The Economic Theory of Derivative Actions

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Abstract

This paper formalizes the economic theory of derivative actions developed during the last 30 years. This action presents two interrelated problems. The first is how to solve the collective action problem that prevents minority shareholders from suing. The second is how to control the risk of collusive settlements between the manager and the plaintiff’s attorney. This paper identifies the fundamental tradeoffs, as well as an optimum that could be used as normative benchmark. In brief, it argues that in order to maximize the shareholder’s wealth, the policy goal should be minimize the sum of inefficient harms and insurance premia.

Keywords: Derivative actions - Corporate governance - Fiduciary duties

JEL Classifications: K22, K41

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1 Introduction

The derivative action entitles shareholders to claim, on behalf of the corporation, that its manager and directors have breached their fiduciary duties. As many other institutions in Corporate Law, the study of this topic was substantially transformed during the 1980s by the Law & Economics movement. Since then, a great deal of scholarly work has studied the effects of almost every conceivable set of rules applicable to this type of litigation. However, a smaller amount of effort has been devoted to formalize the underlying economic theory. This paper builds upon previous attempts of the literature, with the goal of developing such analytical framework.

From an economic perspective, filing a derivative suit entails a problem of collective action: although the shareholder acting as plaintiff is responsible for the financial costs of the litigation, if the suit succeeds any award will be made to the corporation. A critical issue in the academic debate is whether there are other sort of benefits arising from the suit, such as increases in deterrence or improvements in the firm’s corporate governance. However, regarding the monetary recovery, it is clear that the shareholder plaintiff would only benefit from the monetary recovery to the extent that there is an effective increase in the firm’s

\[^1\] Romano (2005) 348–351.
\[^2\] A critical issue in the academic debate is whether there are other sort of benefits arising from the suit, such as increases in deterrence or improvements in the firm’s corporate governance. However, regarding the monetary recovery, it is clear that the shareholder plaintiff would only benefit from the monetary recovery to the extent that there is an effective increase in the firm’s
is generally small, in most cases the shareholders would not sue because the individual costs of litigating on behalf of the corporation will exceed the proportional benefits arising from the suit.

American courts have dealt with this issue using a system of procedural rules that encourages attorneys to share the risk of the suit. Nevertheless, under this scenario the plaintiff’s attorney will likely have an absolute control over the claim, which brings along a problem of second order. On the one hand, managers are provided with a liability insurance that covers only some type of violations ("D&O Insurance"). On the other hand, attorneys working on a contingent basis are neutral to whether the recovery comes from the manager’s pocket or from the insurance company. As a result, both parties can minimize their own risk through a settlement that places the claim inside the scope of the insurance coverage.

Considering that the cost of the insurance premium is ultimately borne by all the shareholders, is far from obvious that they would benefit from a system of enforcement driven by the plaintiff’s attorney.

The evidence on Comparative Law suggests that shareholders’ litigation has played an important role in deterring corporate misconduct. In contrast, most empirical studies conducted in the U.S. have shown that litigation costs on these cases are substantial, while the average recovery is rather small and its impact on the firm’s market price is barely significant. Additionally, a closer look at

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3 Coffee (1985) 25. This system typically includes that attorneys are rewarded on a contingent basis and that the attorney’s fees shall be paid directly from the recovery. Both topics will be further discussed in this paper.

4 In most cases the proportional recovery will be small relative to the litigation costs, which means that the attorney will play a key role in financing the costs of the suit, and accordingly, that the parties will have an asymmetric bargaining power. Additionally, monitoring the litigation is costly for the shareholder because they also face asymmetries of information with respect to the attorney’s work. Both issues will give the attorneys substantial levels of autonomy in deciding, for example, when and how settle the claim. See, Macey and Miller (1991) 12–22.

5 Generally, under a D&O Insurance the violations to the duty of care are covered and the violations to the duty of loyalty are not. The parties, however, can circumvent such exclusion when the claim is settled as a violation to the duty of care and the insurance company does not challenge their decision. Baker and Griffith (2010) 51.

6 Derivative actions are filed regularly only in the U.S., Japan, and England, the three countries that have the most developed securities markets in the world. Kraakman et al. (2009) 175. Moreover, this anecdotal evidence is aligned with the abundant literature supporting a positive correlation between deeper securities markets and higher levels of enforcement. See, La Porta, Lopez-De-Silanes and Shleifer (2008) 292–293.

7 This criticism was originally raised by Fischel and Bradley (1985), and further developed by Romano (1991). Both conclude that in most cases the corporation did not receive any form of monetary relief, because the settlement fund merely covered the attorney’s fees. The latter study also argues that the absence of any measurable form of market punishment against the
the distribution of the outcomes reveals that the larger monetary recoveries, as well as the greatest threat of punishment, comes from government agencies and institutional investors. In other words, the plaintiffs that are capable of financing the litigation by themselves have repeatedly outperformed those whose ability to sue depends on the existence of attorneys willing to share the risk the suit.

Intuitively, a treatment should be avoided if the control group outperforms the treatment group. In this case, however, the normative puzzle has proven to be harder to solve. First, the procedural hurdles introduced to derivative actions in some American courts have not reduced the absolute number of suits, but rather have channeled some of them towards other jurisdictions or causes of action. Second, even if constraining the minority shareholders’ activism were something practically feasible, it is not clear that it would have a positive effect on the level of enforcement. To some extent, the decision-making process of public enforcers and institutional investors creates an upstream agency problem that replicates the one between shareholders and managers. Moreover, government agencies and institutional investors have shown a biased monitoring preference toward bigger companies and highly-publicized cases, which suggests that the function of these profiles of plaintiff should be understood as a strategic compliment to traditional derivative suits and not as a structural substitute.

In sum, after years of being thoroughly reviewed — and perhaps because of its ability to overcome the criticism, the system of enforcement of Corporate Law in the U.S. remains as the best alternative available in Comparative Law. Yet, the managers, as well as the irrelevance of the amendments to the firm’s corporate governance, cast doubts on the existence of non-monetary benefits in derivative suits. Those results have been consistently confirmed in the literature. See, Loewenstein (1999), and Erickson (2010).

Romano (1991) 80, also found that in the small group of cases where the plaintiff had a higher fraction of shares, the outcome of the suits was substantially better. Cox and Thomas (2006) found a similar trend on a larger sample of securities class action cases, concluding that the presence of institutional investors significantly increased the size of the settlement. From a different perspective, Black, Cheffins and Klausner (2006) have used survey work to argue that government agencies and institutions are the larger source of liability risk to outside directors.

Thompson and Thomas (2004) 1773–1775, have observed that, although the restrictions introduced by Delaware state courts are correlated with reductions in the number of derivative actions and increases in their average benefits, the rise on the filing of securities class actions during the same period supports the idea that shareholders are simply choosing the cause of action with the lower procedural burden. Similarly, Erickson (2010) 1762, found that a large number of these suits have been moved into federal courts, which would show this procedural hurdles have not reduced the frequency of filings, but rather encouraged forum shopping.

See, Coffee (1991). It should be noted, however, that both profiles of plaintiff have other potential advantages that might offset their agency problem, such as the ability to specialize and develop economies of scale in monitoring. Black (1992) 834–839.

Davis (2008), 439–444.

role that minority shareholders’ litigation has played in this system continuous
to be a controversial issue: Is it a strength or a weakness? None of the insights
developed by the literature holds a universal answer, but rather they have shown
the fundamental tradeoffs that entail regulating the derivative action. The goal of
this paper is to offer an analytical framework capable of formalizing those tradeoffs.

My point of departure is the economic model proposed by Reinier Kraakman,
Hyun Park and Steven Shavell. The authors develop two basic ideas in their
model. The first is that the manager’s expected salary not only includes an explicit
compensation, but also a hidden component formed by the profits from violations.
Managers will demand a higher explicit compensation when they cannot profit
from violations, and a lower one when they are allowed to do so. The second
idea is that a violation is inefficient whenever the harm caused to the corporation
is greater than the gain obtained by the manager. I will build upon these ideas,
refining the conditions under which the derivative actions could be used to optimize
the tradeoff between inefficient harms and explicit salaries.

On the one hand, monitoring the hidden component of the salary is costly to
the shareholders. Managers can exploit this asymmetry of information and raise
his salary beyond its competitive level, this is, the level that the parties should
have agreed if they would have bargained with perfect information. Hence, the
first contribution of my model is to formalize the choice that the managers face
when deciding to commit a violation. On the other hand, the ability of derivative
actions to capture the inefficiency caused by a violation is limited by the manager’s
liability insurance. Although there could be structural or non-monetary benefits
arising from the suit, the main effect of pursuing insured liability is increasing the
insurance premium. The second contribution of my model consists in including
the effects of the D&O Insurance. When managers do not bear the full cost of the
harm, they will have an adverse incentive to commit inefficient violations. D&O
Insurance amplify the manager’s moral hazard when choosing between explicit and
hidden salaries, as well as when negotiating a settlement in a derivative action.
This, in turn, would make derivative actions a perfect target for opportunistic
attorneys.

Finally, the third contribution of my model is to measure the effect of corporate
ownership in the incentives of the parties. Regarding the shareholder plaintiff, the
proportional benefits of the suit will be discounted from the proportional losses due
to raises in the insurance premium. Under this scenario, it becomes clear when the
shareholders would finance the litigation by themselves and when they will need to
deliver the control of the suit to the attorney. Regarding the defendant manager,
his incentives are modeled using both a fixed-wage and a fraction of corporate
ownership. Considering that an explicit salary raise requires a prior approval by

the representative bodies of the firm, the individual costs of this course of action are defined by the manager’s voting rights. In contrast, the level of beneficial ownership determines the responsiveness of the manager to the inefficiencies implied in a hidden-salary strategy.

Therefore, the policy purpose of derivative actions can be summarized as minimize the sum of the costs of inefficient violations and the costs of insurance premium. My normative claim is that the optimum is achieved when the manager’s salary is fully explicit, this is, when managers are deterred from corporate misconducts and any salary raise is channeled through the mechanisms provided in the firm’s corporate governance. The level of litigation required to reach this optimum will largely depend on the particular values at stake. However, the model proposed in this paper allows evaluating how different institutional designs could help to reach this optimum from a coherent theoretical approach, which in turn, should provide a powerful tool to future research on this field.

2 Description of the Model

In order to organize the description of the model, I will first present its basic assumptions and a list of the relevant variables. Subsequently, I will make further assumptions and comments about the variables. There are three basic assumptions on this model: (i) Risk neutrality. Risk-neutral managers may decide to violate a fiduciary duty and, if so, risk-neutral shareholders may sue; (ii) Perfect information. Shareholders have perfect information on the manager’s performance and thus the probability of detecting a violation equals to one; and, (iii) Rational behavior. Managers and shareholders maximize the value that the litigation represent to each one of them, so the task of Corporate Law would be balancing the interaction of self-interested parties with a set of rules that maximize the net value of the corporation.

Under these assumptions, let:

\[ c_\Pi = \text{the cost of bringing a suit}; \]
\[ c_\Delta = \text{the cost of defending against a suit}; \]
\[ f_\Pi = \text{the fraction of the corporation’s shares owned by the plaintiff}; \]

\[ \]
\( f_\Delta = \) the fraction of the corporation’s shares owned by the defendant;
\( g = \) the gain to the manager from a violation of his duties;
\( h = \) the harm to the corporation if the manager breaches his duties;
\( m = \) the monetary recovery that the corporation will obtain if the suit succeeds;
\( n = \) the structural benefits that the corporation will obtain if the suit succeeds;
\( p = \) the probability that the suit would succeed when brought;
\( v = \) the value of the corporation exclusive of the losses associated with the manager’s violation and the litigation costs;
\( w = \) the actual salary of the manager;
\( w^* = \) the reservation salary of the manager;
\( \alpha = \) the percentage of the monetary recovery that will be outside of the insurance coverage; and,
\( \beta = \) the percentage of the structural benefits that will become a loss in the manager’s controlling rights.

### 2.1 Benefits of the Suit

The monetary recovery is a cash inflow to the corporation. A percentage \( \alpha \) of this recovery will fall outside the D&O Insurance coverage and will be borne by the manager. The remaining percentage \((1 - \alpha)\) of the monetary recovery will be paid by the insurance company. However, \((1 - \alpha)m\) cannot be considered as a true benefit of the litigation. In a perfect-market scenario, the insurance premium will be equal to the actuarial value of the payoffs. The cash inflows via insured monetary recovery will simply cancel out the cash outflows via insurance premium. Considering that the expected insured recoveries are assumed to be perfectly correlated with the insurance premium, \((1 - \alpha)m\) will be treated as a cost to the corporation.\(^{16}\)

There are also structural benefits arising from the suit. For instance, settlements on derivative actions often include restrictions to anti-takeovers tactics,

\(^{16}\text{Whenever the insurance premium roughly mirrors the liability risk of insurers, a corporation cannot gain in any systematic sense when they recover from insurance companies. Kraakman, Park and Shavell (1993) 1746. However, the imperfections of the insurance market would introduce further complexity to the model, because the correlation between insured recovery and insurance premium will be unknown.}\)
mechanism to review self-dealing transactions or increasing the number of outside directors. Similarly, a derivative action may trigger the exit of the injurers from the corporation (i.e., the manager could be fired or the firm targeted with a takeover). These benefits to the corporation produce a loss in the manager’s ability to control the corporation and thus profit from future violations, in a percentage that is assumed to be $\beta$. The remaining percentage $(1 - \beta)$ is the additional value that the litigation creates by improving the firm’s corporate governance.\footnote{This variable is aimed to capture the benefits of what the literature describes as "structural settlements" and "corporate governance reforms" of derivative suits. See, Romano (1991) 63 & 71, and Erickson (2010) 1798.}

2.2 Litigation Costs

Depending on the procedural rules applicable to the case, the litigation costs can be treated as a fixed cost, or either as a variable cost determined as a percentage of the recovery.\footnote{In the latter case, the costs of the plaintiff will become a dependent variable of the monetary recovery. This can be formalized using $\gamma$ as the percentage of the monetary recovery that the plaintiff’s attorney will receive if the suit succeeds. Under these conditions, $c_{\Pi} = \gamma m$. Kraakman, Park and Shavell (1993) 1773.} I will use the former approach, because the process expenses are generally fixed costs and because in derivative actions the Court reimburses the plaintiff attorney’s fees using the product of a reasonable amount of hours times a benchmark price for legal services.\footnote{This is the approach of the Lodestar Formula applied to most derivative actions in the U.S. Coffee (1985) 34. It should be noted, however, that the Lodestar Formula also includes a variable reward contingent to the success of the claim, which in practice reduces substantially the difference between Lodestar fees and fully variable fees. See, Eisenberg and Miller (2004) 58–64.} Although the amount of hours involved in different suits and the benchmark prices may vary greatly, such case-specific variations can be excluded from the model understanding the fixed cost assumption as the average value applied to derivative actions within a particular jurisdiction.

I will also assume that the corporation will reimburse $c_{\Pi}$ to the plaintiff whenever the suit succeeds. Similarly, the corporation will cover $c_{\Delta}$ unless the manager is found liable. Hence, the expected litigation costs will be $(1 - p)c_{\Pi}$ for the shareholder plaintiff, $pc_{\Delta}$ for the defendant manager and $pc_{\Pi} + (1 - p)c_{\Delta}$ for the corporation.\footnote{This assumption follows the Common Fund Doctrine, under which the litigation costs can only be shifted to the corporation. Eisenberg and Miller (2004) 29. However, there are at least two other alternatives. Under the English rule the prevailing party can shift her costs to the losing party, so the expected litigation costs would be $(1 - p)(c_{\Pi} + c_{\Delta})$ for the shareholder, $p(c_{\Pi} + c_{\Delta})$ for the manager and 0 for the corporation. Finally, under an American rule each party shall pay its own costs, this is, $c_{\Pi}$ for the shareholder, $pc_{\Delta}$ for the manager and $(1 - p)c_{\Delta}$ for the corporation. See, Shavell (1982).} The litigation costs borne by the corporation will be assumed to
be covered by D&O Insurance, so the cash outflows via insurance premium would simply substitute the cash outflows via reimbursement of litigation costs. Therefore, the litigation costs to the corporation will be represented by the insurance premium defined as $p(1 - \alpha)m + pc\Pi + c\Delta$.

### 2.3 Manager’s Reservation Salary

The manager’s expected net salary equals the reservation salary denoted by $w^* = w + g - p(\alpha m + \beta n)$. This is, his actual salary plus the gains from violations, minus his expected losses from litigation. Since they do not have to bear such costs, managers should be neutral to the insured amounts of monetary recovery $(1 - \alpha)m$, as well as to the additional value of improved corporate governance $(1 - \beta)n$. Assuming that managers and shareholders are able to negotiate a competitive reservation salary, a reduction in the manager’s ability to profit from a violation would create a pressure to increase the actual salary in a proportional amount. In contrast, if managers are allowed to profit from violations they would demand a lower actual salary.\(^{21}\)

On the other hand, $w$ is defined as a fixed amount. However, in American public corporations the fixed-wage component represents less than one third of the manager’s compensation. The remaining part is formed by variable components, such as cash bonus and stock options plans. Similarly, in other countries where the corporate ownership is highly concentrated, managers and directors ordinarily own a substantial part of the firm. The variable component of the manager’s remuneration will be introduced adding a fraction $f\Delta$ of the costs and benefits that the litigation creates for the corporation.\(^{22}\)

### 3 Economic Effects of Derivative Suits

There are three fundamental questions regarding the economic effects of derivative suits. The first question requires to determine the conditions under which a derivative suit is in the corporation’s best interest. The second question deals with the ability of derivative suits to deter managerial misconduct. The third question

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\(^{21}\)Kraakman, Park and Shavell (1993) 1771. A counterargument is that the gains from a violation are a form of hidden salary that is harder to monitor by the shareholders, which in turn, creates an opportunity for the managers to increase his expected salary beyond the competitive level. I will use the former approach as a point of departure, addressing the tradeoff between hidden salaries and explicit salaries in the section 4.1 below.

\(^{22}\)Bebchuk and Fried (2004), whom provide a thorough review of the mechanism of executive compensation in the U.S. See, Abowd and Bognanno (1995), as well as Core, Guay and Larcker (2003), for a comparative perspective on the same topic.
is aimed to know whether shareholders would effectively sue. I will address these questions in the following sections.

3.1 Appraising Derivative Actions

If the manager commits a violation in order to gain \( g \), the shareholders will brought a suit that will be won with a probability of \( p \). The total salary of the manager will be \( w + g - p(\alpha m + \beta n) = w^* \) and the net value of the corporation will be \( v - [h - p(m + n) + (w^* - w) + p(1 - \alpha)m + \Pi + c_\Delta] \). In contrast, when the manager is deterred from committing a violation, the value of the corporation will be \( v - w^* \). Whenever the gain to the manager from a breach of his duties is less than the harm caused to the corporation, the quantity \( h - g \) represents the inefficiency created by the manager’s violation.\(^{23}\) In this case, the corporation would be better off raising the manager’s salary by \( g \) in order to prevent the harm \( h \). Hence, the interests of the corporation regarding a derivative suit can be summarized in the following expression:

\[
\min \{ (h-g), \left[ \frac{\text{Net harm}}{\text{Net value of the lawsuit}} - \frac{\text{Insurance premium}}{\text{Net harm}} \right] \} \tag{1}
\]

A derivative suit could increase net corporate value in two different situations: (i) **Compensatory perspective.** A suit increases net corporate value if the uninsured monetary recovery of the litigation captures the current inefficiency created by the manager’s violation; and, (ii) **Deterrence perspective.** A suit also increases net corporate value if the prospect of a suit deters the manager from incurring in future inefficient violations. I will analyze the two situations separately.

From a compensatory perspective, a suit increases net corporate value if the expected benefits of the suit exceed the manager’s gains from the violation plus the litigation costs borne by the corporation. Considering that these costs are represented by the full price of the insurance premium, and that by definition, the variable \( n \) will not capture the current inefficiency created by the manager’s violation, this condition can be expressed as \( p\alpha m \geq g + \Pi + c_\Delta \).

From a deterrence perspective, a suit increases net corporate value if the benefits of deterrence are greater than the costs of deterrence. When violations are deterred the value of the corporation is \( v - w^* \), rather than \( v - h - (w^* - g) = v - w^* - (h - g) \). Hence, the increase in corporate value from deterrence equals to \( h - g \), the inefficiency created by a violation. The reason is that the corporation prevents harm from \( h \) but has to raise the actual salary of the manager by \( g \), for a net gain of \( h - g \). Contrasting with the compensatory approach, when a manager

\(^{23}\)Kraakman, Park and Shavell (1993) 1772.
decides whether or not commit a violation, the potential loss to his controlling rights should be relevant. Additionally, deterring misconducts entails a set of litigation costs that will be borne by the corporation. Therefore, this condition can be summarized as 

\[ p(\alpha m + n) \geq g + pc_{\Pi} + (1 - p)c_{\Delta} \]

which encompasses both the deterrence and compensatory perspectives.

**Proposition 1** When a suit increases net corporate value. *For a profit-maximizing firm, a lawsuit would raise net corporate value, if, and only if, \( p(\alpha m + n) \geq g + pc_{\Pi} + (1 - p)c_{\Delta} \).*

*Proof:* That \( p(\alpha m + n) \geq g + pc_{\Pi} + (1 - p)c_{\Delta} \) follows from (1)

\[
\begin{align*}
    h - p(m + n) + (w^* - w) + p(1 - \alpha)m + pc_{\Pi} + (1 - p)c_{\Delta} & \leq (h - g) \\
    -p(m + n) + (w^* - w) + p(1 - \alpha)m + pc_{\Pi} + (1 - p)c_{\Delta} & \leq -g \\
    p(\alpha m + n) - [g - p(\alpha m + \beta n)] - pc_{\Pi} - (1 - p)c_{\Delta} & \leq g \\
    g + pc_{\Pi} + (1 - p)c_{\Delta} & \leq p(\alpha m + n)
\end{align*}
\]

*Corollary:* Considering that the corporation should be neutral between decreases in its value coming from uninsured harms or from insurance premia, the net value of a lawsuit can be rearranged as \( h - p(\alpha m + n) + (w^* - w) + pc_{\Pi} + (1 - p)c_{\Delta} \).

As it can be noticed, the recovery of a suit has a limited ability to capture the inefficiency created by a violation. Even in a perfect compensation scenario where \( m = h \), a fraction of the quantity \( h - g \) will be expended in the insurance premium. On the other hand, the uninsured monetary recovery \( \alpha m \) undermines the manager’s ability to profit from the current violation, while the loss in the manager’s controlling rights \( \beta n \) undermines his ability to profit from future violations. Such benefits, however, require that the corporation pays the price that represents a raise in both insurance premium and executive compensation.\(^{24}\)

### 3.2 Manager’s Deterrence

Managers are assumed to be neutral to the insured amounts of monetary recovery \( (1 - \alpha)m \), as well as to the additional value of improved corporate governance \( (1 - \beta)n \). Hence, the effect of suits on managerial behavior will depends on the coverage

\(^{24}\)As it is discussed below, the assumption that a reduction in the manager’s ability to profit from a violation will create a proportional increase in the actual salary, somehow implies that the manager’s salary could be increased without boundaries. However, it could be the case that the gains from a violation are substantially higher than the quantity in which the shareholders would be willing to raise the salary. If so, derivative suits will become a crucial mechanism to avoid that managers increase their salaries beyond what shareholders are willing to pay.
provided by D&O Insurance and the potential loss in the manager’s controlling rights. Let’s consider the first issue, D&O Insurance can provide coverage for two different types of violations: violations to the duty of care and violations to the duty of loyalty. Both create a harm denoted by $h$ but only the violations to the duty of loyalty also create the gain to the manager represented by $g$. I will analyze the two types of violation separately.

When the insurance provides coverage to violations to the duty of care and a violation of this kind is committed, there is no gain to the manager and the recovery will be borne by the corporation via insurance premium. Since managers do not have the incentive of $g$ to commit the violation, there is no inefficiency created by the manager and the only potential benefits of the suit are related with changes in the firm’s corporate governance. In contrast, when the insurance provides full coverage for violations to the duty of loyalty and a violation of this kind is committed, the recovery will be again borne by the corporation via insurance premium, but this time the manager will also obtain a gain $g$. Insurance coverage thus creates a serious problem of moral hazard. Managers will choose committing inefficient violations until the uninsured amounts of the recovery and the losses to their controlling rights exceed the gains from violations. Hence, the ability of a suit to deter managerial misconducts can be summarized as $p(\alpha m + \beta n) \geq g$.

However, most of the managers are simultaneously shareholders of the corporation. In this case, they will also bear a fraction of the effects of the violation on net corporate value. In other words, they will experience with certainty a fraction of the non-compensated harm. Similarly, they will share a fraction on the expected raises of the manager’s actual salary and on the insurance premium. Therefore, managers will be deterred from committing violations to the duty of loyalty, only if the proportional losses of the violation are greater than the individual benefits thereof. Using the corollary of the Proposition 1, the condition under which the managers are deterred from committing a violation can be summarized in the following expression:

$25$ D&O Insurance generally provides full coverage to violations to the duty of care, with the only exceptions of manager’s willful conduct or when the recovery exceeds the insurance cap. Romano (1991) 57.

$26$ Romano (1990) 1173–1174. For example, suppose that a corporation pays sub-market wages and thus can only hire incompetent managers. After a while, the manager violates his duty of care, shareholders file a suit and the manager is fired. Since the violation does not create a gain, the suit should only impact the manager’s reservation salary as a consequence of the losses in his controlling rights. Then, the increase in $w$ created by the structural benefit of the firing represents an adjustment towards competitive salaries and competent managers.

$27$ Baker and Griffith (2010) 60–63. See, Chalmers, Dann and Harford (2002) 622–631, whom provide some empirical evidence that supports this claim. Particularly, they have observed a consistent trend in which the managers of the IPO firms with the worst performance ex-post, are those that have chosen ex-ante a higher level of insurance coverage.
\[ f_\Delta [h - p(\alpha m + n) + (w^* - w) + pc_\Pi + (1 - p)c_\Delta] \geq g - p(\alpha m + \beta n + c_\Delta) \] (2)

The mechanism of the derivative actions seems to be more relevant in violations to the duty of loyalty than in violations to the duty of care. In the case of the former, insurance coverage undermines the ability of derivative suits to prevent managers from entering into self-interested transactions. Generally, the regulation of executive compensation creates transaction costs that make expensive for managers to negotiate an explicit salary raise. When violations to the duty of loyalty are largely or fully insured, and the fraction of the corporation owned by the manager is relatively small, it will likely be cheaper for him to increase his salary via self-dealing. The cost of such behavior to the corporation is once again represented by \( h - g \), the inefficiency created by the violation.

### 3.3 Shareholder’s Passivity

A shareholder owning a fraction \( f_\Pi \) of the corporation, could decide bringing a suit in order to obtain a proportional gain from the expected benefits of litigation. If the shareholder decides to bring the suit, he will incur in the cost \( c_\Pi \) and will have a probability \( p \) of recovering such cost from the corporation. However, bringing a suit will increase the insurance premium and the manager actual salary. Therefore, the incentives of the shareholders can be summarized as a proportional version of the condition (1), this is:

\[
\min \left\{ f_\Pi (h - g), f_\Pi [h - p(\alpha m + n) + (w^* - w)] + pc_\Pi + (1 - p)c_\Delta] + (1 - p)c_\Pi \right\} \] (3)

However, when his fractional ownership in the corporation is small and thus the litigation costs are relatively large, shareholders will typically be interested in shifting the litigation cost to their attorney using a conditional fee agreement.\(^{28}\) Particularly, shareholders should pursue a conditional fee agreement with his attorney whenever the net proportional benefits are positive, but lower than the expected costs of litigation. In a conditional fee agreement, the corporation will

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\(^{28}\)This model consider three possible agreements between the plaintiff and his attorney: (i) A fee-for-service in which the attorney will receive \( c_\Pi \) in regardless of the success of the suit; (ii) A conditional fee in which the attorney will receive \( c_\Pi \) only if the suit succeeds; and. (iii) A contingent fee in which the attorney will receive \( \delta m \) only if the suit succeeds. Under the first agreement the shareholder will retain the control over the claim, while in the latter two it will be the attorney who controls the suit.
pay the costs of litigation only if the suit succeeds. Otherwise, such costs will be borne by the plaintiff’s attorney.

From this perspective, the shareholders will become neutral to the costs of litigation and will deliver the control over the suit to their attorney. In turn, considering that the litigation costs are assumed to be a fixed cost, the plaintiff’s attorney will become neutral to the expected benefits of the litigation.\(^{29}\) Hence, the only element that influences the attorney’s incentives would be the underlying probability of success of the case.

**Proposition 2** When a shareholder would sue. A rational shareholder should sue in two different situations:

(a) Retaining the control of the suit through a fee-for-service agreement, if, and only if, \( f_\Pi[p(\alpha m + n) - g - p\Pi - (1 - p)c_\Delta] \geq (1 - p)c_\Pi. \)

(b) Delivering the control of the suit through a conditional-fee agreement, if, and only if, the following two conditions hold:

i. \( f_\Pi[p(\alpha m + n) - g - p\Pi - (1 - p)c_\Delta] \geq 0 < (1 - p)c_\Pi. \)

ii. \( p\Pi \geq (1 - p)c_\Pi \iff p \geq 0.5. \)

Proof: The proof of (a) and (b) i. follows from the proof of the Proposition 1, the proof of (b) ii. follows from its own expression. It has to be stressed that the condition (b) ii. is highly dependant on the procedural rules applicable to the case. Particularly, the Common Fund Doctrine increases the willingness of attorneys to share the risk of the suit relative to any other of its alternatives. Under the English rule, an attorney will likely require that \( p\Pi \geq (1 - p)(c_\Pi + c_\Delta) \) before accepting a case on a conditional basis. Regarding the American rule, the inequality would be \( f_\Pi[p(\alpha m + n) - g] \geq c_\Pi. \)

At any level of \( f_\Pi \) the shareholders should maximize their proportional benefits and minimize their proportional losses. Therefore, shareholder-driven litigation should pursue uninsured amounts of monetary recovery and structural benefits, which is roughly aligned with the corporation’s best interest. In contrast, attorney-driven litigation maximizes the attorney’s interest and not necessarily the corporation’s best interest. A contingent fee agreement will not change substantially this outcome. As it follows from the expression \( c_\Pi = \gamma m, \) the plaintiff’s attorneys in this case would not pursue the corporation’s best interest, because he

\(^{29}\)To some extent, this assumption is simply an extreme version of the criticism to the Lodestar Formula made by Coffee (1986) 714-719, who argues that under this mechanism the attorney will become neutral to the marginal increases in the monetary recovery.
can maximizes his own interest by exclusively pursuing a larger monetary recovery that remains under insurance coverage.

Finally, a larger amount of shares implies a larger fraction on the net proportional gain arising from the suit. Accordingly, NGO’s, Pension Fund Managers, institutional investor and other shareholders with some form of outside block ownership should have better incentives to retain the control over the suits, while attorney-driven litigation should be more frequent among smaller shareholders. As it was discussed before, this is aligned with the empirical evidence suggesting that the problem of collusive settlements is stronger in the case of the latter group of plaintiffs.30

4 Adjustments to the Model

The previous sections were directed to modify the model proposed by Kraakman, Park and Shavell (1993), with the purpose of formalizing the effects on the incentives of the parties related with the level of corporate ownership and the existence of D&O Insurance produce. The next step is to introduce further complexity in those variables in order to discuss two pervasive topics on the literature. The first is related with the way in which the D&O Insurance influences the manager’s choice between an explicit salary and a hidden salary. The second consists in analyzing whether the problem of collusive settlements it is also a consequence of the moral hazard created by insuring corporate misconducts.

4.1 Explicit Salary and Hidden Salary

The first problem with the D&O Insurance is that it works as a shield against liability and amplifies the manager’s moral hazard. Precisely because the managers face adverse incentives to decide on these issues, the law requires the approval of the representative bodies of the firm on any issue where the managers are in a conflict of interests. In other words, Corporate Law compels managers to bargain with the shareholders in order to obtain a salary raise. The derivative actions

\[ f^* \pi = f^* - f \pi c^2 \pi \]

This trend should be more pronounced outside the U.S. In contrast with the One-Share Rule that grants legal standing to any shareholder, many foreign jurisdictions require that the plaintiff represents between 1% and 5% of the shares of the corporation. Such threshold creates an additional cost for the plaintiff, who will now have to incur in the transaction costs of forming a coalition whenever his shareholding is below the threshold. Interestingly, this additional cost increases as the plaintiff’s fraction of shares decreases. This can be included into the model, using \( f^*_H \) as the actual threshold required by the rules of legal standing and \( c^2_H \) as the transaction costs of adding another share to the coalition. Then, the additional cost would be represented by \( (f^*_H - f_H)c^2_H \), the difference between the threshold and the plaintiff’s actual shareholding, times the cost of adding a new share to the coalition.
are directed to reinforce those rules, by forcing the managers to internalize the costs of avoiding the explicit bargaining process with the shareholders. However, if the manager fully externalizes these costs through the D&O Insurance, he could increase the hidden component of their salary without fearing a shareholder suit. In sum, the manager’s incentives regarding derivative suits can be reformulated as follows:

$$\max \begin{cases} \text{Bargaining net value} & \quad \text{Individual gain} \\ (w^*-w)-(f_A^*-f_A)c^2_A, & \quad g-p(\alpha m+\beta n+c^1_A) \\ f_A^1[h-p(\alpha m+n)+(w^*-w)+p\Pi+(1-p)c^1_A] & \quad \text{Proportional value of the lawsuit} \end{cases}$$ (4)

From this perspective, the manager’s incentives can be understood as a choice between committing a violation and negotiating a salary raise. With the purpose of formalizing this choice, $f_A^*$ denotes the majority required to approve such agreement. Additionally, the manager’s costs are redefined to include not only $c^1_A$ as the cost of defending against a suit, but also $c^2_A$ as the cost of adding new shares to the manager’s coalition with the purpose of approving a salary raise. Under these conditions, the alternative of bargaining a salary raise can be expressed as $(w^*-w)-(f_A^*-f_A)c^2_A$, this is, the difference between the actual salary and the expected salary, minus the costs of meeting the majority threshold required to approve the salary raise. However, in order to fully capturing this choice it has to be considered that firms are controlled through pyramidal structures, proxies and other mechanisms that separate the controlling rights from the beneficial ownership. To this end, the superscripts $i$ and $j$ are aimed to distinguish between the manager’s controlling rights and his fraction of beneficial ownership.

**Proposition 3** When managers would be deterred. A rational manager would be deterred, if, and only if, $(f_A^*-f_A)c^2_A \geq f_A^1[h-p(\alpha m+n)+(w^*-w)+p\Pi+(1-p)c^1_A] + pc^1_A$.

Proof: That $(f_A^*-f_A)c^2_A \geq f_A^1[h-p(\alpha m+n)+(w^*-w)+p\Pi+(1-p)c^1_A] + pc^1_A$.

31In turn, the majority threshold applicable to each case will depend on two factors: the corporate body entrusted to approve a salary raise and the rules governing the decision-making process in such body. Regarding the former, the alternatives are allocating the approval on the board of directors or either on the shareholder’s meeting. In contrast, the rules governing the decision-making are quite more complex. For example, the quantity $f_A^*$ would be different in the case that the board’s approval requires a simple majority, than in the case that requires a review from an independent committee. Similarly, the majority threshold on the shareholder’s meeting would depend on the proxy regulation, whether the cumulative voting is allowed, and so forth.
follows from (4).

\[
(w^* - w) - (f^*_\Delta - f^*_{\Delta})c^2_{\Delta} \geq g - p(\alpha m + \beta n + c^1_{\Delta}) + f^*_\Delta[h - p(\alpha m + n) + (w^* - w) + pc_{\Pi} + (1 - p)c^1_{\Delta}]
\]

The magnitude of the costs involved in negotiating a salary raise with the shareholders is related with the first part of the preceding inequality, denoted with the subscript \(i\) and representing the strength of the manager’s controlling rights. In contrast, the beneficial ownership arise in the second part of the preceding condition, denoted with the subscript \(j\) and determining the extend to which the managers will be responsive to the proportional losses created by a violation. Obviously, the controlling rights of the managers in dispersedly-owned firms are weaker than those of the managers in tightly-controlled firms. However, provided that both kind of firms are controlled through proxy campaigns, pyramidal structures and other mechanisms that further increase the separation of ownership and control, the first type of managers should also have a significantly lower level of beneficial ownership than the second type of manager. Therefore, within the first group, violations should be more frequent and the problem of moral hazard more severe.

### 4.2 Collusive Settlements

The second problem of D&O Insurance consists in its ability to become a target of opportunistic suits. With the purpose of reduce the manager’s moral hazard, D&O Insurance policies generally exclude from coverage the violations to the duty of loyalty.\(^{32}\) Similarly, Corporate Law forbids the indemnification of the manager’s litigation costs when a violation is affirmed by a final judgment.\(^{33}\) However, if the parties settle the case as a violation to the duty of care, either because the distinction between both duties is blurred or simply because they are disguising a clear case of self-dealing, the insurance companies would not refuse coverage.\(^{34}\)


\(^{33}\)Romano (1990) 1162.

\(^{34}\)There are legal issues involved, such as the fact that insurance companies face the risk of being sanctioned with punitive damages when they refuse to cover a settlement. However, after conducting an extensive survey research on this topic, Baker and Griffith (2010) 200–202, conclude that managers are in a position to arbitrarily decide winch D&O Insurance will be
Similarly, when the parties settle the claim there is no final judgment preventing the indemnification of litigation costs. Parties are aware of these facts in advance and could react strategically, driving the litigation in a way that ensures insurance coverage over a potential settlement.

On the one hand, managers should be more willing to settle a claim when the D&O Insurance covers the monetary recovery and the structural benefits are not collected from their pockets. Particularly, they would agree to settle the case in any particular amount where $\alpha = 0$ and $\beta = 0$, whenever the individual losses of going to trial are higher than the proportional losses arising from the increase on insurance premium caused by the settlement.\(^{35}\) This is, when the following condition holds:\(^{36}\)

\[
p(\alpha m + \beta n + c^1_\Delta) \geq f^\Delta [(1 - \alpha)m + c_{\Pi} + c^1_\Delta] \tag{5}
\]

On the other hand, recall that the plaintiff’s attorney will have full control over the suit when the costs of litigation are higher than the net gain expected by the shareholder. Under this scenario, the attorney can improve his chances of reaching a settlement by minimizing $\alpha$ and $\beta$. Particularly, I will assume that both parties will agree to settle the case at $\alpha = 0$, $\beta = 0$ and $m = c_{\Pi}$. This assumption makes sense because the manager’s fractional ownership will only give him incentives to minimize the amount of litigation costs covered by the insurance.\(^{37}\) Considering that the plaintiff’s attorney is assumed to be neutral to any increase in the recovery exceeding his fees, they will also accept a settlement under this values. Therefore, the parties should only bargain with respect to the extent of the reimbursement of the litigation cost, a quantity that in this model is assumed to be fixed.\(^{38}\) In any purchased and how much will be expended on this item. Accordingly, insurance companies have little incentives to challenge a settlement because their main customer is the manager and not the shareholders.

\(^{35}\)When the probability of winning the case is low, managers will likely avoid a settlement in order to minimize the expenditures on insurance premium. For the reasons expressed below, the plaintiff’s attorney should also avoid a settlement when the probability of success is high. Therefore, collusive settlements seem to be problematic only with moderate probabilities. A similar argument can be made considering the relative optimism of the parties instead of underlying probabilities. See, Cooter, Marks and Mnookin (1982), and Bebchuk (1988).

\(^{36}\)It should be noted that $\alpha = 1$ on the left side of this condition and $\alpha = 0$ on the right side. However, I prefer not simplify the variable $\alpha$ in this equation because it illustrates that the source of the recovery is different in each case.

\(^{37}\)Managers bear the same fraction on the losses caused by the insurance premium than on the losses caused by the uninsured harm. Hence, they should be neutral between increasing the insurance premium or increasing the insured harm. In contrast, higher litigation costs will only increase the insurance premium without increasing the insured harm, creating thus a net loss to the corporation.

\(^{38}\)This assumption can be relaxed using game theory. For instance, the settings of this model
case, it should be noted that when $\alpha$ and $\beta$ are set to zero, derivative suits become largely ineffective from both compensatory and deterrent purposes. Particularly, this type of suits would only be in the shareholder’s interest when the improvements on the firm’s corporate governance exceed the litigation costs.

**Proposition 4** When a collusive settlement increases net corporate value. A collusive settlement increases net corporate value, if, and only if, $(1 - \beta)n \geq c_{\Pi} + c_{\Delta}$.

*Proof:* That $(1 - \beta)n \geq c_{\Pi} + c_{\Delta}$ follows from (1) and (5).

\[
\begin{align*}
    h - p(m + n) + (w^* - w) + p(1 - \alpha)m + pc_{\Pi} + (1 - p)c_{\Delta} & \geq (h - g) \\
    h - p(m + n) + (w^* - w) + p(1 - \alpha)m + pc_{\Pi} + (1 - p)c_{\Delta} & \geq (h - g) \\
    h - p(\alpha m + n) + [g - p(\alpha m + \beta n)] + pc_{\Pi} + (1 - p)c_{\Delta} & \geq (h - g) \\
    h - (1 - \beta)n + g + c_{\Pi} + c_{\Delta} & \geq (h - g) \\
    (1 - \beta)n + g & \geq g + c_{\Pi} + c_{\Delta} \\
    (1 - \beta)n & \geq c_{\Pi} + c_{\Delta} \quad \square
\end{align*}
\]

Here is where a contingent-fee agreement could make a difference, although not a positive one. An attorney working under a fully variable basis should only consent in settling the case when his expected benefit from the settlement is higher than whatever he expects to win from going to trial. Considering that the maximum amount of $m$ is reached when this quantity equals the harm, the attorney should only accept a settlement in which $m = ph$. However, if the attorney has the right to collect his fees with a preference over the shareholders, he would also accept a settlement in which $m = p\gamma h$. Particularly, it would be in the manager’s best interest granting such preference and deliver all the monetary recovery to the attorney in order to set the settlement at $\alpha = 0$, $\beta = 0$ and $m = p\beta \gamma h$. Once again, however, this terms of the settlement would be against the corporation’s best interest.\(^{40}\)

\[^{39}\text{This is the simplest version of how a collusive settlement could take place. Nevertheless, it has to be considered that the interaction between the attorney’s fees and the size of the settlement could be much more complicated. For a review of this topic, Eisenberg and Miller (2004) 30–32.}\]

\[^{40}\text{Any form of fee agreement in which the attorney has the control over the claim will create incentives to minimize } \alpha \text{ and } \beta \text{ in order to improve the chances of settling the case. Therefore, in an attorney-driven litigation the terms of the settlement will only affect the price of the insurance}\]

\[^{19}\]
4.3 Optimal Level of Deterrence

The gains from violations are a form of hidden salary that is costly to monitor by the shareholders.\textsuperscript{41} Hence, the managers could take advantage of this circumstance increasing his total payoff beyond the level that they could have agreed with the shareholders, should the expected salary would have been fully explicit. The easiest way of including the tradeoff between hidden salaries and explicit salaries into the model, is assuming that the reservation salary is fixed in a competitive level. This is, the level that the parties would have agreed in a scenario of perfect information. Under this assumption, the variable $w$ will not only have the ability of marking the optimum $w^* = w \iff g = p(\alpha m + \beta n)$, but also the following properties.

First, whenever the expected gains from a violation are higher than the reservation salary, the actual salary will be a negative quantity. This is, $g - p(\alpha m + \beta n) > w^* \iff w < 0$. In other words, under such extreme scenario of under-deterrence, managers should pay the shareholder for taking the office and not the other way around.\textsuperscript{42} Constraining the variable $w^*$ makes sense, because now the quantity that will be subtracted from the harm is a bounded reservation salary, and not the unbounded gains from violation. Hence, the gains exceeding the competitive threshold will be considered as a form of harm to the corporation. Second, whenever the expected gains from a violation are negative, then the actual salary will be higher than the reservation salary because $p(\alpha m + \beta n) > g \iff w > w^*$. In contrast with the previous case, over-deterrence implies that the shareholders will have to pay the managers an actual salary that exceeds the competitive threshold, this is, the shareholders will have to waste corporate resources in order to compensate the managers for the excessive litigation.

However, What level of enforcement allows to approach the optimum $x^* = w^*$? From Proposition 1, we know that $p(\alpha m + n) \geq g + pc_{\Pi} + (1 - p)c_{\Delta}$ satisfies (1) for those lawsuits that are not subject to collusive settlements. From Proposition 4, we know that $p(1 - \beta)n \geq c_{\Pi} + c_{\Delta}$ satisfies (1) for those lawsuits that are subject to collusive settlements. Therefore, if we let that the unknow variable $x$ denotes premium. As it was discussed before, increasing the insurance coverage over the litigation cost increases the insurance premium. However, the amount of insured harm remains at the same level, creating a net loss for the corporation. Provided that $p_{\gamma}h$ is higher than $c_{\Pi}$ valued as a fixed cost, a contingent-fee agreement would always reduce net corporate value relative to its next-best alternative.

\textsuperscript{41}This model only accounts for the costs of enforcement and not for the costs of gathering information. However, if $b$ denotes the probability of detection, the quantity $(1 - b) \cdot \{h - [w^* + p(1 - \alpha)m] + pc_{\Pi} + c_{\Delta}\}$ should give a measure of the extent of the asymmetries of information between managers and shareholders.

\textsuperscript{42}Suppose that the net expected gain from a violation exceeds the competitive level of the reservation salary and the violation is fully insured. For example, choose $g > w^*$, $m = g$, $p = 0.5$ and $\alpha = 0.5$. In this case, the actual salary will be negative unless the structural benefits are higher enough to compensate the difference.
the frequency of a collusive settlement, the policy purpose of derivative suits can be formulated as follows:

\[
\max \left\{ \left(1 - x\right)\left[p(\alpha m + n) - g - pc_{\Pi} - (1 - p)c_{\Delta}\right], \ x\left[(1 - \beta)n - c_{\Pi} - c_{\Delta}\right] \right\}
\tag{6}
\]

Several procedural institutions, such as the Lodestar Formula or the Substantial Benefit Doctrine, can be seen as a way to ensure that the Propositions 1 and 5 hold in a particular case. Similarly, the Demand Rule and other screening stages on the early steps of procedure are designed to choose those lawsuits that have a better probability of success. Nevertheless, it is far from obvious that these mechanisms would allow to approach the optimal explicit salary. Particularly, it is hard to see how could the condition \(p(1 - \beta)n \geq c_{\Pi} + c_{\Delta}\) help to deter a hidden salary strategy.

**Proposition 5** Policy goal of derivative actions. If \(w^* - w\) denotes the optimal level of deterrence, then the goal of the procedural rules governing derivative actions would be \(\max\{(1 - x)p\}\).

**Proof:** That \(\max\{(1 - x)p\}\) follows from (6). Note that the condition is evaluated at \(w^* = w \iff g = p(\alpha m + \beta n)\).

\[
(1 - x)[p(\alpha m + n) - g - pc_{\Pi} - (1 - p)c_{\Delta}] \geq x[(1 - \beta)n - c_{\Pi} - c_{\Delta}]
\]

Because this condition would only hold when \(p > (1 - p), (1 - x) > x\), and provided that \((1 - \beta)n < c_{\Pi} + c_{\Delta}\). I cannot prove directly that this condition necessarily holds when \((1 - x) > x\) and \((1 - \beta)n > c_{\Pi} + c_{\Delta}\). However, an indirect proof is provided in the appendix.

### 5 Final Remarks

Analytically, the difference between a violation to the duty of care and a violation to the duty of loyalty, is that the injurer obtains a gain in the latter type of cases. Regardless the level of D&O Insurance coverage, if managers hold some amount of the firm’s shareholdings, they will always have incentives to avoid a violation to the duty of care. The reason is that they bear a fraction of the harm caused to the corporation, that is equal to the fraction on the losses represented by the insurance premium. Yet, they do not receive an individual gain that could offset this effect. In contrast, the manager’s individual gain arising from a violation to the duty of loyalty, creates a moral hazard that is amplified by the D&O Insurance. However, if managers are prevented to profit from violations, they will likely require a higher salary.
When the violations to the duty of loyalty are deterred, the firm moves away from schemes of executive compensation with the hidden component that represents the profit from violations, toward schemes closer to an optimum explicit salary. This is the optimum outcome because it expresses the point in which managers are exactly deterred ($w^* = w \iff p(\alpha m + \beta n) = g$). As it can be seen, the move towards explicit salaries increases net corporate value by the quantity $h - g$, this is, the inefficiency caused by the violation. Considering that the expected insured recovery should be perfectly reflected in the insurance premium, only the uninsured monetary recovery would reduce the current inefficiency caused by the violation, and only the losses in the manager’s controlling rights would reduce his ability to profit from future violations. Accordingly, the manager’s incentives to commit violations are primarily driven by their scheme of corporate ownership. On the one hand, the strength of their controlling rights will determine the alternative cost of bargain a salary raise. On the other hand, the fraction of the inefficiency caused by the violation that the managers would have to bear, will be contingent to the extension of their beneficial ownership. Moreover, managers should be neutral to increases or decreases in the amount of insured recovery, because they bear the same fraction on the losses represented by non-compensated harm than on the ones represented by the insurance premium.

The main issue preventing derivative suits from achieving its policy purpose, is that shareholders would only sue if the proportional benefits arising from the suit exceeds the individual costs of litigation. The procedural rules in the U.S. have succeeded in empowering corporate minorities, but only through a system that is prone to be deceived by collusive settlements. If the shareholder’s ownership is small, the plaintiff will be forced to deliver the control of the claim to the attorney in order to finance the suit. In turn, an attorney working on a conditional basis will likely collude with the managers in order to settle the case under insurance coverage, this is, at $\alpha = 0$, $\beta = 0$ and $m = c_\Pi$. From this perspective, the system of derivative actions seems to be trapped in a choice between relying on public enforcement and institutional investors, or either opening the door to opportunistic attorneys.

Certainly, American courts have developed several ways to reduce the risk of collusive settlements and the model proposed on this paper should help to formalize the effect of such mechanisms. However, this will likely require introducing more complex mathematical tools. Particularly, a clever game theorist should be able of shaping this model in dynamic terms, in order to formalize how the parties would be able to foresee the chances of a settlement and react adjusting their behavior. Once that issue is solved, the insurance coverage could move away from the discrete constraint implied in this model and become a continuous variable. This would not only improve the realism of the model, but would also allow analyzing which
standard of liability is preferable. Intuitively, the problem of collusive settlements is related with the gap between the standard used by the law to determine when a violation is committed and the standard used by the insurance policies to exclude situations of moral hazard. In such a case, the movement in Corporate Law towards limiting or excluding the suits grounded on violations to the duty of care, seems to point on the right direction.

In conclusion, the benchmark to reform derivative actions should be delivering to the shareholders a functional set of procedural rules that encourage them to sue when it is desirable from the corporation’s point of view, while preventing them to do so when it is not. However, it has to be stressed that fostering litigation without the proper defenses against opportunistic suits is not desirable. Unrestrained attorney-driven litigation will certainly create an overall increase in insurance premiums, with a rather small —if any— increase in the enforcement of Corporate Law. In fact, between a world without incentives to minority shareholders’ litigation and a world without proper constraints, the former should be preferable. On the one hand, public enforcement and institutional investors could always play a role and it will likely imply less risks. On the other hand, provided that the relationship between weaker managers and higher levels of violations is true, shareholders would be better-off in a world without incentives to sue, because it will be easier for them to minimize the risk of violations through properly diversified portfolios, than avoiding the negative effects of an overall increase in the insurance premiums.
Appendix

This Appendix continues with the proof of the Proposition 5 that is described in the main body of the paper. Particularly, it proves that collusive settlements do not allow approaching to the optimum $w^* = w$, even if $(1 - \beta)n > c_\Pi + c_\Delta$. The proof consists in two steps. The first step consists in reformulate the equation (6) as a function that represents the level of deterrence, and then find its first derivative using implicit differentiation. The second step consist on evaluate if the first derivative could reach zero in four different scenarios: (i) collusive settlements and high-probability of success; (ii) collusive settlements and low-probability of success; (iii) arms-length litigation and high-probability of success; and, (iv) arms-length litigation and low-probability of success.

**Step 1:** Find the first derivative using implicit differentiation. The equation (6), evaluated at $w^* = w \iff g = p(am + \beta n)$, can be reformulated as $\max\{(1 - x)[p(1 - \beta)n - p\Pi - (1 - p)c_\Delta] + x[(1 - \beta)n - c_\Pi - c_\Delta]\}$. In turn, this can be considered as the function $F(x, p)$ that represents the level of deterrence caused by the derivative actions. Under this conditions:

$$F(x, p) = (1 - x)[p(1 - \beta)n - p\Pi - (1 - p)c_\Delta] + x[(1 - \beta)n - c_\Pi - c_\Delta]$$

$$\frac{\partial F}{\partial x} = (1 - \beta)n - c_\Pi - c_\Delta - p(1 - \beta)n + p\Pi + (1 - p)c_\Delta$$

$$\frac{\partial F}{\partial p} = (1 - x)(1 - \beta)n - (1 - x)c_\Pi + c_\Delta$$

$$\frac{dp}{dx} = \frac{(1 - \beta)n - c_\Pi - c_\Delta - p(1 - \beta)n + p\Pi + (1 - p)c_\Delta}{(1 - x)(1 - \beta)n - (1 - x)c_\Pi + c_\Delta}$$

$$= \frac{p(1 - \beta)n - (1 - \beta)n + c_\Pi - p\Pi + c_\Delta - (1 - p)c_\Delta}{(1 - x)(1 - \beta)n - (1 - x)c_\Pi + c_\Delta}$$

**Step 2:** Evaluate $dp/dx$ in different scenarios. Note that following the Proposition 5, here $(1 - \beta)n > c_\Pi + c_\Delta$ by assumption

(i) Collusive settlements and high-probability of success.

$$F(p = 1, x = 1)' = \frac{(1 - \beta)n - (1 - \beta)n + c_\Pi - c_\Pi + c_\Delta}{c_\Delta} = \frac{c_\Delta}{c_\Delta} = 1$$
Which implies that the function \( F(x, p) \) will never reach an optimum with collusive settlements and high-probability of success.

(ii) Collusive settlements and low-probability of success.

\[
F(p = 0, x = 1)' = \frac{c_{\Pi} - (1 - \beta)}{c_{\Delta}} \quad \forall (1 - \beta)n > c_{\Pi} + c_{\Delta}, \quad \in (-\infty, -1)
\]

Which implies that the function \( F(x, p) \) will never reach an optimum with collusive settlements and low-probability of success.

(iii) Arms-length litigation and high-probability of success.

\[
F(p = 1, x = 1)' = \frac{c_{\Delta}}{c_{\Pi} + c_{\Delta} - (1 - \beta)n} \quad \forall (1 - \beta)n > c_{\Pi} + c_{\Delta}, \quad \in (-\infty, 0)
\]

Which implies that, under arms-length litigation and high-probability of success, the function \( F(x, p) \) will become closer to the optimum as the difference between \((1 - \beta)n\) and \(c_{\Pi} + c_{\Delta}\) increases.

(iv) Arms-length litigation and low-probability of success.

\[
F(p = 0, x = 0)' = \frac{c_{\Pi} - (1 - \beta)n}{c_{\Pi} - (1 - \beta)n + c_{\Delta}} = \frac{1}{c_{\Delta}} \quad \in (0, 1)
\]

Which implies that, under arms-length litigation and low-probability of success, the function \( F(x, p) \) will become closer to the optimum as \(c_{\Delta}\) increases.

Remarks

- The function \( F(x, p) \) cannot reach an optimum when the litigation is driven by attorneys. Hence, even if in a particular case a collusive settlement increases net corporate value because \((1 - \beta)n > c_{\Pi} + c_{\Delta}\), the frequency of collusive settlements should follow the benchmark \((1 - x) > x\) as a policy goal.

- The function \( F(x, p) \) could reach an optimum when the shareholder retains the control over the claim. However, the scenario (iv) is not particularly intuitive. A possible interpretation could be that the increases in insurance premia implied in a higher level of \(c_{\Delta}\), should deter shareholders from filing a low-probability suit.

- In contrast, the scenario (iii) has a straightforward reading that supports the intuitions developed on this model. The function \( F(x, p) \) becomes closer to its optimum as \(c_{\Pi} + c_{\Delta} - (1 - \beta)n\) decreases. This is, when the value of the structural benefits arising from amendments to the firm’s corporate governance is increasing relative to the litigation costs.
References


