_S)\left[E(\widetilde{\delta}/\widetilde{\delta} > \underline{\delta}_S)p + b\right] \\ &- \Pr(\widetilde{\delta} > \underline{\delta}_S)\left[1 - E(\widetilde{\delta}/\widetilde{\delta} > \underline{\delta}_S)p\right]\pi S, \end{aligned} \tag{20}$$

which can be rewritten as

$$\begin{aligned} W_S^{U[0,2]} &= \left[-I + \left(1 + \frac{\underline{\delta}_S}{2}\left(1 - \frac{\underline{\delta}_S}{2}\right)\right)p\right] + \left[\left(1 - \frac{\underline{\delta}_S}{2}\right)b\right] \\ &- \left[\left(1 - \frac{\underline{\delta}_S}{2}\right)\left(1 - \left(1 + \frac{\underline{\delta}_S}{2}\right)p\right)\pi S\right]. \end{aligned} \tag{21}$$

Again the first term in brackets reflects the public benefits and the second term the private benefits. However now we have a third term that reflects the litigation costs (LiC) that the minority will pay. Comparing equations (21) and the inefficient market outcome in equation (7) we can see that the only differences arise form: (i) a higher threshold for project approval ($\underline{\delta}_S > \underline{\delta}_I$) and (ii) the litigation costs for the minority.

Interestingly the payoffs received by the minority shareholders will exceed their share of the public benefits because they will also receive a damages award, thus there are benefits

from litigation for the minority. The expected value of these litigation benefits is equal to the probability that the alternative project is undertaken for a value $\delta < 1$, times the probability that it fails given the expected value of δ, times the probability that the minority sues, times the damages award, i.e.

$$LiB^{U[0,2]} = \Pr(1 > \widetilde{\delta} \geq \underline{\delta}_S) \left[1 - E(\widetilde{\delta}/1 > \widetilde{\delta} > \underline{\delta}_S)p\right] \pi D. \tag{22}$$

However, damage awards are a pure transfer between the blockholder and the minority. Therefore, high damage awards may be bad in efficiency terms (because the alternative project may not be chosen often enough and litigation costs increase) but good for deterring minority expropriation.

In what follows, and for comparison purposes with other regimes, we will assume that there is an intermediate level of legal fees relative to damages awards so that, under a standard based regime we have a mixed strategy equilibrium where the minority sues with probability $\pi \in (0, 1)$. Given this assumption we can rewrite

$$\begin{aligned} W_S^{U[0,2]} &= \left[-I + p + \frac{D - 2S}{4(D-S)^2} Dp\right] + \left[\frac{D}{2(D-S)} b\right] \\ &\quad - \left[\frac{[2(D-S)(1-p) - (D-2S)p]\,(b(D-S) - \alpha pS)}{4(D-S)^2\,[(1-p)D - (1-2p)S]} S\right]. \end{aligned} \tag{23}$$

And the litigation benefit can be rewritten as

$$LiB^{U[0,2]} = \left(\frac{1 - \underline{\delta}_S}{2}\right)\left[1 - \frac{1 + \underline{\delta}_S}{2} p\right] \pi D = \frac{[2\,(D-S)\,(1-p) + Sp]\,(b(D-S) - \alpha pS)}{4\,(D-S)^2\,[(1-p)D - (1-2p)S]} S. \tag{24}$$

4.4 Discussion of the results

We are now interested in comparing the efficiency of the alternative mandatory legal regimes with respect to the inefficient unregulated market outcome. As we have seen the their efficiency depends on the view that we take on how private benefits are generated.

The traditional view on private benefits is that they come at the expense of public benefits. When we analyze the regulation with this view in mind we find that both a rules

based and a standard based regulation work well in maximizing the public benefits from the investment decision with low or no cost. And although investment efficiency is not guaranteed, because the regulation does not internalize the private benefits, both regulatory regimes increase total benefits relative to the unregulated market outcome.

For the more complex case where private and public benefits are given characteristics of each investment project, so that the interest of the minority and the controller will show different degrees of conflict ($\widetilde{\delta} \rightsquigarrow U[0,2]$), our results so far can be summarized in the following proposition:

Proposition 3: *The analysis of the alternative regulatory regimes yields the following results:*

1. *The existence of self-dealing opportunities can increase both total wealth and public benefits, therefore self-dealing transactions should not be forbidden outright.*

2. *None of the existing regulatory regimes can guarantee investment efficiency. The alternative project will be chosen:*

   - *Too often when there is no regulation or the regulation only stipulates a minimum value of* α, ($\underline{\delta}_I \leq \underline{\delta}^*$).
   - *Not often enough in a rule-based regime,* ($\underline{\delta}_R \geq \underline{\delta}^*$).
   - *Too often or not often enough depending on the relative levels of private benefits and damage awards in a standard-based regime,* ($\underline{\delta}_S \gtrless \underline{\delta}^*$).

3. *The optimal regime will depend on the values of the parameters, many of which may be specific to each firm-blockholder pair.*

The first and second results of the previous proposition have been commented in the discussion of the regulatory regimes. The third point is illustrated in Figures 1 and 2. These figures show which of the three regimes dominates in terms of total wealth (Figure 1) and

public benefits (Figure 2) depending on the values of p and b and for given values of the remaining parameters.

Figure 1

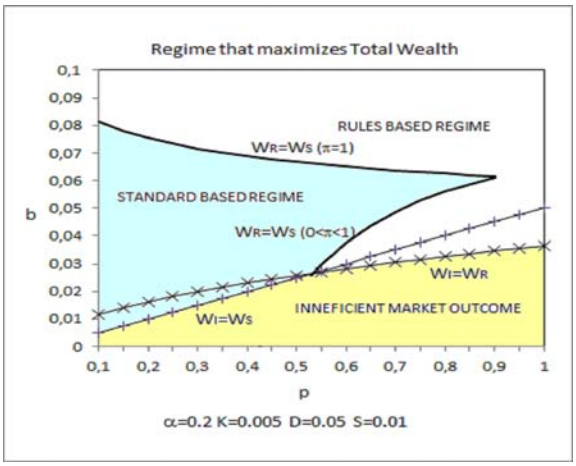
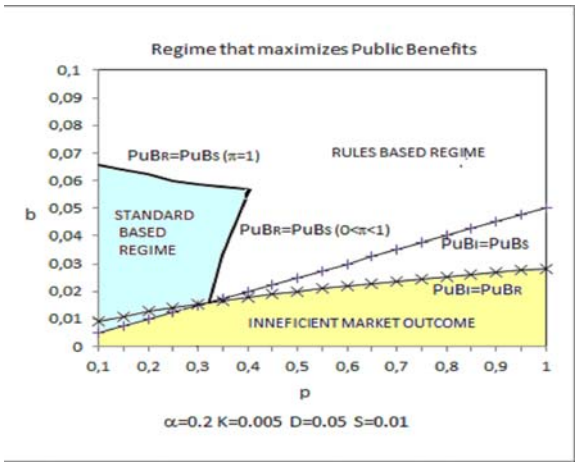


Figure 2



The three different curves in Figure 1 represent the combinations of probability of success of the standard project, p, and private benefits from the alternative project, b, that result in the same total wealth. For the standard based regime we have a bent line depending on wether the probability of litigation is one or lower than one. In the yellow area, p is relatively high compared to b and b is not too high, thus the self-dealing problem is moderate, because the blockholder only deviates for relatively high values of δ. In this area the inefficient market outcome dominates. The inefficient market outcome is preferred to a rule-based regulation because the fixed cost K is high relative to the reduction in public benefits that self-dealing entails. Additionally, for these values of p and b the standard based regime does not produce litigation, therefore it is equivalent to the inefficient market outcome. In the blue area, b is large relative to p and neither b nor p are too high, therefore, in the inefficient market outcome the blockholder would deviate too often. In this area the standard-based regime dominates the other two. When the blockholder deviates to the self-dealing project, it is likely to fail and be subject to litigation. Therefore, the standard based regime with a small probability of litigation ($\pi < 1$) can reduce self-dealing keeping litigation costs low relative to the information costs K. Finally in the white area the rules-based regime, where the

shareholders can impose $\delta = 1$ at a fixed cost K, dominates. This happens in the upper part because b is very high and the standard based regime would induce too much litigation. In the lower white area the rules based regime dominates the standard based regime because p is very high, reducing the probability of detection in the standard based regime.

Figure 2 shows the combinations of p and b that result in the same level of public benefits. It is very similar to Figure 1 but now the blue and yellow areas are smaller and the white area is bigger. This is because the rule-based regime is the one that generates lower private benefits, compared to the other two, and therefore it becomes more attractive when we subtract these private benefits from total wealth.

Together both figures illustrate the idea that one regime does not fit all scenarios. This is true even if we consider a single firm with different blockholders, who may have access to different levels of private benefits, and could be better dealt with under different regimes.

5 Contractual solutions

So far we have seen how regulation can deter the controller form engaging in self-dealing. Deterrence cannot achieve the first best investment outcome, because private benefits are not taken into account. Therefore total benefits are lower than in the first best case. But it does maximize public benefits if we assume that the alternative project with self-dealing opportunities is never interesting for the minority ($\widetilde{\delta} \rightsquigarrow U[0,1]$). However if we assume that private benefits and public benefits may sometimes go hand in hand ($\widetilde{\delta} \rightsquigarrow U[0,2]$) deterrence fails to maximize public benefits and it does not necessarily improve upon the inefficient unregulated outcome.

The natural question that arises is whether contracts can work better in this case. Of course it is clear that if we allow the parties to contract without any restriction they can design a contract that will achieve the first best. But, in our one period setting these contracts generally require contingent transfers of funds from the minority to the controller, which seem

difficult to enforce in practice given the dispersed nature of the minority shareholders[13].

But a contractual solution is feasible if we consider the repeated nature of the investment game between the minority and the controller. Because of the costs of raising financing in the public capital markets, firms raise large amounts of capital through occasional IPOs and SEOs and they use them over time as a source of funding for several years. Therefore our game is in fact a repeated game where in each period an investment decision will have to be made. Interestingly we know that, in this repeated game, it is possible to find a long-term relational self-enforcing contract sustained on the value of future interactions, of the kind that typically appear when enforcement is inefficient (Klein and Leffer, 1981; MacLeod 2007).

5.1 The put option contract in the two period game

Consider the two period version of our game, where in each period a self-dealing opportunity arises. We link both periods in the model by assuming that money is raised only at time $t = 0$. The entrepreneur funds a fraction α of the total cost $2I$ and obtains $(1 - \alpha)2I$ form the outside investors. In this setting the outcome from the second period, when there is only a total amount I left to invest, will be the one we have previously studied depending on the regulation in place. However in the first period it is possible to sustain a contract that improves efficiency and leaves both parties better off[14].

This can be achieved with a simple contract based on awarding a put option for the minority to sell additional shares to the blockholder if he engages in self dealing. We will prove that this contract increases the efficiency of the long term investment relationship between the blockholder and the minority and reduces minority expropriation relative to the

[13]The full analysis of the contractual options for the one and two period settings is available upon request.

[14]The driving force behind our contractual solution is the dynamic nature of the relationship between the controlling shareholder and the firm. Thus it seems natural to extend the time horizon of the model to more than two periods. The analysis of the infinite period game, where the basic results and intuition for the two period game continue to hold, are available upon request.

current regulation, and we will discuss the incentives of the parties to opt out of the current regulation and into this contract.

According to this contract the blockholder obtains the right to choose the project in the first period with a waiver from any rules or litigation regarding self-dealing transactions. In exchange for this waiver, the minority shareholders are awarded a put option. This option can be exercised at the beginning of the second period if, in the first period, the blockholder chose the alternative project. The put gives the minority the right to sell to the blockholder an additional stake γ. The strike price for the option is fixed as the prevalent market price at maturity, i.e. at the beginning of the second period. Notice therefore that the market value of the option is zero throughout its life.

The crucial characteristic of the contract is that it works in an automatic way relaying on only one information input: the verification that a self dealing transaction has occurred, which happens ex-ante, when the investment is approved. In the previous section we explained that current regulation is limited for dealing with investment choices because this is a asymmetric information problem that is costly to solve either with ex-ante (rules based) or ex-post (standard based) verification. However, the main advantage from the proposed contract is that it does not try to elicit or verify the information from the controller. Nevertheless it is aimed at giving him incentives to use the information in the most efficient way. Notice that this is a big departure from current legal regimes that require not only the verification of the self-dealing transaction, but also the costly verification of private information on the merit of the self-dealing transaction (delta)[15].

The use of information is optimized in two ways. First, by opting out of the current regulation, the block-holder gets the right to choose project in both periods relaying on his private information, that he does not need to share, and the decision is never challenged. Second, we do not need additional information to fix the exercise price of the option, since

[15]This verification of delta is made ex-ante by board members in the rules based regime and ex-post by the court in the standard based regime.

we rely on market prices. The contract works automatically because the minority will always exercise the put. Why? Since the exercise price is equal to the current market price, the minority could seem to be indifferent about exercising the option. But the incentives of the blockholder to expropriate in the future will depend on his future stake. Provided he has control, the bigger his stake, the lower will be his incentives to engage in self-dealing in the future. Thus the minority shareholders, considering the future interactions with the blockholder, know that they will suffer less future expropriation if the blockholder is forced to hold a larger stake. They can achieve this by exercising the put. Therefore it is always in the interest of the minority shareholders, individually and as a group, to exercise the option.

Finally, the contract changes the controller's incentives, because from the point of view of the blockholder the exercise of the put penalizes him because in the future he will hold a larger stake and will optimally choose to expropriate less. This is a loss for him from today's perspective.

5.2 Incentives of the minority to exercise the option

To solve the game we proceed backwards starting from the second period. In the second period there are no options and the choice will only depend on the regulation in place, just like we have seen in the previous analysis of the regulatory solutions. To simplify our exposition we will assume that there is no regulation of self-dealing transactions[16].For the two period game we extend the notation we used for the one period game in the following way. We will denote by $\underline{\delta}_{C,t}(\alpha_t)$ the minimum probability of success, under the contract, for which the blockholder will chose the alternative project in period t given his stake at the beginning of period t. We will denote by $G_t(\alpha_t)$ the incumbent blockholder's total expected payoff from period t, given his stake at the beginning of period t, and considering his subsequent choices given that stake, i.e. $\underline{\delta}_{C,t}(\alpha_t)$. Since there is no litigation, we have that $G_t(\alpha_t)$ depends only

[16]The rationale for the results in this section does not change if we assume a default rules-based regime or standard-based regime for the second period.

on the sum of his public and private benefits:

$$G_t(\alpha_t) = \alpha_t \left[-I + \left(1 + \frac{\underline{\delta}_{C,t}(\alpha_t)}{2} \left(1 - \frac{\underline{\delta}_{C,t}(\alpha_t)}{2} \right) \right) p \right] + \left(1 - \frac{\underline{\delta}_{C,t}(\alpha_t)}{2} \right) b. \tag{25}$$

Finally, $PuB_2(\alpha_2)$ denotes the public benefits and expected public value of the shares at the beginning of the second period (i.e. when the option can be exercised) depending on the stake of the controlling blockholder during the second period:

$$PuB_2(\alpha_2) = -I + \left(1 + \frac{\underline{\delta}_{C,2}(\alpha_2)}{2} \left(1 - \frac{\underline{\delta}_{C,2}(\alpha_2)}{2} \right) \right) p. \tag{26}$$

Starting from the second period, in the absence of regulation, we fall back to the inefficient unregulated market outcome, and the investment decision will only depend on the stake of the blockholder. In particular we have that for a stake α_2:

$$\underline{\delta}_{C,2}(\alpha_2) = \underline{\delta}_I(\alpha_2) = \frac{\alpha_2 p - b}{\alpha_2 p}. \tag{27}$$

There are two possible scenarios to consider depending on how the option is exercised at the beginning of the second period. First, if the option was not exercised, the incumbent blockholder's stake is the same $\alpha_2 = \alpha_1$. Second, if the put option was exercised, his new stake is $\alpha_2 = \alpha_1 + \gamma$.

How will the minority use its option at the beginning of the second period? Since the option is to be exercised at current market value there is no gain for them to be made in the transaction. Therefore, they will choose comparing the second period outcome. Equation (7) shows that public benefits for the shareholders in the inefficient market outcome are increasing in the blockholder's stake. Because of this they will always prefer to exercise the put. This is important because it guarantees that ex-post the minority always has an incentive to "punish" the blockholder if he chose the alternative project. Moreover, total wealth in the second stage will always be higher, because the incumbent blockholders' stake will be equal or higher than his initial stake.

Table 1. Characteristics of the put option contract

Contract description	At time $t = 0$ the blockholder gets the right to make investment decisions (without ex-ante interference from the minority and without ex-post court review) in exchange for a put option for the minority.
Put characteristics	Put option gives the minority the right to sell a stake γ to the blockholder at time $t = 1$ upon verification that a self-dealing transaction has occurred. The exercise price is the prevailing market price at maturity ($t = 1$).
Minority incentives	Minority shareholders will always exercise the put. There is no gain at maturity because the exercise price is equal to market price, but forcing the blockholder, who controls investment decisions, to hold a larger stake prevents expropriation in the subsequent period.
Blockholder's incentives	The incentives for the blockholder to deviate to the self-dealing investment opportunity at time $t = 0$ are reduced. This is because engaging in self-dealing at time$t = 0$ implies he will be forced to hold a larger stake at time $t = 1$, so that he will optimally deviate less to the self-dealing investment opportunity at time $t = 1$ and will have less private benefits in the future. From the perspective of $t = 0$ this is a loss.
Relative efficiency	This contract can achieve the same outcomes in terms of investment efficiency than both the standard-based and rules based regimes at a lower total cost, because it does not incur any information or litigation costs. Moreover for some values of the parameters it can induce the first best investment choices.

5.3 Incentives for the blockholder not to expropriate the minority

We now turn to the first period and the blockholder's choice of project. In the first period the blockholder will chose the project taking into account his expected benefit from both periods, therefore he will chose the alternative project only if

$$\alpha_1 \delta p + b - \gamma P u B_2(\alpha_1 + \gamma) + G_2(\alpha_1 + \gamma) \geq \alpha_1 p + G_2(\alpha_1). \tag{28}$$

The left-hand side of this expression reflects the expected value of choosing the alternative project for the blockholder. The first term reflects the public and private benefits he expects

from choosing the alternative project in the first period. The last two terms reflect the blockholders' change in wealth due to the exercise of the option. If the put is exercised he will have to pay the new market price for his additional stake, $\gamma PuB_2(\alpha_1 + \gamma)$, and he can expect a benefit of $G_2(\alpha_1 + \gamma)$ during the second period. The right hand side of this expression reflects the expected value from choosing the standard project in the first period. The first term reflects the blockholder's expected payoff from the standard project $\alpha_1 p$, and the second term reflects his expected benefits from the second period, given that there will be no change in his stake, $G_2(\alpha_1)$.

From the above equation we find that the blockholder will choose the alternative project in the first period if and only if

$$\delta > \underline{\delta}_{C,1} = \frac{\alpha_1 p - b + G_2(\alpha_1) + \gamma PuB_2(\alpha_1 + \gamma) - G_2(\alpha_1 + \gamma)}{p\alpha_1}. \tag{29}$$

This simplifies to

$$\delta > \underline{\delta}_{C,1} = \frac{\alpha_1 p - b + \frac{b^2\gamma^2}{4p\alpha_1(\alpha_1+\gamma)^2}}{\alpha_1 p}. \tag{30}$$

It is easy to check that the new threshold is higher than the inefficient first period threshold, $\underline{\delta}_I$. Moreover, the new threshold is increasing in γ. And interestingly, the efficiency of the arrangement increases as the private benefit level b increases (the threshold $\underline{\delta}_{C,1}$is increasing in b). Notice that we can align the interests and increase efficiency relative to the base case without incurring neither litigation nor information costs.

Why do the options work as an efficient penalty? After all we are only requiring that the blockholder buys a stake at market value. Absent wealth, portfolio or liquidity constrains this cannot be considered as a penalty. The reason why, in our model, it alters the incentives of the blockholder is the following. If after the first period the put is exercised and he is forced to increase his stake, in the second period he will prefer a lower level of expropriation (lower private benefits and higher public benefits). This is the optimal thing to do given his new increased stake. However, from the perspective of the first period, the lower future

private benefits are perceived as a loss, while the higher future public benefits are neutral because they will be paid for. When, after the first period, the call is exercised he is forced to sell his stake at market price and gets no compensation for the foregone private benefits he could obtain in the second period. Obviously, in practice, wealth, portfolio or liquidity constrains will make the penalty even more threatening.

The optimal size of the penalty will critically depend on the extent of the opportunities for self-dealing transactions and the profitability of the investment opportunities (represented by b and p in the model). But it corresponds to the parties to evaluate them. At an extreme the penalty gamma could be set as high as $1-\alpha$, which would transform the put into a kind of redemption right for the minority, like the ones we observe in venture capital deals (Kaplan and Strömberg 2003).

5.4 Efficiency of the proposed contract

Total expected wealth in the first period, given the new threshold for project choice, will be equal to

$$W_{C,1}^{U[0,2]} = \left[-I + \left(1 + \frac{\underline{\delta}_{C,1}}{2}\left(1 - \frac{\underline{\delta}_{C,1}}{2}\right)\right)p\right] + \left(1 - \frac{\underline{\delta}_{C,1}}{2}\right)b. \tag{31}$$

The results obtained by the direct comparison of this expression with equations (7), (10) and (23) are summarized in the following proposition:

Proposition 4: *The comparison of the proposed contract with existing alternative regulatory regimes yields the following results:*

(i) Public benefits are larger and private benefits lower than in the inefficient market outcome. Interestingly, this reduction in minority expropriation is attained at no cost for the minority shareholders.

(ii) For $\underline{\delta}_{C,1} = \underline{\delta}_S$, total value will be higher under the contractual solution than under a standard-based regime, because the contract entails no litigation costs.

(iii) For a threshold $\underline{\delta}_{C,1} = \underline{\delta}_R = 1$*, total value will be higher under the contractual solution than under a rule-based regime because the contract entails no information costs. A contract that induces* $\underline{\delta}_{C,1} = 1$ *can be implemented by setting* γ *such that the following equality is satisfied:*

$$\frac{\gamma^2}{\alpha_1(\alpha_1+\gamma)^2}=\frac{4p}{b^2} \tag{32}$$

(iv) For some values of the parameters the contract can attain investment efficiency. i.e. $\underline{\delta}_{C,1} = \underline{\delta}^*$*. This requires setting* γ *such that the following equality is satisfied:*

$$\frac{\gamma^2}{\alpha_1(1-\alpha_1)(\alpha_1+\gamma)^2} = \frac{4p}{b} \tag{33}$$

Unlike the existing legal regimes, this contract takes advantage of the dynamics of the game making project choice in the second period contingent on the choice made in the first period. It has important benefits when compared with the existing regimes.

First, by linking both periods, we provide at no cost an additional incentive that aligns the interests of the blockholder and the small shareholders: obtaining future private benefits requires limiting current private benefits.

Second, we let the blockholder make the investment decision and punishment only requires the exercise of an option. Doing this we eliminate both information costs K and litigation costs S that critically affect the outcome of the existing regimes. Notice that this implies a departure from the pro-rata distribution rule among shareholders in each transaction. But it does not follow that the minority is disenfranchised of protection against expropriation. The protection is provided by the incentives from the contract and the benefits of both parties can be increased by taking advantage of self-dealing opportunities. Real protection, measured in terms of public benefits, turns out to be higher under the contractual solution.

Third, we do not impose an a priory minimum ownership stake, therefore firms whose blockholders have low α but also low b can benefit from the monitoring and investment op-

portunities that the latter may bring. Notice that contractual solutions are also an improvement with respect to the imposition of a minimum ownership stake for would be controlling shareholders, that the European regulators are trying to enforce, as we discussed in the literature review. A priory restrictions on α have important liquidity costs (restricting the pool of potential controlling shareholders) but they do not offer a solution to expropriation from blockholders with high values of both α and b. Our contract will reveal this type of blockholders and force them to increase their stake ex-post.

Fourth, the changes in ownership composition that are induced by the penalty will tend to increase efficiency in the following periods. Forcing an increase in the blockholder's stake guarantees that, in the future his incentives will be better aligned with those of the small shareholders.

5.5 Incentives to opt-out of the legal regime and implement the contractual solution

We have seen in Proposition 4 that the proposed contract is more efficient than the existing legal regimes, but, in a regulated market, the contract will only be implemented it both the minority and the blockholder have enough incentives to opt-out of the default legal regime and bargain over γ. The default legal regime represents the outside option of the parties and they will contract as long as they can improve their lot relative to this outside option.

The incentives for the minority to opt-out are clear. As we have seen in Proposition 4, the contractual arrangement can implement the same investment outcomes that the standard-based and rules-based regimes at a lower total cost. This implies higher total benefits for the minority, even if private benefits were not reduced. Therefore it is always in the interest of the minority to enter into such a contract.

Moreover, in a rules-based regime, the block-holder will also have incentives to opt-out for exactly the same reason as the minority. In this case it is cheaper to implement the preferred investment strategy of the minority ($\underline{\delta} = 1$) with the contract than under the rules-based

regime.

However in a standard based regime the incentives for the blockholder to opt-out are not so clear. On the one hand, just like in the rules-based regime, he has an interest in opting out to save litigation costs. But, on the other hand, he will also compare the punishment for self-dealing under the contract (lower future private benefits because of the higher stake he will have in the future) with the punishment under the standard based regime (the expected damages award).

This means that legal regimes that are tough on self-dealing (a rules-based regime and a standard-based regime with large expected penalties) will be more effective at inducing the blockholder to opt-out of the prevailing legal regime and contract with the minority.

If both parties find it interesting to opt-out they will have to bargain over γ and the final outcome will depend on their relative bargaining powers. Therefore a non-mandatory default legal regime that is very tough on self-dealing will lower the outside option of the blockholder and gives more relative bargaining power to the minority, resulting in a contract that reduces expropriation and can increase total value.

5.6 Implementation issues

The contract is designed to avoid information issues and collective action problems. However there are two potential problems that can arise when we implement it: "hidden ownership" trough cash-settled equity swaps and price manipulation on the side of the controller.

Hidden ownership occurs when a shareholder can separate the voting and cash-flow rights of her shares trading in derivatives[17]. These practices allow the controller to keep his voting rights but to decuple the corresponding cash-flow rights. Thus the real interest of the controller in the future cash-flows would be much reduced relative to what his stock holdings would suggest. In our model this is a problem because the penalty for the controller is to be required to hold a higher stake when new self-dealing opportunities arise in the future,

[17]Hu and Black (2006) provide a clear explanation of hidden ownership practices and their consequences.

so that he will have more to loose in terms of public benefits.

Regarding price manipulation, there is evidence that insiders are able to manipulate the stock price down before buybacks[18]. This is a problem in our setting because the put option is exercised at market prices. Thus the blockholder could end up making money by engaging in self dealing, manipulating prices down and buying when the option is exercised.

The contract can include safeguards to minimize these risks. It is important to notice that to be effective the contract does not require the blockholder to keep a higher stake in all circumstances, but only if he wants to engage in self-dealing at some point in the future. Thus the crucial requirement is to maintain an increased stake in a time window around the approval of self-dealing investment opportunities. Because of this the contract should forbid any kind of trading (including these types of hidden trading) around these event-windows, and give freedom to trade at other times. Setting a non-trade window around self-dealing opportunities would also minimize the risk of price manipulation. But if this risk is considered high it is also possible to modify the exercise price for the put option requiring the controller to buy the shares at a premium relative to the prevailing market price on the exercise date. This would increase the punishment for self-dealing and discourage it more.

6 Conclusions and policy implications

In this paper we break away from the idea that private benefits are simple transfer from the minority to the controller. We view different investment projects as offering different levels of both public and private benefits, about which there is asymmetric information between the minority and the controller. Private benefits are therefore an unavoidable feature of the investment decisions that firms with controlling shareholders have to make repeatedly. We have discussed the limitations of the existing legal remedies for regulating these type

[18]For example Guojin Gong et al. (2008) report that firms adjust accruals to decrease their reported earnings before stock repurchases. And Dichev et al. (2013) report that 40% of earnings management is income-decreasing.

of self-dealing operations and we have presented a simple long-term contract between the controlling shareholder and the minority that can increase efficiency and leave both parties better-off.

Two important policy implications arise from our analysis. First, regulating self-dealing transactions and preventing minority expropriation without compromising efficiency is difficult and contractual arrangements should be considered as a feasible alternative. Second, in this area, contracts cannot substitute legal regulation entirely because regulation is still necessary to combat fraud and to determine the incentives of the parties for opting out and setting up a contract.

Regarding the first point, our model shows that when private benefits do not necessarily come at the expense of public benefits, the existing legal regimes are costly and they do not produce efficient outcomes. Moreover, the inefficient market outcome is sometimes preferable to either a rules-based or a standard or litigation-based regime. Additionally we have seen that simple, multi-period contracts, that do not impose pro-rata distribution rules for each transaction, and take into account the repeated nature of the relationship between the blockholder and the minority can be more efficient than any of the existing regulations. Thus, there is a strong argument for eliminating mandatory self-dealing regulation and establishing only default rules. However, the traditional legal approach states that anti-self dealing regulation cannot be waived. The reason is to prevent the controlling shareholder to adopt charter amendments repealing the measures for the legal protection of minority shareholders. In this context default rules are conceived as implying tolerance in the face of disloyal conduct and bad faith. Our claim is that making anti-self dealing regulation a default rule does not necessarily leave the minority unprotected. Quite the contrary, they can self-regulate their interests, and enter into a contract with the controlling shareholder, simply because they consider they would be better-off than with the level of protection guaranteed by the existing regulation.

However, coming to our second point, we do not claim that law does not matter. It does because contracts cannot substitute legal regulation entirely. In our view, contracts and regulation are complementary for two reasons.

The first reason is that, as we have shown in our analysis, regulation is a very effective tool to prevent expropriation, while contracts can generate more efficient outcomes. In fact, contracts and anti-self dealing legal measures have different ultimate goals. The purpose of the legal regimes is not to achieve efficiency, but to combat non pro-rata distributions. Notice that the different regulatory models are based on the equal treatment of all shareholders in the distribution of the benefits of the common venture. However, efficiency considerations tell us that there may be an efficient level of private benefits for the blockholder that the law would not ensure. For this reason, regulation is the best instrument to supervise exceptional operations involving large potential risks of minority expropriation. On the other hand, contracts work better for addressing the conflicts of interest between minority shareholders and controlling shareholders in the day-to-day business operations.

The second reason why contracts and regulation are complementary is that regulation determines the incentives of the contracting parties. From the regulator's perspective, it is important to make sure that contractual solutions not only increase efficiency, but also that they are "fair" to the minority. Thus, when opting-out is allowed, the best regulation is the one that strengthens the relative bargaining position of the minority. If the legal systems is very effective at reducing self-dealing, the controlling shareholder will have larger incentives to opt-out than the minority, and this strengthens the bargaining position of the minority. Notice that the rules based regime is more effective at reducing self-dealing when information costs K are low, and the standard based regime is more effective when litigation costs S are low. And these variables are, to some extent, under the control of the regulator. Thus, when opting-out is allowed, the terms that the contracts offer to the minority will be more generous if the regulation is tougher on self-dealing.

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