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ENCYCLOPEDIA OF LAW AND ECONOMICS, SECOND
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Edward Elgar
Cheltenham, UK • Northampton, MA, USA

9 Corporate crime

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1. Introduction

The law and economics literature usually categorized under the heading of corporate crime is actually broader than this (already quite broad) heading. The literature goes beyond crimes (commission of willful illegal acts) to study corporate torts (accidental harms) as well. It is appropriate to study torts as well as crimes because the categorization of acts into torts or crimes is not pre-ordained but is a public-policy choice, which can be informed by economic analysis. The literature is also broader in another way, studying crimes committed not just by incorporated enterprises but by a broad range of business enterprises including closely held firms, non-profit institutions, and government agencies. Many of the economic principles derived in the literature are general enough to apply equally to these different types of enterprise.

Consistent with the broad approach of the literature, then, this chapter will discuss crimes and torts committed by legal enterprises. An enterprise is distinct from an individual (and thus corporate crime is distinct from 'ordinary' crime), in that an enterprise is a hierarchical group of individuals, with low-level employees acting under the direction of a manager (or possibly a tier of managers) who in turn works for the firm's directors and owners. The fundamental issue analyzed by law and economics scholars has been the appropriate level of the hierarchy to target with sanctions in order to deter crime most efficiently. Should sanctions target just the individual within the corporation who was identified as carrying out the criminal act (if it is even possible to identify such an individual)? Or should the whole enterprise be sanctioned in addition or instead, with the burden of the sanctions falling on the enterprise's directors or owners? Should the enterprise be allowed to indemnify a sanctioned employee for fines and legal expenses or vice versa? Such questions are of practical interest because corporate criminal laws in the US and elsewhere have a dual structure of liability, with sanctions targeting both employees and enterprises, and it is useful to determine whether the laws have been designed

* The authors thank Phillip Stocken for insights on the accounting literature, Eric Zitzewitz on the corporate finance literature, and editor Nuno Garoupa for helpful comments. The authors are solely responsible for errors.

efficiently. In addition, all the standard law and economic questions about 'ordinary' crimes and torts – the appropriate level of liability relative to harms caused, the choice between strict liability and negligence rules – can also be asked about corporate crime.

This chapter is complementary to previous surveys on corporate crime published in the 2000 predecessor of this volume, including Kraakman (2000), Lott (2000), and section 11 of Polinsky and Shavell (2000). This chapter also complements other contributions in this volume. Many of the issues regarding corporate crime by legal enterprises could also be analyzed in the context of organized crime, or crimes committed by illegal enterprises. We devote relatively little attention to private versus public enforcement, or administrative enforcement versus criminal enforcement, since those issues are addressed elsewhere in this volume.

We begin by providing updated stylized facts on the nature of corporate crime in Section 2. We then move to the heart of the chapter, the survey of the theoretical corporate crime literature in Sections 3 and 4. Here we highlight the central economic principles that have emerged from this literature regarding the socially optimal structure of sanctions. We will capture a bit of the formalism in this literature by couching our discussion in the context of a principal-agent model. The principal-agent model is particularly attractive because it is the simplest formal way to capture the hierarchical structure that separates corporate from 'ordinary' crime.

The final part of the chapter (Section 5) focuses on a particular category of corporate crime – securities and accounting fraud – in more detail. This category has received considerable recent attention after the Enron, WorldCom and other major fraud cases and the passage of the Sarbanes-Oxley Act in 2002 in response. Another reason for focusing on this category is that it is inherently corporate, whereas other categories (environmental violations, consumer-product fraud, etc.) can be carried out by any sort of enterprise or even individuals. We will survey some of the new theoretical issues raised by securities and accounting fraud and some recent empirical research in the area.

2. Stylized facts

This section updates some stylized facts to help provide an empirical frame of reference for the more abstract analysis in later sections. Our descriptive analysis is closely related to the third section of Cohen (1996) (see also Cohen 1989, 1991, 1992a, 1992b), using a similar data source to update his figures for 1984–90 to the more recent period 2002–06.

The data come from various tables in the US Sentencing Commission's *Sourcebook of Federal Sentencing Statistics* for each of the years 2002–06.

Table 9.1 Enterprises sentenced under Federal Guidelines in past five years

	2002	2003	2004	2005	2006
Total number of cases	252	200	130	187	217
Breakdown by crime category					
Fraud	41%	32%	28%	28%	33%
Environmental	19%	25%	25%	28%	19%
Antitrust	9%	7%	5%	8%	7%
Products	8%	7%	8%	4%	4%
Characteristics of case					
Managerial tolerance	31%	32%	42%	31%	40%
Self-reported	1%	1%	6%	2%	1%
Cooperated with investigation	51%	40%	44%	60%	49%
Court ruling					
Monetary sanction imposed	92%	86%	88%	91%	87%
Inability to pay	43%	37%	28%	36%	42%
Compliance program ordered	15%	12%	16%	19%	20%

Notes: Enterprises sentenced under Chapter 8 of the US Sentencing Commission Guidelines. Dates are fiscal years. Breakdown by crime category' entries are percentages of the year's cases falling into each category. 'Products' category includes food, pharmaceuticals, agriculture, and consumer products. 'Characteristics of case' entries are percentages of the cases with non-missing data exhibiting the characteristic. 'Managerial tolerance' is the percentage of cases in which both the enterprise employed ten or more people and its management was involved or tolerated the crime. In the 'Court ruling' entries, 'Monetary sanction' is the percentage of cases in which a fine and/or restitution was ordered and 'Inability to pay' is the number of cases in which the enterprise was unable to pay the entire monetary sanction as a percentage of those in which some monetary sanction was ordered.

Source: US Sentencing Commission (various years), tables 51, 53, and 54.

The data cover all enterprises sanctioned under Chapter 8 of the US Sentencing Commission Guidelines, averaging about 200 cases a year (see the first row of Table 9.1). Broadly speaking, the figures in Table 9.1 vary considerably over time but exhibit no appreciable trends. Around a third of the cases involved fraud, 20 percent involved environmental violations, around 7 percent involved antitrust, and about an equal fraction involved a general 'product' category which includes food, drugs, other consumer products, and agriculture. The remaining cases are scattered across categories, including immigration, bribery, and gambling.

Around a third of the cases (40 percent in 2006) involved managerial tolerance of behavior of lower-level employees. This figure suggests that different models of corporate crime may apply to different cases. In some cases, the employee directly responsible for committing the crime may have been acting in their own interest as against the interest of his employer, but in at least some cases employees seem to have acted with complicity from higher-ups. This finding relates to Alexander and Cohen's (1999) study of about 100 criminal firms matched against an equal number of others according to industry and size. The authors find that the probability of crime decreases with the percentage of the firm's equity held by directors and officers. Their interpretation is that offering more equity to managers aligns their interests with shareholders', and so the higher crime rate in firms in which managers hold less equity is likely to be against the shareholders' interests. Their result may characterize the majority of observations in their sample but does not rule out the possibility that the reverse is true in a minority (consistent with Table 9.1). Further, their result characterizes shareholder preferences given existing criminal sanctions and does not rule out the possibility that shareholders would prefer crime with lower (or no) sanctions.

Table 9.1 indicates that it is rare for enterprises to self-report crimes – only in 1–2 percent of cases – but common for them to cooperate with the investigation once under way – in around half of the cases. The court's judgment almost always involves some monetary sanction. In around 20 percent of the cases, a compliance program is also ordered. Limited enterprise liability appears to be a significant consideration. In around a third of the cases in which a monetary sanction was ordered, the firm could not pay the entire amount, suggesting the importance of the analysis of the judgment-proof firms, which we will discuss in Section 3.4.

Table 9.2 shows few trends in the mean monetary sanction levied on enterprises, around \$5 million (in 2006 dollars) over the period. The distribution is highly skewed. For example, the median enterprise sanction in our 2006 sample was \$127,800 and the mean was \$5.6 million. The mean sanctions vary considerably across categories within a year and across years within a category, often driven by a few notorious cases with huge sanctions. Antitrust cases tend to generate the highest fines, with a mean as high as \$46.6 million in 2006.

3. Five theoretical principles

We will organize our discussion of the theoretical literature around five broad economic principles that emerge from the literature concerning the design of socially efficient sanction schemes. Some of the principles are clearly and widely stated in the literature. Others come from our own

Table 9.2 *Monetary sanctions on enterprises sentenced under Federal Guidelines*

	2002	2003	2004	2005	2006
Means for all cases	5.6	2.6	7.9	4.6	5.6
Means by crime category					
Fraud	8.5	2.2	0.8	0.6	3.9
Environmental	0.5	0.7	1.6	0.8	0.6
Antitrust	6.0	6.8	11.2	41.3	46.6
Products	17.1	8.4	25.7	0.1	1.5
Other	0.2	0.8	0.9	1.1	0.6

Notes: Entries are mean monetary sanctions (fine and/or restitution) across all cases in category in which a positive monetary sanction was imposed. Figures are in millions of 2006 US dollars, adjusted for inflation using the consumer price index. Dates are fiscal years.

Source: US Sentencing Commission (various years), table 52.

synthesis of the literature. In at least one case – for example, the principle that the sanction should be set equal to the harm – we will see that the principle is less robust than the literature might suggest, requiring a discussion of important caveats and nuances, although the principle still serves as a useful benchmark.

To facilitate the discussion and to give a flavor of the content of the theoretical literature, the principles will be presented in the context of a formal model – a principal-agent model of the enterprise. General analyses of corporate crime in a principal-agent model are provided by Kornhauser (1982), Sykes (1984), Newman and Wright (1990), Polinsky and Shavell (1993), Davis (1996), and Garoupa (2000). Our model introduced in Section 3.1 will follow the structure of Garoupa (2000) closely (with some slight changes in assumptions and notation) since his comprehensive analysis nests much of the previous work.

3.1 Model

The enterprise consists of a principal and an agent. One interpretation is that the principal represents the shareholders and the agent an upper-level manager, say the chief executive officer (CEO) of the corporation. Another interpretation is that the principal is an upper-level manager and the agent is an employee whom the manager supervises.

The agent exerts two sorts of effort: productive effort x and what we will call ‘criminal effort’ a . Criminal effort can be thought of either as deliberate action which causes a harm or as cutting back on precaution which helps prevent an accidental harm. The enterprise’s gross return is

$\Pi(x, a)$, assumed to be weakly increasing in both arguments. Productive effort obviously benefits the enterprise. Criminal effort may also increase profits by cutting the cost of hazardous waste disposal in the case of environmental crime or by increasing revenue in the case of the antitrust crime of price fixing. Let $C(x, a)$ be the agent’s cost of effort and $B(a)$ his private benefit from criminal effort, which is weakly increasing in a . The model allows the crime to benefit the enterprise directly, benefit the agent directly, or both. For example, dumping hazardous waste in a nearby river rather than in a legal site further away may save the enterprise disposal fees, fuel, and the opportunity cost of the transportation equipment and the agent’s time. It may directly benefit the agent to the extent he is the residual claimant of cost savings (say he has to pay the disposal or fees or transportation costs himself or can use the time saved for leisure). Even if $B(a) = 0$, implying that the agent does not benefit directly from criminal effort, as we will see, he may still benefit indirectly through the incentive scheme offered by the principal.

Criminal effort a is socially harmful because it increases the probability $p(a)$ of a harm h to a third party. Assume for now that the state can detect and sanction the harm perfectly but cannot observe a . Therefore, the state can impose a strict-liability rule but not a negligence rule. (In later sections we will adjust the model to allow for imperfect detection and negligence rules.) Let s_p be the monetary sanction on the principal and s_a on the agent, and let $s = s_p + s_a$ be the total sanction under the strict-liability rule. To allow for the possibility of internal transfers, let s_i be the payment from the agent to the principal if the state issues sanctions. A positive value of s_i means that the principal internally sanctions the agent over and above any state sanction; a negative value means that the principal indemnifies the agent for the state sanction (partially or wholly).

The principal cannot control the agent’s efforts directly but only indirectly through the incentives provided by the employment contract. Suppose the contract consists of a fixed wage w plus a share β of enterprise profit $\Pi(x, a)$. High values of β provide the agent with incentives to exert effort but are costly to the principal because she retains a smaller profit share for herself. The contract can be thought of as involving explicit profit sharing, perhaps in the form of stock, stock options, or performance bonuses, or can be less explicit, such as a greater likelihood of continued employment or better external job-market prospects if the firm is observed to perform well.

To start, we take the simple case in which all parties (principal, agent, and harmed third party) are risk neutral and leave the more complicated case of risk aversion to be discussed later. The expected payoff of a risk-neutral principal is

$$(1 - \beta)\Pi(x, a) - p(a)(s_p - s_a) - w \quad (9.1)$$

and of a risk-neutral agent is

$$\beta\Pi(x, a) + B(a) - C(x, a) - p(a)(s_a + s_p) + w. \quad (9.2)$$

Social welfare equals the sum of these payoffs minus expected social harm:

$$\Pi(x, a) + B(a) - C(x, a) - p(a)h. \quad (9.3)$$

The equilibrium contract consists of values of β , w , and s_i maximizing the principal's expected payoff in equation (9.1) subject to two constraints. First, since the principal cannot control the agent's efforts directly, the agent will choose x^* and a^* to maximize his expected payoff in equation (9.2). This is called the incentive-compatibility constraint. Second, the agent will only accept the contract and thus participate in the enterprise if his expected payoff in (9.2) exceeds the payoff from the agent's next best opportunity, which we will normalize to zero for simplicity. This is called the participation constraint.

In the next several subsections, we will use the model to present some basic economic principles behind the optimal sanction scheme.

3.2 Principle: structure of sanctions may be irrelevant

The first principle is the irrelevance of the structure of state sanctions if the enterprise is able to transfer funds frictionlessly between the principal and the agent using the internal payment s_i . That is, only the total sanction $s_p + s_a$ matters, not how this total is divided into a principal and an agent sanction. A consequence is that the state need not be worried about whether enterprise liability (holding only the principal liable and not the agent, so $s_p > 0$ and $s_a = 0$) is better than agent liability (holding only the agent liable and not sanctioning the principal, so $s_a > 0$ and $s_p = 0$) or vice versa or indeed whether some sophisticated combination is optimal. All our knowledge, Kornhauser (1982) was the first to formally establish the irrelevance principle.

The irrelevance principle holds because, for any total sanction, the principal and agent can effect any division of this by varying s_i . To take a numerical example, suppose that the state targets the enterprise with a sanction of \$100 (and no sanction for the agent). Suppose further that the principal and agent find it jointly optimal to split the sanction between themselves, which they can do by requiring the agent to pay the principal

an internal sanction of $s_i = 50$. If instead the state directed the \$100 sanction solely at the agent, the enterprise could obtain the optimal (50, 50) division by now having the principal indemnify the agent ($s_i = -50$).

The irrelevance principle can be seen as another instance of the Coase Theorem (Coase 1960), stating that if bargaining is efficient, parties can unravel external rules (property-rights regimes in the usual context, sanction schemes in the present context) to their mutual benefit. In the present context, efficient bargaining requires that the transfer s_i can be set frictionlessly, which in turn requires that both parties have sufficient wealth so they are not liquidity constrained and that there be no state prohibition against such internal payments (we will discuss prohibition of indemnity payments later). If one or the other parties has limited wealth thus constraining the set of possible transfers s_i , then the division of total sanctions between principal and agent will matter. We will discuss this further in Section 3.4 on judgment proofness.

3.3 Principle: set the sanction equal to the harm

A second principle in the literature is that the socially optimal rule is to set the sanction equal to the harm h from the crime. Our view is that this rule is a useful benchmark, but we will spend some time arguing that it is less robust than generally understood.

To demonstrate that the sanction should be set equal to harm at least under some conditions, assume the agent in the model in Section 3.1 is risk neutral. It is easy to see what the equilibrium contract is. The principal provides the correct incentives for the agent to exert effort by giving him a 100 percent share of profits ($\beta = 1$) and passing the liability for the principal's sanction completely down to the agent by setting $s_i = s_p$. The principal then extracts all the expected surplus from the enterprise through the fixed wage w , effectively selling the enterprise to the agent for an upfront payment. Substituting these contractual terms into equation (9.2), the agent's objective function becomes

$$\Pi(x, a) + B(a) - C(x, a) - p(a)(s_p + s_p) + w, \quad (9.4)$$

which is identical to the social planner's objective in equation (9.3) – and thus would generate the social optimum – if the total sanction is set equal to harm: $s_p + s_a = h$. Thus the sanction-equals-harm principle holds.

Note the special condition under which the principle holds in this model: the agent is assumed to be risk neutral. This assumption effectively eliminates the hierarchical nature of the enterprise because it allows the principal to exit the scene by selling out his interest to the agent. With only the agent, the setting reverts to an 'ordinary' crime committed by

an individual. For 'ordinary' crimes, it is well understood, dating back to Becker (1968), that crime is optimally deterred by setting the sanction equal to the harm, because this forces the potential criminal to internalize the social costs of his actions.

We can argue in fairly general terms why setting the sanction equal to harm is not socially optimal once we depart from the special assumptions that the agent is risk neutral and has unlimited liability. Social welfare involves the sum of three parties' surpluses: the principal, agent, and harmed third party. Without any sanctions, the principal just cares about her own surplus. If the state imposes a sanction h on the principal, she perfectly internalizes the third party's surplus. In either case, the agent is left out of the principal's objective function, and so it may not match the social planner's objective, which does include the agent. Thus the equilibrium may not be socially optimal. For all of the articles deriving a proposition regarding the social optimality of setting the sanction equal to the harm — Newman and Wright (1990), Polinsky and Shavell (1993), Garoupa (2000) — it is possible to identify a way in which the model was finessed to leave out the agent's surplus. Accounting for the agent's surplus, Shavell (1997) shows that the optimal sanction may not equal the harm. Other papers have found that the optimal sanction should be less than harm in other settings and for other reasons, including Chu and Qian (1995) (in which a reduced sanction encourages the enterprise to hire a monitor that will report credibly on the agent's negligence) and Pitchford (1995) (in which a reduced sanction feeds back through reduced debt repayments to increase the firm's residual profit claim and ultimately its precaution level).

To summarize the implications of this section for practical policy, the benchmark result that the socially optimal sanction equals harm, which holds for 'ordinary' crimes committed by an individual, may serve as a starting point for calculating the optimal sanction for a corporate crime but will not be precisely correct. Which direction and how much to adjust the sanction away from the benchmark of the harm h would require detailed knowledge of individual surplus functions among other things. No practical rules of thumb have yet been provided by the law and economics literature, leading Shavell (1997) to conclude, '... the best course for society ordinarily is probably to set damages equal to harm'.

To simplify the discussion, so far we have ignored a well-understood reason for sanctions to diverge from h , that is, to adjust for the state's inability to detect crime (and convict the criminal) perfectly. A principle that applies to 'ordinary' as well as corporate crime, again from Becker (1968), is that the sanction should be scaled up by the inverse of the detection probability. To take a numerical example, if the harm is \$100 and the probability of detection $1/3$, the optimal sanction should equal \$300. More

generally, if σ is the probability that the state detects harm when it occurs, the sanction should scale harm h up by the multiple $1/\sigma$.

3.4 Principle: sanction party that is not judgment-proof

The irrelevance principle suggests that the partition of a given total sanction between the principal and agent does not matter because the enterprise will use internal transfers to unravel any partition. The chief reason the literature has forwarded for the partition to have real consequences is that one or the other party is judgment proof. A judgment-proof party has limited internal resources, preventing it from paying the full amount of a sanction, allowing it to escape the liability for the unpaid portion. Judgment proofness effectively puts a ceiling on the sanction the state can levy on the party. See Shavell (1986), Pitchford (1995), and MacMillin (2002) for further discussion of the judgment-proof problem in a general context and White (1998) in the context of corporate crime.

It is straightforward to adjust the model from Section 3.1 to allow for judgment proofness, although the exact form it takes depends on specifics such as the priority of claims in bankruptcy. Assuming a bankrupt enterprise gives first priority to suppliers and workers and pays fines out of the remaining funds, and that the enterprise has no retained earnings other than those earned in the current period, the effective enterprise sanction s_p is constrained to be no greater than $(1 - \beta)\Pi(x, a) + s_t - w$. Turning to the agent, assuming he has savings ℓ in addition to his current-period earnings, the effective agent sanction s_a is constrained to be no greater than $\beta\Pi(x, a) - s_t + w + \ell$. The savings term can be negative ($\ell < 0$), reflecting the possibility that the agent consumes some of his assets before the fines are imposed. In addition to savings, a positive term $\ell > 0$ can reflect harm that the state can impose on an assetless agent by imprisoning him. (If this interpretation is followed, the modeler should be careful to subtract the agent's harm from being imprisoned, in addition to the costs to the state of running the prison system, from social welfare.)

The literature has derived the principle that if the agent's judgment proofness prevents him from bearing the full amount of a sanction, the principal should be sanctioned as well and vice versa. To take a numerical example, suppose that the state finds it optimal to levy a sanction of \$100 on an enterprise and is deciding how to partition it between the principal and agent. If the agent with internal resources of \$40 and otherwise limited liability is made solely liable for the \$100, it will end up only paying out \$40 and the enterprise will escape \$60 of the liability. The result will be that the enterprise will have too much incentive to cause harm (or equivalently too little incentive to invest in precaution to avoid harm) since it is not bearing the full \$100 sanction. Instead, supposing the principal is unconstrained in

its internal resources, the state could divide the sanction, with \$60 of the liability going to the principal and \$40 to the agent. Other options might be equivalent. The principal could be made solely liable for the \$100 and assuming the principal will require the agent to pay some internal sanction between \$0 and \$40. Or the state could place the \$100 liability initially with the agent but then require the principal to make up any unpaid portion due to the agent's inability to pay.

If the agent is an individual manager or employee of the enterprise, the prospect that he will be judgment proof is a very realistic one. As we will see in the empirical section, sanctions for all categories of crime can average in the millions of dollars. Even with moderate harms, if the state's probability of detection is low, as discussed in the previous section, the resulting sanction may be scaled up considerably, quickly resulting in a sanction too high for the typical individual to afford. If the principal represents the shareholders of a corporation, it is often more likely that such a principal would have more internal resources and would be less likely to be judgment proof than the agent. This is not always the case. The principal in some instances may be an individual or a small enterprise that hires a larger enterprise as an agent. For example, the agent may be a large firm specializing in disposal of hazardous waste, as in Ringleb and Wiggins (1990), or a large retailer selling a smaller manufacturer's product.

The discussion in this section can be summarized in the principle that sanctions should be directed away from judgment-proof parties and toward parties with deep pockets. In most real-world settings, this means that sanctions should tend to be directed toward the principal rather than the agent, thus arguing for enterprise liability rather than agent liability. If the state has recourse to a conditional liability scheme, whereby the agent is liable up to his ability to pay and the principal for the remainder (as outlined in one of the options in the numerical example above) or vice versa, then the judgment-proofness principle becomes less important as a guide to public policy.

3.5 Principle: *body best able to control agent should sanction him*

The principles discussed so far do not provide an especially strong guide as to where within the enterprise the state should place liability. The principle presented in this section related to the ability to control the agent is in our view the strongest and clearest principle. Simply stated, the state should impose enterprise (principal) liability – thereby delegating control of the agent to the enterprise – when the enterprise is better able to control the agent than the state can. The state should impose agent liability, thereby intervening in the control of the agent, only if the state has some advantage over the enterprise in controlling the agent. Stated in these terms,

the principle seems almost tautological: the party better able to control the agent should control the agent. Further discussion is required to understand which party is better able to control the agent and under what conditions.

In many instances, the principal can better control the agent than the state can. The principal may be involved in the day-to-day operations of the enterprise and may routinely observe the agent's conduct. The principal may be able to provide incentives based on the fine-grained information she obtains, perhaps in a formal legal contract, perhaps in an informal contract enforced by long-run reputation. The state as an outsider may understand little about the operation of the enterprise and may have none of this fine-grained information. The state may not know enough to identify which specific agent from a team or hierarchy was responsible for the crime, and indeed it may be the case that no single individual but the whole team or hierarchy may have contributed. In such instances, the state should sanction the enterprise and rely on the enterprise to do its own internal sanctioning based on its better ability to monitor and control its agents. If no further considerations intervene, the presumption based on the control principle is that the state should impose enterprise liability.

There are circumstances under which the state is a better monitor and controller of the agent and thus under which agent liability is socially optimal. The principal may have limited ability to punish the agent. For example, the principal may have the power only to fine the agent but not to force payments from him. The state may be able to force such payments by garnishing future wages earned at other firms. Even if the agent is judgment proof, the state may be able to increase the punishment level by imprisoning him. Moreover, criminal sanctions imposed by the state may carry more severe additional reputational penalties than internal firm sanctions. The state may have better investigative powers to determine what criminal effort a was undertaken by the agent and condition punishments on that.

Segerson and Tietenberg (1992) and Polinsky and Shavell (1993) provide formal models in which agent liability can be socially optimal under some circumstances. Reputational penalties are discussed in more detail in Section 4.3. The merits of conditioning sanctions on intent, effort, and/or criminal attempts are discussed in more detail in Sections 4.1 and 4.2. See Khalil, Martimort, and Parigi (2007) for a general theoretical analysis of the monitoring of an agent by several principals, with applications to financial contracting.

The ability to control the agent shows up in various places in the formal model from Section 3.1. In the basic model, the principal can increase the agent's incentives to take appropriate effort (x) and crime (a) actions by

giving him a larger profit share β . The principal can also adjust the internal sanction s_i . An increase in s_i (recalling this is a payment from agent to principal) would lead the agent to choose a lower level of a . Moving beyond the basic model, one could assume that by expending some cost, say m , the principal can increase its ability to monitor the agent's criminal effort a , perhaps providing a signal \tilde{a} of a that is increasingly precise as m is increased. The principal may improve its control of the agent by building in payments conditional on \tilde{a} in the agent's incentive contract. Alternatively, monitoring may allow the principal to exclude certain extreme behaviors, which could be modeled as a reduction in the domain of possible a the agent could choose.

The government could likewise expend resources to improve its monitoring of the agent. The state may have better or worse monitoring powers than the enterprise, and so have a different mapping from its monitoring expenditures m into signals \tilde{a} of the agent's behavior. As noted in Section 3.4, the state's ability to imprison and to seize an agent's savings may allow it to punish a judgment-proof agent more harshly than his employer could. The control principle clarifies why, given that enterprise liability seems efficient in many contexts, the state does not just pick a single scapegoat enterprise A with deep pockets and make it liable for all corporate crimes and torts in the economy. Presumably enterprise A has little or no ability to monitor and control the employees of other enterprises and so making A liable would not deter crime and torts by these other enterprises. Generally speaking, an enterprise should only be liable for the actions of its own employees or employees of affiliated enterprises. Consistent with this idea, the doctrine of *respondent superior*, which is the basis in the common law for enterprises to be jointly and severally liable for corporate crimes and torts committed by their agents, explicitly requires the agent's wrong to have been committed in the scope of work for a principal as a condition for that principal to be held liable. See Kraakman (2000) for further discussion.

Perverse incentives may be created if the principal can escape liability by demonstrating that it did not have the ability to control the agent. If, as in the model sketched above in this section, the principal's control over the agent is captured as an expenditure m on a monitoring system, the principal would be led to underinvest in m . To avoid these perverse incentives, the state may base its sanctioning policy on what reasonable control mechanisms should have been in place for such an enterprise rather than on the actual level of control the enterprise had in a particular case. Alternatively, the state can induce the principal to adopt appropriate monitoring systems through direct fiat or by having a negligence standard for monitoring systems.

A caveat to the control principle is that even if the state is better than the principal at monitoring the agent, the state may still not want to focus sanctions exclusively on the agent and ignore the principal. Sanctioning the principal will lead it to internalize the social harm from its overall level of production or other activity and to bring this level more in line with the social optimum (see Shavell 1980).

The principle here applies to more complicated hierarchies than just principal-agent structures. In practice, an enterprise may have external parties such as lawyers, auditors, insurers, and banks that are crucial to its operations and may serve as independent monitors of the enterprise's and its employees' activities. Kraakman (1984, 1986, 2000) refers to these parties as 'gatekeepers'. Especially when deterrence is limited by the enterprise's judgment proofness, deterrence may be improved by exposing these gatekeepers to criminal liability. As the control principle suggests, extending liability to gatekeepers will tend to be worthwhile when they are good monitors and controllers of the enterprise and agent. Besides the cites in Kraakman (2000), additional recent work on the gatekeeper idea include Mattiacci and Parisi (2003), Ganuza and Gomes (2007), and a large body of work by John Coffee, including Coffee (2003, 2004).

3.6 *Principle: state should exploit the Prisoner's Dilemma*

The literature on self-reporting (including Malik 1993, Kaplow and Shavell 1994, Levitt and Snyder 1997, and Innes 1999a, 1999b) suggests that integrating self-reports into law enforcement may be of some value: for example, economizing on enforcement costs or providing early warnings that can be used to mitigate further damage. However, the main message of this literature is that self-reporting is of limited value in increasing deterrence because, in order to induce the individual to self-report, there are limits to how harshly he can be punished.

Reporting may be more useful for corporate crimes than for crimes committed by individuals because the former involves multiple parties (at the very least two, the principal and the agent) who can be played off against each other in a version of the Prisoner's Dilemma. A characteristic of the Prisoner's Dilemma and related games is that parties would be jointly better off cooperating on one set of actions (being silent), but self-interest leads them to choose another (informing on the other player). A number of deterrence schemes proposed in the corporate-crime literature can be shown to derive their value from setting up a version of the Prisoner's Dilemma game between the enterprise and agent, inducing each to report on the other. These schemes are able to reward reporting without having to reduce sanctions very much. The state may try to induce the enterprise to report on the agent (as in the monitoring literature), the agent

to report on the enterprise (as in the whistleblowing literature), or have parties race to report each other (as in the corporate-leniency literature). See Fees and Walz (2004) for a game-theoretic analysis of self-reporting in criminal teams.

Turning first to the monitoring literature, Arlen (1994), Chu and Qian (1995), and Arlen and Kraakman (1997) provide models in which partially forgiving enterprise sanctions can increase its incentive to monitor its agent when such monitoring can increase the likelihood of uncovering the agent's criminal acts (see Garoupa 2000 for a synthesis). *Ex post* – after the agent has undertaken the criminal act – the enterprise may have little hesitation in reporting on the agent if this information is used against the agent alone and not against the enterprise. If the state uses the information to penalize the enterprise as well, however, this moves the enterprise from the Prisoner's Dilemma game to the self-reporting game, reducing the enterprise's incentive to set up a monitoring system and to make honest reports. Arlen (1994) finds the perverse result that increased corporate liability can reduce the enterprise's incentive to monitor so much that it results in more corporate crime. Arlen and Kraakman (1997) note further that it is not enough for the state to be neutral toward an honestly reporting enterprise. Reporting may be costly enough for the enterprise *ex post* that it cannot commit to report the results of its monitoring unless given a leniency reward sufficient to offset the cost.

The antitrust literature has studied whether and how to use corporate-leniency programs to unravel cartels by effectively setting up a Prisoner's Dilemma among the cartels' members which has them 'race to the courthouse'. Spagnolo (2008) provides an overview of the evolution of policy and the relevant academic literature, which includes Spagnolo (2000, 2004), Ellis and Wilson (2003), Himloopen (2003), Motta and Polo (2003), and Harrington (2007). Spagnolo (2004) abstracts from the hierarchical nature of firms, treating them as unitary actors, and analyzes leniency toward a firm that blows the whistle on the cartel. He studies socially optimal leniency programs under the constraint that they be self-financing, implying that rewards to whistleblowing firms can be no greater than the total fines on offenders. He derives conditions under which the optimal policy places severe sanctions on offenders, coupled with rewards only for the first reporting firm. Intuitively, the sanction and leniency scheme maximizes the wedge between the payoff from cooperating in the cartel and the payoff from cheating on the cartel and then reporting the cartel to the authorities. Spagnolo's (2004) result that only the first reporting firm receives leniency provides a rationale for this feature in the 1993 US Department of Justice leniency program. Interestingly, there is a limit to how high the offender sanctions should be set. Otherwise the cartel could exploit the leniency

program as a disciplining device to sustain collusion. The cartel could threaten to blow the whistle on itself and subject its members to high sanctions if any firm undercut the high collusive price.

Net (positive) transfers to self-reporting firms are ruled out in the Department of Justice leniency program. Aubert, Rey, and Kovacic (2006) examine the theoretical benefits of relaxing this constraint and offering bounties to agents who blow the whistle on their colluding employers. Such rewards make cartels less profitable because a colluding firm has to 'bribe' its employees not to become whistleblowers. Aubert, Rey, and Kovacic (2006) also note that communication is necessary for cartel success (see Cramton and Palfrey 1990 for a theoretical argument and Genesove and Mullin 2001 for an empirical illustration through the experience of the Sugar Institute). But that communication produces evidence – a paper trail – that can be used in a prosecution or in a leniency application.

Miller (2007) provides an empirical evaluation of the 1993 US Department of Justice leniency program. He advances a formal model allowing him to map unobservables (including parameters of the rates of cartel formation and dissolution) into observables (the number of detected cartels), generating testable predictions about the effects of leniency programs. His empirical estimates indicate that the 1993 leniency policy had substantial effects on deterrence – lowering the rate of cartel formation by over 40 percent – and detection – raising the rate at which formed cartels are detected by over 60 percent.

Dyck, Morse, and Zingales (2007) assembled detailed data from press accounts of all reported fraud cases for large US corporations over the past decade (230 cases in all). Parties with an explicit mandate to detect fraud (regulators and auditors) were responsible for only 36 percent of detections; other sources – including in order of importance employees, the media, financial analysts, and competitors – made up the rest. Employee whistleblowers receive a penalty (firing, quitting under duress, or altered responsibilities) far more often than a reward. In industries in which employee whistleblowers do receive monetary rewards (the Federal Civil False Claims Act provides the whistleblower with a share of the money recovered from frauds against the government), such as healthcare, employees account for a significantly larger share of detections. Bowen, Call, and Rajgopal (2007) analyze a sample of corporations accused of accounting misreporting, comparing those for which the misreporting was revealed by whistleblowing to a control sample. Although it is difficult to infer causation, the authors find significant differences between the two samples regarding firm size, past stock performance, and industry concentration, among other variables. Whistleblowing increased

the probability of the restructuring of the board of directors, including removal of the CEO, removal of insiders, and an increase in attendance at board meetings.

Recently, there have been growing concerns that the ability to set up a Prisoner's Dilemma between the enterprise and agent shifts too much power to prosecutors. In 2007, the indictments were dismissed for 13 of the 16 employees of one of the big-four US accounting firms, KPMG, for illegal tax-shelter activity. The judge found that federal prosecutors inappropriately used the threat of indicting KPMG – which could be a death sentence for an accounting firm – to coerce it into cutting off indemnification of its employees' legal fees. As a result of this case and other negative publicity, the US Department of Justice modified its guidelines on prosecution of enterprises, supplanting the 2003 Thompson Memorandum with the 2006 McNulty Memorandum (see US Department of Justice 2003 and 2006).

4. The structure of sanctions in finer detail

In this section, we delve into some of the finer details of the structure of sanctions that have been analyzed in the literature.

4.1 *Strict liability versus negligence*

According to the doctrine of *respondent superior*, which guides common law toward corporate crime, enterprises face a strict-liability rather than a negligence rule for the crimes and torts of their agents. Kraakman (2000) provides an extensive survey, which we will summarize in this section, of the relative merits of enterprise strict liability versus the alternative of a negligence rule, which requires the enterprise to exert due care in monitoring and controlling the agent's criminal behavior.

Many of the textbook arguments for strict liability over and above negligence for 'ordinary' torts and crimes (see Shavell 1980 for an early reference) carry over to the case of an enterprise in the corporate-crime context. Even if the enterprise has difficulty controlling its agents' criminal or precautionary behavior, strict liability will still lead the enterprise to internalize some of the harm of its commercial activities and to curtail these activities appropriately. A negligence rule would allow the enterprise to escape any liability by exceeding a standard of care and thus lead the enterprise to undertake socially too much of the commercial activity leading to the harm. Furthermore, determining the appropriate standard for something as complicated as enterprise monitoring of agents is terribly difficult and may lead to considerable uncertainty if it is left to the courts to make *ex post* determinations. In the face of this uncertainty, enterprises may undertake inefficiently too little commercial activity.

On the other hand, certain unique features of the corporate-crime

context may weigh in favor of a negligence rule. As pointed out by Arlen (1994), and discussed in Section 3.6, enterprises will have too little incentive to monitor their employees and report on their misdeeds if that information increases the chance that the harm is discovered and the enterprise faces liability. A negligence rule specifying a reasonable level of monitoring could provide the enterprise with better monitoring incentives. Even if there is no issue of hiding crimes, as Arlen and Kraakman (1997) note, the enterprise may have difficulty committing to internal monitoring and sanctioning schemes. Once the agent has undertaken the crime or tort, carrying out monitoring and sanctioning functions may simply add an *ex post* cost for the enterprise and under a strict liability rule would not save it any fines. Under a negligence rule, the enterprise would be better able to commit to monitoring and sanctioning the agent because by so doing it may be able to avoid liability.

Hybrid regimes are also possible. Chu and Qian (1995) study a legal rule under which the enterprise is strictly liable for harm if and only if the agent is found to be negligent. Such a rule may capture the practical distinction between a corporate crime and a corporate tort because some sort of intentionality or negligence is required for crimes. Under this legal rule, the enterprise faces a tradeoff in setting up a monitoring system. By hiring an honest monitor, the enterprise can incorporate the monitor's reports of the agent's effort into an incentive scheme that provides stronger incentives for the agent to behave in a non-negligent way. The drawback of honest reporting is that this increases the chance that the court uncovers any agent negligence. The social optimum is always designed to induce the enterprise to hire an honest monitor, sometimes accomplishing this by reducing the negligence standard below the first-best level or reducing the enterprise's vicarious liability below the full social harm.

4.2 *Civil versus criminal penalties*

A number of articles have questioned whether corporate wrongs should be tried under criminal law or whether civil law would be a better forum. Fischel and Sykes (1996) note that, while good economic arguments can be advanced for applying criminal liability to individuals, the arguments are less strong for enterprises. One of the main benefits of the criminal-law system is that the state has recourse to imprisonment as a punishment in addition to fines. Imprisonment can be valuable if the defendant's judgment proofness limits the highest effective fine that can be levied against him. Since enterprises are not physical entities that can be imprisoned, the main benefit of imprisonment is irrelevant in their case.

In arguing for the virtue of applying civil rather than criminal law to enterprises, Fischel and Sykes (1996) list a number of drawbacks of the

criminal law. (See also Parker 1996; Lynch 1997; Simpson 2002; and James, Kirkbride, and Letza 2005). (a) Pre-specified criminal penalties may not be as flexibly tied to the harm from each particular act as are civil penalties. (b) Civil law does a better job of tracking total fines levied jointly against principals and agents to ensure that the fines together do not greatly exceed the harm caused. Criminal proceedings against the enterprise and agents may result in 'double damages' being assessed, leading to a situation of overdeterrence. (c) The social stigma associated with a criminal conviction may be much higher than with a civil penalty, and when added to the explicit criminal penalties may also lead to overdeterrence. Overdeterrence has a number of social costs, including possibly excessive litigation, excessive internal monitoring by the enterprise, and underinvestment and underproduction by the enterprise. (d) Criminal law often involves at least an implicit negligence standard. Fischel and Sykes (1996) prefer strict liability, citing the difficulty in computing an appropriate standard without introducing judicial error. Faced with an uncertain standard, a textbook result is that parties will engage in excessive precaution. (e) The standard of proof may be inordinately high in criminal cases (beyond a reasonable doubt), and the civil standard (preponderance of the evidence) more appropriate for corporate wrongs.

Arguments can also be advanced in the opposite direction, favoring criminal penalties for enterprises. Although prison is not an option for them, enterprises can be put on probation, including being excluded from certain lines of business and from future government contracts. Probation may be a useful option for punishment in addition to fines. Indeed, of the 217 cases sentenced in 2006 according to Chapter 8 of the US Sentencing Guidelines, organizations were ordered to serve over a month of probation in three-quarters of the cases (US Sentencing Commission, 2006, table 53). Another argument in favor of criminal penalties for enterprises is based on Section 3.3, where we saw that the socially optimal level of enterprise liability may not be as simple as the social harm (or a multiple of harm inversely proportional to the conviction probability). The optimum might involve a complicated combination of factors that would be better analyzed in advance and set into guidelines rather than being determined on an ad hoc basis by a judge in a particular case. Fischel and Sykes (1996) themselves note that a benefit of the criminal-law system is that deterrence can be enhanced by levying criminal penalties on detected attempts as well as realized harms (civil penalties generally require an actual harm to be compensated).

4.3 *Reputational penalties*

As noted in the previous section, in addition to any explicit state sanctions, the enterprise may suffer implicit market or reputational penalties after

detection of a wrong. The reputational penalties can be modeled by adding the term r to the principal's objective function from equation (9.1):

$$(1 - \beta)\Pi(x, a) - p(a)(r + s_p - s_a) - w. \quad (9.5)$$

As Garoupa (2000) shows, starting from a sanction scheme (s_p^*, s_a^*) that delivers the first-best in the absence of reputational penalties, the principal's sanction s_p^* would need to be reduced by r in order to return to the first-best in the presence of reputational penalties. If the reputational penalties are ignored, overall sanctions will be too high, resulting in overdeterrence (see Lott 1996 for further analysis).

Reputational penalties may be beneficial if limited liability of principal or agent prevented the original sanction scheme (s_p^*, s_a^*) from delivering the first best. Additional reputational penalties may help move the sanction scheme closer to an unconstrained social optimum.

Empirical research tends to find reputational penalties only for crimes against parties in a position to extract such a penalty (for example, fraud) and not for crimes against unrelated third parties (for example, environmental violations). For corporations involved in fraud, Karpoff and Lott (1993) find that the loss in stock market value after the announcement of the crime swamps the anticipated criminal penalties, a difference attributed to reputational penalties. For environmental violations, Karpoff, Lott, and Wehrly (2005) attribute most of the decline in the stock-market value of convicted firms to regulatory and legal actions rather than reputational penalties. Alexander (1999) confirms this variety of results in a study of cross-section of crime categories. Reputational penalties also require the signal of wrongdoing to be sufficiently informative. Helland (2006) finds that, except in a limited set of cases, allegations of fraud against officers and directors in private securities class actions do not yield a reputational penalty for them, suggesting that such allegations do not carry much credence in the market.

4.4 *Agent indemnification*

Indemnification payments offer a way for the enterprise and agent to share the costs of being prosecuted and convicted of a corporate crime. Referring to the model in Section 3.1, a positive value of s_i indicates that the agent must indemnify the enterprise's losses and a negative value indicates that the enterprise must indemnify the agent's losses. This section will focus on the latter sort of indemnification (that is, where the enterprise indemnifies the agent) because this is a widespread practice among corporations.

Agent indemnification can either be provided directly by the firm or by purchase of third-party directors and officers (D&O) insurance. State

incorporation laws differ as to what costs the firm may indemnify, but most allow firms to reimburse agents' legal costs and losses from settlements, judgments, and fines.

Public policy is ambivalent toward agent indemnification. Certain policies strongly encourage it; for example, Delaware law requires a firm to provide directors and officers insurance as a condition for incorporation there. On the other hand, officials have recently begun questioning the wisdom of allowing firms to use indemnification to shift all liability away from the agent – see, for example, the speech by the Chairman of the US Securities and Exchange Commission, William Donaldson (Donaldson 2003).

One can see the economic intuition for both sides. The benefit of allowing agent indemnification is that the larger enterprise with perhaps diversified owners is likely to be able to bear risk more efficiently than the agent. It is thus in a position to insure the agent through indemnification against the risk of mistaken prosecutions or judicial error in assessing sanctions. Besides the direct utility provided by insurance, allowing agent indemnification may avoid some of the social costs due to overdeterrence. The drawback of allowing indemnification is that it may remove a powerful tool for crime deterrence. Referring to the model, the agent may get a direct private benefit $B(a)$ from crime, but most of his benefit may come indirectly through his share β of the enterprise's increased profit $\Pi(x, a)$. The agent may put much more weight on the sanction s_a targeted directly at him. Thus it may be very difficult for the enterprise to induce the agent to engage in criminal behavior unless it unravels the agent's sanction by making an indemnification payment equal to this amount: $s_i = -s_a$.

The common law tries to capture the social benefits of agent indemnification while avoiding some of the drawbacks by declaring liability that stems from willful agent misconduct to be uninsurable under the law (Johnston 1978; see also Harrington and Niehaus 1998). The public policy question then reduces to determining standards for the willfulness of criminal conduct above which indemnification would be forbidden. The standards would need to be sufficiently high or else promises to indemnify or to make D&O insurance payments would not have much credibility and the social benefits of indemnification would be lost. The difficulty in denying insurance coverage for willful misconduct is illustrated by the case of Bank of America, fined \$13 billion for its role in the WorldCom fraud. Lloyd's of London agreed to pay its share of Bank of America's insured liability, but Swiss Re and Kemper held out and had to be sued by Bank of America (Fleming and Mollenkamp 2005).

Mullin and Snyder (2009) study the social optimality of forbidding

agent indemnification in a model in which the enterprise benefits from its agent's crime (at least in the absence of state sanctions). The enterprise seeks to induce the agent to commit the crime through the design of the incentive scheme. A crucial feature of the model (see Beckenstein and Gabel 1986 and Schinkel and Tuinstra 2006 for related assumptions about antitrust enforcement) is that the state has a probability of making type I prosecution errors – possibly convicting an honest party – as well as the usual type II errors – failing to convict a guilty party. As suggested by Stone (1980), Kraakman (1984), and Privileggi, Marchese, and Cassone (2001), holding constant the level of sanctions, the state can deter more corporate crimes if it forbids agent indemnification. Forbidding indemnification removes an instrument that would be used in a contract to induce crime.

Nevertheless, Mullin and Snyder (2009) show that forbidding indemnification is socially inefficient. The result follows from employee risk aversion. Banning indemnification prevents the firm from insuring the employee against type I prosecution errors. Since the employee is risk averse, the loss of this insurance is socially costly. Crime can be deterred more efficiently by sanctioning only the firm because a firm sanction is just a transfer between the risk-neutral firm and government involving no loss of social surplus.

It might be countered that the state is not always free to increase the effective level of enterprise sanctions, in particular when the enterprise's limited liability makes it judgment proof. However, as long as state sanctions receive priority over indemnification payments in bankruptcy proceedings, a judgment-proof firm that is unable to meet its fine obligations would also be unable to meet its indemnification obligations even if the law did not explicitly forbid indemnification. Hence judgment proofness is not an argument for actively forbidding indemnification.

Mullin and Snyder (2009) do find a role for forbidding indemnification: when there is scope for the agent to cooperate with prosecutors to raise the probability the enterprise is convicted. For some parameters, it is beneficial for prosecutors to forgive a portion of the agent's sanction as a reward for cooperation. A fully indemnified employee gains nothing from this reward, so forbidding indemnification is necessary to secure the agent's cooperation. This is conceptually similar to issues surrounding corporate leniency policies.

Regarding the enterprise's choice between (a) indemnifying the agent itself or (b) buying third-party insurance such as D&O insurance, Holderness (1990) suggests that a benefit of bringing in a third-party insurer is to add an independent monitor of the agent's criminal behavior, effectively bringing in another gatekeeper, to use Kraakman's (1986) term.

Holderness (1990) offers a range of empirical evidence in support of this hypothesis as against a risk-shifting hypothesis.

5. Securities fraud

This section discusses an important special case of corporate crime: securities fraud, a violation of a public corporation's duty to report mandated financial information that has been audited according to accepted accounting principles. In the United States, the main reporting requirements are quarterly 10-Q reports and more extensive annual 10-K reports filed with the Securities and Exchange Commission.

We devote a separate section to securities fraud for several reasons. The recent wave of high-profile corporate scandals -- including, most notoriously, Enron -- involved securities fraud (see Healy and Palepu 2003 for an analysis of the accounting issues involved in the Enron case). In response to these scandals, the US Congress passed a major reform of securities laws, the Sarbanes-Oxley Act of 2002. The scandals and policy reforms have generated considerable academic research; indeed, securities fraud is the most active area of corporate-crime research, generating a body of research in the accounting and corporate-finance fields as well as law and economics. Finally, securities fraud is perhaps the canonical corporate crime. While individuals or non-corporate enterprises can commit an environmental crime, for example, by dumping pollution in a river, a securities fraud generally involves a public corporation.

In the rest of the section, we will discuss some conceptual issues regarding securities fraud, connecting this special case back to our previous general analysis of corporate crimes. To provide a theoretical framework, we will analyze a recent paper by Bar-Gill and Bebchuk (2002) in some detail. We will then survey the empirical literature on the causes and consequences of financial misreporting and survey preliminary evidence on the effects of the Sarbanes-Oxley Act on the US financial market. See Arlen and Carney (1992) for an earlier survey of the law and economics of securities fraud.

5.1 *Conceptual issues*

Securities frauds add several interesting wrinkles to the conceptual framework we presented earlier for general corporate crimes. Rather than the harm h accruing to some external party that obviously needs protection from the state as in the model in Section 3.1, the harmed party is often an existing or new investor in the corporation, so an existing or prospective principal in the hierarchy. The harm is typically that the investor overpays for a security relative to the full-information price. (There are exceptions: under-reporting earnings in Aboody and Kasznik 2000 lowers the exercise

price for the manager's options and in Liberty and Zimmerman 1986 improves management's position in labor negotiations.) The manager may derive one of a number of benefited private benefits for a longer period retaining his job and the associated private benefits for a longer period (for example, Fudenberg and Tirole 1995), obtaining a higher stock price for inside trades (for example, Bar-Gill and Bebchuk 2002) or as an agent for current rather than future shareholders (for example, Dye 1988), or jamming a principal's observation of his effort in order to increase incentive pay (for example, Goldman and Slezak 2006).

Given that the harmed party is potentially a sophisticated market participant and the harm seems more like an income transfer than a true loss of social welfare, it needs to be argued why the state would need to intervene in the market and mandate information disclosure and auditing procedures. Diamond and Verrecchia (1991), Baiman and Verrecchia (1996), and especially the Verrecchia (2001) survey identify several channels through which misreporting may lead to true social-welfare losses. Misreporting may reduce the liquidity of the market, lowering an individual's surplus from holding securities. Misreporting may distort the market signals and divert financial capital away from high-value uses toward low-value ones. Misreporting may reduce the value of information in structuring managers' incentive contracts. Misreporting may reduce the ability to use incentive contracts based on the reported information to provide incentives to management.

Even though there may be social losses from misreporting, it is not clear why the private market could not solve the problem without intervention from state mandates. Grossman and Hart (1980) argue that if information is verifiable ex post, an information cascade may arise, resulting in full revelation of managers' private information. Suppose a manager had private information about the firm's sales growth. Managers whose information was above some threshold would have an incentive to share this with the market to boost the stock price. But managers just below the threshold would prefer to announce as well to separate themselves from the average firm that did not make an announcement. In this way, all, except perhaps for the manager with the worst news, would announce their private information. Information only cascades in this way under special assumptions, including costless announcements and perfect verifiability ex post of the announced information. Indeed, one role of the state in the market would be to provide a mechanism for such ex post verification.

Even if conditions for an information cascade are absent, the private market may still provide full revelation. A fundamental principle of the economics of contracts, the revelation principle, says that investors, as principals of the firm, can structure an optimal contract so that the

manager has incentives to announce his private information truthfully. (See Myerson 1979 for general theory on the principle and Arya, Glover, and Sunder 1998 and Lambert 2001 for its application to the specific context of financial disclosure). For the revelation principle to hold, the reporting agent must be able to communicate his information completely, the principal must have access to a full range of contracting options, and the principal must be able to commit to the contractual mechanism. In practice, transactions costs may prevent fully flexible communication and contract design. Commitment may be even more problematic. In the face of significant ex-post auditing and reporting costs, the principal and agent would have an incentive to renegotiate the contract. Commitment would be especially difficult if the manager working by himself or the manager and current investors working together could expropriate the surplus of a third party – new investors – by misreporting. When the conditions for the revelation mechanism do not hold, optimal contracts can involve at least some earnings smoothing (shifting revenue recognition earlier if earnings are expected to be low and delaying revenue recognition in high-earnings periods), if not outright fraudulent misreporting, rather than truthful reporting (see Dye 1988, Fudenberg and Tirole 1995, and Goldman and Siezak 2006 for theoretical models).

Additional factors may constrain the extent of misreporting. A corporation that continually inflates earnings period after period will be increasingly likely to have its misreporting detected. Sunder's (1997) 'law of the conservation of income' suggests that corporations cannot continually inflate earnings without the deficit eventually being detected. Maintaining a long-run reputation may provide incentives for honest reporting (Benabou and Laroque 1992, Stocken 2000). The addition of an auditor may improve the quality of financial statements and reporting. The auditor serves as what we referred to in Section 3.5 as a gatekeeper. The auditor may not be a perfect control on misreporting because he may shirk on auditing effort (Dye 1993) and may be captured by the management through promises of continued retainer for auditing or additional consulting services (Pagano and Immordino 2007).

5.2 *Theoretical model*

To make some of the ideas from the previous section more concrete, it is worthwhile discussing a theoretical model in more detail. We will cover Bar-Gill and Bechtuk (2002) here because it is one of the most complete and useful frameworks on securities fraud in the law and economics literature.

The timeline for their model begins with the manager's undertaking actions, which are costly to the firm, that facilitate over-reporting earnings

later. Such investments might include, as Enron did, setting up special-purpose entities to hide liabilities, or choosing trading partners on the basis of willingness to structure transactions flexibly rather than on the basis of price. The manager's investment is analogous to the criminal action a in Section 3.1. The manager then learns whether the firm's type – its baseline revenue will be at the end of the game – is high or low. The manager then issues an earnings report. If the firm's type is high, the manager will report truthfully. If the firm is the low type, the manager is more likely to be able to misreport this as high, the more he invested initially in facilitating misreporting. The manager then trades his own stock, and these trades may or may not be observable to the market, depending on the model variant.

Next, the firm is presented with a follow-on investment opportunity, which will require raising outside equity to fund. The funds raised by this secondary offering depend on the earnings report. Since the high type is partially pooled with the low type, it does not obtain as high an equity price as under full information. If the discount is sufficiently high, it may forgo the follow-on investment opportunity, even though this may be commonly known to have positive net present value. On the other hand, a misreporting low type may receive a sufficient price premium over full information that it undertakes the secondary equity offering even though the follow-on project has negative net present value. Finally, baseline revenue and the revenue from the follow-on project are realized and paid to investors.

There are several sources of real social costs of misreporting in the real world. The manager's ex-ante investment in facilitating misreporting is a real cost. An additional cost is that capital is misdirected away from positive net present value projects for the high-revenue firms and toward possible negative net present value projects for low-revenue firms. The authors find that the manager invests more in facilitating misreporting the lower is a parameter measuring the stringency of legal and accounting controls, the more stock the manager owns, and the less public his insider trades.

5.3 *Empirical studies of misreporting*

A large literature, much of it in accounting and corporate finance, analyzes the characteristics of firms accused of misreporting financial information compared to a matched sample of control firms (usually the match is to a firm in the same industry that is closest in size). It is impossible to uncover all instances of misreporting since much of it is presumably hidden. Instead, most studies use a sample of firms (around 200 in a typical study) required by the Securities and Exchange Commission to restate earnings during a certain period of time because of a violation of generally accepted

accounting principles. The studies take the restatement as an indication of the earlier misreporting by the corporation, so in the subsequent discussion we will use 'restatement' and 'misreporting' synonymously. Many studies find significant differences between the characteristics of misreporting firms and matched controls, whether in the design of the manager's compensation scheme or in the firm's financial or corporate-governance structure. Healy and Palepu (2001) survey the earlier literature.

Regarding the structure of managerial compensation, CEO's stock options appear to be the sole piece of his compensation package related to misreporting (Burns and Kedia 2006; Efendi, Srivastava, and Swanson 2007). Erickson, Hanlon, and Maydew (2006) find no relationship between executive compensation and misreporting, but this may in part be due to their small sample (50 observations) because they restrict attention to violations rising to the level of criminal fraud. Regarding the firm's financial structure, Richardson, Tuna, and Wu (2003) find a correlation between outstanding debt levels (and also the market's expectations of future growth) and the probability of restatements. Regarding the firm's corporate-governance structure, Dechow, Sloan, and Sweeney (1996) find many significant differences between misreporting and control firms, including the CEO's also being chairman of the board, the founder of the firm continuing as CEO, the absence of an audit committee, dominance of the board by insiders, and the absence of an outside blockholder. Further analysis by Agrawal and Chadha (2005) finds fewer significant correlates between misreporting and corporate governance (first, having no director with financial expertise on the board or audit committee and, second, having a member of the founding family as CEO).

A number of studies find a relationship between the timing of activities by a manager or the stock market and misreporting. Efendi, Srivastava, and Swanson (2007) find restatements are more likely if the firm recently raised new debt or equity. Beneish (1999) finds that the managers of restating firms are more likely to sell equity holdings and exercise stock appreciation rights. Desai, Krishnamurthy, and Venkataraman (2006) find that restatements are preceded by a run-up in short selling, and this short selling is more intense when accounting accruals appear to be inflated, suggesting that some market participants are able to anticipate the market's response to what they see is suspect financial reporting.

Core (2001) notes that it is difficult to infer causation from empirical studies of restatements because the structure of managerial compensation, corporate governance, and financial structure are determined jointly with misreporting. These structures might be designed to mitigate the problem of misreporting rather than the cause of it. Core (2001) also points to the possibility of substantial measurement error. One overlooked source of

error is in assuming that the window during which the firm is misreporting ends exactly with the issuance of the formal restatement. Often a long period intervenes during which the firm may institute reforms to remedy reporting violations. The consequences of errors in measuring event windows can be severe. Karpoff, Lee, and Martin (2007) painstakingly track restating firms throughout the entire relevant period and show that 93 percent of responsible managers lose their jobs as a result, most being fired. If instead of observing event windows, they had used the assumptions maintained in previous studies, they would have missed almost half of the firings of responsible managers because these happened far in advance of the formal restatement. Leaving aside Core's (2001) criticisms, the body of empirical findings is consistent with the model and conclusions of Bar-Gill and Bebechuk (2002). Misreporting appears to be used to increase the price at which the manager sells his equity and to reduce the firm's cost of raising new capital. The manager's stock holdings (stock options more specifically) appear to increase incentives to misreport.

5.4 *Sarbanes-Oxley Act and other securities laws*

We will focus on the Sarbanes-Oxley Act because it is such a major recent reform, although at the end of the subsection we will also review studies of earlier reforms and some macroeconomic evidence on the efficiency of securities laws. See Seligman (2003) for a history of US securities laws and Zitzewitz (forthcoming) for a survey of economic analyses of these laws. Enriques and Volpin (2007) survey corporate governance reforms in Europe.

The provisions of the Sarbanes-Oxley Act, summarized in Coates (2007), generally strengthened auditing requirements, in particular creating a new regulatory body (the Public Company Accounting Oversight Board) and requiring CEOs and auditors to certify material weaknesses in their accounting control systems. To maintain independence between auditors and the audited firm, the act requires firms to rotate their auditing partners every five years and restricts auditors from providing consulting services for client firms, which used to be a significant source of revenue and a possible lever for management to control auditors' reports.

While the tradeoffs involved in the act are clear – enhancing the credibility of financial reports at the cost of increased compliance, auditing, and liability expenses – the net effect is more controversial, with Coates (2007) seeing it as positive but Romano (2005) calling it 'quack corporate governance'. Empirical work is challenging because the act affected all public firms at once, so it is difficult to find a control sample to compare with affected firms. The study by the Committee on Capital Markets Regulation (2006) offered evidence that the market for initial public offerings was drying up

in the US compared to Europe, but it is difficult to separate the time-series effect of Sarbanes-Oxley from secular trends in increased competition for financial services outside the US. Rezaee and Jain (2006) and Zhang (2007) find mixed results in their study of the aggregate US stock-market reaction to passage of the act. Chhaochharia and Grinstein (2007) compare the abnormal returns of a portfolio of firms that were already compliant with the act's provisions before its passage to those that were not. They find a 6–20 percent abnormal return, suggesting net benefits to shareholders. Dividing the sample by firm size, they find negative abnormal returns for small firms that were previously non-compliant, suggesting substantial fixed costs of complying with the new provisions that are a larger relative burden for small firms. Hochberg, Sapienza, and Vissing-Jorgensen (2007) find that firms whose management lobbied harder against the act had greater positive abnormal stock returns from its passage, providing additional evidence that the act generally produced at least small net benefits. Li, Pincus, and Rego (2008) find that firms' abnormal stock returns to Sarbanes-Oxley legislative events were positively related to measures of firms' earnings management, and they conclude that investors anticipated that Sarbanes-Oxley would constrain earnings management.

Several studies have looked at policy changes preceding Sarbanes-Oxley. Choi (2006) and Johnson, Nelson, and Pritchard (2006) examined the Private Securities Litigation Reform Act of 1995, aimed at discouraging nuisance class-action lawsuits by imposing sanctions on lawsuits judged to be frivolous, limiting attorney fees, insulating forward-looking statements from suits, among other provisions. The studies generally suggest that the act has been successful in reducing frivolous lawsuits, but at the margin some meritorious suits seem to have been discouraged as well, with some evidence of a resulting decline in deterrence of securities fraud. Greenstone, Oyer, and Vissing-Jorgensen (2006) analyzed the effects of mandated disclosure in the Securities Act amendments of 1964.

La Porta, Lopez-de-Silanes, and Shleifer (2006) analyze the effectiveness of the broad suite of securities laws in a cross-section of 49 countries. They find that mandatory disclosure laws and low standards for establishing liability are the most important factors in determining the level of development of a country's stock market; the stringency of public enforcement does not appear to matter. The results suggest that securities laws work best if they facilitate private contracting rather than substituting for it through public monitoring.

6. Conclusion

The volume of cites provided in this chapter across the literatures of law and economics, accounting, and corporate finance may overwhelm the

reader new to the area of corporate crime. Besides this chapter, earlier surveys in the 2000 predecessor of this volume – Kraakman (2000), Lott (2000), and section 11 of Polinsky and Shavell (2000) – are useful introductions to the topic. A good view of the modeling techniques would be provided by reading Polinsky and Shavell (1993) and Garoupa (2000). On securities fraud, Arlen and Carney (1992) provide a useful survey and Bar-Gill and Bechtuk (2002) an accessible but comprehensive formal model. The body of empirical work is relatively extensive on securities fraud. Chhaochharia and Grinstein (2007) provide a good example of this work, and it is topical because it covers the effects of the major recent policy reform in the US, the Sarbanes-Oxley Act.

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