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WORKING PAPER NO. 00-1

OPTIMAL FINANCIAL CONTRACTS FOR LARGE INVESTORS:

THE ROLE OF LENDER LIABILITY

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OPTIMAL FINANCIAL CONTRACTS FOR LARGE INVESTORS: THE ROLE OF LENDER LIABILITY

Abstract

Our paper explores the optimal financial contract for a large investor with potential control over a firm's investment decisions. We show that an optimally designed menu of claims for a large investor will include features resembling a U.S. version of lender liability doctrine, equitable subordination. This doctrine permits a firm's claimants to seek to subordinate a controlling investor's financial claim in bankruptcy court, but only under well-specified conditions. Specifically, we show that this doctrine allows a firm to strike an efficient balance between two concerns: (i) inducing the large investor to monitor, and (ii) limiting the influence costs that arise when claimants can challenge existing contracts in bankruptcy court.

Our paper also provides a partial rationale for a financial system in which powerful creditors do not generally hold blended debt and equity claims.

**OPTIMAL FINANCIAL CONTRACTS FOR LARGE INVESTORS:
THE ROLE OF LENDER LIABILITY**

1. Introduction

In the United States, institutional investors have increasingly replaced individual investors as the main conduit for channeling funds to firms, and according to recent research by La Porta, et.al. (1999), large investors with significant stakes in firms are the norm rather than the exception throughout the world. Especially in light of pervasive regulations limiting the types of financial claims that large investors may hold, it is natural to ask about the optimal structure of the financial claim for an investor with potentially significant influence over the firm. This is the focus of our paper.

In particular, we examine the role of lender liability[1] and focus on a U.S. variant of lender liability, *equitable subordination*, a legal doctrine that permits a firm's claimants, such as bondholders, trade creditors, or even stockholders, to petition the bankruptcy court to subordinate a controlling investor's financial claim.[2] Following the security design approach, we ask whether equitable subordination might arise as part of an optimal contracting scheme, and we find that an optimally designed menu of claims for a powerful investor will, indeed, include features that resemble equitable subordination. An essential feature of the doctrine is that it assigns different standards of liability to different types of financial claims, with the standard of liability determined by the type of control

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[1]We use the term "lender liability" to address a creditor's potential fiduciary responsibilities to the borrower's other claimants. We do not address a creditor's legal liability for tort claims against its borrower, for example, whether a bank that takes land as collateral should be responsible to clean up buried toxic wastes.

[2]One benefit of our focus on U.S. lender liability doctrine is that there is a large body of case law and legal discussion that helps to discuss the law as it is practiced; thus, we feel confident that we are not examining a law that exists only on the books. Despite our focus on U.S. legal doctrine, we believe our model has more general application. According to Westbrook, "Far more often, the other country's law does address the problem, but under a different name, with a different focus, and perhaps a different 'title' of its statutes...[V]irtually every developed country has rules protecting against abuses by corporate insiders, even if they are part of corporate (company) law rather than insolvency law and even if they are not called 'equitable subordination.' That these doctrines are not found in insolvency law hardly means that they are not equivalent." p. 17 (footnote 61).

associated with the claim. Thus, the firm can make an efficient choice of its influential investor's standard of liability along with other features of the investor's claim.

Our model is simple. There are two types of contracts: rule-driven contracts and discretionary contracts.[3] Rule-driven contracts (imperfectly) limit the powerful investor's discretion to choose among actions that affect the likelihood that the firm will face liquidation. Discretionary contracts explicitly allow the investor to choose any action, unconstrained by contract.

Equitable subordination is a mechanism that permits the firm to choose between two distinct legal rules, one for discretionary contracts and one for rule-driven contracts. The optimal legal rule for discretionary contracts maximizes the influential investor's incentive to monitor by making the investor's payoff in liquidation *state-contingent*, penalizing the investor by subordinating his claim when his actions lead to an inefficient liquidation. In our model, only a costly court investigation can enforce state-contingent payoffs, and these costs must be weighed against the efficiency gains from greater monitoring. At the outset, we emphasize that the costly court investigation is a simple modeling device that represents a wider class of influence costs that arise if claimants are permitted to challenge existing contracts whenever things turn out poorly.

The optimal legal regime for rule-driven contracts concedes that ex post inefficient outcomes are an inevitable feature of inflexible rules, and the optimal rule-driven contracts are *noncontingent*, without the need for costly investigations. To the informed investor with a rule-driven contract, the doctrine of equitable subordination, in effect, provides a safe harbor against subsequent claims by other investors who may have been harmed by actions that led to liquidation. This preserves the firm's and investor's ability to agree to rule-driven financial contracts in the first place.

Our paper makes two main contributions to the literature on optimal security design and

[3]Williamson (1988) distinguishes between debt and equity as two different corporate governance mechanisms, one rule-driven and one discretionary.

financial system architecture.[4] For the most part, the literature on security design assumes that control of economic assets or decisions is assigned in a straightforward way by contracts—through voting rights or through other contractual clauses such as covenants.[5] Our model introduces the possibility that different types of contractual control may be viewed very differently by the legal system. Indeed, some forms of influence that would clearly be viewed as economic control by theoretical models are not defined as control at all by the legal system. We argue that this legal distinction between different types of control expands the menu of contractual instruments in an efficient way and increases agents' ability to make commitments.

Our model also provides a partial rationale for a legal system that promotes *specialization* in the holding of debt claims by powerful creditors, as well as one in which creditors are reluctant to take an active management role in distressed firms.[6] Holding a blended debt-equity claim or intervening closely in the management of a distressed firm places a creditor in a grey area of the law, in which there is no

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[4]Allen and Winton (1995) and Shleifer and Vishny (1997) survey the security design literature and Thakor (1996) and Allen and Gale (2000) survey the system architecture literature. In part, our paper belongs in one branch of the literature that treats the bankruptcy mechanism as an object of security design. Other papers in this literature include Harris and Raviv (1995), Kalay and Zender (1997), Berkovitch, Israel, and Zender (1998), Berkovitch and Israel (1999), and Cornelli and Felli (1998).

[5]Aghion and Tirole (1997) draw a distinction between formal control, which is assigned by contract, and actual control, which requires adequate information to make a decision (as well as the contractual right to do so). This distinction is also employed by Burkhart, Gromb, and Panunzi (1997) in their discussion of the design of equity contracts to allocate control between managers and investors.

[6]Fear of equitable subordination is widely believed to be an important reason banks in the U.S. are wary of taking an active management role in their borrowing firms, especially firms in distress. See, for example, Roe (1994), p.194. Indeed, practitioner discussions often include lists of dos and don't s for bankers with loans outstanding to firms in financial difficulty, with an eye to avoiding subsequent claims for subordination of the bank's claim. See for example Bauch (1987), Johnson and Gaffney (1990), and Watson (1980). James (1995) documents that banks are unwilling to take equity positions in distressed firms—even when legally permitted to do so—particularly when the bank's claim is secured and there are other public bondholders. Kroszner and Strahan (1999) provide evidence that concerns about lender liability make banks less willing to sit on the boards of directors of borrowing firms in the U.S.

truly safe harbor from fiduciary responsibilities.[7] This rationale complements previous work by Berglof and von Thadden (1994) and Dewatripont and Tirole (1994), who explain specialization by creditors as a mechanism for imposing hard budget constraints on management, and Berlin, John, and Saunders (1996), who view a specialized lender (with a pure debt claim) as best equipped to promote coordination among the claimants of a distressed firm.

Our paper proceeds as follows. In Section 2, we provide some background on the doctrine of equitable subordination. In Section 3 we describe the model, and in Section 4 we derive the optimal menu of contracts. Section 5 contains our main results, showing the correspondence between the contractual governance structure (discretionary versus rule-driven) and the legal structure (state-contingent versus noncontingent payoffs in bankruptcy). In Section 6, we conclude and discuss directions for future research.

2. Equitable Subordination

Equitable subordination—a doctrine first formally enunciated in the late 1930s—permits the court to subordinate the claims of corporate insiders to those of other claimants in bankruptcy proceedings.[8] The key problems for the courts have been to define: (i) those conditions in which an investor may be

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[7]As stated by Chaitman (1984): "When a bank exposes itself to a finding that it improperly exercised control over a borrower corporation, it risks the subordination of its *entire* claim against the borrower. Factual determinations as to the dollar extent of injury to creditors caused by an overreaching bank are difficult, time-consuming, expensive, and probably speculative at best. Hence, when faced with a scenario of serious impropriety, a bankruptcy court is likely to react by subordinating the bank's entire claim." (emphasis added).

[8]The original cases are *Taylor v. Standard Gas & Electric Co., 306 U.S. 307 (1939)* and *Pepper v. Litton, 308 U.S. 295, 310 (1939)*. The principle is codified in Section 510(c) of the Bankruptcy Code, but the code is intentionally vague about when courts should apply the doctrine, leaving the resolution of this question to the evolution of case law. Here, we don't attempt to give a full account of the history of equitable subordination, but, instead, we distill its main elements for modeling purposes. While we believe that our account gives a fair picture of the consensus view, we don't do justice to the differences of interpretation and emphasis to be found in judicial decisions and in the legal literature. Useful references about equitable subordination and lender liability include Watson (1980), Chaitman (1984), DeNatale and Abram (1985), Fischel (1989), Dickens (1987), Karg (1991), French (1995), and Koh (1998).

held responsible for harm to other claimants, and (ii) the types of actions that would justify subordination.

Insiders, such as directors, managers, and dominant shareholders, have traditionally been held to a fiduciary standard, but powerful nonmanagement creditors have not traditionally been held to have a strict fiduciary relationship to other firm claimants.[9]

An investor who "controls" the firm *may* be held responsible for harm to other claimants, although the prerequisites for being viewed as a controlling investor have evolved with the case law. Other than being an insider, there is no single characteristic sufficient to identify an investor as a controlling investor. Instead, courts typically look for multiple indicators of control.[10] However, the courts have consistently held that a creditor exercising its *contractual* rights—including "sharp practices" that place the creditor's interests before those of other claimants—will *not* be viewed as a controlling investor, so long as the contractual agreement flows from an "arm's length" relationship.[11] In this sense, the loan contract provides a safe harbor against any claim for equitable subordination, as long as the creditor's actions can be seen as straightforward attempts to enforce contractual clauses.

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[9]"A premise underlying commercial transactions between banks and their borrowers is that a creditor owes no special duty to its debtor. Moreover, one creditor owes the other creditors of the debtor no fiduciary or contractual duty. When the relationship is solely that of creditor-debtor, and the trustee or other creditor challenges the claim of a nonmanagement creditor, the party must prove substantial inequitable conduct." (Dickens, 1987).

[10]See Karg (1991, pp. 450-451): "Among the more weighty factors indicating control are: rights to a controlling interest in the debtor's stock, coupled with a use of those rights to coerce the debtor into acting to the detriment of other creditors; actual ownership of a controlling interest in the debtor's stock; a merger of identity between debtor and creditor; unreasonable, arbitrary, and unwarranted exercise of control; joint control of the debtor's bank accounts requiring the creditor's signature for all substantial checks; placing employees of the creditor as directors and officers of the debtor; participation of the creditor's employees in the day to day operation of the debtor; loan agreements with provisions that are not within industry standard and provide the creditor with control exceeding the industry norm; and coercing the debtor into executing security agreements after it becomes insolvent."

[11] "[The Bankruptcy] Code nowhere says that a creditor may not protect his investment in accordance with the security and loan agreements." (*In re Clark Pipe & Supply Co. Inc., 893 F.2d 693 (5th Cir. 1990)*). In this influential case the court reversed its original ruling; we refer to the two opinions as *In re Clark I and II*.

For example, a firm may have contractually agreed to pay its bank directly from the liquidation of receivables, according to some fixed percentage. The bank may be fully aware of its borrower's impending failure, yet continue to press the firm to liquidate receivables to cover its own claim without fear of being viewed in control and possibly having its claim subordinated, even if the bank is aware its actions will harm the firm's other creditors. Similarly, a bank can refuse to renew a loan commitment without fear of subordination. Thus, it doesn't matter that the bank has gained substantial influence over the firm.[12] The bank may have intimate knowledge of the firm's affairs, and indeed, the firm may have no alternative source of funds at any reasonable cost, both of which give the bank tremendous influence over the firm. Instead, the courts have reasoned that the bank's right to refuse further funds at maturity is a *predictable* part of a contractual relationship into which the firm and the bank entered as equals.[13]

This doesn't mean, however, that the courts have granted creditors blanket immunity from being viewed as a controlling investor. Much of the case law concerns instances in which the creditor used its power to press the borrower to take actions to improve the creditor's own position at others' expense, but not in strict pursuance of explicit contractual rights. Continuing the example above, the bank might use its influence to insist that the firm make *all* payments to the bank and withhold payments to other creditors as long as possible. In cases such as these, the courts have looked to the details of the relationship between the creditor and the borrower to determine whether the creditor's influence should be viewed as control.

For a contractual agreement to provide a creditor with a safe harbor from equitable

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[12] "...there is generally no objection to a creditor using his bargaining position, including his ability to refuse to make further loans needed by the debtor, to improve the status of his existing claims." From the second circuit court's opinion *In re WT Grant Co*., 699 F.2d 599 (2nd Cir. 1983). Also, see the cases cited in Koh (1998, footnote 56).

[13] "[There was] no evidence that the loan documents were negotiated at anything other than arm's length or that they are atypical of loan documents used in similar asset-based financings." (*In re Clark, II*). Also see Judge Easterbrook's influential opinion in *Kham and Nate's Shoes No.2 v First Bank*, 908 F.2d 1351 (7th Cir. 1990).

subordination, the courts have required the agreement to have been made at arm's length. Among the factors used to define an arm's length relationship in concrete terms, two appear particularly weighty. The first is whether the firm was solvent at the time the contract was negotiated; if not, the court is less likely to view the contract as an arm's length transaction.[14] A second factor taken into account by the courts is whether the terms of the contract are consistent with prevailing business practice (see footnote 12). A finding that a renegotiated contract with an insolvent borrower gave the investor unusual rights of intervention in exchange for waiving contractual clauses negotiated earlier would predispose the court to view the investor as a controlling agent.

If the court establishes that a creditor is a controlling investor, a second hurdle must be passed before a claim for subordination of the creditor's claim can be effective. The action itself must be inequitable. This has two components: (i) the action undertaken must actually harm another creditor; (ii) the action of the investor must constitute "egregious conduct."[15] Actions that would normally be undertaken by a creditor protecting its own security interest are not inequitable, even if the creditor's influence increases its own payoff at the expense of other creditors.

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[14]"Authority on equitable subordination has found undercapitalization to be evidence of inequitable conduct." (Long ,1993, p. 99). See, for example, *In re Clark Pipe, I and II* and *In re Multiponics,* 622 F.2d 709,717 (5th Cir.1980). Discussing *In re Multiponics*, Watson writes, "The test used in the Fifth Circuit is that a corporation is undercapitalized if 'reasonably prudent men with [a] general business background would deem the company undercapitalized.' Application of this test is facilitated by a two-part inquiry that asks what a skilled financial analyst would consider adequate capitalization under the attendant circumstances and whether the corporation could have obtained comparable loans from informed outside sources." (p. 631).

[15] Long (1993, p. 106) cites two types of inequitable conduct that have given rise to the subordination of nonmanagement creditors' claims: (i) misconduct or misrepresentation by a claimant upon which others relied to their damage; (ii) mismanagement of the bankrupt by the claimant to the detriment of other creditors.

3. The Model

3.1 Agents

There are two risk neutral agents, one passive *claimholder*, F, and one dominant *investor*, I. The claimholder represents a range of claimants—trade creditors, customers, and perhaps even small stockholders—who have no direct control over the firm's investment decisions and who are unlikely to be well informed about the firm's affairs. The investor has the power to make all production decisions except where constrained by contract. For example, this investor might be a financially distressed firm's bank (or a coalition of the firm's managers and its bank).[16]

The timing of the model is presented in Figure 1.

3.2 Production and monitoring

At the beginning of the period, the two agents provide total funds of \$1. Without loss of generality, assume that all funds come from the investor, whose opportunity cost of funds is ρ. The expected gross payoff depends both on the state of the world, $s \in \{a, b\}$, and an action taken by the investor, $d \in \{\alpha, \beta\}$. For simplicity, each state occurs with equal probability. Once the initial investment is made—but before any investment decisions are made—the investor can also pay to receive some interim information about the underlying state of the world. But greater accuracy comes at a higher cost, and there are diminishing returns to increasing accuracy.

Formally, the investor bears an initial cost $c(q) = cq^2/2$ and observes an indicator, $i \in \{a',b'\}$, where $p(s = a \mid i = a') = p(s = b \mid i = b') = (1+q)/2$; that is, the investor learns the state correctly with

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[16]By treating the informed investor as a single agent, we abstract completely from all issues concerning the division of control between other insiders and the informed investor. In this sense, our model resembles Admati and Pfleiderer's (1994) model of a venture capitalist and contrasts with important contributions that examine optimal contract design in the presence of *contested* control among insider groups, including Aghion and Bolton (1992), Aghion and Tirole (1997), and Burkart, Gromb, and Panunzi (1997). Although our model could apply literally to the design of an optimal claim for a single dominant investor, we view it as an idealization of a situation in which the investor has substantial influence, for example, the case of a firm nearing financial distress with a single banking relationship or a start-up firm guided by venture capitalists.

probability $(1+q)/2$ and incorrectly with probability $(1-q)/2$. Thus, q measures the accuracy of the indicator, with $q = 0$ corresponding to a completely uninformative indicator and $q = 1$ corresponding to a perfectly informative indicator.[17]

After receiving this information, the investor may choose to *continue* the project ($d = \alpha$) or the investor may *abandon* the project ($d = \beta$). The firm's expected value is V_s in state s if the investor chooses to continue and L_s in state s if the investor chooses to abandon.[18]

What happens when the investor abandons the project? For the most part, our model will treat abandonment as a synonym for liquidating the firm's assets, but we view this as a stylized way of representing a broader class of actions, not all of which automatically lead to actual liquidation. Abandoning the project refers to an action that reduces the value of the firm as an ongoing organization and increases its value as a collection of assets that can be transferred to various claimants. Such actions might include the forced sale of assets or the requirement that the firm postpone investments and hold large hoards of cash or liquid inventories, actions that might be forced upon a firm seeking to satisfy common debt covenants or under the pressure of the debt repayment schedule.

We assume that continuing the project yields a higher expected payoff in state a and that abandoning the project yields a higher expected payoff in state b, that is,

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[17]Our central results carry over to the more general case where $c'(q) > 0$, $c''(q) > 0$, and $c'''(q) \geq 0$, and where $p(s = a) = p(i = a') = \theta$, $p(s{=}a|i{=}a') = q + (1-q)\theta$, and $p(s{=}b|i{=}b') = q + (1-q)(1-\theta)$. In this parameterization, the indicator is a weighted function of a perfectly informative indicator and a completely uninformative indicator; a more accurate indicator has a larger weight on its perfectly informative component.

[18]As a technical matter, we assume that the investor's action generates a distribution of returns $G_s(r|d)$—with strictly positive density $g_s(r|d)$—where r has a support $[r_0,r_1]$ that is independent of the underlying state. Thus, the expected values if the firm continues or is discontinued are $V_s = \int r g_s(r|\alpha)dr$ and $L_s = \int r g_s(r|\beta)dr$. That all final payoffs are drawn from a common support means that no agent could infer either the underlying state or the action chosen directly from observing the project's final payoff. Having said this, our presentation is significantly simplified by focusing on expected payoffs, conditional on the underlying state and the action, rather than on realized payoffs, and with risk neutral agents there is no loss of generality. We use the terms payoffs and payments to refer to expected payoffs and expected payments.

Assumption 1: $V_a > L_a$ and $V_b < L_b$. (1)

3.3 Information structure

The *realized* payoff, from which all contractual payments are drawn, is costlessly verifiable and, thus, contractible. However, neither the investor's expenditure on the indicator nor the indicator itself is verifiable; thus, forcing contracts conditioned on the indicator are infeasible, as are contracts that achieve efficient monitoring by fiat. In contrast, the underlying state can be verified by a court in a costly judicial process that involves accountants, lawyers, and perhaps even economists (charging by the hour). Total court costs, which we assume are shared equally between the investor and the claimant, total \$2m.[19]

With probability 1-p the investors' actions are costlessly verifiable, but with probability p the action can't be verified at any cost. In this case, the investor can, for example, manipulate the books to make it seem as if either action was chosen.

Assuming that actions might be directly verifiable is a shorthand way to capture the idea that actions give rise to measurable outcomes; for example, decisions that increase the liquidity of the firm's assets can be measured by various accounting ratios such as the working-capital-to-asset ratio. To the extent that actions can be measured precisely, we may think of the action itself as verifiable. Of course, the firms' accounts may be subject to manipulation, or, more generally, actions with very different long-term consequences may look identical on the firm's books in the short term. We make the polar assumption that actions are either completely verifiable or completely unverifiable mainly to keep things simple, but it is not hard to think of examples for which this is a close approximation. For example, a decline in demand in a particular market may reduce organizational slack and make accounting measures of performance both more exacting and more informative, when under normal conditions, the investor

[19]Note that the court can observe the state, s, without error. Although it is reasonable to assume that the court might make mistakes, for our purposes it is essential only that there be some cost of relying on the court to verify the state of the world. Our specification is the simplest possible way of introducing such a cost.

may be able to manipulate reported accounting measures of performance. In this case, $1-p$ would represent the probability of low demand.

3.4 Contracts

Contracts have two elements: *rules* and *payments*.

3.4.1 Rules versus discretion.

A rule is a commitment by the investor to choose a particular action based on contractible information. In our simple world, there are two possible rules, $d(i) = \alpha$, and $d(i) = \beta$, and each corresponds to a particular *rule-driven contract*. The first tells the investor "always choose α" ($d = \alpha$); the second tells the investor "always choose β" ($d = \beta$).

A rule is enforceable only when the underlying action is verifiable, so the rule is enforceable with probability $1-p$. And with probability p the contract effectively gives the investor complete discretion.

The alternative to a rule-driven contract is a *fully discretionary contract* that gives the decision-maker complete discretion to choose the action, that is, $d(i) \in \{\alpha, \beta\}$, $i = a', b'$.

3.4.2 An illustration.

To illustrate our contracting environment and terminology, consider the following simple example. The underlying state of the world is either that the firm has NPV > 0 (s = a) or that it is has NPV < 0 (s = b). The investor has a choice of two possible actions: to permit the firm to make new investments ($d = \alpha$) or to force the firm to liquidate its core assets ($d = \beta$). The rule may take the form of requiring the firm to make a coupon payment to prove that it has made a positive NPV investment.

If the ability to generate interim cash flows is a relatively poor measure of the quality of the firm's investment choice, then rules will be difficult to enforce. (In our notation this case would correspond to a high value for p.) For example, cash flow may be raised by selling essential assets that raise immediate revenues but ultimately increase the likelihood of default. Then the investor would look like he was continuing to invest productively even though he was actually abandoning the project.

Alternatively, an investor might force a firm to close down relatively unprofitable operations to focus on core businesses, thereby reducing interim cash flows but increasing the likelihood of ultimate success. In this case, the investor would look like he was abandoning the project but was actually choosing to continue. In cases where the relationship between interim cash flows and ultimate profitability are poorly understood or unstable, a rule-driven contract still leaves the investor with substantial discretion.[20]

3.4.3 Payments.

Under all contracts, payments are made out of end-of-period payoffs. Payments may be conditioned on the action chosen, and if the court conducts an investigation they may also be conditioned on the actual state. From the outset, we make the following assumption:

Assumption 2: The court will never investigate if the project is continued.[21]

Since the state can't be verified without an investigation, the payments to the investor and claimant when the project is continued are independent of the state and can be denoted as D_I and D_F, respectively.

However, it *may* be profitable for the firm to secure funds with a contract in which the payoffs in liquidation are state-contingent. It is convenient to write the agents' payoffs in liquidation as shares of the firm's liquidation value; thus, the investor's and claimant's payments in liquidation states are $\phi_{Is}L_s$ and $\phi_{Fs}L_s$, respectively. If the contract calls for no investigation, liquidation payoffs can't be conditioned on the underlying state and $\phi_{ja} = \phi_{jb}$, j = I,F.

We assume:

Assumption 3: Payoffs are divided completely between the two claimants.

[20]This discussion suggests that it may be reasonable to view the probability p as an object of contractual design rather than an exogenous feature of the contracting environment. Where actions are hard to measure accurately, contracts will optimally give the investor substantial discretion. Alternatively, at some cost, closer monitoring or more elaborate accounting systems might reduce p.

[21]This policy of restricting investigations to liquidation states will be optimal as long as the costs of an investigation, 2m, are sufficiently high relative to $[V_a - L_a]$.

Assumption 4: Agents have limited liability.[22]

Together, these two assumptions imply that $\phi_{Is} + \phi_{Fs} = 1$, so ϕ_{Is} measures the investor's priority in liquidation in state s.

We assume that neither actions nor payments are renegotiable. It is not hard to see that there may be gains from renegotiation once information has been revealed to the investor, since both agents have a joint interest in avoiding costly investigations. However, since our claimant represents numerous agents with differing interests, multilateral negotiations in a private workout are likely to be too costly; thus, we believe that a formal analysis of renegotiation-proof contracts would be an empirically dubious digression.[23]

3.4.4 Equitable subordination.

To capture the doctrine of equitable subordination in the context of our model we need operational definitions of "control" and "inequitable conduct." For our purposes, the court views an investor with a discretionary contract—but not one with a rule-driven contract—as a controlling investor, even though the court knows that with some probability the investor with a rule-driven contract actually has discretion to direct the firm's affairs.[24] This accords with the legal distinction between an investor

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[22]Limited liability is a more controversial assumption than it might seem at first. Its effect is to rule out penalties more extreme than subordination—which might enforce a first-best level of monitoring by the investor. Our main rationale for this assumption is that without an upper bound on penalties, every contract between the firm and a new small investor or customer would subject the large investor to the threat of very large (and unpredictable) losses. The investor could not avoid these costs by choosing the first-best level of monitoring, since monitoring is noisy and mistakes will always happen with some probability. Thus, any contract that imposes fiduciary responsibilities may threaten participation by the investor. Also, as Winton (1993) argues, unlimited liability imposes the cost of monitoring to ensure that the investor is wealthy enough to pay the penalty.

[23]If we think of negotiations occurring in formal bankruptcy proceedings, it would be incorrect to impose the constraint that outcomes are renegotiation-proof, since bargaining rules in bankruptcy are subject to prior design.

[24]There is no presumption that the court knows this probability for any particular case. We think of the creation of two different legal standards of liability as one means of allowing contracting parties to use this information optimally.

pursuing specified contractual remedies and a controlling investor. We define inequitable behavior as an action that both benefits the investor at the expense of other claimants and reduces the value of the firm (given the state)—actions that would be impermissible for an investor with fiduciary responsibilities.

In our setting, equitable subordination is a doctrine with a different face for different types of financial claims. It imposes state-contingent payments in default states on an investor viewed as a controlling agent, with a penalty of subordination for a breach of fiduciary responsibilities. But it also offers a safe-harbor to a noncontrolling investor, protecting the priority of the investor's claim even when the investor has chosen an action that is both self-serving and inefficient.

So, in our model the optimal contracting scheme includes *equitable subordination* if the following three conditions hold:

(1) optimal fully discretionary contracts are state-contingent;

(2) optimal rule-driven contracts are noncontingent; and

(3) the investor's claim is automatically subordinated if the firm is liquidated ($d = \beta$) and the court finds that the underlying state was a, that is, $\phi_{Ia} < \phi_{Ib}$.

3.4.5 Discussion.

To help clarify the connections between real world financial contracts and our theoretical contracts, consider a powerful investor entering into contractual negotiations with the firm, for example, to renegotiate existing contracts with the management of a formerly healthy, but now distressed, firm. Assume that the investor has a collateralized loan and that negotiations were triggered by a missed coupon payment. This investor clearly enters negotiations with a rule-driven contract, but whether he leaves with a rule-driven contract or a fully discretionary contract depends, among other things, on the financial condition of the firm and the terms of the renegotiated contract.

For example, if the firm is insolvent and the investor insists on intrusive new contractual clauses as a condition of postponing default, then the investor leaves the contract negotiations with a fully discretionary contract. Alternatively, if negotiations are fruitless and the investor forecloses on the collateral, then the investor enters and leaves negotiations with a rule-driven contract, because the investor has merely enforced existing contractual clauses.[25]

In our model, a large equity claim with voting rights would clearly be a fully discretionary contract because the investor would be routinely viewed as an insider by the courts. Under any conditions, distressed or otherwise, an exchange of equity for debt would still leave the investor with a fully discretionary claim.

4. Optimal Contracts

We assume that the contract is designed to maximize firm value, contingent on the participation of the investor and the other claimants.

We restrict attention to the class of contracts that induce the investor to choose the efficient decision rule, $d(a') = \alpha$ and $d(b') = \beta$, whenever he is free to do so.[26]

4.1 First-best contracts

To fix ideas, it is useful to derive the optimal contract in a world where no contracting problems arise, that is, one in which information production by the investor is contractible and in which incentive compatibility constraints can be ignored. With risk-neutral agents, it is uncontroversial to view the first-best contract as one that maximizes the expected value of the firm,

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[25]Of course, we are drawing a very sharp line in a situation where the real world seldom permits such precision. Most important, we assume that the investor and the courts agree on the meaning of the term intrusive, that is, the law is clear about the types of contractual provisions that are typical of loan documents used in similar financings (see footnote 12). If this were not true, the investor would never know with certainty whether he had a rule-driven contract. We are currently working on extending our model to include *implied* contractual terms, which are both a source of flexibility and a source of uncertainty (see Goetz and Scott, 1985).

[26]Thus, we rule out contracts that design payments to induce the investor to choose a simple rule, say $d = \beta$, even when the investor has discretion. Such contracts are uninteresting since the investor doesn't monitor at all. At the cost of some added complexity we could modify the model to include an increasing opportunity cost of imposing an inflexible rule. See Berlin and Mester (1992) for a model of optimal covenants with this feature. This complication would endogenize our restriction but would yield no additional insights in the present context.

$$\Pi(q) = \frac{1}{2}\left[\left(\frac{1+q}{2}\right)V_a + \left(\frac{1-q}{2}\right)V_b\right] + \frac{1}{2}\left[\left(\frac{1-q}{2}\right)L_a + \left(\frac{1+q}{2}\right)L_b\right] - \frac{cq^2}{2} - \rho . \qquad (2)$$

The first expression is the expected value of the firm when the indicator $i = a'$ and the second expression is the expected value of the firm when $i = b'$. In each case, the investor chooses the correct action with probability (1+q)/2 and the incorrect action with probability (1 − q)/2, since the indicator is noisy.

Maximizing (2) with respect to q, the first-best level of q, q*, is determined by the first order condition,

$$(1/4)[(V_a - L_a) + (L_b - V_b)] - cq^* = 0. \qquad (3)$$

The expression in brackets—which is positive by the inequalities in (1)—measures the marginal benefit of monitoring: the higher contractual surplus from a more efficient liquidation policy. Examination of first order condition (3) makes transparent the net benefits of monitoring. The optimal monitoring level increases when the benefits from efficient liquidation are higher and decreases when monitoring costs rise quickly with q (that is, c is higher).

4.2 The general contracting problem

Next we show that the choice between a contract with state-contingent payoffs in liquidation and one with noncontingent payoffs in liquidation depends on a simple tradeoff. Contingent payoffs provide stronger incentives for the investor to monitor to increase the accuracy of the indicator. But contracting agents must weigh the costs of the court's investigation against the increase in efficiency due to more monitoring.

We assume that the firm's financial structure is designed to maximize the firm's expected value subject to participation by the investor. Although it would be easy to modify the model to include *ex ante* bargaining among the various claimants with different degrees of market power, we assume that the claim for the influential investor is determined in a competitive market.[27]

With a little notation we can conveniently view all of our contracts as special cases of the solution to a single contracting problem. Index the contract types by k and let k = α,β for the two rule-driven contracts and k = e for the fully discretionary contract. Think of a general contract in which each rule can be imposed with some probability and in which the borrower has discretion with the remaining probability. For each contract type $k \in \{\alpha, \beta, e\}$, denote these probabilities by $z_k \equiv [z_{k1}, z_{k2}, z_{k3}]$, where z_{k1} is the probability that rule $d = \alpha$ constrains the investor's behavior, z_{k2} is the probability that rule $d = \beta$ constrains the investor's behavior, and z_{k3} is the probability that the investor has discretion. Thus,

$$z_\alpha = [(1-p), 0, p],\ z_\beta = [0, (1-p), p], \text{ and } z_e = [0, 0, 1].$$

Note that $z_{k1} + z_{k2} + z_{k3} = 1$. For each contract type there are two potential variants—a state-contingent variant and a noncontingent variant. Let δ be an indicator function that equals 1 when a contract is state-contingent and equals 0 when the contract is noncontingent. Denoting a particular contract by $C_\delta(z_k)$, the optimal state-contingent contract solves the following problem,

$$\begin{aligned}
\text{Max } \Pi^f(C_\delta(z_k)) = {} & z_{k1}\left[\frac{1}{2}(V_a - D_I) + \frac{1}{2}(V_b - D_I)\right] \\
& + z_{k2}\left[\frac{1}{2}(L_a(1-\varphi_{Ia}) - \delta m) + \frac{1}{2}(L_b(1-\varphi_{Ib}) - \delta m)\right] \\
& + z_{k3}\left\{\frac{1}{2}\left[\left(\frac{1+q}{2}\right)(V_a - D_I) + \left(\frac{1-q}{2}\right)(V_b - D_I)\right]\right. \\
& + \left.\frac{1}{2}\left[\left(\frac{1-q}{2}\right)(L_a(1-\varphi_{Ia}) - \delta m) + \left(\frac{1+q}{2}\right)(L_b(1-\varphi_{Ib}) - \delta m)\right]\right\},
\end{aligned} \tag{4}$$

subject to,

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[27]It is easy to modify the problem to explicitly model a coalition of insiders and an influential investor. The problem would maximize the firm's surplus subject to a division of the surplus according to their relative bargaining power. It is more interesting to ask whether maximization of firm value is the right way to model the objective function of a firm with a large investor when the investor has multiple goals, for example, if he is an intermediary or has stakes in more than one firm. For empirical evidence that such issues may matter empirically, see Weinstein and Yafeh (1998).

$$\Pi^I(C_\delta(z_k)) \;=\; z_{k1}\left[\frac{1}{2}D_I \;+\; \frac{1}{2}D_I\right]$$

$$\begin{aligned}
&+\; z_{k2}\left[\frac{1}{2}\left(\varphi_{Ia}L_a \;-\; \delta m\right) \;+\; \frac{1}{2}\left(\varphi_{Ib}L_b \;-\; \delta m\right)\right] \\
&+\; z_{k3}\left\{\frac{1}{2}\left[\left(\frac{1+q}{2}\right)D_I \;+\; \left(\frac{1-q}{2}\right)D_I\right]\right. \\
&+\; \left.\frac{1}{2}\left[\left(\frac{1-q}{2}\right)\left(\varphi_{Ia}L_a \;-\; \delta m\right) \;+\; \left(\frac{1+q}{2}\right)\left(\varphi_{Ib}L_b \;-\; \delta m\right)\right]\right\} \\
&-\; \frac{cq^2}{2} \;-\; \rho \;\geq\; 0\,,
\end{aligned} \tag{5}$$

$$q \;=\; \text{argmax}\;\; \Pi^I(C_\delta(z_k))\,, \tag{6}$$

$$D_I \;\geq\; \left(\frac{1+q}{2}\right)\left(\varphi_{Ia}L_a \;-\; \delta m\right) \;+\; \left(\frac{1-q}{2}\right)\left(\varphi_{Ib}L_b \;-\; \delta m\right), \tag{7}$$

$$D_I \;\leq\; \left(\frac{1-q}{2}\right)\left(\varphi_{Ia}L_a \;-\; \delta m\right) \;+\; \left(\frac{1+q}{2}\right)\left(\varphi_{Ib}L_b \;-\; \delta m\right), \tag{8}$$

$$z_\alpha = [1-p,\, 0,\, p], \quad z_\beta = [0,\, 1-p,\, p], \quad \text{and} \quad z_e = [0,\, 0,\, 1], \text{ and} \tag{9}$$

$$\delta = 1. \tag{10}$$

Subject to the investor's participation constraint (5), this contract maximizes the expected value of all other claims on the firm, as given in (4). Remember, in both expressions, the investor follows rule d = α with probability z_{k1}, rule d = β with probability z_{k2}, and exercises discretion with probability z_{k3}. Condition (6) says that the investor chooses his level of monitoring to maximize his own expected profits, while conditions (7) and (8) are incentive compatibility conditions that ensure that d(a ′) = α and d(b′) = β, respectively. In each case the investor chooses between continuation (the left-hand side of (7) or (8)) and liquidation (the right-hand side of (7) or (8)). Constraint (9) repeats our definition of z_k, k = α, β,e. In this program, δ = 1, which means that the court conducts a costly investigation whenever the firm is liquidated.

The optimal noncontingent contract is the solution to (4)-(9) and two more conditions,

$\delta = 0,$ (10)′

and,

$\phi_{ja} = \phi_{jb}, \quad j = I,F.$ (11)

The noncontingent contract avoids the costly court investigation but has the disadvantage of added constraint (11), which says that the priority of claims can't be conditioned on the state, s.

4.2.1 Parametric restrictions.

Before deriving the optimal contracts and stating our main results we impose some parametric restrictions, primarily to simplify the presentation. First we make the parametric restriction that

Assumption 5: $L_b > L_a$, (12)

a necessary condition for noncontingent contracts to satisfy IC conditions (7) and (8) in our highly simplified setup.[28]

We also assume

Assumption 6: $[V_a - V_b] - L_a > 0$, (13)

which is both a necessary and sufficient condition for the first-best level of monitoring defined in equation (3) to be unattainable under any of our contracts.

Keeping in mind that the rule "always abandon" ($d(i) = \beta$) is just a stylized way of modeling a contract with very stringent repayment and covenant conditions, we make parametric restrictions that ensure that such a contract is feasible, whether it is state-contingent or noncontingent, respectively:

Assumption 7: $L_b/2 > \rho + m$, and $[L_a + L_b]/2 > \rho$. (14)

Our final two parametric restrictions, along with Assumption 7, ensure interior solutions for all contracts, that is, that the contracts $(\phi_{Ia}, \phi_{Ib}) = (0,1)$ and $(\phi_{Ia}, \phi_{Ib}) = (1, 1)$ satisfy the incentive compatibility conditions (7) and (8) for *all* contracts $k = \alpha, \beta, e$. (Note that weaker sufficient conditions

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[28]This condition is mainly an artifact of the stark structure of our model, in which the investor's payoffs in continuation (D_I) are *completely* independent of the state. A weaker condition would hold if there were a verifiable component of the firm's revenues or if the investor sold other services to the firm—as do many banks—more profitably in state a than in state b.

guarantee interior solutions for individual contracts.)

Assumption 8:

$$\frac{1}{p^2}\frac{L_b}{2} - \left(\frac{1-p^2}{p^2}\right)(\rho + m) \le \frac{c}{2}\left(\frac{L_b}{4c}\right)^2 + \rho + m \ , \tag{15}$$

Assumption 9:

$$\frac{1}{p^2}\left(\frac{L_b+L_a}{2}\right) - \left(\frac{1-p^2}{p^2}\right)\rho \le \frac{c}{2}\left(\frac{L_b-L_a}{4c}\right)^2 + \rho \ . \tag{16}$$

The underlying economic interpretation of these restrictions is that the face value of the investor's claim (D_I) derived from his participation constraint is neither: (i) so high that the investor would insist on keeping the firm afloat under all circumstances, even if he were given the full proceeds from liquidating the firm's assets (Assumption 7); nor (ii) so low that he would always liquidate the firm (Assumptions 8 and 9). These conditions make sense in a world where the investor is large, but only one among many claimants.

4.3 Optimal contracts

Proposition 1: ***Optimal state-contingent contracts***

Given Assumptions 1-8 the investor's optimal state-contingent claim is subordinated in state a and has priority in state b, that is,

$$\phi_{Ia} = 0, \ \phi_{Ib} = 1. \tag{17}$$

The investor's monitoring level, $q_1(z_k)$ is defined by,

$$z_{k3}\ (1/4)L_b - cq = 0, \quad k = \alpha,\beta,e. \tag{18}$$

In particular, for the fully discretionary contract,

$$(1/4)L_b - cq_1(z_e) = 0, \tag{19}$$

and for the two rule-driven contracts,

$$p\ (1/4)L_b - cq_1(z_d) = 0, \quad d = \alpha, \beta\ . \ \blacksquare \tag{20}$$

The proof of Proposition 1 is straightforward and intuitive. Conditions (17) and (18) are derived immediately by maximizing the investor's expected profits, defined in (5), with respect to q, which yields the first order condition:

$$z_{k3}(1/4)[\phi_{Ib}L_b - \phi_{Ia}L_a] - cq = 0. \tag{21}$$

Note that the level of monitoring doesn't depend on z_{k1} or z_{k2} under any contract. These are the probabilities that the investor will be constrained by an enforceable rule and, thus, that monitoring will turn out to have been pointless. It is only the likelihood of discretionary decision-making that increases the investor's incentive to monitor.

Assumption 6 ensures that monitoring is below the first-best level. But the investor can be motivated to increase monitoring by setting contract terms appropriately, that is, by rewarding the investor for correct liquidation decisions and penalizing him for incorrect liquidation decisions. The most powerful reward/penalty scheme is to give the investor a full priority claim in state b ($\phi_{Ib} = 1$) and a completely subordinated claim in state a ($\phi_{Ia} = 0$). Expression (18) follows when we substitute these values into first order condition (21).

Note that the level of monitoring is higher under the fully discretionary contract than under either of the rule-driven contracts, since the investor's incentive increases with his degree of discretion. Note also, from equation (18), that the level of monitoring is equal under both rule-driven contracts. This follows from the stark structure of our model, in which both contracts are verifiable with identical probability $1-p$; thus, the verifiability of the contract depends neither on the prescribed action nor on the underlying state.

We can now turn to the noncontingent contracts.

Proposition 2: *Optimal noncontingent contracts*

Given Assumptions 1-7 and Assumption 9, the investor's optimal noncontingent claim has full priority, that is,

$$\phi_I = 1, \tag{22}$$

and the investor's monitoring level, $q_0(z_k)$, is defined by,

$$z_{k3}\,(1/4)[L_b - L_a] - cq = 0, \quad k = \alpha,\beta,e. \tag{23}$$

In particular, for the fully discretionary contract,

$$(1/4)[L_b - L_a] - cq_0(z_e) = 0, \tag{24}$$

and for the two rule-driven contracts,

$$p\,(1/4)[L_b - L_a] - cq_0(z_d) = 0, \quad d = \alpha,\,\beta. \;\blacksquare \tag{25}$$

Note that the inability to condition the investor's priority on the state leads to a less powerful system of penalties and rewards for the investor and, thus, a lower level of monitoring, that is, $q_0(z_k) < q_1(z_k)$ for each k. This can be seen by comparing expressions (18) and (23). Expression (23) is derived using first order condition (21) and imposing the restriction that $\phi_{Ia} = \phi_{Ib}$. We see that full priority increases monitoring by the investor as much as possible, since $L_b > L_a$, by Assumption 5. Without state-contingency, the contract can't penalize the investor for making the wrong decision (abandon in state a); it can only reward the investor for making the right decision (abandon in state b). This reduces the incentive to monitor compared to the state-contingent contract.

5. Optimal legal regimes

5.1 The value of state contingency under discretionary versus rule-driven contracts.

In this section we present our main result: that the optimal fully discretionary contract is state-contingent over a larger part of the parameter space than is the optimal rule-driven contract. To show this, we examine the difference in surplus under the state-contingent and noncontingent variants of a contract of type k,

$$\begin{aligned}\Delta_k^{10} &\equiv \Pi(C_1(z_k)) - \Pi(C_0(z_k)) \\ &= \left[z_{k3}\frac{1}{2}\gamma(q_1(z_k)) - \frac{cq_1(z_k)^2}{2} - (2z_{k2} + z_{k3})m\right] - \left[z_{k3}\frac{1}{2}\gamma(q_0(z_k)) - \frac{cq_0(z_k)^2}{2}\right],\; k=\alpha,\beta,e\;,\end{aligned} \tag{26}$$

where the monitoring levels are defined by first order conditions (18) and (23), where,

$$\gamma(q) \equiv \left[\left(\frac{1+q}{2}\right)V_a + \left(\frac{1-q}{2}\right)V_b\right] + \left[\left(\frac{1-q}{2}\right)L_a + \left(\frac{1+q}{2}\right)L_b\right], \tag{27}$$

and $z_{e3} = 1$, $z_{\alpha 3} = z_{\beta 3} = p$, $z_{e2} = z_{\alpha 2} = 0$, $z_{\beta 2} = 1-p$.

Then, we have the following two propositions. Proposition 3 establishes that if the costs of a court investigation, 2m, are not too large, state-contingent contracts are preferred to noncontingent contracts when the liquidation value of the firm's assets in state a, that is, L_a, is high and that noncontingent contracts are preferred when L_a is low. Proposition 4 says that state contingency is preferred over a larger part of the parameter space for the discretionary contract than for either of the rule-driven contracts.

Proposition 3: Fix z_k. For

$$m < m(z_k) \equiv \psi(z_k)\frac{L_b}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_b}{2}\right], \quad \text{where } \psi(z_k) \equiv \left[\frac{z_{k3}^2}{2z_{k2}+z_{k3}}\right],$$

there exists $L_a(z_k) \in \{0,L_b\}$ such that:

$$\Delta_k^{10} \geq 0 \Leftrightarrow L_a \geq L_a(z_k), \quad k=\alpha,\beta,e. \ \blacksquare \tag{28}$$

Proof: In the appendix.

Proposition 4: Let $m(z_k)$, $k=\alpha,\beta,e$, be defined as the largest m such that $\Delta_k^{10} \geq 0$, i.e.,

$$m(z_k) \equiv \psi(z_k)\frac{L_a}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right], \quad \text{where } \psi(z_k) \equiv \left[\frac{z_{k3}^2}{2z_{k2}+z_{k3}}\right],$$

and let $L_a(z_k)$, $k=\alpha,\beta,e$, be defined as in Proposition 3. Then,

(i) $m(z_e) > m(z_\alpha) > m(z_\beta)$, and

(ii) $L_a(z_e) < L_a(z_\alpha) < L_a(z_\beta)$. $\blacksquare$

Proof: In the appendix.

Propositions 3 and 4 are illustrated in Figure 2. The figure shows that for each contract, there will typically exist some range of values of L_a near 0, where the optimal contract of any type will be noncontingent. As L_a varies, so does the value of state contingency in promoting stronger incentives to monitor by making the investor's payoffs in liquidation more sensitive to actual outcomes. This is because when L_a is very low ($L_a < L_a(z_e)$), the monitoring levels under state-contingent and noncontingent contracts are nearly equal—see expressions (18) and (23)—and it is unlikely that the efficiency gains from higher monitoring will outweigh the court costs. Similarly, when L_a is high ($L_a > L_a(z_\beta)$), state-contingent contracts will typically dominate. This is because monitoring approaches zero under the noncontingent contract as the investor's liquidation payoffs are nearly identical in states a and b—see expression (23). However, in an intermediate range, ($L \in [L_a(z_e), L_a(z_\alpha)]$) the optimal fully discretionary contract is state contingent while the optimal rule-driven contract is noncontingent. The size of this intermediate range decreases with p. As shown in Figure 2, the fully discretionary contract is optimally state contingent for more values of L_a than either of the two rule-driven contracts.

The intuition behind Proposition 4 is simple. The value of monitoring by the investor is greater when he has more discretion; rule-driven contracts permit less discretion, so monitoring is less important. Since the benefit of state-contingent liquidation payments is to increase monitoring by the investor, fully discretionary contracts are more likely to be more profitable if they include costly state contingency. Since rule-driven contracts allow discretion only with probability p, avoiding the costs of state contingency is more likely to be profitable.

5.2 Equitable subordination as an efficient contracting scheme

We view Proposition 4 as our main support for the doctrine of equitable subordination as an efficient contracting scheme. Consider the diagonally hatched region in Figure 2, where the optimal discretionary contract is state contingent and the optimal rule-driven contract is noncontingent. In this region, when the contracting agents make their contractual choice, they also elect a legal rule governing the investor's fiduciary responsibilities. The court is a mechanism for enforcing state-contingent liquidation payments, but only if the investor holds a discretionary contract, that is, only if the investor is in control in the eyes of the court. In this case, when the court's investigation concludes that the investor's actions reduced firm value to the benefit of the investor alone, the investor's claim is subordinated.

But a costly investigation to determine whether the investor's claim should be subordinated is efficient only when the powerful investor has substantial discretion under the optimal contract and when the costs of the court's investigation are sufficiently low. In the intermediate region, the court also acts as a mechanism that enforces the investor's priority in bankruptcy under all circumstances, as long as the investor holds a rule-driven contract. This contract effectively precommits all agents to operate within a legal regime that permits the investor to take any action without penalty. When investigation costs are high and when the benefits of discretionary decision-making are relatively low, the investor will have a priority claim, and the priority of this claim can't be challenged by other claimants.

While the extra costs of more extensive court investigations are not a negligible matter, we view these court costs as a stand-in for a broader class of influence costs that arise when claimants are permitted to challenge the validity of existing contracts whenever they are harmed. If we take a more expansive view of what we have modeled as court costs, the benefits of using courts instead of direct contracts among multiple claimants become clearer. Think of potential claims for subordination as coming from a whole range of suppliers of products and funds. The rule-driven contract of our model is a mechanism that permits the firm to *commit* to a system of bilateral contracts that grants the influential investor protection against future claims for subordination. That is, we can think of the contract between the firm and its investor as a means of enforcing commitments between the firm and its many other claimants.[29]

6. Conclusion and Directions for Further Work

In this paper we explore the economic rationale for *equitable subordination*, a legal doctrine that permits a firm's claimants to petition the bankruptcy court to subordinate an informed investor's financial claim. We adopt the security design approach and ask whether equitable subordination might arise as part of an optimal contracting scheme, taking the view that the bankruptcy process itself is part of the security design problem. In our stylized model with a single powerful investor with substantial

[29]See Fischel (1989) and Koh (1998) for opposing views of the economic costs and benefits of insisting on the primacy of written contracts in bankruptcy proceedings.

influence over the firm, an optimally designed claim will include features that resemble equitable subordination.

Equitable subordination permits the firm to choose between different legal rules governing the dominant investor's fiduciary responsibilities along with the form of the investor's claim. When monitoring is very valuable and flexibility is very important compared to the costs of permitting other claimants to challenge the priority of the dominant investor's claim, and when contracts are necessarily coarse, dominant investors will have open-ended rights of intervention and will bear fiduciary responsibilities. When monitoring and flexibility are less valuable, when contracts are relatively precise, and when the costs of allowing claimants to challenge existing contracts are large, dominant investors will be constrained by explicit rules and will receive a safe harbor against challenges to their priority.

One limitation of our model is that it cannot account for influential investors who hold pure equity claims, since our investor with a fully discretionary contract has a priority claim as long as the courts do not find a breach of fiduciary responsibilities. This feature may be related to a second limitation of our model—that it abstracts completely from the interesting issue of contested control among distinct insider groups. This issue has been emphasized in much of the recent literature, for example, articles by Aghion and Bolton (1992), Aghion and Tirole (1997), and Burkart, Gromb, and Panunzi (1997). A more complete model would consider both the optimal assignment of control between insider groups and the management of conflicts among claimants.

Figure 1. Timing

Investor provides funds = $1.

Investor and claimholder sign contract. There are six possible choices: state-contingent rule-driven d= α contract; state-contingent rule-driven d=β contract; noncontingent rule-driven d=α contract; noncontingent rule-driven d=β contract; state-contingent fully discretionary contract; noncontingent fully discretionary contract.

Investor decides whether to pay and receive an indicator $i\in\{a',b'\}$ about the underlying state of the economy.

Investor chooses his action: to continue the project, d=α; or to abandon the project, d=β.

If the investor chooses d=α, then the firm's expected value is V_s in state $s\in(a,b)$.

If the investor chooses d=β, then the firm's expected value is L_s in state $s\in(a,b)$.

The state of the world is revealed.

Court determines state of the world if investor chose to abandon and contract was state contingent.

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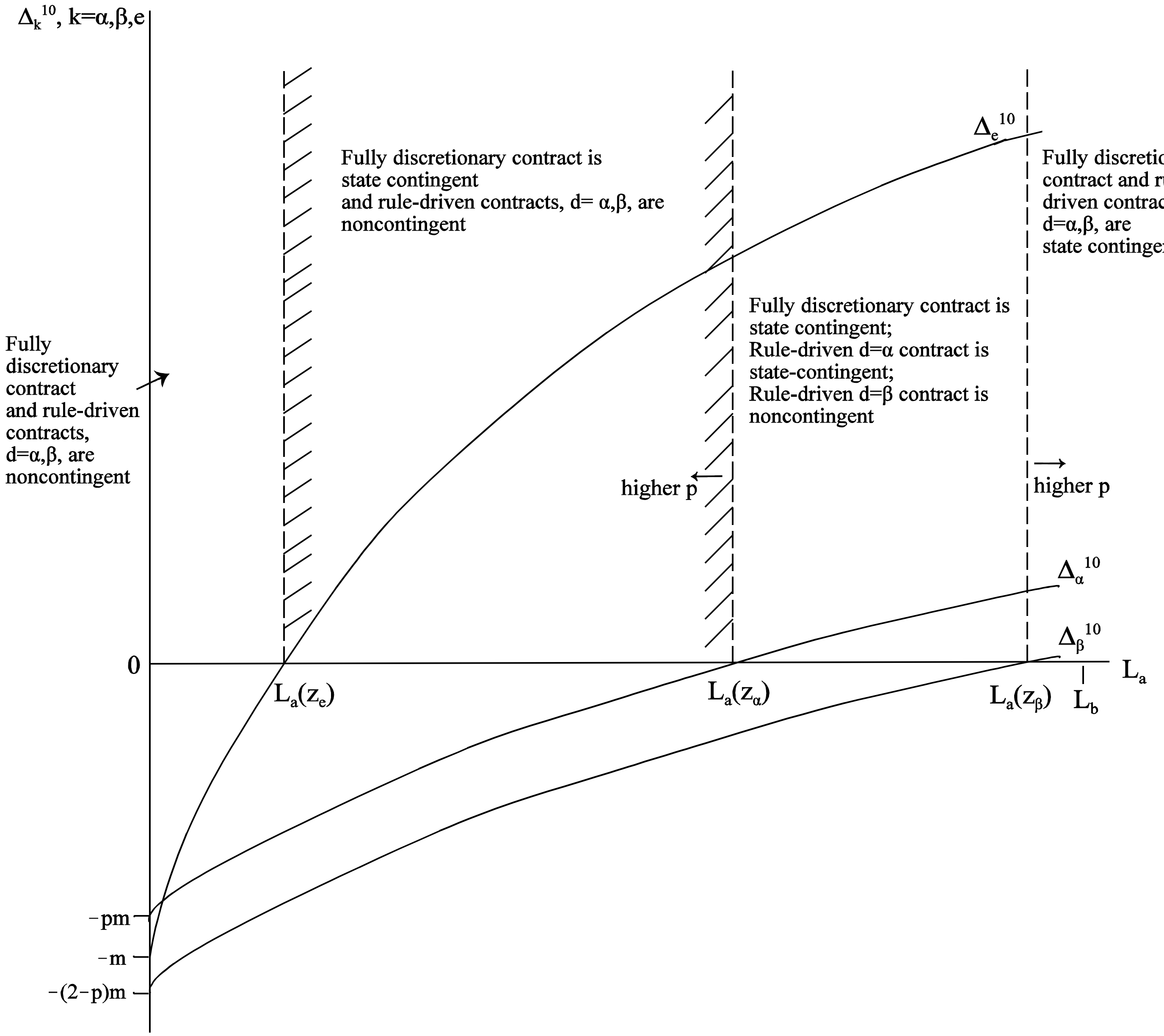
Figure 2. Regions of the parameter space where fully discretionary contract and rule-driven contracts are state contingent and noncontingent



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Appendix.

Proof of Proposition 3

See Figure 2. Simplifying equation (25) in the text yields:

$$\Delta_k^{10} \equiv \frac{1}{4}z_{k3}[q_1(z_k) - q_0(z_k)][(V_a - L_a) + (L_b - V_b)] - \left(\frac{cq_1(z_k)^2}{2} - \frac{cq_0(z_k)^2}{2}\right) - (2z_{k2} + z_{k3})m$$

$$= [q_1(z_k) - q_0(z_k)]\left[\frac{1}{4}z_{k3}[(V_a - L_a) + (L_b - V_b)] - \frac{c}{2}[q_1(z_k) + q_0(z_k)]\right] - (2z_{k2} + z_{k3})m \,, \quad \text{(A1)}$$

where $z_{\beta 2} = p$, $z_{e2} = 0$, $z_{\alpha 2} = 0$; $z_{e3} = 1$, $z_{k3} = p < 1$, $k = \alpha,\beta$. Using equations (18) and (23), $q_1(z_k) = z_{k3}L_b/4c$ and $q_0(z_k) = z_{k3}(L_b - L_a)/4c$. Substituting these into equation (A1) and simplifying yields:

$$\Delta_k^{10} = z_{k3}^2\frac{L_a}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right] - (2z_{k2} + z_{k3})m. \quad \text{(A2)}$$

By Assumption 6, that is, whenever the optimal level of monitoring under the fully discretionary contract is less than first best, the term in square brackets in equation (A2) is positive. Now,

$$\frac{d\Delta_k^{10}}{dL_a} = z_{k3}^2\frac{1}{16c}\left(V_a - V_b - L_a\right) > 0 \text{ by Assumption 6,}$$

and $L_a \in \{0,L_b\}$ by Assumption 5. Thus, for any $m < \psi(z_{k3})\frac{L_b}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_b}{2}\right]$, there exists a $L_a(z_k) \in \{0,L_b\}$ such that $\Delta_k^{10} \geq 0 \Leftrightarrow L_a \geq L_a(z_k)$. QED

Proof of Proposition 4

(i) Fix L_a.

$$m(z_k) \equiv \psi(z_k)\frac{L_a}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right], \quad \text{where } \psi(z_k) \equiv \left[\frac{z_{k3}^2}{2z_{k2}+z_{k3}}\right].$$

Thus, $$m(z_e) = \frac{L_a}{4c}\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right], \quad \text{(A3)}$$

$$m(z_\alpha) = p\,\frac{L_a}{4c}\,\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right], \tag{A4}$$

$$m(z_\beta) = \frac{p^2}{2-p}\,\frac{L_a}{4c}\,\frac{1}{4}\left[(V_a - V_b) - \frac{L_a}{2}\right]. \tag{A5}$$

Therefore, $m(z_e) > m(z_\alpha) > m(z_\beta)$, since $0 < p < 1$.

(ii) Fix $m < m(z_\beta)$. Define $L_a(z_k)$ as the smallest L_a such that $\Delta_k^{10} > 0$. Then, by equation (A2), $L_a(z_k)$ is defined implicitly by

$$\frac{L_a(z_k)}{4c}\,\frac{1}{4}\left[(V_a - V_b) - \frac{L_a(z_k)}{2}\right] = \frac{m}{\psi(z_k)} \text{ where } \psi(z_k) = \frac{z_{k3}^2}{2z_{k2}+z_{k3}}. \tag{A6}$$

The right-hand side of (A6), $m/\psi(z_k)$, equals m for k=e, equals m/p for k=α, and equals $(2-p)m/p^2$ when k=β. Therefore, $m/\psi(z_e) < m/\psi(z_\alpha) < m/\psi(z_\beta)$, since $0 < p < 1$.

The derivative of the left-hand side of (A6) with respect to L_a is

$$\frac{1}{16c}\left[V_a - V_b - L_a(z_k)\right] > 0 \text{ by Assumption 6}. \tag{A7}$$

So the left-hand side of (A6) is increasing in L_a.

Thus, $L_a(z_e) < L_a(z_\alpha) < L_a(z_\beta)$. QED

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