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Punishing Corporate Crime: An Economic Analysis

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Declaration

I declare that this thesis is my own work and that, to the best of my knowledge, it contains no material that has been published or written by another person(s) except where due acknowledgement has been made. This thesis has not been submitted for award of any other degree or diploma at the University of New South Wales or at any other educational institution. I declare that the intellectual content of this thesis is the product of my own work except to the extent that assistance from others is acknowledged.

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28th October 2016

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Abstract

This thesis investigates the optimal allocation of punishment for corporate crime, between the employee and the firm. We compare the social welfare outcomes associated with the different punishment strategies: 1) punishing the firm, 2) punishing the employee and 3) punishing both the firm and the employee to determine which strategy is optimal and under which condition it is so. We find that the choice of punishment strategy is dependent on the size of the maximum fine on the employee. If the maximum employee fine is larger than a threshold value then social welfare is maximised when the employee is punished. If the maximum employee fine is smaller than the threshold value the social welfare is maximised when the firm is punished.

CHAPTER 1

Introduction

Over the past century, the corporate form has become ubiquitous in virtually every aspect of our lives - corporations employ millions, provide goods and services and generate economic growth. As such, misconduct by corporations and in particular, punishment of corporate crime, has become an increasingly important field of research for law, economic and criminology theorists alike. A key difference between punishing corporate crimes and non-corporate crimes is that there are two potential defendants liable for a corporate crime: 1) the firm and 2) the employee. For a non-corporate crime, usually only the individual/s who committed the crime is liable. Since there is a choice of defendant in corporate crime cases, the question naturally arises — who should be punished when a corporate crime is committed? Our thesis aims to explore this question.

The optimal allocation of punishment between the firm and the employee is an important question, since some allocations may result in sub-optimal deterrence. This question has been examined in the existing literature, with various answers being presented. It has been suggested that in the absence of any limits on the fine size and assuming both players are able to contract freely between themselves, there is no difference between punishing either player (Arlen, 2012; Kornhauser, 1982; Mullin and Snyder, 2009). However, when either player is faced with a wealth constraint, necessarily limiting the size of the fine, then it is suggested that the punishment of both players is necessary (Garoupa, 2000; Polinsky and Shavell, 1993; Shavell, 1997).

Similarly, within legal scholarship, there is also much debate about the allocation of individual and corporate responsibility for corporate crimes. This analysis largely revolves around the relative merits and trade-offs between individual liability and corporate liability and how the corporate liability regime should be structured in light of these trade-offs. Corporate liability determines the extent to which a firm is liable for a crime committed by their employee, whilst individual liability determines the extent to which employees are liable for their own actions. There are some who advocate for reducing the scope of corporate liability to limit the government's

ability to punish the firm and believe punishing the employee is optimal (Fisse and Braithwaite, 1993; Hawke, 2000). Others advocate for broadening the scope of corporate liability and believe punishing the firm is optimal (Fisse and Braithwaite, 1993; Hawke, 2000). A key argument of those in favour of corporate liability, is that firms are able to implement internal control mechanisms, which allow them to deter employees from committing crime more efficiently than the government.

This paper seeks to contribute to the existing literature by introducing two innovations into the analytical framework. By utilising this new framework, we provide new insights into the optimal allocation of punishment for corporate crimes. First, we allow the firm in the model to be able to implement an internal crime prevention measure. We do this to examine the claim in the legal literature that punishing the firm is preferable due to their ability to internally deter crime. To our knowledge, no prior work has modeled how the firm's internal control system may affect optimal allocation of punishment between the employee and the firm. Second, in contrast to the existing economic literature, we assume the firm *cannot* contract freely, through the mechanism of the employment contract, with the employee. Thus the firm cannot transfer punishment to the employee. We believe this to be a more realistic assumption, since there are often legal restrictions on the employment contracts the employer can offer.

This paper presents a theoretical model of punishment comparing social welfare outcomes when the government implements different punishment strategies — 1) the firm alone is punished, 2) the employee alone is punished and 3) both the firm and employee are punished. The employee can choose whether or not to commit a crime and the firm can choose whether or not to implement internal crime prevention measures. Consistent with the literature, we assume there are constraints on the size of the fines that can be imposed on both the firm and the employee, however the constraint on the firm is non-binding. We also make the assumption that the commission of certain crimes have a net beneficial effect on society ("optimal crimes"). For example, there is literature which discusses how crimes such as bribery and collusion may actually increase firm efficiency and benefit consumers. As the government aims to maximise social utility, they seek to deter "sub-optimal crime" only (where the harm exceeds the gains).

These two assumptions reflect the key trade-offs inherent for different punishment strategies in the model. The firm has more assets than the employee and hence can be deterred to a greater extent. However due to information asymmetry, the firm is not able to distinguish between optimal and sub-optimal crime. Thus they are unable to implement their internal control mechanism to deter employees from

committing only sub-optimal crime and will deter both sub-optimal and optimal crime, resulting in over-deterrence. Conversely, the employee does not suffer from information asymmetry and can distinguish between the two categories of crimes. Therefore they can be deterred by the government from committing sub-optimal crimes only. However, they also have less assets making them less susceptible to deterrence, resulting in potential under-deterrence.

The purpose of this paper is to examine which punishment strategy maximises social welfare and under what conditions. The key result of the model is that the optimal allocation of punishment in this model depends on the maximum employee fine- if the maximum employee fine is sufficiently large then it is optimal for only the employee to be punished, if it is small then it is optimal for only the firm to be punished. Unless the first best can occur, punishing the employee results in under-deterrence, due to asset insufficiency. As the maximum employee fine decreases, the deterrent effect of punishing the employee decreases and the disutility from under-deterrence increases. When the maximum employee fine is sufficiently small, the disutility from under-deterrence will be greater than the disutility associated with the over-deterrence when the firm is punished. In this case it will social utility maximising to punish the firm instead of the employee. This result is largely driven by the trade-off between efficiency of punishment and the deterrent effect of punishment. Punishing the employee is more efficient since they can identify suboptimal crime, however they are also wealth constrained so are less affected by the deterrent effects of punishment.

We find the results from our model are qualitatively different from the optimal allocation of punishment suggested in the existing literature , for example Polinsky and Shavell (1993); Shavell (1997) and Garoupa (2000). In our set-up, we find that the government is *not* indifferent between punishing the employee and the firm. We also show there is no situation where it is optimal for the government to punish both parties, since punishing the firm results in all crime being deterred through the internal control system.

The results of the model have meaningful policy implications regarding the future developments of the corporate liability regime and also empirical implications. First, the model provides support for increasing the scope of corporate liability in the law, to ensure that the government is able to punish the firm in circumstances where punishing the firm is preferable. This result is consistent with the past policy decisions in Australia to implement law reform to expand the legal basis for corporate liability. Second, the findings suggest that the statutory limit on fine sizes for corporate crimes should be raised to increase the deterrence effect of sanctions,

whilst minimising the cost of enforcement. This applies for fines for both employee and the firm. There are also testable empirical implications which arise from the findings. If punishing the employee is preferable when the maximum employee fine is sufficiently large, then this would suggest we should find that jurisdictions with larger maximum employee fines would punish employees more frequently than firms. Conversely, jurisdictions with smaller maximum employee fines should be found to punish employees less frequently.

The structure of the rest of the paper is as follows. Chapter 2 provides an introduction to the Australian corporate law regime and the jurisprudence in so far as it examines the differences between corporate and individual liability. Chapter 3 reviews the existing economic literature on the punishment of corporate crimes. Chapter 4 presents a model of punishment, and the socially optimal punishment strategies. Chapter 5 provides a discussion of the policy implications of the results. Chapter 6 discusses the limitations of the model and potential areas for future work. Chapter 7 concludes.

CHAPTER 2

Legal Background

The question of who should be punished for a corporate crime should be understood within its legal context, since the features of the legal system will guide the modeling approach. Within the legal literature, there has been much debate regarding punishment of corporate crime, specifically comparing the merits of corporate liability to individual liability. This debate parallels the discussion in the economic literature about the optimal allocation of punishment and introduces some theoretical trade-offs associated with each form of punishment.

In this chapter, first we define the term "corporate crime" as it is used in this paper. In the second section, we define what is a corporation and discuss what types of corporation are considered in the paper. In the third section, we provide an introduction to the legal basis for which both the employee and the firm can be punished for a corporate crime in Australia. Lastly we summarise the legal discussion on the topic of punishment allocation to provide context to the trade-offs discussed in the economic literature in the subsequent chapter.

2.1 CORPORATE CRIME

Grabosky and Braithwaite (1987) define corporate crime as "crime committed within the course of one's occupation by persons of relatively high social status". The victims of corporate crimes are often members of the public, the government, creditors, investors, the environment and corporate competitors. The beneficiaries of crime are usually the corporation itself. Grabosky and Braithwaite make a distinction between white-collar crime and corporate crime. In the former, the beneficiary of the crime is usually the individual *not* the corporation and the corporation is commonly the victim. For example, an employee embezzling funds from an employer would commonly be classified as a white-collar crime but not a corporate crime. In contrast, corporate tax evasion would be classified as a corporate crime. The distinction is not always precise nor is it universally accepted¹. However

¹For example, the term "white collar crime" was originally defined by Edwin Sutherland in a

for the purpose of this thesis we will adopt Grabosky and Braithwaite's definition and restrict our analysis to crimes where the corporation benefits from the commission of the crime, rather than being the victim.

2.2 WHAT IS A CORPORATION?

A corporation is defined as such by s 57A of the *Corporations Act 2001* (Cth) if it is registered as a company with the Australian Securities and Investment Commission (ASIC). When an entity is registered as a corporation this has significant legal consequences. First and foremost, the corporation becomes a separate "legal person" and is invested with the legal capacity and powers of an individual. This means that the corporation has a legal identity distinct from that of its managers, owners and employees. A corporation can own assets in its own name, enter into contractual agreements, sue and be sued. A natural consequence of a corporation's status as a legal person, is legal liability. If a corporation has the rights of a person, it must also bear the duties and responsibilities of a person. This includes the responsibility to be held accountable for any wrongdoing. Thus this is the theoretical basis for corporate liability.

2.2.1 TYPES OF CORPORATIONS

Different types of crimes are associated with different types of corporation. Corporations can be largely divided into two main types: 1) owner-managers firms (usually smaller in size) and 2) publicly-held firms (usually larger in size).

In owner-manager firms, the owners of the corporation are closely involved with the management of the corporation. These firms also tend to be smaller in size and most of the employees and/or managers of the firms have interests closely tied to the long-term profitability of the firm. For example, a small business where most of the employees are owner-managers of the business and hold significant amounts of equity. In these firms, the individual offender is more likely to be motivated by the firm's benefit and does not receive any direct private benefit from the commission from the crime separate from the firm's benefit. An owner-manager may commit a crime to increase the firm's profit and hence increase the value of their share of the firm's profits. In these type of corporations there is limited incentive incompatibility issues since the employee of the firm is likely to have a meaningful claim on the

speech in 1939 as "a crime committed by a person of respectability and high social status in the course of his occupation" and no such distinction between corporate crime and white collar crime is acknowledged.

firm, thus a conflict of interest is less likely to arise. As a result, the principal agent problem is less relevant in this context.

In publicly-held firms, the owners and managers (and employees) of the corporation are more likely to be separate people. As such there is an increased possibility that the employees may be influenced by their personal interests, rather than acting solely in the best interest of the firm. As such, publicly-held firms are likely to be more affected by the agency problem. Crimes committed by individuals in publicly-held firms may be motivated by the individual's private benefit. For example, an employee commits a crime to improve their performance at work which benefits them privately through a bonus or a promotion but also benefits the firm, through increased profits.

In this paper, we will be focusing more on the prevention of corporate crime in the latter category, that is, crimes involving publicly-held firms, where the offending employee is motivated by personal benefit.

2.3 TYPES OF LIABILITY

When a corporate crime is committed, there are two parties which may be legally liable for the commission of the crime: a) the employee/s who committed the act which constitutes the crime and/or b) the corporation. The important thing to note is that, when a corporate crime is committed, the individual responsible for committing the crime is usually always liable for the offence. However, the corporation may only be liable in certain circumstances.

2.3.1 LIABILITY OF THE EMPLOYEE

A corporation is an abstract entity. As such is not able to, in a literal sense, physically commit crime or possess the requisite state of mind which constitutes part of the crime. Therefore, an employee of the corporation, who is a natural person (human being) will usually be involved in committing the wrongdoing. Hence, the employee's liability for a corporate crime comes as a direct result of their actions.

2.3.2 CORPORATE LIABILITY

The source of corporate liability is more complex. A corporation can be held liable for a crime committed by their employees in the following ways: a) vicarious liability, b) identification doctrine and c) statutory-based liability.

Vicarious Liability

An employer is vicariously liable for the criminal actions of their employee if the law holds the employee criminally responsible for the acts of the employee, which were committed within the scope of their employment. In Australia, employers can only be found vicariously liable for criminal offences if specified by the legislation governing the offence. Vicarious liability does not apply for most corporate crimes.

Identification Doctrine

A corporation can also be found liable for an offence if the employee who took the criminal action is identified as the "directing mind and will" of corporation (*Tesco Supermarket Ltd v. Nattrass* [1971] UKHL 1). The actions and mental state of that individual are attributed to the corporation. As such, the identification doctrine is only likely to apply, if the employee in question is member of the board of directors, the managing director or another person to whom a function of the board has been fully delegated. Other employees, for example, a middle manager, have been deemed not sufficiently senior to trigger to the identification doctrine.

Statutory-based Liability

For statutory offences, the statute itself will specifically define the circumstances where the corporation is liable. For example, the *Criminal Code Act 1995* (Cth) which applies to all Commonwealth criminal offences (but not state offences), holds the corporation liable if the employee acted within the scope of their authority (s 12.2) and the corporation authorised or permitted the commission of the offence (s 12.3(3)) or the corporate culture encouraged, tolerated or led to the wrongdoing (s 12.3(c)(d)). Majority of corporate crime offences, for example, insider trading, market manipulation and failure to disclose information are Commonwealth offences. Thus they are covered by the *Criminal Code Act 1995* (Cth).

2.4 THEORY OF CORPORATE CRIME ENFORCEMENT

Within legal scholarship, there is much debate surrounding the optimal allocation of individual and corporate liability for corporate crime. The discussion can be broadly divided into two main schools of thought- individualism and enterprise liability theorist, which is summarised in Fisse and Braithwaite (1993).

Those advocating for individualism argue that individual liability is a preferable tool of corporate crime enforcement compared to corporate liability. On a practical level, individualists argue that punishing the corporations may be ineffective since there is no guarantee that convicted corporations will implement internal accountability measures in order to deter future wrongdoing. Hence individual liability is a more direct and certain form of punishment, which guarantees that individuals are not able to hide behind the corporate form to avoid punishment (Fisse and Braithwaite, 1988). Commentators have noted that individual liability is likely to enhance accountability and performance standards (Hawke, 2000). Additionally there has been suggestions of a spillover effect when punishing the corporation, since monetary penalties have the potential to be shifted by the corporations onto third parties, for example, shareholders, employees or consumers and hence reducing their deterrent effect (Chesterman, 1993). On a philosophical level, individualist posit that corporate blameworthiness is a fiction since the corporation is not a natural person and retributive theories of punishment do not extend to corporate entities (Cressey, 1989; Lederman, 1985).

In response to this reasoning, Fisse and Braithwaite (1993) argues that individualists underestimate the difficulty of successfully prosecuting and identifying the specific individual/s responsible for committing the crime. They also suggest that individualists underestimate the ability of corporations to indemnify the punished individual or other measures corporations can take to protect employees from punishment. Further, they counter the suggestion that notions of fault can only apply to human beings who are capable of making moral decisions. Fisse and Braithwaite argue that corporate policy, strategy and culture can form the basis for corporate intention and decision-making and hence corporations should not be able to escape blame for their decisions.

In contrast, enterprise liability theorists posit that corporate criminal liability is the most efficient means to deter crime and as a result, the sources of corporate liability (i.e. vicarious corporate liability, identification doctrine and statutory-based liability) should be expanded and broadened. The key claim is that optimal monetary penalties imposed on the corporation will induce the corporation to implement internal controls, which will be a more effective mechanism to deter crime than punishing the employee directly. Kraakman (1984) argues individual liability is more costly than corporate liability since individual employees of firms are more risk averse compared to the shareholders of the corporation who enjoy diversified risk and hence will seek a high level of indemnity from the corporation. However, he acknowledges that individual liability may be relied upon in specific circumstances where enterprise liability was insufficient. Other arguments in support

of enterprise liability include: it is typically less costly and easier to identify and punish a corporation rather than an individual (Elzinga and Breit, Elzinga and Breit; Stone, 1980) and that fault for corporate crime is usually diffuse throughout the corporations (Stone, 1980).

Fisse and Braithwaite respond to these claims by emphasising the role of responsibility and accountability as a mechanism for social control, which is lost when only the corporation is punished. Moreover it is suggested that enterprise liability relies on unrealistic and artificial agency theory of the firm, whereby the firm is a legal fiction which serves as a nexus of contracts among individuals, such as the employees, managers and owners of the firm (Jensen and Meckling, 1976). Fisse and Braithwaite argue that there are often power imbalances between the corporation and the individuals, hence the reliance on the corporation to implement a fair and efficient internal control system may be naive.

There are also many commentators who suggest the appropriate approach is to find a mix between individual liability and corporate liability which allows the legal system to allocate responsibility and accountability fairly between the guilty individual and the guilty corporate responsible for defective corporate governance (Fisse and Braithwaite, 1993). This will allow the legal system to take advantage of the possibilities offered by the firm's internal control mechanisms whilst maintaining a focus on individual accountability.

Whilst this is a very rich area of debate and there are numerous arguments on either side, this paper will be specifically focusing on exploring the claim that corporate criminal liability is preferred to individual liability because the corporation's internal control mechanisms is a more efficient method of deterrence.

CHAPTER 3

Literature Review

The question of optimal allocation of punishment of corporate crime has been considered in various works in the existing literature. Kornhauser (1982) considers the allocation of liability for corporate accidents and finds that there is no difference between punishing the firm or the employee if there are no wealth constraints (hence no constraints on the fine) and the firm can contract freely with the employee. The reasoning is that when the firm is punished, they are able to transfer this punishment to the employee, through the employment contract. This result is supported by various later papers (Mullin and Snyder, 2009; Polinsky and Shavell, 1993; Segerson and Tietenberg, 1992; Sykes, 1984). This result was also found to hold in the case of intentional corporate crime (Arlen, 2012). Although our paper examines the same issue as some of the existing literature in this field, in our model we examine the case where firms are *not* able to freely contract with their employees. Thus firms cannot internally punish employees for their malfeasance.

Kornhauser (1982) also considers the case where the employee's assets are constrained, necessarily limiting the size of the employee fine. He argues that the effectiveness of employee punishment compared to firm punishment in this situation depends on the firm's ability to punish to the employee, through the employment contract. Extending upon Kornhauser (1982), Polinsky and Shavell (1993) and Shavell (1997) considers a situation where the maximum punishment the firm can impose on the employee is *less* than that of the government. In this case, they find that the firm may not be able to induce employees to take the optimal level of care and hence punishing the firm solely could lead to under-deterrence and so both the employee and firm should be punished. Arlen (2012) find similar results. Shavell (1997) considers the same situation, with the additional assumption that firms can offer their employees "supernormal wages". In contrast to other works, he finds that the optimal sanctions on the firm could be above or below the amount of harm to society, since the firm's attempt to deter the employee may actually result in additional costs to society. This paper is influenced by the discussion of the effect of wealth constraints on optimal punishment strategies and makes a similar assumption

to Arlen (2012) that individual employees are more wealth constrained than the firm. The discussion in Polinsky and Shavell (1993) and Shavell (1997) regarding the maximum punishment the firm can impose on the employee compared to the government punishment is not relevant in our paper, as we do not assume the firm is able to punish the employee.

The firm's internal control mechanisms and its effect on corporate crime punishment has been considered by some previous works. Arlen (1994); Chu and Qian (1995) and Arlen and Kraakman (1997) explore which liability standard is optimal when firms can implement internal monitoring systems which increase the likelihood of uncovering the employee's wrongdoing. They find that the strict vicarious liability (where the corporation is automatically liable for the acts of their employee, regardless of any measures that the firm may have taken to prevent the crime from occurring) is not ideal since it provides perverse incentives for the firm not to implement crime deterrent mechanisms themselves, in order to protect themselves from punishment. Arlen and Kraakman (1997) posit that a duty-based vicarious liability, where the corporation is punished based on whether they have failed to satisfactorily attempt to deter criminal behaviour, is a more effective liability regime. Under duty-based liability, the government is able to incentivise corporations to optimally use their resources to deter crime. This paper also seeks to examine the effect of firm internal control systems on corporate crime punishment. However our model differs from the existing literature by assessing the firm's internal control system in the context of optimal allocation of punishment rather than optimal liability structure.

There has also been some analysis of how the liability structure for firms affects optimal punishment allocation. Mullin and Snyder (2005) consider the problem of punishing corporate crime in the context of the firm's liability structure. They find that in a scenario where the firm has limited liability, which means that the shareholders of the firm are not liable for the fines, then the government should target the employee in addition to the firm, since the firm's limited liability constrains how severely it can be punished. Conversely if the firm has unlimited liability then punishment of the employee is unnecessary. Our model does not address these concerns and presumes that the firm's wealth constraint is not binding. Hence the extent the firm can be punished is not an issue.

The effects of agent indemnification on corporate crime punishment has also been discussed in various works. Agent indemnification occurs when the firm "indemnifies" (pays for) the legal costs and/or penalties incurred by the employee as a result of wrongdoing. Kornhauser (1982) finds that if agent indemnification and

insurance is allowed then the government should be indifferent between punishing the firm or the employee since liability is transferred between the two agents. Stone (1980) and Kraakman (1984) find that the state can deter more corporate crime if it forbids agent indemnification, since indemnification indirectly induces the employee to commit crime. In contrast Mullin and Snyder (2009) argue that agent indemnification can be beneficial as it may induce risk averse employees to choose an efficient level of activity and the state can compensate for the inducement effect of indemnification by raising the fine imposed on the firm. Since agent indemnification is illegal in the Australian jurisdiction (s 199A *Corporations Act 2001* (Cth)), we do not consider its effect on punishment allocation.

CHAPTER 4

Modelling

To determine the optimal allocation of punishment for a corporate crime, we construct a model of punishment and compare the different punishment strategies (punishing the firm alone, punishing the employee alone and punishing both) to find which one maximises social welfare and under what conditions it does so.

4.1 SETUP

Consider a game with three risk neutral players: an employee of a firm, the firm and the government. Each of the three players are able to take the following actions:

Employee The employee chooses whether to attempt a crime ($\alpha = 1$) or not ($\alpha = 0$). If the employee attempts to commit a crime, the attempt is not necessarily successful. The firm cannot commit a crime.

Firm The firm chooses a level of prevention $q \in [0, 1]$ to reduce the probability of crime from being successfully committed. $1 - q$ represents the probability that the crime is successfully committed by the employee. This prevention system can be thought of as a firm's corporate governance strategy which can implement rules to reduce the opportunity for wrongdoing. For analytical simplicity, we assume the prevention mechanism is costless.

Government The government chooses a punishment regime which includes the probability of punishment and the size of the punishment $\{p_e, p_f, F_e, F_f\}$. The probability of detecting and punishing a player for the crime is given by $p_i \in [0, \bar{p}]$ for $i = e, f$. The subscript e represents the employee and f represents the firm. The government has a fixed limit of enforcement which can be implemented, such that $p_e + p_f \leq \bar{p}$. For analytical simplicity, we assume there is no cost to implementing this enforcement system. The fines which the government can impose are also limited such that $F_f \leq \bar{F}_f$ and $F_e \leq \bar{F}_e$.

Expected payoffs

The employee receives benefit G_e from committing a crime, which is privately known and $G_e \sim u[0, 1]$. Therefore the employee receives an expected payoff:

$$(1 - q)[G_e - p_e F_e] \quad \text{if } \alpha = 1 \quad (4.1)$$

$$0 \quad \text{if } \alpha = 0 \quad (4.2)$$

If a crime is committed the firm also receives a benefit G_f , which is exogenously determined. The employee will only attempt to commit the crime if the expected gain from crime is greater than the expected fine, so $p_e F_e \leq G_e \leq 1$.

Then the firm's expected payoff is given by:

$$\int_{p_e F_e}^1 [1 - q](G_f - p_f F_f) dG_e \quad (4.3)$$

The first term $(1 - q)$ represents the probability a crime is successfully committed and the second term $G_f - p_f F_f$ represents the firm's payoff when a crime is successfully committed.

H represents the harm to society caused by the crime is also a parameter of the model. Society's payoff is then as follows:

$$\int_{p_e F_e}^1 (1 - q)[G_e + G_f - H] dG_e \quad (4.4)$$

Similarly, the first term $(1 - q)$ represents the probability a crime is successfully committed and the second term $G_f + G_e - H$ represents society's payoff when a crime is successfully committed.

4.1.1 TIMING

The timing of the model is as follows:

Stage 1 The government commits to a punishment strategy, which includes who to punish and the appropriate fine/s. The chosen punishment strategy is observed by all players.

Stage 2 The firm chooses a level of prevention, which is observed by all players

Stage 3 The employee observes G_e and decides whether to attempt to commit the crime ($\alpha = 1$) or not ($\alpha = 0$)

Stage 4 If a crime is committed the government's punishment strategy is realised

4.1.2 DISCUSSION

In contrast to the existing literature, we have assumed that firms cannot contract freely with their employees. Hence the firm cannot impose their own monetary penalties on the employee for wrongdoing. Instead we assume that the firms are able to implement an internal control mechanism, in the form of a prevention system which reduces the probability that crime can be successfully committed. In reality, the firm's ability to credibly contract with its employee is limited. There are often many legal restrictions and external factors limiting the firm's ability to freely contract, for example workers union agreement, labour laws etc. Another example is that agent indemnification and insurance is also prohibited in Australia (s 199A *Corporations Act 2001* (Cth)). Moreover, termination of employment is the largest punishment the firm can impose on the employee. However, since the employee has outside options in the form of alternate employment, even this threat may not have severe deterrence effects. As such, it is more plausible that the main mechanism of firm disciplinary control over its employee is through its corporate culture and corporate governance.

Consistent with the existing literature we have also assumed that the fines are limited by an upper bound. There are two interpretations of this upper-bound. First it can reflect the statutory legal limit on the fine sizes, for example in the Australian jurisdiction, there is a maximum fine that the court can impose for specific corporate crimes. Second the upper bound can reflect the wealth constraint of the employee and the firm. It is not possible to impose a fine which is greater than the player's wealth since they will not be able to pay the fine. Therefore the upper bound of

the fine will be whichever is lower- the player's wealth constraint or the statutory maximum fine.

We have introduced information asymmetry into the model by assuming that the employee gain G_e is privately known. This is a plausible assumption since in reality the employee will gain knowledge in the course of their employment, which allows them to have more information about the potential private gains from committing a crime. The government has limited understanding of the operational aspects of the employees work. In large firms, each employee may have quite specialised roles and information sharing between employees may be limited. As such it is plausible that the firm may also face information asymmetry.

In the model it is also assumed that there is a fixed limit on the amount of enforcement which the government can choose, $p_e + p_f \leq \bar{p}$. This assumption reflects the reality that governments are faced with finite resources available for law enforcement, for example, a certain proportion of the governmental budget is allocated to spending on enforcement agencies, police and the legal system.

4.1.3 ASSUMPTIONS

We also impose the following additional assumptions:

Assumption 1:

For the model, we assume that $G_f + \frac{1}{2} - H < 0 < G_f + 1 - H$.

Since G_e is uniformly distributed between zero and one, expected value of G_e is $\frac{1}{2}$ and $G_f + \frac{1}{2} - H$ represents the expected net utility of crime to society. We assume the expected utility of crime to be negative to ensure the government will prefer over-deterrence, (social utility will be equal to zero), rather than no deterrence (social utility will just be the net expected utility). We make this assumption to ensure that the government always prefers to punish the firm, which will result in over-deterrence rather than punish no-one. Hence there is no equilibrium where neither the firm nor employee is punished.

The right-hand term implies that when $G_e = 1$, the net effect of crime is positive. Therefore, the commission of certain crimes will actually be beneficial to society and the government will not want to deter *all* crime, only crime which is sub-optimal and net harmful to society. Examples of possible crimes which could have net beneficial effects on society include corruption/bribery and collusion. Corruption and bribery on behalf of the firm may benefit society in certain circumstances since it can improve efficiency through reduction in

bureaucratic costs and faster service delivery (Huntington, 2006; Lien, 1990; Lui, 1985) . Collusion between firms may also be beneficial to society as consumers enjoy price stability and in industries with high R&D costs, firms may reinvest the super-normal profits generated from collusion into R&D. Collusion may also prevent competitive firms from employing social surplus reducing tactics. Through cooperation firms can avoid the prisoners dilemma scenario and hence increase social surplus.

Assumption 2:

To ensure that punishing the firm occurs in equilibrium, we make an assumption that $G_f \leq \bar{p}\bar{F}_f$. The firm will not implement a prevention system unless $G_f \leq p_f F_f$. Therefore if $G_f > \bar{p}\bar{F}_f$, the firm is always better off not implementing a prevention system, such that $q = 0$, since their gain from crime is greater than the maximum possible expected punishment. In this case there is no benefit to punishing the firm since they will never implement a prevention system. Thus if $G_f > \bar{p}\bar{F}_f$ then the firm will never be punished in equilibrium.

Implicit in this assumption is that either the maximum firm punishment is high or the gains to the firm are small (this is unlikely since historically in corporate crime cases there have been very high gains to the firm). The assumption that \bar{F}_f is high is reasonable since in Australia and other jurisdictions, the maximum fine for a corporation is far larger than the maximum fine for an individual for the same offence. Alternatively, firms in general have more resources than an individual, so this would also result in a higher maximum firm fine.

Assumption 3 :

We assume that if the same outcome can be achieved by multiple values of p_e and/or p_f , the government will always choose the lowest p_i , where possible. We make this assumption, on the basis that the government will choose the p_i that is easiest to achieve. In the baseline model we assume the enforcement system is costless. However in section 4.4 we consider the case when enforcement is costly. If the system were not costless this assumption holds since the government would also choose the lowest p_i . Costs of enforcement could potentially include expenditure on law enforcement resources and the judicial system.

4.2 ANALYSIS OF THE MODEL

The solution to the model is a Subgame Perfect Nash Equilibrium (SPNE) that is characterised by a sequence of probabilities of punishments, fines and prevention effort.

$$\{F_i^*, p_i^*, q^*\} \quad (4.5)$$

In the equilibrium, all players make decisions based on the anticipated sequence of probabilities, fines and prevention levels. The anticipated sequence is accurately realised in equilibrium. The model in each punishment strategy is solved through backward induction. For clarity I reiterate the notation:

- $G_i =$ Gains to player i from crime
- $H =$ Harm from crime
- $F_i =$ Fine imposed on player i
- $p_i =$ Probability state punishes player i
- $q =$ Probability firm prevents commission of the crime

All players seek to maximise their own utility, with the government seeking to maximise social utility. As such, as mentioned above, the employee will only attempt to commit the crime if $G_e \geq p_e F_e$ and the firm will only implement a prevention scheme if their utility is maximised by doing so.

Therefore the firm will choose the following prevention levels:

$$q \in \max_q \int_{p_e F_e}^1 [1 - q](G_f - p_f F_f) dG_e \quad \text{where } q \leq 1 \quad (4.6)$$

Therefore

$$q = \begin{cases} 1, & \text{if } G_f \leq p_f F_f \\ 0, & \text{if } G_f > p_f F_f \end{cases} \quad (4.7)$$

Anticipating the actions of the employee and the firm, the government solves the following maximisation problem:

$$\begin{aligned}
& \max_{F_e, F_f, p_e, p_f, q} \int_{p_e F_e}^1 [1 - q](G_f + G_e - H)d(G_e) & (4.8) \\
& \text{subject to} \\
& p_e + p_f \leq \bar{p} \\
& F_e \leq \bar{F}_e \\
& F_f \leq \bar{F}_f \\
& q \in \max_q \int_{p_e F_e}^1 [1 - q](G_f - p_f F_f)dG_e \quad \text{where } q \leq 1
\end{aligned}$$

4.3 RESULTS

Lemma 1: *The government will always set the fine of either player equal to the maximum possible fine, $F_e^* = \bar{F}_e$ and $F_f^* = \bar{F}_f$.*

Intuitively, the probability of punishment p_i and the fine F_i are deterrent substitutes. For risk neutral agents, the relevant deterrent device is the expected fine $p_i F_i$. If we increase F_i , we can decrease p_i and achieve the same expected fine and hence the same level of deterrence. The government prefers the lowest possible p_i . This can be achieved by imposing the maximum fine on the player, $F_i = \bar{F}_i$ so that optimal deterrence can be achieved at the lowest probability possible. This concept has been discussed in depth in the existing economic literature on crime (Becker, 1968).

Proof: See Appendix A

Lemma 2: *In equilibrium, the government will either punish the firm or the employee, it will never punish both.*

If the firm is punished, they will implement the prevention system which will prevent all crime from occurring (4.7). As such, punishing the employee has no effect on social utility since all wrongdoing is already deterred by the internal prevention system. Therefore when the firm is punished, the punishment of the employee becomes irrelevant and p_e can take on any value as long as $p_e \leq \bar{p} - p_f^*$. Since the government always prefer to choose the lowest possible p_i , $p_e^* = 0$. Thus when $p_f^* > 0$ then $p_e^* = 0$. There will never be a situation where both players are punished. Note

that this result contrasts to the findings in Garoupa (2000); Polinsky and Shavell (1993); Shavell (1997) and Segerson and Tietenberg (1992), where it was optimal for both players to be fined when the employee was wealth-constrained. Our results differ because the inclusion of the firm's internal prevention system, which allows the firm to deter all crime, renders employee punishment redundant.

Proof: See Appendix A

4.3.1 FIRST BEST

We first examine the first best outcome when the employee can be induced to only ever commit a crime when it is optimal to do so for society, hence maximising total social utility.

Proposition 1: *If $\bar{F}_e \geq \frac{H-G_f}{\bar{p}}$ then only the employee is punished and the first best is achieved.*

If $\bar{F}_e \geq \frac{H-G_f}{\bar{p}}$ then the expected fine for the employee will be $p_e^*F_e^* = H - G_f$. In this scenario, the non-private effects of the crime ($G_f - H$) are fully endogenised within the employee's payoff function through the expected fine. The employee's payoff function is now $G_f + G_e - H$, which is identical to society's payoff function (4.4). As such, since the employee's benefit from the crime G_e is privately known by the employee ex ante the commission of the crime, the employee will now only attempt to commit the crime if it is socially optimal to do so. There will be no need to punish the firm since punishing the employee alone already achieves a socially optimal result. From Lemma 2 we know that if the firm is punished, then they will choose $q = 1$ and all crime is deterred, which is sub-optimal (see Assumption 1).

Proof:

Case 1: When only the employee is punished, the social utility is as follows:

$$U_e = \int_{p_e F_e}^1 (G_f + G_e - H) dG_e$$

From first order conditions, the optimal punishment for the employee is:

$$F_e^* = \frac{H - G_f}{p_e}$$

$$p_e^* = \frac{H - G_f}{F_e}$$

Therefore the optimal expected fine is

$$p_e^* F_e^* = H - G_f$$

Note the second derivative of the objective function is negative with respect to F_e, p_e so the solution to the government's problem is a maximum.

Substituting $p_e^* F_e^* = H - G_f$, we find

$$U_e = \int_{H-G_f}^1 (G_f + G_e - H) dG_e$$

$$= \frac{[H - G_f]^2 - 2H + 2G_f + 1}{2}$$

Case 2: When punishing the firm only the social utility is as follows:

$$U_f = \int_0^1 (1 - q)(G_f + G_e - H) dG_e$$

As proven in Lemma 2, the optimal expected fine for the firm when $p_f^* > 0$ is $p_f^* \bar{F}_f = G_f$. When $p_f^* \bar{F}_f = G_f$ then $q = 1$. Substituting $q = 1$, we find

$$U_f = \int_0^1 (1 - 1)(G_f + G_e - H) dG_e$$

$$= 0$$

Thus if U_e is positive then $U_e > U_f$ and social utility is maximised by punishing the employee only.

Let $U_e = 0$

$$\begin{aligned}
0 &= \frac{[H - G_f]^2 - 2H + 2G_f + 1}{2} \\
H &= G_f + 1
\end{aligned}$$

Since $\frac{[H - G_f]^2 - 2H + 2G_f + 1}{2}$ is a convex function with a single real root at $H = G_f + 1$, $U_e > 0$ for all values of H and G_f except $H = G_f + 1$. However from Assumption 1, we know $G_f + 1 - H > 0$ therefore $H \neq G_f + 1$.

Therefore $U_e > U_f$ and hence the government will always punish employee if $\bar{p}\bar{F}_e \geq H - G_f$.

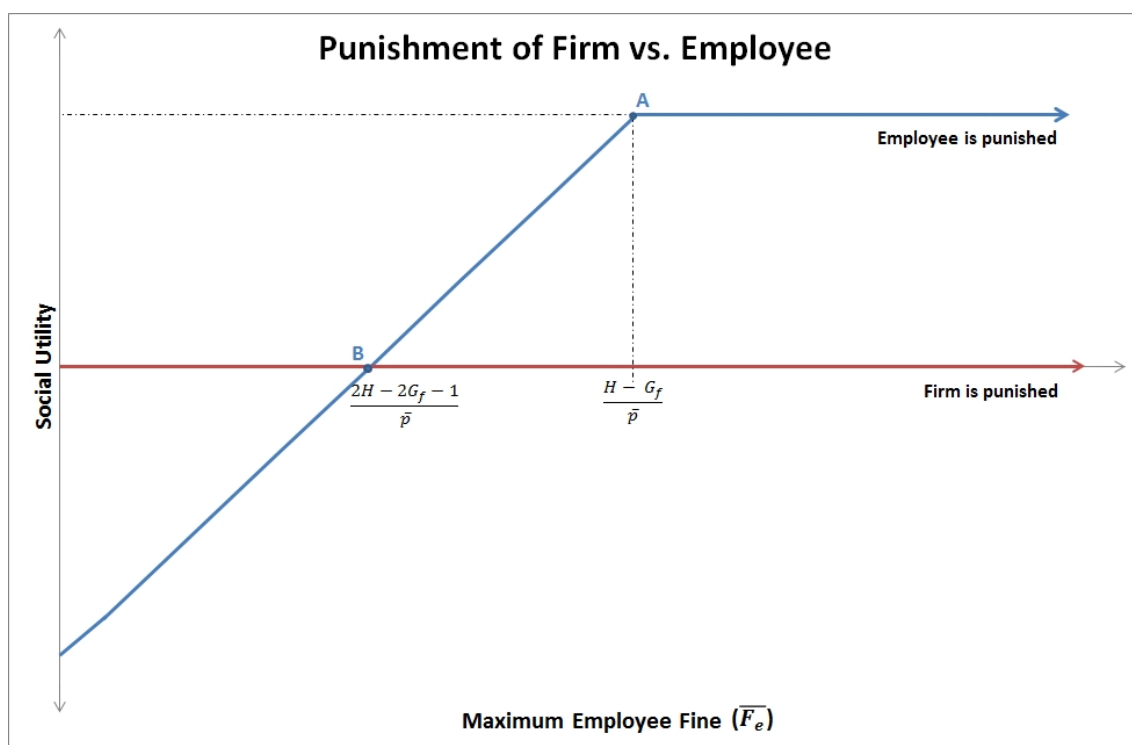
4.3.2 SECOND-BEST

We now consider the situation when the first best is not achievable. This means when the maximum employee fine is not sufficiently large, i.e. $\bar{F}_e \leq \frac{H - G_f}{\bar{p}}$. The analysis of the second best provides the key insight of this paper.

Proposition 2: *When $\bar{F}_e < \frac{H - G_f}{\bar{p}}$, the government will punish the employee if $\frac{H - G_f}{\bar{p}} > \bar{F}_e \geq \frac{2H - 2G_f - 1}{\bar{p}}$. Otherwise they will punish the firm.*

When the maximum fine that can be imposed on the employee is relatively small such that $\bar{F}_e < \frac{H - G_f}{\bar{p}}$, the government cannot induce the employee to only commit crime when it is socially optimal to do so, since the non-private effects of crime are no longer fully endogenised within the employee's payoff function. If the government persists with punishing the employee, this will be suboptimal as more crime will be committed than is socially optimal because employees are being under-punished. This is reflected in Figure 4.1, where the blue line represents the social utility from punishing the employee alone as a function of the maximum employee fine. We can see that when \bar{F}_e decreases from the point $\frac{H - G_f}{\bar{p}}$ the social utility also decreases.

Figure 4.1: Punishment of Employee vs. Firm



If the government punishes the firm it will implement prevention measures which will prevent all crime, since unlike the employee, the firm cannot be induced to only deter crime that is harmful to society. This is a result of information asymmetry. The employee gain G_e is privately known and hence neither the government or the firm can determine whether a crime is an "optimal" crime or a "sub-optimal" crime. Only the employee can distinguish between the two. Therefore, punishing the firm is also sub-optimal as beneficial crimes are also deterred. The red line in Figure 4.1 represents the social utility when only the firm is punished. We see that social utility is constant at zero, when the firm is punished, since all crime is deterred.

Therefore in this scenario, the government will need to choose between: a) punishing the employee, which will result in under-deterrence; or b) punishing the firm, which will result in over-deterrence since even crimes which have a net positive benefit to society are deterred. Both these scenarios are inferior to the first best situation where the optimal level of crime was achieved. This can be seen in Figure 4.1 where social utility is maximised at point A, when the employee is punished and $F_e = \frac{H - G_f}{\bar{p}}$.

Which of these two options is preferable will depend on the size of the maximum employee fine, \overline{F}_e . If \overline{F}_e is only slightly less than the first best situation such that $\overline{F}_e = \frac{H - G_f}{\bar{p}} - \epsilon$, then there will only be slightly more crime than is socially optimal

and as such, the social disutility from under-deterrence will be less than the social disutility from over-deterrence. Note the upward sloping social utility function with respect to maximum employee fine in Figure 4.1. As the maximum employee fine decreases, the disutility from under-deterrence decreases as more sub-optimal crimes are committed. Therefore it is only optimal to punish the firm when the maximum employee fine is sufficiently low such that the disutility from over-deterrence is less than the disutility from under-deterrence. Graphically, we see that at point B in Figure 4.1, the utility from punishing employee is identical to the utility from punishing the firm. If the maximum employee fine is less than the threshold value at point B, than utility is higher when the firm is punished.

Proof: Let $\bar{F}_e = \frac{H-G_f-\theta}{\bar{p}}$.

Then the social utility from punishing the employee only is

$$\begin{aligned} U_e &= \int_{H-G_f+\theta}^1 (G_f + G_e - H) dG_e \\ &= G_f + \frac{1}{2} - H - G_f H + \frac{1}{2} G_f^2 + \frac{1}{2} H^2 - \frac{\theta^2}{2} \end{aligned}$$

The social utility from punishing the firm only is

$$\begin{aligned} U_f &= \int_0^1 (1-q)(G_f + G_e - H) dG_e \\ &= 0 \end{aligned}$$

The government will continue to punish the employee up to the point where $U_e \geq U_f$:

$$\begin{aligned} G_f + \frac{1}{2} - H - G_f H + \frac{1}{2} G_f^2 + \frac{1}{2} H^2 - \frac{\theta^2}{2} &\geq 0 \\ 2G_f + 1 - 2H - 2G_f H + G_f^2 + H^2 - \theta^2 &\geq 0 \\ (H - G_f)^2 + 2G_f - 2H + 1 - \theta^2 &\geq 0 \end{aligned}$$

Let $U_e = 0$

$$(H - G_f)^2 + 2G_f - 2H + 1 - \theta^2 = 0$$

$$\theta = \begin{cases} H - G_f - 1, & < 0 \\ G_f + 1 - H, & > 0 \end{cases}$$

Since $\theta > 0$ by definition, therefore $U_e \geq 0$ when $\theta \geq G_f + 1 - H$.

Substitute $\theta \geq G_f + 1 - H$:

$$\overline{F}_e \geq \frac{2H - 2G_f - 1}{\bar{p}}$$

If $\overline{F}_e \geq \frac{2H - 2G_f - 1}{\bar{p}}$ then $U_e \geq U_f$.

4.4 INTRODUCING GOVERNMENT ENFORCEMENT COSTS

When we relax the assumption that the government's enforcement system is costless, we see that this does not significantly alter the results. We find that the first best can still theoretically be achieved, although is more unlikely to occur than in the baseline model. The key result that the optimal allocation of liability will depend on the size of the maximum employee, such that if the maximum employee fine is sufficiently high then the employee will be punished and if it is below some threshold then the firm will be fined, remains robust.

Using a convex cost function, the government's new maximisation problem is:

$$\max_{F_e, F_m, p_e, p_f, q} \int_{p_e F_e}^1 [1 - q](G_f + G_e - H)d(G_e) - (p_e^2 + p_f^2) \quad (4.9)$$

subject to

$$p_e \leq 1$$

$$p_f \leq 1$$

$$F_e \leq \overline{F}_e$$

$$F_f \leq \overline{F}_f$$

$$q \in \max_q \int_{p_e F_e}^1 [1 - q](G_f - p_f F_f)dG_e \quad \text{where } q \leq 1$$

Proposition 3: *The first best result from the baseline model where the employee is induced to only commit optimal crimes can now only be achieved when $F_e \rightarrow \infty$.*

Since enforcement is now costly, there is a trade-off between the benefit of reducing suboptimal criminal activity and the cost of implementing the enforcement system. In the base model there is no cost to enforcement. There is no trade-off so the first best result is for the government to deter *all* sub-optimal criminal activity, $G_f + G_e - H < 0$. However, when enforcement is costly, it will only be optimal to deter all sub-optimal crime when $\bar{F}_e \rightarrow \infty$, hence $p_e \rightarrow 0$ and enforcement costs is zero. This replicates the scenario when we assumed enforcement was costless. Otherwise, the first best cannot be achieved and the employee cannot be induced to only commit optimal crimes. As such in this case, the first best is less likely to occur compared to the baseline case, where the first best result could be achieved when $\bar{F}_e \geq \frac{H-G_f}{\bar{p}}$.

Proof: See Appendix A

Proposition 4: *The government will punish the employee only if $G_f + \frac{1}{2} - H + \frac{\frac{1}{2} \bar{F}_e^2 (H-G_f)^2}{\bar{F}_e^2 + 2} \geq -\frac{G_f^2}{F_f}$*

The left-hand term represents the social utility when punishing the employee and the right-hand term represents the social utility when punishing the firm. Compared to the base model, the utility when punishing the firm is now negative due to the enforcement costs. $G_f + \frac{1}{2} - H + \frac{\frac{1}{2} \bar{F}_e^2 (H-G_f)^2}{\bar{F}_e^2 + 2}$ is monotonically increasing with respect to \bar{F}_e . Therefore we see that as with the base model, if \bar{F}_e is sufficiently low, such that $G_f + \frac{1}{2} - H + \frac{\frac{1}{2} \bar{F}_e^2 (H-G_f)^2}{\bar{F}_e^2 + 2} \geq -\frac{G_f^2}{F_f}$, the government will prefer over-deterrence by punishing the firm rather than under-deterrence by punishing the employee.

Proof: See Appendix A

CHAPTER 5

Discussion

5.1 INDIVIDUAL V CORPORATE LIABILITY

As mentioned in Chapter 2, a key argument of those advocating for corporate liability is that punishing the firm results in a more efficient way of deterring crime through their internal control system (Kraakman, 1984). Re-evaluating this claim using our model, we show that this may not always be the case where there exists a distinction between crimes which have a positive net effect on social utility and those which do not. When socially beneficial crime exists, the internal control system is inefficient due to its inability to distinguish between the two types of crime. This is a result of the information asymmetry between the employee, the government and the firm- the employee benefit is privately known.

Our result is dependent on our assumption that there exists some crimes which yield a net benefit to society and there is information asymmetry. If we make the contrary assumption that all crimes is harmful to society, then we will not have a situation where the firm's internal control system is inefficient due to over-deterrence. In such a scenario the government will be indifferent between punishing the firm or the employee, assuming that $p_e F_e = H - G_f$. If $\bar{F}_e < \frac{H - G_f}{\bar{p}}$, punishing the employee would result in under-deterrence and the first best could be achieved by punishing the firm instead.

Similarly if information asymmetry did not exist and the government could observe the employee's gain G_e before the crime is committed and the punishment strategy is determined, then the first best could be achieved by punishing the firm. Since the government can now also identify whether crimes are socially beneficial or not, they would punish the firm only when the crime is socially harmful. Thus the firm's internal prevention mechanism would only be triggered by the government when it is optimal to do so. However, it is highly unlikely that the government has perfect information regarding employee gain, as such this is an unrealistic scenario.

5.2 POLICY IMPLICATIONS

The optimal way to punish corporate crime is an important public policy issue. The results of this model can provide some insight into how law reform in this area should be conducted. We can also examine recommendations put forward in the literature regarding law reform and assess their suitability.

5.2.1 REFORM OF CORPORATE LIABILITY REGIME

With the high-profile nature of corporate crimes in the past few decades, there has been much discussion about how to reform our existing liability regime for punishing corporate crime. As noted by Hill (2003), there has been a paradigm shift in the punishment of corporations in Australia in the past few decades. The introduction of the *Criminal Code 1995* (Cth) has broadened the scope of corporate liability significantly and made it easier to attribute fault to the corporations. Key changes include s 12.2 which imposes vicarious liability upon the corporation for any acts committed by any employee within the scope of employment. Section 12.3(1) also extends corporate liability to situations where the corporation has "expressly, tacitly or impliedly authorised or permitted the commission of the offence". Prior to these reforms, the scope of corporate liability was more restricted, with corporations only liable for corporate wrongdoing in very few circumstances. A report by the Standing Committee of Attorneys-General from Federal, State and Territory Governments (1993) has described the new expanded liability as a "much more realistic net of responsibility over corporations".

This movement in Australia towards a wider scope of corporate liability is supported by the findings of the model. Although, the results highlight the inefficiencies associated with punishing the firm, we still find that corporate liability is the optimal punishment choice in circumstances where the maximum employee fine is sufficiently low. As such, the expanded basis of corporate liability is useful to ensure that the option to punish the firm is available in these circumstances when punishing the employee is no longer the optimal choice. However, as noted by Fisse (1991), a negative consequence of this may be that prosecutors are more likely to choose to punish the corporation due to the increased ease with which corporations can be found liable, under the new reforms. Whilst this is concerning, it can potentially be remedied by reframing the prosecution guidelines used by the Departments of Public Prosecution and other agencies responsible for prosecuting corporate crimes. Therefore, the ideal policy scenario implied by our results, is that we should increase the availability of corporate liability, so the firm can be punished when it is optimal

to do so, but avoid encouraging the prosecution of the corporation, when it is not optimal to do so.

5.2.2 FINE SIZES

"This is a bit of a paradise, Australia, for white collar crime"

- Greg Medcraft, ASIC Chairman, 2014¹

From Lemma 1, we see that imposing the maximum fine possible is preferable as that allows the government to set a lower probability of punishment to achieve the same level of deterrence. The maximum size of the fine is restricted by two factors: a) wealth constraint of the offender and b) the legal maximum fine imposed by statute. Whilst the government has no control over the wealth constraint of the offender, it can amend the statute to increase the legal maximum fine.

In a recent report by ASIC (2014), comparing the maximum penalties for statutory corporate crimes, Australia's legislated maximum penalties for a range of different corporate crimes were notably lower compared to other jurisdiction with relatively similar legal systems, such as the United States, the United Kingdom and Canada (see Table 5.1 and Table 5.2). This suggest that there is scope for Australia to increase the maximum fine for certain corporate crimes to bring our system in line with the international standard and potentially reduce expenditure on law enforcement. Our results suggest that having an unlimited statutory maximum fine, like in the United Kingdom, would be the most efficient method of deterrence, since then the agent's wealth constraint will be the only limit on fine size.

¹Williams, R. and Wilkins, G. "Trouble in paradise: Greg Medcraft's white collar crime comments get people hot under the collar" *Sydney Morning Herald* 25th October 2014

Table 5.1: Comparison of fines for individuals (\$AUD)

Country	Insider trading	Market manipulation	Disclosure	False statements	Fraud
Australia	Greater of \$765,000 or 3x benefit gained	Greater of \$765,000 or 3x benefit gained	\$34, 000	Greater of \$765,000 or 3x benefit gained	Greater of \$765,000 or 3x benefit gained
United States	\$5.6 million	\$5.6 million	\$5.6 million	\$5.6 million	\$5.6 million
United Kingdom	Unlimited	Unlimited	-	Unlimited	Unlimited
Canada	Greater of \$5.25 million or 3x benefit gained	\$5.25 million	\$5.25 million	\$5.25 million	-
Hong Kong	\$1.44 million	\$1.44 million	-	\$1.44 million	-

Comparing Tables 5.1 and 5.2 we can see also that the maximum fine imposed on the individual is significantly smaller compared to the corporation. A recent Australia Law Reform Commission (2002), also recommended that penalty for corporations should be five times the size of the penalty for individuals. Realistically, the difference between the maximum fine for the corporation and for the individual is to capture the discrepancy in resources between the two. However, this may mean that wealthy individuals whose wealth exceeds the statutory fine limits may not be sufficiently deterred by the current penalty regime. Also, Fisse (1991) argues that the smaller penalties for individuals may disincentivise prosecutors from prosecuting individuals, since they may prefer being able to recover larger fines. Thus in the case of the wealthy offender, the relatively small statutory fines for individual is problematic since it reduces deterrence and may also encourage prosecutors to choose to punish the corporation, when it would have been preferable, from a social utility standpoint, to punish the individual. Thus this implies that statutory maximum fine for the individual and the corporation should *both* be unlimited.

Table 5.2: Comparison of fines for corporations (\$AUD)

Country	Insider trading	Market manipulation	Disclosure	False statements	Fraud
Australia	Greater of \$7.65 million or 3x benefit gained	Greater of \$7.65 million or 3x benefit gained	\$170, 000	Greater of \$7.65 million or 3x benefit gained	Greater of \$7.65 million or 3x benefit gained
United States	\$25 million	\$25 million	\$25 million	\$25 million	\$25 million
United Kingdom	Unlimited	Unlimited	-	Unlimited	Unlimited
Canada	Greater of \$5.25 million or 3x benefit gained	\$5.25 million	\$5.25 million	\$5.25 million	-
Hong Kong	\$1.44 million	\$1.44 million	-	\$1.44 million	-

5.3 EMPIRICAL IMPLICATIONS

The results of this paper also present some testable empirical implications. We show that the government should choose to punish the employee if the maximum employee fine is sufficiently large and punish the firm if it is not sufficiently large. Assuming the wealth constraints of individuals are relatively similar in the jurisdictions which we mentioned above (Canada, the United Kingdom, the United States, Hong Kong), then jurisdictions with larger statutory fine limits for individuals would have larger maximum employee fines. Thus in countries like the United Kingdom, Canada and the United States, we would expect to see a higher proportion of individuals being prosecuted for corporate crimes compared to Australia. This is because where the maximum employee fine is higher, assuming everything else is constant, it is more likely that punishing the individual is the utility maximising choice. However, there may also be various other factors which could effect the result. For example the harm from corporate crime may be different in different jurisdictions. This would raise the threshold maximum employee fine where it is preferable to punish the employee, since the threshold value is dependent on harm (see Proposition 2).

CHAPTER 6

Limitations and future works

This paper presents a modeling framework to analyse the optimal allocation of punishment when the firm is able to implement their own internal control system. However, there are numerous other factors to consider which may affect how punishment should be optimally allocated but are too extensive to include in this paper but may provide avenues for future work. In addition there are some theoretical issues surrounding the purpose of punishment which have not been addressed within the model.

6.1 INCLUSION OF PREVENTION COSTS

The model presented in this paper assumes the implementation by the firm of an internal prevention system is costless for analytical simplicity. However, in reality there are likely costs associated with the firm improving the corporate governance structure to increase firm oversight of employees actions. For example, purchasing new software, hiring additional personnel etc. Therefore a natural extension of this work may be to model the optimal punishment allocation when prevention costs are taken into account.

We predict the results may change qualitatively when the prevention costs are included. The firm's choice of prevention effort will no longer be $q = 1$ when $p_f F_f \geq G_f$ since the marginal cost of prevention is no longer zero. As punishing the firm no longer results in all crime being deterred there may be circumstances where it is optimal to punish the firm and the employee. The government will punish at the point which the marginal benefit of punishing the employee is equivalent to the marginal benefit of punishing the firm. We predict that introducing prevention costs will result in the firm lowering their prevention effort since it is now costly. As such, we expect that the threshold for when it is optimal to only punish the firm will be much lower, since the firm is less responsive to punishment.

6.2 ALTERNATE FIRM INTERNAL CONTROL MECHANISMS

As discussed in Arlen and Kraakman (1997) there are variety of mechanisms which the firm can implement to prevent and deter crime. The mechanisms can be ex ante measures, such as the preventative measures discussed in this paper, to reduce the probability of crime from occurring, or monitoring systems which may increase the cost for employees to commit a crime. There are also ex poste measures that allow firms to assist in crime enforcement after the crime has been committed. For example, the firm may have more information about the activities within the firm and hence can co-operate with government enforcement officials to increase the probability that the offending employee is punished, hence increasing the cost of crime for the employee. These alternate ex poste measures have not been considered in this paper and may provide interesting insights when included.

6.3 CONTRACTING WITH EMPLOYEE

In our model, we argue that there are often restrictions on contracting between the firm and the employee. For this reason, we make the simplifying assumption that firms are unable to contract freely with their employee to internally punish the employee for wrongdoing. However a more realistic assumption may be to allow for limited forms of contracting, for example, the offering a high and low wage, for when the employee has not committed a crime and when they have committed a crime. Thus it may be interesting to examine how the inclusion of two firm responses to punishment- limited contracting and internal control mechanism- may affect the choice of punishment allocation.

6.4 PURPOSE OF PUNISHMENT?

The purpose of punishment within our criminal justice system is a deeply philosophical question and not one which has a clear answer. Traditionally there are three theories which have been proposed in response to the question of the justification for punishment: retribution, deterrence and rehabilitation. Other theories which have been posited include incapacitation, reparation and restoration.¹ In this past, the retributive theory of punishment, which argue that wrongdoers morally deserve to be punished proportionally for any wrong committed, dominated the discourse. However, this notion of punishment for the sake of punishment is considered

¹For more details about the various theories of punishment please see Acton and Honderich (1970).

outdated and has been criticised in modern legal scholarship (Fisse and Braithwaite, 1988). Nowadays, there is an increasing emphasis on deterrence, rehabilitation and restorative justice which focus on the practical benefits of punishment to society and hence are aligned with the utilitarian moral principles of philosopher Jeremy Bentham. In Australia, s 3A of the *Crimes (Sentencing Procedure) Act 1999* (NSW), outlines the legislative objectives of punishment which includes deterrence, incapacitation, rehabilitation, denunciation, retribution, accountability and recognition of harm done to the victim. Therefore we can see that within Australia, the purpose of punishment is to fulfill multiple purposes and there are various (and sometimes competing) factors which need to be considered when determining the appropriate punishment.

An important characteristic of the model presented in this paper, is that sole goal of the government is utility maximisation and hence the only purpose of punishment is to deter suboptimal criminal activity and maximise social utility. The other dimensions and purposes of punishment discussed above, such as deterrence, retribution etc. are not explicitly taken into account in our modelling framework. Adopting a different objective of punishment would alter the findings of the model. For example, if we choose deterrence of all crime as the objective of the government then the first best could be achieved by punishing the firm, as that would prevent the commission of all crime. Since, in reality, the purpose of punishment is extremely nuanced, we presumed a goal of utility maximisation in an attempt to best capture the utilitarian aspects of punishment. However this approach is not without its drawbacks, since other important considerations are not accounted for.

6.5 AGENCY PROBLEMS

In a modern corporation, there is often a separation between ownership and control (Berle and Means, 1932) - the senior executives and managers who manage the corporations are not usually the major shareholders. The diffusion of shareholder ownership in a modern large corporation means that owner scrutiny over the actions of the managers is weakened. There is a risk of incentive incompatibility, with the manager acting in his/her own interest which is contrary to the firm's interest to encourage or allow for criminal activity within the firm. A key reason for this separation of interest is the diverging time-frames that the manager and the corporation operate on- the manager only spends a finite period of time with the corporation and hence is primarily driven by short-term concerns, whilst the corporation can theoretically have an unlimited life-span and hence their interests are more long-term (Coffee, 1981) . For example a senior manager may condone

criminal behaviour which results in high profits (in the short-term) for his/her division, in order to secure a promotion or bonus but which may ultimately have negative ramifications for the firm in the long-term, in terms of punishments and negative publicity.

Punishing the corporation may also fail to induce the managers of the firm to implement internal control mechanisms as presumed by the model, due to spillover effects Fisse and Braithwaite (1993). When a fine is imposed on a corporation, it is likely to be borne by the shareholders, whose stock may drop in value or they may receive reduced dividends. In a situation where there is a lack of owner discipline over management of a corporation, this means that punishing the firm may not induce the managers to respond by implementing internal control mechanisms, since their interests may not be affected by the firm punishment. Coffee (1981) describes this situation aptly, noting "when the corporation catches a cold, someone else sneezes" (pg. 401).

As a result, the model presented in this paper, does not take into account any agency problems between manager and firm. We presume, that when the firm is punished, the managers responsible for making decisions on behalf of the firm, will respond accordingly with the best interests of the firm. A natural extension may be to include a fourth player, a manager, within the model and see how the existence of an agency problem between the firm and the manager may affect results.

CHAPTER 7

Conclusion

This thesis presents a new and different framework to answer the question of optimal allocation of punishment between employees and firms for corporate crime. We compare the social welfare outcomes of the different punishment strategies: 1) punishing the firm, 2) punishing the employee and 3) punishing both and find which maximises social welfare and under which conditions it does so. Our contribution to the literature lies in introducing the firm's internal control mechanism into punishment allocation analysis.

We find that the optimal allocation of punishment depends on the maximum employee fine. If the maximum fine on the employee is sufficiently large, the government should punish the employee. However, if the maximum fine is small, then the government should punish the firm. This result reflects the trade-off between the efficiency of punishment and the deterrent effect of punishment. Punishing the employee is a more efficient form of punishment since they have perfect information and can be induced to commit socially optimal crimes only. Punishing the firm has a higher deterrent effect since the firm has more assets rendering them more sanctionable. We find that the under-deterrence problem associated with the employee is dependent on the maximum employee fine and it increases as maximum employee fine decreases.

The results of this paper imply that statutory maximum fines should be increased in Australia. The findings also support the argument that we should increase the scope of corporate liability, in order to ensure the government has the ability to punish the corporation when it is optimal to do so. However it is important to find a balance in the policy such that prosecutors do not become over-incentivised to punish the corporation, even in circumstances it is not optimal to do so.

There are however, a range of other relevant issues which have not been considered in our framework but would be meaningful to do so. An analysis of different firm responses to punishment may yield different and interesting insights into the punishment allocation question. It may also be meaningful to investigate how agency

problems between the manager and the firm may influence choice of punishment strategy.

APPENDIX A

Appendix A

A.1 LEMMA 1 PROOF

Suppose there exists an equilibrium where $p_i^* F_i^* = z^*$, such that $F_i^* < \overline{F}_i$ and F_i^* represents the socially optimal fine. Since $F_i < \overline{F}_i$ then there must exist a \hat{F}_i and \hat{p}_i , such that

$$F_i^* < \hat{F}_i < \overline{F}_i$$

Then there must exist a \hat{p}_i such that

$$\hat{p}_i \hat{F}_i = z^*$$

Since $\hat{F}_i \hat{p}_i = F_i^* p_i^* = z^*$ and $\hat{F}_i > F_i^*$ therefore $\hat{p}_i < p_i^*$

The same level of deterrence is achieved in both cases ($\hat{F}_i \hat{p}_i = F_i^* p_i^* = z^*$). As per Assumption 3, the government will always choose the lowest level of p_i possible. Since $\hat{p}_i < p_i^*$, imposing fine \hat{F}_i is preferred to F_i^* . Therefore, by contradiction, the optimal fine size cannot be less than the maximum fine, $F_i^* \not< \overline{F}_i$.

A.2 LEMMA 2 PROOF

Suppose that there exists an equilibrium where $p_f^* > 0$, $p_e^* > 0$ and $p_f^* + p_e^* \leq \bar{p}$.

First we prove that when $p_f^* > 0$ the expected firm fine in equilibrium is $p_f^* \overline{F}_f = G_f$ and $q^* = 1$.

Case 1: Consider the case where $p_f^* \overline{F}_f < G_f$. From (4.7), we know that if $p_f F_f < G_f$ then $q = 0$. When $p_f = 0$ then $q = 0$ also. Therefore both $p_f = 0$ and $p_f^* \overline{F}_f < G_f$ have the same deterrent effect. The government prefers to choose

the lowest level of p_i (Assumption 3). Therefore $p_f^* \overline{F}_f \not\leq G_f$, since government will always choose $p_f = 0$ instead.

Case 2: Consider the other case where $p_f^* F_f^* > G_f$. From (4.7), we know that if $p_f F_f \geq G_f$ then $q = 1$. If $p_f F_f = G_f$ then $q = 1$ also. $p_f^* F_f^* > G_f$ and $p_f F_f = G_f$ result in the same deterrent effect i.e. $q = 1$. Thus $p_f^* F_f^* \not\leq G_f$ as the government will always prefer $p_f F_f = G_f$ (Assumption 3).

Therefore if $p_f > 0$, as in this case, then $p_f^* \overline{F}_f = G_f$ and the firm will be induced to choose $q^* = 1$.

Now we compare social surplus when the firm only is punished and both the firm and the employee is punished.

Case 1: When both firm and employee are punished the social surplus is as follows:

$$\tilde{U} = \int_{p_e \overline{F}_e}^1 (1 - q)(G_f + G_e - H) dG_e$$

From our findings above, substitute $q^* = 1$

$$\begin{aligned} \tilde{U} &= \int_{p_e \overline{F}_e}^1 (1 - 1)(G_f + G_e - H) dG_e \\ &= 0 \end{aligned}$$

Case 2: The social surplus when only the firm is punished is as follows:

$$\hat{U} = \int_0^1 (1 - q)(G_f + G_e - H) dG_e$$

Substitute $q^* = 1$

$$\begin{aligned} \hat{U} &= \int_0^1 (1 - 1)(G_f + G_e - H) dG_e \\ &= \int_0^1 (1 - 1)(G_f + G_e - H) dG_e \\ &= 0 \end{aligned}$$

Therefore,

$$\tilde{U} = \hat{U}$$

The social surplus is identical when punishing the firm alone compared to punishing both the firm and employee. As such, even though $\tilde{U} = \hat{U}$, relying on Assumption 3, the government will choose to punish the firm only and set $p_e = 0$.

A.3 PROPOSITION 3 PROOF

The government's maximisation problem

$$\begin{aligned} \max_{F_e, \bar{F}_m, p_e, p_f, q} \int_{p_e F_e}^1 [1 - q](G_f + G_e - H)d(G_e) - (p_e^2 + p_f^2) \\ \text{subject to} \\ p_e \leq 1 \\ p_f \leq 1 \\ F_e \leq \bar{F}_e \\ F_f \leq \bar{F}_f \\ q \in \max_q \int_{p_e F_e}^1 [1 - q](G_f - p_f F_f)dG_e \quad \text{where } q \leq 1 \end{aligned}$$

From first order conditions:

$$F_e^* = \frac{H - G_f}{p_e} \tag{A.1}$$

$$p_e^* = \frac{F_e(H - G_f)}{F_e^2 + 2} \tag{A.2}$$

From Lemma 1, we know $F_e^* = \bar{F}_e$. Substituting this into the first order conditions, gives us

$$p_e^* F_e^* = \frac{\bar{F}_e^2 (H - G_f)}{\bar{F}_e^2 + 2} \tag{A.3}$$

Therefore

$$\lim_{\overline{F}_e \rightarrow \infty} \frac{\overline{F}_e^2 (H - G_f)}{\overline{F}_e^2 + 2} = H - G_f$$

A.4 PROPOSITION 4 PROOF

Case 1: The social utility when punishing the employee only is

$$U_e = \int_{p_e F_e}^1 (G_f + G_e - H) d(G_e) - p_e^2$$

Substituting (A.1) and (A.2) we have

$$\begin{aligned} U_e &= \int_{\frac{\overline{F}_e^2 (H - G_f)}{\overline{F}_e^2 + 2}}^1 (G_f + G_e - H) d(G_e) - \frac{\overline{F}_e (H - G_f)^2}{\overline{F}_e^2 + 2} \\ &= G_f + \frac{1}{2} - H + \frac{1}{2} \frac{\overline{F}_e^2 (H - G_f)^2}{\overline{F}_e^2 + 2} \end{aligned}$$

Case 2: The social utility when punishing the firm only is

$$\begin{aligned} U_f &= \int_0^1 [1 - q] (G_f + G_e - H) d(G_e) - p_f^2 \\ &= -p_f^2 \end{aligned}$$

From Lemma 1 and Lemma 2, we know $F_f^* = \overline{F}_f$ and $p_f^* \overline{F}_f = G_f$, therefore $p_f^* = \frac{G_f}{\overline{F}_f}$.

Substituting we get

$$U_f = -\frac{G_f^2}{\overline{F}_f}$$

Therefore the government will punish the employee only if:

$$\begin{aligned} U_e &\geq U_f \\ G_f + \frac{1}{2} - H + \frac{1}{2} \frac{\overline{F}_e^2 (H - G_f)^2}{\overline{F}_e^2 + 2} &\geq -\frac{G_f^2}{\overline{F}_f} \end{aligned}$$

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