INVESTOR PROTECTION AND THE COASIAN VIEW*

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Abstract
Some legal regimes leave gaps in the protection provided by the law to firm investors. This paper considers the decision by a firm to opt out of the law and bridge those gaps using private contracts. Examining the charters of a sample of Mexican firms, we find that private firms often enhance significantly the protection offered by the law to their investors, but public firms rarely do so. To explain our findings, we construct a model that endogenizes the degree of investor protection that firms provide. We assume that legal regimes differ in their ability to enforce, what we call, precisely filtering contracts, namely, contracts that provide protection only in those cases where expropriation can occur. The provision of investor protection is costly to the firm, because when constrained to using imprecisely filtering contracts, it may lead to an overinclusion problem whereby the firm is prevented from taking some efficient actions. In choosing the level of protection to provide to their investors, firms weigh the benefit of expropriation reduction against the overinclusion cost. Since this overinclusion cost is increasing in the cost of renegotiation with investors, we propose that firms will tend to offer their investors higher protection when renegotiating with them is less costly. Therefore, consistent with our findings, private firms, which are characterized by low renegotiation costs, would tend to provide more protection to their investors than would public firms, for which renegotiation is almost infeasible. Furthermore, since the overinclusion cost is decreasing in the adeptness of legal regimes at enforcing precisely filtering contracts, we propose that firms operating in legal regimes that are more adept at enforcing such contracts will offer their investors more protection.

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1 Introduction

Much evidence suggests that the level of investor protection provided by a legal system has important economic consequences. The higher is investor protection provided by the law, the more developed are the financial markets (La Porta et. al. 1997, 1999), and the faster is economic growth (King and Levine 1993, Beck et. al. 2000, Mahoney 2001).

This evidence clashes with some basic theoretical considerations. A direct application of the Coase Theorem holds that, absent significant transaction costs, capital suppliers and users should agree and privately contract on the efficient level of investor protection when that level is not provided by the law.\(^1\) The possibility of filling in the gap left by the law by contractually “opting out” from it should, in principle, make the resultant investor protection efficient across all legal systems. This, in turn, should render immaterial the level of investor protection provided by the law, contrary to the findings.

This ostensible Coasian puzzle assumes, however, that different legal systems are equally adept at strict enforcement of contracts. A possible resolution to the puzzle then suggests that a legal system with low investor protection provided by law is associated with courts that are anemic in the enforcement of contracts that enhance investor protection (see Glaeser et. al. 2001, La Porta et. al. 1999, Djankov et. al. 2002).

We begin this paper by taking the previous argument to the testing ground of the Mexican legal system.\(^2\) We first note that Mexican law provides scant protection to its investors and, therefore, leaves a need for contractual opting out to supply that protection privately. Now, if the Mexican legal system is also inept at enforcing contracts, then opting

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\(^1\) Easterbrook and Fischel 1991 provide an extensive discussion of this.

\(^2\) Due to the natural importance of contractual opting out as a mechanism of improving investor protection, we do not deal with other means of achieving the same end, such as incorporation in a foreign country or international takeovers.
out from the law should rarely be observed; it would be of little use anyway. If, on the other hand, the Mexican legal system is adept at enforcing contracts, then opting out by private contracting should accompany virtually all types of capital supplied by investors to users. We find neither.

We construct a sample of all firms that went public in the Mexican stock exchange from 1992 to 2000. For each firm in the sample, we examine the charter that was in effect at the time of the IPO and the charter preceding it.

We observe two things. First, when privately held, over half the firms offer their investors significant protection beyond that provided by Mexican law. This is a clear manifestation of contractual opting out from the law. It also indicates reliance of the contracting parties on the Mexican courts to enforce those contracts.

Second, we observe that when going public, virtually no firm provides significant investor protection to its public investors beyond that provided by the law. This seems to contradict the first observation. If supplemental private contracting of investor protection is needed in Mexico, and if the Mexican courts can be relied upon to enforce such contracts in private offerings, then why are similar contracts not written when Mexican firms go public?

To answer this question, we present a model that endogenizes the degree of investor protection provided by firms. We consider a firm that is wholly owned by a single agent, the insider, and that raises equity for a project. Once equity is sold and the project undertaken, the insider has the potential to expropriate investors. To curb his own ability to expropriate, the insider can offer investor protection through a private contract.

Rather than assume, as is common in the literature, that legal regimes differ in the level of protection that they provide by law to investors, we assume that each is characterized
by the set of contracts that it can enforce. Specifically, we assume that legal regimes differ in their ability to enforce precisely filtering contracts, i.e., those that provide protection in those cases where expropriation can occur, and only in those cases.

For example, certain legal regimes can enforce a precisely filtering contract that provides rights to investors in all cases when “tunneling of assets occurs.” In other legal regimes, however, the only investor protection contract that is enforceable is one that provides rights whenever “assets are sold.” This characterization of legal regimes according to their enforceable contract set is very much in the spirit of Coffee 2001, which refers to a “smell test” that courts in common law legal regimes can perform to detect expropriation, unlike civil law legal regimes that cannot.

Naturally, curbing expropriation through an imprecisely filtering contract may result in situations in which investor protection should be provided, but is not; an underinclusion problem. But an imprecisely filtering contract may also result in an overinclusion problem, whereby investors are granted unnecessary rights over actions that are unrelated to expropriation. For example, a contract that, in order to protect investors, indiscriminately bars all sales of assets would prevent efficient ones too.

Thus, with only imprecisely filtering contracts at his disposal, the insider faces a trade-off in choosing the level of investor protection. On one hand, increasing investor protection generates two benefits: It increases the firm’s pledgeable income, preventing possible ex-ante costs of underinvestment. It also reduces the extent of expropriation that, in and of

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3Johnson et. al. 2000 define tunneling as “the transfer of assets and profits out of firms for the benefit of those who control them.”
itself, is assumed to be inefficient. On the other hand, increasing investor protection also generates costs by preventing the firm from taking efficient actions in some cases.\footnote{We use the term precisely filtering contract because it allows efficient actions while blocking expropriation.}

We propose then that when a small number of investors provide capital privately to the firm, the insider, bound to choose from a menu of imprecisely filtering contracts, would tend to offer to them contracts that are overinclusive. By doing so, the insider captures the attendant benefits without incurring the costs of preventing efficient actions. This is so because the small number of investors allows renegotiation to occur. Once a situation arises in which the contract empowers investors to block the firm from taking an efficient action renegotiation ensues, appropriate side-payments are made, and efficient actions are taken.

By contrast, when the number of investors is prohibitively large to allow successful renegotiation, as in a publicly held firm, the overinclusion cost associated with imprecisely filtering contracts remains. Insiders would then tend to shun overinclusion and they would tend to underinclusion instead.

These two predictions are consistent with our findings that firms in Mexico are more likely to provide rights to their private investors than to their public investors.

Moreover, when the firm operates in a legal regime that is more adept at enforcing precisely filtering contracts, the overinclusion cost decreases, so that the insider is more likely to provide a higher degree of protection. Stated differently, the degree of investor protection provided by the insider is increasing in the size of the enforceable contract set of the legal regime in which the firm operates.
Much of the related research regarding the endogenous provision of investor protection refers to the market for corporate control. This includes empirical studies such as Daines and Klausner 2000 and Field 1999, and theoretical studies such as Grossman and Hart 1988 and Bebchuk 1994. However, this branch of literature does not focus on the enhancement of investor protection through contractual opting out in legal regimes that provide lax investor protection.

Easterbrook and Fischel’s 1991 classic treatment of the analysis of corporate law stresses the importance of the private provision of investor protection. In analyzing a firm’s decision to provide investor protection, they refer to the cost of opportunistic holdup problems, exacerbated by large numbers of investors. They do not focus on the importance of the set of enforceable contracts in a legal regime as a determinant of the degree of protection that firms provide to their investors.

Ehrlich and Posner 1974 deal with the choice of promulgating legal rules as standards or bright line rules, focusing among other issues on the overinclusion costs associated with the use of bright line rules. As in our model, Coffee 1999 refers to these overinclusion costs and the choice of the degree of investor protection provided by firms. However, the importance of the ability to renegotiate, and the implications for the provision of protection to private and public investors are not discussed.

Additionally, Glaeser and Shleifer 2002 provide an historical explanation for why legal regimes may differ in the set of contracts that their courts can enforce, discussing the different use of bright line rules and standards in common law and civil law legal regimes.

Gomes and Novaes 2000 endogenize investor protection in a setting where the cost of providing rights is that corporate paralysis may result when parties have joint control over
an action. Once again, the emphasis is not on contractual opting out in an environment with lax investor protection.

Finally, the financial contracting literature dealing with the costs and benefits of multiple creditors is related to our work in its focus on the problems arising in multi-party renegotiation (see e.g. Bolton and Scharfstein 1994).

Section 2 presents the empirical evidence. Section 3 presents a theoretical model that explains the evidence. Section 4 concludes.

2 Empirical Evidence

Mexican law provides scant protection to investors. In La Porta et. al. 1998, the measure of protection offered by law to equity investors places Mexico in the bottom 15% in their sample of 49 countries.\(^5\) Therefore, when Mexican insiders and their respective investors write their corporate charters—sets of rules that stipulate how a given firm is to be governed—it should be expected that many will include rules aiming to fill in the gap between the existing and the optimal levels of investor protection.

Our initial sample comprises all the firms that went public between 1992 and 2000. Excluding financial firms and firms owned by the government leaves us with 63 firms.\(^6\) By law, any firm undertaking an IPO in Mexico must file its charter of constitution and all modifications to it with the Mexican stock exchange (Bolsa Mexicana de Valores). For each firm in the sample, we look at the charter that was in effect just before the IPO. We call it

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\(^5\) Mexico obtains a score of 1 out of 6 in their measure of equity protection. The average for countries with common law origin is 4, while for countries with French civil law origin it is 2.33. Mexico is part of the latter group. In June 2001, the Mexican law was reformed to provide additional protection to investors; firms in our sample were not operating under this new legal regime.

\(^6\) Additionally, we did not include the single case in which a public firm spun-off a subsidiary.
the “private charter,” as it provides rights to private investors. We also look at the charter that replaced the private charter at the time of the IPO. This charter provides rights to the public investors, and therefore we call it the “public charter.”

We discard another 16 firms from the sample, because they lack complete information, leaving a final sample of 47 firms for which we have both the public and the private charters. In addition, our sample includes the ownership structure that was in effect at the time that each charter was written.

The analysis of contractual opting out in the private charters is aided by the fact that the distribution of the degree of investor protection beyond that provided by law is bi-modal. This in the sense that in almost all cases, there is either a significant degree of opting out or no opting out at all.

The following is an example of a case in which the private charter provides additional investor protection (two other examples are included in Appendix A):

In December 1996, GAMI Investments Inc., a subsidiary of Equity Group Investment Inc., purchases 8.3% of Grupo Azucarero Mexicano S.A. de C.V. for $25 million. GAMI Investments is issued a special class of shares — C shares. The charter states that a resolution in a shareholder meeting dealing with any of the following issues must be approved by the C shares:

- Merger or acquisition by Grupo Azucarero or any of its subsidiaries in one or more related transactions for an amount greater than $30 million

- Sale, rent, or transfer of more than 10% of Grupo Azucarero’s or any of its subsidiaries’ consolidated assets in one or more related transactions

- Share repurchase
- Modification to the charter

- Long term debt issuance

- Liquidation of the firm

- Removal or appointment of comptrollers or external auditors

- Voting shares of subsidiaries in any of the above issues

In addition, the C shareholders will appoint three members of the board, a majority of which must approve any board resolution dealing with the above issues.

We thus classify a firm as contractually opting out through its private charter when investors are provided substantial information and control rights, affording them redress against opportunistic insider behavior. These contractual opting out provisions include veto powers provided to specific classes; board representation; rights to appoint external auditors and comptrollers; supermajority attendance-quorum requirements and resolution-quorum requirements for shareholder meetings and board meetings; and supermajority requirements for resolutions dealing with specific cases such as capital expenditures, sale of assets, acquisitions, financing, compensation, general operational activities, and contract approvals.⁷

In addition, we examine ownership structures to identify firms with outside investors, because only those are expected to exhibit contractual opting out. We mark a firm as having outside investors if there are either two shareholders that do not belong to the same family, or else if no shareholder owns more than 95% of the shares. This is a very conservative criterion; a firm jointly owned by two brothers, say, one with 90% of the shares and the other with the remaining 10%, is still considered to have an outside investor.

⁷There are six firms that provide only informational rights (mainly board representation to investors which would not have been provided by law). We do not classify these as contractually opting out cases.
We find that of the 47 firms in our sample, 39 had outside investors when they were privately held. Of these 39 firms, we find that 20—just over 50%—exhibit contractual opting out providing investor protection that is not granted by the law.

When those 47 firms went public, the private charters were replaced by public ones. In all but five of the those public charters, firms did not provide any protection to public investors beyond what was provided by law, with the exception of American Depository Receipts (ADRs) which we discuss shortly. One of those five firms, Hilasal S.A. de C.V., provided significant additional rights to its investors. Also, two firms provided a single investor protection enhancing provision in their charters, which, while not comparable to the degree of protection offered by Hilasal, we classify as providing non-negligible additional investor protection. The charters of the remaining two firms include a single right that we consider as providing negligible additional investor protection.\(^8\)

We find that 16 firms issued ADRs in addition to the shares issued in the Mexican stock exchange. We do not consider these to be significant cases of contractual opting out.\(^9\) While providing some informational and acquisition-related rights, the degree of investor protection is not comparable to that provided by Hilasal or the 20 firms in the private case. Furthermore, half of the firms issued ADRs comprising mostly non-voting shares.

In sum, only one out of the 47 firms in our sample (less than 3%) significantly enhanced the protection offered to its public investors through contractual opting out provisions, and two additional firms (just below 5%) enhanced this protection in a non-negligible manner.

Thus, while just over half of the private firms use contractual provisions to significantly

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\(^8\) Appendix B details the rights that these five firms provide to their investors.

\(^9\) The most important rights provided by ADRs are disclosure of large shareholders, timely disclosure of material information, restrictions on insider trading, equal opportunity to participate in tender offers, and “fair price” payment to minority shareholders in going private transactions (Coffee 1999). The acquisition related rights provided by ADRs do not apply to shares traded in the Mexican Stock Exchange.
enhance the protection offered to their investors, practically no public firm does the same for its public investors.\footnote{We find that in most cases the outside investors of the private firms do not leave the firm when the firm goes public. Out of the aforementioned 20 private firms that provided significant investor protection, five firms still provide significant protection to their private investors in their public charters. We do not know whether the remaining 15 firms stripped their investors of their rights since it is quite possible that these rights were transferred to a private shareholders' agreement. It should be added that the possibility of a private shareholders' agreement only enforces our finding that contractual opting out does occur with private investors. Of course, private shareholder agreements cannot be written with public investors, so we observe all rights provided to these investors.}

These findings suggest first, that in a country where the legal system provides poor investor protection, firms do contractually opt out. Second, courts in such countries appear to be able to enforce at least some types of contracts that enhance investor protection.\footnote{An argument can be made that even though these contracts are written, they will not be enforced. The great detail within charters and the high variability between them seem to suggest otherwise. Furthermore, two firms out of the 20 that opt out allow the use of arbitration according to the rules of the International Chamber of Commerce for the enforcement of their charters. This would suggest that the remaining 18 firms choose to use Mexican courts for the enforcement of their charters.}

Finally, it appears that the choice of whether to supplement investor protection is affected by whether the firm is publicly traded or privately held. In the next section we present a model motivated by these observations that endogenizes and explains the observed choices of investor protection enhancement.

## 3 The Model

### 3.1 Setup

Consider a firm faced with an opportunity to invest in a positive NPV project. Choosing to invest an amount $I > 0$ in the project yields a return of $f(I)$, with $f' > 0$, $f'' < 0$, $f(0) = 0$, and $f'(0) > 1$. We assume that the firm is cash constrained, so that any amount invested must be raised through outside equity.\footnote{While we focus on equity financing, allowing the firm to raise external capital by issuing debt does not change the results.} For simplicity, we assume that the firm is
initially wholly owned by a single agent, whom we call the insider. We also assume that all agents are risk neutral, that the discount factor is 1, and that capital markets are perfectly competitive.

Once equity has been sold, the insider has the opportunity to expropriate firm funds. We assume, as is standard in the literature, that expropriation is wasteful and therefore inefficient (see Burkart et. al. 1997). Formally, we assume that the insider can divert a fixed fraction $s$ of the return, from which a part that is equal to a fixed fraction $c$ of the return is wasted.

We further assume that the insider can expropriate wealth from the firm only when he takes a certain action $A$, which, in itself, may well be efficient in some states of nature. For example, $A$ could be the sale of firm assets, which is efficient in many situations, but also presents the insider with the opportunity to expropriate through the practice of tunneling. Formally, we assume that with probability $p$ the action $A$ is efficient, and if taken, it yields an additional positive gross return of $B$. To simplify the analysis, we assume that the insider cannot expropriate from the additional benefit $B$. Obviously, when the firm forgoes an efficient action it does not get the attendant benefit $B$. We will call that the cost of forgone opportunities.

As a benchmark to the analysis that follows, we spell out the first best outcome of our model. Clearly, the first best level of investment $I^{FB}$ solves $f'(I^{FB}) = 1$. Next, since expropriation is inefficient, it never occurs in the first best outcome. Also, the first best outcome dictates that action $A$ is taken whenever it is efficient. Finally, since, as we assume, capital markets are perfectly competitive, the insider captures the full NPV of the project, yielding him an expected payoff of $f(I^{FB}) - I^{FB} + pB$. 

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Continuing with our model, we assume that every legal regime is characterized by a different set of contracts that can be enforced in a court of law. In each regime, the only contracts that are used are from this set, which we call the enforceable contract set. This is relevant to the insider who may benefit from committing not to expropriate. In that case, the insider will offer to his investors a contract from the enforceable set describing the degree of protection he is ready to grant them.

To simplify, we consider only two types of legal regimes: high precision and low precision.

Low precision legal regime: We assume that in this type of regime, expropriation by an insider is not verifiable. Therefore, the only contracts that courts can enforce are those that ban action A, efficient or otherwise. We denote this imprecisely filtering contract by \( \neg A \).

The insider’s alternative to offering the \( \neg A \) contract is to not offer investor protection at all. To ease notation, we identify this choice with the null contract that allows the firm to take action A unfettered, and we designate it by A. Thus, the set of enforceable contracts in a low precision legal regime is \{ \( \neg A \), A \}.

High precision legal regime: In this type of regime, courts can enforce a contract that specifically bans expropriation (without banning action A), because they can verify when it occurs. The set of enforceable contracts of the high precision regime then includes this contract, denoted \( \neg \exists X \) (as well as the contracts of the low precision enforceable set).\(^{13}\)

We next analyze four cases. In each of the two distinct legal regimes, we consider an insider’s optimal decisions in a public firm and in a private firm. In a public firm,

\(^{13}\)In an earlier version, we allowed for a continuous measure of the degree of precision of legal regimes. Expropriation was taken to be correlated with a verifiable variable, where the degree of this correlation determined the precision of the legal regime. The current simplified version does not change the intuition of the results.
equity is sold to a group of dispersed atomistic investors, and contract renegotiation is very difficult; it is ruled out in our model. In a private firm, on the other hand, equity is sold to a small number of investors—an investor, in this paper—and therefore contracts can be renegotiated. For each of the four cases, we examine how the insider solves the corresponding decision tree, and then we compare and contrast the solutions.

3.2 Public firm in a low precision legal regime

Figure 1. The timeline

The timeline is shown in Figure 1 (the full decision tree is shown in Figure 2 in Appendix C). At Stage 0, the insider decides whether to offer the A contract that allows action A, or the ¬A contract that disallows it. He then offers for sale a share γ of the firm to outside investors. Being competitive by assumption, the investors react by bidding for that share an amount I that is equal to the amount that they expect to receive, which, in turn, is determined by the contract they are offered. This implies that they take no part of the project’s NPV and leave all of it to the insider. We will call that equality between the investors’ payment and their return expectation, the competitive financing constraint. The insider decides to sell that share γ of the firm that maximizes the NPV, which he fully captures, subject to the competitive financing constraint.14

14The same is true in the other cases that we analyze below.
At Stage 1, the firm invests the \( I \) it has raised in the project, and at Stage 2, Nature reveals whether taking action \( A \) is efficient or is not.

At Stage 3, if no protection was given at stage zero (contract \( A \)), the insider can either take action \( A \) and expropriate from the returns; take \( A \) and not expropriate; or not take \( A \), hereupon expropriation is impossible. If, on the other hand, contract \( \neg A \) was signed, then the insider cannot take action \( A \) and, therefore, cannot expropriate. Finally, at Stage 4, the firm prorates the funds that remain to its inside and outside shareholders.

We solve this decision tree by backward induction. At Stage 3, after a history \( \neg A, \gamma, \) and \( I \), the insider is barred from taking action \( A \), and, because the firm is public, he cannot renegotiate the \( \neg A \) contract to implement \( A \) even when it is efficient. This is the cost of forgone opportunities imposed by the low precision legal regime. On the other hand, the benefit is that the insider’s commitment not to expropriate holds up, and the expropriation inefficiency is eliminated. The firm then earns \( f(I) \) and splits it; \( (1-\gamma)f(I) \) to the insider, and \( \gamma f(I) \) to the investors.

Receding now to Stage 0: Anticipating their share in the returns, the investors agree to pay \( I = \gamma f(I) \) for their \( \gamma \) share of the firm. This competitive financing constraint makes \( I \) a function of \( \gamma \), and implies that the insider gets \( (1-\gamma)f(I) = f(I) - I \); the whole NPV. The insider, therefore, selects a \( \gamma \) that maximizes the NPV subject to the constraint, i.e. he solves

\[
\begin{align*}
\text{Max}_{\gamma} & \{ f(I) - I \} \\
\text{s.t.} & \quad I = \gamma f(I)
\end{align*}
\]
whose solution is $I^{FB}$, the first best investment amount. We now have,

**Proposition 1** *In the public case, in a low precision legal regime, when using the imprecisely filtering contract ($\neg A$) to curb expropriation, the insider invests the first best amount, but does not take action $A$ even when it is efficient, and, therefore, the NPV falls short of the first best by $pB$, the cost of forgone opportunities.*

To complete the solution of the decision tree, we go back to Stage 3 to the end of an alternative history $A$ (instead of $\neg A$), $\gamma$, and $I$. The insider is then allowed to implement action $A$. The insider implements action $A$ whenever it is efficient, and irrespective of its efficiency, exploits $A$ to expropriate if and only if

$$\gamma > \frac{c}{s}.$$  \hspace{1cm} (2)

This is the standard Jensen-Meckling condition that states that an agency cost arises only when the insider owns a small enough fraction of the cash flow.\hspace{1cm} (2)

Receding now to Stage 0, we solve for the insider’s optimal $\gamma$ decision. First, the insider has to maximize his expected payoffs by choosing $\gamma$ under two alternatives: (a) $\gamma \in (c/s, 1]$, whence the insider plans to expropriate at Stage 3; or (b) $\gamma \in [0, c/s]$, whence the insider plans not to expropriate at Stage 3. The insider then compares his maximal payoffs under the two alternatives, and selects the greater between the two by choosing its corresponding $\gamma$.

\hspace{1cm} (2)

\hspace{1cm} (2)

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Equation (2) follows from comparing the insider’s payoff on the uppermost branch of Figure 2 (Appendix C) to his payoff on the branch below it.
Under alternative (a), the insider solves

\[
\text{Max}_{\gamma \in [0, 1]} \{ (1 - c) f(I) - I + pB \},
\]

\[\text{s.t. } I = \gamma [(1 - s) f(I) + pB] \tag{3}\]

where the maximand is the insider’s expected payoff, and the RHS of the competitive financing constraint is the expected payoff to the investors under the current alternative (a).

Expropriation is reflected in two ways in this maximization problem. First, the \((1 - c)\) factor in the maximand represents the expropriation waste. Second, the competitive financing constraint becomes tighter. As reflected by the \((1 - s)\) factor, investors know that they will be expropriated, and are therefore willing to provide less financing (smaller \(I\)) for any given firm share \(\gamma\). When \(s\) is large enough, the tight financing constraint leads to an underinvestment problem.

Under alternative (b), the insider solves

\[
\text{Max}_{\gamma \in [0, 1]} \{ f(I) - I + pB \},
\]

\[\text{s.t. } I = \gamma [f(I) + pB] \tag{4}\]

where the maximand and the constraint are the analogs of those in alternative (a). In this case, there are obviously no inefficiencies associated with expropriation, since it does not occur. However, the financing ability of the insider is limited by the fact that the fraction of the firm sold may not exceed \(c/s\).
For the rest of the paper, we assume that the parameters of the model are such that the insider is led to select the optimal $\gamma$ in $(c/s, 1]$, i.e., that the more interesting alternative (a) obtains. The agency problem is then severe enough, so that selling a fraction $\gamma$ of the firm that does not lead to subsequent expropriation causes a severe underinvestment problem.\footnote{Formally, this happens when $c$ is small enough compared to $s$.}

We now have the following

**Proposition 2** In a low precision legal regime, not providing investor protection to investors in a public firm (i.e., using an $A$ contract) involves a cost and a benefit. The cost is the waste caused by expropriation and the possible ex-ante cost of underinvestment. The benefit is that actions are taken whenever they are efficient.

Based on Propositions (1) and (2), in choosing between the $\neg A$ contract and the $A$ contract at Stage 0, the insider faces the following trade-off: Using the $A$ contract allows implementation of efficient actions capturing the attendant benefits, but it wastes resources through expropriation, and also causes an underinvestment problem when expropriation is severe enough. In contrast, using the imprecisely filtering $\neg A$ contract allows an efficient level of investment without wasting resources through expropriation. However, this contract also forbids taking actions even when they are efficient, generating the cost of foregone opportunities.

The following proposition gives the relevant comparative statics.

**Proposition 3** The $A$ contract is more attractive for the insider whenever (i) $p$ or $B$ increase, (ii) $s$ decreases, and (iii) $c$ decreases.

Proposition 3 is quite intuitive. The benefit of the $A$ contract increases whenever (i) the expected benefit to taking the efficient action is greater, (ii) the underinvestment
problem due to expropriation is less severe, and (iii) the waste associated with expropriation decreases.

It is noteworthy that we assumed that when a firm awards a $\neg A$ contract to its atomistic public investors, they will, in fact, enforce it. This assumption needs some justification, as each small investor would prefer not to sue, when he bears the potentially substantial costs of doing so, while the benefits spread thinly to all other investors.

One mechanism that can solve this free rider problem is the class action lawsuit. An alternative mechanism operates when investors accumulate shares at prices that do not fully incorporate the pending enforcement of the investor protection contract. This can be justified either by the assumption that shares can be accumulated secretly, or by the assumption that an accumulator can hide his order for shares within liquidity induced trades as in Kyle 1985. We provide the details in Appendix D.

### 3.3 Public firm in a high precision legal regime

In a high precision legal regime, $\neg EX$ is in the enforceable contract set, and the insider can meaningfully offer it to the public investors. The changes to the insider’s decision tree from that of the low precision regime are obvious. Solving it, at Stage 3, after the history $\neg EX$, $\gamma$, and $I$, the precisely filtering contract now prevents the insider from expropriation as intended, yet allows him to take action $A$, which he does, whenever the action is efficient. Therefore, there is no ex-post cost associated with the $\neg EX$ contract.

Receding now to Stage 0, the insider solves
\[
Max_{\gamma} \{ f(I) - I + pB \},
\]

\[s.t. \ I = \gamma f(I) + \gamma pB\]  

(5)

where the maximand is the insider’s expected payoff (the project NPV), and the RHS of the competitive financing constraint is the expected payoff to the investors in the current situation.

The solution to (5) is \(I^{FB}\), the first best level of investment. This, together with taking action \(A\) whenever it is efficient, implies that using the \(\neg EX\) contract is optimal since it achieves the first best outcome.

3.4 **Private firm in a low precision legal regime**

The insider’s decision tree in this case is similar to that of the public firm in the same regime, except for the all-important possibility of contract renegotiation that we insert at Stage 2.5, between Stages 2 and 3. The solution is again by backward induction. After a history that comprises \(\neg A, \gamma, \) and \(I\), at Stages 0 and 1, and an efficient \(A\) at Stage 2, the insider and the private investor face a joint surplus of \(B\), which—unlike in a public firm—they can capture by renegotiating the \(\neg A\) contract. Indeed they do. After a successful Nash bargaining with power \(\mu\) to the investor, they sign a new contract, which stipulates that (i) action \(A\) is generally still barred, but is allowed on the specific occasion at hand for capturing the surplus \(B\), and that (ii) the investor shall get a share \(\mu B\) from this surplus.

In line with the incomplete contracting literature, we assume here that in contrast to when
contracting ex-ante (at Stage 1), the use of action A in an efficient manner is verifiable ex post (see Hart 1995 for an extensive discussion).\footnote{For example, while it is impossible to stipulate ex ante in a contract all the contingencies whereupon the sale of firm assets is efficient and the fair prices for such transactions, it is possible to describe and contract ex post on the efficiency and sale prices in a particular case, once it materializes.}

Effectively, the investor is relinquishing his right vis-a-vis the firm in return for a payoff. In doing so, he is providing slack in those cases in which the courts can only enforce a contract that is too stringent.

Receding now to Stage 0, the insider solves

\[
\begin{align*}
\max_{I} \{ f(I) - I + pB \}, \\
\text{s.t. } I = \gamma f(I) + \mu B
\end{align*}
\]

where the maximand is the insider’s expected payoff (whole NPV), and the RHS of the competitive financing constraint is the expected payoff to the investor in the current situation.

The solution of this maximization problem is \( I^{FB} \), the first best level of investment. This, together with taking action A whenever it is efficient, implies

**Proposition 4** In a low precision legal regime, providing the imprecisely filtering contract \( \neg A \) to investors in a private firm achieves the first best outcome, because that contract is renegotiated when necessary.

Back to Stage 3, but after an alternative history that comprises \( A \) (instead of \( \neg A \)), \( \gamma \), and \( I \); the situation is almost completely analogous to the public firm in the same regime
after the same history. We will assume then the interesting case in which the insider’s optimal $\gamma$ falls in $(c/s, 1]$, and therefore he would be expected to expropriate.

But he does not. The reason is that also in this situation, the insider and the investor can and do bargain over a surplus that is created as the investor convinces the insider not to expropriate and to save the associated waste $cf(I)$ for the benefit of both in return for a “bribe.” Specifically, with Nash Bargaining, assuming a bargaining power of $\mu$ to the investor, the expected payoff to the investor is $\gamma(1 - s)f(I) + \gamma pB + \mu cf(I)$ and to the insider is $[(s - c) + (1 - \gamma)(1 - s)]f(I) + (1 - \gamma)pB + (1 - \mu)cf(I)$.$^{18}$

Receding now to Stage 0. The insider solves

$$
\begin{align*}
\text{Max}_\gamma & \{f(I) - I + pB\} \\
\text{s.t.} & \quad I = \gamma(1 - s)f(I) + \gamma pB + \mu cf(I)
\end{align*}
$$

(7)

where the maximand is his expected payoff from the bargaining agreement, which is also equal to the whole NPV from the project, and where the RHS of the competitive financing constraint is the investor’s expected payoff from the same bargaining agreement.

It is clear why the expropriated fraction $s$ would appear in the competitive financing constraint when expropriation materializes on the equilibrium path, as in (3) above. But here, expropriation never materializes on the equilibrium path. Nevertheless, $s$ plays a role in (7). The reason is that at the time of renegotiation, the insider still has the outside option (as a credible threat off the equilibrium path) to expropriate $sf(I)$ at the cost of

$^{18}$To see this, note that if bargaining breaks down the insider expropriates and his outside option payoff is $[(s - c) + (1 - \gamma)(1 - s)]f(I) + (1 - \gamma)pB$ in expectation, while that of the investor is $\gamma(1 - s)f(I) + \gamma pB$. But if they do agree, then the total pie becomes $f(I) + pB$, which is larger than the sum of the disagreement payoffs by a surplus of $cf(I)$.  

22
wasting \( cf(I) \). Thus, through renegotiation, the insider gets \((s-c)f(I)\) while dividing \( cf(I) \) with the investor.

As \( s \) increases, the insider’s pledgeable income decreases, the financing constraint in (7) tightens, and an underinvestment problem arises. Also, since no expropriation occurs there is no waste of resources. We now have

**Proposition 5** In a private firm operating within a low precision legal regime, whenever the expropriation problem is potentially severe (large \( s \)), providing no investor protection (using contract \( \bar{A} \)) generates an underinvestment problem.

Following from Propositions 4 and 5 is

**Proposition 6** In a low precision legal regime, when selling securities to private investors, providing imprecise investor protection (using \( \neg A \), the imprecisely filtering contract) weakly dominates not providing it at all (using the \( A \) contract). When the expropriation problem is potentially severe (large \( s \)), the said dominance becomes strict.

Proposition 6 is a direct result of the fact that regardless of whether protection is provided to private investors in a low precision legal regime (under both \( A \) and \( \neg A \)), the firm takes the efficient actions, and expropriation never occurs. The difference is that the first best level of investment is achieved with imprecise investor protection (the \( \neg A \) contract), but an underinvestment problem may occur when investor protection is not provided (the \( A \) contract).

### 3.5 Private firm in a high precision legal regime

The analysis of the private firm in a high precision legal regime is identical to that of the public firm in that regime. Once again, the use of a \( \neg EX \) contract involves no cost:
expropriation does not occur, action $A$ is taken whenever it is efficient, and the first best outcome is achieved.

### 3.6 Solution Summary

In a low precision legal regime, the insider of a public firm faces a trade-off when deciding what investor protection to offer—imprecise protection ($\neg A$ contract) or no protection at all ($\hat{A}$). Each has its own advantages and disadvantages. On the one hand, using an imprecisely filtering contract that disallows any action that may be exploited to expropriate ($\neg A$) allows implementation of the first best level of investment and prevents expropriation and its associated waste, but also precludes efficient actions and their attendant benefits. On the other hand, providing no protection at all ($\hat{A}$) entails the costs associated with expropriation—underinvestment and waste—but allows taking efficient actions, capturing their benefits. The optimal choice depends on the relative magnitudes of these effects.

The insider of a private firm operating in a low precision legal regime has a clear choice. Regardless of the investor protection he provides, either imprecise or none at all, due to the possibility of contract renegotiation, the firm takes efficient actions and the insider does not expropriate. However, providing imprecise investor protection ($\neg A$) is more attractive, since providing no protection ($\hat{A}$) leads to an underinvestment problem.

Finally, in high precision legal regimes, providing precise protection ($\neg \text{EX}$ contract) is always optimal, achieving the first best outcome in both the private and the public firms. Table 1 in Appendix C summarizes the different effects that are factored into the insider’s choice of the degree of investor protection. The analysis above leads to the following final proposition, which explains our empirical findings in Mexico.
**Proposition 7** In a low precision legal regime, when the benefits of taking efficient actions outweigh the costs of underinvestment and waste associated with expropriation, it is optimal to provide protection, albeit imprecise, to private investors; and it is optimal to provide no protection to public investors.

### 3.7 Insider Initiative

We have shown that within a low precision legal regime, where only imprecisely filtering investor protection contracts ($\neg A$) are available, private firms will use those contracts as an effective substitute for the unavailable precisely filtering contracts ($\neg EX$). This is so because private firms can renegotiate the imprecisely filtering investor protection contracts when the need arises, and can clear their strictures to achieve the same first best outcome that can be achieved with the precisely filtering contracts.

We have used this observation to explain the reason why under the low precision Mexican legal regime, a large proportion of private firms provide investor protection, while public firms virtually do not. It remains to be explained why some private firms do not find it optimal to provide the imprecisely filtering investor protection contracts.

We do this next by introducing more structure into the model in the form of insider initiative. When the returns on the firm’s actions are sensitive to the amount of effort that the insider decides to exert, his incentives to do so will be dampened by the availability of only imprecisely filtering contracts, even when those can be renegotiated. In the spirit of Aghion and Tirole (1997), this effect is due to a hold up problem, whereby the investor extracts some of the rents due to the insider’s ex-ante initiative during the bargaining of the surplus created by allowing the firm to take an efficient action when an imprecisely
filtering contract bans it. Therefore, within a low precision legal regime, a private firm will optimally provide investor protection when its actions are less sensitive to the insider’s initiative; while another private firm, whose insider initiative is important enough, may find it optimal to refrain from providing investor protection.

Formally, we model a private firm insider’s initiative by inserting an additional stage, 1.5, between stage 1 and stage 2, at which, at a cost $e$, the insider can exert an effort $e$ to increase the return to an efficient action $A$ to $B(e; k) := kb(e) + b_0$, where $b'(e) > 0$ and $b''(e) < 0$. The sensitivity of insider initiative is parameterized by $k$.

At this point, it is useful to describe in greater detail the renegotiation process between the insider and the investor, before an efficient action is allowed to be implemented, in order to endogenize and compare the shares of the surplus captured by the insider when using different types of investor protection contracts.

Consider first the case of a private firm within a low precision legal regime where no investor protection has been granted ($A$), and where the more interesting Jensen-Meckling condition $\gamma > c/s$ holds. Suppose action $A$ turns out to be efficient. Since the insider controls the firm, he decides whether to take action $A$. The insider can decide to be content with the extant sharing contract, take action $A$, and get $(1 - \gamma)B(e; k)$ out of its returns. On the other hand, the insider can decide to use his discretion to threaten the investor with not taking action $A$ at all. We assume that, in that eventuality, the insider has enough bargaining power to extract $(1 - \mu)B(e; k)$ of the return to action $A$, leaving $\mu B(e; k)$ to the investor, with $\mu \in [0, 1]$. (When the bargaining protocol is a “take it or leave it” offer, and preferences are self regarding, then $\mu = 0$.)
Therefore, the insider decides to renegotiate the extant sharing contract when \((1 - \mu) > (1 - \gamma)\). Hence, the insider share of the return to the efficient action \(A\) is \([1 - \min(\gamma, \mu)]B(e; k)\), leaving \(\min(\gamma, \mu)B(e; k)\) to the investor.

In addition, as before, the insider will renegotiate with the investor over the surplus \(cf(I)\) created by avoiding expropriation. The insider will therefore obtain a stage 3 expected payoff of \(\left[ (s - c) + (1 - \gamma)(1 - s) \right] f(I) + \left[ 1 - \min(\gamma, \mu) \right] pB(e; k) + (1 - \mu)cf(I) - e\). The insider will thus exert effort at Stage 1.5 satisfying \(b'(e) = 1/[(1 - \min(\gamma, \mu))pk]\).

Therefore, at Stage 0, the insider will solve

\[
\max_{\gamma} \left\{ f(I) - I + p[kb(e) + b_0] - e \right\}
\]

s.t. \(I = \gamma(1 - s)f(I) + \min(\gamma, \mu)pkb(e) + b_0 + \mu cf(I)\)

\(b'(e) = 1/[(1 - \min(\gamma, \mu))pk]\)

Consider now the case of a private firm within a low precision legal regime, where investor protection has been granted (the \(\neg A\) contract). When the action \(A\) is efficient, the insider must first renegotiate the \(\neg A\) contract with the investor in order to clear the ban on \(A\), implement it, and generate the surplus \(B(e; k)\). Assuming the same bargaining powers as in the previous case, the insider’s agreement share would then be \((1 - \mu)B(e; k)\) and the investor’s will be \(\mu B(e; k)\).

Note that the investor gets at least as large a share of the return to action \(A\) (when \(\gamma \geq \mu\)), and sometimes a strictly larger share of those returns (when \(\gamma < \mu\) under the \(\neg A\) contract relative to under the \(A\) contract. Indeed, since the insider must renegotiate with the investors to clear the \(\neg A\) stricture, the investor will always hold up the insider, extracting part of the rents created by the insider’s ex-ante initiative.
The insider’s expected payoff at stage 3 will therefore be $(1-\gamma)f(I) + (1-\mu)pB(e; k) - e$. The insider will thus exert effort satisfying $\theta'(e) = 1/[(1 - \mu)p k]$.

At stage 0, the insider will solve

$$Max_{\gamma} \left\{ f(I) - I + p[kb(e) + b_0] - e \right\}$$
\[ s.t. \quad I = \gamma f(I) + \mu p[kb(e) + b_0] \]
\[ \theta'(e) = 1/[(1 - \mu)p k] \]

Since when $\gamma < \mu$, the investor extracts more of the returns to action $A$ under the $\neg A$ contract than under the $A$ contract, the insider will exert less effort under the former.

When $\gamma \geq \mu$ the insider’s share of the surplus is equal to $\mu$ both under the $A$ and under the $\neg A$ contracts, and so he will exert the same level of effort in both cases. It then follows that with respect to effort, the $A$ contract weakly dominates the $\neg A$ contract.

On the other hand, as in the analysis without the effort consideration, the $A$ contract involves underinvestment when $s$ is large enough. The insider will therefore trade off between the underinvestment and the optimal effort effects when deciding which contract to offer to the investor.\(^\text{19}\)

When $k$, the sensitivity to effort, is small enough, so that the effort effect is weak, the $\neg A$ contract will dominate the $A$ contract. It is straightforward to show that

\(^{19}\)A slightly alternate modeling approach would have been to assume that when exerting effort $e$, the insider creates a surplus $B(e; k) + k\beta(e)$, where $\beta(e)$ represents the private benefits of control enjoyed by the insider. As is common in the literature, these private benefits of control would be non-transferable to the investor. This assumption would only strengthen our result that the $\neg A$ contract dampens insider initiative as compared to the $A$ contract.
**Proposition 8** For each set of parameters of the model, there exists a $\overline{k}$ such that for $k < \overline{k}$ the $\neg A$ contract dominates the $A$, while for $k \geq \overline{k}$ there is no domination. Indeed, for every $k$, there exists an $\overline{s}$, such that for $s < \overline{s}$, the $A$ contract dominates the $\neg A$ contract.

Considering now a private firm in a high precision legal regime, the $\neg EX$ contract will capture the benefits of the $A$ and of the $\neg A$ contracts in the low precision legal regime. It will avoid the underinvestment problem suffered by the $A$ contract, and will lead to the exertion of the same effort as under the $A$ contract, avoiding the dampening of the insider’s effort exertion as under the $\neg A$ contract.

To see this, note that at stage 3, when the action $A$ is efficient, the insider will renegotiate the original sharing contract with the investor whenever $\gamma \geq \mu$ to obtain a fraction $1 - \mu$ of the action returns $B(e; k)$. When $\gamma < \mu$, the insider will choose not to renegotiate with investors, and will take the efficient action $A$ to obtain a fraction $1 - \gamma$ of the action returns. Also, under the $\neg EX$ contract, the insider will never expropriate.

The insider’s expected stage 3 payoffs will therefore be $(1-\gamma)f(I) + (1-\min(\gamma, \mu))pB(e; k) - e$, while the investor's stage 3 expected payoff will be $\gamma f(I) + \min(\gamma, \mu)pB(e; k)$. At stage 0, with a $\neg EX$ contract, the insider will thus solve

$$\max_\gamma \{f(I) - I + p[kb(e) + b_0] - e\}$$

s.t. $I = \gamma f(I) + \min(\gamma, \mu)p[kb(e) + b_0]$

$U(e) = 1/[1 - \min(\gamma, \mu)]pk$

It is straightforward to show the following.

**Proposition 9** For each set of parameters of the model, there exists a $\overline{k}$ such that for $k < \overline{k}$ the $\neg EX$ contract in the high precision legal regime and the $\neg A$ contract in the low precision
legal regime will yield the same payoff to the insider, and indeed the \( \neg \Lambda \) contract will be chosen over the \( \Lambda \) contract in the low precision legal regime. For \( k \geq \bar{k} \), the insider’s payoff using the \( \neg \mathbb{E}X \) contract in the high precision legal regime will not be smaller and sometimes larger than the insider’s payoff in the low precision legal regime. Indeed, it is larger for \( k \) above \( \bar{k} \) and close enough to it, when the \( \gamma \) that obtains the first best investment with the \( \neg \Lambda \) contract is greater than \( \mu \).

To recap, in a low precision legal regime, when exertion of effort is important enough, the \( \neg \Lambda \) contract no longer dominates the \( \Lambda \) contract for private firms, and, therefore, some of them will choose not to provide investor protection. In addition, when exertion of effort is important enough, the insider’s payoff in a high precision legal regime is larger than his payoff in the low precision legal regime. Finally, for public firms, it is easy to see that these results are more pronounced. This is so because under the \( \neg \Lambda \) contract the insider will not exert any effort, because the \( \neg \Lambda \) contract cannot be renegotiated.

4 Conclusion

It has been demonstrated that the better is investor protection that is provided by law, the more developed are the financial markets and the faster is economic growth. However, if there exists some efficient target level of investor protection, then, from a Coasian perspective, suppliers and users of capital should achieve that level voluntarily by opting out from the law, signing contracts that fill in the gap between the default and the efficient levels of protection. In doing so, total levels of investor protection should become equalized across different legal systems, rendering immaterial the level of investor protection offered by law, contrary to the findings. A resolution of this Coasian puzzle that is offered in the
literature suggests that legal systems that provide poor investor protection by law are also those that are incapable of enforcing contracts that enhance investor protection.

In this paper, we begin by taking the previous argument to the testing ground of the Mexican legal system, where the law provides poor investor protection. We have two main findings: First, when privately held, over half of the firms in the sample significantly enhance the protection offered to their investors through private contracts. This finding indicates an expectation that such contracts can and would be enforced when necessary. Our second finding, which seems at odds with the first, is that when going public, virtually no firm provides significant investor protection to its public investors beyond that provided by law. Thus, investor protection appears to be both necessary and enforceable by contracts, yet it is not provided by the public firm.

In order to explain the Coasian puzzle in a way that is consistent with the Mexican experience and, in particular, explain the marked difference in voluntary investor protection provision between the private and the public firm, we present a model that endogenizes this choice.

At the base of the model is our assumption that legal systems differ in their ability to enforce precisely filtering contracts that provide protection in those cases where expropriation can occur and only in those cases. When only imprecisely filtering contracts can be enforced, a public firm faces a trade-off in choosing the level of investor protection. On the one hand, increasing investor protection generates two benefits: It increases the firm’s pledgeable income, preventing possible ex-ante costs of underinvestment. It also reduces the extent of expropriation that, in and of itself, is assumed to be inefficient. On the
other hand, increasing investor protection also generates contract overinclusion costs by preventing the firm, at times, from taking efficient actions.

A private firm would face a similar trade-off, except that due to its small number of investors, contract renegotiation becomes possible. Therefore, in those cases in which investors’ imprecise contractual rights would have prohibited the private firm from taking an efficient action, the parties will circumnavigate the problem by renegotiating the blocking clauses. They will agree on side payments, and the firm will be allowed to take the efficient action. Thus, the overinclusion costs associated with provision of imprecise investor protection is greatly mitigated in a private firm relative to a public firm. Therefore, in a legal regime that can enforce only imprecisely filtering contracts, private firms would tend to provide imprecise investor protection more often than public firms, which is consistent with our empirical findings.

Moreover, when operating in legal systems that are more adept at enforcing precisely filtering contracts, overinclusion costs—generated when a firm is prevented at times from taking efficient actions—decrease and so firms will be more likely to provide a higher degree of protection. Stated differently, the degree of investor protection that is provided by the insider is increasing in the size of the enforceable contract set of the legal regime in which the firm operates.

On a more general level, our model suggests that a possible driving force behind the empirical findings relating the level of investor protection provided by law to economic variables, such as growth and financial market development, is the precision of the contracts that are enforceable in each legal system.
References


Appendix A

Investor Protection Provided to Private Investors: Additional Examples

1. In November 1993, Bell Atlantic Latin America Holdings Inc. purchases 23.17% of Grupo Iusacell S.A. de C.V. It is issued a special class of shares — B shares. The charter states that any resolution taken in a shareholder meeting must be approved by the B class. In addition, the B class will appoint five out of the 17 members of the board. Any resolution taken by the board must be approved by at least one of these five members. Finally, the B class has the right to approve one of the three comptrollers of Iusacell.

2. Fondo de Optimizacion de Capitales S.A. de C.V. purchases 47.65% of Agro Industrial Exportadore S.A.de C.V. The requirement for a resolution in a shareholder meeting dealing with any of the following issues is raised from 50% to 76%:

   a) Sale, rent, or transfer of any business or asset, tangible or intangible, in any non-customary transaction for an amount greater than 5% of the firm’s asset value

   b) Equity and long-term debt issuance

   c) Share repurchase

   d) Approval of the compensation of the board members and comptrollers

   e) Approval of financial statements

   f) Approval of dividend payment

   g) Appointment of firm auditors
In addition, any board resolution dealing with any of the following issues must be approved by board members representing 76% of the shares:

a) Appointment removal and compensation of officers

b) Approval of annual budgets and business plans, as well as their modifications

c) Approval, modification, or renewal of any contract in which any shareholder is directly or indirectly involved

d) Approval of accounting procedures

e) Appointment of external auditors and their compensation

f) Sale, rent, or transfer of any business, property, or asset, tangible or intangible, in any non-customary transaction for an amount greater than 10% of the firm’s asset value
Appendix B

Case where Investor Protection is Provided to Public Investors

- Hilasal:

Provides rights including supermajority attendance-quorum and resolution-quorum requirements; a requirement for unanimous approval of shareholders to allow any shareholder to use the firm’s know-how, patents, etc.; the right to arbitration according to the rules of the International Commerce Chamber, and no deposit of shares prior to a shareholder meeting.

- Two firms with non-negligible rights:

The charter of one firm states that it will not lend or provide a loan guarantee to its parent firm, and the charter of the other requires a mandatory tender offer for 100% of the shares in case of a transfer of 51% of the shares.

- Two firms with negligible rights:

The charters of these firms state only that the deposit of shares before a shareholder meeting is not required.
Appendix C

Figure 2. Insider’s decision tree; public firm in a low precision legal regime.
Table 1
Low precision legal regime – solution summary

<table>
<thead>
<tr>
<th>Effect</th>
<th>$A \text{ contract}$</th>
<th>$\neg A \text{ contract}$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient action</td>
<td>Taken</td>
<td>Not Taken</td>
</tr>
<tr>
<td>Underinvestment</td>
<td>Yes*</td>
<td>No</td>
</tr>
<tr>
<td>Waste</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Private</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient action</td>
<td>Taken</td>
<td>Taken</td>
</tr>
<tr>
<td>Underinvestment</td>
<td>Yes*</td>
<td>No</td>
</tr>
<tr>
<td>Waste</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

* When expropriation is severe.
Appendix D

Contract enforcement through secret share accumulation

We noted in the paper that even after the insider provides an investor protection contract that bars him from executing an action $A$, if the investors are dispersed as in a public firm, then no single investor may have the incentive to enforce that contract, because the costs of doing so may well outweigh the benefits which spread out thinly to all investors; a classic free-rider problem. In this appendix we show how accumulation of shares will reinstate the incentive to sue a contract violating insider. This credible threat will, in turn, act to deter the insider from violating the investor protection contract in the first place.

We refine the timeline presented in Figure 1 by superimposing more detail. After granting the $\neg A$ investor protection contract, the insider decides whether to violate the contract at Stage 3 by taking action $A$, which, if efficient, generates a benefit $Bf(I)$.\footnote{For expositional purposes, we assume that all variables are proportional to firm size.} Then, at Stage 3.1, following Stage 3, a randomly chosen investor decides whether to accumulate a fraction $\beta$ of the firm’s shares. At Stage 3.2, this investor, whom we call the intervening investor, chooses whether to sue the violating insider at a cost $lf(I)$. At Stage 4, if the insider violated the contract and if the intervening investor sues, the court finds for the intervening investor, and orders the insider to pay $Df(I)$ in damages to the firm, which increases its value by that amount.

We first treat the low precision legal regime. We solve for the subgame perfect equilibrium of the game played between the insider and the intervening investor by backward induction. Consider the intervening investor’s decision whether to sue at Stage 3.2 after a history that includes $\neg A$, $\gamma$, $I$, insider’s contract violation, and the intervening investor having accumulated a fraction $\beta$ of the shares at Stage 3.1. The latter will sue if the cost of doing so, $lf(I)$, is smaller than his claim on the awarded damages, $\beta Df(I)$. That is, if $l < \beta D$, which we assume to hold.

Receding to Stage 3.1, we examine the intervening investor’s choice whether to accumulate shares. A precondition for share accumulation is that the intervening investor can do so secretly. The reason is that if accumulation were observable, the price of the accumulated shares would reflect the anticipation that the case would be tried and that damages would
be awarded. Therefore, any payoffs that the intervening investor would get from his share in the awarded damages would be exactly offset by a parallel increase in the accumulation price, leaving him to bear alone the litigation costs. Therefore, the intervening shareholder would choose not to accumulate in the first place. In other words, observable accumulation of shares cannot be part of an equilibrium.

In any equilibrium of the game, even if accumulation is secret, it is never optimal for the intervening investor to accumulate shares with certainty after contract violation, even if \( l < \beta D \). The reason is that if accumulation were certain, it would be as good as observable, and observability of accumulation, as already explained, offsets any gain to the intervening investor, leaving him to bear the litigation costs alone. We therefore assume that the intervening investor can commit to a mixed strategy by which, with probability \( q < 1 \) he accumulates shares secretly and then sues the insider.

Denote by \( V^{\text{viol}} \) the value, as of Stage 3.1, of the total claim on the firm’s cash flow, when the contract was violated, and the insider was not sued. The variable \( V^{\text{viol}} \) can take on one of three values. If the action \( A \) was revealed efficient, and the insider performed it, but did not expropriate, then \( V^{\text{viol}} := f(I)(1 + B) \). If the insider performed the efficient \( A \) and also expropriated, then \( V^{\text{viol}} := (1 - s) f(I) + f(I)B \). If action \( A \) was revealed inefficient and the insider performed it and expropriated, then \( V^{\text{viol}} := (1 - s) f(I) \).

The market reacts to the intervening investor’s choice of strategy—the accumulation probability \( q \)—by competitively pricing the whole firm at its expected value, given that strategy. That price is therefore \( q[V^{\text{viol}} + D f(I)] + (1 - q)V^{\text{viol}} \).

In order for the intervening investor to employ a mixed accumulation strategy \( q \) in equilibrium at Stage 3.1, he must be indifferent between the pure “don’t accumulate” strategy and the pure “accumulate a fraction beta of the firm” strategy. His payoff (profit) from the first strategy is, obviously, zero—recall that all shareholders are atomistic before Stage 3.1—while his payoff from the second strategy is

\[
\{ \beta [V^{\text{viol}} + D f(I)] - l f(I) \} - \beta q[V^{\text{viol}} + D f(I)] + (1 - q)V^{\text{viol}},
\]

(8)
where the first part in the last expression is his revenue from holding a fraction $\beta$ of the firm and then successfully suing the violating insider, and where the second part is the amount that he paid for accumulating the fraction $\beta$ of the firm in the first place.

Equating the payoffs to the intervening investor from the two pure strategies, namely, equating (8) to zero, and solving for $q$ yields the equilibrium accumulation probability,

$$q^* = 1 - \frac{l}{D\beta}. \quad (9)$$

Receding now to Stage 3, we consider a history $\neg A$, $\gamma$, and $I$, where the action $A$ is revealed as not efficient. The insider must choose then whether to abide by the contract and not expropriate, in which case his payoff is $(1 - \gamma)f(I)$; or to violate the contract by performing action $A$ in order to expropriate, whereupon his expected payoff is $[(s - c) + (1 - \gamma)(1 - s)]f(I) - q^n \gamma Df(I)$.$^{21}$ The insider chooses to abide when

$$s\gamma + \frac{l\gamma}{\beta} < D\gamma + c. \quad (10)$$

Still after the history $\neg A$, $\gamma$, and $I$; assume instead that the action $A$ is revealed to be efficient. Then at Stage 3, the insider chooses one of three feasible courses of action. (i) He can decide to abide by the contract, not do $A$, and consequently not expropriate, in which case his payoff is $(1 - \gamma)f(I)$. (ii) He can decide to violate the contract by taking action $A$ and then expropriate, whereupon his payoff is $[(s - c) + (1 - \gamma)(1 - s)]f(I) + (1 - \gamma)Bf(I) - q^n \gamma Df(I)$. (iii) He can decide to violate the contract, but not expropriate, but this is dominated by course (ii) of violating and expropriating.$^{22}$

The insider therefore chooses course of action (i); abide and not expropriate when

$$s\gamma + \frac{l\gamma}{\beta} + (1 - \gamma)B < D\gamma + c. \quad (11)$$

When (11) is satisfied—which implies that (10) is satisfied also—the insider will never choose to violate a $\neg A$ contract. Thus, in this situation, the model presented here is

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$^{21}$Note that since the insider owns $(1 - \gamma)$ of the firm, and since damages are paid to the firm, the insider’s true cost of paying $Df(I)$ in damages is $\gamma Df(I)$.

$^{22}$As in the body of the paper, we assume the more interesting case where the optimal $\gamma$ that is chosen at Stage 0 satisfies $\gamma > \frac{l}{D}$. 

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equivalent to the model of the low precision legal regime presented in the body of the paper where we assumed that the choice of a $\neg A$ contract prevents the performance of the action $A$.

Turning now to the case of a high precision legal regime, we consider histories where the $\neg EX$ contract was chosen by the insider. At Stage 3, whenever the action $A$ is efficient, the insider will perform it, since the investor protection contract does not bar it. We thus need only consider whether the insider will choose to expropriate.

As in the low precision legal regime, the insider knows that after expropriating, he will pay expected damages of $q^\alpha Df(I)$ to the firm. Thus, at Stage 3, given a $\neg EX$ contract, the insider chooses not to expropriate whenever $[(s - c) + (1 - \gamma)(1 - s)]f(I) - q^\alpha \gamma Df(I) < (1 - \gamma)f(I)$. Therefore, whenever (10) holds, the insider will choose not to expropriate so that, once again, the model presented here is equivalent to the model of the high precision legal regime presented in the body of the paper, where we assumed that the choice of a $\neg EX$ contract prevents the performance of expropriation.

In sum, the ability to secretly accumulate shares leads to contract enforcement even in the presence of the free-rider problem caused by atomistic investors.

Share accumulation hidden in liquidity trading

Instead of assuming that shares can be accumulated secretly, the accumulation process can be endogenized employing a market structure as in Kyle 1985, in a framework similar to that in Holmstrom and Tirole 1993 and in Maug 1998.

We modify the timeline described above, by changing only Stage 3.1. At this stage, we assume that with probability 0.5, a portion $\eta$ of investors suffer a liquidity shock and are forced to sell their shares, while with probability 0.5, there is no such shock and no investor is forced to sell shares. Also at this stage, an intervening investor, chosen randomly from all investors who do not suffer a liquidity shock, decides what fraction of the firm’s shares to accumulate. Shares are bought and sold as in Kyle 1985: all investors anonymously submit their orders to buy or sell shares to a market maker who can only observe the total order flow of all investors. The price of shares is then set by the market maker as the expected value of the shares, given the total order flow.
We find the subgame perfect equilibrium of this game by backward induction, presenting only the solution to the case of a high precision legal regime. The solution to the case of a low precision legal regime is identical.

We consider histories where the $\neg \exists X$ contract is chosen at Stage 0. Beginning at Stage 3.2, it is clear that the intervening investor will never sue if the insider did not expropriate at Stage 3. If, however, the history is such that the insider did expropriate at Stage 3, and, therefore, has violated the contract, and the intervening investor accumulated a fraction $\theta$ of the firms shares at Stage 3.1 (with $0 \leq \theta \leq \gamma$), it is straightforward to see that the intervening investor will sue if and only if

$$l < \theta D. \quad (12)$$

Receding to Stage 3.1, we consider a history that includes $\neg \exists X$, $\gamma$, $I$, and the insider having expropriated. We assume that the intervening investor can commit to a strategy where, with probability $q$ he accumulates a fraction $\theta$ of shares, while with probability $1 - q$ he does not accumulate any shares. The value of $\theta$ and $q$ will be endogenously determined below.

As is standard in this type of model, for the intervening investor to make any gains on the shares that he accumulates, it must be that, with at least some positive probability, the market maker cannot distinguish between the case where the intervening investor accumulates shares and the case where he does not. That is, the intervening investor must successfully hide his demand for shares in the (negative) demand of the liquidity traders. Since the demand for shares of all investors other than the intervening investor will be either $-\eta \gamma$ or 0, the intervening shareholder’s demand for shares in the case where he does accumulate must satisfy

$$\theta^Q = \eta \gamma. \quad (13)$$

The total order flow submitted to the market maker can thus take on one of three values: $-\eta \gamma$, 0, or $\eta \gamma$. 

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We denote by $V^{EX}$ the value of the total claim of the firm’s cash flow when the insider expropriates and is not sued. $V^{EX}$ can take on one of two values: it equals $(1 - s)f(I)$ when the efficient action A is not taken, and $(1 - s)f(I) + Bf(I)$ when the efficient action A is taken.

When the total order flow is $-\eta\gamma$, the market maker infers that the intervening investor did not accumulate shares and so share price is set equal to $V^{EX}$. When the total order flow is equal to $\eta\gamma$, the market maker infers that the intervening shareholder did accumulate shares and will sue, so share price is set equal to $V^{EX} + Df(I)$. Finally, when the total order flow is 0, the market maker cannot infer the intervening investor’s action. Employing Bayes Rule, the market maker sets share price equal to $q(V^{EX} + Df(I)) + (1 - q)V^{EX}$.

We assume that $D$ is greater than $\frac{1}{\eta\gamma}$, so that by (12) and (13), if the intervening investor accumulates shares he will sue. His expected profit is then

$$\theta^{eq}\{V^{EX} + Df(I) - E[price|accumulation]\} - lf(I), \quad (14)$$

where $E(price|accumulation)$ denotes the expected price per share set by the market maker conditional on the intervening investor accumulating. Since, conditional on accumulation, the total order flow is 0 with probability 0.5 and $\eta\gamma$ with probability 0.5, the expected payoff from accumulation is

$$\theta^{eq}\{V^{EX} + Df(I) - [0.5(V^{EX} + Df(I)) + 0.5(q(V^{EX} + Df(I)) + (1 - q)V^{EX})]\} - lf(I), \quad (15)$$

In order for the mixed strategy to be chosen in equilibrium, the intervening investor must be indifferent between accumulating shares and not accumulating shares. Since the profit from not accumulating shares is 0 (recall that prior to accumulation the intervening investor is atomistic), by equating (15) to 0, we find that the equilibrium probability of accumulation must satisfy
\[ q^{eq} = 1 - \frac{2l}{\eta \gamma D}. \]  \hspace{1cm} (16)

Receding now to Stage 3, we examine the insider’s choice of whether to expropriate. (Clearly, the insider will always take the action \( A \) when it is efficient, since the \( \neg \text{EX} \) contract does not bar efficient actions.)

Denoting by \( 1_{A_{\text{Eff}}} \) the indicator function that takes on the value 1 when \( A \) is efficient, and 0 when it is not; the insider’s payoff from not expropriating and performing the action \( A \) when it is efficient, is \((1 - \gamma) f(I) + 1_{A_{\text{Eff}}} B(1 - \gamma) f(I)\). On the other hand, if the insider expropriates, he will be forced to pay damages to the firm with probability \( q^{eq} \). The expected payoff from expropriating and performing the action \( A \) when it is efficient is thus \[ [(s - c) + (1 - \gamma)(1 - s)]f(I) - q^{eq} \gamma D f(I) + 1_{A_{\text{Eff}}} B(1 - \gamma) f(I). \] By (16), the insider will choose not to expropriate whenever

\[ s \gamma + \frac{2l}{\eta} < D \gamma + c. \]  \hspace{1cm} (17)

Therefore, as in the case of secret accumulation, when (17) is satisfied, the insider will never choose to expropriate when investors are provided with a \( \neg \text{EX} \) contract. Stated differently, the model presented here justifies our reduced form assumption in the body of the paper that a \( \neg \text{EX} \) contract prevents the insider from expropriating.