

Why is Bank Debt Senior?

A Theory of Asymmetry and Claim Priority Based on Influence Costs¹

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Abstract

This theory can explain why bank debt is universally senior, consistent with the presence of conflict (lawyers) and absolute priority violations in financial distress: Better organized banks would more strongly contest priority in financial distress if they were junior. Because “deterrence” can reduce creditors’ total expenses in a priority contest, the ex-post stronger lobbyist/litigant should be senior ex-ante. For equivalent reasons, the theory can advise when public debt should be senior to trade credit and/or implicit contracts, and can even suggest one rationale for the absolute priority rule (APR). The paper further shows that Chapter 11 creditor reimbursement procedures can lower overall costs.

Firms almost always choose capital structures in which bank debt is senior to public debt. For example, Carey (1995) finds that in the 18,000 loans made between 1986 and 1993 and recorded in the Loan Pricing Corporation *Dealscan* data base, over 99% of all bank loans contain a senior priority clause. Our paper provides an explanation for this observed priority structure: The expected deadweight lobbying and litigation expenses, associated with a fight for preferential treatment (priority or side awards) in financial distress, can be lower if one awards the potentially stronger creditor ex-post (the bank) the position with more power ex-ante. That is, to maximize the “deterrence” to avoid a fight between creditors involved in *rent-seeking* activities, it can be efficient to promise the stronger contender priority.¹ Naturally, because creditors demand a yield to reflect possible future contest expenses, choosing the optimal priority structure allows firms to raise capital at a lower cost.

It is important not to interpret the litigative and lobbying costs too narrowly: such expenses should include the costs of organizing the creditor class, free-rider problems, reputation benefits in future restructuring negotiations (both positive and negative), and management time and hassle. Because of our wide interpretation of expenses, banks are likely to have a lower cost than public debt to produce one “unit” of litigative/lobbying activity. This assumption is justified in detail in section 2.

Our theory is not only consistent with the presence of lawyers (lobbying) absolute priority violations in financial distress, but it also has normative implications, explaining the circumstances under which privately placed debt should be senior to public debt, under which (better organized) investment bankers should take on

¹Priority in our model works in one of two ways to increase strength: [1] when firms reimburse creditors’ expenses, the junior creditor effectively pays for the senior’s expenses; [2] when firms do not reimburse creditors, an assumed bias in favor of the default (absolute priority) makes “defense” of APR easier than “offense” against APR.

the more senior claims (mezzanine vs. equity) in LBOs, or under which public debt (represented by a trustee) *should* be senior to *old* trade credit (usually dispersed and subject to free-rider and coordination problems). In turn, implicit contracts (such as warranties) are smaller, and thus even less likely to be contested, so an even more junior role may be appropriate. There are exceptions, however, when obligations to customers are not implicitly junior and a fight erupts over priority. These episodes can be quite costly. For example, Anderson (1987, p.442) describes the Manville asbestos experience:

An Institute for Civil Justice–Rand Corp study estimates that for every dollar paid to injured claimants, nearly two dollars are spent on litigation expenses. More specifically, of the total amount paid by producers and insurers, 37 percent was received by plaintiffs, 26 percent by plaintiff’s attorneys, and 37 percent was spent by producers and insurers on defense costs.

There is some academic evidence on the magnitude of “administrative” costs in formal Chapter 11 bankruptcy and Chapter 7 liquidation. Weiss (1990) documents 37 cases, in which the direct reimbursed costs of lawyers, accountants, and other professionals involved in the Chapter 11 bankruptcy filing alone amounted to an average of 3.1% of firm value (with a range of 1% to 5.5%). Earlier studies had hinted at 4% to 25%. In addition, there are indirect costs (e.g., management time), which are borne by implicit contractors (Titman (1984)), and legal fees not reimbursed by the firm itself but paid by creditors. It is plausible that reducing the litigative propensity of its creditors (by making the bank the senior creditor) is likely to reduce not only the direct but also the indirect costs.

The remainder of this paper proceeds as follows. Section 1 positions the paper within the related literature. Section 2 justifies the crucial assumption that banks

are stronger fighters than public creditors. Section 3 provides the model. A firm has decided to raise a given amount of senior and junior debt, despite potential conflicts of interest among priority classes. The firm's decision is whether to make the bank or the public debt the more senior claim. Section 4 considers formal reorganization, which differs from informal reorganization in that creditors' legal expenses are borne by the firm, not by the creditors. The section ends with a comparison of waste in the no-reimbursement scenario (informal reorganization) with the reimbursement scenarios (formal reorganization as in Chapter 11). Contrary to the common perception that costs are larger when creditors do not pay themselves and possibly "free-ride" off the firm (and thus other creditors), there are parameter values under which the reimbursement scenario can result in *lower* overall expenses for creditors. Section 5 discusses empirical issues and possible extensions. Because asymmetry in strength minimizes conflict, the model can explain the presence of different creditor types (banks and public credit) and credit forms (senior and junior debt).

1 Related Literature

Financial distress and its influence on capital structure are complex issues. The role of information, control rights and the induced incentive and moral hazard problems on management has dominated corporate finance for decades (see Hart (1995)).

A large literature focuses on the special role of banks. Bulow and Shoven (1978) consider optimal termination and continuation of the firm, and argue that banks' special role is extending new credit in a bankruptcy. Diamond (1984) points out that a financial intermediary (a bank) can solve the free-rider and information duplication problems in monitoring a firm. Diamond (1991) considers a more general

scenario in which different types of firms can choose *either* bank *or* public debt to reduce moral hazard. He shows that the comparative statics are rather complex. In Chemmanur and Fulghieri (1994), banks devote more resources to evaluating whether to liquidate or continue a firm in Chapter 11. Yosha (1995) argues that firms choose bank debt over public debt to keep information proprietary. In Rajan (1992), the benefit of bank debt is its flexibility in default. The cost of bank credit is that banks have bargaining power and expropriative incentives over the firm's profits if a short-term crisis arises. Rajan and Winton (1995) argue that collateral and covenants can serve to make the effective priority of loans (especially bank loans) contingent on monitoring. Although banks play no role in Berglof and von Thadden (1994), and Bolton and Scharfstein (1994), multiple creditors do. In the former, firms can use multiple creditors to commit to optimal ex-post termination; in the latter, an optimal number of creditors trades off ex-post renegotiation against ex-ante monitoring.

Our own paper cannot address these important concerns and omits such important issues as the *influence* and *role* of management and the *costs* of lobbying on running the firm. Instead, our theory focuses sharply on the cost/benefit tradeoff of making the bank either senior or junior.² This choice was also considered in Diamond (1993a)—building on Diamond (1993b), Berglof and von Thadden (1994), and others—which argues that different types of debt in different hands can commit the firm to *ex-post* termination that is optimal in an *ex-ante* sense. The special role of the bank is that “only the bank lenders have the specific expertise to implement a liquidation.” To ensure that short-term creditors (banks) do not prefer continuation, they need to be senior. Park (1994) points out that if the monitor (bank) were junior debt, another party (the senior debt) would free-ride. From a joint perspec-

²**It is a common misconception that bank regulation favors collateralization.** Although government securities require less capital backing than corporate securities, all corporate securities are treated alike, regardless of securitization or seniority.

tive, this produces too little monitoring, particularly if firm value cuts deep into the junior's share when bankruptcy can be detected. Our own theory differs from these two theories in that it can explain bank debt seniority, even if a junior position would induce the bank to monitor *more* and the bank could force liquidation when the firm value would satisfy *all* creditors,³ or if termination was out of the question to begin with. Burkart, Gromb, and Panunzi (1995) argue that by making the bank senior, the bank can “safely” *reduce* its monitoring efforts, which—under *suitably chosen* parameters—might induce management to work *harder*, which helps the firm *ex-ante*. Our theory differs from all three theories in that it attributes a new empirical role to lobbying, lawyers, litigation, and absolute priority violations, and in that the prescription of bank debt seniority (due to “deterrence”) seems relatively more *universal*. Taking a step back, the three theories capture different cost/benefit aspects of the choice of bank debt seniority, all of which are likely to play a role.

Our own paper is set in a framework outside the predominant paradigm of strategic information economics: conflict theory. Conflict theory was pioneered by Jack Hirshleifer, who argues in his presidential address (Hirshleifer (1994)) that “the dark side [conflict] is no mere outlying peninsula but rather an entire intellectual continent on the map of economic activity.” Conflict theory differs in that it assumes a mechanistic outcome as a result of lobbying activity. This is probably a response to the inability of strategic information bargaining models to come up with robust generic insights about observed bargaining.

Our work addresses not only a new setting with conflict theory (bankruptcy, financial distress, creditors, and non-linear debt payoff functions), but also how *ex-ante* choice of claimant identity can reduce *ex-post* conflict costs. Our work is

³Franks and Torous (1994) document high recovery rates, with 80% recovery even to junior debt in distressed exchanges, indicating that the decline in firm value has not effectively wiped out the junior creditor.

also related to influence costs (e.g., Milgrom and Roberts (1990)), and extended to capital structure in Bagwell and Zechner (1993). Rajan and Zingales (1995) consider how the search for power among divisions can result either in a destructive or a constructive rat-race. In contrast to their work, which focuses on intra-firm influence and lobbying costs, the conflict discussed here originates from outside debt holders. Finally, some research has argued that firms should minimize possible future bankruptcy renegotiation problems. For example, Bergman and Callen (1991) model a debt renegotiation game between debtholders and shareholders.

Our theory can naturally explain the identity of creditors. It is new insofar as it does not assume a costless immediate reorganization (or liquidation), but instead permits lawyers to influence the court and management and priority violations to occur. The theory offers a simple economic intuition (“deterrence”) for creditor identity, is broadly consistent with some anecdotal and empirical evidence, and offers unique empirically testable implications. Future research may provide a synthesis of bargaining theory, information theory, and conflict theory, to address other important issues, mentioned above.

2 Are Banks Better Fighters?

Our theory rests on the premise that banks are better lobbyists/litigants than public creditors. Consider:

1. (Organization.) As a single entity, a bank is intrinsically better organized than public bondholders to pressure management before bankruptcy (or the court in bankruptcy) to change the risk profile of investments, provide outright side-payments, or favorably change loan terms. It can oversee its own lobbying and legal representation and hire the best lawyers or even maintain a legal

department by guaranteeing payment.

In contrast, diffuse bondholders cannot as easily supervise their outside lawyers (“agents”). In formal reorganization, the bondholders are organized into one or several creditor committees (with internal conflicts of their own). Outside formal bankruptcy, when banks can already move to influence management, there is little or no organized public bondholder representation. Consequently, any lawyers willing to defend bondholders would also first need to organize and coordinate their clients. In formal bankruptcy, these lawyers must hope that the court will reimburse them later (and typically only about 80% are reimbursed today).⁴

2. (Funding Influence.) Before and during formal reorganization, banks have information and some control over the day-to-day liquidity of the firm. This allows them to more effectively pressure management or the court, in effect lowering the cost of a unit of legal/lobbying representation. Similarly, banks often obtain better terms because they can offer to raise additional funds. Diffuse bondholders cannot easily organize to offer extra financing.
3. (Reputation.) Unlike bondholders, a bank can benefit more from a reputation for tough behavior in financial distress, discouraging opportunistic renegotiation by its other borrowers.

For example, outside formal bankruptcy, other creditors need not even be informed of the reallocation of claims, e.g., caused by side payments or additional security given to an outstanding loan. An extreme example of a management giving a bank special treatment (that was ultimately reversed and punished by *equitable*

⁴The funds and incentives of the bond indenture trustee, appointed when the bond is issued, are quite limited. His obligation is merely to find if formal bond covenants have been violated. Our paper suggests that the weaker the role the trustee, the lower are the lobbying expenses.

subordination) is the behavior of the *First National Bank of St. Paul* (FNB) before the *American Lumber Company* (ALC) bankruptcy. FNB had security interest in some of ALC's property, which covered the value of some of FNB's loans to the company, and the rest of the loans remained unsecured. As is common, the bank required its corporate client to maintain an account. The bank had the following information that was unavailable to other creditors:

On October 24, 1975, the Bank knew that ALC was in default on its loans to it. It knew that its losses were mounting. It knew that ALC was in an overdraft situation in both its payroll and checking accounts. It knew that ALC's accounts receivable had been foreclosed upon (5, *B.R. 470*, [*D.Minnesota*] 1980).

Having reasonable certainty that the corporation was insolvent, the bank sought to gain an additional security interest in the inventory and equipment of ALC. ALC attempted to deny the interest, but ultimately the bank was in a position of control. The bank proceeded to take all funds in its custody, through the accounts of ALC, and appropriated them to offset ALC's unmet unsecured obligations. This effectively eliminated the company's operating capital, forcing it to accept new loans. These new loans were secured, in effect transforming unsecured to secured loans.

To be fair, there are also plausible reasons why these arguments may be exaggerated. First, public debt can be less diffuse (held primarily by one individual or group) or bank debt can be more diffuse (e.g., in syndicated deals) in some firms. Second, the frequently analyzed "hold-out" problem limits public creditors' ability to respond. When flexibility could mean compromising to worse terms (waiving formal covenants), public creditors can be stronger. But an "inability to move" does not always convey strength. Covenants cover only specific contingencies, and firms and banks can maneuver around covenants to avoid the need for formal consent.

For example, covenants cannot exclude all (possibly secret) side payments (or risk policy changes) to other claimants. When firms have sufficient time, they can expropriate public creditors using an exchange offer. Kahan and Tuckman (1993) and Asquith, Gertner, and Scharfstein (1994) provide evidence that firms indeed coerce public bondholders into accepting covenant modifications, suggesting that public debt has high costs to organize and defend itself.⁵ And there is indirect evidence from large firms' reorganizations. In the typical situation in large U.S. bankruptcies, the senior creditor is so deep in the money that he/she would get fully satisfied even if the liquidation dragged on for years. There is no reason to expect the senior creditor (banks) to offer more than token compromise in favor of more junior creditors (and note that by providing ongoing services to the firm, banks can offer public compromises and privately receive bribes from the firm). The very fact that firms do manage to reorganize means either that one must argue that junior public creditors can give some way or that one must argue the less appealing hypothesis that far-in-the-money senior creditors are willing to throw away value. Fourth, James (1995) finds that "for firms with public debt outstanding, banks never make concessions unless public debtholders also restructure their claims." His Table 1, Panel B shows that bank creditors experience less principal reduction than public creditors (37% vs. 49% of facevalue) and receive more equity than public creditors (50% vs. 30% of face value). (Plus, only banks can extort secret bribes.)

In sum, it is likely that banks have both the incentive and the ability to more strongly contest formal priority structure than public bondholders. Under this assumption, the hypothesis advanced in this paper is that, to reduce rent-seeking and avoid lobbying and litigation waste, it can *ex-ante* be better to award seniority to

⁵Kahan and Tuckman (1993) describe some exceptions in which public debt did manage to organize itself to resist coercion. Gertner and Scharfstein (1991) describe theoretically how firms can structure exchange offers to coerce public debt owners. Bernardo and Talley (1996) show how firms may even destruct wealth to coerce a better exchange offer from public creditors.

banks. Our analysis suggests that when arbiters try to hold onto agreed upon priority but can be somewhat influenced by lobbying, the position of the bank as senior creditor typically reduces the expected total ex-post expenses on lobbying activities.

3 Informal Pre-Bankruptcy Creditor Lobbying Without Fee Reimbursement

We assume that firms maximize their current market value. There are no asymmetric information, taxes, liquidity, or non-lobbying bankruptcy deadweight problems. We also assume for now that the firm has already decided to raise a given amount of senior and junior debt, and now decides only whether to make the bank or public debt the senior or the junior claim. Because the only source of friction in the model is the contest expenses of the creditors, firm-value today is maximized when creditors' expected lobbying expenses are minimized. The mechanism by which the firm benefits from choosing the correct senior creditor are lower overall borrowing costs. In order to induce competitive bondholders not to invest in risk-free government bonds instead, the firm must offer an interest rate which takes the payoffs *including litigation/lobbying costs* into account. We concentrate on the *wasteful* component of lobbying only: where lobbying produces useful information to increase firm value, reducing lobbying would not increase the value at which securities can be sold (the firm would in effect purchase information from its creditors).

We now develop a model in which creditors' lobbying expenses in informal distress are not reimbursed by the firm. (In Section 4, the firm enters formal legal proceedings and courts reimburse creditors' legal expenses.) The decision-maker in this section is management, which is likely to uphold existing rules favoring the more senior creditor, but not perfectly so (it is not impervious to lobbying).

3.1 A Model

3.1.1 Common Assumptions

Assume that at time 1 the firm has issued all debt, and we are now at time 2 when bankruptcy might have occurred. Let V denote firm value. S and J denote the face value of senior and junior debt outstanding, respectively. A conflict of interest among creditors arises only if $V < S + J$, i.e., when not all debt can be paid off. In this case, under the absolute priority rule (APR), the senior creditor receives $\min(V, S)$, the junior creditor receives $\max(V - S, 0)$. Under the opposite extreme, complete violation of APR and claim equality, i.e., a hypothetical “equal priority rule” (EPR), the senior creditor receives $\left(\frac{S}{S+J}\right) V$, the junior creditor receives $\left(\frac{J}{S+J}\right) V$.

Subscripts J and S denote junior and senior creditor, respectively. Denote by α the allocation of payoffs.⁶ When α is 0, creditors are satisfied according to the APR, when α is 1, creditors are satisfied according to the EPR. Furthermore, assume that α is a function of the two creditor’s contest activities,

$$\alpha = \alpha(L_S, L_J), \quad (1)$$

where L_S is the (endogenous) amount of lobbying activities of the senior creditor, L_J those of the junior creditor, and $\partial\alpha/\partial L_S < 0$ and $\partial\alpha/\partial L_J > 0$.⁷ Consequently,

⁶ α could be considered a probability with which either complete APR or complete EPR occurs. It could also be considered a sharing rule: For example, if $S = \$400$, $J = \$200$ and $V = \$450$, APR would assign $P_S = \$400$, $P_J = \$50$. EPR would assign $P_S = \$300$, $P_J = \$150$. When the judge (or management) decides on an α of 1, APR obtains; when the judge decides on an α of 0, EPR obtains; when the judge decides on an α of 0.5, $P_S = \$350$, $P_J = \$100$; when the judge decides on an α of 0.75, $P_S = \$375$, $P_J = \$75$.

⁷Debt size itself is important, but enters indirectly into the payoff function. When one of the two bonds has a low face value, for example, with a junior bond with a face value of \$1 vs. a senior bond with a face value of \$100, APR might assign \$0 to the junior, EPR would assign at most 1 cent to the junior. Neither party would expend much effort to influence this choice.

the payoffs P to the two contestants are

$$P_S = \begin{cases} \alpha(L_S, L_J) \left(\frac{S}{S+J}\right) V + [1 - \alpha(L_S, L_J)]S - c_S L_S & \text{if } V > S \\ \alpha(L_S, L_J) \left(\frac{S}{S+J}\right) V + [1 - \alpha(L_S, L_J)]V - c_S L_S & \text{if } V < S \end{cases} \quad (2)$$

and

$$P_J = \begin{cases} \alpha(L_S, L_J) \left(\frac{J}{S+J}\right) V + [1 - \alpha(L_S, L_J)](V - S) - c_J L_J & \text{if } V > S \\ \alpha(L_S, L_J) \left(\frac{J}{S+J}\right) V + [1 - \alpha(L_S, L_J)]0 - c_J L_J & \text{if } V < S \end{cases}, \quad (3)$$

where c denotes the per-unit cost to produce a given amount of lobbying. As stated in the introduction, we assume that $c_{\text{Public Debt}} > c_{\text{Bank}}$. The equilibrium concept will be Nash, and both creditors move simultaneously with full knowledge of each other's moves.

For simplicity, to derive specific meaningful results to illustrate the basic point, and lacking the empirical knowledge of a good representation of the effects of lobbying expenses on reallocations, we use the most common functional form, the ratio contest success function (e.g., Hirshleifer (1995)):

$$\alpha(L_S, L_J) = \frac{nL_J}{mL_S + L_J}, \quad (4)$$

where m ($m \geq 0$) and n ($0 \leq n \leq 1$) are two parameters.⁸ This allocative rule has the following features: when only the junior creditor hires a lawyer ($L_S = 0, L_J > 0$), the rule provides for EPR if $n = 1$. When only the senior creditor hires a lawyer ($L_S > 0, L_J = 0$), the rule provides for APR. When both senior and junior creditors spend equal amounts, the allocation rule assigns a weight of $1 - n/(m + 1)$ to

⁸The use of such “production functions,” not derived from underlying technology, has a long tradition in economics. In conflict theory, this is called the “contest success function” (CSF). The Appendix derives a more general characterization of α functions under which the main result holds. However, the specific function used in the text has the advantage of conveying the intuition in a simpler way.

APR. More importantly, a large m increases the efficiency of the senior creditor's lobbying expenses relative to that of the junior creditor. If the senior creditor ex-ante specified APR contract is of value, that is, if management is not easily persuaded to abandon its own promises, we would expect m to be greater than 1. (Although m is exogenous, we will show later that it is in the interest of the firm to have an m different from 1.) The parameter n adjusts the decision in favor of APR, i.e., if n is close to zero, α is close to zero and the allocation rule tilts towards absolute priority.

Because the allocation function is the primary simplifying exogenous assumption of the model, it deserves some justification. Management in this section and courts in the next section are essentially “black boxes” which respond positively to lobbying effort. (The precise family of functions can be very flexible [see the appendix], reflecting the general intuition that it is advantageous to set up deterrence of ex-post conflict among creditors; what is important is that there is a positive response to lobbying.) There also is good evidence that funds are spent on lobbying and litigation, and that firms, courts, and other creditors indeed make concessions in financial distress to individual creditors. In sum, our paper addresses what happens *if* courts (and management) are influenced, not *why* courts (and management) are influenced. In our opinion, it is an assumption defensible because it is realistic.

Still, we can speculate why firms/courts listen. One reason may be that the arbiter tries to allocate shares according to its inference about the private information held by creditors. This information could be what creditors believe their own appropriate share value should be—if unsatisfied, a creditor may force expensive escalation. If creditors can spend funds to increase the probability that the firm (judge) sees their private information, then those creditors who know that they deserve a higher share would find it in their interest to “purchase” more public “revelation.”

In a signaling equilibrium, the firm (judge) optimally tilts the allocation in line with observed dissipative expenses: more signal leads to a better share allocation.⁹ In both the signaling setup and in the conflict setup, although expenses do not increase the pie, they still result in a better allocation.

An alternative view states that lobbying/litigation can be efficient *ex-ante* (sought after by the firm) to uncover creditor information about the optimal course of action—to continue or not to continue—at lowest cost.¹⁰ But large firms are rarely liquidated, the final arbiters (the courts) are probably less interested in efficiency than in “fairness,” and informal evidence (e.g., the FNB anecdote above) suggests that creditors activities are less socially desirable than they are self-serving.

3.1.2 Solution 1: $S < V < J + S$

We first concentrate on the case in which $S < V < J + S$. With the function α , we can differentiate (2) and (3) to derive the two first-order conditions

$$FOC_S : -\frac{mnL_JSV}{(mL_S^* + L_J)^2(S + J)} + \frac{mnL_JS}{(mL_S^* + L_J)^2} - c_S = 0 \quad (5)$$

and

$$FOC_J : -\frac{nJVL_J^*}{(J + S)(L_J^* + mL_S)^2} - \frac{mn(V - S)L_S}{(L_J^* + mL_S)^2} + \frac{nJV}{(L_J^* + mL_S)} - c_J = 0. \quad (6)$$

⁹Our ratio CSF, while most common, has an odd feature. Players always have an incentive to spend at least epsilon (signal some quality), because the marginal gain from lobbying (signaling) is infinite. Thus, within a signaling justification, it must be assumed that there are no types that should spend 0, or that type 0 players are naturally perfectly revealed. Furthermore, because with a ratio function the potential gains from lying decreases with type, it must be that the natural probability of revelation decreases with type (else higher quality firms would need to signal less). This is detailed in a note available on <http://linux.agsm.ucla.edu/academic.finance/signalconflict.html>.

¹⁰This view applies primarily to management as decision-makers. It applies less to courts (see our next section), which are likely to listen to arguments in favor of individual creditor advantage/fairness anyway. Because firms are faced with such rent-seeking *ex-post*, assigning creditor identity *ex-ante* can reduce its harmful effects.

Although this is a quadratic equation system, the response functions can be solved and, the Nash equilibrium lobbying expenses as a function of the exogenous parameters are

$$L_J^* = c_S \left[\frac{mnS(S+J-V)}{(mc_J + c_S)^2(S+J)} \right] \quad L_S^* = c_J \left[\frac{mnS(S+J-V)}{(mc_J + c_S)^2(S+J)} \right]. \quad (7)$$

The in-equilibrium ratio of lobbying is the inverse of the ratios of the two lobbying costs. Note that the optimal lobbying does not depend differently on each creditor's claim—it is *not* the non-linear payoffs defined by V , S , and J that drives differences in lobbying, but the relative cost of lobbying and the influence of APR on the α function that determines lobbying. The total waste (W) on lobbying expenses is the sum of the two lobbying expenses:

$$W^* = c_J L_J^* + c_S L_S^* = \left[\frac{2mnS(S+J-V)}{(S+J)} \right] \frac{c_J c_S}{(mc_J + c_S)^2} = \left[\frac{2mnS(S+J-V)}{(S+J)} \right] \frac{(c_S/c_J)}{[m + (c_S/c_J)]^2}. \quad (8)$$

The comparative statics are now straightforward. The interesting implications derive from the influence of the cost function.

$$\frac{\partial W^*}{\partial c_S} = \left[\frac{2mnS(S+J-V)}{S+J} \right] \frac{c_J(mc_J - c_S)}{(mc_J + c_S)^3} \quad (9)$$

and

$$\frac{\partial W^*}{\partial c_J} = \left[\frac{2mnS(S+J-V)}{S+J} \right] \frac{c_S(c_S - mc_J)}{(mc_J + c_S)^3}. \quad (10)$$

The sign of the two derivatives, respectively, is positive and negative, if $m > c_S/c_J$ —which will be the case if the bank is the senior creditor, because we assumed the allocation rule to assign an m of greater than 1. In other words, slightly increasing c_S increases waste, slightly increasing c_J reduces waste.

Our paper focuses on the question of how the total deadweight waste changes

when we simultaneously reduce the lobbying costs of the senior creditor and increase the cost of the junior creditor. In other words, if we reverse the role of the bank (low cost c) and the role of public debt (high cost c), how will total waste change? Inspection of total waste in equation 8 shows that if $m > 1$, reversing c_J and c_S influences only the denominator, $mc_J + c_S$. (The fact that $m > 1$ means that the senior creditor is more effective in lobbying his position. This is the *only* advantage accruing to seniority in *this* section.) This provides us with our main proposition:

Proposition 1 *In an environment in which management is more likely to pay attention to the position of the senior creditors (i.e., favoring the contracts that specify ex-ante that senior creditors should be compensated according to APR), it is more efficient when the senior creditor has better lobbying abilities (lower cost) than the junior creditor. Consequently, if banks have lower costs of conducting lobbying than public debt, it is more efficient for the senior debtor to be the bank instead of public creditors.*

To illustrate the proposition, if the firm value $V = \$400$, the senior and junior creditors' face values are $S = \$300$ and $J = \$200$, and the default allocation to APR is $n = 1$ and $m = 3$ (3/4 APR, 1/4 EPR when both spend equal amounts on lobbying), further if the junior creditor's lobbying costs are $c_J = \$7/\text{unit}$ and the senior lobbying costs are $c_S = \$8/\text{unit}$, then the junior creditor chooses $L_J^* = 1.71$ units, the senior creditor chooses $L_S^* = 1.50$ units, and total waste is $W^* = \$23.97$. If the lobbying costs were reversed, i.e., $c_J = \$8/\text{unit}$ and $c_S = \$7/\text{unit}$, then the junior creditor chooses $L_J^* = 1.31$ units, the senior creditor chooses (only a slightly higher) $L_S^* = 1.50$ units, and total waste is only $W^* = \$20.98$.

3.1.3 Solution 2: $0 < V < S$

Repeating the computations when $0 < V < S$ reveals that

$$W^* = \left(\frac{2mnJV}{J+S} \right) \frac{c_J c_S}{(m c_J + c_S)^2} = \left(\frac{2mnJV}{J+S} \right) \frac{c_S/c_J}{[m + (c_S/c_J)]^2} \quad (11)$$

which shows that m , the judicial allocation parameter, continues to play the crucial role. When the expenses of senior creditors are more efficient, i.e., when m is large, then the firm is better off if the low-cost lobby (i.e., the bank) is the senior creditor. Note also that when $V = S$, waste W^* in (11) and (8) are identical, so lobbying waste is a continuous function of V .¹¹

3.2 The Allocative Rule: The Role Of m

As Proposition 1 shows, m , the functional parameter of the allocation function, plays the crucial role: the advantage of seniority being that the senior creditor's argument is more effective (when $n = 1$, management awards better than 50/50 APR/EPR allocations and a dollar spent by senior creditors is more effective). Given that APR is the default arrangement and that banks can, at their discretion, have an influence over the day to day financial operations of the firm, assuming that APR preference induces $m > 1$ is appropriate.

In contrast, when $m = 1$, total waste is unaffected by reversing c_J and c_S . For every dollar that the senior creditor optimally increases lobbying, the junior creditor

¹¹To illustrate the algebra, if the firm value $V = \$250$, the senior and junior creditors' face values are $S = \$300$ and $J = \$200$, and the default allocation to APR is $n = 1$ and $m = 3$ (3/4 APR, 1/4 EPR when both spend equal amounts on lobbying fees), further if the junior creditor's lobbying costs are $c_J = \$7/\text{unit}$ and the senior lobbying costs are $c_S = \$8/\text{unit}$, then the junior creditor chooses $L_J^* = 2.85$ units, the senior creditor chooses $L_S^* = 2.50$ units, and total waste is $W^* = \$39.95$. If the lobbying costs were reversed, i.e., $c_J = \$8/\text{unit}$ and $c_S = \$7/\text{unit}$, then the junior creditor chooses $L_J^* = 2.18$ units, the senior creditor chooses (only a slightly higher) $L_S^* = 2.50$ units, and total waste is only $W^* = \$34.96$.

optimally reduces it by one dollar. But although creditor identity is irrelevant when $m = 1$, total waste is very high. It “pays” for the firm not to have to pay equal attention to both creditors.

If $m < 1$, i.e., when management is more likely to listen to junior creditors and throw out APR agreements, then it would be more efficient if the senior creditors had the higher lobbying costs, and would give in quickly.

Proposition 2 *There are two efficient scenarios: one in which banks (the more efficient lobbyist) are the senior creditors and management tends to honor APR; and another in which banks are the junior creditors and management tends to pay little attention to APR.*

The intuition is that the best system minimizes the amount of effort that the stronger contestant, the bank, will exert. Thus, it is in the interest of the firm (if it were allowed to choose a parameter m) to listen more to the bank, regardless of whether it is senior or junior.

Although this proposition addresses the interaction between the allocative rule and the choice of which of two parties ought to be the senior creditor, one can ask if there is an optimal allocative rule (m)? The answer can be obtained from the comparative statics (or from simply examining W^*). When $V > S$,

$$\frac{\partial W^*}{\partial m} = \left[\frac{2nS(S+J-V)}{S+J} \right] \frac{c_J c_S (c_S - mc_J)}{(mc_J + c_S)^3}, \quad (12)$$

$$\lim_{m \rightarrow \infty} W^* = \lim_{m \rightarrow 0} W^* = 0. \quad (13)$$

Clearly, there are two waste-minimizing equilibria (lobbying waste is *maximized* when $m = c_S/c_J$; the firm can do even worse than setting $m = 1$ [paying equal attention] by paying more attention to the weaker creditor in a way that handicaps

the senior creditor to “level the playing field”): either when m is 0—management pays no attention to the senior creditor—or when m is infinity—management pays no attention to the junior creditor. Naturally, when management pays attention only to one side, lobbying expenses to influence management’s decision are useless.

Proposition 3 *Lobbying waste is high when management pays equal attention to both creditors ($m = 1$). Lobbying waste is minimized if management were not influenced, and instead took the position always to follow either the junior or senior creditor.*

Our results hold as long as creditors are not completely ignored—a realistic assumption. With management likely to favor senior creditors ($m > 1$), it is always better for the bank to be the senior creditor. Franks and Torous (1989) and Weiss (1990) document substantial and varying deviations from APR in Chapter 11 bankruptcy (although neither measures the influence of lobbying expenses). Eberhart, Moore, and Roenfeldt (1990) estimate the priority valuations to *equity* to be as large as 35%, with a mean of 7.5%.¹²

We can speculate why creditors are not always ignored. Some financial flexibility can have advantages that outweigh the induced costs to lobbying (especially, if creditor identity is appropriately chosen). Gertner and Scharfstein (1991) discusses how violations of APR can change investment incentives, and, depending on circumstance, this can be value-enhancing. Rajan (1992) discusses how flexibility in deviations can be coerced by the bank, which in turn may induce banks to participate and monitor appropriately. In the signaling model interpretation (p. 14) of the conflict model, it is necessary to elicit the creditors’ private information to resolve value/share uncertainty in order to avoid even more costly termination. This can

¹²It is difficult to document priority valuations accruing to banks, because there is no publicly available market value by definition. Similarly, neither bank nor management would be eager to disclose pre-bankruptcy wealth shifts from public creditors to bank creditors.

only be accomplished by rewarding signaling with favorable deviations from APR.

4 Formal In-Bankruptcy Creditor Litigation With Fee Reimbursement

In contrast to the model in the previous section, we now assume that the court forces the firm to reimburse claimants' fees. This reflects the formal bankruptcy and liquidation process in the United States, where courts routinely ask the firm to reimburse both banks and creditor committees for their legitimate legal expenses.¹³

4.1 The Model

We assume the same allocation function:

$$\alpha = \alpha(L_J, L_S) = \frac{nL_J}{mL_S + L_J}. \quad (14)$$

But note that although the functional specification is identical, courts may use different rules (m , n) than firms. The value of the firm after bankruptcy costs are taken into account, V_p (p stands for "post-litigation"), is

$$V_p = V - c_S L_S - c_J L_J \quad (15)$$

¹³It is interesting to note, though, that "[t]he bankruptcy courts disagree over whether Congress intended official, unsecured creditors' committees to be reimbursed from the debtor's estate for the administrative expenses they incur during a bankruptcy proceeding" (Lintz (1991, p.229f)). To the extent that courts approve such expenses only *ex-post* and that courts can use their discretion to deny legal expenses (doing so regularly), formal proceedings resemble a combination of the model in this and in the previous section.

The senior creditor receives

$$P_S = \begin{cases} \alpha \left(\frac{S}{S+J} \right) V_p + (1 - \alpha)S & \text{if } V_p > S \\ \alpha \left(\frac{S}{S+J} \right) V_p + (1 - \alpha)V_p & \text{if } V_p < S \end{cases}, \quad (16)$$

while the junior creditor receives

$$P_J = \begin{cases} \alpha \left(\frac{J}{S+J} \right) V_p + (1 - \alpha)(V_p - S) & \text{if } V_p > S \\ \alpha \left(\frac{J}{S+J} \right) V_p + (1 - \alpha)0 & \text{if } V_p < S \end{cases}. \quad (17)$$

We examine two Nash equilibria: $V_p > S$, which we will casually refer to as the “bankruptcy” scenario, and $V_p < S$, which we will casually refer to as the “liquidation” scenario. This language is justified by the empirical observation that in Chapter 11, company value typically exceeds senior claims, while in Chapter 7, company value often does not. We also discuss three cases: in the first case, $V_p > S$ regardless of whether the bank or the debt is the senior creditor. In the second case, $V_p < S$ regardless of the senior creditor’s identity. In the third case, equilibrium is allowed to switch when the identities are reversed.

4.1.1 Case 1: “Bankruptcy” ($V_p > S$)

Substituting for α (14) and V_p (15) into (16) and (17), the first order conditions are

$$FOC_S: \frac{nL_J S [-mV + L_J (mc_J - c_S) + m(S + J)]}{(mL_S^* + L_J)^2 (S + J)} = 0, \quad (18)$$

$$FOC_J: \frac{nc_J L_J^{*2} S + nmSL_S (J + S - V + c_S L_S + 2c_J L_J^*) - c_J (J + S) (L_J^* + mL_S)^2}{(mL_S + L_J^*)^2 (S + J)} = 0. \quad (19)$$

The optimal choices for legal representation are the roots of this equation¹⁴

$$L_J^* = 0, \quad (20)$$

$$L_S^* = \frac{nS(S + J - V)}{mc_J(S + J) - nc_S S}. \quad (21)$$

Although perfect APR might appear to be an extreme outcome, it should be taken to be suggestive: junior claimants should be less likely to spend their own money to contest senior claimants if they know that they will effectively have to pay for both their own and the senior's legal expenses. (Moreover, if some costs are borne by the litigants themselves, the outcome is likely to be a combination of the informal distress and the formal distress scenario, i.e., with mild violations of APR even in formal distress.)¹⁵

Substituting the two above equations into this equilibrium's condition ($V_p > S$) proves the following theorem:

Proposition 4 *If at the time of distress the following relation holds:*

$$\frac{S[n(c_S/c_J)J + m(S + J)]}{m(S + J)} < V < S + J, \quad (22)$$

which assumes [1] that after taking into account legal fees, the firm is worth at least S and [2] that the firm is in default, then a local Nash "bankruptcy" equilibrium exists in which only senior creditors hire lawyers (to preempt the junior creditors), and all

¹⁴We are assuming that an unimpaired senior claimant does not wish to reduce the junior claim as long as he remains unimpaired. (When unimpaired, it is possible that the second-order condition is zero, because the senior can be indifferent between spending more or less.) It is also interesting to note that these results depend on the simultaneous moves of the creditors. If the senior creditor were to move later, the junior could always expend zero, and the senior creditor could expend epsilon. (*But* if the senior creditor moves first, the outcome is the same as it is in the simultaneous move game.)

¹⁵A second reason would be the ability of the junior claimant to delay settlement, which provides him with an option value. If the junior claimant were to be almost out-of-the-money, this option might be quite valuable. This extra power might induce the senior claimant to compromise.

litigation costs are borne by junior creditors.

The total waste in this equilibrium is

$$W^* = c_J L_J^* + c_S L_S^* = \frac{nS(S + J - V)}{m(c_J/c_S)(S + J) - nS}. \quad (23)$$

The denominator can be signed, because the outer conditions in (22)—and the non-negativity constraint in (21)—can only be satisfied if $c_S/c_J < \frac{m(S+J)}{nS}$.¹⁶

Our paper focuses on the influence of the legal cost schedule:

$$\frac{\partial W^*}{\partial c_S} > 0, \quad \frac{\partial W^*}{\partial c_J} < 0, \quad \lim_{c_J \rightarrow \infty} W^* = \lim_{c_S \rightarrow 0} W^* = 0. \quad (26)$$

When the cost of litigation increases for the senior creditor, although he can use less legal services, his total costs (and consequently total waste) increase. When the cost of litigation increases for the junior creditor, he is less likely to fight the senior claimant, allowing the senior creditor to reduce expenses and with it, total waste:

Proposition 5 *If a “bankruptcy” Nash equilibrium prevails regardless of the claimants’ identities, litigation waste is lower when the senior creditor has lower litigation costs than the junior creditor.*

This confirms the previous section’s result that it is more efficient if bank debt

¹⁶The comparative statics are

$$\frac{\partial W^*}{\partial V} < 0, \quad \lim_{V \rightarrow S+J} = 0. \quad (24)$$

Consequently, waste is least significant when the firm just “scratches” defaults. As the firm value declines, the incentives for junior creditors to obtain more than their assigned share increases—and with it the need for senior creditors to preempt such desires. Conversely, an increase in the face value of claims increases default, and thus total waste:

$$\frac{\partial W^*}{\partial S} > 0, \quad \frac{\partial W^*}{\partial J} > 0. \quad (25)$$

is senior. In contrast to the reorganization case considered in the previous section, regardless of m or n , the legal allocation rule does not matter when expenses are paid by the firm. The intuition is that when the senior creditor's expenses are paid by the junior creditor, it is always in the interest of the senior creditor to retain enough legal advice to deter the junior creditor. When this is cheaper for him and more expensive for junior creditors to fight, fewer legal fees are needed to “defend” the senior claim.

To illustrate the proposition, assume a firm value $V = \$400$, the senior and junior creditors' face values are $S = \$300$ and $J = \$200$, and the default allocation to APR is $m = 3$ (3/4 APR, 1/4 EPR when both spend equal amounts on legal fees) and $n = 1$. If the junior creditor's litigation costs are $c_J = \$7/\text{unit}$ and the senior litigation costs are $c_S = \$8/\text{unit}$, then the junior creditor chooses $L_J = 0$ units, the senior creditor spends $L_S = 3.7$ units, and total waste is $W^* = \$29.60$. If the litigation costs were reversed, i.e., $c_J = \$8/\text{unit}$ and $c_S = \$7/\text{unit}$, then the junior creditor chooses $L_J = \$0$, the senior creditor chooses $L_S = 3.03$ units, and total waste is only $W^* = \$21.21$.

4.1.2 Case 2: “Liquidation” ($V_p < S$)

It is also possible that junior creditors would be completely out-of-the-money under APR, once legal expenses are considered. However, in real life, such cases are probably rare. Legally, junior creditors are not entitled to defend their claims—using the firm's assets to pay for their claims. Thus, a “liquidation” equilibrium can only occur when there is sufficient uncertainty about the value of the firm to allow junior creditors to convince the judge that they should be allowed to ascertain an allegedly much higher firm value.

The behavior of creditors is drastically different now. The respective first order

conditions are

$$FOC_S: c_S + \frac{nJL_J [L_J(mc_J - c_S) - mV]}{(mL_S^* + L_J)^2 (S + J)} = 0 \Rightarrow L_S^* = \frac{L_J}{m} - \sqrt{\frac{nJL_J (c_S L_J + mV - mL_J c_J)}{m^2 c_S (S + J)}}, \quad (27)$$

$$FOC_J: -\frac{nJ \left(-VmL_S + c_S L_S^2 m + 2c_J L_J^* mL_S + c_J L_J^{*2} \right)}{(mL_S + L_J^*)^2 (S + J)} = 0 \Rightarrow L_J^* = -mL_S + \sqrt{\frac{mL_S (mc_J L_S + V - c_S L_S)}{c_J}}. \quad (28)$$

Solving the above response functions in terms of exogenous parameters requires tedious algebraic simplification,

$$W^* = c_S L_S^* + c_J L_J^* = [1 - \sqrt{\omega}] \frac{V}{2} \quad (29)$$

where ω is a fraction between 0 and 1:

$$\omega = \left[1 + \frac{4mnJ(J + S)(c_J/c_S)}{(S + J - nJ)^2} \right]^{-1}$$

Proposition 6 *When*

$$V < \frac{2S}{1 + \sqrt{\omega}}, \quad (30)$$

a local equilibrium can¹⁷ exist in which both parties spend heavily on litigation, and the senior creditor bears a significant share of the litigation expenses.

Inspection of the equation for waste (29) reveals that

$$\frac{\partial W^*}{\partial c_S} < 0, \quad \lim_{c_S \rightarrow 0} W^* = \lim_{c_S \rightarrow 0} c_J L_J^* = V/2, \quad (31)$$

$$\frac{\partial W^*}{\partial c_J} > 0, \quad \lim_{c_J \rightarrow 0} W^* = \lim_{c_J \rightarrow 0} c_S L_S^* = 0. \quad (32)$$

The junior creditor fights for some claim, but takes the marginal loss to the firm

¹⁷Note that V_p is guaranteed to be positive. Yet, there is an algebraically exceedingly complicated condition to guarantee non-negativity of legal expenditures by the two contestants.

into account, expending exactly half the firm. When the junior participant can fight without expending resources ($c_J = 0$), the junior creditor can expropriate the firm, which under APR would have belonged to the senior participant. Intuitively, when the junior creditor has nothing to lose (i.e., ending up with nothing under APR) but can pay for fighting with what would otherwise be the senior creditor's share, he is in effect stronger. Any funds that the senior expends just cut into his own share (under EPR).

Proposition 7 *If a “liquidation” Nash equilibrium prevails regardless of the claimants’ identities, litigation waste is lower when the senior creditor has higher litigation costs than the junior creditor.*

Again, we emphasize in closing that, although logically consistent, it is unlikely that courts would permit a “liquidation” equilibrium, and (in large U.S. bankruptcies) it is rare that firm value has declined enough to fall into this category (footnote 3).

4.1.3 Case 3: Switching Equilibrium

The above discussion provides comparative statics under the assumption that the same equilibrium is feasible when c_S and c_J are reversed. However, when $S < V < S + J$, this need not always be the case. The major concern of equilibrium switches to us—i.e., inconsistency with our argument that banks should be the senior creditor when firm value at the time of bankruptcy is large—would arise if only the liquidation equilibrium ($V_P < S$) were feasible when the bank is senior, and the bankruptcy equilibrium ($V_P > S$) were feasible when the bank is junior.¹⁸ However, this is not the case:

¹⁸This argument implicitly assumes that when both equilibria are feasible, the pareto-superior bankruptcy equilibrium prevails.

Proposition 8 *The feasible region of the bankruptcy equilibrium decreases strictly with c_S/c_J . Consequently, if the bankruptcy equilibrium is not feasible when the bank is the senior creditor, it is also not feasible when the bank is the junior creditor.*

Unfortunately, equilibrium seems to always exist only when $c_S < c_J$, i.e., when the bank is senior. When $c_J > c_S$ there are situations in which neither equilibrium exists:¹⁹

Proposition 9 *The feasible region of the bankruptcy equilibrium decreases strictly with c_S/c_J . Consequently, if c_S/c_J is large enough and $S < V < S + J$, then neither the liquidation nor the bankruptcy equilibria exist. (Proof: The liquidation equilibrium becomes feasible only if $V < S$, the bankruptcy equilibrium only if $V > \infty$.)*

The intuition is that under the bankruptcy equations, both parties would spend too much, while under the liquidation equations, both parties spend too little. Looking at the reaction functions, when the junior party spends less than the amount required for V to reach S , the senior party will spend more (wasting the junior's funds). However, when the junior party spends more, the senior party would be better off spending less, and as a result so would the junior party.

Unfortunately, because the algebra in the liquidation case is overwhelming, not much additional insight can be gained from analyzing alternative games (e.g., where one of the contestants is assumed to act first).

¹⁹For example, for the parameters $V = 300$, $c_S = 10$, $c_J = 1$, $n = 1$, $m = 2$, $S = 150$, $J = 1,000$: Assuming a bankruptcy equilibrium, $L_S^* = 159.375$, $L_J^* = 0$, and therefore $W^* = \$159.375$. Consequently, $V - W^* < S$ and the bankruptcy equilibrium is infeasible. Assuming a liquidation equilibrium, $L_S^* = 8.13$, $L_J^* = 45.55$, and therefore $W^* = \$126.83$. Consequently, $V - W^* > S$ and the liquidation equilibrium is infeasible.

4.2 In-Bankruptcy (Chapter 11) or Out-of-Bankruptcy Organization?

In the United States, firms typically do not reimburse creditors' expenses in informal distress (creditors pay themselves), but courts do award creditors reimbursement for their legal expenses in Chapter 11. We now show that there are parameter values under which one reimbursement regime can fare better than the other.²⁰ Our point is that the first intuition that creditors should *always* internalize their own legal expenses is false. There are strategic interactions on one creditor when the other creditor pays (or is forced to pay) for lobbying expenses. To make a comparison, we equate total waste in the bankruptcy equilibrium (23) and the reorganization equilibrium (8). Aside from 0 and a negative solution, the following solution for indifference emerges:

$$c_S/c_J = \frac{\sqrt{-4m_R(m_R - 2m_B)(J + S)^2 + 4m_R^2(J + S + nS)^2} - 2m_R(J + S + nS)}{2(J + S)} \quad (33)$$

where m_R denotes the firm's allocation function in reorganization and m_B denotes the judicial allocation function in bankruptcy.

One could argue that the neglected creditor would not agree to an out-of-court restructuring if the firm were to use a different m than the courts, putting pressure for the m_B and m_R to converge. If m_R and m_B were equal and if per-unit costs of representation are equal in reorganization and bankruptcy,²¹ admittedly heroic assumptions, we would find that

²⁰Naturally, a comparison across regimes cannot be made literally, because such parameters as m and n are likely to be systematically different in formal bankruptcy and informal distress. Still, firms are unlikely to be able to choose m/n that is too different from those used by the arbiter of last resort—the disadvantaged creditor might escalate the financial distress. Also, we are not deriving an optimal regime, because we do not permit voluntary side-payments.

²¹Public creditors might face such high costs of lobbying in informal distress (unless a covenant has been violated, there is very little representation) that informal reorganization might be cheaper.

Proposition 10 *The total waste in the bankruptcy equilibrium is lower than in the reorganization equilibrium if*

$$c_S/c_J < m \left\{ \frac{-[1 + n + (J/S)] + \sqrt{2 + 4(J/S) + 2(J/S)^2 + 2n + 2(J/S)n + n^2}}{1 + (J/S)} \right\} \quad (34)$$

*Consequently, when both the bankruptcy and reorganization equilibria are feasible, the firm is more likely to minimize total waste if it enters formal bankruptcy (rather than reorganization) • if the senior creditor has very low lobbying costs relative to the junior creditor; • if the face value of the junior claim is high relative to the face value of the senior claim.*²²

In other words, it is not always better if firms do not reimburse claimants, because one claimant's optimal contest expenditures influences the other claimant's optimal contest expenditures. The intuition is that by having the firm pay, if firm value is high relative to the senior claim, the junior creditor effectively pays for the senior creditor's contest expenses. The junior creditor still benefits, because this effectively allows him to commit himself to fight relatively less with the senior creditor.

To illustrate the previous proposition, if $m = 2$, $S = \$150$, $J = \$100$, and $V = 240$, the critical cost is $c_S = \$0.574$. When the senior creditor's cost is $c_S = \$4/9$ ($c_J = \$1$), total wastes in the bankruptcy and reorganization equilibria are \$1.54 and \$1.79, respectively. When the senior creditor's cost is $c_S = \$7/9$, total wastes in the bankruptcy and reorganization equilibria are \$3.04 and \$2.42 respectively. These values are illustrated in Figures 1 and 2. The figures further illustrate that when V is very high or V is very low, there is very little waste. In the former case, both

²²Note that there is an implication about m , too. However, because the firm has some control over m only in the reorganization equilibrium, it would be misleading to assume that the bankruptcy court moves its m with that of the firm.

claims are satisfied; in the latter claim, there is little to gain by fighting. Lobbying expenses are high only when V is intermediate. Figure 3 illustrates waste as a function of c_S/c_J . As before, the figure shows that for low values of c_S/c_J , the formal bankruptcy equilibrium is better than the informal reorganization equilibrium. Furthermore, the figure shows that both formal reorganization equilibria cease to exist for large enough c_S/c_J .

Insert All 3 Figures About Here.

The model has some further basic predictions on how differences in the negotiation process (formal vs. informal financial distress) impacts claims, although it ignores how the fallback of formal reorganization impacts pre-bankruptcy negotiation. Specifically, the model predicts fewer violations of APR in formal reorganization. Although Franks and Torous (1994) do not measure market values of APR violations and do not control for different firm and credit characteristics, Chapter 11 deviations for banks are only about -1%, compared with -3.5% in distressed exchanges. (The principal beneficiary in distressed exchanges seems to be equity, however, rather than junior debt.) This could be consistent with the recognition by other creditors that disagreement with the bank is in effect paid fully by them in Chapter 11.

5 Further Discussion

5.1 The Optimal Seniority Structure

5.1.1 Relevant Equilibria

Our theory is a partial equilibrium theory in the sense that we assumed a decision had already been made by the firm to sell a given amount of junior claims and a given amount of senior claims. The firm minimizes expected lobbying and litigation costs

to increase the value of its securities today by choosing only who of two creditors should be junior and who should be senior. The basic conclusion that this paper offers is that the firm should make the bank the senior creditor, as long as firm value is still large when the firm suffers financial distress. For example, when the firm's value follows a smooth random walk and financial distress is easy to detect, it is unlikely that the firm will cut into senior creditors' claims. But, if the firm's value can experience sharp drops, e.g., in the biotechnology industry where drugs either succeed or fail, or when it is difficult to detect if the firm can pay for its claims, so that distress is detected only when it is "too late," then it may be comparatively less bad if the bank were the junior creditor.

5.1.2 One Claimant?

It is also worthwhile to speculate why firms sell to more than one claimant, and why they split multiple claimants into multiple priority classes. For this discussion we assume a firm whose value moves smoothly enough for outsiders to recognize financial distress before the senior creditors end up having to pay for the expenses of junior creditors that are out-of-the-money.

Clearly, if there is only one creditor, there are no frictions between stake-holders. This limits the natural importance of our theory: the introduced friction by taking on multiple creditors must be less than the perceived benefits of having multiple creditors. One natural benefit of multiple creditors is the desire of small creditors to have limited exposure to a variety of projects. But for small firms, issuing to only one creditor (typically a bank) is the common choice. Only for larger firms do we observe a diverse capital structure in which there are both senior and junior claims. Another natural benefit is that multiple creditors may be less forceful in exploiting ex-post surplus accruing to firm owners (see also Rajan (1992)).

5.1.3 Multiple Claimants and Multiple Classes

The more interesting question in light of the proposed theory is why firms have different claimants with different priorities if contest costs among different priorities classes are a concern. There are two answers: First, pragmatically, our theory is still of interest if we know there are different classes of creditors with potential conflicts of interest. If other reasons for multiple classes also influence priority decisions, then conflict can be a *confounding* rather than fully explanatory cost. Second, the model can be reinterpreted to handle both multiple claimants of the same type and multiple claimants of different priority. Assuming that the firm needs to accept multiple creditors, our theory could be modified to explain why firms may be reluctant to deal with multiple banks or multiple syndicates. Inspection of Figure 3 or the expression for waste in equilibrium (8) shows that waste is small when $c_S \gg c_J$. When two banks are involved, $c_S \approx c_J$, and waste can be much higher.²³

The model can also be reinterpreted as one in which the banks capture a larger share of the firm's value against public creditors of *equal* priority. For example, banks can influence firm management before the bankruptcy. Aware of their information and ability to force a settlement, management would be tempted to "pay off" bank debt, e.g., by offering special exchange offers only to bank creditors. Indeed, the cited example of *equitable subordination* in formal bankruptcy on page 7 described a situation in which the bank's claim was originally of equal seniority as unsecured public debt. The model would then be easy to redefine: if the bank is successfully prevented from improving its status, EPR obtains; if the bank is not prevented, the bank ex-post can gain preferential status through its efforts, and APR (or something between EPR and APR) obtains.

²³German companies often deal separately with multiple banks. However, the discretion of courts and firms in Germany is considerably lower in Germany. In general, Germany appears to be a less adversarial country.

White (1980) notes that even an examination of liquidation cases suggests there are many possible legal maneuvers which can push up or down a particular creditor's priority—even when the court has assumed control. For example, while creditors must be notified of the bankruptcy petition (which management needs not to), each creditor bears the burden of proving his claim. Even secured claims must be “perfected” or they are subject to legal challenge. The bankruptcy trustee can challenge these claims at will (but at a cost to the firm). Similarly, a bank may influence a bankruptcy court as to the value of some parts or aspects of the firm, a proposed new capital structure, its better ability to administer claims, its own important monitoring and certification function, or its role in securing additional funding. Thus, banks may still face an advantage over public debt with equal priority, and expend funds (and force public debt to expend funds). By awarding ex-ante priority to banks, firms could thus also minimize the within-class frictions.

5.2 New Empirical Implications

In contrast to theories based on inside information or agency considerations, our theory is based on conflict cost proxies that are intrinsically empirically observable.²⁴ Recapitulating, the model parameters are:

- The litigation and lobbying cost schedule faced by claimants.
- Actual lobbying/legal expenses chosen by claimants.

²⁴Agency and information theories are quite rich (as is conflict theory), in that it is possible to construct similar models to fit a wide range of (possibly opposite) empirical facts. However, if all information were observable, one could typically write contracts to eliminate the deadweight signaling/agency costs. While this does not detract from the fact that information and agency considerations are important in the real world, it does render direct empirical tests of these models difficult.

- The effects of contest expenses and ex-ante contracts on management decisions and court rulings (priority violations and favorable exchanges).
- The value of the firm in distress.
- The face value of claims.

The most important empirical basis of the model is the relationship between a claimant's representation and the decisions of management or the court, that is, estimation of a function for α . It is this author's opinion that such evidence would greatly enhance our understanding of financial distress—and the choice of ex-ante contractual arrangements, such as capital structure. One could reject the model if one found that management and courts are not influenced by lobbying and litigation, respectively.

The second empirical hypothesis is that banks are better contestants. A good measure of c would include such costs as management time, coordination problems, and the per-hour fees of loan representatives and lawyers. (In an ideal test, it would also exclude the lobbying that serves to enhance firm value.) An indirect test of the model could also try to measure whether syndication weakens bank power and concentration increases public creditor power.

A third hypothesis is that when a firm takes on a new class of creditors (such as new bank debt), one might expect the value of old securities (e.g., outstanding public debt) to decrease by the amount of expected future strife, holding constant the benefits in additional funding (lower bankruptcy probability). Similarly, one would expect a lower promised yield on securities subject to less expected strife.

Fourth, in some cases, like the aforementioned Manville bankruptcy, the priority structure was unexpectedly reversed. The model predicts increased strife in such cases. The model further predicts relatively few deviations from APR in formal

distress (as before), and relatively more allocation to the previously senior/now junior creditor in informal distress.

Fifth, the theory suggests that court reimbursement induces junior creditors to put up little resistance if the value of the firm is relatively high and much resistance if the value of the firm is very low. One might expect a step function in the resistance put up by junior creditors as a function of firm value.

Sixth, *if* “liquidation” equilibria exist, in which courts permit junior creditors to expropriate senior creditors, then the theory offers systematic predictions as to what type of firms (large junior layer, smooth observable evolution of future firm values) should make banks the senior creditors. Finally, our theory has offered some implications on when firms should reorganize and when firms should enter formal bankruptcy.

6 Summary and Conclusion

The significant size of the market for legal services hints that negotiation and bargaining over power (“rent-seeking”) is a fact of corporate life, especially in distressed firms. Indeed, the most prominent non-academic views of the financial distress and bankruptcy process is that this process revolves primarily around conflict and its resolution, and that reducing the socially inefficient costs of rent-seeking is one goal of good corporate governance rules.

The two premises of our theory were that banks have lower negotiation, lobbying and litigative costs than diffuse public debt, and that either firms or courts are influencable by these lobbying activities—that violations from absolute priority can occur. Under these assumptions, by making the bank the senior creditor, the resulting “deterrence” can reduce socially useless ex-post squabbling. Our theory

relies on intrinsically observable variables, and thus lends itself relatively easily to empirical tests. Specifically, we expect a link between lobbying expenses and priority decisions in financial distress, which has not yet been predicted or examined elsewhere. Further, we showed that there are situations in which the formal reorganization reimbursement procedure (where creditors' legal expenses are paid by the firm) could have an advantage over the informal reorganization scenario (where creditors have to pay their own lobbying expenses), in the sense that formal reorganization can economize on creditors' contest expenses. By effectively subsidizing senior claimants' legal expenses with junior claimants' share of the firm, junior claimants are less tempted to wastefully attack senior claimants (who in turn would have to "retaliate"). To our knowledge, this is the first economic rationale in favor of the Chapter 11 legal reimbursement process.

More generally, our theory has extended conflict theory by considering an *ex-ante* choice of parties that can later become involved in a conflict in which effort can influence the outcome. It thus provides not only an argument for why it is better to have strong senior claimants ("strong seniority"), but also a—sometimes overlooked—rationale for contracts. Selecting unequal parties and placing the burden of proof on the weaker party (consumers, employees, etc.) could reduce overall waste. For example, if firm management were more organized than equity holders, legal arrangements that provide in-place management with greater power can be efficient. Firm-owners could expropriate the rents due to them with side-payments before a management team is chosen. Or, if a conflict of interest might arise between large and small shareholders (e.g., as in a takeover), *ex-ante* laws permitting larger shareholders some seemingly "unfair" advantages might reduce extended fights and expenses *ex-post*. Finally, our theory has provided one rationale for *asymmetry* in general. The fact that there are unequal contestants minimizes wasteful conflict expenditures.

Appendix

This appendix relaxes the ex-ante imposition of the specific α function. Because not much additional economic intuition can be gained (other than a more general characterization of α functions permitting the result in the text), the main text focuses on one specific α function. Let $\alpha = \alpha(L_S/L_J)$ depend only on the ratio of expenditures of the two parties and some parameters, and let $\alpha(x)$ fall in the range $[0, 1]$ for $x \in [0, \infty)$; and $\alpha'(x) < 0$ for all x which insures that we can compute a unique inverse.

Consider the case where $V > S$. The first derivative of the senior party's payoff with respect to L_S is

$$-c_S - \frac{S \alpha'(L_S/L_J)}{L_J} + \frac{SV \alpha'(L_S/L_J)}{L_J(J+S)}.$$

Solving the FOC for L_S^* ,

$$L_S^* = L_J \alpha'^{-1} \left(-\frac{c_S L_J (J+S)}{S(J+S-V)} \right).$$

The first derivative of the junior party's payoff with respect to L_J is

$$-c_J - \frac{JL_S V \alpha'(L_S/L_J)}{L_J^2 (J+S)} + \frac{L_S (V-S) \alpha'(L_S/L_J)}{L_J^2}.$$

This cannot be simplified directly, so we need to substitute for L_S from above. After considerable simplification, this expression reduces to

$$-c_J + c_S \alpha'^{-1} \left(-\frac{c_S L_J (J+S)}{S(J+S-V)} \right).$$

Consequently, the lower priority claimant's optimal L_J^* is

$$L_J^* = \left[\frac{S(V - S - J)}{S + J} \right] \frac{\alpha'(c_J/c_S)}{c_S}.$$

Overall waste in equilibrium is defined as $c_S L_S^* + c_J L_J^*$, which after considerable simplification yields

$$W^* = \left[\frac{2S(V - J - S)}{J + S} \right] \left(\frac{c_J}{c_S} \right) \alpha'(c_J/c_S).$$

We can verify this equation for the α function used in the text,

$$\alpha(x) = \frac{n}{mx + 1} \Rightarrow \alpha'(x) = -\frac{mn}{(1 + mx)^2}.$$

Substituting $\alpha'(c_J/c_S)$ into waste W^* simplifies to (8). More generally, for W^* to be smaller when c_S and c_J are reversed, it is necessary that the $\alpha(\cdot)$ function satisfies

$$\left(\frac{c_J}{c_S} \right) \alpha'(x)|_{x=c_J/c_S} > \left(\frac{c_S}{c_J} \right) \alpha'(x)|_{x=c_S/c_J}.$$

if $c_J > c_S$. This condition is not very restrictive. For example, the border of this condition is exactly satisfied by the family of functions $\alpha'(x) = k/x$ ($\alpha(x) = k \log(x) + c$) and/or the family of functions $\alpha'(x) = -k/(1+x)^2$ ($\alpha(x) = k/(1+x) + c$). Indeed, one can easily construct a function satisfying this relationship from any function defined on $[0, 1]$. Of particular interest is the following function:

$$\alpha(x) = \left(\frac{n}{mx^\lambda + 1} \right) \Rightarrow \alpha'(x) = -\frac{\lambda mn x^{\lambda-1}}{(1 + mx^\lambda)^2},$$

which generalizes our contest success function in the text by one parameter λ , which is sometimes called a “decisiveness” parameter in the conflict literature. A large λ

amplifies the difference in the ratio of lobbying. Our condition tells us that waste is lower if the senior is the stronger creditor iff

$$-1/\gamma \cdot \frac{\lambda mn(1/\gamma)^{\lambda-1}}{[1 + m(1/\gamma)^\lambda]^2} > -\gamma \cdot \frac{\lambda mn\gamma^{\lambda-1}}{(1 + m\gamma^\lambda)^2}$$

where γ ($\gamma < 1$) is the ratio of costs c_s/c_j . This simplifies into

$$\gamma^\lambda(1 - m) > (1 - m)$$

which holds for any $\lambda > 0$, provided $m > 1$ and $\gamma < 1$ ($c_s < c_j$).

When $V < S$, equivalent computations yield

$$L_S^* = L_J \alpha'^{-1} \left(-\frac{c_S L_J (J + S)}{JV} \right),$$

and, after substituting for L_S into the junior claimant's first derivative,

$$L_J^* = - \left(\frac{JV}{S + J} \right) \frac{\alpha'(c_J/c_S)}{c_S}$$

and waste becomes

$$W^* = - \left(\frac{2JV}{J + S} \right) \left(\frac{c_J}{c_S} \right) \alpha'(c_J/c_S)$$

Thus, the condition for the α function, assuming the inverse of its first derivative exists, to satisfy is again

$$\left(\frac{c_J}{c_S} \right) \alpha'(c_J/c_S) > \left(\frac{c_S}{c_J} \right) \alpha'(c_S/c_J).$$

References

- Anderson, D. R., 1987, "Financing Asbestos Claims: Coverage Issues, Manville's Bankruptcy And The Claims Facility," *Journal of Risk and Insurance*, 54(3), 429-451.
- Asquith, P., R. Gertner, and D. Scharfstein, 1994, "Anatomy of Financial Distress: An Examination of Junk-Bond Issuers," *The Quarterly Journal of Economics*, 109(3), 625-658.
- Bagwell, L. S., and J. Zechner, 1993, "Influence Costs and Capital Structure," *The Journal of Finance*, 48(3), 975-1008.
- Berglof, E., and E.-L. von Thadden, 1994, "Short-Term Versus Long-Term Interests: Capital Structure with Multiple Investors," *The Quarterly Journal of Economics*, 439, 1055-1084.
- Bergman, Y. Z., and J. L. Callen, 1991, "Opportunistic Underinvestment in Debt Renegotiation and Capital Structure," *Journal of Financial Economics*, 29(1), 137-171.
- Bernardo, A., and E. Talley, 1996, "Investment Policy and Exit-exchange Offers within Financially Distressed Firms," *The Journal of Finance*, 51(3), 871-888.
- Bolton, P., and D. S. Scharfstein, 1994, "Optimal Debt Structure and the Number of Creditors," working paper, MIT Sloan School of Management.
- Bulow, J., and J. Shoven, 1978, "The Bankruptcy Decision," *Bell Journal of Economics*, 9(2), 437-456.
- Burkart, M., D. Gromb, and F. Panunzi, 1995, "Debt Design, Liquidation Value and Monitoring," working paper, London School of Economics and Stockholm School of Economics/MIT/IDEI.

- Carey, M., 1995, "Are Bank Loans Mispriced?," working paper, Board of Governors of the Federal Reserve System.
- Chemmanur, T. J., and P. Fulghieri, 1994, "Reputation, Renegotiation, and the Choice between Bank Loans and Publicly Traded Debt," *The Review of Financial Studies*, 7(3), 475-506.
- Diamond, D. W., 1984, "Financial Intermediation And Delegated Monitoring," *Review of Economic Studies*, 51-166, 393-414.
- , 1991, "Monitoring The Reputation: The Choice Between Bank Loans And Directly Placed Debt," *Journal of Political Economy*, 99(4), 689-721.
- , 1993a, "Bank Loan Maturity and Priority When Borrowers Can Refinance," in Mayer and Vives (eds.), *Capital Markets and Financial Intermediation*, pp. 46-80.
- , 1993b, "Seniority And Maturity Of Debt Contracts," *Journal of Financial Economics*, 33(3), 341-368.
- Eberhart, A. C., W. T. Moore, and R. L. Roenfeldt, 1990, "Security Pricing And Deviations From The Absolute Priority Rule In Bankruptcy Proceedings," *The Journal of Finance*, 45(5), 1457-1470.
- Franks, J. R., and W. N. Torous, 1989, "An Empirical Investigation of U.S. Firms in Reorganization," *The Journal of Finance*, 44(3), 747-769.
- , 1994, "A Comparison of Financial Recontracting in Distressed Exchanges and Chapter 11 Reorganizations," *Journal of Financial Economics*, 35, 349-370.
- Gertner, R., and D. Scharfstein, 1991, "A Theory of Workouts and the Effects of Reorganization Law," *The Journal of Finance*, 46(4), 1189-1222.

- Hart, O. D., 1995, *Firms, Contracts, and Financial Structure*. Clarendon Press, Oxford University Press, New York.
- Hirshleifer, J., 1994, "The Dark Side of the Force: Western Economic Association International 1993 Presidential Address," *Economic Inquiry*, 23, 1-10.
- , 1995, "Theorizing about Conflict," working paper, UCLA Department of Economics.
- James, C., 1995, "When do Banks Take Equity in Debt Restructurings," *The Review of Financial Studies*, 8(4), 1209-1234.
- Kahan, M., and B. Tuckman, 1993, "Do Bondholders Lose from Junk Bond Covenant Changes," *Journal of Business*, 66(4), 499-516.
- Lintz, J. A., 1991, "Bankruptcy Law: Money—That's What They Want...but Should the Administrative Expenses of Official Unsecured Creditors Committees Be Reimbursed From the Bankruptcy Debtors Estate? (Case Note)," *University of Dayton Law Review*, 17, 229-252.
- Milgrom, P., and J. Roberts, 1990, *Bargaining Costs, Influence Costs, and the Organization of Economic Activity*. Cambridge University Press, Cambridge, England.
- Park, C., 1994, "Monitoring and Debt Seniority Structure," working paper, The University of Chicago.
- Rajan, R., 1992, "Insiders and Outsiders: The Choice between Informed and Arm's Length Debt," *The Journal of Finance*, 47(4), 1367-1400.
- Rajan, R., and A. Winton, 1995, "Covenants and Collateral as Incentives to Monitor," *The Journal of Finance*, 50, 1113-1146.

Rajan, R. G., and L. Zingales, 1995, "Power Struggles and Inefficiency," working paper, University of Chicago and NBER.

Titman, S., 1984, "The Effect Of Capital Structure On A Firm's Liquidation Decision," *Journal of Financial Economics*, 13(1), 137-151.

Weiss, L. A., 1990, "Bankruptcy Resolution: Direct Costs And Violation Of Priority Of Claims," *Journal of Financial Economics*, 27(2), 285-314.

White, M. J., 1980, "Public Policy Toward Bankruptcy: Me-First And Other Priority Rules," *Bell Journal of Economics*, 11(2), 550-564.

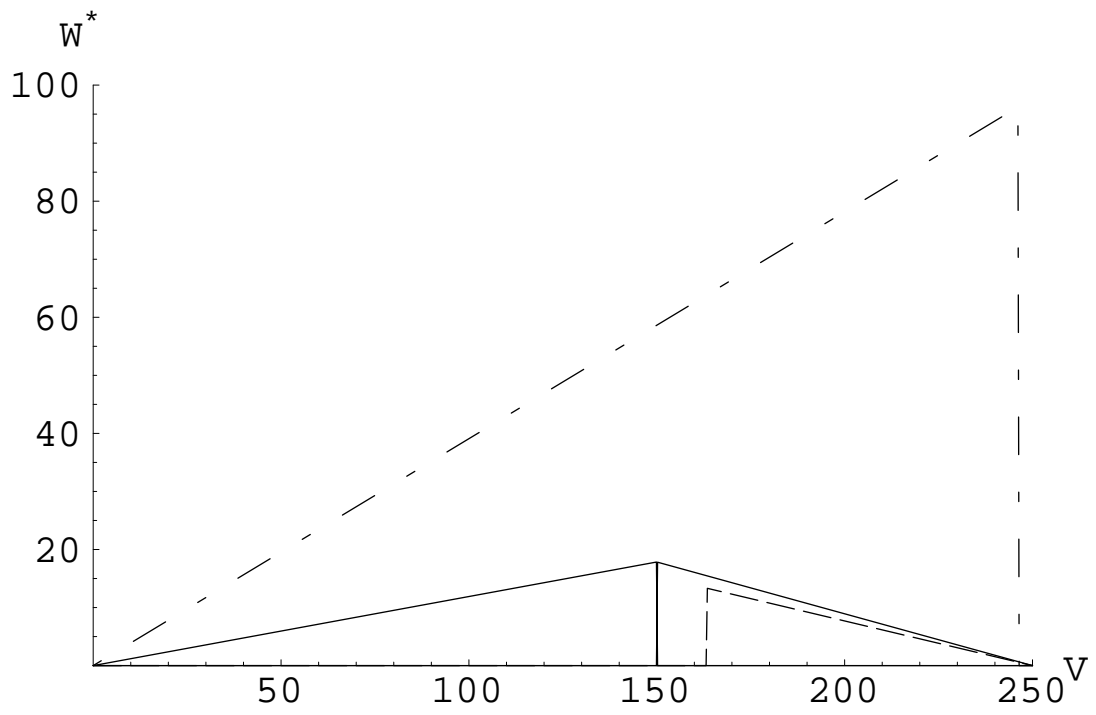
Yosha, O., 1995, "Information Disclosure Costs and the Choice of Financing Source," *Journal of Financial Intermediation*, 4(1), 3-20.

7 Figures

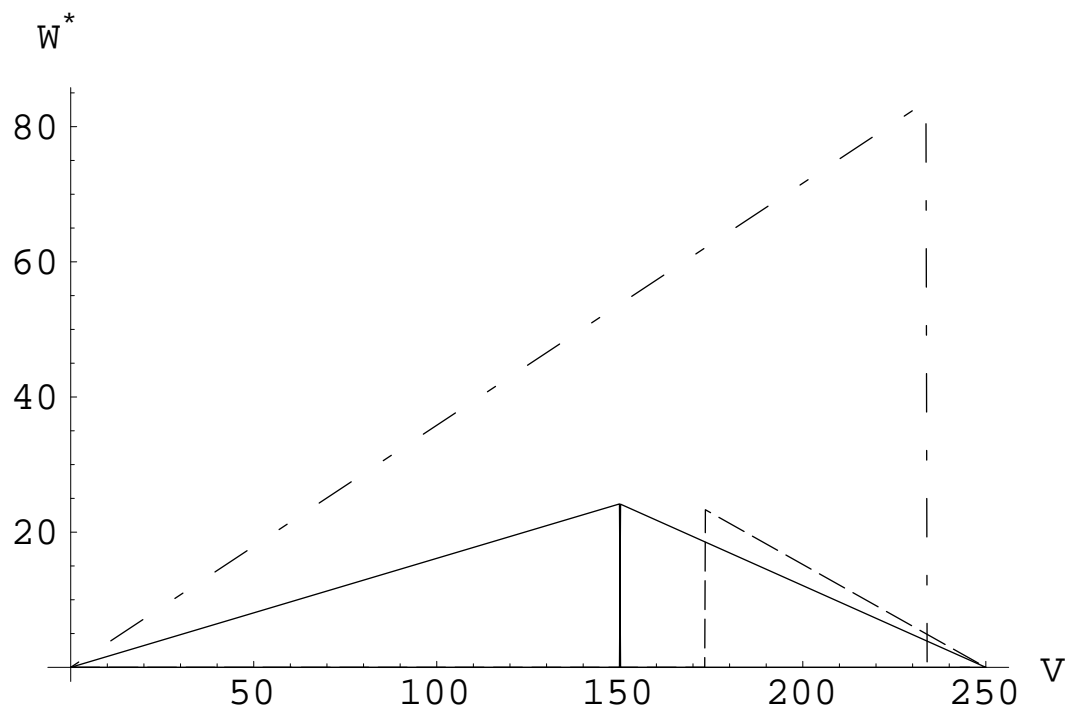
Figure 1 displays equilibrium waste W^* as a function of V , when $n = 1$, $m = 2$, $S = \$150$, $J = \$100$, and $c_S/c_J = 4/9$. The reorganization equilibrium's total waste (solid line) increases linearly to \$17.85 until $V = S = \$150$ and then decreases linearly. The liquidation equilibrium (dot-dashed line) is feasible over almost the entire range of V , up to $V = \$246$. Clearly, it is the "worst" equilibrium. The bankruptcy equilibrium's total waste (dashed line) is feasible when $V > \$164$. Note that the formal bankruptcy equilibrium carries *lower* waste than the comparable reorganization equilibrium.

Figure 2 is as Figure 1, with the exception that $c_S/c_J = 7/9$. It is noteworthy that waste in the formal bankruptcy equilibrium (dashed line) is now higher than in the comparable reorganization equilibrium (solid line).

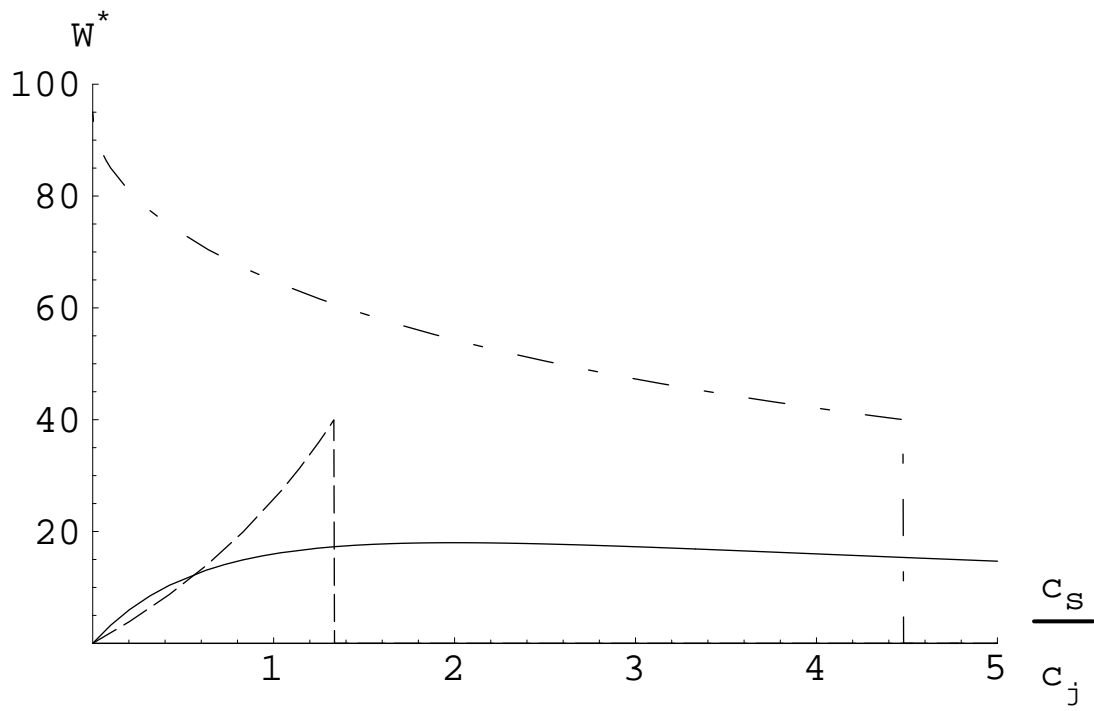
Figure 3 plots waste as a function of c_S/c_J , when $n = 1$, $m = 2$, $S = \$150$, $J = \$100$, and $V = 190$. When $c_S/c_J < 1$, the bank is the senior creditor, when $c_S/c_J > 1$, the bank is the junior creditor. (The solid line represents informal reorganization, the dot-dashed line represents liquidation, the dashed line represents bankruptcy.) The figure shows that both formal reorganization equilibria fail to exist when $c_S \gg c_J$, i.e., when the bank would be the junior creditor. Furthermore, for very low c_S (a very efficient bank), informal reorganization (without reimbursement of expenses) produces lower waste than formal bankruptcy (with reimbursement of expenses). When c_S and c_J are close, however, formal bankruptcy can dominate internal reorganization.



(Figure 1)



(Figure 2)



(Figure 3)