Corporate Liability and Capital Structure

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Abstract

Liability is imposed on corporations to deter bad behavior and compensate victims. Yet the imposition of liability may lead to negative consequences including missed debt payments, job losses, and insolvency. In this article I show that *how* a corporation pays liability has important implications for deterrence, compensation, and collateral consequences. With debt in place, shareholders are biased towards paying liability through issuing debt or selling assets rather than through issuing equity, shifting some of the incidence of the liability onto creditors and imposing collateral consequences on workers. I show that shareholders can benefit from social-welfare decreasing corporate malfeasance even when detection is certain and the liability is equal to the harm caused. Furthermore, standard restrictive debt covenants do not solve the problem. I propose that officials mandate that firms issue equity to pay liability, and show that this eliminates the trade-off between the benefits and costs of liability and better aligns the interests of corporations and society.

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Contents

1 Introduction **3**
- 1.1 The Deterrence-Collateral Consequences Trade-off . . . 5
- 1.2 Legal Framework . . . 6
- 1.3 Corporate Liability . . . 8
- 1.4 Capital Structure . . . 9

2 Paying Liability: Investors' Preferences **11**
- 2.1 Equity Issuances . . . 13
- 2.2 Debt Issuances . . . 14
- 2.3 Downsizing and Asset Sales . . . 17
- 2.4 The Funding Choice . . . 19
- 2.5 Debt Covenants . . . 20
  - 2.5.1 Relevant Covenants . . . 21
  - 2.5.2 Avoiding and Violating Covenants . . . 23
  - 2.5.3 When the Interests of Creditors and Shareholders Align . . . 24

3 Paying Liability: Collateral Consequences **26**
- 3.1 Job Losses From Insolvency . . . 26
- 3.2 Job Losses From Asset Sales and Downsizing . . . 29

4 The Inadequacy of Standard Sanctions **31**
- 4.1 Problem 1: Underdeterrence . . . 31
- 4.2 Problem 2: The Deterrence-Collateral Consequences trade-off . . . 36

5 Mandating Equity Issuances **37**
- 5.1 The Incentives of Directors and Managers . . . 38
- 5.2 Repurchasing Shares . . . 40
- 5.3 The Mechanics of Mandatory Equity Issuances . . . 40

6 Reintroducing Frictions **42**
- 6.1 The Costs of an Equity Issuance . . . 42
- 6.2 Information Asymmetries . . . 43
- 6.3 Alternative Asset Prices . . . 43
- 6.4 Optimal Capital Structure . . . 44

7 Discussion **45**

A Data on Corporate Criminal Sanctions **48**
- A.1 Organizational Sentencing Guidelines . . . 48
- A.2 Stylized Facts on Corporate Sanctions . . . 49

1 Introduction

Corporate liability is meant to deter bad behavior and to compensate victims of corporate misconduct. But in the pursuit of these goals, the imposition of civil or criminal liability can lead to a variety of collateral consequences including missed debt payments, job losses, and insolvency. Decision makers therefore face an apparent trade off: large sanctions may be necessary to adequately deter corporations and provide compensation, but the imposition of large sanctions may lead to undesirable consequences. On the other hand, while small sanctions will limit collateral consequences, they may lead to insufficient deterrence and undercompensation.

In this paper I show that this apparent trade-off only arises because corporations have discretion over *how* to pay sanctions. With debt in place, shareholders favor issuing debt and selling assets to pay sanctions. By increasing leverage and the riskiness of the firm, debt issuances and asset sales shift some of the cost away from shareholders and onto creditors, thereby undermining deterrence. Furthermore, asset sales lead to immediate job losses for the employees associated with those assets, and the corporation's increased leverage threatens all employees' future employment. Given the prospect of debt issuances and asset sales, decision makers face the difficult choice of how to balance the benefits and costs of imposing sanctions.

But while shareholders favor paying liability through debt issuances and asset sales, other corporate stakeholders and society more broadly would be better served if corporations paid sanctions through equity issuances. Unlike debt issuances and asset sales, equity issuances impose the full incidence of sanctions on shareholders. And because equity issuances simply dilute the holdings of shareholders, they have no effect on the corporation's assets, debt, leverage, or employment. I argue in this paper that decision makers should mandate that corporations pay sanctions through issuing equity. Mandating equity issuances removes the trade-off between the costs and benefits of sanctions and better aligns the interests of corporations and society.

In this paper I provide a framework for understanding the impacts of how a corporation pays sanctions. The choice between issuing equity, issuing debt, and selling assets has profound implications for deterrence, compensation, and collateral consequences.

The issues addressed in this paper and the potential solution can be illustrated by the following example. In 2009, Beazer Homes, one of the country's largest home builders, settled civil and criminal charges with several state and federal agencies for $50 million. [1] Immediately, the DOJ was criticized for being too soft given that Beazer had engaged in mortgage and accounting fraud leading to substantial losses for homebuyers, investors, and the government. Even the Inspector General of Housing and Urban Development criticized the DOJ, arguing that $50 million was too little for the losses that were suffered.[2]

The U.S. Attorney's Office justified the $50 million settlement by stating that "the imposition of additional criminal penalties or the requirement of additional payment at this time would jeopardize the solvency of Beazer and put at risk the employment of approx-

[1] Henriques, Diana B. "Beazer Homes Reaches Deal on Fraud Charges." The New York Times. 07/01/2009.

[2] Javers, Eamon "DOJ Responds to Criticism of Beazer Homes Investigation." MSNBC. 09/24/2010.

imately 15,000 employees and full-time contractors not involved in the criminal wrongdoing."[3] Given Beazer's financial position in the wake of the crash of the housing market, the fears of the U.S. Attorney's Office were likely justified. Beazer's market capitalization had fallen over 70% over the past three years. The fine of $50 million amounted to nearly one third of the firm's market capitalization. A large fine could lead to layoffs, inefficient asset sales, risky business practices, or insolvency.

Decision makers therefore faced an apparent choice: large sanctions may have been necessary to adequately deter and provide compensation, but the imposition of large sanctions may have lead to undesirable consequences. The DOJ felt that $50 million was the correct balance, while officials at HUD thought the settlement amount should have been larger. This is a difficult trade-off and reasonable minds can differ.

However, the government may have been able to achieve the goals of compensation and deterrence while avoiding the harmful collateral consequences. Instead of imposing a $50 million fine on Beazer, the government could have imposed a larger fine with the condition that it *must be paid through an equity issuance*. By mandating an equity issuance, the government effectively imposes the full liability on the shareholders who are the ultimate principals of the firm. Because of this, shareholders will generally resist equity issuances when they are not mandatory. Following an equity issuance, the solvency of Beazer would not be affected, because nothing about the firm's financial position would have changed. The 15,000 employees and full-time contractors who were not involved in the criminal wrongdoing would be able to continue their jobs. The $50 million fine was approximately one third of Beazer's market capitalization (the market value of all outstanding equity) at the time of the settlement. But a mandatory equity issuance could have raised the entire value of Beazer's current market capitalization without leading to collateral consequences for employees.

This example illustrates the simple mechanics and potential benefits of mandating equity issuances for corporate liability. The remainder of the article is structured as follows. In the next section I discuss the corporate sanction literature and the capital structure literature. In particular, I show that while the literature on corporate liability has explored the effects of the principal-agent relationship that arises in firms, it has overlooked the importance of the debt-equity conflict as it applies to corporate malfeasance.

In Section 1 I introduce the fundamental frictions of the deterrence-collateral consequences trade-off as applied to corporate liability. I discuss the fears that arise from imposing liability and legal provisions that give prosecutors and agencies discretion to consider the collateral consequences of imposing liability. I then review the largely-disconnected literatures on corporate liability and capital structure.

In Section 2 and 3, I consider the ways in which a corporation can pay sanctions and the effects of that choice on investors and employees respectively. I show that shareholders prefer to sell assets or issue debt, imposing costs on creditors and leading to job losses for employees. I first consider the choice of how to pay liability under standard debt covenants that prevent shareholders from looting the firm before considering covenants more generally. I show that these covenants will generally only provide modest protection for creditors,

[3] https://archives.fbi.gov/archives/charlotte/press-releases/2009/ce070109.htm (last accessed May 7, 2019).

and that when they do protect creditors, they can exacerbate collateral consequences for employees.

In Section 4, I consider the choice facing a sanctioning decision maker. I show that there are two fundamental problems that arise when corporations pay liability through asset sales or debt issuances. The first is that shareholders can profit from malfeasance even when liability is equal to the harm caused, and detection is certain. I show that this in turn implies that in order to achieve optimal deterrence, sanctions must be greater than the harm caused. The second problem that arises is the deterrence-collateral consequences trade-off.

In Section 5, I develop the proposal that officials mandate that corporate liability be paid through equity issuances. Doing so achieves proper deterrence by imposing the full incidence of liability on shareholders, and eliminates the collateral costs to creditors and employees. I further discuss the practical aspects and potential concerns of implementing a mandatory equity issuance. Section 6 discusses additional extensions. Section 7 concludes.

1.1 The Deterrence-Collateral Consequences Trade-off

Corporations employ workers, contract with suppliers, and sell goods to employees. Entire communities may depend on a single large firm. The imposition of liability on the corporation may cause collateral consequences for many different constituencies.

Most salient are the costs that corporate liability may impose on the firm's employees. Employees contribute to the firm and make relationship-specific investments, but the vast majority of employees have little control over the actions of a firm. Nonetheless, employees tend to be the stakeholders most reliant on a firm's continuing viability, and are therefore often the most vulnerable of stakeholders. There are two channels through which liability can harm employees. The first is that both asset sales and debt issuances increase a corporation's leverage, thereby increasing the probability of insolvency and job losses. The second is that there may be immediate job losses when a firm downsizes and sells assets to pay down liabilities. Just as the means of paying liability matters for shareholders and creditors, employees will be differentially affected based on *how* the firm pays its liability. Like creditors, employees have a clear preference for paying liability through equity issuances.

In aggregate, employees suffer when the corporation that they work for becomes insolvent. Of course, some employees will retain their jobs through insolvency as their divisions are restructured or sold to acquiring firms while others will be able to secure alternative employment. There is substantial empirical evidence on the negative effects of job losses on future earnings and happiness. Jacobson et al. (1993) use administrative data to show that high-tenure workers separating from distressed firms suffer average earnings losses of 25% per year. Furthermore, they show that employees begin suffering losses before their actual separation. Davis et al. (2012) document that a majority of layoffs are concentrated at firms that shrink by more than 10% in a quarter. Moreover, when workers are laid off, they face significant frictions. Elsby et al. (2010) find that roughly 90% of laid-off workers flow into unemployment (versus only about 20% of workers who voluntarily quit). Other research finds that laid-off workers have inferior earnings paths (Davis et al., 2012). Job

loss has a significant effect on happiness, with Helliwell (2003) finding that only a marriage separation outranks the loss of a job in terms of its detrimental effect on happiness. Losing a job is equal to a significant drop in household wealth, and actually outranks the death of a spouse.

Overall, there is empirical evidence consistent with the idea that employees suffer from asset sales. Financially distressed firms frequently restructure and make considerable operational changes (Jensen, 1989). Ofek (1993) shows a robust relationship between a firm's financial leverage and asset restructuring and employee layoffs following financial distress. Ofek (1993) further shows that distressed firms restructure assets in order to generate immediate cash to pay liabilities. Asquith et al. (1994) find that 83% of firms reduce capital expenditures, with company downsizing accounting for much of the reduction, and find that financially distressed firms that sell a large portion of their assets are less likely to file for bankruptcy than firms that sell little or no assets. Finally, Giroud and Mueller (2015a) study the effect of a positive economic shock at a plant on the capital and labor outcomes at other plants within the same firm. They find that financially constrained firms pay for the new investment opportunity by withdrawing capital and laying off workers at other plants within the firm. Importantly, because of the distance between plants, it is unlikely that the firm is simply transferring employees between locations, and the decline in employment is greater than the increase in employment.

1.2 Legal Framework

In both criminal and civil cases, government decision makers are generally allowed, or even required, to take into account collateral consequences or whether a penalty would lead to collateral consequences or affect the financial viability of the firm.

Criminal prosecutions of corporations raise two fears. If a corporation is charged with–or pleads guilty to—a criminal offense, it may be debarred from government contracts or the government may revoke licenses and permits. For many businesses, this can amount to a virtual death sentence.[4] In part because of the high costs of a criminal conviction, there has been a rapid growth in the use of Deferred Prosecution Agreements (DPAs) and Non-Prosecution Agreements (NPAs) over the past two decades. These agreements allow prosecutors to use the threat of a future prosecution to achieve a settlement that does not lead to the negative effects of a corporate criminal conviction. While these collateral costs are an important factor in corporate criminal convictions, they are not the focus of this paper.

Even in the absence of a criminal conviction, prosecutors may be concerned about the effect of imposing liability on a corporation. In 1999 the Deputy Attorney General Eric Holder issued a memorandum on corporate criminal liability (the "Holder Memorandum"),[5] in which he articulated that "[p]rosecutors may consider the collateral consequences of a corporate criminal conviction in determining whether to charge the corporation with a

[4] Reference SNC Lavalan Affair

[5] "The Holder Memorandum", Memorandum from Deputy Attorney General Eric H. Holder, Jr. to Heads of Department Components and U.S. Attorneys, Bringing Criminal Charges Against Corporations, June 16, 1999.

criminal offense." This position was reiterated by the DOJ in 2003 and again in 2008,[6] and is codified in the U.S. Attorney's Manual.[7] In particular, prosecutors are instructed to take into account "harm to shareholders, pension holders, employees, and others not proven personally culpable, as well as [the] impact on the public arising from the prosecution."[8]

The consideration of collateral consequences is further stressed in the United States Sentencing Guidelines (USSG).[9] In principle the Organizational Guidelines are "designed so that the sanctions imposed upon organizations and their agents, taken together, will provide just punishment, adequate deterrence, and incentives for organizations to maintain internal mechanisms for preventing, detecting, and reporting criminal conduct."[10] However, the USSG explicitly instruct prosecutors to consider collateral consequences, providing mechanisms to adjust sanctions downwards to "avoid substantially jeopardizing the continued viability of the organization."[11]

The consideration of the financial effects of liability payments carries over to civil penalties as well. Under many statutes, a violator's ability to pay is one of the factors to weigh when determining a civil penalty.[12] Under other statutes, agencies are directed to take into consideration "the economic impact" or "effect" of the penalty on the violator.[13]

As an example, consider the the EPA's Stationary Source Civil Penalty Policy. Stationary sources are facilities that must install pollution control equipment and meet specific emission limits. These stationary sources are among the largest emitters of harmful emissions. The EPA's Stationary Source Civil Penalty Policy has multiple provisions dealing with the effects of liability, including collateral consequences ("The economic benefit component may be mitigated where recovery would result in plant closings, bankruptcy, or other extreme financial burden.")[14] and the firm's ability to pay ("The agency will generally not request penalties that are clearly beyond the means of the violator. Therefore, EPA should consider the ability to pay a penalty in adjusting the preliminary deterrence amount.").[15]

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[6] "The Thompson Memorandum", Memorandum from Deputy Attorney General Larry Thompson to Heads of Department Components and U.S. Attorneys, Principles of Federal Prosecution of Business Organizations, January 20, 2003; "The McNulty Memorandum", Memorandum from Deputy Attorney General Paul J. McNulty to Heads of Department Components and U.S. Attorneys, Principles of Federal Prosecution of Business Organizations, December 12, 2006.

[7] The U.S. Attorney's Manual, 9-28.000 Principles of Federal Prosecution of Business Organizations.

[8] *Id.*

[9] US Sentencing Guidelines Manual.

[10] USSG §8.

[11] USSG §8C3.3(b).

[12] *See e.g.* Clean Water Act (CWA), §309(g)(3), 33 U.S.C. §1319(g)(3); Toxic Substances Control Act (TSCA), §§16(a)(2)(B), 207(c)(1)(C), 15 U.S.C. §§2615(a)(2)(B), 2647(c)(1)(C); CERCLA, §109(a)(3), 42 U.S.C. §9609(a)(3); Emergency Planning and Community Right-to-Know Act (EPCRA), §325(b)(1)(C), 42 U.S.C. §11045(b)(1)(C); and the Act to Prevent Pollution from Ships (APPS), §9(b), 33 U.S.C. §1908(b).

[13] *See e.g.* Clean Air Act (CAA), §§113(e)(1), 205(c)(2), 42 U.S.C. §§7413(e)(1), 7524(c)(2); CWA, §§309(d), 311(b)(8), 33 U.S.C. §§1319(d), 1321(b)(8); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), §14(a)(4), 7 U.S.C. §136l(a)(4); and the Safe Drinking Water Act (SDWA), §1423(c)(4)(B)(v), 42 U.S.C. §300h-2(c)(4)(B)(v).

[14] "Clean Air Act Stationary Source Civil Penalty Policy", Environmental Protection Agency, October 25, 1991. §II(A)(3)b.

[15] *ibid.* §IV.

1.3 Corporate Liability

The primary reasons for corporate liability are deterrence and compensation.[16] From this perspective there is little theoretical distinction between civil and criminal corporate liability.[17] I therefore broadly refer to bad corporate actions as *malfeasance* and any legal judgments against a corporation as *liability*.

Optimal deterrence entails choosing sanctions for harmful actions that maximize social welfare, taking into account that actors will anticipate sanctions. When enforcement is certain, optimal deterrence is achieved when sanctions imposed on the decision maker are equal to the harm caused (Bentham, 1789). This induces actors to internalize the harm that they cause, so that they only take harmful actions when those actions increase social welfare.

When actors are individuals, those that make a decision, those that benefit from the decision, those that pay sanctions, and those who bear the costs of those sanctions are one and the same person. However, in a corporate context, managers make decisions, a variety of corporate stakeholders may or may not benefit from the decision, sanctions are often imposed on "the corporation", and a variety of stakeholders bear the costs of those sanctions. This complicates the analysis of deterring corporate malfeasance.

Given that corporations are legal fictions, one option is to only impose sanctions on those real persons at the corporation who engaged in malfeasance, rather than the corporation as a whole. While imposing liability on the agent who engaged in malfeasance induces the agent to internalize some of the harm caused, the problem of agent insolvency severely limits the effectiveness of personal liability (Sykes, 1983). The potential insolvency means that the expected loss to the agent is less than the harm caused, undermining deterrence. While criminal liability and imprisonment may be useful to overcome personal insolvency, many acts of malfeasance do not rise to the standard of criminal liability.[18] Furthermore, even if corporate agents are able to pay sanctions, it is often difficult to identify culpable individuals involved in corporate malfeasance.[19]

[16] Theories of punishment can be widely separated into consequentialist and retributive theories (Duff and Hoskins, 2018). Consequentialist theories structure punishment to achieve socially desirable outcomes, while retributive theories view punishment as a means of giving wrongdoers their just deserts. The literature is generally skeptical of applying the retributive theory of punishment to corporations (Byam, 1982; Khanna, 1995). More colorfully, Alschuler (2009) argues that attributing blame to a corporation is no more sensible than attributing blame to a dagger, a fountain pen, a Chevrolet, or any other instrumentality of crime. Furthermore, while there are other consequentialist goals such as rehabilitation, these are secondary aims (Byam, 1982).

[17] Judge Learned Hand recognized in United States v. Nearing, 252 F. 223 (S.D.N.Y. 1918) that "there is no distinction in essence between the civil and the criminal liability of corporations."There are of course important characteristics that differentiate corporate civil and criminal liability, including procedural protections (e.g. evidentiary standards), sentencing guidelines, enforcement powers, and message sending. But for the main analysis I will make no distinction between civil and criminal liability.

[18] Many statutes contain both civil and criminal components. However, they differ in that civil liability is generally strict while criminal liability requires a *mens rea*. Furthermore, civil liability carries lower standards of proof. In either case, the corporation may face a monetary penalty.

[19] This is exemplified by the Deepwater Horizon disaster. The disaster arose after years of cutting corners at British Petroleum rather than from any discrete decision. Many large corporate accidents arise from the combination of many small contributing factors (Dekker, 2016).

Given that personal liability is often insufficient for deterring bad corporate actions, liability may be imposed on the corporation itself. By imposing liability on the corporation, the shareholders who control and benefit from the corporations' actions should in principle monitor its employees to ensure that they obey the law. The potential agency conflict between a firm's beneficiaries and its employees has defined the literature on corporate malfeasance. Newman and Wright (1990) consider how principals can design employment contracts to reduce agents' incentives to engage in malfeasance. Polinsky and Shavell (1993) study the benefits of imposing liability both on employees and the corporation, while Shavell (1997) explores how corporate liability should be structured given that profit-maximizing corporations have limited ability to penalize their employees. And Arlen (1994) shows that imposing liability on corporations may actually undermine the monitoring of employees by corporations. However, this research overlooks the importance of debt in the organizational structure of corporations.

To achieve proper deterrence, shareholders must bear the costs of sanctions. They elect boards of directors, who in turn appoint managers to run corporations. As the residual claimants to the firm's income, shareholders have the potential to profit from corporate malfeasance. And while shareholders may exert limited control, boards of directors are frequently treated as agents for shareholders, and there is wide agreement that firms should be run in the financial interests of their shareholders (Hansmann and Kraakman, 2001). In the absence of imposing costs on shareholders for corporate malfeasance, there is no reason to believe that shareholders will want the firm to obey the law. Sanctions should be used to align the interests of shareholders with society. And in order to properly align shareholders with society, shareholders need to bear the full incidence of corporate sanctions.

1.4 Capital Structure

Corporations can be funded through a variety of channels. Initially corporations can borrow money and sell equity shares to raise funding. An established company can further fund investments by using its own profits. The corporation's *capital structure*, that is its mix between debt and equity funding, is central to corporate decision making The foundational insight about corporate funding came from the analysis of Modigliani and Miller (1958). Their result is based on a basic conservation principle. A corporation's assets produce cash flows, and simply changing how those cash flows are paid out to investors does not *in and of itself* change the value of the corporation. In other words, changing the proportion of a corporation that is funded through debt versus equity does not in and of itself affect the value of the corporation. This is often referred to as the Modigliani and Miller irrelevancy result. Under the strong assumptions of Modigliani and Miller, there is little role for corporate finance.

However, as Modigliani and Miller (1963) recognized, the assumptions underlying their irrelevancy result do not hold in the real world. This leads to an immediate corollary: if the value of a corporation depends on its funding structure, it must be because of some frictions of the funding mix. And there are many frictions. For example, in most countries corporations can deduct interest expenses on debt. Corporations therefore save on taxes by using debt rather than equity to fund their investments. But while debt can carry

advantages, it also carries costs for the corporation. The deadweight costs of bankruptcy and agency distortions will be anticipated by creditors and factored into the price and terms of debt. Under the trade-off theory of capital structure, firms trade off the advantages of debt against the other costs that arise.

Much of the discussion of capital structure treats the funding decision as if it only occurs one time. The corporation is assumed to have chosen a capital structure that maximizes the value to its investors. However capital structure is dynamic. Profits, losses, debt payments, stock buybacks, and other day-to-day decisions of the firm result in a capital structure that is ever-changing. And while creditors may have a degree of control at the time of lending, once debt is in place managers and shareholders retain wide discretion. Debt covenants restrict some actions, but rarely cover all future contingencies, so that the ability of shareholders and creditors to commit to specific actions over the long run is limited. Once debt is in place, a fundamental conflict of interest arises between shareholders and creditor. And the decisions made to benefit shareholders may not be in the interests of creditors or other corporate stakeholders.

The debt-equity conflict arises from the distinct nature of debt and equity claims. The simplest form of a debt is a fixed claim on a predetermined amount of the firm's assets. Equity holders receive any profits in excess of the debt claim, and are therefore referred to as the *residual claimants*. Because of limited liability, creditors and shareholders can only lose as much as they have invested in the firm. But while creditors have a fixed claim, shareholders have a potentially unlimited upside. The divergent nature of creditor and shareholder claims leads to a conflict that plays out in many ways: shareholders would like to liquidate firm assets to pay themselves dividends (unauthorized distributions); invest in higher-risk assets (asset substitution); fund negative net present value projects (over-investment); forgo projects that benefit creditors (under-investment); and issue higher-priority debt (claim dilution).

Particularly relevant to this paper is the problem of *debt overhang* (Myers, 1977). Debt overhang is the phenomenon that, once debt is in place, firms may underinvest in profitable projects because the gains to those investments will be partially appropriated by existing creditors.[20] However, the distortions that arise from debt can be even more problematic than forgoing some profitable investments. In particular, once a firm has debt in place, shareholders will resist leverage reductions–increasing the amount of the firm that is funded with equity, either through issuing equity or retiring debt–no matter how much the leverage reduction may increase firm value (Admati et al., 2018).

In this paper I explore the effect of this debt overhang on how a firm will pay liability, and in turn I study the effect of that choice on the welfare of corporate stakeholders and society more broadly. I proceed by adopting the framework of Modigliani and Miller (1958) where a corporation's capital structure does not in and of itself affect the value of the corporation. This simplification allows me to maintain focus on a more important question: how a corporation's capital structure affects social welfare more broadly. Maintaining the Modigliani and Miller irrelevancy result allows me to illustrate that even if *how* a corporation pays liability does not affect the value of the corporation, it *does* matter for social costs and social benefits. In Section 6.4 I discuss the effects of relaxing this assumption.

[20]

2 Paying Liability: Investors' Preferences

In this section I explore how corporations pay sanctions and how that choice affects shareholders, creditors, and employees. For this discussion, I assume that a corporation is funded through both debt and equity. There is a huge variety of credit, varying in maturity, priority, security, and a variety of other features. For simplicity this section explores a single class of unsecured debt protected by a standard *restricted payments* covenant that prevents shareholders from paying themselves excessive dividends.[21] I consider the possibility of issuing junior, *pari passu*, or senior debt. In section 2.5 I consider covenants restricting asset sales that allow creditors to demand immediate repayment if the covenant is breached. I assume that decisions are made based on how they affect shareholders' wealth.[22]

When faced with a liability, firms generally have several options. The most basic is to use cash on hand. Before the financial crisis, the median US firm held cash and marketable securities equal to about 8% of total assets (Campello et al., 2010). So while some expenses can be paid with cash on hand, many firms do not hold sufficient cash to make substantial payments, and even firms that do must replenish their cash on hand quickly to avoid a variety of negative outcomes.[23] Following cash on hand, firms can raise funding though retaining earnings rather than paying dividends to shareholders. However, like cash on hand, retained earnings are not an effective means of making a large and unexpected payment, because raising a substantial sum of money through retained earnings may take years. A firm that needs to quickly raise substantial sums therefore needs to look to outside financing venues Broadly, a firm can choose from three broad categories of external funding: equity financing, debt financing, and asset sales.

Figure 1 shows some of the ways in which the firm can pay sanctions. Panel (A) represents the firm's initial balance sheet, and the fundamental accounting identity that Assets = Liabilities + Equity. The remaining four diagrams represent the firm's balance sheet after paying sanctions through four possible ways of raising external financing: equity issuances, junior debt issuances, *pari passu* debt issuances, and asset sales. Each will have a unique effect on shareholders, creditors, and employees. Which will the firm choose? Importantly, shareholders make the decisions for solvent firms, meaning the decision will be the one that maximizes the value of equity.

In the next section I consider the choice between issuing debt and issuing equity. The priority level of the debt will determine shareholders' (and creditors') preferences over the type of security issuance. Both equity issuances and junior debt issuances effectively impose the entire incidence of the sanctions on shareholders, so both shareholders and creditors are indifferent between the type of security issuance. But shareholders prefer *pari passu*

[21] A *restricted payments* covenant limits a corporation's ability to make payments in the form of dividends, distributions, and share repurchases. This provision ensures that shareholders are not paid before creditors.

[22] Shareholders elect directors who appoint managers who, in turn, manage the day-to-day operations of corporations. Managers and directors have their own interests that can diverge from those of shareholders. Over the past decades, aligning the interests of managers with those of shareholders has been the chief endeavor or scholarship in corporate governance. The primary solution to the managerial agency conflict has been to tie managerial compensation to financial measures of the corporation's performance.

[23] Campello et al. (2010) find that financially constrained firms that burn through cash on hand subsequently sell assets, cancel plans, and bypass attractive investments.

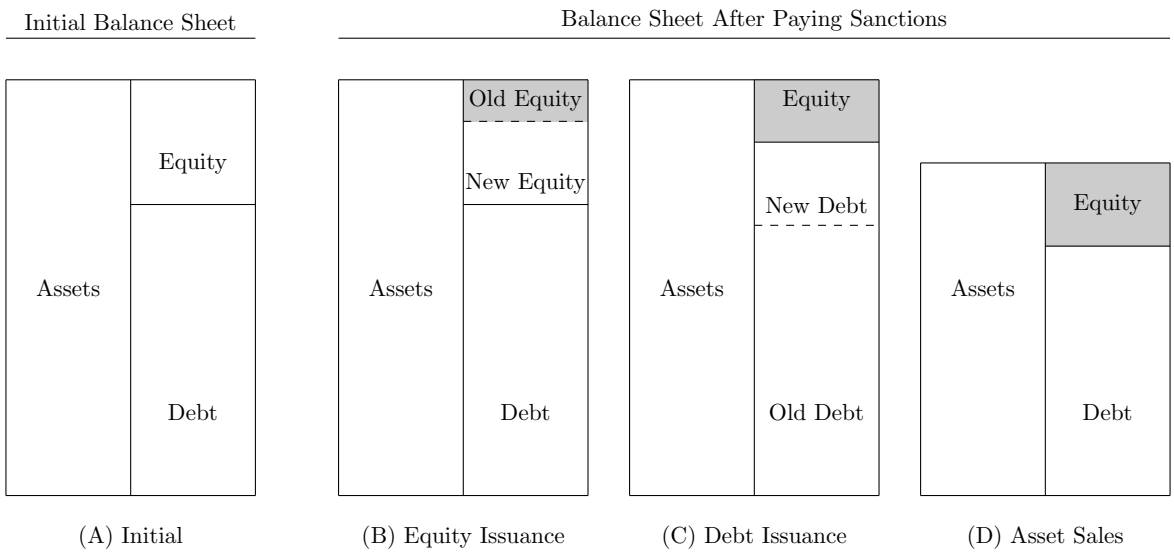

Figure 1: Ways to Pay Sanctions. The firm may raise money to pay sanctions through an equity issuance, a debt issuance, or asset sales.

debt issuances to equity issuances because they dilute current creditors to the benefit of shareholders. After discussing equity and debt issuances, I then consider possibility of raising funds through asset sales.

A corporation's ability to raise funds is constrained in part by the market—the corporation can only raise as much as investors are willing to pay for equity, debt, or assets. Furthermore, the corporation's options may be further circumscribed by the presence of debt covenants. Debt covenants restrict the actions that corporations can take. Particularly relevant to this paper, a *restricted payments* covenant limits a corporation's ability to sell assets and use those proceeds to make payments in the form of dividends, distributions, and share repurchases. However, while this covenant effectively prevents shareholders from paying themselves dividends through asset sales, it does not prevent shareholders from limiting their losses through asset sales. This distinction has important implications for the incidence of corporate sanctions.

Ultimately, while covenants provide protection for creditors, they are necessarily incomplete, and it is often desirable to leave shareholders with some discretion to take actions that benefit all stakeholders. I discuss the impact of covenants in detail in Section 2.5.

In this section I begin by restricting attention to the simple case of a firm that has a single asset with an uncertain return that is funded by both existing debt and equity, and must raise funds to pay liability. By issuing equity, shareholders dilute their claims on the firm's residual income and must share any income proportionally with new shareholders. By issuing debt, the current shareholders remain the sole residual claimants. However, because creditors have priority to the firm's income, issuing debt puts shareholders' claim on cash flows behind the old and new creditors. Finally by selling assets, shareholders do not alter the fundamental claims on the firm's income, but instead reduce the expected income.

2.1 Equity Issuances

In a *secondary equity offering*, a corporation issues stock subsequent to its initial public offering. When a company raises money by issuing new shares, it increases the total number of outstanding shares, thereby diluting the voting rights of the existing shares. However, the equity issuance will not in and of itself reduce the value of outstanding equity. The influx of capital increases both the number of shareholders and the total value of the firm. In the absence of frictions, these two effects balance one another, so the value of each individual share in the firm remains unchanged.[24]

However, a firm that issues equity to pay sanctions does not retain the capital that is raised. This has the effect of diluting both the voting rights of existing shareholders *and* the value of those shares. In order to issue equity to pay sanctions, the firm must offer an attractive investment to prospective investors. The number of shares offered and the price of those shares will reflect that the new shareholders are subordinate to creditors and are paid proportionately with the preexisting shareholders. And because the value the firm remains unchanged after an equity issuance is used to pay liability, the liability is effectively paid for entirely by the existing shareholders. The following example illustrates the effect of an equity issuance.

> **Numerical Example 1** (Equity issuances): Suppose that a firm has an asset that returns either 80 or 120, each with probability 50%. This means that the expected value of the firm is 100. Let the firm have outstanding debt with a face value of 50. The market value of debt is therefore 50 and the market value of equity is 50.[25] Now suppose that the firm must immediately pay sanctions of 45. Consider the effects of paying with an equity issuance.
>
> *Equity Issuance:* In order to raise 45 to pay sanctions, the firm must issue enough equity so that the new shareholders can expect to break even. The firm must therefore issue enough shares so that new shareholders hold 90% of the total outstanding equity, meaning that the original shareholders are only entitled to 10% of the returns to equity.[26] The value of the new equity is 45. Therefore the value of the old equity drops to 5. Because issuing equity has no effect on the solvency of the firm, creditors will receive the same expected payoffs and the value of debt is unchanged at 50.

Note that this example is simplified in order to convey the intuition. In reality, firms

[24] To see this consider the following example. Consider a firm with a market capitalization of $100,000 that has 1,000 shares outstanding. The value of each share is therefore $100. Now suppose that the firm issues an additional 1,000 shares at $100 each to raise an additional $100,000. The company now has 2,000 shares outstanding. So a shareholder who held 200 shares before the equity issuance controlled 20% of the vote of the company (200/1,000), but now has been diluted to only controlling 10% of the vote (200/2,000). However, the equity issuance does not dilute the *value* of the existing shares. The company now has a market capitalization of $200,000 and 2,000 shares outstanding, so every share still has a value of $100.

[25] Value of Equity $= (0.5)(30) + (0.5)(70) = 50$.

[26] If there is initially one share outstanding, the firm issues equity e such that the percentage of the company owned by the new company is $\frac{e}{1+e}$. The equity issued is therefore the e that solves: $(0.5)(30)(\frac{e}{1+e}) + (0.5)(70)(\frac{e}{1+e}) = 45$. Which means that $e = 9$ and $\frac{e}{1+e} = 0.9$.

have assets that have a continuum of possible returns. But all that matters for our purposes is that there is a possibility that the firm will become insolvent.

If there is asymmetric information on the part of the managers, equity issuances can be bad for both shareholders and creditors. Section 6.2 discusses the effect of this and how mandatory equity issuances alleviate this concern.

2.2 Debt Issuances

An equity issuance raises money by attracting new residual claimants for the firm's income. In a debt issuance, a firm borrows money from a bank or other investors and commits to pay back that money before shareholders are paid. Unlike shareholders who have an unlimited potential upside, creditors have a fixed claim on the firm's assets.

Most corporations have debt in place, so when new debt is issued, the corporation will generally have several other debt issues outstanding. The order in which the debt claims are paid will depend on the relative priority structure of the new and outstanding debt claims. If the new debt issuance is junior to the existing debt, the new creditors will be paid only after the existing creditors are paid. If the new debt issuance is senior to the existing debt, the new creditors will be paid before the existing creditors. And if the new debt issuance is the same priority as the existing debt, or *pari passu*, then the old and new creditors will be paid *pro rata* in accordance with the amount of the creditors' claims. The choice over the relative priority of a new debt issuance will generally be determined by a combination of covenant, convention, and market forces. But the ultimate choice of the priority level will have implications for all corporate stakeholders. In general, shareholders will prefer that the firm issues new debt that is senior to existing debt while existing creditors will prefer that new debt is junior to existing debt. There are two features that drive these divergent preferences. First, the market value of new debt is invariant in its seniority, while the face value of the debt is decreasing in its seniority. And second, shareholders are always paid last, so increases in the face value of debt are costly.

That the market value of the new debt is invariant in its seniority may seem counter-intuitive. After all, new creditors will only invest in the company if they can expect to at least break even in expectation. However, while the market value of the debt issuance is invariant in seniority, the face value is not. The more junior the debt, the more risk investors bear, so investors in junior debt will demand a higher face value (i.e. interest rate) to compensate them for the increased risk.[27] Market forces will mean that new investors will be indifferent about the type of debt and, regardless of its priority level, the market value of new debt will be equal to the level of liability.[28]

[27]The ratio of the face value of the debt to its market value at the time of sale is a way of gauging the interest. For example, in order to raise $100, a corporation may issue senior debt with a face value of $110 and a maturity of one year. This is a 10% interest rate. If the firm issues debt that is *pari passu* with existing debt, it may need a face value of $120 in order to raise $100 (a 20% interest rate). And if the firm issues junior debt, it may need a face value of $130 to raise $100 (a 30% interest rate). The interest rate captures the increase in risk. But regardless of what type of debt is issued, the expected value to a risk-neutral investor is the same.

[28]In some cases, the problem of debt overhang will mean that a firm is able to raise money through senior issuances but not through more junior issuances.

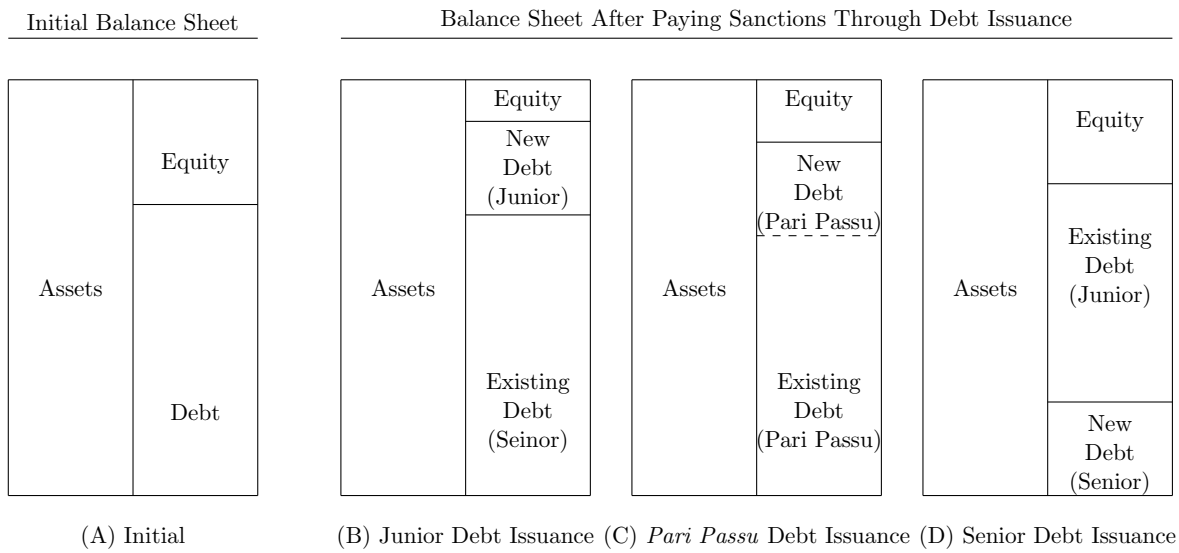

Figure 2: Types of Debt Issuances. The firm may raise debt that is junior, pari passu, or senior to existing debt.

But while new creditors are indifferent about priority, shareholders and existing creditors are not. Regardless of the seniority of the new debt issuance, shareholders will only be paid after all creditors are paid in full. And because more junior debt issuances require a higher face value to compensate new investors, they are relatively more costly to shareholders than more senior issuances. In direct contrast, existing creditors prefer more junior issuances. A junior debt issuance will not dilute existing creditors, a *pari passu* debt issuance will result in moderate dilution, and a senior issuance will result in heavy dilution.

Figure 2 gives a graphical representation of the effects of the priority of a debt issuance on shareholders and existing creditors. Panel (A) represents the firm's initial balance sheet, while the remaining three diagrams represent the firms balance sheet after paying sanctions through a junior, *pari passu*, or senior debt issuance. Following Modigliani and Miller (1958) the value of the corporation does not depend on the type of debt that is issued, so all of the balance sheet diagrams are of the same height. Furthermore, in all three cases, the market value of the new debt is equal to the level of sanctions. This is because in efficient capital markets the new creditors will break even in expectation. However what differs between these three cases are the values of equity and existing debt. The difference in values can be understood by examining the right hand side of each balance sheet from bottom to top. The claims that are on the bottom of the diagram are highest priority and are paid first. Only after a claim is paid in full do revenues begin to accrue to the next level.

The balance sheets in Figure 2 show the market value of the firm's liabilities and equity. As discussed above, the market value of the new debt is constant, regardless of the seniority of the issuances. However, this obfuscates that the face value of the new debt varies by its priority, with lower priority debt receiving a higher face value in order to achieve the same market value. The following numerical example shows the differing face values of the three types of debt issuances and the effect on shareholders and existing creditors.

Numerical Example 2 (Debt issuances): Suppose that a firm has an asset that returns either 80 or 120, each with probability 50%. This means that the expected value of the firm is 100. Let the firm have outstanding debt with a face value of 50. The market value of debt is therefore 50 and the market value of equity is 50.[29] Now suppose that the firm must immediately pay sanctions of 45. Consider the effects of paying with debt issuances of varying priority.

Junior Debt Issuance: The firm must issue enough junior debt so that the new creditors can expect to break even. Because these creditors will be paid after existing creditors, they face a degree of risk. In order to raise 45 to pay sanctions, the corporation must issue junior debt with a face value of 60.[30] Because existing creditors are higher priority, the value of their claim remains unchanged at 50. The value of equity from a junior debt issuance is 5.

Pari Passu Debt Issuance: Because new creditors are the same priority as existing creditors, they face less risk than junior creditors would. In order to raise 45 to pay sanctions, the corporation must issue *pari passu* debt with a face value of 50.[31] This new debt dilutes existing creditors, and the value of their claim drops to 45. The value of equity from a *pari passu* debt issuance is 10.

Senior Debt Issuance: Because new creditors are higher in priority than existing creditors, they will face no risk. In order to raise 45 to pay sanctions, the corporation can issue senior debt with a face value of 45. Because the value of the assets is always greater than 45, senior creditors are guaranteed to be paid back. However, this severely dilutes existing creditors, and the value of their claim drops to 42.5.[32] The value of equity from a senior debt issuance is 12.5.

This example illustrates investors' preferences over various types of debt issuances. Comparing examples 1 and 2 gives a complete representation of investors' preferences: shareholders prefer senior debt issuances to *pari passu* debt issuances, prefer *pari passu* debt issuances to junior debt issuances, and are indifferent between junior debt issuances and equity issuances. Existing creditors have divergent preferences to shareholders. Existing creditors are indifferent between junior debt issuances and equity issuances, prefer junior debt issuances to *pari passu* debt issuances, and prefer *pari passu* debt issuances to senior debt issuances. Table 1 summarizes investor preferences as a function of the method of paying sanctions.

Table 1: Investor Utility From Method of Security Issuance

Shareholders:	Equity	=	Junior Debt	<	Pari Passu Debt	<	Senior Debt
Existing Creditors:	Equity	=	Junior Debt	>	Pari Passu Debt	>	Senior Debt
New Investors:	Equity	=	Junior Debt	=	Pari Passu Debt	=	Senior Debt

[29] Value of Equity $= (0.5)(30) + (0.5)(70) = 50$.

[30] Calcs[!]

[31] Calcs[!]

[32] Calcs[!]

The divergent preferences arise because of the possibility of insolvency. If liability is sufficiently large, the firm will be unable to attract new investors and the firm will default.[33] However, insolvency does not occur only when the firm cannot pay its liability. Insolvency can also subsequently occur if future earnings are insufficient to meet the corporation's debt obligations. The method of paying sanctions affects the prospective solvency of the corporation. An equity issuance to pay sanctions recapitalizes the firm, and therefore has no effect on the probability of insolvency. A debt issuance however, leaves the firm with higher leverage and thereby increases the chance of future insolvency. And the more junior the debt that is issued, the more likely the firm will default in the future. The effect of liability on prospective insolvency has important implications for collateral consequences and deterring corporate malfeasance, which I discuss in Section 4.1.

Shareholders control corporations, and in the absence of frictions they will prefer to issue senior debt wherever possible to pay sanctions. Understanding shareholders' incentives in the absence of frictions is important, because we can then ask whether the frictions that we observe in the real world will be sufficient to change those preferences. Covenants, managerial preferences, and asymmetric information could impact corporate funding decisions. I discuss debt priority structure and covenants in Section 2.5, and while covenants and market forces may limit the ability of shareholders to issue debt at the expense of existing creditors, they fail to fully protect creditors. In Section 6 I discuss other frictions that may either dampen or strengthen shareholders' preferences.

2.3 Downsizing and Asset Sales

Corporations' funding decisions are generally framed around the choice between issuing debt or issuing equity. However, firms also raise considerable sums through asset sales, with recent evidence suggesting that proceeds from asset sales are roughly the same as the proceeds from equity *plus* debt issuances (Eckbo and Kisser, 2015). Corporations will often find it advantageous to pay liability through asset sales, because doing so is another means of shifting costs away from shareholders and onto creditors.

Shareholders' preference for (and creditors' preference against) asset sales stems from the uncertain nature of firm earnings. Because creditors hold a fixed claim on the firm's assets, they prefer that a firm take actions that maximize the probability that they are paid back. Creditors do not gain from any profit beyond their fixed claim. But as the residual claimants to the firm's income, shareholders are interested in maximizing the expected value of their claim, even if that comes at the expense of creditors. These competing claims lead to divergent preferences about risk and leverage: creditors prefer low leverage and low risk, while shareholders prefer high leverage and high risk.

This can be seen by looking back to Figure 1, which represents the fundamental accounting identity that assets equal debt plus equity. The issuance of equity or debt changes the firm's liabilities (the right hand side of the balance sheet), but has no effect on the firm's assets (the left hand side of the balance sheet), because the funds raised go to paying the sanctions. Because assets remain unchanged, the firm's expected income remains unchanged. Therefore the total payout to existing shareholders and creditors will decrease,

[33] See figure 3.

and the incidence of this decrease will depend on the type of security that is issued.

But unlike equity and debt, selling assets has effects on both sides of a firm's balance sheet. The decrease in assets leads to a corresponding decrease in the value of the firm's liabilities. Creditors hold a fixed claim, but a decrease in assets means that there is an increased probability that the claim will not be paid back in full. By selling assets, there are some states of the world in which creditors would have previously been paid in full and where they are now not paid in full. This lowers the value of debt. But because the decrease in asset value must equal the sum of the decrease of debt and equity, this means that the decrease in the value of equity is less than the total decrease in the value of assets. An asset sale effectively transfers some of the incidence of sanctions away from shareholders and onto creditors. To see this, consider the following example:

> **Numerical Example 3** (Asset sales): Suppose that a firm has an asset that returns either 80 or 120, each with probability 50%. This means that the expected value of the firm is 100. Let the firm have outstanding debt with a face value of 50. The market value of debt is therefore 50 and the market value of equity is 50. Now suppose that the firm must immediately pay sanctions of 45. Consider the effects of paying with an asset sale.
>
> *Asset Sale:* Assume that the asset is homogeneous in the sense that the firm can sell $x\%$ of the asset and the realized return will be reduced by $x\%$. Because the initial value of the firm was 100, it must sell 45% of its assets in order to raise 45. The asset returns are now reduced by 45% in both states of the world. So the asset returns either 44 or 66, each with equal probability.[34] The value of the existing debt therefore drops to 47 .[35] The value of equity is 8.[36]

Shareholders bore the entire incidence of liability when liability was paid through an equity issuance or a junior debt issuance. When *pari passu* or senior debt was used, shareholders were able to transfer some of the incidence to existing creditors by diluting them. This dilution lowers the probability that existing creditors will be paid back. An asset sale is an alternative means of transferring costs away from shareholders and onto creditors. An asset sale dilutes existing creditors by reducing the probability that those claims will be paid by lowering the value of the corporation's revenue-generating assets.

The ability of a corporation to pay a liability through asset sales will depend on a variety of factors. In perfect capital markets, the corporation will be able to sell the assets for their net present value. However, in some cases the assets would need to be sold at a discount, which could lessen shareholders' preferences for asset sales. In other cases, the sale price of the assets may be more than their value to the firm, strengthening shareholders' preferences for asset sales. Both of these cases are considered in Section 6.3.

It is important to note that the corporation's cash is an asset. So if the corporation pays liability with cash on hand, it is paying through an asset sale. While paying with cash does not have the immediate job-loss effects of selling productive assets, it still has a negative

[34] calcs[!]

[35] $V_D = (0.5)(44) + (0.5)(50) = 47.$

[36] $V_E = (0.5)(0) + (0.5)(16) = 8.$

effect on the prospective solvency of the firm. When cash stores are run down, the corporation will be susceptible to negative shocks until cash stores are depleted. Campello et al. (2010) find that financially constrained firms that burn through cash on hand subsequently sell assets, cancel plans, and bypass attractive investments.

The literature generally frames firms funding choices around the choice between debt or equity, asset sales are another important source from which firms can raise funds (Edmans and Mann, 2018). While Shleifer and Vishny (1992) show that asset sales may not be an effective means of raising funding when there is industry-wide distress, Hite et al. (1987) give empirical evidence that firms sell assets as an alternative to issuing new securities. Eckbo and Kisser (2015) find that the proceeds from asset sales are roughly the same as those from debt plus equity issuances, suggesting that asset sales are a considerable source of funding. Over half of asset-selling firms state financial motives for voluntarily selling assets (Borisova et al., 2013), and financially constrained firms are much more likely to sell assets to fund operations than unconstrained firms (Campello et al., 2010). However, while asset sales may benefit shareholders, piecemeal asset sales may generate less income than assets that are sold as a going-concern package (Hotchkiss et al., 2008).

2.4 The Funding Choice

This section has considered equity issuances, debt issuances, and asset sales as means of paying liability. Once initial debt is in place, there is a clear conflict between shareholders and creditors. Shareholders will resist any equity issuances, and will instead prefer debt issuances and asset sales. Existing creditors prefer issuing equity to issuing debt or selling assets.

Outside of covenant violations and managerial agency conflicts, corporations are run in the interest of shareholders.[37] This implies that corporations will be systematically biased towards issuing debt and/or selling assets to pay liability. When a leveraged corporation pays liability through relatively senior debt issuances or asset sales, shareholders will only pay a proportion of that liability. Very small liability has a very small effect on the expected solvency of the firm, so shareholders will effectively pay the entire amount. However, as the level of liability increases, creditors will bear an increasing fraction. So not only do shareholders prefer asset sales and debt issuances to equity issuances, but the magnitude of this preference is increasing in a firm's leverage. Shareholders in a low-leverage firm will have a mild preference for asset sales and debt issuances, while shareholders in a high-leverage firm will have much stronger preference. Shareholders benefit from increased leverage, and asset sales and debt issuances increase the leverage of a highly leveraged firm by more than a lowly leveraged firm.

Shareholders will strongly resist issuing equity to pay liability. The degree to which they will be able to avoid issuing equity will depend on real-world frictions. Covenants

[37] While Triantis and Daniels (1995) and Baird and Rasmussen (2006) provide anecdotal evidence of creditor influence before defaults occur, they focus on the role of creditors in overcoming managerial agency problems rather than debt-equity conflicts. Nini et al. (2012) provide empirical evidence that creditors intervene to address the debt-equity conflict after firms violate covenants but before default. But in the absence of covenant violations, shareholder-elected directors control the company. I discuss the impact of covenants on the firm's choice of paying sanctions in section 2.5.

are discussed in the next section and other relevant frictions are discussed in Section 6. In general, corporations will not find it necessary to issue equity to pay liability, which in turn has troubling implications for collateral consequences and deterring corporate malfeasance.

2.5 Debt Covenants

Creditors recognize the debt-equity conflict and take steps to reduce the ability of shareholders to expropriate their wealth. The previous section explored the idea that the government could improve corporate liability by mandating equity issuances. This section explores the degree to which creditors will take steps to protect themselves from shareholders issuing debt and selling assets to pay liability. While covenants can provide some protection for creditors, debt covenants are necessarily incomplete, which leaves room for shareholders to pay liability in a way that harms other stakeholders.

Covenants are necessarily incomplete. Writing an optimal complete contingent debt contract is impossible. In some cases, covenants may effectively protect creditors, but in other cases they may be ineffective. If covenants are too weak, shareholders may easily expropriate creditors. However, if covenants are too strong, shareholders may lack the discretion to pursue actions that are mutually beneficial for both shareholders and creditors. The ex ante covenant decision weighs the potential agency conflicts against the potential mutual gains to shareholders and creditors from retaining flexibility.

While covenants provide a degree of protection, there is considerable variation between covenants in public and private debt. Private loan agreements generally have much stronger covenants (Nikolaev, 2010). Firms that issue private debt tend to be smaller, have less long-term debt, fewer tangible assets, and more volatile cash flows than those firms that issue public debt (Bradley and Roberts, 2015). Furthermore lenders may also issue secured debt, which gives them a stronger claim on the firm's assets than unsecured debt.

Public debt issuances, on the other hand, may place vanishingly few restrictions on the firm's behavior. As an example, consider the conditions placed on a $2 billion issuance of unsecured and unsubortinated debt to be traded on the New York Stock Exchange by British Petroleum.[38] The prospectus explicitly states that BP is "permitted to sell or lease substantially all of our assets to another corporation or other entity or to buy or lease substantially all of the assets of another corporation or other entity." Furthermore, the prospectus states that BP "may take these actions even if they result in a lower credit rating being assigned to the debt securities" and further that BP has "no obligation under the indenture to seek to avoid these results, or any other legal or financial effects that are disadvantageous to you, in connection with a merger, consolidation or sale or lease of assets that is permitted under the indenture." The prospectus for the debt issuance has a small number of restrictions. Short of reducing the amount due, changing the maturity, or changing the voting rules, creditors can only intervene in the event of a missed payment. It is notable that after this issuance, BP sold tens of billions of dollars of assets and the 10-year cumulative default probability of BP increased three-fold (van Deventer, 2015). Loan agreements like this provide no protection against asset sales by the firm. What explains these permissive terms? Investment grade bonds frequently rely more on the market's trust

[38] https://sec.report/Document/0001193125-14-391678/d811140d424b5.htm (last accessed May 3,2019).

of the firm's solvency rather than restrictive covenants. While higher-risk bonds typically have stronger covenants, Mellow (2017) reports that recent years have seen an erosion in the protective clauses in high-yield investors. This process of erosion even extends to bank senior bonds. Caiger-Smith (2017) reports that senior bank bonds increasingly omit acceleration covenants, removing the ability of investors to demand immediate payment except in the case of default.[39]

In this section, I first discuss the most relevant covenants when imposing corporate liability. In general, these covenants will provide a degree of protection for creditors. However, these covenants are insufficient to induce a sanctioned corporation to issue equity to pay for the full level of liability. I then consider how corporations may avoid violating covenants and discuss how the presence of covenants may actually exacerbate collateral consequences. Finally, I conclude the section by showing that in some cases creditors as well as shareholders may benefit from malfeasance, and creditors may therefore not insist on restrictive covenants that would limit the ability of shareholders to create mutual profits for the firm.

Importantly, I am not arguing that covenants are ineffective or unimportant. Instead, my purpose in this section is to illustrate that covenants do not fully protect creditors when liability is imposed upon the corporation. Creditors bear costs when liability is paid through asset sales or debt issuance. In order for shareholders to bear the full incidence of liability, the firm must issue equity to pay that liability. This section is meant to illustrate that covenants are generally insufficient to ensure that the firm pays *entirely* through an equity issuance, meaning that costs will be imposed on creditors.[40]

2.5.1 Relevant Covenants

I discuss three types of covenants that are particularly relevant to the imposition of corporate liability. First, debt covenants frequently contain restricted payments covenants that are meant to prevent shareholders from looting the firm by selling assets and using the proceeds to pay themselves dividends. In the absence of sanctions, such a restricted payments covenant only allows dividend payments if the firm is in a sufficiently sound financial position. However, once liability is imposed, asset sales can transfer value from creditors to shareholders *without* the need to pay dividends. The wealth transfer occurs through increasing the leverage and the riskiness of the firm, which benefits shareholders at the expense of creditors. Second, priority structure covenants restrict the type of future debt that can be issued by the corporation. Because the issuance of senior or *pari passu* debt can dilute existing creditors, these creditors may limit the ability of shareholders to issue debt. Third, covenants on asset sales are meant to prevent a corporation from selling a large portion of its assets and thereby threatening future cash flows. Finally, a balance sheet covenant may restrict the firm's leverage ratio.

[39] Economist (2019) reports that among leveraged loans, "covenant-light" loans make up around 85% of new issuances.

[40] This also means that employees will suffer collateral consequences.

Restricted Payments Covenants

Restricted payments covenants restrict the ability of shareholders to issue dividends or repurchase shares. In the absence of a restricted payments clause, shareholders could liquidate the corporation's assets and use the proceeds to pay dividends, leaving creditors with valueless claims. This provision is meant to ensure that creditors are paid before equity holders. Typically a restricted payments covenant does not forbid all payments to shareholders, but instead allows payments up to a threshold so long as the company is not in default.

A well-functioning restricted payments covenant prevents shareholders from paying themselves dividends funded by excessive asset sales. However, it does not prevent shareholders from limiting their losses through asset sales. As demonstrated in Section 2.3, shareholders can extract value from creditors by selling assets to pay down corporate liability. In this case, shareholders choice to sell assets or issue debt to pay corporate liability will not be in violation of a typical restricted payments covenant.

Asset Sales Covenants

Loan agreements will typically restrict the ability of the corporation to sell its assets. In the absence of such a covenant, creditors are concerned that shareholders will use the proceeds from asset sales to pay dividends. However, because corporations frequently buy and sell assets in the normal course of business, these covenants do not prevent all asset sales, but are instead focused on limiting potentially problematic asset sales.

An analysis of over 4,000 public bonds issued by U.S. industrial companies shows that 90% include restrictions on asset sales (Reisel, 2014). However these covenants do not generally prevent asset sales, but instead typically require that assets are sold at a fair market value, limit non-cash proceeds, limit asset sales to a particular value, or put limits on leverage following the asset sale. While these requirements will provide some protection, they may be ineffective at preventing the firm from selling assets to the benefit of shareholders. Even if assets are sold at fair market value (or even above fair market value), paying sanctions through asset sales can harm creditors.

Balance Sheet Covenants

Most fundamentally, covenants can address fundamental balance sheet variables, including leverage, net worth, and current Ratio. In principle, these variables can be used to ascertain the financial position of a firm and ensure that the firm remains in a viable financial position. For example, leverage is the ratio of total debt to total assets (or total net assets), and a covenant restricting leverage is meant to ensure that the corporation retains sufficient assets to pay its debts.

While more than 80% of loan agreements had balance sheet covenants in the 1996, only 32% did by 2007 (Demerjian, 2011). This change is attributed to the rise of new accounting standards including accounting for goodwill and fair value accounting. These approaches often entail making estimates about the value of the firm's assets and liabilities which introduces bias and error into the balance sheet. In response to the decline in the

use of balance sheet covenants, debt agreements are more likely to use income statement covenants (including interest coverage, fixed charge coverage, and debt-to-earnings) which are indicative of the firm's current-period profitability. Unlike balance sheet covenants that are meant to align the interests of creditors and shareholders, income statement covenants act as trip wires that shift control to creditors. However, even these fundamental accounting definitions can be altered to give borrowers more slack to take actions that may harm creditors. (Badawi and de Fontenay, 2019).

Priority Structure Covenants

By issuing new debt, shareholders can transfer expropriate value from shareholders (Section 2.2). To combat this, debt agreements may have covenants that restrict the issuance of subsequent debt. However, Reisel (2014) finds that only 25% of bonds include covenants that restrict the issuance of additional debt.[41]

Many firms issue debt at only one level of seniority, so all creditors are paid *pari passu*.[42] But while many firms issue debt of a single priority level, there is substantial heterogeneity in debt issuances (Ravid et al., 2015). In particular, high-credit-quality firms tend to issue only senior unsecured debt, while lower-credit-quality firms rely on multiple tiers of debt, including secured, senior unsecured, and subordinated unsecured debt (Rauh and Sufi, 2010). Of particular interest are "fallen angels"–firms that have been downgraded from investment grade to speculative grade–which move from having only senior unsecured debt to adding secured bank debt and subordinated debt after the downgrade. The increase in bank debt comes with much stricter covenants including increases in cross-default clauses, consistent with theoretical arguments that bank monitoring increases as a firm's credit rating decreases. However, while this new debt structure protects new creditors, it does not fully protect existing creditors.

2.5.2 Avoiding and Violating Covenants

The previous section illustrated that standard covenants will generally not be a complete bar to the sale of assets or the issuance of additional debts. However, this does not mean that covenants are meaningless. In many cases, shareholders will have some latitude to act while not violating covenants, but they may not have a completely free reign. In this section I discuss how shareholders can avoid violating covenants and conclude by considering the impact of violating covenants.

One channel through which shareholders avoid violating debt agreements is through weakening covenants. Recent empirical research has shown some of the effective limits of covenants. Over the past two decades there has been a significant rise in "covenant-lite" loans (Demiroglu and James, 2010). Ivashina and Vallee (2019) show that while covenants in principle restrict borrowers actions, issuers successfully take steps to weaken the scope of these restrictions. In particular, the authors show the widespread prevalence of "fine print"

[41] Reisel (2014) also finds that these restrictions have decreased over time.

[42] Using data on the issue of 162,593 public and private debt issuances from over 10,000 companies, (Ravid et al., 2015) show that 85% of firms issue debt at only one level of seniority. Of these, the majority issue debt only at the senior subordinated or senior level.

clauses that weaken fundamental negative covenants, which frequently provide shareholders with highly valuable options when the firm is distressed. For example, over 75% of firms with covenants that restrict Total debt/EBITDA to 5x are actually able to issue debt in excess of 6x later on. Badawi and de Fontenay (2019) demonstrate that fundamental accounting definitions such as EBITDA can be altered to give borrowers more slack to take actions that may harm creditors.

While shareholders can benefit from slack in debt agreements, they may also be able to take actions ex post to avoid violating covenants when they have run out of slack. For example, Admati et al. (2018) show that balance sheet covenants may in fact exacerbate the sale of assets when a firm is forced to recapitalize. Because junior debt can be repurchased at a relatively low price, the firm can sell additional assets in order to buy back a substantial amount of junior debt. So while a leverage covenant may limit the risk to creditors, it may exacerbate asset sales, thereby increasing the collateral consequences imposed on employees.

However, in some cases shareholders may violate covenants. The ramifications of doing so will depend on the specifics of the debt agreement. In some cases creditors can immediately take action, but public debt contracts often only require annual compliance certification (Kahan and Tuckman, 1993). In response to covenant violations, loan agreements have acceleration clauses that allow the lender to demand the immediate repayment of the principal and any accrued interest. However, creditors almost never accelerate the loan and instead relaxes the covenant that is in breach in exchange for a higher interest rate and/or new restrictions (Garleanu and Zwiebel, 2008; Nini et al., 2012). Finally, while violated covenants generally allow the lender to call in the loan, some agreements only allow the loan to be called in the event of insolvency (Caiger-Smith, 2017).

2.5.3 When the Interests of Creditors and Shareholders Align

Asset sales and debt issuances allow shareholders to shift some of the incidence of liability onto creditors. There are steps that creditors can take to protect themselves, but standard covenants do not provide full protection. One way that creditors could fully protect themselves is to insert a clause that stipulates that liability needs to be paid through equity issuances. This would effectively negate the need for the government to intervene. However, while creditors and shareholders disagree about how to pay liability *ex post*, both may benefit from malfeasance *ex ante*. In some cases, creditors may not find it optimal to restrict the ability of shareholders to engage in malfeasance.

Ex ante, creditors as well as shareholders can benefit from malfeasance. This is because, in the absence of liability, the profits that the firm makes from malfeasance increase the probability that creditors will be paid back. The following example shows that while creditors will prefer equity issuances *ex post*, they may profit from not insisting on equity issuances *ex ante*.

> **Numerical Example 4** (Aligned Interests): Suppose that a firm has an asset that returns 10 or 90, each with probability 50%. This means that the expected value of the firm is 50. Let the firm have outstanding debt with face value 30. The market value of debt is therefore 20 and the market value of

equity is 30.[43] Now suppose that shareholders can decide whether or not to engage in an an action that creates a benefit of 20 for the firm while imposing costs of 30 on society. The probability that the harm is detected is 60%. If the government detects the malfeasance, the fine will be 30.[44]

Suppose if liability is imposed, shareholders will use the proceeds from the malfeasance to pay the first 20 of liability, and will pay the remaining liability through a senior debt issuance. Creditors anticipate this, and can choose whether or not to impose a debt covenant that mandates that liability be paid through an equity issuance. This example illustrates that creditors will *not* impose the covenant. Consider the effects of imposing the covenant or not.

Senior Debt Issuance (no covenant): Suppose that the shareholder engages in malfeasance. There is a 50% chance that the malfeasance will not be detected, in which case the value of equity is 40 and the value of debt is 30.[45] If malfeasance is detected, the first 20 will be paid with the proceeds of malfeasance, and the remaining 10 is paid with senior debt, reducing the value of equity to 25 and the value of debt to 15.[46] The expected value of equity from engaging in malfeasance is therefore 31, and the expected value of existing debt from engaging in malfeasance is 21.[47] Therefore, shareholders will engage in malfeasance and both shareholders and creditors will profit in expectation.

Equity Issuance (covenant): Suppose that the shareholder engages in malfeasance. If malfeasance is detected, the first 20 will be paid with the proceeds of malfeasance. The covenant means that the corporation will pay the remaining liability of 10 through an equity issuance. The value of equity therefore drops to 20 and the value of debt remains at 20. In expectation, engaging in malfeasance decreases the value of equity to 28 and increases the value of debt to 24.[48] But because shareholders expect to lose money from engaging in malfeasance, they will not do so, so the value of equity will be 30 and the value of debt will be 20.

In the absence of a covenant, shareholders will engage in malfeasance, which will benefit both shareholders and creditors in expectation. When liability is imposed, creditors are worse off from senior debt issuances than they would be

[43] $V_E = \frac{1}{2}(0) + \frac{1}{2}(90 - 30) = 30$, $V_D = \frac{1}{2}(10) + \frac{1}{2}(30) = 20$.

[44] In this example, liability is set equal to harm. In principle, the liability should be increased based on the uncertainty of detection. Following Becker (1968), the optimal fine, in the absence of limited liability, is the ratio of the harm divided by the probability of detection: $f = \frac{h}{p} = \frac{30}{.6} = 50$. Significant multipliers on large fines are rare in practice, and even in the presence of multipliers, both creditors and shareholders can benefit in expectation from malfeasance.

[45] $V_E = \frac{1}{2}(0) + \frac{1}{2}(110 - 30) = 40$. $V_D = \frac{1}{2}(30) + \frac{1}{2}(30) = 30$.

[46] Because the asset always returns at least 10, the firm can issue senior debt with a face value of 10 that also has a market value of 10. This results in a value of equity of $V_E = \frac{1}{2}(0) + \frac{1}{2}(90 - 30 - 10) = 25$, and a value of existing debt of $V_D = \frac{1}{2}(0) + \frac{1}{2}(30) = 15$.

[47] Expected value of equity from engaging in malfeasance and paying with a senior debt issuance: $(40\%)(40) + (60\%)(25) = 31$. Expected value of existing debt from engaging in malfeasance and paying with a senior debt issuance: $(40\%)(30) + (60\%)(15) = 21$.

[48] Expected value of equity from engaging in malfeasance and paying with an equity issuance: $(40\%)(40) + (60\%)(20) = 28$. Expected value of existing debt from engaging in malfeasance and paying with a senior debt issuance: $(40\%)(30) + (60\%)(20) = 24$.

from equity issuances. However, creditors will not insist on equity issuances, because doing so would prevent shareholders from engaging in mutually profitable malfeasance.

This example illustrates that creditors can profit from malfeasance ex ante. Society cannot rely on private solutions to control malfeasance and pay liability. In order to achieve proper deterrence and to limit collateral consequences, the government has an interest in not just the size of corporate liability, but also in how that liability is paid.

3 Paying Liability: Collateral Consequences

The imposition of liability matters far beyond just the effects on investors. Corporations employ workers, contract with suppliers, and sell goods to employees. Entire communities may depend on a single dominant firm. The imposition of liability may cause collateral consequences far beyond the corporation's investors. Employees are affected through channels. First, employees may lose their jobs if the firm becomes insolvent. And second, employees may lose their jobs if the firm downsizes and sells assets.

3.1 Job Losses From Insolvency

One channel through which employees are affected when firms pay liability is through the increased chance of insolvency. Both debt issuances and asset sales increase a corporation's leverage, and thereby increase the probability that the corporation will become insolvent. The more that leverage is increased, the more likely insolvency will occur. Employees will therefore prefer that the corporation pays liability in a manner that does not affect leverage: an equity issuance.

Figure 3 gives a graphical representation of the means of paying liability on the probability of insolvency. This figure draws from numerical examples 1 through 3 and assumes a corporation with existing debt of 50 an asset that takes on a value of 80 ("low-value") or 120 ("high-value"), each with equal probability. But Figure 3 differs in the level of liability imposed on the firm. The horizontal axis represents the level of liability imposed, ranging from 0 to 100 (the expected value of the corporation's assets). The vertical axis represents the probability of subsequent insolvency given a particular level of liability. Each of the horizontal lines represents one of the five possible ways of paying the liability. In this example, the payment of liability will result in a probability of insolvency of 0%, 50%, or 100%.[49]

For example, suppose that a liability of 10 is imposed on the corporation. In this case, the probability of insolvency is 0, regardless of the method of paying sanctions. No matter the choice, the corporation will be able to pay all of its debts, even in the low-value state of the world. Next, consider a liability of 35. The firm can issue equity, which never affects the solvency of the firm. Asset sales also do not affect the probability of insolvency

[49] In this simple example, the probability of insolvency is always 0%, 50%, or 100% because the corporation's assets only take one of two possible values. In reality, firms' assets can take on a continuum of possible values, so the probability of insolvency would be continuously increasing in the level of liability.

for sanctions of 35. This is because, after selling 35% of its assets to pay liability, the corporation's returns are still sufficient to pay the outstanding debt, even in the low-value state of the world.[50] If the corporation issues debt to pay the liability, the probability of insolvency jumps to 50%. Because the corporation already has debt with face value 50 in place, it can issue additional debt with a face value of at most 30 before creating the risk of insolvency. Once the face value of new debt exceeds 30, the firm will be insolvent in the low-value state of the world.

Increasing the level of liability still further, there is a range in which equity issuances alone are able to maintain the corporation's solvency (37.5 to 50 in this example). But once liability reaches a certain level, it is no longer possible to issue equity to pay down the liability because the new shareholders cannot be promised a sufficient return to compensate them for investing. In this example, the maximum that can be raised through an equity issuance is 50. The same bound applies to junior debt issuances, because they will only be paid after the existing creditors are paid. Once liability is greater than 50, the firm faces a chance of insolvency and can only pay liability through asset sales, *pari passu* debt issuances, or senior debt issuances. At this point, the corporation's liabilities exceed its expected assets. Yet because shareholders are protected through limited liability, it is in their interest to keep the firm going and to *gamble for resurrection*.[51]

Figure 3 makes clear that equity issuances are weakly preferable to any other means of paying liability in terms of insolvency risk. For very low levels of sanctions, the corporation will remain solvent regardless of the choice of payment. And for very large levels of liability, insolvency is guaranteed. But for a substantial range of liability, equity issuances maintain the corporation's solvency while other means of paying the liability increase the probability of insolvency.

Because of the negative effects of insolvency, employees prefer that equity is used to pay sanctions. This preference is consistent with a growing body of empirical evidence showing the effects of leverage on employment. Aneja and Avenancio-León (2019) show that financial leverage acts as a transmission mechanism for unemployment in labor markets, with workers in highly-leveraged firms facing increased risk of unemployment. Furthermore, the authors find that leverage-related distress costs are disproportionately borne by disadvantaged groups. Giroud and Mueller (2015b) use firm-level data to show that counties with more highly-leveraged firms exhibit a significantly larger decline in employment following shocks than counties with less-leveraged firms. Giroud and Mueller (2018) find

[50] In the absence of asset sales, the assets return 80 in the low-value state of the world and 120 in the high-value state of the world. Selling sufficient assets to raise 35 reduces the returns by 35% to $(1-35\%)*80 = 52$ and $(1-35\%)*120 = 78$.

[51] In Figure 3, the corporation can raise up to 100 through senior debt, *pari passu* debt, or asset sales. However, frictions are likely to prevent the firm from raising this much. For example, to raise 100, the corporation could issue senior debt with a face value of 120. Because this new debt is senior to existing debt, it would completely wipe out the value of existing debt. But because insolvency is guaranteed for high levels of liability, existing creditors would likely force the corporation into bankruptcy proceedings in order to claim as much of the corporation's remaining assets as possible. Alternatively, fraudulent conveyance law would generally prevent the sale of all of the firm's assets (Baird, 2006). But while the corporation may find its alternatives restricted once insolvency is a near-certainty, it has much more freedom to take actions that impose moderate increases to the probability of insolvency.

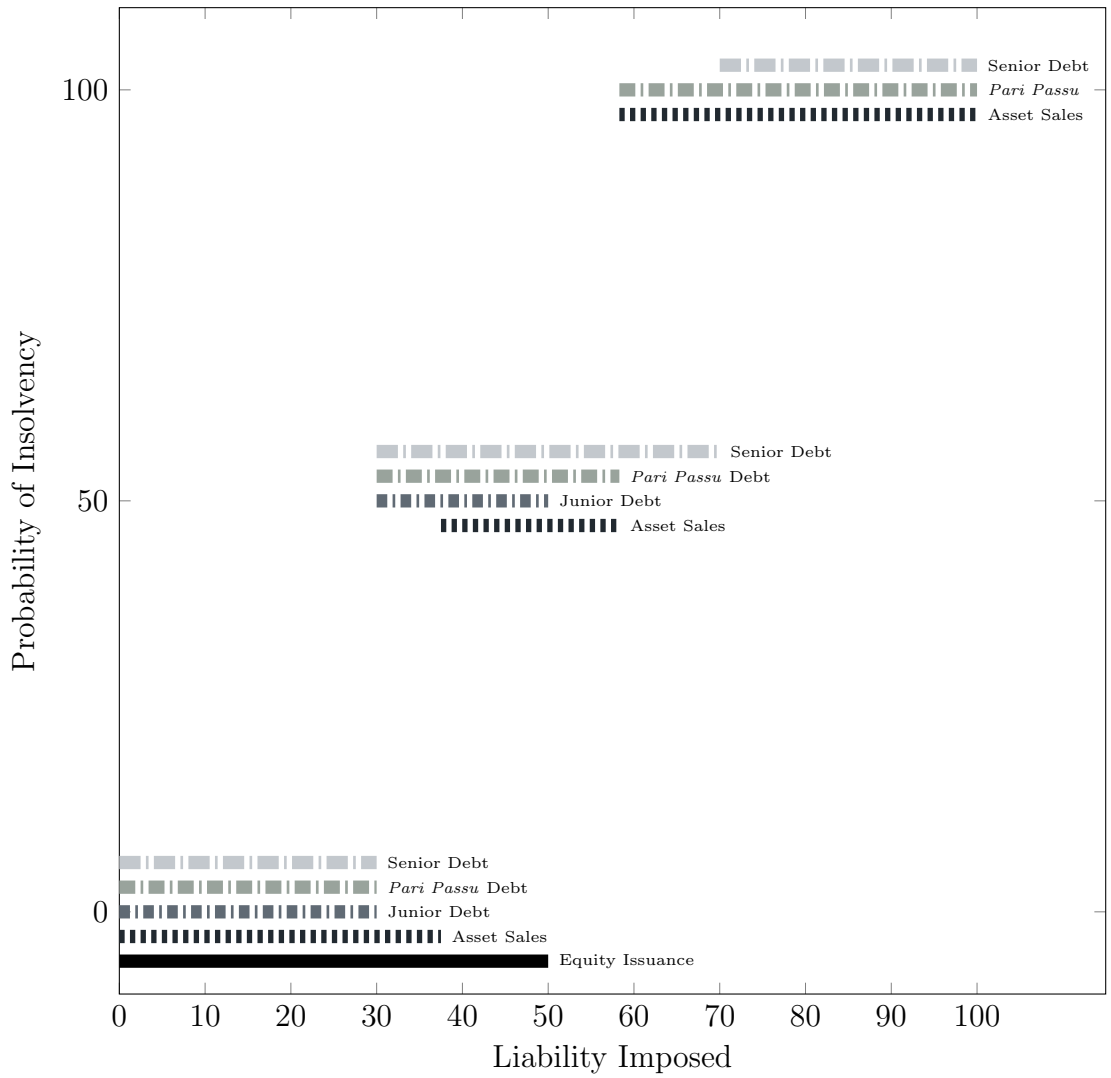

Figure 3: Insolvency Probability as a Function of the Method of Paying Liability.

that regional increases in firm borrowing are associated with boom-bust cycles, resulting in declines in medium-run employment. Giroud and Mueller (2015a) show that financially constrained firms pay for new investment opportunities by withdrawing capital and laying off workers. Finally Bernstein et al. (2018) find that employment declines substantially in the immediate neighborhood of liquidated establishments.

3.2 Job Losses From Asset Sales and Downsizing

Even when the firm that they work for remains solvent, employees may bear costs. Firms may manage a wide variety of revenue-generating assets including real property, intellectual property, equipment, inventory, marketable securities, and human capital. These assets require employees in order to generate revenue. When a firm sells assets, it no longer needs the employees who worked those assets. Some workers may be transferred to a new division, others may be able to get a position at a firm that buys the assets, and others may be able to find employment elsewhere. However, significant labor market frictions mean that asset sales will result in unemployment, and employees will prefer that firms pay liability in a manner that does not affect their employment.

Looking back to Figure 3, there are ranges of liability for which the probability of insolvency is the same for asset sales and debt issuances. If debt is issued, employees will be threatened when the assets return a low-value and the firm is insolvent. Similarly, asset sales can lead to insolvency. But if assets are sold, the employees who worked those assets may lose their jobs even if the firm remains solvent. Figure 4 shows the dual effects of asset sales on employees. The horizontal dotted lines reproduce those from Figure 3, and represent the probability of insolvency for a given level of liability. The downwards-sloping line represents the level of assets remaining given that the corporation has sold assets to pay liability. As the level of liability increases, the corporation must sell an increasing fraction of its assets, thereby laying off an increasing share of employees, even if the corporation remains solvent. And as asset sales get sufficiently high, those employees that were not laid off through asset sales face the prospect of insolvency and subsequent employment loss.

Paying liability through asset sales is bad for employees. Debt issuances expose employees to the prospect of future job losses, but are generally better than asset sales. Employees' clear preference for paying liability is through equity issuances. Because equity issuances simply introduces new residual claimants to the firm, they have no effect on most employees.

However, while employees who are motivated by employment clearly prefer that liability be paid through equity issuances, some employees may have other relevant motivations. In particular, employees may have stock options or employee stock ownership plans that may partially align their interests with shareholders. This is particularly true of the executives and managers who make the most important decisions for the corporation. However, concerns other than employment are likely to be concentrated among managers and high-earners. While there are roughly 15 million participants with am average of approximately $90 thousand invested in employee stock ownership plans in the United States,[52] the vast majority of workers do not hold equity positions in the firms that they work for, and the

[52]https://www.nceo.org/articles/statistical-profile-employee-ownership (last accessed April 27, 2019).

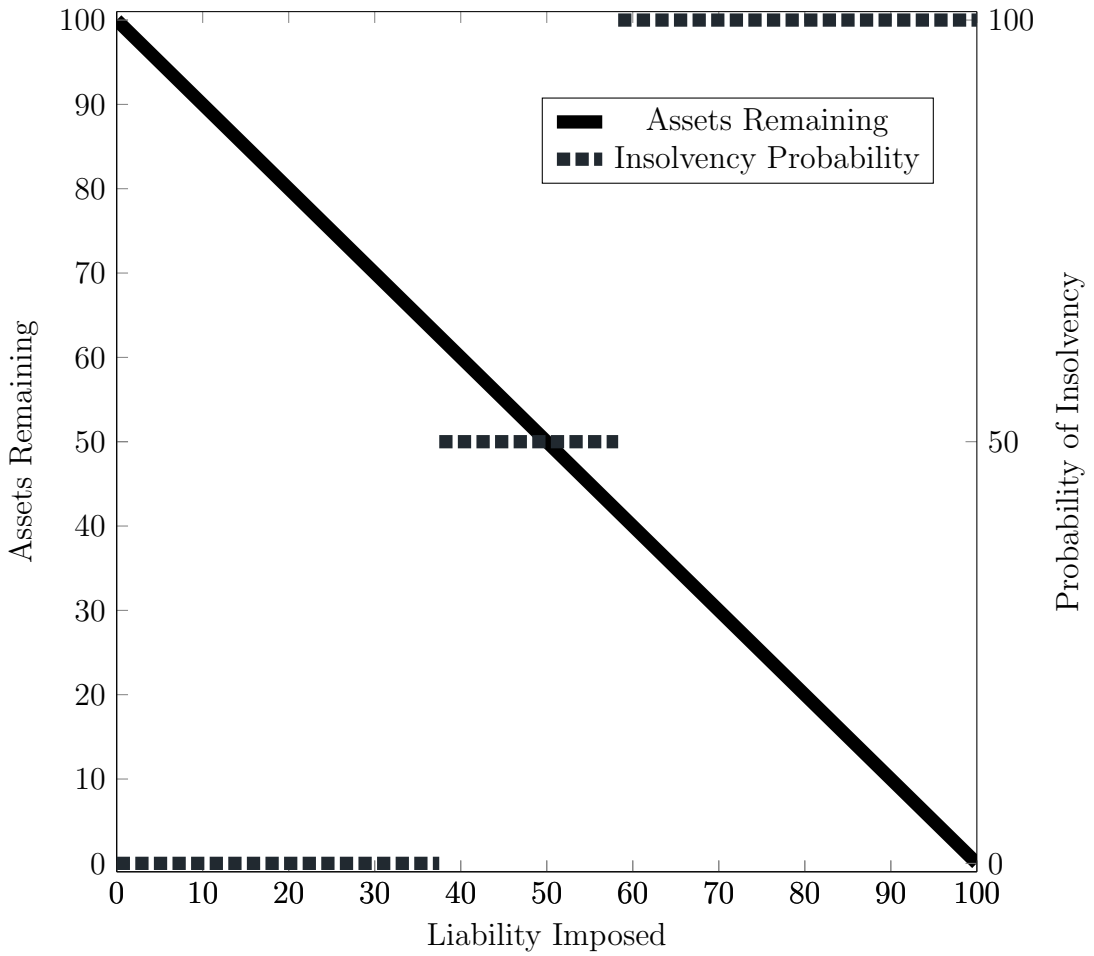

Figure 4: The Dual Effects of Asset Sales on Employees as a Function of Liability

majority of Americans do not hold equity in any company at all, meaning that most workers will have little direct interest in the value of their employer's stock.

There is the possibility that asset sales could be good for all corporate stakeholders. For example, if counterparties will no longer deal with the corporation because of some malfeasance, the assets may sell for more than their value to the selling corporation, and all stakeholders may benefit. However, it is also possible that assets may sell for a steep discount. I discuss the ramifications of these possibilities in Section 6.3.

Overall, there is empirical evidence consistent with the idea that employees suffer from asset sales. Financially distressed firms frequently restructure and make considerable operational changes (Jensen, 1989). Ofek (1993) shows a robust relationship between a firm's financial leverage and asset restructuring and employee layoffs following financial distress. Ofek (1993) further shows that distressed firms restructure assets in order to generate immediate cash to pay liabilities. Asquith et al. (1994) find that 83% of firms reduce capital expenditures, with company downsizing accounting for much of the reduction, and find that financially distressed firms that sell a large portion of their assets are less likely to file for bankruptcy than firms that sell little or no assets. Finally, Giroud and Mueller (2015a) study the effect of a positive economic shock at a plant on the capital and labor outcomes at other plants within the same firm. They find that financially constrained firms pay for the new investment opportunity by withdrawing capital and laying off workers at other plants within the firm. Importantly, because the distance between plants, it is unlikely that the firm is simply transferring employees between locations, and the decline in employment is greater than the increase in employment, giving evidence for the negative effect of asset sales on employees.

Given the negative effects of both debt issuances and asset sales on employees, only equity issuances offer a means of paying liability that is not socially costly.

4 The Inadequacy of Standard Sanctions

In Section 4.1 I explore the effect of how a corporation pays liability on deterrence. In order to be deterred, shareholders need to bear the costs of their actions. But when liability is paid through debt issuances or asset sales, shareholders only bear a fraction of the liability, undermining deterrence.

Finally, in Section 4.2 I discuss the tension between deterrence and collateral consequences. Given that shareholders are biased towards debt issuances and asset sales, liability imposes collateral consequences on employees. Furthermore, because shareholders only bear a fraction of the costs, the level of liability needs to be further increased in order to achieve proper deterrence. Decision therefore face a trade-off. Low liability limits collateral consequences but leads to underdeterrence, while high liability achieves deterrence while imposing high costs on employees.

4.1 Problem 1: Underdeterrence

A key takeaway from the theory of deterrence is that liability should be imposed at the level of the decision maker who engages in malfeasance. However, shareholders' resistance to

equity issuances means that they will only bear a fraction of the total liability imposed on the corporation. Shareholders bear the full incidence of liability only if the level of liability is less than the market capitalization of the corporation *and* the liability is paid through either an equity or junior debt issuance. If liability is greater than the corporation's market capitalization or is paid through either asset sales, *pari passu* debt, or senior debt, creditors will bear some of the incidence of the liability. This gap between the liability imposed and the liability borne by shareholders leaves room for corporations to take harmful actions that benefit shareholders at the expense of other corporate stakeholders and society more broadly.

In order for shareholders to internalize the harm that the firm caused, the sanctioning authority must take into account that shareholders will pay liability in a manner so that they will only bear some of the cost of liability. In general, in order to impose a particular cost on shareholders, the liability imposed on the corporation must be greater than the desired cost.

Figure 5 gives a graphical representation of this based on the same numerical example used above. The horizontal axis is the desired cost to be imposed upon shareholders. The vertical axis shows the level of liability required to impose the given cost on shareholders. The lines indicate the various methods of paying liability. First, note the solid black line that represents the liability required to impose a given cost given that the corporation pays through an equity issuance (or a junior debt issuance). This line is at 45°, because equity issuances ensure that shareholders bear the full incidence of sanctions.

However, things change when the corporation pays liability through senior debt, *pari passu* debt, or asset sales. For low levels of liability, all methods of funding are equivalent. This is because low levels of liability have only a minor effect on the prospect of insolvency.[53] But as liability increases, shareholders are able to transfer some of the incidence of liability onto creditors. This in turn means that the liability imposed must increase above the desired cost to be imposed on shareholders, so the liability required rises above the 45° line. Furthermore, as the desired cost increases, the level of liability required for shareholders to internalize that cost increases at an increasing rate. For very high levels of liability, shareholders are able to transfer a large fraction of the incidence onto creditors, so liability must be increased by a large amount. Given that they only bear a fraction of corporate liability, shareholders will therefore not internalize harm if liability is set equal to harm, even under certain detection.

Up to this point, I have discussed the ex post decision of how to set liability so that shareholders internalize the harm that the corporation has caused. I now turn to the question of shareholders' ex ante incentives to engage in malfeasance. The profitability of malfeasance will be determined by the prospective benefits and costs. And given the

[53] In Figure 5, the methods are equivalent. However this equivalency arises from the simplified nature of the numerical example. In the example, the firm's assets return either 80 or 120, meaning that the corporation's solvency is guaranteed up to a liability of 30 (see Figure 3). Therefore shareholders cannot benefit from their limited downside for small levels of liability. In reality, the distribution of asset returns are continuous, meaning that even relatively small levels of liability will affect the probability of insolvency. With asset returns that follow a distribution with continuous support (such as a normal distribution), the liability required for senior debt, *pari passu* debt, and asset sales will be strictly greater than that required for equity issuances for any level of liability.

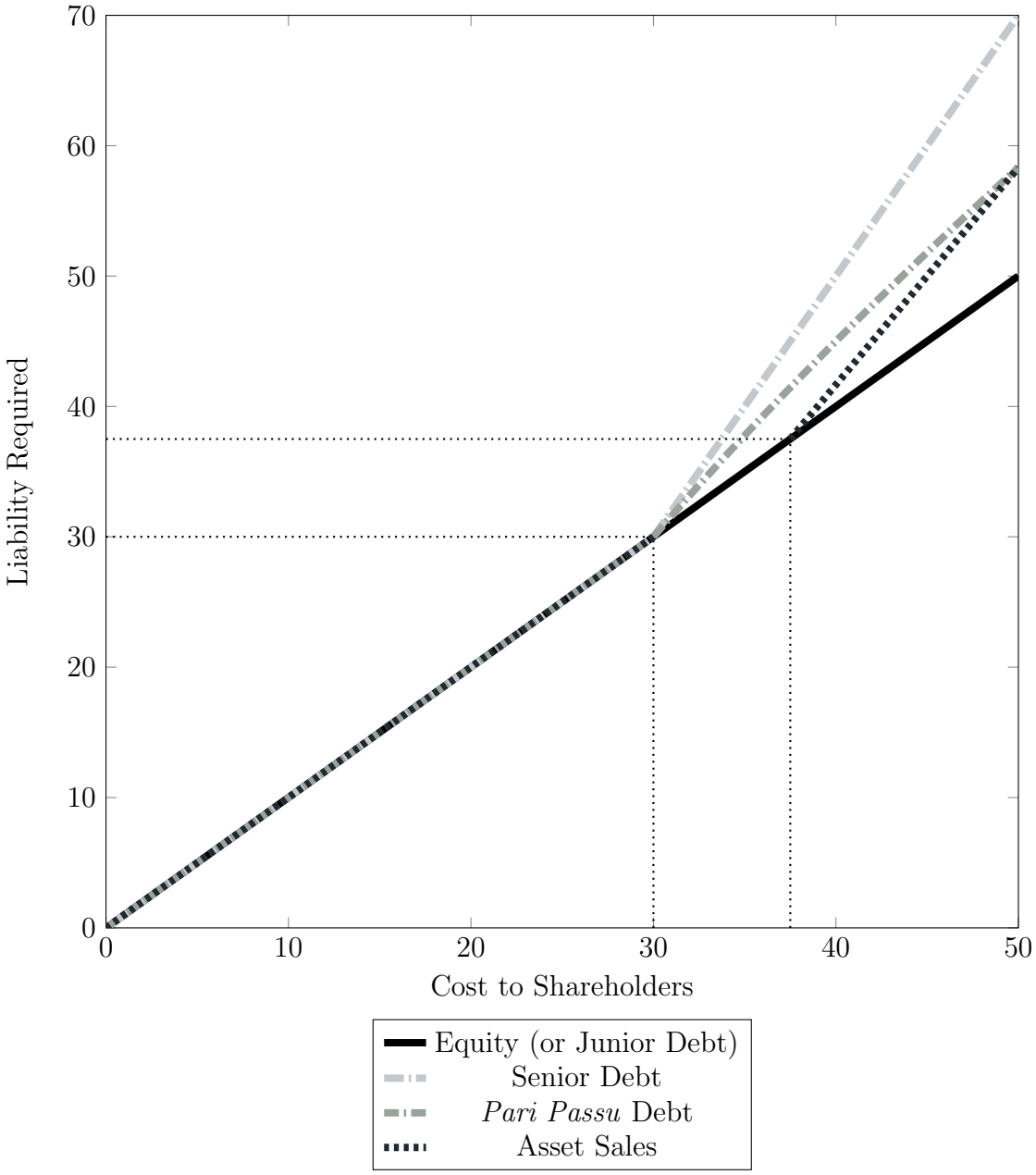

Figure 5: Liability Required to Impose a Given Cost on Shareholders

ability to pass on some of the incidence of liability to creditors, shareholders can gain from malfeasance even when the liability imposed is greater than the benefit to the corporation *and* even when the malfeasance is detected with certainty.

When malfeasance occurs, the corporation profits while simultaneously imposing costs on other parties. But while shareholders may benefit from malfeasance, other stakeholders may as well. If undetected, the benefits of malfeasance decrease the chance of insolvency, thereby benefiting not only shareholders, but also creditors and employees. However, once the malfeasance is detected and liability is imposed, the corporation will be forced to disgorge its profits. But because shareholders choose how the proceeds from malfeasance are spent and how the corporation pays liability, they are in a unique position to benefit from malfeasance.

The simplest case to consider is when the corporation's benefit is equal to the harm imposed, and the liability is set equal to the harm. If the malfeasance is immediately detected and liability is immediately payable, there is no scope for shareholders to benefit from the wrongdoing. But in general there is substantial delay between from the time that a corporation engages in malfeasance to the time of detection, and further delay from the time of detection to the time that liability is imposed.[54] During this period, the corporation will have higher cash flow than it would otherwise have had. What does the corporation do with these proceeds? There are at least four options: (i) the corporation may pay shareholders dividends, (ii) the corporation may reduce debt, (iii) the corporation may retain the money as cash, or (iv) the corporation may invest the money. *How* the corporation uses the cash windfall will determine who bears the benefits and costs of malfeasance and subsequent liability.

First consider the case of dividend payments (or, equivalently, share repurchases). If all of the proceeds are used to pay dividends, shareholders will capture the full benefits of malfeasance. Furthermore the corporation's capital structure will remain unchanged. And because shareholders only bear the full incidence of liability if the liability is paid through an equity or junior debt issuance, shareholders will benefit from malfeasance so long as they can pay some of the liability through *pari passu* debt, senior debt, or asset sales.

Instead of returning the money to shareholders through dividends, the corporation could return the money to creditors through retiring debt. In order to buy back debt, the corporation needs to offer a price such that, on the margin, creditors are indifferent between selling or retaining their debt.[55] Creditors will benefit when the corporation retires debt. But shareholders will not. When a corporation retires debt, shareholders lose some of their default option: there were previously states of the world in which creditors were not paid in full but where they are now paid. This in turn lowers the value of equity, so shareholders should resist retiring debt.

The corporation may retain the proceeds as cash. Before liability is imposed, this increase in the corporation's cash holdings will boost the stock price and will also increase the probability that creditors will be paid pack, benefiting both shareholders and creditors. After liability is imposed, the large cash holdings mean that the firm is at a low risk of insol-

[54]For example, it took over 30 years for DuPont to pay $670 million for releasing a toxic chemical in the 1980s (Shapira and Zingales, 2017).

[55]This holdout effect is discussed in Frenkel et al. (1989) and Bulow and Rogoff (1990).

vency (relative to the imposition liability without the additional cash holdings), benefiting creditors. While retaining the proceeds of malfeasance as cash can benefit shareholders, doing so effectively transfers money to creditors relative to using the proceeds to make dividend payments.

Finally, the corporation may invest the proceeds from malfeasance. The effects of investment on the costs and benefits of malfeasance will depend on the specifics of the investment. Creditors will prefer safe investments that maximize the probability of solvency. But because shareholders have an unlimited upside and a limited downside, they will benefit from relatively risky investments. Shareholders may even benefit from risky investments with a negative expected value, because the creditors will bear much of the cost of these investments.

Given these options, shareholders will benefit most from using the proceeds of malfeasance for dividend payments and new investments, and less from retaining cash or retiring debt. Blanchard et al. (1994) provide empirical evidence for what corporations do with large cash windfalls that supports the above arguments. They find that corporations return a significant fraction of the money to shareholders through share repurchases. Corporations do not retire debt following cash windfalls. Instead, most firms significantly *increase* their long term debt levels following the windfall. While a significant portion of the windfall is paid directly to shareholders, the majority of the windfall is kept inside the corporation where it is used to make new investments. However, these investments are very risky and fail at a high rate, suggesting that most corporations do not use the award to create value.

Shareholders have ample scope to profit from malfeasance, even when it is detected with certainty. Any proceeds that are paid out to shareholders while the firm is solvent are generally out of reach from creditors, tort victims, and the government.[56] Alternatively, new investments that increase the riskiness of the corporation will benefit shareholders ex ante. Once malfeasance is detected, a corporation can pay liability in a manner that shifts some of the incidence of liability away from shareholders and onto creditors.

In principle because creditors will frequently bear costs of liability, this could mean that creditors would monitor the firm in order to prevent malfeasance. However, imposing costs on creditors is unlikely to further the goal of deterrence. While creditors can intervene at firms after covenants are breached, they otherwise have little scope for exerting control. Furthermore, if malfeasance is not detected and sanctioned with certainty, creditors can benefit ex ante. I discus these issues in Section 2.5.

Corporations regularly take harmful actions with impunity. And in those instances where corporations are found liable for malfeasance, the liability is often less than the harm caused. Only in a fraction of cases do corporations actually pay liability equal to the harm caused. This insufficient sanctioning of corporate malfeasance has troubling implications for society. But this section has drmonstrated that things are worse than this: even when our justice system is working as we think that it *should*, detecting and imposing liability on all harmful actions, shareholders and corporations can profit at others' expense.

[56]There are exceptions to this. Fraudulent conveyance law allows creditors to object to value-reducing transactions that leave a firm insolvent or with an "unreasonably small" level of capital (Baird, 2006). In particular, fraudulent conveyance law prevents insolvent corporations from paying dividends, but dividends paid before insolvency are much less likely to be recaptured by creditors.

4.2 Problem 2: The Deterrence-Collateral Consequences trade-off

The previous section shows that in order to properly deter shareholders, standard monetary liability must generally be greater than the harm caused. But because imposing liability will create collateral consequences for creditors and employees, the imposition of standard liability leads to a trade-off between deterrence and collateral consequences. Depending on the situation, the decision to impose liability and the magnitude of those sanctions will be made by a judge, jury, prosecutor, regulator, or politician. The fear of collateral consequences may undermine deterrence.

In Appendix A I provide some data in support for the proposition that fines are adjusted downwards due to the fear of collateral consequences. Data from the United States Sentencing Commission show that at least 372 solvent firms have had their criminal fines reduced since 2002 because of a perceived inability to pay all of a portion of the fine. This provides plausible support for the proposition that decision makers regularly revise down sanctions in order to maintain the solvency of firms.

There is a direct trade-off between deterrence and collateral consequences. In the absence of any sanctions, the firm's solvency is not threatened, so there are no collateral consequences. However, the absence of sanctions also means that shareholders are not deterred from engaging in malfeasance. Increasing sanctions will improve deterrence, but will also lead to job losses. However, as discussed in the previous section (and shown graphically in Figure 5), in order to achieve proper deterrence, sanctions must be greater than the harm caused. But this has the effect of further increasing the collateral consequences on employees. So while it is possible to set sanctions so that shareholders internalize the harm caused, doing so is very costly from a societal perspective.[57] A sanctioning decision maker therefore faces a difficult trade-off.

There is every reason to believe that corporations can exploit the fear of collateral consequences. Airlines that are financially distressed receive greater concessions in labor negotiations than non-distressed firms (Benmelech et al., 2012). Towner (2016) finds that indebted firms are able to extract more surplus from bargaining with non-financial stakeholders, who are reticent to extract too much value from the firm for fear of jeopardizing solvency and threatening future returns. But not only can firms benefit from fears of existing debt, Matsa (2010) shows that firms strategically increase leverage in order to improve their bargaining position against workers. While there is no empirical evidence of the effect of fear of collateral consequences on the magnitude of sanctions, the same forces should be at play.

Should decision-makers take collateral consequences into account when sanctioning firms? Decreasing sanctions based on collateral consequences may help mitigate losses to third parties, but also may undermine the very goals of imposing sanctions in the first place. Determining the optimal trade-off between these two forces is beyond the scope of this paper. However, the next section shows that sanctions can be imposed in a way

[57] However, if the costs imposed on creditors and employees from the firm's asset sales are factored into the harm, the level of sanctions would have to be increased still further in order for shareholders to internalize the harm.

that imposes the full incidence of sanctions on shareholders and eliminates collateral consequences, thereby avoiding any need to balance interests.

5 Mandating Equity Issuances

The previous sections paint a bleak picture of corporate malfeasance. When liability is imposed, shareholders will only pay a portion of that liability, undermining deterrence. Furthermore, employees will suffer from liability, even though there is little that most could have done to prevent malfeasance. Given shareholders resistance to equity issuances, liability must be increased in order for shareholders to internalize the harms caused. However, this imposes further collateral consequences on employees. And because decision-makers will be reticent to impose liability on corporations for fear of corporate insolvency and collateral consequences, shareholders will face even less deterrence. A potential solution to these problems is to require that corporations pay liability by issuing new equity.[58] Doing so solves the fundamental problems raised in Section 4.

First, recall that standard corporate liability leads to underdeterrence.[59] Under standard liability, shareholders will be biased towards paying fines through asset sales and debt issuances, bearing only some of the incidence of the liability. In order for shareholders to bear a particular level of liability, standard sanctions must be increased beyond that level. The precise amount of the increase will depend on a variety of factors including how the corporation will pay liability (e.g. debt or asset sales), the corporation's current capital structure, and the corporation's prospective earnings. Furthermore, any increases in standard liability will lead to increases in collateral consequences.

Mandating that corporate liability be paid through an equity issuance solves the problem of underdeterrence. An equity issuance means that the full incidence of corporate liability falls on shareholders. This in turn greatly simplifies the problem of calculating the level of liability to impose. If decision makers wish to impose a particular level of liability on shareholders, they can simply impose that level of liability. Furthermore, achieving the correct level of liability no longer leads to collateral consequences for employees.

Under standard liability, employees' jobs are threatened given that the firm may downsize or become insolvent. But mandating that liability be paid through equity issuances means that shareholders alone bear the costs of corporate of liability, and no collateral consequences are imposed on others. This allows decision makers to impose fines that are far larger than feasible under the standard approach. Consider again the case of Beazer Homes, which was sanctioned $50 million for mortgage fraud in 2009. At the time of the

[58] Coffee (1980) first recognized some of the benefits of forcing corporations to issue stock, but only briefly analyzed the case before dismissing it as a possibility "which has little chance of political adoption." Furthermore, the lack of a model limits the precision of his arguments. For example Coffee recognizes that the issuance of new equity results in shareholders bearing the costs. But he also contradicts this by arguing that, because equity issuances do not increase the chance of insolvency, "[t]hus, even as to the stockholders, there is a marginal degree of superiority associated with fines levied in securities over fines levied in cash." However, this is directly contradicted by my results, and if shareholders prefer equity issuances, mandating an equity issuance would be superfluous because shareholders would choose to do so themselves.

[59] See Section 4.1.

fine, Beazer's market capitalization was approximately $150 million.[60] Even this modest fine could have threatened Beazer's solvency and employees' jobs. But an equity issuance would have allowed the government to impose a fine of up to Beazer's $150 million market capitalization without threatening the firm's solvency or employees.

Imposing a monetary fine on a company that is a significant portion of its market capitalization will threaten its solvency. For this reason, the United States Sentencing Guidelines explicitly allow for downwards adjustments to fines in order to "avoid substantially jeopardizing the continued viability of the organization."[61] The equity issuance removes the need for decision makers to weigh deterrence against collateral consequences and thereby reduces the reticence to impose sanctions.[62] Without the fear of insolvent creditors and laid-off workers, decision makers are more likely to impose the correct level of sanctions, aligning shareholders' interests with society's.

Mandating equity issuances confers significant advantages. The remainder of this section considers the implementation of such a policy in more detail. First, I move beyond the incentives of shareholders to consider the incentives of the managers and directors who oversee corporations. Next, I show that shareholders cannot easily undo equity issuances by repurchasing shares. And finally, I consider the mechanics of mandating equity issuances and the legal ramifications.

5.1 The Incentives of Directors and Managers

This paper has assumed that decisions are made by shareholders (or in the interest of shareholders). However, while shareholders are the ultimate authorities, their control is largely delegated to directors who in turn delegate power to managers. Understanding the effect of a mandatory equity issuance therefore requires understanding the incentives of directors and managers.

Shareholders elect directors to manage the affairs of a corporation. Boards of directors do not manage the corporation, but instead advise and oversee the management of the corporation. In principle, directors have duties to act in the interest of the corporation, but this is often interpreted in practice to mean that directors have a duty to act in the interest of shareholders.[63] Furthermore, survey evidence shows that directors frequently believe that they have a duty to maximize shareholder value (Rose, 2007). And because directors generally must approve equity issuances,[64] directors can be expected to oppose actions that will lead to equity issuances that are costly for shareholders. Mandating

[60] https://www.macrotrends.net/stocks/charts/BZH/beazer-homes-usa/market-cap

[61] USSG §8C3.3(b).

[62] However, many decision makers are wary about even imposing costs on shareholders. For example, in the case of a fine against Barclays for violating international sanctions, the presiding judge asked of the fine: "Who pays that? Does that come out of the shareholders?[...]There's no alternative source of income to pay for this?[...]Why should the shareholders have to pay for the Bank's irresponsibility? I don't understand that" (Garrett, 2014).

[63] For example, see *Revlon Inc. v. MacAndrews & Forbes Holdings, Inc.* 506 A.2d 173 (Del. 1985), in which the Delaware Supreme Court held that [a] board may have regard for various constituencies in discharging its responsibilities, provided there are rationally related benefits accruing to the stockholders.

[64] Delaware General Corporation Law §152.

equity issuances ensures that directors cannot choose to pay sanctions in ways that benefit shareholders but are socially costly.

While directors oversee corporations, managers are the most important force in the day-to-day operations of the firm. These managers may work to further their own compensation rather than shareholders' interests. Studying the manager-shareholder agency conflict has been a driving question in corporate finance and corporate governance over the past half century, and the primary solution to the managerial agency problem has been to tie managerial compensation to financial measures. Managerial compensation is typically a combination of a salary, bonus, and stock-based incentives. The bonus and stock-based incentives are meant to get managers to internalize shareholders' preferences. In recent decades, there have been dramatic increases in stock-based pay, and the sensitivity of executive pay to shareholder returns has increased substantially (Tirole, 2010).

Managers who are compensated based their firms' profits can benefit from malfeasance that benefits shareholders.[65] When liability is imposed on a firm, a self-interested manager will pay the sanctions in the manner that maximizes her own well-being. Given that the majority of large corporations have executive compensation plans with a stock-based component, (Huang et al., 2014), these managers, like shareholders, will generally favor selling assets to pay sanctions.[66] The avoidance of equity issuances means that managers internalize less of the cost of sanctions than they would if the sanctions were paid through an equity issuance. So mandating equity issuances can be expected to better deter malfeasance by managers.

Furthermore, even if a manager's pay were maximized by equity issuances, a manager still might refrain from issuing equity because of faulty perceptions by investors. The textbook view of equity issuances is that earnings are not diluted following an equity issuance if a firm earns the required return on the new equity (Modigliani and Miller, 1958). However, there is a common view among executives that share issuance dilutes earnings (Graham and Harvey, 2001) or that "equity is expensive" (Admati et al., 2013). To the extent that investors (and managers) do not properly understand dilution, managers may face an additional penalty from issuing equity, which may help to better deter malfeasance.

The effectiveness of the mandatory equity issuance would further increase in closely held firms or in dual-class firms where insiders obtain private benefits from control (Grossman and Hart, 1980). Using the exchange of controlling blocks in 39 countries, Dyck and Zingales (2004) estimate that the average value of control is 14% of the equity value of the firm. This preference for control means that closely held firms would be even more biased away from equity issuances and towards asset sales. A mandatory equity issuance would dilute insider ownership and control, giving controlling shareholders stronger incentives to refrain from malfeasance.[67]

[65] However, managers will generally be tenure-motivated as well, meaning that they may trade off the potential financial benefits of malfeasance against the possibility that they will lose their position.

[66] In fact, because much managerial pay is in the form of options, managers may have even stronger preferences for selling assets and increasing leverage than typical shareholders.

[67] For example, Mark Zuckerberg controls roughly 60% of Facebook's vote despite only owning about 20% of its shares (Seetharaman and Horwitz, 2019). Given Zuckerberg's wealth and his clear preference for retaining control, even a substantial monetary fine may not be enough to deter him from malfeasance, whereas a mandatory equity issuance could threaten his control and give much stronger incentives.

5.2 Repurchasing Shares

Shareholders have a clear preference for issuing debt and selling assets rather than issuing equity. This raises the following question: will shareholders, following a mandatory equity issuance, immediately issue debt or sell assets and use the proceeds to repurchase the newly-issued shares?

First, note that if shareholders could profit from issuing debt or selling assets and repurchasing shares after the equity issuance, they could have done so before. Shareholders' incentives to loot a leveraged firm by selling assets to buy shares are *always* present, which is why creditors take steps to protect themselves. Covenants aim to restrict the actions that may benefit shareholders at the expense of creditors. For example covenants may limit dividend payments, restrict share repurchases, ban affiliated transactions, require that loans be earmarked for specific purposes, or require minimum standards of insurance coverage. In the absence of these covenants, shareholders would often find it in their interests to expropriate value from creditors, even in the absence of a mandatory equity issuance. If these covenants were effective at preventing expropriation before the equity issuance, they should remain effective afterwards.

Furthermore, market forces may discourage further equity repurchases. Under the prominent static trade-off theory of capital structure, firms' capital structures are determined by a trading off the costs and benefits of more debt. If a firm's capital structure was optimal before sanctions were imposed, that capital structure should remain optimal after the equity issuance. While sanctions diluted shareholders, it did nothing to change the firm's fundamental capital structure. So if it was not optimal for the firm to change its capital structure before liability, it is still not optimal for the firm to do so after liability is imposed.[68]

While covenants and market incentives will limit the repurchase of newly-issued shares, the government can take further steps to limit share repurchases. Most fundamentally, the firm could be restricted from repurchasing shares or paying dividends for some period of time or until some financial milestones are met. Alternatively, the government could require that the equity be issued through a general issue in the secondary market instead of a rights offering. In a rights offering, current shareholders are given the first opportunity to buy the new shares, whereas in a general issuance the shares are sold on the open market to any buyers. Mandating a general issuance dilutes the original shareholders. So if the firm does repurchase shares, the original shareholders will only capture a fraction of the gains, thereby eliminating a share repurchase as a means of completely undoing the mandatory equity issuance.

5.3 The Mechanics of Mandatory Equity Issuances

Mandatory equity issuances can be implemented in both civil and criminal cases. They can be implemented at the conclusion of a trial by a judge, through a civil settlement, or

[68] Admati et al. (2018) show that firms' capital structures are unlikely to be explained by a series of firm-value maximizing choices, but instead that capital structures will evolve over time based on shareholders' preferences. However in this case, the mandatory issuance of equity has no real effect on the decisions available to the firm.

through a criminal deferred-prosecution agreement. This section briefly sketches out how decision makers might implement mandatory equity issuances.

In civil cases, courts cam implement remedies through legal or equitable relief. While legal relief, consisting of damages, is the presumptive form of relief in most cases, equitable relief allows courts to impose injunctions and coercive remedies on the defendant (Dobbs, 1993). This injunctive relief could be used to mandate equity issuances. In criminal cases, the United States Sentencing Guidelines instruct judges on how to sentence organizations. And while monetary fines are the principal means of sanctioning corporations, the USSG also provides that the court can direct the organization to make an in-kind payment to the victim or organization other than the victim.[69] Furthermore, judges can also impose probation and mandate that corporations satisfy conditions prescribed by the court.[70] If these conditions are violated, the court may impose a master or trustee to ensure compliance.[71]

While judges should have the tools to implement mandatory equity issuances, most cases settle before trial. In these cases, the corporation engages into a settlement agreement with a regulator or prosecutor. While settlement agreements could require equity issuances, shareholders would resist issuing equity. In order to induce compliance, regulators may be able to threaten the revocation of a corporation's charter, and prosecutors may threaten prosecution. However, settlement would hinge on the credibility of the threat, and the amount of the equity issuance may be less than would be ideal. However, even if shareholders resist paying liability through equity issuances, there is scope for a Pareto improvement in which shareholders agree to reduced liability that is paid through an equity issuance.[72]

Importantly, the government does not need to calculate the price of the new equity or the number of shares that the corporation must issue. The government can simply order that the corporation raise a given amount of money through an equity issuance. It would the be up to the corporation to determine the details of the equity issuance and to submit proof to the government.[73] The government would give the corporation some amount of time to comply, but because the the process of a secondary offering is much faster than initial public offerings, the deadline would likely be a matter of months.

Because the corporation's shares are already traded, pricing the equity issuance will be much simpler than pricing an initial public offering. The price for the issuance will effectively be set by the market. The prospect of an equity issuance will reduce the value of outstanding shares, as investors anticipate that their shares will be diluted. For example, suppose that there is a corporation worth $100 that is entirely funded by 100 shares of equity. Therefore each share is worth $1. Now suppose that shareholders anticipate that the

[69] USSG §8B1.1(d).

[70] USSG §8D1.1, §8D1.3(c).

[71] (USSG §8F).

[72] A Pareto improvement is a reallocation in which at least one party is made better off without making any other parties worse off. To see the possibility of a Pareto improvement, begin by supposing that standard monetary liability is imposed on a firm. This will result in shareholders bearing some cost less than liability. Now suppose that the liability is simultaneously reduced and paid through an equity issuance. This allows the same cost to be imposed on shareholders, but removes collateral consequences. However, while this would eliminate collateral consequences, it would not affect the problem of underdeterrence.

[73] The corporation would then hire an investment bank to manage the details of the equity issuance.

corporation will need to raise \$60 through an equity issuance to pay liability. The share price will drop to \$0.40 *before* any equity is issued. This price reflects the market's understanding that the corporation is going to raise \$60 through an equity issuance. Therefore, at \$0.40 per share, the corporation will be able to issue 150 shares to raise \$60. The prospect of attracting new investors effectively allows the market to set the price of the mandatory equity issuance. After the issuance, there will be 250 shares outstanding at a price of \$0.40 per share, meaning that the value of the corporation remains at \$100.

Faced with corporate malfeasance, the government has a number of options. The status quo under certain enforcement, supported by the literature, is to impose a monetary fine equal to the harm caused. But this has the effect of under-deterring shareholders and imposing collateral consequences. If a monetary fine is imposed, shareholders will only internalize the harms imposed if the liability is set greater than the harm caused, but this results in even greater collateral consequences. Imposing liability and mandating equity issuances alleviates the problems of under-deterrence and collateral consequences, and is the best solution for corporate malfeasance.

6 Reintroducing Frictions

The main analysis established that shareholders are biased towards asset sales and debt issuances and that social welfare could be improved by mandating that liability be paid through equity issuances. I kept the institutional details simple in order to focus on the most important forces. In Section 2.5 I considered the possible effects of covenants. This section extends the discussion of frictions further. I discuss potential frictions including the costs to issue equity, information asymmetries, alternative asset prices, and more general theories of capital structure. In general, reintroducing these frictions strengthens the main results of the paper.

6.1 The Costs of an Equity Issuance

This paper has argued that mandating equity issuances would improve the deterrence effects of corporate liability while eliminating the collateral consequences. In section 2.5 I discussed why covenants alone will not induce corporations to pay liability through equity issuances. In this section I have reintroduced financial frictions to show the robustness of the advantages of equity issuances in paying corporate liability. In this section, I conclude by addressing the question "would an equity issuance ever be socially undesirable?"

One potential disadvantage of equity issuances is the direct cost of issuing equity. Underwriting fees in seasoned equity offerings range between 3% and 8% of proceeds (Eckbo et al., 2007).[74] The flotation costs of debt are generally less than that for equity—Lee et al. (1996) find that costs are 7.1% for secondary equity offerings versus 3.8% for convertible debt and 2.2% for straight debt. However, while flotation costs for debt are low, most debt

[74] When a security is issued, investment banks raise money on behalf of the corporation. As an underwriter, the investment bank acquires the security from the corporation and sells it to the end investors. Because the underwriter takes the risk of selling the securities, the underwriter charges an "underwriting spread" between the price it pays the corporation and the price is sells the security for.

has a life of less than 10 years (Eckbo et al., 2007), meaning that a firm that relies on debt will need to incur repeated rounds of flotation costs.

6.2 Information Asymmetries

An additional cost of equity issuances is that there is a negative effect on the share price of between -2% and -3% upon the announcement (Eckbo et al., 2007). This evidence is consistent with theories of information asymmetry and adverse selection. Myers and Majluf (1984) show that when managers have superior information, their choice to issue equity signals something about the future profitability of the corporation. If managers act in the interests of current shareholders, they will be reluctant to issue shares when they think that the corporation is undervalued. New investors will anticipate this and the share price will go down upon the announcement of the equity issuance. However, the negative price effect of the equity offering depends critically on the ability of the manager to choose whether or not to issue equity. If the corporation is forced to issue equity, there will be no signaling effect. The only decrease in the value of the shares will therefore be the *desirable* liability imposed on shareholders.

6.3 Alternative Asset Prices

The value of assets to those within and outside of a corporation are not always equal. In some cases, a corporation may only be able to sell its assets at a loss, making asset sales relatively less attractive to shareholders. In other cases, a corporation may actually be able to sell assets for more than they are worth to the corporation, making asset sales relatively attractive to both shareholders and creditors. In this section I consider both of these cases and how the sale price of assets affects the desirability of asset sales for both shareholders and other stakeholders.[75] In general, equity issuances remain the most socially-desirable means of paying liability.

First consider the case where the corporation can only sell assets at a loss. This may occur because potential buyers may not value the assets as much as the firm, there may be liquidation costs to sell assets, or industry-wide distress may depress prices. Regardless of the reason, there is ample theoretical and empirical evidence for why shareholders and managers may engage in inefficient reorganization decisions (Bulow and Shoven, 1978; White, 1980; Gertner and Scharfstein, 1991; Aghion et al., 1992; Hotchkiss et al., 2008). If assets are sold at a discount, shareholders will benefit less from asset sales. If this discount is large enough, shareholders may even prefer equity issuances to asset sales. However, even if asset sales are inefficient there is scope for shareholders to profit from asset sales rather than security issuances.[76] The scope of the discount will determine whether shareholders

[75] Ideally, assets should be put to their most efficient uses. So a firm that is distressed but efficient should continue to operate, while a firm that is distressed and inefficient should transfer its assets to areas where they have higher uses. The inefficiency of liquidating some efficient firms while not liquidating inefficient firms is explored in White (1989).

[76] To see this more clearly, consider Numerical Example 3, where shareholder utility from asset sales was 60% higher than shareholder utility from an equity issuance. In the context of this example, the discount on assets would have to be 10% before an equity issuance is preferable to asset sales.

will resort to asset sales. However, even if a corporation cannot profitably sell assets, it is likely to look to issuing debt before it considers issuing equity to pay liability.

Alternatively, the corporations' assets may be less valuable inside the corporation than they would be outside of the corporation. One reason for this is that, depending on the type of malfeasance, corporations may bear reputational penalties.[77] Customers, suppliers, employees, and other counterparties may no longer want to deal with the offending corporation. This can lower the value of assets so long as they stay within the corporation. Therefore the corporation may be able to profit from selling assets, making asset sales relatively more appealing to shareholders and to society more broadly as a means of paying liability.

However, it would still be socially desirable for the corporation to pay liability through an equity issuance because of the difficulty of distinguishing between welfare-increasing asset sales and welfare-decreasing asset sales. If the corporation is free to sell assets to pay liability, shareholders can profit from both welfare-increasing and welfare-decreasing asset sales, as shown in Section 2.3. But suppose instead that the firm is forced to issue equity to pay liability. Doing so would impose the incidence of liability on shareholders, but would do nothing to preclude the corporation from also engaging in asset sales. Critically, as discussed in Section 5, the equity issuance means that shareholders cannot profit from asset sales that threaten the solvency of the corporation. But shareholders, and others, can still profit from welfare-increasing asset sales. For example, suppose that after the corporation's malfeasance, there is an asset that loses nearly all of its value for the corporation, but would be valuable to other firms. After an equity issuance, shareholders will have an incentive to sell this distressed asset, benefiting themselves as well as creditors. The mandated equity issuance has the effect of better aligning the incentives of shareholders with creditors and society more broadly when it comes to asset sales.

6.4 Optimal Capital Structure

This paper has explored a corporation's choice of how to pay liability in the frictionless environment of Modigliani and Miller (1958). The advantage of this approach is that it shows shareholders' preferences in the absence of frictions. However, scholars have demonstrated many frictions, and most theory on capital structure falls into one of two paradigms (Myers, 1977). The *trade-off* theory of capital structure argues that firms balance the costs and benefits of debt towards an optimal capital structure. The *pecking order* theory argues that because of adverse selection, firms will favor retained earnings, followed by debt, and only will rely on equity in extreme cases. This section briefly considers the role of mandatory equity issuances in the context of these two theories. For a broader treatment of these theories and empirical evidence see Frank and Goyal (2008).

First, consider the trade-off theory. If the corporation was at the value-maximizing leverage ratio before liability was imposed, an equity issuance would keep the firm at the

[77] Karpoff and Lott Jr (1993) find a significant reputational drop in share prices following corporate fraud. Alexander (1999) show that criminal allegations can lead to suspended or terminated customer relationships. However, Karpoff et al. (2005) find no apparent reputational penalty for environmental violations.

optimal leverage ratio. However, while an equity issuance would be the best choice for firm value, shareholders will still resist equity issuances. Admati et al. (2018) show that in a dynamic trade-off model, shareholders will resist issuing equity, even when doing so would increase the value of the firm. So while a debt issuance would decrease the value of a firm that had an statically optimal leverage ratio, shareholders will generally prefer debt issuances to equity issuances in the context of the trade-off theory of capital structure. Under the trade-off theory, mandatory equity issuances have the added benefit of increasing the value of the firm relative to debt issuances.

Under the pecking order theory, corporations resort to equity issuances only when absolutely necessary. The main version of the theory (discussed in Section 6.2) is that managers will only issue equity if the firm is undervalued, so the choice to issue equity is a negative signal about the firm. This in turn means that the corporation will need to sell equity at a relatively low price. If there is uncertainty about the corporation's prospects, the pecking order theory implies that the corporation will prefer debt issuances to equity issuances. A mandatory equity issuance would take away the choice of funding, which would remove the negative signaling effect of equity issuances.

7 Discussion

This paper has shown that firms' capital structures have important consequences for the incidence of sanctions related to corporate malfeasance. With debt in place, firms that act in the interest of shareholders will pay sanctions by selling assets, thereby increasing leverage and imposing costs on employees. Importantly, shareholders will only bear a portion of sanctions, meaning that standard fines will underdeter corporate malfeasance. Importantly, this paper has shown that under standard sanctions, shareholders can profit from malfeasance even when it is detected and sanctioned with certainty. And because standard liability imposes costs on innocent third parties, decision makers face the difficult job of balancing deterrence and collateral consequences.

In principle, creditors and employees could anticipate corporate malfeasance in advance and could take steps to protect themselves. If creditors charge higher interest rates because of the expected effects of asset sales, then the cost of capital will increase above its efficient level. Introducing stronger debt-to-equity ratio or no-asset-sale covenants in loan agreements may protect creditors to an extent, but they are not a panacea. Furthermore while these covenants may help in the event of corporate misconduct, they may impose even greater costs in normal operating times. While these covenants protect some of the creditors' interests ex post, it still keeps shareholders from internalizing the full cost of the harms that they cause. Furthermore, even strong covenants protected by debt acceleration clauses only provide modest protection, and these covenants may increase the costs for unprotected creditors and the collateral harms to employees.

Employees have even less opportunity to protect themselves than do creditors. While employment contracts provide a measure of protection, most employees can be fired without much difficulty. While employees should, in principle, take actions to monitor the firm and prevent corporate malfeasance, the majority of employees who will be adversely effected

by asset sales are not in the position to monitor corporate malfeasance. Executives and managers with stock options benefit the most from corporate malfeasance, yet their jobs tend to be more secure than rank-and-file employees, and even when these managers lose their jobs, they tend to have better employment prospects.

And after malfeasance has occurred, those responsible for sanctioning the corporation often fail to effectively do so. The justice department explicitly tasks prosecutors to take collateral harms into account. Sentencing guidelines encourage downwards adjustments to fines if a firm's viability is threatened. Many agencies are tasked with taking the firm's financial condition into account when determining fines. It is admirable that these decision makers take the welfare of employees, creditors, shareholders, and communities into account. However, this concern with collateral consequences undermines justice and the effectiveness of deterrence.

This paper has offered a solution for the problems of insufficient internalization of harms by shareholders and the fear of collateral consequences: in some cases decision-makers should require that firms pay sanctions through equity issuances. Doing so has two effects. First, it induces shareholders to fully internalize the results of their actions. And second, it eliminates collateral harms, thereby reducing the reticence of prosecutors, regulators, and judges to impose large fines on corporations.

In order to capture stakeholders' fundamental motivations, this paper has considered firms' choices in the frictionless setting of Modigliani and Miller (1958). This led shareholders and creditors to be indifferent between debt and equity financing. However, this may change in the presence of frictions such as tax-subsidized debt and bankruptcy costs. Admati et al. (2018) show that shareholders are predisposed to increasing leverage in a manner that expropriates value from creditors. This force implies that firms may rely on both asset sales and debt issuances to pay sanctions. This is particularly relevant in cases where assets would be sold at a discount, because it still leaves room for shareholders to pass costs to creditors.

This paper presents a number of avenues and challenges for empirical work. This paper predicts that a firm's market capitalization will decline by less than imposed sanctions, and the value of debt will fall as well. However, because decision-makers may be concerned about collateral consequences, sanctions may be adjusted downwards (Garrett, 2014; Racz, 1997). Appendix A provides some preliminary stylized facts from corporate criminal sentencing, but understanding the degree to which decision-makers adjust sanctions downwards for fear of collateral consequences is a promising avenue for future research. And while some work has been done on firms rationally engaging in malfeasance (Shapira and Zingales, 2017), the extent to which firms can and do engage in malfeasance that is likely to be detected is unknown.

A key message of this paper is that firms' financing decisions have important implications outside of areas that are traditionally related to finance and corporate law. While increasing shareholder value is often associated with increases in firm value, that is not always the case. Shareholders can take actions that decrease firm value while increasing shareholder value. This paper illustrates that shareholders, not the corporation, are the ultimate principals. When deciding how to combat corporate malfeasance, society must take into account the realities of the corporate form. It is shareholders who are ultimately

in control of corporations, and by overlooking this fact, the present system of dealing with corporate malfeasance fails to achieve its desired ends.

A Data on Corporate Criminal Sanctions

In this appendix I use data from the United States Sentencing Commission (USSC) to examine whether corporations have their fines reduced because of a fear of collateral consequences. In the next section I review the United States Sentencing Guidelines (USSG) for organizations. In Section A.2 I discuss the data that I have collected and provide some stylized facts.

A.1 Organizational Sentencing Guidelines

Sentencing of organizations is guided by Chapter 8 of the U.S. Sentencing Guidelines. When an organization is sentenced, the court must first, when possible, order that the organization remedy harm caused by the offense, where the remedy may consist of a restitution order, remedial order, probation, community service, or an order of notice to victims.[78] Second, the court determines the fine to be imposed on the organization.[79]

The court begins by determining the base fine in one of three ways.[80] First, the court calculates the organization's "offense level," based on the specific offenses that the organization committed.[81] The offense level is then converted to a monetary amount using the offense level table.[82] Second, the court uses the pecuniary gain to the organization from the offense. And third, the court uses the pecuniary loss caused by the organization, to the extent that the loss was intentionally, knowingly, or recklessly caused.[83] Whichever of these three values results in the greatest base fine is applied.[84]

After the court determines the base fine, the organization's culpability score is calculated.[85] Aggravating and mitigating factors including willful ignorance, prior history of misconduct, the existence of a compliance program, whether the organization self-reported the offense, and whether the organization accepted responsibility for its conduct. The culpability score is then used to calculate minimum and maximum multipliers,[86] which are then used to calculate guideline fine range.[87] The guideline range is then combined with any statutory minimums or maximums, and the final range is determined.[88]

Importantly, the organizational sentencing guidelines provide an avenue for a reduction of the fine based on inability to pay so long as "reduction under this subsection shall not

[78] USSG, Ch. 8, intro. comment.

[79] USSG §8C1.1 provides special rules for organizations operating primarily for criminal purpose. These are a small fraction of the total, and the court is tasked with setting a finr sufficient to divest the organization of all of its assets.

[80] USSG §8C2.4.

[81] USSG §8C2.3.

[82] USSG §8C2.4(d)

[83] USSG §8C2.4(a)(1)-(3), comment.

[84] Data on how the base fine is determined is missing in approximately 40% of observations. Among populated observations, 72% of base fines are determined by the offense level table.

[85] USSG §8C2.5

[86] USSG §8C2.6

[87] USSG §8C2.7

[88] USSG §8C3.1

be more than necessary to avoid substantially jeopardizing the continued viability of the organization."[89] What constitutes "substantially jeopardizing" is not explicitly stated.

Finally, while the organizational sentencing guidelines provide a range penalties, courts may depart from this range. Some factors that may be worthy of departures are set out in the organizational guidelines.[90] But this list is not exhaustive and departures may be warranted if "that there exists an aggravating or mitigating circumstance of a kind, or to a degree, not adequately taken into consideration by the Sentencing Commission in formulating the guidelines that should result in a sentence different from that described."[91]

However, while the above process applies to sentencing by a court, the vast majority of cases conclude with a plea agreement rather than a trial. When a plea agreement includes a specific sentence, the court may accept the agreement if the sentence is within the applicable range;[92] or if the sentence is outside the appicable guideline range for justifiable reasons.[93] So while judges have less control over fines in plea agreements than in trials, the sentencing guidelines are still applicable.

A.2 Stylized Facts on Corporate Sanctions

I have argued that there exists a trade-off between deterrence and collateral consequences. The anecdotal evidence and Justice Department memoranda discussed in Section 4 suggest that fines may be set lower than they otherwise would be due to the fear of these collateral consequences. To examine whether this is empirically plausible, I use data collected by the USSC. The primary mission of the USSC is to promulgate and amend the federal sentencing guidelines discussed in the previous section. However, the USSC also is tasked with research and data duties.[94] The commission collects data from sentencing documents that are required to be sent directly from federal courts within 30 days of the entry of judgment in a criminal case.

I collect data on sentences imposed on organizational offenders, including corporations, non-profits, and governmental organizations (e.g. public entities or public service corporations) for fiscal years 2002 through 2018. Because the focus of the analysis is on business firms, I drop non-profits and governmental organizations. I further drop observations with missing data, leaving a sample of 1,748 observations. Table 2 gives summary statistics for the data.

The summary statistics confirm that the vast majority (91%) of cases are resolved by plea bargains rather than through trial. This is in line with research by Garrett (2014, 2019) on the decline of corporate prosecutions. Furthermore, a full 27% of organizations are defunct at the time of sentencing.

The base fine used in calculating the guideline range is highly skewed, with a mean base fine of $10.9 million and a median base fine of $350,000. Unfortunately the data do not include the precise value of the fine imposed, but only one of three bins. However, despite

[89] USSG §8C3.3.
[90] USSG Ch.8, Pt.4, intro. comment.
[91] 18 U.S.C. §3553(b).
[92] USSG §8B1.2(c)(1).
[93] USSG §8B1.2(c)(2).
[94] The research and data duties are described in 28 U.S.C. §995(a)(12) through (16).

Variable	Mean
Guilty Plea	0.912
Defunct at Sentencing	0.269
Base Fine	$10.9 million
(Base Fine Median)	($350,000)
Fine Imposed	
$0 to $99,999	.656
$100,000 to $999,999	.220
$1,000,000 or more	.124
Restitution Imposed	
$0 to $99,999	.766
$100,000 to $999,999	.15
$1,000,000 or more	.084
Fine Reduced Because Inability to Pay	0.402
Among Defunct Firms	0.706
Among Solvent Firms	0.290
Final Sentence Below Guideline Range*	0.0942
Observations	1,748

**Notes:* Because of data issues, it is not possible to determine whether a sentence is below the guideline range for all observations, so the reported statistic is only for the 70% of observations for which it is possible to determine this.

Table 2: Summary Statistics on Corporate Sentencing

that the base fine is greater than $350,000 in half of the cases, 65% of firms are imposed a fine that is less than $100,000. Table 2 also reports summary statistics on restitution imposed, but there is no way from the data to tell whether or not this is an adequate level of restitution.

The key variable of interest is whether the fine was reduced because of an inability to pay all or a portion of the fine. This reduction is authorized by USSG §8C3.3. In this sample, 40.2% of firms had their fines reduced because of an inability to pay. However this includes both solvent and defunct firms. Restricting attention to solvent firms, a full 29% of firms have their fines reduced. Unfortunately, there is no clean way to estimate the extent to which the fines were reduced or what reduction was necessary to maintain the solvency of the firm.[95]

Alexander et al. (2000) point out two areas of concern in the Commission's data. First, they show that a substantial number of cases seem to be missing from the data. Second, they point out that important variables are not included in the data. Whether there are still a significant number of missing observations in the data is beyond the scope of this study. However, even if a significant number of observations are missing, the data are still useful in shedding light on the question of whether sanctions are lowered because of the fear of collateral consequences. As Table 2 shows, 29% of fines imposed on solvent firms are reduced because of concerns about the firm's ability to pay. Given the concerns raised by Alexander et al. (2000), this number should not be taken as an unbiased estimate of the population mean. However, this works out to 372 solvent firms that had fines reduced because of an inability to pay from 2002 through 2018, which provides plausible evidence that prosecutors and courts take firms' financial condition into account.

Finally, note that the data in this section only captures criminal sentences. However, the results of this paper apply more broadly to any judgment that must be paid by a corporation. According to the Corporate Research Project of Good Jobs First's Violation Tracker, 83 of the largest 100 fines imposed on corporations since 2000 are civil in nature. Regardless of why a firm must pay sanctions, the fear of collateral consequences may lead to inadequate deterrence.

[95] A small minority of observations have a text field explaining the financial condition of the firm at the time of sentencing. Examples include "seizure of assets put company in jeopardy", "lost revenue since instant offense", and "very few assets."

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