A Contractual Approach to Disciplining Self-dealing by Controlling Shareholders

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ABSTRACT

In this paper we model the relationship between a controlling shareholder and outside investors when the presence of the controlling shareholder generates valuable self-dealing investment opportunities. These self-dealing operations generate private benefits for the controller but they may also be profitable for the outside investors. Our analysis proves that regulation of self-dealing opportunities is necessary to facilitate access to funding when self-dealing is not verifiable, and explains why current regulation does not simply ban all self-dealing operations. We then analyze the two alternative existing enforcement mechanisms, which are based on disclosure and approval rules (*Rules-based regime*) and/or on litigation rules (*Standard-based regime*). While both prove effective at facilitating access to funding, we show that an alternative penalty default regulation could improve overall efficiency by providing incentives for the controller and the outside investors to opt-out and implement the first-best contract.

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 share-owners. 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".

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1   Introduction

One of the central challenges in corporate law is to design the right tools to deal with controlling shareholders. This problem is especially acute in publicly traded companies with dispersed outside shareholders, where information asymmetries and transactional and coordination costs are higher than in private corporations. These tools should be aimed at protecting the outside 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 or his focus on long-term value but, more importantly, because his relationship with the company generates valuable self-dealing opportunities.

In this paper we present a model of the relationship between a controlling shareholder, the board of directors and dispersed outside shareholders, taking into account the existence of these valuable self-dealing opportunities. In our model, private benefits are not a simple transfer from the outside investors 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 outside investors, the board 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 these alternative investment choices. Adopting this more complex view of private benefits we are able to explain why regulation of self-dealing opportunities is needed and why this regulation does not simply ban self-dealing altogether. We also discuss whether the regulation of self-dealing should be mandatory and argue that an alternative penalty default regulation could improve overall efficiency.

Our analysis proceeds in three parts. We first show the existence of an optimal first-best contract between the controller and the outside investors that allows all investment projects to be financed. This contract is simple and very general, and can be implemented through the issuance of standard equity shares plus warrants that the outside investors can exercise when the controller engages in self-dealing. However this contract can be implemented only if self-dealing is verifiable, which is unlikely when there is asymmetric information about investment opportunities. If self-dealing opportunities are not verifiable the contract cannot be implemented because the controller does not have ex-post incentives to disclose his self-dealing operations. In this second-best scenario many profitable investment projects may not get funding since the controller cannot credibly commit to a fair rate of return because he will engage in value-decreasing self-dealing investment opportunities too often.

In the second part we discuss how the current regulation addresses this problem. We model the two alternative existing enforcement mechanisms, which are based on disclosure and approval rules (*Rules-based regime*) and/or on litigation rules (*Standard-based regime*). We show that both types of mandatory regulation are designed to prevent the controller from engaging in self-dealing too often, but both allow self-dealing when it is compatible with the interests of outside investors. Therefore we argue that the existing regulation is necessary to avoid market failure in the second-best scenario. It is designed to facilitate access to financing and it improves upon a simple ban on self-dealing. However, we also acknowledge the costs of these enforcement mechanisms. In the case of the rules-based regime these costs are related with the loss of information when the investment decision is made by disinterested directors rather than by the controller. In the case of the standard-based regime these costs arise because ex-post litigation is costly. Moreover, under both regimes, many valuable self-dealing opportunities may be lost. Therefore, for the firms that could get funding under the second-best scenario, the current regulation reduces total wealth.

In the last part of the analysis we explore an alternative, more efficient, non-mandatory regulation. This alternative combines a penalty default regulation that is very restrictive of self-dealing opportunities with the opportunity for

firms to opt-out by contracting to pursue these opportunities. We show that this alternative would be, at least, as effective as current regulation at avoiding the second-best outcome by facilitating access to funding to all companies that accept the default. But, unlike current mandatory regulation, the penalty default regulation would also improve the investment choices and total value of the firms that prefer to opt-out. The harsh penalty default gives incentives to the controller to disclose self-dealing so that the first-best contract can be implemented.

We contribute to the literature on minority expropriation by adopting a new perspective on the relationship between the controlling shareholders, the board of directors and the outside investors. Most papers dealing with private benefits of control consider these benefits as pure agency cost that reduces total benefits. The controlling shareholder can appropriate a non-pro-rata share of cash-flows through various means, such as transactions with controlled companies, and investments in favorite projects at the cost of reducing total wealth. 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 and banning all opportunities for self-dealing. 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 and effort for the controlling shareholder. In accordance with this point of view, private benefits may be the necessary reward to give incentives to the controlling shareholder for his contribution to firm value. If, like Parigi *et al.* (2013), Gilson and Schwartz (2015) or Burkart *et al.* (1997), one takes this perspective, and considers private benefits as the only way to reward the controlling shareholders, it is no longer clear that a very restrictive regulation is optimal. In fact, as Gilson and Schwartz (2015) point out, if private benefits are used to remunerate the controlling shareholders, the optimal level of private benefits is unlikely to be zero and may differ for each company. But it is a complex problem to fix this level within the current regulation and for each firm. Because of this they argue that some firms may be better off opting out of fiduciary duties to allow their controlling shareholders to obtain a higher level of private benefits. Nevertheless, none of these papers explains why companies need to remunerate controlling shareholders inefficiently by allowing some opaque level of private benefits, rather than banning private benefits altogether and fixing a remuneration contract.

In this paper, by focusing on the process that generates private benefits, we are able to explain why the current regulation does in fact allow for some level of private benefits. We argue that private benefits appear as the result of choices on potential courses of action. 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. Seen 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 controller has more information on which is the best decision, but he will exploit this information to his advantage in cases where the decision with higher public benefits does not coincide with the decision with higher private benefits. This hinders outside financing. The current regulation tries to alleviate this problem but it faces a trade-off. By limiting the decision power of the controller (either by ex-ante rules in the case of the rules-based regulation or by ex-post review in the case of standard-based regulation), on the one hand it reduces inefficient self-dealing and facilitates financing but, on the other hand, it reduces efficient self-dealing and total wealth creation for the firms that obtain funding. For this reason mandatory regulation banning private benefits (such as a strict pro-rata distribution rule) is not optimal. In this paper we study the limits of the existing regulation faced with this trade-off and propose a penalty default as a better alternative.

We also contribute to the debate about penalty default regulation initiated by Ayres and Gertner (1989) and Posner (2006). Default rules, unlike mandatory rules allow the parties to contract around them. The traditional theory of default rules, exemplified by Easterbrook and Fishel (1982) and Posner (1986), states that they exists because transaction costs are high and therefore the default should be set to reflect the preferences of a majority of the parties who found themselves in conditions similar to those of the parties to the contract. However, Ayres and Gertner (1989) argue that in some cases default rules should be set as penalty defaults that harm one or both parties to encourage more efficient information exchange between asymmetrical parties.[1] This influential theory has been contested by Posner (2006), arguing that examples of penalty default rules are rare in contract law, and by Maskin (2006), proving that information-forcing rules are not always optimal. Here we provide a clear example where a penalty default rule would optimally induce the party with superior information (the controlling shareholder) to share this information with majoroutside investors and this would allow the implementation of an efficient contract that would increase total wealth and leave both parties better off.

Finally, we also contribute to the legal literature that studies conflict resolution mechanisms among shareholders. This literature deals with the use of major 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

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[1]This view is also shared by Sunstein and Thaler (2003) in their influential work on libertarian paternalism, suggesting that "[w]hat [people] choose is strongly influenced by details of the context in which they make their choice, for example default rules ...."

are useful only for preventing very outrageous forms of expropriation. Our contribution here is to show that the combination of a penalty default rule and a simple financial contract provides incentives to ameliorate conflicts that arise in day-to-day investment decisions.

In terms of policy implications, our main conclusion is that contractual arrangements should be considered as an alternative for regulating the self-dealing transactions of controlling shareholders. 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 controlling shareholders' private benefits. In fact in public corporations 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 outside investors. A contractual solution is only feasible if the controller wants to opt-out of the current regulation. This may happen in the case of a firm going public, where the founder is selling to outside investors and internalizes the negative impact on firm value of expected expropriation. But it is unlikely in the case of a firm that already has a controlling block-holder. As shown by Djankov *et al.* (2008) regulatory regimes currently observed in most countries allow the controllers that do get funding to obtain large private benefits, and therefore do not induce them to disclose information and promote contracting. Moreover, these regimes may be preventing other firms from raising funds in the capital markets. Therefore, we do not claim that contracts can overrule existing regulation. Quite the contrary, self-dealing contracts can only arise if the law effectively safeguards the outside 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 unregulated first-best and second-best outcomes of the model in Section 4. Section 5 discusses the existing alternative regulatory regimes and explains how they improve upon the second-best outcome. We present the opting-out solution and prove this alternative to be better at facilitating both access to financing and investment efficiency. In Section 6 we discuss our results and their policy implications. Section 7 offers a brief conclusion.

2   Literature Review

There are several strands of both the economic and the 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 between 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 block-holder will only exert control if the sum of public and private benefits that he gets from doing so outweighs 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 block-holders as a pure transfer of resources that reduces public benefits (Bebchuk, 1999). Other authors model them as inefficient transfers, taking the view that value is lost when public benefits are diverted for private uses (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 *et al.* (1997) present a model where the controller has to choose between 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 that 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 part of these benefits accrue to outside 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 these 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 in the stock market, the outside 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 in which private benefits of control are large will have lower equity values (there will be a price discount reflecting insufficient protection) but the outside 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, the question as to whether small shareholders are good at anticipating ex-ante the degree of expropriation to which they may be subject ex-post is an empirical one. And the available evidence suggests that they are

not good at it. Gompers *et al.* (2003), Giannetti and Koskinen (2010) and Giroud and Mueller (2011) demonstrate that firms in which 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 (2010) 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 the party in control to choose 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), and 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 and Roe (1999) show that when private benefits of control are large and the optimal ownership structure is a disperse one (with no controlling shareholder) it may not be possible to implement it. Even if the founder sells to disperse shareholders, they anticipate that subsequent 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 choose 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 extent 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 block-holders 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 that 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 investors, 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

The legal analysis of self-dealing studies the design of legal strategies to combat minority expropriation. There are two main alternatives of regulating self-dealing activities with controlling block-holders. The first focuses on the reduction of ex-post expropriation. The second strategy focuses on ex-ante restrictions to ownership structure in order to prevent inefficient decisions. Legal academics have discussed both alternatives.

The most significant papers analyzing the problem of controlling shareholder and the reduction of ex-post expropriation are Goshen (2003), Gilson and Gordon (2003), Gilson (2006), Dammann (2008), and Atanasov *et al.* (2011) and, from an empirical point of view, Djankov *et al.* (2008), who construct an anti-self-dealing index. All of them stress the key role of corporate law in reducing the inefficiencies caused by controlling shareholders.

A clear conclusion reached in this literature is that American Law is well-armed to fight "block-holders' costs". The entire fairness review under corporate law has proven very effective in this regard, as has corporate tax law limiting pyramid structures, and thus incentives and opportunities for cash-flow tunneling within business groups. As a result, controlling shareholders are rare in American public corporations, while they are the norm in the emerging markets and other jurisdictions where the protection of outside shareholders is weak compared to the US. This seems consistent with the empirical evidence showing a negative correlation between the quality of investors' protection and the concentration of ownership (La Porta *et al.*, 1999). Therefore, from this literature, one can conclude that improving the legal protection of outside investors and reducing private benefits of control will disincentivate the concentration of ownership and reduce expropriation. But things become more nuanced if one considers the potential benefits of controlling shareholders.

The idea that controlling shareholders can bring benefits to the firm is stressed by Dammann (2008), Gilson (2006) and Goshen and Hamdani (2016). This would explain why concentrated ownership structures, in different fashions and shapes, are prevalent in most jurisdictions around the world. The challenge,

then, is how to facilitate the emergence of productive controlling block-holders while discouraging looters and inefficient ones. Thus the issue of how best to regulate the activities of controlling shareholders remains open and it is important to analyze how these activities are regulated in jurisdictions where controlling shareholders thrive.

In particular in Europe the legal view of private benefits differs substantially from the US view. Reducing private benefits of control has not been a traditional goal of European corporate law. In contrast with the low scores of these countries in the anti-self-dealing index of Djankov *et al.* (2008), the received wisdom among European legal scholars is that outside shareholders receive extensive protection against majority shareholders by force of mandatory rules in corporate law. As an example of this common view Conac *et al.* (2007) explain how outside shareholders in Europe are protected through a complex set of idiosyncratic rules, doctrines and remedies, different from the US rules, but, the authors claim, equally effective.

However, there are also some critical voices that recognize that related-party transactions are problematic in many European jurisdictions where it is difficult to hold controlling shareholders liable for engaging in "unfair" self-dealing unless they are "formally" part of the management (Enriques, 2002; Johnson *et al.*, 2000). These critical views are gaining ground and have promoted the governance reforms undertaken of late in many European countries, mimicking the corporate governance model from the U.S., as explained in detail by Enriques and Volpin (2007) and Enriques *et al.* (2009b). There is empirical evidence that the introduction of more independent boards and more stringent disclosure requirements increases firm value for firms with concentrated ownership (Black *et al.*, 2015). But the effectiveness of these transplants of US based reforms to jurisdictions with concentrated ownership is likely to be insufficient, because the governance problems in the US, which arise because shareholders face important difficulties to control managers, are different from the ones that are prevalent in firms in which significant shareholders have very powerful mechanisms for active monitoring of the managers' activities. Bebchuk and Hamdani (2009) argue that transplants are not the best answer because the arrangements that can enhance investor protection are different in companies with or without a controlling shareholder. Thus the current corporate governance reforms that have been adapted from the US give controlling shareholders additional tools to hold managers accountable but do not alter the relationship between the controlling shareholder and the outside investors. Enriques (2015) argues that the real debate on the design of new procedural mechanisms to tackle this more fundamental problem in Europe has just started, with proposals such the creation of a European Commercial Court, in to whose jurisdiction a corporation may opt (Gilson and Schwartz, 2013).

Summing up we conclude that on the one hand US-style regulation can effectively protect outside investors from block-holders but this is done at the cost

of ending up with a dispersed ownership structure and renouncing the potential benefits of controlling shareholders. On the other hand it seems very difficult to come up with other effective ways of reducing ex-post minority expropriation. Because of this it is important to consider the second alternative for regulating the self-dealing activities of controlling block-holders, i.e. introducing ex-ante restrictions to ownership structure in order to prevent inefficient decisions. This second strategy is a hot topic in the literature. The argument is that the only effective way to reduce private benefits of control while maintaining the benefits of block-holders is to regulate ownership structure. Therefore the regulator should 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).

There are three regulatory options to force high ownership stakes: (i) changes of control under the equal opportunity rule, which lies at the heart of the mandatory bid rule in takeovers; (ii) enforcement of the one share-one vote rule and (iii) promotion of shareholders' democracy and improvements in the voting system. It is clear that all of these options disincentivate minority controlling shareholders but they do not work against majority shareholders. But there are many critical voices against this perspective. Burkart and Lee (2008), Ferrarini (2006), Ventoruzzo (2008) and Enriques (2004) argue that these "minority-friendly" rules, instead of protecting minorities and fostering efficiency, have been designed to serve the interests of the largest block-holders. In fact these rules leave the channels that these block-holders have for private benefit extraction untouched and impede control challenges that may come form activist investors.

3   The Model

3.1   *Agents and Payoffs*

Consider a one-period economy where all agents are risk neutral and the discount rate is normalized to zero. A firm has access to an investment project. The project requires a fixed investment I at time $t = 0$ and the managerial abilities of an agent who we will call the controller or the insider, which can be interpreted as a manager or as a controlling shareholder. To finance the investment the insider must sell securities worth I to outside investors.

Once the funds have been raised the firm always 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 $(1-p)$.

Additionally, the insider can propose an alternative self-dealing investment project in each period (the *self-dealing* project). The projects are mutually exclusive. The self-dealing project also requires an investment I and its return

can be one or zero, but it generates private benefits b for the insider. Moreover the probability of success of the self-dealing 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 outside investors to the controlling insiders. This view can be accommodated in our model assuming that $\widetilde{\delta}$ follows a uniform distribution in the $[0, 1]$ interval. If this were the case the outside investors would always be worst off if the insider engages in self-dealing. But our view is that there will be situations in which both public and private benefits can go hand in hand. We model this alternative view of private benefits by assuming that $\widetilde{\delta}$ follows a uniform distribution in the $[0, 2]$ interval. This specification allows us to encompass different degrees of conflict between the insider and the outside investors. If $\delta > 1$ the insider and the outside investors have congruent interests. For lower values of δ their interests will diverge depending on the value of b. We will assume that the insider observes the realization of δ during the course of his managing or monitoring activities, but it is not observed by the outside investors.

In what follows, to make the problem interesting we will assume that the parameters of the game are such that:

$$b < I < p < 1/2. \tag{1}$$

This ensures that both the standard and the self-dealing projects have a positive net present value and that both projects have a positive probability of failure.

This simple setting attempts to capture some of the particularities of self-dealing that are not present in previous papers. In particular the insider can generate higher public benefits not because of his managerial abilities, but from the self-dealing opportunities that he brings to the firm. 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 insider proposes the self-dealing 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 modeling 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 outside investors against expropriation by corporate insiders in 72 countries and find that enforcement mechanisms are based on disclosure and approval rules (*Rules-based regime*) and/or on litigation rules (*Standard-based regime*).

3.2.1   Rules-Based Regime

The rules-based regime introduces disinterested directors as representatives of the outside investors that can make decisions on their behalf inside the firm. In the particular case of selecting investment projects the rules-based regime implies that when the insider is an interested party to a transaction, the decision is made only by the disinterested directors. There are two characteristics of these disinterested directors that will influence their relationship with the insider.

The first aspect refers to the quality of the information the directors have. We have assumed that the insider knows the value of δ, but we will assume that the disinterested directors receive an informative signal on the quality of the self-dealing project. The signal can be high (H) or low (L), indicating a high value of δ above 1 or a low value of δ below 1. The parameter ω measures the precision of the signal received by the disinterested directors, and we will assume that

$$\omega = \Pr[H|\delta \geq 1] = \Pr[L|\delta < 1] > \frac{1}{2}. \tag{2}$$

As ω increases, the quality of investment decisions made by the disinterested directors increases.

The second aspect refers to the uses that the board can make of the information. The literature on boards of directors has stressed the dual role of boards in advising and monitoring insiders.[2] Better informed disinterested directors will make better investment decisions but they will also use that information to monitor the insiders. To reflect this dual function for the directors we will assume that the ability of the insider to extract private benefits out of the self-dealing project diminishes with the quality of the information of the disinterested directors. In particular we will assume that the private benefits become $b(1 - k\omega^2)$.

3.2.2   Standard-Based Regime

Unlike the rules-based regime, the standard-based regime makes use of the superior information of the insider to make the investment decision. In this case the full board will make the decision. Since the insider will be present either directly or indirectly in the board his information and his preferences

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[2]Raheja (2005), Adams and Ferreira (2007) and Harris and Raviv (2008) present theory models where the board of directors both advisees and monitors the insiders based on the information that the insiders provide them with. As the percentage of independents on the board increases the board monitors more and finds more problems for getting information. This trade-off implies that board composition must balance the gains from monitoring with the gains from advising. Therefore there is some optimal board composition, and regulation imposing a board with a majority of independent directors is not necessarily optimal for many companies.

will influence the investment decision. Therefore, depending on the extent of the influence of the insider, the board's decision will be a compromise between the interests of the insider and the outside investors. For simplicity, and without loss of generality, we will assume that the insider effectively controls the board's decisions and his interests will prevail.[3]

Because of this, we will assume that if the board chooses the self-dealing project and it fails,[4] the investors can bring a lawsuit against the insider and the court will verify project choice and the value of δ. Bringing a lawsuit is costly for the investors, but if the defendant is found liable (i.e. if the court determines that δ was below one) he will pay a damages award to the investors.[5]

If taken to court, the insider 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 self-dealing project knowing that it had a low δ. We will assume that the court must verify project choice (i.e. the existence of self-dealing) and that proving bad faith requires the plaintiff to present evidence verifying δ. The need to verify self-dealing and to provide evidence of bad faith makes the lawsuit costly. We will denote by S the total cost of the lawsuit for the outside investors.

Finally, in a standard-based regime, damages or monetary penalties are to be paid by the insider when found guilty.[6] Under a bath faith standard the court needs to find out whether the insider chose the self-dealing project when δ was lower than one. We will assume that the probability that an innocent defendant is found guilty is zero, and the probability that a guilty defendant is found guilty is one. The variable D denotes the damages award to be paid when the insider is found guilty.[7]

3.3   Timing and Strategy for the Analysis

The timing of the game is the following:

- In *stage 1* the insider raises the amount I by selling securities to outside investors.

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[3]The results do not change substantially if we assume that the board makes decisions that are halfway between the interests of the insider and those of the outside investors.

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

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

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

[7]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 $D' = gD$.

- In *stage 2* the choice of project is made according to the chosen procedure. One of the projects (the standard or the self-dealing project) is undertaken.

- In *stage 3* payoffs from the chosen project are realized.

- In *stage 4*, if the self-dealing project is chosen and fails, under a standard-based regime we enter a litigation sub-game:

   – In *stage 4.1* the outside investors 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 insider is liable after verifying δ.

   – In *stage 4.3* damages D are paid and the period game ends.

Formally, this is a 4-stage dynamic game of complete information. We define $\underline{\delta}$ as the minimum probability of success for which the self-dealing project will be chosen. The choice of $\underline{\delta}$ determines both the public benefits and the private benefits that can be achieved.

4 Unregulated Outcomes

In this section, we discuss two different potential outcomes assuming self-dealing opportunities and private benefit extraction are not regulated. First we study the first-best outcome that can be achieved through a private contract. Then we discuss the second-best outcome that will occur if the parties cannot contract because project choice is not verifiable. These first-best and second-best outcomes will be the references that we will use in the following section to evaluate the regulated outcomes.

4.1 First-Best

Given that the risk-neutral outsiders demand an expected payoff of zero, the insider will offer a contract that gives them an expected payoff equal to I and he will capture all the upside potential of the project. Therefore, from an ex-ante perspective, it is in the interest of the insider to look for mechanisms that can guarantee the most efficient project choice, since he will be the beneficiary of the increase in total value. Here we describe the contract that implements the optimal investment policy.

Efficiency requires that the self-dealing project be chosen when it offers a greater total expected value than the standard project, taking into account both public and private benefits:

$$\delta p + b \geq p. \tag{3}$$

Thus the self-dealing project should be chosen only for:

$$\delta \geq \underline{\delta}^* = \frac{p - b}{p}. \tag{4}$$

If the project is chosen according to the first-best rule the total expected wealth is equal to:

$$W^* = \left[\Pr(\widetilde{\delta} \leq \underline{\delta}^*)p + \Pr(\widetilde{\delta} > \underline{\delta}^*)E(\widetilde{\delta}/\widetilde{\delta} > \underline{\delta}^*)p \right] + \left[\Pr(\widetilde{\delta} > \underline{\delta}^*)b \right]. \tag{5}$$

In this expression the first term in brackets reflects the expected public benefits (PuB^*) and the second term in brackets represents the private benefits of control (PrB^*). If we look at the public benefits, the first term is equal to the probability that the standard project is chosen times its expected return if chosen, and the second term is the probability that the self-dealing project is chosen times its expected return if chosen. The expected private benefits reflect the probability that the self-dealing project is chosen times the private benefit. Substituting for the probabilities of a uniform $[0, 2]$ distribution and given $\underline{\delta}^*$ we can rewrite total expected wealth as

$$W^* = \left[p + \frac{p^2 - b^2}{4p} \right] + \left[\frac{(p + b)\, b}{2p} \right], \tag{6}$$

where again the first term in brackets reflects the public benefits (PuB^*) and the second the private benefits (PrB^*).

In order to implement this outcome, since the value of δ is only known by the insider, it is best to leave control of the investment decision in the hands of the insider, but the contract between the insider and the outside investors must be designed to give him the incentives to make the efficient choice. Moreover the contract must satisfy the outside investors' participation constrain.

Contract payoffs can be made contingent on both project choice and outcome. However, by limited liability, payoffs are zero if the project's outcome is zero. Therefore we denote by R_j the payoff that the contract offers to the insider when he chooses project j $(j \in \{St, Sd\})$ and the outcome is one. Limited liability also implies $R_j \in [0, 1]$.

To implement the first-best outcome two conditions must be satisfied.

First, the insider must select the self-dealing project whenever $\delta \geq \underline{\delta}^*$. Given the contract, the insider prefers the self-dealing project if:

$$R_{Sd}\delta p + b \geq R_{St}p. \tag{7}$$

Therefore the contractual payoffs must be such that:

$$\underline{\delta}^* = \frac{p-b}{p} = \frac{R_{St}p-b}{R_{Sd}p}. \tag{8}$$

This condition will be satisfied for pairs (R_{St}, R_{Sd}) for which

$$R_{St} = \frac{R_{Sd}(p-b)+b}{p}. \tag{9}$$

The second condition requires that the payoffs for the outside investors are high enough to satisfy their participation constraint, i.e.

$$\Pr(\tilde{\delta} \le \underline{\delta}^*)p(1-R_{St}) + \Pr(\tilde{\delta} > \underline{\delta}^*)\left[E(\tilde{\delta}/\tilde{\delta} > \underline{\delta}^*)p(1-R_{Sd})\right] > I. \tag{10}$$

Substituting for the probabilities of a uniform $[0,2]$ distribution and given $\underline{\delta}^*$ and equation (9), this gives us an upper-bound on the value of R_{Sd},

$$(1-R_{Sd})\left[p + \frac{(p-b)^2}{4p}\right] > I. \tag{11}$$

But given our assumption that $p > I$ this condition can be trivially satisfied for a low enough value of R_{Sd}.

This contract can be interpreted as an equity contract where equity is divided between the outside investors and the insider, but the insider must pay an extra dividend to the outsiders (or renounce a performance bonus) whenever he engages in self-dealing. It can also be implemented by means of a convertible debt contract where the debt-holders can convert into equity when the insider engages in self-dealing. This implies that the insider is forced to split his private benefits with the outside investors when he chooses the self-dealing project, via an extraordinary dividend, a lower bonus or a convertible debt contract where part of the debt can be converted into equity in case of self-dealing.

This contract can be implemented if project choice is verifiable. But if this is not the case, ex-post the insider does not have incentives to reveal that he is deviating to the self-dealing project. If this is the case the payoff of the insider cannot be made contingent on project choice. This is our second-best scenario.

4.2 Second-Best

When project choice cannot be verified the insider will get a fixed payoff $(R \in [0,1])$ if the project is successful. Therefore he will choose the self-dealing project whenever:

$$R\delta p + b \ge Rp, \tag{12}$$

which implies that he will choose the self-dealing project if

$$\delta \geq \underline{\delta} = \frac{Rp - b}{Rp}. \tag{13}$$

If the firm gets funding, total expected wealth in each period will be equal to

$$W = \left[\Pr(\widetilde{\delta} \leq \underline{\delta})p + \Pr(\widetilde{\delta} > \underline{\delta})E(\widetilde{\delta}/\widetilde{\delta} > \underline{\delta})p\right] + \left[\Pr(\widetilde{\delta} > \underline{\delta})b\right]. \tag{14}$$

Here again the first term in brackets reflects the expected public benefits (PuB) and the second term in brackets represents the private benefits of control (PrB). We can now substitute the probabilities and, given $\underline{\delta}$, we have:

$$W = \left[p + \frac{R^2 p^2 - b^2}{4R^2 p}\right] + \left[\frac{(Rp + b)\, b}{2Rp}\right]. \tag{15}$$

Finally, in this case the project will get funding if the fraction of the public benefits that the outside investors appropriate is higher than their required investment, i.e. if

$$(1 - R)\left[p + \frac{R^2 p^2 - b^2}{4R^2 p}\right] > I. \tag{16}$$

This contract can be interpreted as a standard debt or equity contract. But, under this second-best contract, investor participation is not guaranteed, particularly if b is high. This means that there is a role for regulation to increase the efficiency of the game when project choice is not verifiable. To investigate this issue we now turn to the study of the regulatory solutions to see how they compare to both the first-best and second-best outcomes that could be achieved in the absence of regulation.

5   Regulatory Solutions

In the previous section we have seen that, in the absence of regulation, if the project's type is not verifiable, some projects with positive net present value will not get funding because the self-dealing problem excessively reduces the cash-flows that the outsiders expect to get. This justifies the introduction of some regulatory solution for the self-dealing problem. In this section we analyze the regulatory outcomes of the game under the rules-based and standard-based regulation.

5.1   Rules-Based Regime (R)

Approval by disinterested directors guarantees that the investment decision is made in the best interest of the outside investors. Recall that the disinterested

directors receive a signal that can take the value H, indicating $\delta \geq 1$ or the value L indicating $\delta < 1$ is below 1. The probability that the signal is correct is given by $\omega > 1/2$.

The unconditional probability of the realization δ being above or below 1 is 1/2. But after observing the signal the directors update their beliefs about the desirability of the self-dealing project. The directors' estimate of the probability of the self-dealing project being preferred by outside investors after they receive a specific signal is given by

$$\Pr[\delta \geq 1|H] = \omega > \frac{1}{2} > 1 - \omega = \Pr[\delta \geq 1|L]. \tag{17}$$

Therefore their optimal strategy is to choose the self-dealing project only when they receive the high signal. Given that ω is the probability that the signal is correct, total expected wealth in each period will be equal to

$$
\begin{aligned}
W_R = & \left[\Pr(\widetilde{\delta} \leq 1) \left[\omega p + (1 - \omega)(E(\widetilde{\delta}/\widetilde{\delta} \leq 1)p \right] \right. \\
& \left. + \Pr(\widetilde{\delta} > 1) \left[\omega(E(\widetilde{\delta}/\widetilde{\delta} > 1)p + (1 - \omega)p \right] \right] \\
& + \left[\left[\Pr(\widetilde{\delta} \leq 1)(1 - \omega) + \Pr(\widetilde{\delta} > 1)\omega \right] b(1 - k\omega^2) \right].
\end{aligned} \tag{18}
$$

Notice that the first line reflects the public benefits and the second the private benefits. This equation simplifies to

$$W_R = \left[p + \frac{p}{2} \left(\omega - \frac{1}{2} \right) \right] + \left[\frac{b(1 - k\omega^2)}{2} \right]. \tag{19}$$

Recall that when project choice is not verifiable the contract can only offer the insider a fixed payoff, $R \in [0, 1]$, if the project is successful. In this case it is never optimal to offer any compensation to the insider because he does not make any decision. Therefore the project can always get funding because the outsiders can appropriate all the public benefit and this public benefit is bigger than p, which in turn is higher than I. Therefore we can see that a rules-based regime is very effective in ensuring that all firms get financing because the conflict of interest is eliminated. This is true even if $\omega = 1/2$ and all information is lost. However the informational loss reduces the total and public wealth that the project generates.

Therefore the relative quality of the rules-based regime depends crucially on ω, the quality of the information that directors have. In particular, for the projects that can get funding under the second-best regime, public benefits will be higher with a rules-based regime only if:

$$\omega > 1 - \frac{b^2}{2R^2 p^2}. \tag{20}$$

How likely is this condition to be satisfied? To the extent that disinterested directors depend on the insider as a source of information, we may expect ω to be low, because the insider does not have any incentives to provide information that will reduce his private benefits. Giving the insider contingent based remuneration, i.e. raising R above zero, could alleviate this problem, but it would also reduce public benefits bringing us closer to the second-best case and making financing more difficult.

5.2   Standard-Based Regime (S)

We now consider the standard-based regime as an alternative regulatory strategy to deal with the insider's private benefits. We proceed backwards and first look at the litigation strategy of the outside investors. Since project choice is observable, the outside investors will sue only if the self-dealing project fails and

$$\Pr(\widetilde{\delta} < 1/\widetilde{\delta} \geq \underline{\delta}_S)D \geq S. \tag{21}$$

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

Given the litigation strategy of the outside investors, the optimal project choice for the insider under the second-best remuneration scheme, when $\delta < 1$ and he expects to be sued with probability π, is to select the self-dealing project if and only if

$$R\delta p + b - (1 - \delta p)\pi D \geq Rp. \tag{22}$$

Therefore the insider prefers to undertake the self-dealing project whenever

$$\delta \geq \underline{\delta}_S = \min\left\{1, \frac{Rp - b + \pi D}{p(R + \pi D)}\right\}. \tag{23}$$

Notice that the interests of the investors and the insider coincide whenever $\delta \geq 1$, so that sometimes the self-dealing project is optimal both for the insider and the outside investors. This implies that the outside investors will sue only when they expect the insider to deviate for values of δ below 1. Therefore for an equilibrium with a positive probability of litigation π must adjust so that $\underline{\delta}_S < 1$. And for $\underline{\delta}_S < 1$ equation (21) can be rewritten as

$$\frac{1 - \underline{\delta}_S}{2 - \underline{\delta}_S}D \geq S. \tag{24}$$

The equilibrium of this litigation game depends on the relative level of litigation costs and damages award. Proposition 1 describes the three possible equilibria of the litigation game.

Proposition 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 there will be no litigation ($\pi = 0$) and the game falls back to the unregulated second-best equilibrium. This happens whenever*

$$S \geq \frac{b}{b + Rp} D. \tag{25}$$

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

$$\pi = \frac{b(D - S) - RpS}{[(1 - p)D - (1 - 2p)S] D} \in (0, 1). \tag{26}$$

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

$$\frac{b}{b + Rp} D > S > \frac{b - (1 - p)D}{b + Rp - (1 - 2p)D} D. \tag{27}$$

3. *Equilibrium with maximum litigation. When legal fees are very low relative to damages awards the outside investors will always sue ($\pi = 1$). In this case the insider will choose the self-dealing project for $\delta \geq \underline{\delta}_S = \frac{Rp - b + D}{p(R + D)}$. This happens whenever*

$$S \leq \frac{b - (1 - p)D}{b + Rp - (1 - 2p)D} D. \tag{28}$$

In equilibria 1 and 3 there is under-litigation and over-litigation. Therefore, in what follows, we will focus on equilibrium number 2, where there is an intermediate level of legal fees relative to damages awards so that we have a mixed strategy equilibrium where the outside investors sue with probability $\pi \in (0, 1)$. In this case the expected total wealth generated in each period will have three components. The first component includes the net investment returns given by

$$InvR_S = \Pr(\tilde{\delta} \leq \underline{\delta}_S)p + \Pr(\tilde{\delta} > \underline{\delta}_S)E(\tilde{\delta}/\tilde{\delta} > \underline{\delta}_S)p. \tag{29}$$

The second component refers to the net litigation benefits for the outside investors

$$LiB_S = \Pr(1 > \tilde{\delta} \geq \underline{\delta}_S) \left[1 - E(\tilde{\delta}/1 > \tilde{\delta} > \underline{\delta}_S)p \right] \pi D$$
$$- \Pr(\tilde{\delta} > \underline{\delta}_S) \left[1 - E(\tilde{\delta}/\tilde{\delta} > \underline{\delta}_S)p \right] \pi S. \tag{30}$$

The third term reflects the private benefits net of litigation costs for the insider, given by

$$PrB_S = \Pr(\widetilde{\delta} > \underline{\delta}_S)b - \Pr(1 > \widetilde{\delta} \geq \underline{\delta}_S)\left[1 - E(\widetilde{\delta}/1 > \widetilde{\delta} > \underline{\delta}_S)p\right]\pi D. \quad (31)$$

Substituting for the value of the threshold $\underline{\delta}_S = \frac{D-2S}{D-S}$ we can rewrite

$$InvR_S = p + \frac{D - 2S}{4(D - S)^2}Dp. \tag{32}$$

$$LiB_S = \frac{b(D - S) - RpS}{4\,(D - S)\,[(1 - p)D - (1 - 2p)S]}Sp. \tag{33}$$

$$PrB_S = \frac{D}{2(D - S)}b - \frac{[2\,(D - S)\,(1 - p) + Sp]\,(b(D - S) - RpS)}{4\,(D - S)^2\,[(1 - p)D - (1 - 2p)S]}S. \tag{34}$$

Notice that, if condition (27) holds, the investment return is higher than p ($InvR_S > p$) and the litigation benefit is positive ($LiB_S > 0$). This implies that for a low enough value of R the project can always get funding because the part of the public benefits that outside investors appropriate is higher than I, i.e. it is always possible to find a value of R such that the following condition holds, even if the litigation benefit tends to zero:

$$(1 - R)InvR_S + LiB_S \geq I. \tag{35}$$

Therefore, just as in the case of the rules-based regime, we find that a standard-based regulation can be effective in facilitating firms' access to finance. However we also see again that total wealth is reduced because of the litigation costs and the suboptimal investment strategy that may be induced. In particular notice that according to equation (26) if R is very low the probability of litigation will be high and this will generate substantial net litigation costs. Increasing R would reduce litigation costs and align incentives better but it would also reduce the share of public benefits that outside investors can appropriate, bringing us closer to the second-best case and making financing more difficult.

6 Opting-Out

In Section 4 we identified the simple financial contract between the insider and the outside investors that could implement the first-best outcome. This contract cannot be implemented if project choice is not verifiable because in the absence of regulation, the insider does not have incentives to reveal his project choice. In the second-best outcome, which would occur in the absence of regulation, many firms would not get funding. In Section 5 we have

seen how the current regulation addresses this financing problem: it allows more firms to access financing by limiting private benefits. Nevertheless it reduces investment efficiency for those firms that could get financing under the second-best scenario.

In this section we argue that designing regulation as a penalty default that allows companies to opt-out and implement a contract would improve upon the current situation. Very strict regulation that forbids self-dealing and functions as a penalty default with the option to opt into a contract would ensure access to financing in case the parties prefer not to contract. But it would also give the insiders incentives to opt-out and reveal project choice, so that the first-best contract can be implemented. In this sense we can say that the regulation of self-dealing should be designed as a penalty default that allows the parties to opt-out and implement a more efficient outcome than that which could be achieved either in the absence of regulation or under mandatory regulation.

To see how this would happen, consider an alternative regulation that simply does not allow for self-dealing. In the rules-based regime this would imply that the board would be instructed to oppose any project that generates private benefits for the insiders. In the standard-based regime it implies a strict liability regime according to which the insider has to pay D if the self-dealing project fails. If the parties do not opt-out, when the self-dealing project fails the outsiders will litigate for any $D > S$. And, under the second-best contract, the insider would only deviate to the self-dealing project if:

$$R\delta p + b - (1 - \delta p)D \geq Rp. \tag{36}$$

If D is high enough, the insider would never deviate to the self-dealing project. This minimum D is increasing in δ and decreasing in R. Therefore the insider would never deviate to the self-dealing project provided that

$$D > \max\left\{S, \frac{b}{1 - 2p}\right\}. \tag{37}$$

Under this strict regulation the standard project would always be implemented, expected total wealth would be equal to $p,$, and the project would always get funding if the parties accept the default regulation. Therefore the second-best outcome would be avoided.

But this would also allow the parties to implement the first-best. This could be achieved by offering the insider a waiver from the default regulation in exchange for disclosing his project choice and accepting the contract (R_{St}, R_{Sd}). To implement the first-best this contract must satisfy several conditions.

First, having opted out, the threshold for project selection must be $\underline{\delta}^*$. Under truthful revelation the insider prefers the self-dealing project whenever

$$R_{Sd}\delta p + b \geq R_{St}p. \tag{38}$$

Therefore the first condition that the contract must satisfy is that payoffs R_{Sd} and R_{St} are such that

$$\underline{\delta}^* = \frac{p-b}{p} = \frac{R_{St}p - b}{R_{Sd}p}. \tag{39}$$

Second, the insider must have incentives to disclose that he is deviating to the self-dealing project. He will do this if he prefers this to staying in the default regulation. In the rules-based regulation if he does not disclose, the board implements the standard project and therefore the previous condition is enough to guarantee truthful revelation. However, in the standard-based regime the insider may not disclose but still implement the self-dealing project being subject to subsequent litigation if it fails. Therefore under a standard-based regulation the insider will only reveal truthfully if:

$$R_{Sd}\delta p + b \geq R_{St}\delta p + b - (1 - \delta p)D. \tag{40}$$

This implies that he will only have incentives to disclose project choice when δ is low relative to D, so that the probability of failing and having to pay damages is sufficiently high, i.e.

$$\delta \leq \frac{D}{[(R_{St} - R_{Sd}) + D]\,p}. \tag{41}$$

Given our assumption that $\delta \in [0,2]$, ensuring that he will always disclose truthfully (i.e. for any δ below 2) sets a lower-bound on the value of R_{Sd}. In particular it requires

$$R_{Sd} \geq R_{St} - \frac{(1-2p)D}{2p}. \tag{42}$$

But interestingly this condition can also be interpreted as a minimum value for D, implying that D has to be high enough given the terms of the contract to satisfy:

$$D \geq \frac{2p\,(R_{St} - R_{Sd})}{(1-2p)}. \tag{43}$$

Finally the third condition requires that the payoffs for the outside investors are high enough to satisfy their participation constraint. As we showed in Section 4 this gives us an upper-bound on the value of R_{Sd},

$$(1 - R_{Sd})\left[p + \frac{(p-b)^2}{4p}\right] > I. \tag{44}$$

The conclusion from this analysis is that a very strict regulation on self-dealing that allows opting out into a contract of the type (R_{Sd}, R_{St}) guarantees both access to financing for the firms that adopt the default and investment

efficiency for the firms that opt-out. This can be implemented both under a rules-based regime that does not allow the board to approve any self-dealing project and under a standard-based regime that sets very high penalties for engaging in self-dealing, i.e. for D high enough to meet conditions (37) and (43).

7 Discussion of the Results

There is an ongoing debate in the legal literature discussing the regulation of self-dealing and other types of private benefits. The issue is further complicated because different insiders have different means of extracting private benefits. Managers usually obtain private benefits via remuneration contracts, while controlling shareholders mostly obtain private benefits through self-dealing operations, which are often carried out within business groups.

On the other hand the economic literature has viewed private benefits as an inefficient transfer from investors to insiders, which leads to the conclusion that the optimal regulation should eliminate opportunities for private benefit extraction. Therefore, from this point of view the legal debate seems to be only centered on fairness issues, since from an efficiency point of view the law should restrict all opportunities for private benefits and particularly for self-dealing. If insiders need to be compensated it is more efficient to do so explicitly via remuneration.

In this paper we have taken a more nuanced approach to private benefits, allowing for the existence of self-dealing opportunities that may simultaneously, though not equally, benefit outside investors and insiders. The assumption is that insiders widen the strategic choices of the firm through their access to self-dealing opportunities about which they have superior information. The problem is to align the incentives so as to make sure good self-dealing opportunities are seized and pernicious ones avoided. Viewed in this light the regulation of self-dealing opportunities is a complex issue.

Our analysis has shown that in a setting where the insider has superior information about the self-dealing operations and verification is not possible, the outside investors and the insiders can only implement standard debt or equity contracts. This results in many valuable business projects not getting funding, and it makes regulation necessary.

A careful analysis of the two existing regulatory regimes (rules-based and standard-based) shows that they increase public benefits by limiting self-dealing opportunities. Therefore, when effectively enforced, these regulatory regimes allow more firms in the economy to access funding, solving the market failure that occurs in the second-best scenario. But for many firms, which could get funding even in the second-best scenario, the regulation is costly because total benefits are reduced. In the rules-based regime this happens because

it is inefficient to leave the investment decision in the hands of disinterested directors that have less information than in the insider about strategic choices. In the standard-based system this happens because recourse to courts to verify project choice is costly.

If self-dealing regulation is considered mandatory, it is not possible to improve upon this regulatory outcome. But if one allows for the possibility of opting out of the default regulation and into a contract, there would be firms that could get funding at a lower cost by contracting on self-dealing operations.

We have seen that if the regulation is designed as a penalty default, in the spirit of Ayres and Gertner (1989), it is possible to induce the insiders to reveal that they are engaging in self-dealing, thus solving the verification problem. This allows the implementation of a contingent contract that benefits both the insider and the outside investors and guarantees a better exploitation of the investment opportunities available in self-dealing operations. This contingent contract can be interpreted as an equity contract where equity is divided between the outside investors and the insider, but the insider must pay an extra dividend to the outsiders whenever he engages in self-dealing. But the contingent contract is compatible with any contract that forces the insider to split his private benefits with the outside investors when he engages in self-dealing, via an extraordinary dividend, a lower bonus or a convertible debt contract where part of the debt can be converted into equity in case of self-dealing. A perquisite for these contracts is a regulation that is tough on self-dealing.

The results from our normative study of the model also allow us to analyze and compare the different approaches that we observe in the regulation of self-dealing and in the availability of external financing and the extent of private benefit extraction across jurisdictions. The regulation of conflict-of-interest transactions concerning managers is similar both in the US and in Europe. But there is a big difference in the treatment of conflicted transactions when the interested party is a controlling shareholder. In the US control effectively triggers liability.[8] But in Europe this is not the case: a controlling shareholder does not face a duty of loyalty for his managing decisions, even if he effectively exerts control, which is the case in most European listed firms.[9] Therefore,

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[8]In Delaware, it has been held that the breadth of the majority shareholders' fiduciary duty is dependent on the circumstances of each case. Generally, the "business judgment rule" will apply to the decisions of the majority that have a rational business aim. But where the minority shareholders (plaintiffs) manage to prove that the activity of the majority involves "self-dealing" the court adopts the "intrinsic fairness" test and the burden of proving the fairness of the transaction shifts to the majority (defendants). Sinclair Oil Corp. v. Levien, 280 A.2d 717 (Del. Sup. Ct. 1971); Gabelli & Co. v. Liggett Group Inc., 444 A.2d 261 (Del. Ch. 1982), affd, 479 A.2d 276 (Del. Sup.Ct. 1984); Weinberger v. UOP Inc., 457 A.2d 701 (Del. Sup. Ct. 1983).

[9] For example, English case law has recognized a shareholder's voting rights as property, which may be used as the owner wishes. The only exceptions are cases of alteration of the

according to our analysis the European regulation seems inefficient in reducing private benefit extraction by the inside shareholders in controlled companies and the resulting situation is similar to our second-best scenario.

This is consistent with the stylized facts in these two jurisdictions. Even though the American and the European economies are of similar size, the American stock market doubles the size of the European[10] and the difference in availability of venture capital is even bigger.[11] Fearing expropriation investors are less willing to provide financing for European firms. Moreover, the American system discourages the growth of controlled firms, because the regulation limits the benefits that can be obtained from this type of ownership structure. On the other hand, in Europe controlled firms and especially business groups flourish because, provided they get financed, they can fully exploit the advantages of the strategic self-dealing opportunities that this ownership structure conveys.

Interestingly, in equilibrium a superficial analysis of these differences tends to reinforce the validity of the initial regulatory approach. In the US most conflict-of-interest transactions have to do with executive remuneration, which leaves little benefit for the investors and therefore warrants a tough approach. In Europe most conflict-of-interest transactions have to do with intra-group business operations where it is more difficult to value the relative gains for the controlling shareholders and the outside investors and some degree of leniency is optimal ex-post.

Is opting out through contract a viable alternative in any of these systems? In the US the current regulation is effective in giving firms access to funding. Nevertheless, opting out would increase the total wealth generated by some firms with many valuable self-dealing opportunities and the current regulation gives the correct incentives to facilitate contracting, which as we have seen could be implemented by means of extraordinary dividends for the outside shareholders. In Europe at present the possibility of opting out would be largely irrelevant because of the laxity of the current regulation. The most pressing need is to introduce liability for the controlling shareholder, to facilitate

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articles of incorporation -where supermajorities should be required- and cases of fraud on the minority. For a detailed discussion of the controlling shareholders' duties across jurisdictions see Enriques *et al.* (2009a).

[10]The Word Bank reports an increase in stock market capitalization as a percentage of GDP in the US from 129.8% in 2005 to 151.2% in 2014, while for the Euro zone the percentage was 59.4% in 2005 and 59% in 2014.

[11]Hege *et al.* (2009) report that early-stage financing in Europe in 1999 at the height of the Internet bubble was 12 billion euros, roughly a quarter of what it was in the US that year. The Economist reports 2.2 billion euros in seed and start-up capital in Europe for all of 2009, roughly equal to what it was in just the first quarter of 2009 for the US (June 12, 2010, p. 78). The Wall Street Journal (Jul. 31, 2013) reports that just taking the second quarter of 2013, US venture capital investments into business and finance, information technology and consumer services totaled $4,674 million. That is more than the entire amount invested in Europe in 2012 ($3,905 million). US VCs completed 563 deals compared to 229 in Europe (which together were worth $999 million).

financing and access to capital markets for small controlled firms that have growth opportunities. Allowing companies to contract over private benefits would only make sense under a stricter regulation.

8   Conclusions

In this paper we break away from the idea that private benefits are a simple transfer from the outside investors to the controlling insiders. We view different investment projects as offering different levels of both public and private benefits, about which there is asymmetric information between the outside investors and the insiders. Private benefits are therefore an unavoidable feature of the investment decisions that firms have to make repeatedly. We have discussed the reasons for and the limitations of the existing legal remedies for regulating these types of self-dealing operations and we have argued that a strict penalty default regulation that is very though on self-dealing but allows the parties to opt-out into an efficient contract can guarantee both access to financing for the firms that opt for the default and investment efficiency for the firms that choose to opt-out.

Two important policy implications arise from our analysis. First, regulating self-dealing transactions and preventing outside investor 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 a default strict regulation of self-dealing is still necessary to ensure all firms can get funding from outside investors and to give incentives for the insiders for opting out and setting up an efficient contract.

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