

Rotterdam Institute of Law and Economics (RILE)

Working Paper Series

www.rile.nl

No. 2009/04

Inducing Corporate Compliance: A Law and Economics Analysis of Corporate Liability Regimes

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Abstract

Corporate liability has two major social goals: (i) inducing corporations to internalize all social consequences of their activity; and- (ii) inducing corporations to prevent, police, and report their own regulatory violations. Previous studies have shown that neither strict nor duty-based corporate liability regimes can reach both social goals simultaneously. Thus far, the structure of an optimal corporate liability regime has remained an unsolved puzzle. This paper follows a Law and Economics approach to develop an innovative structure of a corporate liability regime which may present an optimal legal structure in most settings. The suggested regime is composed of two layers: (i) A default sanction which is determined by the total social cost caused by corporations' wrongdoings; and- (ii) A mitigated sanction which applies when corporations have appropriately self-reported.

Keywords: Law enforcement, self-enforcement, corporate liability, deterrence, regulation, compliance.

JEL Classification: K42, L50

1. Introduction

Individuals and corporations in modern societies are subject to substantial governmental regulations; such regulations cover almost every aspect of their activities, including competition, environment, securities, and employment. Policy-makers across the globe have acknowledged that market forces may fail to produce an optimal resource allocation. Such failure may occur, for instance, when market forces are distorted as a result of asymmetric information, externalities, market powers, or public goods.¹ Under these circumstances, governments may possess an important role in ensuring the proper functioning of the marketplace by providing regulatory standards of behavior which accord agents' behavior with the social interest.² Examples for such regulations are: disclosure requirements, pollution restrictions, and precaution duties.

Compliance with regulations is a key aspect of every legal system; from a social perspective, regulations are worthless if market agents do not comply with them.³ Therefore, legal systems employ various enforcement mechanisms, including private and public enforcement, which are aimed at inducing market agents to comply with the regulatory standards. Such mechanisms are designated to deter agents from violating the regulations by imposing civil, administrative, or criminal sanctions for violations. Taking into account the expected sanctions, market agents may prefer to comply with regulations rather than to violate them.

Policy-makers face a major challenge when crafting an enforcement policy which is designated to induce corporations, rather than private individuals, to comply with regulations. Under the organizational settings of corporations, the basic presumption of a single entity which makes behavioral choices is no longer valid. Behavioral choices of corporations are made and carried-out by different individuals

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¹ For an overview of the market failures *see*, (Cooter & Ulen, 2007), at 43-48; (Stiglitz, 2000), at 77-92; *See also* (Gruber, 2007), (Bator, 1958), (Arrow, 1969) and (Akerlof, 1970).

² For the role of public legislation in correcting market failures *see, for instance*, (Cooter & Ulen, 2007), at 43-48.

³ *See* (Heyes, 1998), at 61: “*regulations are only useful insofar as they are enforced – either fully or partially*”.

acting integrally on behalf of the corporations. Even when corporations decide to comply with the regulations, their employees' activity may generate a violation, intentionally or unintentionally. These unique characteristics have led many legal systems to employ a unique policy measure, namely, corporate liability. Corporate liability has two major social goals: (i) inducing corporations to internalize all the social consequences of their activity when making behavioral choices; and- (ii) inducing corporations to actively prevent, police, and report own violations.⁴

The scholarly literature has identified three major structures of corporate liability regimes:⁵ (i) *corporate strict liability*, under which corporations are held strictly liable for every violation, regardless of the actions taken by these corporations to prevent, police, or report the violation; (ii) *negligence-based liability*, under which corporations are held liable for violations only if they failed to meet a legal duty to prevent, police, and report the violations; and- (iii) *composite regime*, under which corporations are held liable for violations and incur a high sanction for every violation committed. However, according to the latter regime, these sanctions may be mitigated, rather than eliminated, in a case where the corporations have met their legal duty to prevent, police, and report the violations.⁶ The aforementioned regimes have been criticized by Law and Economics scholars for their relative weaknesses.⁷ Thus far, the optimal structure of corporate liability has not been recognized.

This paper seeks to fill in the gap in the existing literature. Our goal is to develop a corporate liability regime which maximizes the social welfare by reaching both social goals of liability regimes. To this end, we evaluate the strengths and weaknesses of existing corporate liability regimes according to their impact on social

⁴ See (Arlen & Kraakman, 1997), at 692: "Where corporate liability is justified, it must accomplish two goals: it must induce firms to select efficient levels of productive activity (the activity level goal) and to implement enforcement measures that can minimize the joint costs of misconduct and enforcement (the enforcement goal)".

⁵ See (Arlen & Kraakman, 1997); (Krawiec, 2005).

⁶ The corner stone of the composite liability is commonly attributed to the US Organizational Sentencing Guidelines ('OSG'), 1991. Chapter eight of the OSG substantially reduces corporations' criminal liability for the illegal actions if the corporation can demonstrate that it had put in place an effective compliance program and promptly reported the violation to the relevant agency. A similar approach has been adopted in respect to non-criminal actions, for instance in areas such as environmental protection, See, U.S. EPA, Policy statement - Incentives for Self-Policing: Discovery, Disclosure, Correction and Prevention of Violations (2000), [FRL 6576-3], available at: <http://www.epa.gov/compliance/resources>

⁷ For a critical analysis See (Arlen & Kraakman, 1997) and (Krawiec, 2005).

welfare.⁸ Armed with the results of our analysis, we develop an innovative structure of a corporate liability regime which combines the strengths of the existing regimes while remediating their weaknesses. Our analysis reveals that a corporate liability regime may be socially optimal if it is structured into the following layers: *first*, a default sanction which equals the sum of the social harm caused by the violation and the social enforcement costs, divided by the probability of detection; and *second*, a mitigated sanction which equals the social harm caused by the violation. The mitigated sanction shall be imposed when a corporation has appropriately self-reported the violation. As we shall see, under such a compound regime, corporations are incentivized to internalize all social consequences of their activity, as well as to prevent, police, and report own regulatory violations whenever such actions are socially desirable.

The remainder of this paper is structured as follows: the *second* section provides a short overview of the economic function of enforcement systems in inducing regulatory compliance; the *third* section presents the unique challenges involved in controlling corporate misconduct and the social goals of corporate liability; and the *fourth* section develops an analytical framework for a systematic comparative evaluation of corporate liability regimes. In the *fifth* section we turn to evaluate the alternative corporate liability regimes according to the incentives they provide corporations with. The analysis reveals that none of the alternative regimes presents an optimal liability regime from a social perspective. In the *sixth* section, we develop a compound corporate liability regime which may present an optimal legal structure in most settings. The *seventh* section concludes.

2. Enforcement and Compliance

Regulatory standards often oblige the subjected agents to take certain precautions, such as keeping records, disclosing certain kinds of information, or using abatement equipments to reduce the level of pollution. Compliance with such regulations imposes costs on the regulated agents.⁹ Therefore, profit-maximizing

⁸ For the sake of simplicity, hereafter the composite regime and the duty-based regime are collectively referred to as “duty-based liability regimes,” except where the context requires a distinction between the two.

⁹ See (Heyes, 1998), at 50. For an empirical study of the costs of compliance in the financial services market, see, for instance, (Economics, 2003).

agents will rationally strive to avoid these costs and refrain from complying with the regulations.¹⁰ In order to induce regulated agents to comply with regulatory standards, legal systems employ various enforcement mechanisms.

The role of an enforcement policy is often explained in the Law and Economics literature by the *deterrence theory*. According to the theory, utility-maximizing agents decide whether to obey the law or to violate it according to a cost-benefit analysis;¹¹ agents compare their expected compliance utility, *i.e.*, the payoffs expected to be obtained when they obey the law, with their expected violation utility, *i.e.*, the expected payoffs when they violate the law. Consequently, the agents will obey the law only when their expected compliance utility is greater than their expected violation utility.¹² This method of rational choices reveals the role of enforcement systems; these systems are designated to induce market agents to comply with the regulations, by reducing the expected violation utility to the level in which market agents will be better-off complying than violating the regulations.

Enforcement systems can attain an optimal level of deterrence by setting the expected sanction for regulatory violations at the level of the total social costs caused by the violation, divided by the probability of detection; this way, regulated agents are compelled to bear the social costs of their regulatory violations.¹³ Stigler (1970) has shown that when considering the total social cost of a violation, one must take into account the enforcement costs which are generated due to the violation.¹⁴ Hence, an optimal sanction should be determined by the total social costs, *i.e.*, the social harm and the social enforcement costs caused by the violation, divided by the probability of detection. If sanctions against regulatory violations are set at the optimal level, regulated agents' expected compliance utility shall be greater than their expected

¹⁰ See (Spence, 2001), at 918-919.

¹¹ See (Spence, 2001), at 919.

¹² See (Becker, 1968); (Stigler, 1970); (Heyes, 1998); and (M. A. Polinsky & Shavell, 2000).

¹³ For analysis of 'harm-based liability', according to which deterrence can be reached by setting the expected sanction for non-compliance at the level of the social harm caused by the infringer, see (Stigler, 1970); (Cooter, 1984); (Becker, 1989), (Block, 1991), (Heyes, 1998) and (M. A. Polinsky & Shavell, 2000). It should be noted that deterrence can be achieved through an alternative mechanism, *i.e.*, through a 'gain-based liability' which forces the infringer to disgorge the gains achieved due to the law violation - See (Becker, 1968), and (Van den Bergh, 2007), at 196. However, when considering the possibility of courts' errors in estimating the gain and harm, 'harm-based liability' may be superior to a 'gain-based liability'. For a comparative analysis of a 'gain-based liability' and a 'harm-based liability', see, (A. M. Polinsky & Shavell, 1994).

¹⁴ See (Stigler, 1970), at 533. See also (Block, 1991), at 397.

violation utility. In that case, rational regulated agents will prefer to obey the law rather than to violate it.

It is important to notice that enforcement of regulatory standards may be carried out through various frameworks. In some areas of law, legal systems employ private enforcement systems in order to deter legal violations. In these cases, violators are held liable for the harm which has resulted from their violations, while individual victims are entitled by the law to claim their losses from the violators through the judicial system.¹⁵ Other frameworks of enforcement employ the public enforcement system, either administrative or criminal enforcement, in order to reach deterrence goals. In those cases, public agents are entrusted with enforcement powers to pursue the perpetrators and to impose administrative or criminal sanctions against legal violations.¹⁶ The choice of the optimal enforcement framework under each relevant setting is commonly derived from the question which framework is better capable to ensure regulatory compliance at the lowest social costs. Addressing this question, scholars have suggested various criteria for the optimal structure of enforcement systems considering the relative strengths and weaknesses of each alternative framework.¹⁷

3. The Role of Corporate Liability

The organizational settings of corporations, under which various agents act on behalf of their corporation, pose some challenges to the enforcement system. Under the setting of the corporation, the assumption of a single entity which conducts a cost-benefit analysis when making behavioral choices is no longer valid. Behavioral choices in corporations are taken and executed on two inter-connected levels: first, *the central decision-making level*, in which the corporation administration shapes the

¹⁵ A common example of such form of private enforcement is presented by tort law, under which a violation of legally-imposed standard of behavior triggers civil actions by the victims.

¹⁶ Common examples of public enforcement methods traditionally exist in areas such as competition, environmental and securities laws.

¹⁷ *See, for instance*, (M. A. Polinsky, 1980), (Shavell, 1982), (Shavell, 1984a), (Shavell, 1984b), (Shavell, 1993), (M. A. Polinsky & Shavell, 2000), (A. M. Polinsky & Shavell, 2006), (Segal & Whinston, 2006), (Van den Bergh, 2007), (Bowles, Faure, & Garoupa, 2008). Scholars considered criteria such as information superiority of the enforcer, the magnitude of the harm, the rate of violation detection, insolvency risks and the administrative costs involved. In some cases, when none of these frameworks presents an optimal enforcement system, scholars suggested to opt for a combination of various enforcement frameworks, so that they can mitigate each others' weaknesses. *See, for instance*, (Van den Bergh, 2007), at 183 and 201.

corporate business activity by determining the sorts of activity, the technology to be used, and the overall level of activity; and second, the *execution level*, in which corporation's employees of different levels are operating as an integrated team to execute the corporation's policy. Under this complex structure, even when corporations decide to comply with the regulations, violation may be committed at the execution level. Such violations may occur, for instance, due to an imperfect flow of information and commands within corporations, or due to conflicts of interests between corporations and their employees. Given the challenges above, an enforcement policy may fail to achieve an efficient outcome by treating corporations simply as they treat individual perpetrators; it cannot ensure corporate compliance by simply incentivizing the corporate central decision-makers to adjust the corporate policy to the regulatory requirements. An enforcement policy must take a further step and ensure that deterrence is provided at the execution level as well.

In an optimal world, deterrence effects could have been generated by imposing individual liability on the primary actors, operating on behalf of corporations.¹⁸ However, such liability scheme may fall too short to provide adequate deterrence for various reasons; at the outset, an individual liability scheme does not consider the agency relationship within corporations, and therefore may fail to provide appropriate incentives at both decision-makers and executors levels.¹⁹ In addition, such a scheme may fail to cope with the unique challenges involved in controlling a group of various individual actors operating as an integrated team.²⁰ Moreover, challenges to the

¹⁸ See (Arlen & Kraakman, 1997), at 695.

¹⁹ Individual liability alone cannot provide adequate compliance incentives to the corporations' employees, whereas those employees are often limited in their discretion to the execution of the corporation's internal policy. For instance, a single employee is not capable of changing the level of activity or deciding which technology to use. Such decisions are taken by the corporation's administration. Therefore, holding an individual employee liable for violations which resulted from over-production or improper technology may not achieve deterrence goals. Therefore, if liability is imposed on the employees' level alone, no deterrence effect is generated at the corporations' central-decision-makers level.

²⁰ The regulated actions are actually undertaken within the corporations by an integrated team of employees operating on behalf of the corporations. Such integration of various actors may make more difficult the application of enforcement measures, including monitoring regulated operations, detecting and investigating violations, and sanctioning culpable actors. To illustrate this challenge, assume, for instance, that a certain good produced by a corporation turned out to be a defective good which does not meet the regulatory standards. In addition, assume that various employees were directly and indirectly involved in designing, producing, packing, and delivering the good. Given that these employees act as an integrated team, an enforcement system which relies on an individual liability scheme requires a close monitoring and substantial information regarding the actions taken by each individual employee. When the acquisition of such information is costly, individual liability may not present an efficient enforcement policy.

individual liability scheme may arise with regards to the limited wealth of individual employees which may not suffice to cover the sanctions imposed by the enforcement system.²¹ Considering all the challenges above, many legal systems employ corporate liability as a policy measure which is aimed to induce corporate compliance.

Corporate liability holds corporations liable – at least to a certain extent – to the regulatory violations committed by their agents within the scope of their employment. Such policy has two major social goals:²² the first is to induce corporations to *internalize* the social consequences of their activity; by that, corporations are encouraged to adjust their activity to the socially optimal standard of behavior. The second goal is to induce corporations to *Self-enforce*, that is, to act in order to prevent, police, and report own regulatory violations. This goal is derived from the presumption that under certain circumstances corporations' self-enforcement actions may be more efficient - that is, more effective and less costly - than public agencies' enforcement actions in deterring regulatory violations. With regards to the later goal, let us consider the major self-enforcement actions which can be taken by corporations, and their potential positive impact on the social welfare:

1. *Ex-ante self-policing* – this form of actions includes all prevention and deterrence actions which may be taken by corporations *before* a regulatory violation occurs, *e.g.* provision of detailed working procedures, guidelines, manuals, ethics codes, employees' trainings, and close monitoring. Given the vast amount of information possessed by corporations regarding the nature of their regulated activities, self-prevention actions may substantially reduce the frequency of regulatory violations, and by that, increase the social welfare.
2. *Ex-post self-policing* – this form of action includes all deterrence actions which may be taken by the corporations *after* a violation occurs. Within this category of actions we may consider, for instance, active detection and self-investigation schemes of regulatory violations. Given the superior access of

²¹ See (Shavell, 1986); and (Heyes, 1998) at 57. This judgment proof problem may be stringent when the optimal sanction is severe, for instance due to the rigorous harm resulted from the violation. Indeed, public enforcement frameworks may partially solve this judgment proof problem by employing *ex-ante* administrative measures, such as licensing requirements, or through criminal non-monetary sanctions, such as imprisonment. However, those measures are involved with substantial social costs and may not be optimal in every case. See (Bowles et al., 2008), at 405.

²² See *supra* note 4.

corporations to the relevant information, such actions may improve the probability of violation detection by the corporations, which by its nature is often greater than the probability of detection by the public agency. As we shall see, the efficiency of violation detection may play a central role in maximizing the social welfare, given the substantial costs which are commonly involved with violation detection by public agencies.

3. *Self-reporting* - by self-reporting we refer to a statement or account made by corporations to the relevant public agency describing own violations. Self-reporting may save substantial enforcement costs, such as detection, investigation, litigation, and error costs.²³ In addition, prompt reports of violation may be crucial in restoring the harm and preventing its expansion.²⁴

As we shall see in what follows, by compelling corporations to bear sanctions for their regulatory violations, corporate liability may reach each of these social goals; *first*, if a harm-based sanction is imposed such that corporations' expected liability equals the social costs caused by their misconduct, corporations may be incentivized to internalize the social costs of their conduct;²⁵ *Second*, if corporate liability is structured such that corporations are rewarded for self-enforcement actions, *e.g.*, by mitigating the sanctions imposed, corporations may be incentivized to undertake self-enforcement actions. A major challenge of policy-makers is to craft a liability regime which can fulfill these two goals simultaneously.

After the social goals of corporate liability have been clarified, in the subsequent sections we sketch the analytical framework for a comparative welfare evaluation of the alternative liability regimes, and examine to what extent each of these regimes may achieve such goals.

²³ See (Kaplow & Shavell, 1994) and (Malik, 1990).

²⁴ To see how self-reporting may be useful for restoring purposes, consider, for instance, the case of drinking-water pollution. It is clear that a prompt detection of the discharges may be crucial in preventing a greater social harm.

²⁵ See *supra* note 13.

4. The Analytical Framework

The optimal structure of liability regimes has been thoroughly studied in the Law and Economics literature. Commentators have identified the relative strengths and weaknesses of strict liability and negligence-based liability in different contexts of individual wrongdoers.²⁶ However, as discussed above, individual liability schemes – whether they take the form of strict liability or negligence-based liability – may not suffice when the potential perpetrators are corporations, rather than individuals. To induce corporate compliance, the liability regime must induce corporations not only to internalize the social costs caused by their activity, but also to self-enforce the regulations when by doing so, corporations may minimize the social costs of misconduct and enforcement. Considering these two goals of corporate liability regimes, the optimal structure of such regimes somewhat deviates from the conventions regarding the individual liability schemes.

We start by sketching an analytical framework which permits a systematic comparative analysis of liability regimes. Such framework is designed to examine whether a given liability regime may maximize the overall social welfare, *i.e.*, to minimize the social costs of regulatory violations and enforcement.²⁷ We start by presenting the relevant setting under which the welfare evaluation is made. Then, we present the compliance and self-enforcement decisions that corporations often face. In the next phase, we identify the optimal decisions to be taken by corporations from a social perspective.

4.1. The General Settings

Our point of departure is that a certain standard of behavior is provided by regulations, *e.g.*, prohibition of price fixing, or restrictions on pollution discharges. We assume that a regulatory violation generates a positive social harm, H ; ($H > 0$). We further assume that the public agency may detect a violation with a positive probability P ; $P \in (0,1)$, and that corporations have a private gain, G , generated by engaging in the regulated activity, *e.g.*, gains from production or trade. Within this framework, our analysis further relies on the following assumptions:

²⁶ For a general discussion of the optimal choice between strict liability and negligence standards at the individual liability scheme *see*, (Shavell, 1980).

Assumption 1: corporations' *ex-ante* self-policing actions (prevention and monitoring) reduce the probability that a violation occurs within these corporations: meaning that, if a corporation does not self-police *ex-ante*, the probability that a violation occurs is V^H ; $V^H \in (0,1)$. Alternatively, if a corporation self-polices *ex-ante* and bears the private costs of these actions, C_{ea} per violation, it reduces the probability that a violation occurs to V^L ; ($V^L \in (0,1)$; $V^L < V^H$).

$$\text{In summary: } \begin{cases} C_{ea} = 0; & V^* = V^H \\ C_{ea} > 0; & V^* = V^L \end{cases} \quad (0 < V^L < V^H < 1)$$

Assumption 2: corporations' *ex-post* self-policing actions (detection and investigation) increase the probability that corporations detect their own violations. If corporations do not self-police *ex-post*, the probability of self-detection is D^L ; $D^L \in (0,1)$. If alternatively, corporations self-police *ex-post*, and bear the private costs of *ex-post* self-policing, C_{ep}^P per violation, the probability of self-detection increases to D^H . ($D^H \in (0,1)$; $D^H > D^L$).

$$\text{In summary: } \begin{cases} C_{ep}^P = 0; & D^* = D^L \\ C_{ep}^P > 0; & D^* = D^H \end{cases} \quad (0 < D^L < D^H < 1)$$

Assumption 3: self-reporting can be done with negligible costs; meaning that, once corporations are fully aware of a regulatory violation they committed, reporting such violation to the relevant agency involves no significant costs.

Assumption 4: when corporations do not self-report, the social costs of detection, investigation, and litigation are, C_{ep}^S per violation ($C_{ep}^S > 0$). On the other hand, when a violation has been appropriately self-reported, the public enforcement agency is no longer required to invest in detecting the perpetrators, investigating and collecting evidences for their culpability, or prosecuting them. Put differently, Self-reports of regulatory violations are assumed to make public *ex-post* enforcement actions with respect to the reported violations unnecessary ($C_{ep}^S = 0$).²⁸

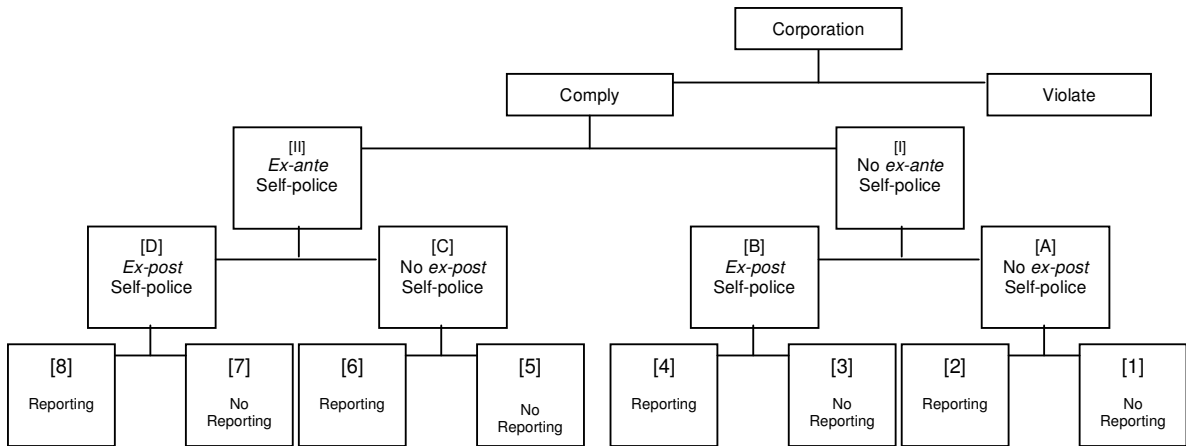
²⁷ See (Stigler, 1970), at 533. .

²⁸ According to this assumption, costs of verifying the reported violation are negligible.

4.2. Corporations' Compliance and Self-Enforcement Decisions

Compliance and self-enforcement decisions are made by corporations in subsequent stages. Each decision is made by comparing the corporations' expected utility under each of the alternative choices. Corporations' compliance and self-enforcement choices are sketched in Scheme 1.

Scheme 1: Corporations' compliance and self-enforcement decisions



Let us briefly discuss these decisions:

1. **Compliance decision** – corporations have to choose whether to comply with regulations, taking into account the expected sanction in case of a violation. This decision often includes choices which are related to the sort of corporate activity (*e.g.*, what to produce?); the level of activity (*e.g.*, how much to produce?); and the technology to be used (*e.g.*, how to produce?). When corporations opt for the compliance option, they have to adjust their activity to the regulatory standards, *e.g.*, to set the level of production so that the resulting pollution does not exceed the permitted levels. In addition, when corporations decide to comply, they face the following subsequent decisions.
2. **Ex-ante self-policing decision** (decision: I–II in Scheme 1) – corporations have to choose whether to self-police *ex-ante*, *i.e.*, whether to act in order to prevent violations. When considering this decision, corporations take into account: (i) the costs involved with *ex-ante* self-policing, $C_{ea} > 0$; and- (ii) the

benefits which may result from these actions, namely, a reduction in the probability that a violation occurs in spite of the corporations' decision to comply; $\delta V = V^H - V^L$.²⁹

3. ***Ex-post self-policing*** (decisions: *A-B / C-D* in Scheme 1) – corporations have to choose whether to undertake *ex-post* self-policing actions, *i.e.*, whether to detect and investigate violations which have taken place within the corporation. When considering this decision, corporations take into account: (i) the private costs involved with *ex-post* self-policing, $C_{ep}^p > 0$; and- (ii) the additional detection rate of violations which results from the *ex-post* self-policing actions, $\delta D = D^H - D^L$. As we shall see, a higher probability of self-detection may affect corporations' expected utility under certain liability regimes.

4. ***Self-reporting*** (decisions: *1-2 / 3-4 / 5-6 / 7-8* in Scheme 1): provided that corporations may self-detect own violations, they have to choose whether to self-report such detected violations to the relevant public agency.³⁰

As mentioned above, utility-maximizing corporations make compliance and self-enforcement decisions using a cost-benefit analysis; they compare their net expected utility under each of the alternative choices and opt for choices which maximize their expected utility. Given the subsequent nature of corporations' decisions, the comparative analysis shall be made through a backward induction. Before turning to evaluate the incentives provided by each liability regime, it is useful to identify first, the optimal decisions corporations should make, from a social perspective.

²⁹ As mentioned above, given the complex structure of corporations, it is plausible that violations take place at the execution level, in spite of the central decision-makers decision to comply.

³⁰ It shall be noticed that some positive probability of self-detection may exist even when corporations decide not to self-police *ex-post*, for instance, when employees voluntarily report violations to the corporation. Hence, the self-reporting decision remains relevant whether corporations decided to self-police or not.

4.3. Optimal Decisions from a Social Perspective

Under which circumstances are corporate compliance and self-enforcement socially desirable? The answer to this question is provided by a ‘golden rule’, according to which a certain action is socially desirable whenever the social benefits from such action equal or exceed the associated social costs. Put differently, a given action is socially desirable when the net expected social welfare is greater when such action is taken, rather than not taken. Following this rule, let us now consider corporations’ compliance and self-enforcement decisions from a social point of view. The results of the analysis are summarized in Table 1:

Table 1: The socially optimal corporate compliance and self-enforcement decisions

	The Condition for a socially desirable action
Self-reporting	Always (<i>i.e.</i> , whenever a violation has been self-detected)
Ex-post self-policing (given self-reporting)	$C_{ep}^S \cdot V^* \cdot \delta D \geq C_{ep}^P$ (“condition [1]”)
Ex-ante self-policing (given self-reporting)	$(H + C_{ep}^S - D^* C_{ep}^S) \cdot \delta V \geq C_{ea}$ (“condition [2]”)
Compliance (given conditions [1] and [2])	$(H + C_{ep}^S)(1 - V^L) + V^L D^H C_{ep}^S \geq C_{ea} + C_{ep}^P$ (“Condition [3]”)

Self-reporting - it is socially desirable that corporations self-report whenever the social benefit from self-reporting is greater than the social costs of self-reporting. Self-reporting, which can be done with insignificant costs (Ass. 3 above), may save the public enforcement costs (Ass. 4 above). Hence, self-reporting is socially desirable, when:

$$\text{Social benefit of self-reporting} \longrightarrow C_{ep}^S > 0 \longleftarrow \text{Social cost of self-reporting}$$

Given that C_{ep}^S is positive by definition, it is *always* socially desirable that corporations self-report every self-detected violation.

Ex-post self-policing – *ex-post* self-policing actions (detection and investigation) may improve the probability that corporations detect own violations. As we have seen, self-reporting is always socially desirable. Therefore, a social welfare evaluation assumes that corporations report every self-detected violation. As a result,

whenever corporations self-report, public enforcement actions such as detection, evidences collection, and litigation are no longer required. Hence, *ex-post* self-policing is desirable whenever the costs of such actions are lower than the public enforcement costs which would have been invested had the violation not been self-reported.³¹ Meaning that, corporate *ex-post* self-policing is socially desirable if condition [1] is met, when V^* represents the relevant probability that a violation takes place:³²

$$[1] \quad \begin{array}{ccc} \text{Social benefit of } ex\text{-post} & \longrightarrow & C_{ep}^S \cdot V^* \cdot (D^H - D^L) \geq C_{ep}^P \\ \text{self-policing} & & \longleftarrow \text{Social cost of } ex\text{-post} \\ & & \text{self-policing} \end{array}$$

Ex-ante self-policing – *ex-ante* self-policing actions may reduce the probability that a violation occurs. Hence, such actions are socially desirable whenever their costs are lower than the total social costs, *i.e.*, the social harm and the social enforcement costs which can be saved by such actions. Hence, *ex-ante* self-policing is socially desirable whenever:³³

$$[2] \quad \begin{array}{ccc} \text{Social benefit of } ex\text{-ante} & \longrightarrow & (H + C_{ep}^S - D^* C_{ep}^S)(V^H - V^L) \geq C_{ea} \\ \text{self-policing} & & \longleftarrow \text{Social cost of } ex\text{-ante} \\ & & \text{self-policing} \end{array}$$

Compliance – compliance with regulations is socially desirable whenever the total social costs caused by a violation are greater than the social costs associated with compliance. Assume, for instance, that conditions [1] and [2] above are met. Under these circumstances it is socially desirable that corporations will comply with the regulations whenever the costs associated with compliance, *i.e.*, the costs of self-enforcement, are lower than the social benefit of compliance, *i.e.* the total social costs

³¹ A consideration of the social costs of enforcement is required by the application of Stiglers' contribution, according to which social enforcement costs shall be counted as part of the total social costs of wrongdoing. *See supra note 14.*

³² When the corporation self-police *ex-ante*, $V^* = V^H$; alternatively, when the corporations do not self-police *ex-ante*, $V^* = V^L$ (*see ass. 1, above*).

³³ For every violation committed, the society bears a cost which equals the social harm caused by the violation and the social cost of enforcement, including detection, investigation and litigation ($H + C_{ep}^S$). As we have seen, it is socially desirable that corporations report every self-detected violation. Hence, when considering the social condition for *ex-ante* self-policing, we assume that corporations report every violation they detected with a probability D^* , and by that save $D^* C_{ep}^S$ for every reported violation. Note that $D^* = D^H$ when corporations self-police *ex-post*; alternatively, when corporations do not self-police *ex-post*, $D^* = D^L$. As mentioned, *ex-ante* self-policing may reduce the probability that a violation occurs ($\delta V = V^H - V^L$). Hence, such actions are socially desirable whenever the social costs of the prevented violations $(H + C_{ep}^S - D^* C_{ep}^S)(V^H - V^L)$ are greater than the costs of *ex-ante* self-policing, C_{ea} .

saved due to corporations' decision to comply and self-enforce. Hence, the condition for an efficient compliance is presented by the following expression:³⁴

$$[3] \quad \text{Social benefit of self-enforcement} \longrightarrow (H + C_{ep}^S)(1 - V^L) + V^L D^H C_{ep}^S \geq C_{ea} + C_{ep}^P \longleftarrow \text{Social cost of self-enforcement}$$

The analytical framework presented in this section, will be used in the next section to evaluate the welfare impact of the alternative liability regimes.

5. Evaluating Liability Regimes

As we have seen the maximization of social welfare requires that corporations self-report any violation they detect. In addition, if conditions [1] and [2] are met, it is socially desirable that corporations self-police *ex-ante* and *ex-post*. Accordingly, a given liability regime is deemed socially desirable if it aligns the private incentives with the social interest. In what follows, we examine the extent to which corporations' incentives are aligned with the social interests under each liability regime. The results of the analysis are summarized in Table 2:

Table 2: *Comparative evaluation of corporate liability regimes*

	Incentives provided to corporations	
	Strict Liability	Duty-Based Liability
Self-reporting	No	Yes
Ex-post self-policing	No	No (given the problem of asymmetric information)
Ex-ante self-policing	Yes (suboptimal)	No (the same as above)
Compliance	Yes (suboptimal)	No

5.1. Strict Liability

Corporate strict liability holds corporations strictly liable for every legal violation committed by their employees within the scope of their employment.³⁵ When a violation has been detected, corporations incur a default sanction which

³⁴ For the sake of simplicity we assume that compliance with regulations is not involved with positive costs except for costs of self-policing. Hence, if conditions [1] and [2] are met, and the a corporation decides to comply and self-police, the social benefit from these decisions are presented by the total costs which were saved due to the corporation's compliance $(H + C_{ep}^S)(1 - V^L)$, and the enforcement costs saved due to the corporation's self-policing $V^L D^H C_{ep}^S$. When such social benefit is equal or greater than the costs of compliance, $C_{ea} + C_{ep}^P$, compliance is socially desirable.

³⁵ See *supra* note 5 above.

equals the social harm caused by the violation, divided by the probability of detection ($L^D = H/P$).³⁶ By imposing such a harm-based sanction, corporations are compelled to internalize the social harm caused by their conduct when making behavioral choices. Note that the strict liability regime disregards any action taken by the corporations to prevent, police, or report their own regulatory violations; the harm-based sanction is strictly imposed whenever a wrong has been detected. Let us examine the incentives provided by the strict liability regime.

Self-reporting³⁷ – given that under a strict liability regime the actual sanction stays unchanged whether corporations self-report or not, by self-reporting corporations increase their expected liability. Therefore, it is clear that utility-maximizing corporations have no incentives to report their own violations. This conclusion can be easily seen by comparing corporations’ expected utilities associated with reporting decisions. The expected utilities of corporations when they self-report, U^R , and when they do not do so, U^{NR} , are given by the following expressions:³⁸

$$U^{NR} = G - V^* \cdot P \cdot \frac{H}{P},^{39} \quad U^R = G - V^* \left[D^* \cdot \frac{H}{P} + (1 - D^*) \cdot P \cdot \frac{H}{P} \right];^{40}$$

U^{NR} is always greater than U^R .⁴¹ Hence, under a strict liability regime, corporations have no incentives to self-report.⁴²

³⁶ See *supra* note 13 above. Previous studies which evaluated corporate strict and duty-based liability regimes considered the harm-based sanction as determined by the social harm caused by the violation, divided by the probability of detection, regardless of the social enforcement costs. See (Arlen & Kraakman, 1997), (Krawiec, 2005). While evaluating the welfare impact of strict and duty-based liability regimes, we stay adherent to this approach. Nevertheless, it should be noted that an alternative evaluation can be made according to Stiglitz’ approach; *i.e.*, the default sanction can be determined by the sum of the social harm and the enforcement costs caused by the violation, divided by the probability of detection. See *supra* note 14 and the related text.

³⁷ See decisions 1-2 / 3-4 / 5-6 / 7-8 in Scheme 1 above.

³⁸ These utilities are related to decision 1-2 in Scheme 1 above. The conclusions derived from the comparison between these utilities are similar to the ones which can be derived in respect to decisions 3-4 / 5-6 / 7-8 in Scheme 1 above. In the latter decisions, attention should be paid to the costs of self-policing actions.

³⁹ U^{NR} equals the gain of corporations from engaging in their activity, G , minus the expected sanction, $P \cdot H/P$, multiplied by the relevant probability that a violation occurs, V^* .

⁴⁰ U^R equals the gain of corporations from engaging in their activity, G , minus the relevant probability that a violation occurs, V^* , multiplied by the sum of the expected sanction when corporations detect and report, $D^* \cdot H/P$, and the expected sanction when they do not do so and the violations is detected by the agency $(1 - D^*) \cdot P \cdot H/P$.

⁴¹ U^R would have been greater than U^{NR} only if $P > 1$. However, by definition: $P \in (0, 1)$.

⁴² Meaning that corporations choose branches: 1 / 3 / 5 / 7 in Scheme 1 above. Compare with (Arlen, 1994) and (Arlen & Kraakman, 1997), at 707-710.

Ex-post self-policing⁴³ – if corporations self-police *ex-post* and bear the costs involved with such actions, they may improve the probability of self-detection. As mentioned, under strict liability, *ex-post* self-policing has no effect on the sanction, *i.e.*, even if corporations report every violation they detect, they will still incur the harm-based sanction ($L^p = H/P$). Hence, in this case, as in the case of self-reporting, it is straightforward that under a strict liability regime corporations have no incentives to self-police *ex-post*.⁴⁴

Ex-ante self policing⁴⁵ – by *ex-ante* self-policing corporations may reduce the probability that a violation occurs; *i.e.*, by acting in order to prevent regulatory violations, corporations may reduce their expected liability. Under such circumstances, it is clear that corporations have certain incentives to prevent regulatory violations. Such incentives can be demonstrated by comparing the relevant expected utilities; recall that under a strict liability regime corporations neither self-police *ex-post* nor self-report. Hence, the corporations expected utilities when they self-police *ex-ante*, U_{ea}^{SP} , and when they do not do so, U_{ea}^{NSP} , are given by the following expressions:

$$U_{ea}^{NSP} = G - V^H \cdot P \cdot \frac{H}{P}; \quad U_{ea}^{SP} = G - C_{ea} - V^L \cdot P \cdot \frac{H}{P}$$

Corporations will self-police *ex-ante* when $U_{ea}^{SP} \geq U_{ea}^{NSP}$, *i.e.*, when $H(V^H - V^L) \geq C_{ea}$.⁴⁶ That is to say, corporations will self-police *ex-ante* only to the extent that the costs of such actions are lower than the reduction in their expected sanction. However, as we have seen, the social optimal condition for *ex-ante* self-policing requires that corporations internalize the total social costs associated with their actions, *i.e.*, the social harm and the enforcement costs caused by their conduct.

⁴³ Decisions: *A-B / C-D* in Scheme 1 above.

⁴⁴ Meaning that corporations choose branches *A1 / C5* in Scheme 1 above. It should be noted that another strong argument has been made against a strict liability regime with respect to the disincentives it provides for *ex-post* self-policing. According to this argument, under a strict liability, *ex-post* self-policing actions may generate a perverse effect according to which the corporations' expected liability increases when the outputs of such actions are captured by the public agency. (Arlen, 1994) and (Arlen & Kraakman, 1997), at 707-710, show that monitoring measures, such as phone and video records, as well as internal investigation statements, may serve as evidence for the corporations' culpability and hence may increase the probability that the violation is detected and that the corporation is convicted. Therefore, under a strict liability, corporations have no incentive to engage in an optimal self-policing activity.

⁴⁵ Decisions: *I-II* in Scheme 1 above.

Hence, a maximization of social welfare requires corporations to self-police *ex-ante* whenever $(H + C_{ep}^S - D^*C_{ep}^S) \cdot \delta V \geq C_{ea}$ (condition [2] above). Therefore, under strict liability, corporations are expected to insufficiently self-police *ex-ante*.⁴⁷

Compliance – as mentioned, whenever corporations choose to violate a regulation their expected liability equals the social harm, H , caused by the violation. Therefore, when deciding whether to comply with a regulation, corporations internalize one component of the total social costs of their wrongdoing, *i.e.* they internalize the social harm caused by their violation, but do not internalize the social enforcement costs generated by the violation. Therefore, under strict liability corporations are expected to comply with regulations to a suboptimal extent. Let us demonstrate this argument by comparing the private expected utilities of corporations, assuming that the private condition for self-policing ($H(V^H - V^L) \geq C_{ea}$) is met; considering our previous conclusions we expect that under strict liability corporations neither self-police *ex-post* nor self-report. In this example, corporations' expected utilities when they choose to comply, U^C , and when they do not do so, U^V , are given by the following expressions:

$$U^V = G - P \cdot \frac{H}{P} \qquad U^C = G - C_{ea} - V^L \cdot P \cdot \frac{H}{P}$$

Corporations choose to comply with the regulation whenever $U^C \geq U^V$; *i.e.*, whenever $H(1 - V^L) \geq C_{ea}$. It is easy to see that this private condition for corporate compliance does not coincide with the social interest (reflected by condition 3 above). Therefore, under a strict liability regime corporate compliance levels are suboptimal.

5.2. Duty-Based Liability

Under duty-based liability regimes the sanctions for violations are eliminated (negligence-based regime) or mitigated (composite regime), if corporations meet their legal duty to act in order to prevent, police, and report their own violations.⁴⁸ These

⁴⁶ Meaning that under the condition $H(V^H - V^L) \geq C_{ea}$, corporations choose branch IIC5 in Scheme 1 above.

⁴⁷ It should be noted that even if sanctions are set at the level of the total social costs ($H + C_{ep}^S$), corporations still do not have optimal incentives to self-police, whereas the social optimal condition for *ex-ante* self-policing takes into account that corporations self-report own violations and account for the social costs saved by such reports, $D^*C_{ep}^S$.

⁴⁸ See *supra* note 5.

regimes assign full mitigation or elimination of the sanction, even if corporations fail to report violations, provided that they fail to report because they did not detect the violations.⁴⁹ If, alternatively, corporations do not fulfill their duty to take ‘due care’, *i.e.*, to self-police and to self-report, a default harm-based liability ($L^D = H/P$) is assigned.⁵⁰ Let us examine the incentives provided the duty-based regimes.

Self-reporting – assume that by self-reporting corporations may prove that they fulfilled their duty of care, and therefore, the sanction is mitigated or eliminated. It is clear that under these circumstances, corporations have an incentive to report violations, as long as the expected (mitigated) sanction is lower than the expected (default) sanction. Put differently, the corporations’ expected utilities when they self-report, U^R , and when they do not do so, U^{NR} , are given by the following expressions,

When $\frac{h}{P}$ is the mitigated or eliminated sanction ($\frac{h}{P} \in \left[0, \frac{H}{P}\right)$):

$$U^{NR} = G - V^* \cdot P \cdot \frac{H}{P} \qquad U^R = G - V^* \cdot \left[D^* \cdot \frac{h}{P} + (1 - D^*) \cdot P \cdot \frac{H}{P} \right]$$

U^R is greater than U^{NR} ,⁵¹ hence, under a duty-based liability corporations have an incentive to self-report.

Ex-post and Ex-ante self-policing – Unlike strict liability, duty-based liability requires courts and agencies to determine whether the duty to self-police has been duly met. Such determination may involve substantial social costs. Krawiec (2003, 2005), for instance, has shown that self-policing actions are easily mimicked by ‘window dressing’ ones which are less costly for the corporations.⁵² In these studies Krawiec shows that courts and agencies do not always possess complete information and therefore they are not likely to adequately distinguish between effective and ‘cosmetic’ self-policing actions. As a result, duty-based regimes may encourage corporations to adopt cosmetic self-enforcement actions, whereas by mimicking the effective actions, corporations may engage in privately profitable violations while benefiting from mitigated or eliminated sanctions. Therefore, although duty based liability could, in theory, induce corporations to self-police, they are unlikely to do so

⁴⁹ See (Arlen & Kraakman, 1997), at 722.

⁵⁰ See our comment in *Supra* note 36.

⁵¹ Given that $\frac{h}{P} \in \left[0, \frac{H}{P}\right)$, U^R is greater than U^{NR} .

⁵² See (Krawiec, 2003), and (Krawiec, 2005). For a different approach, see (Aviram, 2005).

given the asymmetric information between the public enforcement system, *i.e.*, courts and agencies, and the corporations regarding the effectiveness of the self-policing actions.

Compliance – under duty-based regimes, sanctions against violations are mitigated or eliminated if courts and agencies determined that the corporation has met its duty to take due care. Given the mitigation or elimination of the sanctions, corporations are neither induced to internalize the entire social costs of their conduct nor to adjust their activity to the regulatory standards.⁵³ It is clear that as the volume of asymmetric information regarding the effectiveness of self-policing actions is greater, corporations' incentives to comply are even more distorted.

Summing up, none of the traditional corporate liability regimes, strict liability or duty-based liability, comprises an optimal legal structure. The choice between the alternative regimes presents a trade-off between the social goals that may be achieved. While strict liability may induce corporations to partially internalize the social costs caused by their conduct, this regime may not provide corporations with incentives to police and report. Duty-based liability, on the other hand, may induce corporations to report their misconduct, but is unlikely to induce them to internalize the social costs caused by their conduct or to effectively self-police.

6. Compound Liability

The deficiencies of the traditional liability regimes call for an innovative regime to be crafted under which both social goals are met. Such regime may be presented by a compounded liability which sets the sanctions against corporate misconduct into two layers: *first*, a default sanction which equals the sum of the social harm and the public enforcement costs caused by the violation, divided by the probability of detection ($L^D = \frac{H + C_{ep}^S}{P}$); *second*, a reduced sanction which is set at the level of the social harm caused by the violation ($L^R = H$). According to the compound regime, the reduced sanction shall apply when corporations appropriately self-report. The compound regime can be seen as making the corporations liable for two different sorts of wrongs: (i) the regulatory violations committed by corporations; and (ii)

⁵³ See (Krawiec, 2005), at 579, and (Arlen & Kraakman, 1997), at 698.

corporations' failure to act in order to deter and report the regulatory violation. This regime ensures that the corporations face an expected sanction which equals the total social costs caused by each of these wrongs.⁵⁴

It is important to notice that the total social costs are greater when corporations do not report, rather than report. Accordingly, the expected liability of corporations is greater when they do not report rather than report. To see why, let us use an illustration: assume that a corporation exceeds the permitted level of pollution discharges and by that causes a social harm of \$1,000. Further assume that if the corporation does not report, public agencies have to detect, investigate and prosecute the corporation. We assume that the total costs of the public enforcement actions are \$100 per violation. According to the compound regime, if the corporation does not self-report, it is expected to incur a sanction which equals to the total social costs of the violation, divided by the probability of detection, *i.e.*, $L^D = 1,100/P$. In that case, the corporation's expected sanction equals the total social harm caused by the violation, *i.e.*, \$1,100.⁵⁵ Accordingly, when deciding whether to violate the regulations, the corporation internalizes the total social costs of the violation. Alternatively, assume that the corporation self-reports the violation, and therefore the public agencies shall not invest in *ex-post* enforcement actions. In this case, the total social costs are the direct harm caused by the violation, *i.e.*, \$1,000. According to the compound regime, if the corporation appropriately reports the violation, it incurs a reduced actual sanction which equals the social harm caused, \$1,000. This amount also reflects the expected sanction, whereas when the corporation self-reports, the probability of detection is a unity ($P=1$). When comparing the default sanction and the reduced sanction, it is revealed that the mitigation of the sanction equals the costs of public enforcement which can be avoided if the corporation self-enforces. Therefore, when deciding whether to self-enforce, corporations internalize the total social costs of enforcement actions. They are expected to undertake self-enforcement actions, *i.e.*, self-policing and self-reporting, whenever the costs of such actions are lower than the costs of public enforcement actions.

⁵⁴ When the corporation does not self-report, public agencies have to detect, investigate, and litigate. Such actions generate social costs, C_{ep}^s . However, when the corporate self-report, such costs are saved ($C_{ep}^s = 0$, *see* ass. 4 above), and the probability of detection goes to unity ($P=1$).

To sum up, the compound regime induces corporations to internalize the total social costs of their conduct, and at the same time, to self-police and report wrongdoings whenever such actions are socially desirable. Let us demonstrate these effects using a comparison between corporations' expected utilities under each of the decisions they face.

Self-reporting – under the compound regime, if corporations self-report, they incur a reduced sanction which equals the social harm caused by the violation. In other words, if corporations self-report they face a lower expected sanction ($EL^R = H$), than if they do not report ($EL^D = H + C_{ep}^S$).⁵⁶ The corporations' expected utilities when they self-report, U^{NR} , and when they do not self-report, U^R , are given by the following expressions:

$$U^{NR} = G - V^* \cdot P \cdot \left(\frac{H + C_{ep}^S}{P} \right) \quad U^R = G - V^* \left[D^* \cdot H + (1 - D^*) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

U^R is grater than U^{NR} .⁵⁷ Hence, under the compound regime, corporations have an incentive to self-report every detected violation. This incentive coincides with the socially optimal condition for self-reporting (see Table 1 above).⁵⁸

Ex-post self-policing – as we have seen, by *ex-post* self-policing corporations may increase the probability of self-detection. Given that under the compound regime corporations have an incentive to report every self-detected violation, *ex-post* self-policing increases the probability of self-reporting, and hence reduces the expected

⁵⁵ The expected sanction equals the actual sanction to be imposed when the violation is detected, multiplied by the probability that the violation is detected.

⁵⁶ If the corporation does not report, the actual sanction is $L^D = \frac{H + C_{ep}^S}{P}$, and the probability of detection is P . Hence, the expected liability is ($EL^D = H + C_{ep}^S$). If, alternatively, the corporate self-reports, the actual sanction is $L^R = H$, and the probability of detection becomes a unity ($P=1$). Hence, the expected liability is ($EL^R = H$).

⁵⁷ U^R is grater than U^{NR} , when $V^H \cdot D^L \cdot C^H > 0$, which by definition is always the case.

⁵⁸ The alignment of corporations' incentives and the social interests regarding self-reporting actions is produced by the mitigation of the expected sanction, taking into account the public enforcement costs which are saved due to the corporations' reports. As mentioned above, we assume that such reports can be verifiable with negligible costs (*see supra note 28*). If this assumption is relaxed, the mitigated sanction shall be adjusted accordingly, *i.e.* when corporations appropriately self-report, they shall incur a mitigated sanction which equals the sum of the social harm and the verification costs of their report. Given that verification costs are expected to be lower than the total public enforcement costs when corporations do not self-report, the alignment of corporations' incentives and the social interest is kept.

liability. The expected utilities of corporations when they self-police *ex-post*, U_{ep}^{SP} , and when they do not do so, U_{ep}^{NSP} , are given by the following expressions:

$$U_{ep}^{NSP} = G - V^* \left[D^L \cdot H + (1 - D^L) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right] \quad U_{ep}^{SP} = G - C_{ep}^L - V^* \left[D^H \cdot H + (1 - D^H) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

U_{ep}^{SP} is greater than U_{ep}^{NSP} whenever $C_{ep}^S \cdot V^* \cdot \delta D \geq C_{ep}^P$. Meaning that, under the compounded regime, corporations' incentives to *ex-post* self-police coincide with the social interest (condition [1] in Table 1 above).

Ex-ante self policing – by *ex-ante* self-policing the corporation may reduce the probability that a violation takes place. Such actions may reduce corporations' expected liability. Given that corporations self-report and self-police *ex-post* whenever such actions are socially desirable, the expected utilities of corporations when they *ex-ante* self-police, U_{ea}^{SP} , and when they do not do so, U_{ea}^{NSP} , are given by the following expressions:

- When corporations self-police *ex-post* and self-report: (*i.e.*, when condition [1], $C_{ep}^S \cdot V^* \cdot \delta D \geq C_{ep}^P$, holds):

$$U_{ea}^{NSP} = G - C_{ep}^P - V^H \left[D^H H + (1 - D^H) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

$$U_{ea}^{SP} = G - C_{ep}^P - C_{ea} - V^L \left[D^H H + (1 - D^H) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

U_{ea}^{SP} is equal to or greater than U_{ea}^{NSP} whenever $(H + C_{ep}^S - D^H C_{ep}^S) \cdot \delta V \geq C_{ea}$, *i.e.*, the corporations' *ex-ante* self-policing is aligned with the social interest (see condition [2] in Table 1 above).

- When corporations do not self-police *ex-post*, but self-report (*i.e.*, when condition [1] does not hold, and therefore $C_{ep}^S \cdot V^* \cdot \delta D < C_{ep}^P$,):

$$U_{ea}^{NSP} = G - V^H \left[D^L H + (1 - D^L) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

$$U_{ea}^{SP} = G - C_{ea} - V^L \left[D^L H + (1 - D^L) \cdot P \cdot \frac{H + C_{ep}^S}{P} \right]$$

U_{ea}^{SP} is equal to or greater than U_{ea}^{NSP} whenever $(H + C_{ep}^S - D^L C_{ep}^S) \cdot \delta V \geq C_{ea}$, *i.e.*, the corporations' *ex-ante* self-policing is aligned with the social interest (see condition [2] in Table 1 above).

Compliance – given that under the compound regime corporations always face an expected liability which equals the social costs caused by their conduct, corporations' incentives to comply with regulations are aligned with the social interests. For instance, Assuming that the conditions [1] and [2] for self-policing *ex-ante* and *ex-post* are met (*i.e.*, $C_{ep}^S \cdot V^* \cdot \delta D \geq C_{ep}^P$; $(H + C_{ep}^S - D^L C_{ep}^S) \cdot \delta V \geq C_{ea}$). Corporations' expected utility when they comply, U^C , and when they violate the regulation, U^V , are given by the following expressions:

$$U^V = G - P \cdot \frac{H + C_{ep}^S}{P} \quad U^C = G - C_{ea} - C_{ep}^P - V^L [D^H H + (1 - D^H)(H + C_{ep}^S)]$$

Corporations choose to comply whenever $U^C \geq U^V$, *i.e.*, whenever $(H + C_{ep}^S)(1 - V^L) + V^L D^H C_{ep}^S \geq C_{ea} + C_{ep}^P$. Meaning that under the compound regime, corporations' incentives to comply coincide with the social interest (condition [3] in Table 1 above). Hence, under the compound regime corporations are expected to comply with regulations whenever compliance is socially desirable.

In summation, the compound regime aligns corporations' incentives with the social interests. It does so, by compelling corporations to internalize the social costs associated with each of the decisions they Make. When corporations violate the regulations and appropriately self-enforce, they are compelled to bear an expected sanction which equals the social harm caused by the violation. Alternatively, when corporations violate the regulations but do not self-enforce, they are compelled to incur an expected sanction which equals to total social costs of their conduct, *i.e.*, the direct social harm caused by the violations and the social costs of enforcement actions. Given the complete alignment of incentives, the compound regime reaches both social goals of a liability regime simultaneously and is likely to induce corporate compliance and self-enforcement whenever those are socially warranted.

Finally, would the merits of the compound regime hold even when corporations may have a private gain from violation of the regulations? Does the compound regime provide corporations with the optimal incentives even when by violating the regulations corporations may increase profits? The answer to these questions is positive. To see why, consider, for instance, the case of safety regulations which require corporations to use certain safety equipment; if corporations violate the regulations and do not use such equipment, they may save certain costs or improve their production. Under these circumstances corporations incentives to comply and self-enforce are somewhat reduced compared to the case in which no gains are generated as a result of a regulatory violation. However, when applying the compound regime, one must account for the effect of the additional gains from violations not only on the private utility of corporations, but also on the social interest. In the example above, the net social harm generated by the violation is simply the difference between the actual harm caused by not using the safety equipment and the gains earned by the corporation due to this omission.⁵⁹ Hence, even when additional gains are generated by a violation, under the compound regime, corporations' incentives and the social interests remain aligned.

7. Concluding remarks

When crafting an enforcement policy whose aim is inducing corporate compliance, one must take into account the complex organizational structure of corporations; even when corporations decide to comply with regulations their employees' actions may generate regulatory violations. Such violations can be efficiently deterred if corporations are incentivized to undertake self-enforcement actions whenever the social costs of such actions are lower than the costs of the public enforcement system. To induce corporations to self-enforce, the expected sanction they face when they self-enforce must be lower than the expected sanction they face when they refrain from doing so; if corporations are not rewarded for self-enforcement actions, they have no incentives to do so, considering the costs involved with such actions. Such lack of incentives to self-enforce is the major flaw of the strict liability regime: under the latter regime, actual sanctions stay unchanged whether

⁵⁹ See (Becker, 1968), at 173, which introduces "the social value of the gain to offenders" from their offense.

corporations self-enforce or not. Therefore, by self-reporting corporations not only do not benefit from a lower expected liability, but they might even increase their expected liability. On the other hand, if the mitigation of sanctions is determined by corporations' self-policing actions, an asymmetric information problem may result in an inefficient reduction of sanctions which is triggered by cosmetic self-policing actions. The latter problem is attributed to duty-based liability regimes which require courts and agencies to evaluate the effectiveness and trustworthiness of corporations' self-enforcement actions. Unlike the traditional liability regimes, the compound regime suggested in this paper overcomes these two pitfalls: *first*, it reduces corporations' expected liability by an amount which reflects the social enforcement costs, if such costs are actually saved due to corporations' self-enforcement; *second*, the mitigation of the sanction is triggered by a verifiable action, *i.e.*, self-reporting, which is not bounded by an asymmetric information problem.

As with any other theoretical framework of optimal liability regimes, the application of the compound regime in real-life policy-making is not free of practical challenges. Policy components such as the social harm caused by the violation, the probability of detection, and the enforcement costs, are not always easily estimated even when focusing on a specific sector or a particular type of violations. Nevertheless, the theoretical framework presented in this paper may be of significant value for policy-makers, because it can equip them with a sound intuition for an optimal structure of corporate liability regimes. The compound regime suggested in this paper acquires its merits from several sources: *first*, it provides corporations with the appropriate incentives to comply with regulations and to self-enforce them whenever such actions are socially desirable; *second*, this regime minimizes the sum of the social harm generated by regulatory violations and the costs of enforcement actions; *third*, unlike the duty-based liability, the compound regime does not require courts and agencies to evaluate the effectiveness and the trustworthiness of self-policing actions – evaluations which tend to be a crucial flaw of the duty-based regimes. Instead, the mitigation of sanctions under the compound regime relies on a verifiable action, self-reporting, and therefore, it does not suffer from asymmetric information consequences; *fourth*, and closely related to the former strength, the compound regime provides a workable solution which does not involve substantial administrative costs. Under the compound regime policy-makers are not required to

define the proper level of care. Such determination is expected to be done by each corporation when choosing the optimal self-enforcement actions to be employed given its specific circumstances.

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