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Investment Policy and Exit-Exchange Offers Within Financially Distressed Firms

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ABSTRACT

This article examines the conflict of interest between shareholders and bondholders in a setting in which firms can renegotiate the terms of existing debt with public debtholders. In particular, we consider one of the most common types of debt restructuring: the exit-exchange offer. Our analysis explores the relation between exit-exchange offers and investment choice by the manager, and it concludes that managers, acting strategically on behalf of shareholders, may select inefficient investment projects in order to enhance their bargaining position vis-a-vis creditors. Holding the upside potential of an investment project fixed, managers/shareholders prefer projects with lower payoffs in states of bankruptcy because it induces individual bondholders to accept poorer terms in a debt-for-debt exit-exchange offer, thus generating a greater residual for shareholders in states of solvency. Additionally, we show how the investment inefficiencies in our analysis depend on (i) the inability of bondholders to coordinate their actions; (ii) the ability of managers to commit to suboptimal investment projects; and (iii) the coupling of an individual bondholder's decision to tender and her decision to consent to allow the firm to strip fiduciary covenants. We suggest conditions under which a ban on coupled exit-exchange offers—or alternatively, constraints on "debt-for-debt" exchanges—would be efficiency-enhancing.

IT IS WELL KNOWN that "financial distress" within a firm can exacerbate incentive problems between shareholders/managers and bondholders.[1] Indeed, outside of formal bankruptcy reorganization under Chapter 11, managers ostensibly act solely in the interests of the residual claimants (the shareholders).[2] Consequently, managers of distressed firms may take actions that increase shareholder value, yet decrease the value of the firm as a whole. For example, the preference accorded debtholders under the absolute priority rule (often called "debt overhang") may induce managers of distressed firms to forego projects with positive net present value when such returns are certain.[3] Ad-

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[1] We define "financial distress" as a situation where a firm is not currently insolvent, but its current investments may leave it insolvent should they fail.

[2] We do not address agency problems between managers and shareholders in this article, opting instead to concentrate on debtholder/shareholder conflicts of interest.

[3] See Myers (1977).

ditionally, managers of distressed firms may be wholly "indifferent" to downside risk, overinvesting in speculative projects[4] because the shareholders' claims resemble an out-of-the-money call option with exercise price equal to the debt commitment.[5]

This paper examines this agency conflict in a setting in which firms can renegotiate the terms of existing debt with public debtholders. In particular, we consider one of the most common types of debt restructuring: the exit-exchange offer. Under such an offer, debtholders receive a package of new securities (including debt, equity, and/or cash) in exchange for their preexisting debt. In a debt-for-debt exchange, bondholders typically receive the option of tendering their debt to the firm in exchange for debt with lower face value but higher priority.[6] This analysis explores the relation between exit-exchange offers and investment choice by the manager, and it demonstrates that investment inefficiency may be rooted in a stronger form of agency problem than those articulated above. We argue that managers and shareholders may select inefficient investment projects strategically in order to enhance their bargaining positions vis-à-vis creditors. Explicitly, we demonstrate that shareholders may choose stochastically dominated projects in order to distort the terms and success rates of the exchange offer.

Similar to other recent articles in this field, our analysis maintains that financial distress (as opposed to economic distress) "matters" from an efficiency standpoint. While this assertion may seem obvious, the Coase (1960) theorem implies that in a frictionless world there are no economic costs imposed by the threat of "bankruptcy" per se. If the firm as a going concern can be made profitable by changing its capital structure, efficient recontracting would result in a restructuring of financial claims to maximize the firm's value. Indeed, if there were costs to transferring ownership, they could be eliminated by selling new shares in the firm and using the proceeds to pay creditors.[7]

In contrast to this Coasean prediction, our approach recognizes a number of transactional frictions that can impede efficient restructuring. Accordingly, our thesis is predicated on three critical assumptions that embody these frictions. First, we examine situations in which debtholders are numerous, so that it is prohibitively costly for them to coordinate their bargaining strategy amongst themselves.[8] Collective action problems can force individual bondholders within such atomistic credit structures to behave strategically against

[4] Id.

[5] See Jensen and Meckling (1976) for the classic analysis.

[6] Franks and Torous (1994) report that when such offers are made to senior debtholders, the predominant form of consideration (38.32 percent) is in fact more senior debt. The next most frequent type of consideration is cash (29.23 percent), followed by equity/preferred stock (29.13 percent). Additionally, Gertner and Scharfstein (1991) note a sample of 169 exchange offers by 67 companies, in which 48 of such offers consist of debt-for-debt proposals.

[7] Haugen and Senbet (1978).

[8] In the model, *infra*, we actually make a stronger, *simplifying* assumption that the bondholders are atomistic. This stronger assumption is made only for tractability, however, and the same results carry through when there are a finite, large number of bondholders owning commensurable amounts of debt.

one another. For example, when faced with a debt-for-debt exit-exchange offer, it may be optimal for a typical bondholder to exchange her debt for more senior debt with lower face value, in a unilateral effort to win priority over fellow debtholders. This unilateral strategic concern can lead to equilibrium behavior in which *all* debtholders choose to tender, even though they will be made collectively worse off because all their new debt will have the same relative priority, but lower face value.[9]

Second, we assume that the manager makes her investment choice before bargaining begins, and that this choice is irreversible. We argue that this irreversibility gives the manager an incentive to pursue inefficient projects in order to distort the terms of the exchange offer in favor of shareholder interests. Note that irreversibility is equivalent to perfect commitment on behalf of the manager.[10]

Finally, we assume that a creditor's consent to debt restructuring and tendering of debt are *simultaneous* rather than *sequential* moves. This assumption corresponds to the provisions of the Trust Indenture Act,[11] which requires a firm wishing to renegotiate its debt to receive consent from every bondholder whose debt is to be altered rather than simply a majority of bondholders.[12] This legal constraint has given rise to the "exit-exchange" offers that are the subject of this paper, in which bondholders *simultaneously* receive the options to tender and give their consent to debt restructuring. By exploiting this opportunity to couple the exchange offer with the exit consent, managers can create a collective action problem for the bondholders that induces them to tender when they otherwise might not if they had the opportunity to vote on the consent issue before committing to a tendering decision. Consequently, our model suggests instances in which regulatory action may be prudent.

The analysis is organized as follows. Section I introduces a simple model of debt renegotiation, and demonstrates our central argument of strategic value destruction in the context of a debt-for-debt exchange offer. The section then briefly analyzes debt-for-equity exchange offers, and it demonstrates that such exchange offers are not coercive, and consequently do not entail inefficient investment choices by managers. Section II analyzes the importance of the three critical assumptions outlined above. Section III presents concluding remarks.

[9] This phenomenon is described in Kahan and Tuckman (1993), though they do not explicitly model its relationship to investment choice.

[10] Bergman and Callen (1991), while not addressing exit-exchange offers, present a model in which managers can, under some conditions, affect the outcome of debt renegotiations with *coordinated* debtholders merely by *threatening* to allow value destruction until an agreement is reached. We discuss the relationship between their model and ours *infra* at Section II.

[11] See Trust Indenture Act of 1939, 15 U.S.C. §§ 77aaa-77bbbb (1994).

[12] 15 U.S.C. § 77ppp (1994).

I. Framework and Model

We analyze a simple model of debt recontracting and corporate investment policy in financial distress. We consider a firm with cash holdings of I and outstanding debt with face value D. All debt has the same seniority and matures next period. Assume that the firm may consider investing in one of a continuum of projects, each of which costs I and has a common "upside" payoff of $X_H > D$, which occurs with probability p. Each project also entails a "downside" payoff X_L, which, for simplicity, lies on the interval [0, D].[13] The preexisting $\$D$ of outstanding debt is held in equal proportions by a continuum of debtholders distributed on the unit interval [0, 1].[14] Shareholders and bondholders are assumed to be risk neutral with respect to the firm's payoffs.

In addition to choosing X_L, the distressed firm may propose a restructuring of its outstanding debt. Debt restructuring prior to bankruptcy reorganization is governed by Section 316 of the Trust Indenture Act (hereinafter "TIA"),[15] which essentially requires that the firm receive consent from all bondholders whose debt is to be altered before changing the principal, interest, or due dates of repayment of their debt contracts.[16]

Although a mere majority vote is insufficient to effect a change in the central terms of a public debt security issue, the TIA does not proscribe the stripping of financial covenants (such as a covenant not to subordinate further the debt issue in question). Thus, a firm can effect such changes upon a majority or supermajority vote of the debtholders without violating the TIA. Thus, by coupling the vote and the tender offer, the firm can move affirmatively-voting, tendering bondholders into senior status through reissue, while leaving the repayment terms of the negatively-voting, nontendering bondholders unchanged.

[13] Note that because all projects have the same upside payoff, the project with downside payoff D is the first-best.

[14] Thus, if one views each debtholder as possessing a fraction dx of the outstanding debt D, then the aggregate amount of debt is given by

$$\text{Aggregate debt} = \int_0^1 D\, dx = D.$$

[15] Trust Indenture Act of 1939, 15 U.S.C. §§ 77aaa-77bbbb (1994).

[16] Id. § 316(b), 15 U.S.C. § 77ppp(b) (1994), which states (in relevant part):

> (b) Notwithstanding any other provision of the indenture to be qualified, the right of any holder of any indenture security to receive payment of the principal of and interest on such indenture security, on or after the respective due dates expressed in such indenture security, or to institute suit for the enforcement of any such payment on or after such respective dates, shall not be impaired or affected without the consent of such holder, except as to a postponement of an interest payment consented to as provided in paragraph (2) of subsection (a). . ." Id.

A. Debt-for-Debt Exchanges

As noted above, one of the most common types of senior debt restructuring is a debt-for-debt, exit-exchange offer. Under such an offer, debtholders are given the option of tendering their debt holdings (initially Ddx per representative debtholder) in exchange for a smaller amount of debt, Edx, but with priority over nontendering debtholders. Thus, should a fraction α of debtholders tender, the firm's aggregate debt will be $\alpha E + (1 - \alpha)D$. The analysis below describes equilibrium tendering behavior of debtholders conditional on the values of E and X_L chosen by the firm.

By assumption, $E \leq D$, since the firm would never offer E greater than D. Thus, recalling that $X_L \leq D$, the firm's exchange offer and investment policy strategy pair (E, X_L) is in the space [0, D] $\times$ [0, D]. Within this region, we partition the equilibrium analysis into two subregions—$E \geq X_L$ and $E < X_L$.

Case 1: $E \geq X_L$

When $E \geq X_L$, it is possible that nontendering debtholders will see some payoff in a bad state *if* the aggregate amount of new senior debt, αE, is less than or equal to the payoff in the low state X_L. Conversely, if $\alpha E > X_L$, then even higher priority, tendering debtholders will not recover fully in the bad state.

Because debtholders are atomistic on the unit interval, we can analyze all symmetric and asymmetric equilibria of this game as the set of symmetric mixed strategy equilibria in which each debtholder tenders with probability α and refuses to tender with corresponding probability $(1 - \alpha)$.[17] It is straightforward, then, to derive the payoffs π consistent with tendering and no tendering for a representative bondholder:

$$\pi(\text{tender}) = pEdx + (1 - p) \cdot \begin{cases} Edx & \text{if } \alpha E \leq X_L \\ \dfrac{X_L}{\alpha}\, dx & \text{else} \end{cases} \tag{1}$$

$$\pi(\text{no tender}) = pDdx + (1 - p) \cdot \begin{cases} \dfrac{(X_L - \alpha E)}{(1-\alpha)}\, dx & \text{if } \alpha E \leq X_L \\ 0 & \text{else} \end{cases} \tag{2}$$

Assuming a proportion α of all debtholders accept the exchange offer, a tendering debtholder will get Edx in the high state and Edx in the low state if $\alpha E \leq X_L$. If $\alpha E > X_L$, then all the tendering debtholders cannot receive Edx in a low state, and therefore must divide the low-state cash flows, X_L, equally. Nontendering debtholders will get the full face value of their debt (Ddx) in the high state by our assumption that $X_H \geq D \geq E$. If $\alpha E \leq X_L$, then nontendering debtholders, whose claims are junior to the tendering debtholders,

[17] Because there are a continuum of debtholders, each tendering independently with probability α, the law of large numbers implies that with probability one, an α proportion of the population of debtholders will tender.

divide the remaining $X_L - \alpha E$ equally among themselves. If $\alpha E > X_L$ then the nontendering debtholders get nothing. The discussion above suggests that we must partition this case further into two additional cases: (i) $\alpha E \leq X_L$; and (ii) $\alpha E > X_L$.

(i) $E \geq X_L$; $\alpha E \leq X_L$: In this region, equations (1) and (2) yield the following payoff functions for a representative debtholder:

$$\pi(\text{tender}) = pEdx + (1-p)Edx = Edx \tag{3}$$

$$\pi(\text{no tender}) = pDdx + (1-p)\frac{(X_L - \alpha E)}{(1-\alpha)}dx \tag{4}$$

It turns out that this region supports both pure and mixed strategy Nash equilibria. The only viable pure strategy equilibrium is $\alpha = 0$ (symmetric no tender).[18] In a symmetric no-tender equilibrium, debtholders weakly prefer not to tender when they conjecture that no debtholders will tender. Using the two equations above, and substituting $\alpha = 0$, this occurs when

$$E \leq pD + (1-p)X_L. \tag{5}$$

To compute the mixed strategy equilibria, we simply look for some $\alpha^* \in (0, X_L/E)$ such that the marginal debtholder is indifferent between tendering and holding out. Thus, in a mixed strategy equilibrium, if an α^* proportion of debtholders tender, then tendering with probability α^* must be a weak best response for the representative debtholder. Using equations (3) and (4), the indifference condition is given by:

$$(a) \quad E = pD + (1-p)\left(\frac{X_L - \alpha^* E}{1-\alpha^*}\right); \tag{6}$$

$$(b) \quad \alpha^* > 0;$$

$$(c) \quad \alpha^* \leq \frac{X_L}{E}.$$

We can simplify the above equations to derive the following conditions for a mixed strategy equilibrium:

$$(a) \quad \alpha^* = 1 - \left(\frac{1-p}{p}\right)\left(\frac{E - X_L}{D - E}\right); \tag{7}$$

$$(b) \quad E < pD + (1-p)X_L;$$

$$(c) \quad E \geq pD.$$

[18] In this region a symmetric tendering equilibrium ($\alpha = 1$) is viable only in the trivial case where $E = X_L = D$. We show below, however, that the firm will never choose $E = X_L = D$ in a debt-for-debt exchange.

(ii) $E \geq X_L$; $\alpha E > X_L$. Here, we can use equations (1) and (2) once again to derive two types of equilibria, one pure and one mixed. Recall first the two payoff functions.

$$\pi(\text{tender}) = pEdx + (1 - p)\frac{X_L}{\alpha}dx \tag{8}$$

$$\pi(\text{no tender}) = pDdx + (1 - p)0dx = pDdx. \tag{9}$$

Clearly, from the assumption $\alpha E > X_L$, any pure strategy equilibrium will entail $\alpha = 1$ (i.e., the symmetric tender equilibrium). Given the above expressions, there exists a symmetric pure strategy tendering equilibrium if and only if the payoff from tendering weakly exceeds the payoff from not tendering when it is conjectured that all debtholders will tender. Thus there exists a symmetric tendering equilibrium in pure strategies if and only if:

$$E \geq D - \frac{(1-p)}{p}X_L. \tag{10}$$

Analogously, a mixed strategy will emerge when the following conditions hold:

$$(a) \quad pE + (1 - p)\frac{X_L}{\alpha^*} = pD \tag{11}$$

$$(b) \quad \alpha^* < 1$$

$$(c) \quad \alpha^* E > X_L,$$

which, after some simplification, yield:

$$(a) \quad \alpha^* = \left(\frac{1-p}{p}\right)\left(\frac{X_L}{D-E}\right) \tag{12}$$

$$(b) \quad E < D - \frac{(1-p)}{p}X_L$$

$$(c) \quad E \geq pD$$

Case 2: $E < X_L$.

In this region, the only feasible case is $E < X_L$ and $\alpha E < X_L$. Using reasoning similar to that behind the derivations of equations (1) and (2), the

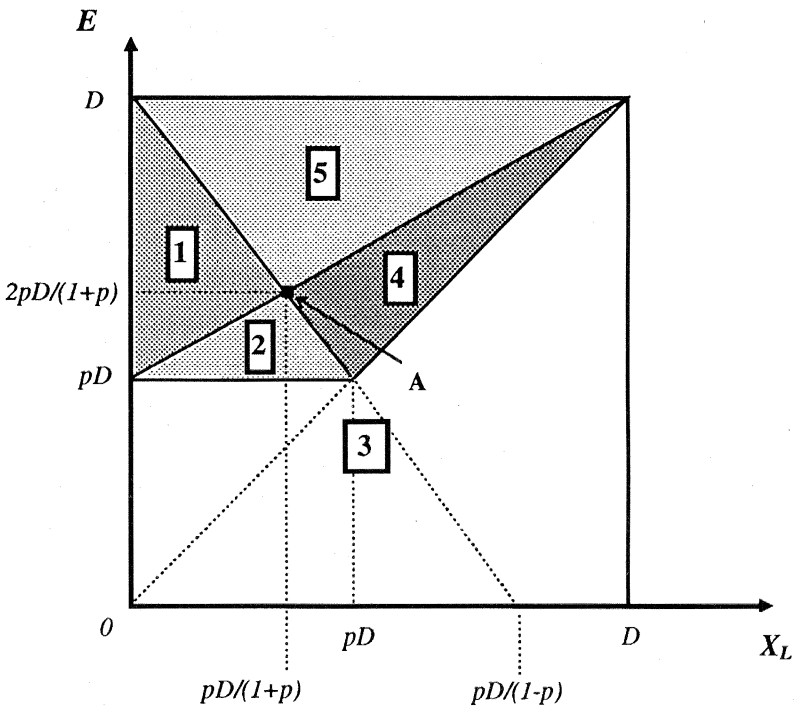

Figure 1. Equilibrium regions in E – X_L space.

tender and no tender payoff functions are:

$$\pi(\text{tender}) = pEdx + (1-p)Edx = Edx \tag{13}$$

$$\pi(\text{no tender}) = pDdx + (1-p)\begin{cases} \dfrac{(X_L - \alpha E)}{(1-\alpha)}\,dx & \text{if } X_L - \alpha E \leq (1-\alpha)D \\ D\,dx & \text{else} \end{cases} \tag{14}$$

Here, because $D \geq X_L > E$, holding out dominates tendering (i.e., it is strictly dominant for all debtholders not to tender) regardless of the value of α. Thus the only equilibrium possible in this case is $\alpha = 0$.

Figure 1 displays the subregions of $E - X_L$ space that give rise to the various equilibria described above. In subregion 1, there is one unique equilibrium outcome in mixed strategies, where $\alpha = (1-p)X_L/[p(D-E)]$. In subregion 2, there are three equilibria, one of which is a pure strategy "no tender" equilibrium ($\alpha = 0$), and the other two are mixed strategy equilibria (with $\alpha = (1-p)X_L/[p(D-E)]$ and $\alpha = 1 - (1-p)(E - X_L)/[p(D-E)]$, respectively). Subregion 3 supports solely the symmetric "no tender" equilibrium ($\alpha = 0$). Subregion 4 supports pure strategy equilibria of "no tender" and "tender" ($\alpha = 0, 1$ respectively) as well as one mixed strategy equilibrium ($\alpha = 1 - (1-p)(E - X_L)/[p(D-E)]$). Finally, subregion 5 supports the "tender"

($\alpha = 1$) equilibrium uniquely. The reader will notice that as is typical for generic normal form games with bounded strategy spaces, all subregions contain an odd number of equilibria.

In Regions 2 and 4, the multiplicity of equilibria make it somewhat more difficult to determine, as a predictive matter, how debtholders will respond to an exchange offer with parameters in those relevant ranges. Moreover, because in these regions the game becomes one of coordination, the usual refinements of Nash equilibria are not helpful for selecting between equilibrium profiles. These observations are perhaps consistent with the stylized fact that a large number of exchange offers are proposed but then retracted when tendering rates do not meet expectations.

For current purposes, however, it is only necessary for us to supply a reasonable equilibrium selection criterion in order to illustrate our thesis. One such criterion is what one might call a "Pareto" criterion, which stipulates that when faced with a strategic environment that supports a number of equilibrium profiles, the debtholders will never choose to coordinate on an equilibrium profile whose payoffs are Pareto-dominated by those produced by some other equilibrium profile. We thus proceed with the following assumption:

Assumption P: *Suppose α^* represents an equilibrium strategy profile for the exchange offer game defined by (E, X_L). If there exists some other equilibrium strategy profile α' such that $\pi_i(\alpha') \geq \pi_i(\alpha^*)$ for each debtholder i and $\pi_j(\alpha') > \pi_j(\alpha^*)$ for some debtholder j, the equilibrium α^* occurs with zero probability.*

The assumption above asserts that, in the presence of numerous equilibrium outcomes, the set of possible "focal points" coincides with the set of equilibria on the Pareto frontier among debtholders. For the purposes of this analysis, the above assumption is not critical, and our results are qualitatively similar upon relaxing this assumption. Together, Assumption P and the equilibrium characterization above yield the following proposition:

Proposition 1. *If Assumption P holds, the manager/shareholders' optimal choice of E is equal to $2pD/(1 + p) < D$, the optimal choice of X_L is $pD/(1 + p) < D$ and all debtholders tender ($\alpha = 1$).*

Proof: See Appendix.

Proposition 1 is significant in two ways. First, it asserts that even after accounting for the possibility of a no-tender equilibrium,[19] bondholders may find it optimal to tender in an exchange offer if $E < D$.[20] Second, and more importantly, Proposition 1 implies a particularly pernicious effect on investment choice. A number of scholars have argued that bankruptcy and debt overhang can lead to risky investment choices, and potential negative NPV

[19] For example, Gertner and Scharfstein (1991) does not address this possibility.

[20] This result is similar to the results in the literature on two-tiered takeover bids. In a two-tiered offer, atomistic shareholders who cannot coordinate their actions may find it individually rational to tender even though it is optimal for all shareholders to hold out. Grossman and Hart (1980).

investment choices. The argument centers on the observation that managers and equity holders, as residual claimants, are only concerned with the "upside" of an investment and are therefore indifferent to the prospect that the investment may have significant downsides.[21] Our results confound this argument even more, however. Even when the firm has access to a continuum of projects with equal payoffs in good states, managers may not be "indifferent" about the payoffs in bad states, but may actively pursue such projects.

The economic intuition is as follows. In making her tendering decision, a representative bondholder must trade off (i) the benefit of debt seniority in bad states, which results from tendering; against (ii) the benefit of retaining high face value in good states, which results from holding out. Thus, if the payoff in the bad state is too *low*, bondholders will demand a higher face value on their debt (E) to tender. Furthermore, if the payoff in the bad state is too *high*, the manager is constrained to offer face value of debt that is at least that high because it is never rational for any bondholder to tender when $E < X_L$. Given that the manager/shareholders' sole interest is to minimize their debt obligations in the good state,[22] they will choose the project that makes their debt burden as small as possible subject to the constraint that the exchange offer will induce tendering among bondholders in equilibrium.

B. Debt-for-Equity Exchanges

As noted in the introduction, the debt-for-debt exchange discussed above is not the only type of exit-exchange offer. Indeed, another common type of exchange offer involves tendering of debt for an equity stake in the firm. In this subsection, we consider such an offer and demonstrate that unlike a debt-for-debt exchange, a debt-for-equity exchange is not coercive and does not give rise to inefficient investment by managers/shareholders. However, the payoff that managers/shareholders receive under such an offer is less than they would receive under the debt-for-debt exchange offer analyzed above.

Consider a debt-for-equity exchange offer in which the firm offers each debtholder the opportunity to tender the face value of his debt, Ddx, in exchange for an equity share of the firm, γdx. Thus, if *all* bondholders tender their debt, then the firm will transfer a fraction γ of firm ownership to the debtholders.

It is immediately apparent that the debt-for-equity exchange induces a classic free-rider problem among bondholders. A non-tendering bondholder is made unambiguously better off when other bondholders tender in the debt-for-equity exchange, because he holds a senior claim.[23] Therefore, to induce all bondholders to tender, managers/shareholders must offer each individual an expected payoff of at least Ddx, because a bondholder who conjectures that all

[21] See, e.g., Jensen and Meckling (1976); Myers (1977); Gertner and Scharfstein (1991).

[22] Because there is never tendering when $X_L > E$, the shareholders/managers make a positive payoff only in the good state.

[23] Note the contrast to the debt-for-debt case, in which nontendering bondholders can be made *worse off* when other bondholders tender, and are therefore coerced into tendering.

Table I

Private and Social Payoffs of Debt and Equity Exchange Offers Relative to "No Renegotiation"

Expected Payoffs	No Renegotiation	Debt-for-Debt Exchange	Debt-for-Equity Exchange
Bondholders	D	pD	D
Shareholders	$p(X_H - D)$	$p[X_H - 2pD/(1 + p)]$	$p(X_H - D)$
Social Welfare	$pX_H + (1 - p)D$	$pX_H + D(1 - p)p/(1 + p)$	$pX_H + (1 - p)D$

other bondholders will tender their debt for equity would receive the full face value of his debt by holding out. Thus, managers/shareholders are only as well off as they would be if they did not renegotiate and, furthermore, they have no incentive to destroy value strategically. Proposition 2 formalizes this intuition and extends it to all mixed strategy equilibria of the debt-for-equity game:

Proposition 2. *In a debt-for-equity exchange, the manager's optimal choice of* X_L *is* D *and all parties receive the same payoffs as if there were no debt renegotiation.*

Proof: See Appendix.

C. Comparison

Table I summarizes the above analysis by describing the expected payoffs to bondholders and shareholders if there is (i) no debt renegotiation; (ii) a debt-for-debt exchange; and (iii) a debt-for-equity exchange. Observe that, compared to no renegotiation, shareholders prefer a debt-for-debt exchange (as they are made better off by the amount $Dp(1 - p)/(1 + p) > 0$ when they can induce such an exchange). However, in aggregate, bondholders are made worse off under a debt exchange (by the amount $(1 - p)D$).[24] Thus, under a debt-for-debt exchange, aggregate social welfare is lower (by $D(1 - p)/(1 + p)$) than it would be either in the absence of renegotiation or in the presence of an equity exchange.

As we argued above, the managers/shareholders have an incentive to choose a dominated investment project to strengthen their bargaining position in a debt-for-debt exchange. In a debt-for-equity exchange, however, managers/shareholders increase the value of the securities they offer (i.e., equity) by choosing the investment with the highest payoff in the low state. Consequently, there is no investment inefficiency in a debt-for-equity exchange.

[24] The intuition is as follows. To induce tendering in a debt-for-debt exchange offer, managers/shareholders must make it profitable for an individual bondholder to tender *when the bondholder conjectures that all other bondholders* will tender. If, however, all other bondholders tender and $X_L \leq E$, the bondholder will get 0 in the low state and Ddx in the high state with probability p. Thus, managers/shareholders need only offer the bondholders an expected payoff of $pDdx$ to ensure full tendering.

Interestingly, note that in a debt-for-debt exchange, not only would the manager/shareholders choose an investment project that exacerbates the firm's financial distress, but they have an incentive to choose an investment project that places the firm in financial distress to begin with (i.e., they choose $X_L < D$ when $X_L = D$ is available).

II. Robustness

The coercive nature of the debt-for-debt exchange offer in the above analysis, and its accompanying investment inefficiency, depend on the ability of managers/shareholders to use investment policy to strengthen their bargaining position vis-à-vis the bondholders. More explicitly, our thesis depends critically on three assumptions, which we discuss in more detail below.

First, we assumed that bondholders do not coordinate their actions. If in a debt exchange all bondholders tender, they are each made worse off than if they all did not tender because the new debt will have the same relative priority but will have lower face value, $E < D$. Consequently, individual bondholders would choose not to renegotiate with shareholders if they could coordinate their actions and the source of investment inefficiencies would vanish. Admittedly, this assumption is too strong for the analysis to apply to a firm with a large proportion of its debt held in few hands. However, firms typically have many classes of debt, some of which are widely held by bondholders who cannot coordinate their actions (e.g., subordinated debentures). The possibility of investment inefficiency remains because exchange-offers can be targeted to these classes of debt.

Second, we assumed that managers adopt the suboptimal investment project *prior* to renegotiating and, furthermore, that this choice is irreversible. This assumption is critical to our analysis because any "threat" to take the suboptimal investment policy is not credible if any fraction, $\alpha > 0$, of the bondholders tender in the exchange offer. If the debt-for-debt exchange offer is successful, the debt commitment becomes $\alpha E + (1 - \alpha)D < D$, and thus it would be optimal for the managers to invest in the project that pays D in the low state because they would receive $D - \alpha E - (1 - \alpha)D = \alpha(D - E)$. Bondholders would understand that the threat is not credible and would not tender in the exit-exchange offer because they could achieve a higher payoff by holding out, D, than they could be tendering, E.[25] Thus, the mere "threat" of embarking on a suboptimal investment policy will not lead to the success of the exchange offer. The decision to embark on the optimal project prior to renegotiation is tantamount to perfect commitment by the manager.

Although they do not address the coercive nature of exit-exchange offers, Bergman and Callen (1991) also develop a model in which managers may

[25] This observation leads to an interesting paradox. If no debtholder tenders then the threat to choose a suboptimal investment project will be carried out. If, however, any positive fraction of debtholders tender then the threat is not credible. Clearly, debtholders prefer that some fraction among them tender, however, no individual debtholder has the incentive to "take it for the team."

threaten to allow the deterioration of firm value in order to enhance their bargaining position. Our analysis differs from theirs in the degree of commitment required from the respective players in equilibrium. In both models, managers can credibly threaten to destroy value off the equilibrium path (i.e., should bondholders reject an offer). However, in Bergman and Callen's analysis, the bondholders—acting as a coordinated player—can commit to accepting or rejecting the proposed exchange offer. Should they commit to accepting as a group, the manager need not make good on her threat, and therefore she need not destroy firm value *along* the equilibrium path.

Our model, in contrast, hypothesizes a continuum of bondholders, each acting atomistically. None of them views himself as "pivotal" to the success of the exchange offer, and therefore he may choose to "defect" from the group should a sufficiently large number of fellow bondholders tender. The resulting collective action problem keeps creditors from being able to commit to accepting an offer (as they can in Bergman and Callen's analysis). Given this inability of bondholders to commit, the manager must make an even stronger threat, committing to destroy value *even when* the exchange offer is accepted unanimously.[26]

The above observation has implications for optimal capital structure in firms with multiple classes of debt. Our model suggests that when managers can commit to destroy firm value, they may proceed to do so in equilibrium when debtholders behave atomistically. When debtholders are coordinated, on the other hand, the manager may merely *threaten* to destroy firm value, but she will not do so in equilibrium. Because junior debt is more prone to managerial opportunism than is senior debt, our model suggests that an optimal debt structure would place junior debt in the hands of coordinated actors (e.g., banks).

It is well known, however, that among firms who issue debt, bank debt typically has senior status, while junior debt is more likely to be publicly held. Such an ownership structure has long been seen as puzzling, since banks are generally believed to possess lower costs of monitoring opportunistic behavior.[27] Our results further confound this puzzle, because even holding monitoring costs constant, the incentives for strategic value destruction are greater when junior debt is held by disaggregated investors.

Finally, we assumed that an individual bondholder's decision to tender is coupled with vote of consent to allow the firm to strip fiduciary covenants (i.e., exit consent). If this exit consent decision occurs independent of (and prior to) the tendering decision, the debt-for-debt exchange offer will not succeed when the firm's investment policy is taken as given. The reasoning is as follows. By

[26] In addition, Bergman and Callen's model utilizes an alternating offers game in which the manager/shareholders threaten to deplete assets at the end of every unsuccessful round of bargaining. This threat is credible because the shareholders' payoffs in any continuation game are wholly determined by their *future* ability to destroy value; value destruction in the *current* period is wholly borne by the bondholders. Nevertheless, their results depend crucially on the ability of debtholders to commit both to accepting restructuring proposals and to making counterproposals.

[27] See Welch (1996) for a survey of the literature.

coupling the exit consent and tender decisions, the bondholders compare the payoffs from not tendering to the payoffs from tendering conditional on the success of the exchange offer. In this case, it may be individually rational to tender even though it is suboptimal for bondholders as a whole. If the exit consent decision is decoupled from the tendering decision, the bondholders decision to give exit consent will depend on the payoffs from renegotiating with shareholders compared to the payoffs from not renegotiating. We demonstrated earlier, however, that bondholders are always better off by not renegotiating, and thus the exchange offer would fail at the consent stage.

As such, we are sympathetic to the arguments in other recent articles[28] that legal reform may be required to decouple the two actions, forcing consent votes to be "non-coercive" in nature (i.e., even those who vote against the covenant stripping proposal may tender if the vote goes through). However, we do not view the repealing of the TIA as a panacea to this sequential consent-tender dilemma, as the TIA simply does not proscribe such behavior. Rather, we suggest that an outright ban on coupled debt-for-debt exit-exchange offers may be warranted when debt is sufficiently widely held.[29]

III. Conclusion

This article demonstrated the possibility of investment inefficiencies when a firm is in financial distress. In particular, we showed that managers, acting on behalf of shareholders, may choose to invest in stochastically dominated projects. Unlike many previous theories that suggest that managers are "indifferent" about payoffs in bad states, we found that managers may prefer investments with lower payoffs in bad states because it improves the shareholders bargaining position with (atomistic) bondholders in debt-for-debt renegotiation. Moreover, we found that an alternative form of restructuring, a debt-for-equity exchange, is not likely to be used for coercive purposes, and thus does not give rise to such investment inefficiency.

Normatively, this analysis suggests one conclusion in particular with respect to prudent legal reform. In analyzing the debt restructuring agency problem, others have suggested that a principal impediment created by exchange offers is the marriage of the consent vote to the tendering action.[30] The usual remedial suggestion in such situations is for the law to mandate a decoupling of the vote from the tender option, thereby allowing debtholders costlessly to voice opposition to the exchange plan, yet still be able to take advantage of the option should the firm proceed with restructuring through such a plan. Our analysis supports this view if (i) ownership of debt is widely dispersed; and (ii) managers can commit to suboptimal investment policies.

[28] E.g., Coffee and Klein (1991) and Gertner and Scharfstein (1991).

[29] Kahan and Tuckman (1993) note that dispersed bondholders frequently form bondholder groups to either defeat or substantially modify the terms of an exchange offer, thereby overcoming the collective action problem on their own accord. However, if the debt ownership is sufficiently dispersed, the cost of forming such groups may be prohibitive.

[30] See, e.g., Gertner and Scharfstein (1991).

Appendix

Proof of Proposition 1

In terms of Figure 1 it is easily confirmed that Assumption P dictates that the "no tender" pure strategy equilibrium ($\alpha = 0$) prevails in subregions 2 and 4. Thus, any feasible (X_L, E) pairs will induce tendering (and therefore profitability) only when they are in subregions 1 or 5. We therefore confine our attention to those regions.

The optimal (X_L, E) offer for the (risk neutral) manager solves the following program:

$$\underset{(X_L,E)}{\text{Max}}\ p\ \text{Max}\{[X_H - \alpha(X_L, E)E - (1 - \alpha(X_L, E))D], 0\} + (1 - p)$$
$$\text{Max}\{X_L - \alpha(X_L, E)E - (1 - \alpha(X_L, E))D], 0\}. \quad \text{(A-1)}$$

Recall that by assumption in this model, $X_H \geq D \geq E$. Moreover, subregions 1 and 5 are such that $E > X_L$. Combining these observations with the above objective function allows us to simplify the firm's objective to the following:

$$\underset{(X_L,E)}{\text{Min}}\ \alpha(X_L, E)E + (1 - \alpha(X_L, E))D \quad \text{(A-2)}$$

Notice that X_L enters this objective only through the tendering probability α. Consequently, for any value of E, the optimal value of X_L is that which maximizes the probability of tendering, α. We will assume that in the case of "ties" where shareholders are indifferent between packages, managers will act in accordance with the interests of bondholders.

Consider first the (X_L, E) pairs within subregion 5 of Figure 1. Within this region, $\alpha = 1$ everywhere; thus the choice of X_L here does not affect the payoff of managers/shareholders, and it is clear then that the optimal value for E is the smallest one possible. Thus, if constrained to subregion 5, the firm will choose a package that is arbitrarily close to point A in Figure 1, at coordinates $(pD/(1 + p), 2pD/(1 + p))$.

Now consider the optimal choice of the firm in subregion 1. Recall that within this subregion, there is a unique mixed strategy equilibrium at $\alpha = (1 - p)X_L/[p(D - E)]$. Note that this value is strictly increasing in X_L for any fixed E. The firm's objective in this region is thus:

$$\underset{(X_L,E)}{\text{Min}}\left[\frac{(1-p)X_L}{p(D-E)}E + \left(1 - \frac{(1-p)X_L}{p(D-E)}\right)D\right], \quad \text{(A-3)}$$

which simplifies to:

$$\underset{(X_L,E)}{\text{Min}}\left[D - \frac{(1-p)}{p}X_L\right]. \quad \text{(A-4)}$$

Thus, the optimal (X_L,E) pair in subregion 1 is the one that maximizes X_L. Notably, this observation suggests that the firm will choose a pair arbitrarily close to point A once again.

Proof of Proposition 2

Assume, as before, that given the project choice X_L and the exchange offer choice γ, a fraction α of debtholders tender their debt (where $0 \leq \alpha \leq 1$). It is convenient to subdivide the analysis into two parts. First, consider the case in which sufficiently many debtholders tender to allow full compensation of holdouts in the bad state (i.e., $X_L \geq (1 - \alpha)D$), and second, when the opposite is true (i.e., $X_L < (1 - \alpha)D$).

When $X_L \geq (1 - \alpha)D$, the representative debtholder's payoff from tendering is:

$$\pi(\text{tender}) = [pX_H + (1 - p)X_L - (1 - \alpha)D]\gamma dx \tag{A-5}$$

Her payoff from not tendering is:

$$\pi(\text{no tender}) = Ddx \tag{A-6}$$

The resulting payoff to the incumbent shareholders (whose shares are diluted by fraction $\alpha\gamma$ after the tender offer) is:

$$\pi_{SH}(\gamma) = [pX_H + (1 - p)X_L - (1 - \alpha)D](1 - \alpha\gamma). \tag{A-7}$$

We now show that $\pi_{SH}(\gamma) \leq p(X_H - D)$ for all $\alpha \in [0, 1]$. For a given γ, a mixed strategy equilibrium profile (if one exists) dictates that each debtholder must in equilibrium be indifferent between tendering and holding out. Solving the above expressions for equilibrium value α^*:

$$\alpha^* = 1 + \frac{1}{\gamma} - \frac{pX_H + (1 - p)X_L}{D}. \tag{A-8}$$

Assuming α^* is interior, then whenever $X_L \leq D$, the payoff for the incumbent shareholders (using equation (A-7) is:

$$\begin{aligned}\pi_{SH}(\gamma) &= [pX_H + (1 - p)X_L - (1 - \alpha^*)D](1 - \alpha^*\gamma) \\ &= pX_H + (1 - p)X_L - D \\ &\leq p(X_H - D)\end{aligned} \tag{A-9}$$

Moreover, $X_L = D$ is the optimal choice of X_L, and still the incumbent shareholders do only just as well as they would do absent negotiation.

We now consider pure strategy equilibria. First suppose $\alpha^* = 0$; in this case, it must be true that $X_L = D$. Consequently, the shareholders' payoff function is:

$$\pi_{SH}(\gamma|\alpha = 0) = pX_H + (1 - p)X_L - D = p(X_H - D). \tag{A-10}$$

Conversely, suppose $\alpha^* = 1$. Here, the shareholders' payoff would be:

$$\begin{aligned}\pi_{SH}(\gamma|\alpha = 1) &= [pX_H + (1 - p)X_L](1 - \gamma) \\ &\leq pX_H + (1 - p)X_L - D \\ &\leq p(X_H - D)\end{aligned} \tag{A-11}$$

where the first inequality is due to the fact that tendering occurs only when $\gamma[pX_H + (1 - p)X_L] \geq D$. Thus, under either of the pure strategy cases, the shareholders can do no better than to choose $X_L = D$, and their payoff is no larger than if they were simply to refuse to renegotiate.

The case where $X_L < (1 - \alpha)D$ is similar in nature, and it is therefore omitted.

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