

# Claimholder Incentive Conflicts in Reorganization: The Role of Bankruptcy Law

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**When a firm is in financial distress, in most cases a set of mutually advantageous reorganization plans exist. This article shows that the bankruptcy code, by providing rules governing the negotiation process, yields a unique solution to the reorganization process. In addition, the structure imposed by the code mitigates the holdout problem created by the individual claimant's divergent incentives.**

When a firm is in financial distress, reorganization is often desirable because it avoids losses from liquidation or suboptimal incentive alignment of the existing contracts.<sup>1</sup> However, incentive conflicts among claimholders make reorganization tenuous. Each creditor has an incentive to be the first to force liquidation of some of the firm's assets to guarantee it is paid in full. Successful reorganization requires that the claimants overcome this "common pool" problem. Jackson (1982) motivates the role for a formal bankruptcy proceeding in that it requires *collective* agreement among claimholders

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<sup>1</sup> For example, the following quote from Broude (1984) represents the practitioner view of liquidation: "If agreement could not be reached between the debtor and its unsecured creditors, the debtors ultimate resort was to threaten to convert to straight (liquidation) bankruptcy. It was generally thought, correctly, that straight bankruptcy would insure that unsecured creditors got very little or nothing from liquidation and that a secured creditor's collateral would be liquidated at auction, resulting in a much smaller recovery than that promised pursuant to a Chapter XI plan."

before liquidation or reorganization can occur. Thus the common pool problem is mitigated.

With the existence of a set of mutually advantageous reorganization plans and the requirement of collective agreement, the actual plan chosen is not obvious. Further, since any class of claimants can veto the outcome, and since another plan always exists that makes at least one class better off, approval is not assured. While previous analyses model the reorganization process considering only the claimants' rights in default—their ability to veto an outcome and their payoffs in liquidation—this article shows that the formal rules embodied in the code are an important determinant of the bargaining outcome. For example, these additional rules govern the sequencing of proposals and the allowable plans.

The model examines the bargaining game in reorganization under the assumption of perfect information. Although this assumption is unrealistic, it permits us to capture two salient points in a simple model. First, the outcome of the reorganization process under the structure provided by the bankruptcy code is substantially different than under unstructured bargaining. Second, the rules greatly reduce the bargaining set which reduces the individual claimant's incentives to hold out.

To begin, the bargaining game under the claimants' rights in default, referred to as the "private game," is examined. This game is a benchmark against which the outcome of the highly structured "formal game" in bankruptcy is compared. The private game yields a large set of potential equilibria. The particular plan chosen in this set depends on the relative bargaining strengths of the participants. The additional structure of the private game greatly reduces the bargaining space. In addition, rules are imposed on the sequence of proposals within the bargaining space. The two basic implications of the additional structure are that (1) the outcome is much less dependent on the bargaining strengths of the players and (2) there is less of an incentive for the individual claimants to hold out.

Conflicting views exist about the extent to which reorganization is costly. Haugen and Senbet (1978) argue that if claimants cannot agree on a reorganization plan, one claimholder class can simply purchase the claims of the others in the capital market, so that the cost of eliminating bargaining by capital market transactions represents an upper bound on bankruptcy costs. Since the costs of transacting in the capital markets are small, it is argued that bankruptcy costs are small. On the other hand, Warner (1977), Aivazian and Callen (1980, 1983), and Titman (1984) claim that reorganization is a complex negotiation process that requires coalition formation among claimholders, so that costless reorganization is not a foregone conclusion.

Bulow and Shoven (1978) and Aivazian and Callen (1983) present formal models of the reorganization process. Bulow and Shoven model the decision problem of whether to liquidate or to continue faced by three classes of claimants: bondholders (who have first priority), bank lenders, and equity. If bank lenders provide loans so that the equity class can pay off

the bondholders, then liquidation is avoided. Continuation occurs when the coalition of bank lenders and equity is better off than in liquidation. Their model assumes that bondholders' claims cannot be restructured, so that the payoffs in liquidation and continuation are fixed. Aivazian and Callen generalize the reorganization problem to an arbitrary number of claimholder classes, and assume that any claim can be restructured. Consistent with claimholders' actual rights in default, each class is allowed to veto the outcome. If the value of the firm is less in liquidation than in continuation, then there exists a set of reorganization plans that provides every class of claimholders with at least as much as they can receive acting alone, their value in liquidation.

Explicit modeling of the collective choice process in reorganization that includes the structure provided by the bankruptcy code yields conclusions different from previous works. First, reorganizations facilitated by share purchases, as in Haugen and Senbet (1978), are greatly influenced by the outcome in a formal bankruptcy. Second, in contrast to Bulow and Shoven (1978) and White (1980), this more general model of the reorganization process shows that the claimants make efficient decisions to liquidate or continue.

The article is organized into three sections. Section 1 motivates why claimholders reorganize and outlines the rules that govern the process. In Section 2 the reorganization process is formally modeled and the two major theorems of the article are developed. The article ends with a discussion of the implications of relaxing the common knowledge assumption of the analysis and a summary.

## 1. Default and Reorganization

It is useful to begin by considering why claimants choose to reorganize. In a solvent firm the residual claimant class, the stockholders, controls the assets of the firm. As the value of the firm falls, debt claims become more akin to a residual rather than a fixed claim and equity claims become nearly valueless and thus have little downside risk. Well-known incentive problems result, and debt contracts are written so that control is transferred from the equity to the debtholders.<sup>2</sup> This control transfer takes place when the legally defined condition of default is satisfied by the violation of some provision of the debt contract such as the requirement to make a coupon payment.

One of the control rights transferred to debtholders in default is the right to *accelerate* claims.<sup>3</sup> Maturity acceleration allows debtholders to file suit against the equityholder for the immediate payments of the principal

<sup>2</sup> This point is elaborated upon by Easterbrook and Fischel (1983).

<sup>3</sup> For a complete discussion of these and other provisions of bond indentures, see *Commentaries on Model Indenture Provisions* [American Bar Foundation (1971)].

and interest remaining on the bond. Meeting the liabilities created by the acceleration is likely to require a liquidation of assets.

To avoid both the existing suboptimal incentive alignment under continuation and the costs of liquidation it is necessary to restructure the claims. Restructuring prior to bankruptcy occurs by *remedying* the default on each type or "issue" of securities. The Trust Indenture Act of 1939 delineates bondholder rights outside of bankruptcy; for restructuring to occur all the bondholders of a given class must approve the restructuring. Most indentures include a cross-default provision which stipulates that the issue is in default whenever any other issue is in default. Thus, approval of a plan generally requires approval of all claimholders of all classes. The cross-default clause is critical in that it does not allow remedies to occur sequentially. Hence, the common pool problem is mitigated.

Once default has been declared, claimholder negotiations begin. There are three possible outcomes, two of which can be unilaterally enforced. First, any class of unsecured claimants can unilaterally force *liquidation* by exercising its right to accelerate claims; this ends the negotiations. Second, any class of claimants can file a *bankruptcy petition*, which moves the negotiations into a formal setting. Third, *reorganization* can occur in an informal setting without filing a petition; but liquidation and bankruptcy are avoided if and only if the claimants unanimously agree on a reorganization plan.

Reorganization in the formal setting of bankruptcy also requires unanimous approval among claimholder classes. However, considerable structure is imposed on the reorganization process by the legal system. For example, some proposals are not allowed, limitations on the veto power of certain classes are imposed, specific agenda rules govern the sequencing of proposals, and a bankruptcy judge presides over the negotiations to enforce the bankruptcy code. The structure provided by the bankruptcy code includes the following provisions.

**Voting rules.** The bankruptcy code requires that a reorganization plan be approved by each class of claimants, with approval of a two-thirds majority of the securities required within the class. These requirements are less stringent than those needed for an informal reorganization.<sup>4</sup>

<sup>4</sup> Additional, stronger conditions for approval are concerned with "strategic" voting in which individuals holding more than one class of claims do not vote as wealth maximizers of each individual class.

Consider the incentives of a coalition that owns all of one claim and a two-thirds majority of a second claim. This coalition may wish to accept a plan that is not in the best interests of the second class of claimants, but allows a large payoff to the class that the coalition owns in entirety. However, certain features of the code preclude this behavior. In order for a class to accept a plan, a two-thirds majority of claimholders by value and a simple majority by number of claimholders must accept. The rule requiring a simple majority of claimholders to accept a plan reduces the ability of a small group of claimholders to obtain a majority of the bonds and vote strategically. Further, if strategic voting is detected the votes are ignored. Claimholders who do not vote in "good faith" do not count as part of the required majorities for acceptance of the plan. [Bankruptcy Reform Act of 1978, paragraph (a) of Section 1126]

**Liquidation.** The bankruptcy code states that each party in a reorganization must receive at least as much as it would in a liquidation; otherwise it is deemed to have rejected the plan.<sup>5</sup> The liquidation value of a class is obtained by applying the *absolute priority rule* to the value of the firm in liquidation. The absolute priority rule requires that the assets be allocated to the classes of claimants by seniority. A class receives nothing until all more senior classes are paid in full.

**Cram down.** The cram down provision allows certain reorganization plans to be accepted without unanimous approval of the claimholder classes.<sup>6</sup> The bankruptcy judge can approve a plan at the request of the proponent of the plan, even if the plan has not received unanimous approval. Invoking the cram down requires the court to determine the value of the assets and verify the creditor's ability to meet the obligations stipulated in the reorganization plan.

If the court is not well informed about the value of the assets, obtaining a value of the assets and hence invoking the cram down is costly. The court must rely on inputs from the claimants and/or attempt to value the assets independently. In either case, the value of the assets is adjudicated by a time-consuming, costly process. As long as the court is *uninformed*, even if each of the claimants knows the true value of assets, they each have an incentive to misrepresent this to the less informed court. Since the court has neither any past experience with the firm nor an economic incentive to acquire such information, it is reasonable to view the court as uninformed prior to the proceedings.

According to legal scholars, these proceedings are very costly because they require adjudication. For example, Roe (1983) claims that

[l]acking expertise for case-by-case fact finding or appellate court direction as to generalized results, bankruptcy courts must either defer to the proposals of the parties or undertake tasks (valuation and provision of a capital structure) for which they are inexpert. The parties' proposals . . . are likely to come forth quickly and need not have firm viability as a dominant concern. [Roe (1983, p. 533)]

Further, Carr (1982, p. 52), referring to valuation hearings states that "[t]he Bankruptcy Court can make such a determination only as part of valuation litigation that may be time consuming and expensive."

Once the value of the assets has been adjudicated the code requires that the plan be "fair and equitable." Application of the fair and equitable standard is taken by the court to mean that the plan satisfies an application of the absolute priority rule to the asset value determined by the court.

In practice, the bankruptcy courts deviate somewhat from absolute priority. Specifically, the outcome of cram down favors junior claimants by

<sup>5</sup> Bankruptcy Reform Act of 1978, Section 1129 (7)(A).

<sup>6</sup> Bankruptcy Reform Act of 1978, Section 1129 (7)(A). The details of the cram down rule are discussed in Broude (1984), Coogan (1982), and Klee (1979).

granting secured creditors bonds with a nominal principal value equal to the adjudicated value of the firm's assets. This nominal principal value is often determined by discounting the promised coupons at a rate not much above the current riskless rate. Because the debtor remains in possession, he receives equity with positive value, violating absolute priority.<sup>7</sup>

It is assumed here that the court strictly applies the absolute priority rule to the adjudicated firm value. For the purpose of this article, the important thing is that, since cram down is costly, it provides the classes with a right that is very similar to that of liquidation: Claimants are able to end the process, receiving payoffs that are not in the Pareto set.

**Impairment.** The impairment rules affect the outcome of the reorganization game by limiting the plans that claimant classes are allowed to reject. A plan that does not alter the contractual rights of a class is said to leave that class *unimpaired*.<sup>8</sup> This implies that if a debt class receives cash equal to the face value of its claims, or the plan calls for no scaling down of the payment schedule in the existing contract, it is unimpaired. The unimpaired classes in any plan are automatically deemed to have accepted the plan.<sup>9</sup> Equity, under the code's definition of a fixed contractual claim, is never unimpaired.

**Agenda rules.** The agenda rules set the sequence of proposals. Equity is allowed the right of first proposal unless a trustee has been appointed by the court.<sup>10</sup> In the majority of the cases a trustee is not appointed. This article, because of the assumption of full information, has no role for the trustee. However, the importance of the trustee is shown when the implications of private action are discussed.

If no plan is proposed by equity within 120 days or no plan by equity is accepted in 180 days, then each of the claimholder classes is allowed to make a proposal. When equity's monopoly proposal right ends, each party has the opportunity to submit one plan. The judge determines the order in which the proposals are voted, and if all the plans are rejected, the firm is liquidated.

## 2. The Reorganization Game

As described in the previous section, the bankruptcy code imposes significant constraints on the process of negotiation and reorganization. To understand the impact of those constraints on the reorganization outcome, we begin by studying the private game among the different classes of

<sup>7</sup> This is discussed in detail in Roe (1983).

<sup>8</sup> Bankruptcy Reform Act of 1978, Section 1124.

<sup>9</sup> Bankruptcy Reform Act of 1978, Section 1126 (F).

<sup>10</sup> Bankruptcy Reform Act of 1978, Section 1121.



claimholders, showing the types of potential incentive problems. Then specific details of the formal legal process redefine the game.

## 2.1 Definitions and assumptions

The participants in the reorganization, the claimholders, are characterized by the following assumptions:

**Assumption 1.** *Each class of claimants is treated as a single agent.*

This assumption is more applicable within bankruptcy than prior to bankruptcy. The unanimous approval requirements of the Trust Indenture Act may lead to holdout problems within a class. This assumption is invoked to isolate the lack of structure in the private game.

**Assumption 2.** *The liquidation value of each claim and the going concern value of the firm are known by all the claimants.*

The court is assumed not to know the going concern value. In the context of this model, the court is not a player. The court is a mechanical referee who provides a valuation of the assets when called upon to do so.

The final assumption limits the analysis to the case in which there are potential gains from reorganization.

**Assumption 3.** *The value of the firm is greater in reorganization than in liquidation.*

It is shown below that liquidation occurs only when there are no gains from reorganization.

The capital structure of the firm is assumed to consist of  $n$  different classes of financial claims which are ordered by decreasing seniority. Claims  $i = 1, \dots, n-1$  are assumed to be debt claims and claim  $n$  is an equity claim (e.g., no warrants). The face value of the claim of debt class  $i$  is  $D_i$  and  $D = \sum_{i=1}^{n-1} D_i$ .

In the event of liquidation, the total liquidation value of the firm,  $V_b$ , is allocated according to the absolute priority rule. The vector of payoffs in liquidation,  $LCR^n$ , is denoted  $(L_1, \dots, L_n)$ , and by definition  $\sum_{i=1}^n L_i = V_b$ .

A plan may be passed without unanimous approval of the claimant classes if it is approved by the bankruptcy court under the cram down rule. A plan will be accepted by the court if and only if it satisfies the absolute priority rule, which requires a costly “valuation hearing” to determine the value of the firm. As a result, the posthearing value of the firm,  $V_o$ , is less than the value in reorganization,  $V_r$ . The payoffs in the event of the cram down are the postvaluation hearing value of the firm,  $V_o$ , allocated according to the absolute priority rule, denoted  $(C_1, \dots, C_n)$ .

The set of reorganization plans that may be chosen is denoted  $PCR^n$ . Plans that satisfy the condition  $\sum_{i=1}^n P_i \leq V_r$  are called *feasible*. The Pareto set,  $P^*$ , is the set of reorganization plans for which  $\sum_{i=1}^n P_i = V_r$ .

The reorganization game is partitioned into two successive stages or subgames. The first stage, the “private” game, takes place prior to default and is defined by the claimholders’ contractual rights in default. If a solution is not reached, the game moves into a second stage, called the “formal” game, that corresponds to the formal proceedings in bankruptcy. Initially it is useful to model the two subgames in isolation. Comparing the outcomes of the two games demonstrates the effect of the additional rules in the formal game. The games are then modeled in sequence, showing, in particular, the effects of the second game on the actions and agreements in the first.

## 2.2 The private game

Considering the private game in isolation, claimants can only choose either to liquidate or to reorganize informally. Liquidation can be unilaterally enforced by any claimholder class while reorganization requires unanimous approval. Since each claimholder class can unilaterally force liquidation, no class  $i$  would accept a plan that gives them less than  $L_i$ . A set of plans in  $P^*$  exists that satisfy  $P_i > L_i$  for all  $i = 1, \dots, n$ ; since  $\sum_{i=1}^n L_i = V_l < V_r$ .<sup>11</sup> The actual plan chosen in this bargaining space depends on the relative bargaining strengths of the different classes.<sup>12</sup> Unanimous agreement on a plan in the bargaining space may be difficult to achieve as the following proposition demonstrates.

**Proposition 1.** *For every plan in  $P^*$  there exists a set of plans that both allows each class at least its liquidation value and makes all but one class better off.*

*Proof.* For any plan in  $P^*$ , at least one class  $j$  must receive a payment  $P_j$  strictly greater than  $L_j$  since  $V_r > V_l$ . The set of plans that provides  $P_i + e_i$  to all classes  $i \neq j$  where  $\sum_{i=1}^n e_i = P_j - L_j$  is preferred by all classes other than class  $j$ . ■

Notice that for any plan that does not allocate  $L_i$  to all but one class, for all  $n$  classes there exists a plan that is preferred.

Since each class can reject any plan proposed, nearly all the classes will have an incentive to propose a more favorable plan. In the absence of structure on the bargaining process, these lead to a continuous proposal process during which resources are dissipated.<sup>13</sup>

This private game will be preempted by forced liquidation if the common

<sup>11</sup> The set of plans that satisfy this constraint and are elements of  $P^*$  constitute the core of the private game. Aivazian and Callen (1983) recognize that the core is not unique.

<sup>12</sup> Aivazian and Callen (1983) claim the outcome of reorganization is the Nash bargaining solution over the set of feasible plans that satisfy  $P_i > L_i$  for all  $i$ .

<sup>13</sup> Formal models of similar bargaining games where participants incur bargaining costs or costs from a delayed solution find that agreement is reached without delay in situations of full information [Rubinstein (1982)]. However, incomplete information leads to delays [Fudenberg and Tirole (1983) and Crampton



pool problem is not mitigated by a cross-default mechanism. In this case, the first proposition is most useful as a benchmark for comparison against later outcomes when the structure of the code is imposed on the model.

### 2.3 The formal game

In the formal game, the *liquidation* rule limits the set of plans that can be approved, since classes are automatically deemed to reject plans that do not allow them at least their liquidation value,  $L_i$ . The liquidation constraint eliminates the same set of feasible plans that claimants would veto in the private game.<sup>14</sup>

The *impairment* rule limits the veto power of certain classes by preventing all debt classes that are provided at least  $D_i$  from vetoing the plan. This can be used to limit the payoffs to senior debt classes.

**Proposition 2.** *A proposal by class  $i$  will set  $P_j = D_j$  for all classes  $j \neq i$  for which  $L_j = D_j$ .*

*Proof.* Classes for which  $L_j = D_j$  can receive no less than  $D_j$ . If  $P_j = D_j$ , by the impairment clause the class  $j$  is automatically deemed to have accepted the plan. Hence,  $P_j$  set equal to  $D_j$  minimizes the share of the firm going to class  $j$ . Minimizing the payoffs to all classes  $j \neq i$ , maximizes the payoffs to class  $i$ . ■

The agenda rules give equity the right of first proposal. Combining the agenda and impairment rules, the formal game outcome is determined in the case where  $V_i > D$ .

**Theorem 1.** *If  $V_i > D$ , then the outcome of the formal game is  $P_i = D_i$  for all  $i = 1, \dots, n - 1$  and  $P_n = V_r - D$ .*

*Proof.* Equity has the right of first proposal; the proposal  $P_i = D_i$  for  $i = 1, \dots, n - 1$ , is accepted by all the debt classes since it leaves them unimpaired. From Proposition 2, this proposal maximizes the payoff to equity. Hence, it is the outcome of the formal game when  $V_i > D$ . ■

**Corollary.** *Equity captures all the rents in excess of liquidation value when  $V_i \geq D$ .*

When  $V_i$  is less than  $D$ , the liquidation value of some classes leaves them impaired. From Proposition 2, equity's initial proposal sets  $P_i = D_i$  for all classes for which  $L_i = D_i$ . This allows us to simplify the analysis to a three-player game. Those classes  $i = 1, \dots, k$  for which  $L_i = D_i$  are referred to

(1984)]. Labor strikes and congressional filibusters are practical examples of dissipative bargaining. Libecap and Wiggins (1984, 1985) demonstrate the imperfect information results in an inability to reach a mutually advantageous solution to the common pool problem in the case of oil field utilization.

<sup>14</sup> In other words, the liquidation constraint in the formal game is the same as the individual rationality constraint in the private game.

as *senior* debt ( $C = 1$ ). Classes impaired by equity's initial proposal,  $i = k, \dots, n$  for which  $L_i < D_b$  are referred to as *junior* debt ( $C = 2$ ). The third player is equity ( $C = 3$ ). The strategy sets and payoffs are identical for each junior debt class, so they can be treated as a single class.

When  $V_i < D$ , the formal game proceeds as follows. Equity chooses a proposal  $(P_1, P_2, P_3)$  that leaves senior debt unimpaired, at the first node of the game. At the second node of the game, junior debt accepts or rejects the initial proposal. If junior debt rejects, the claimants receive their payoffs in the *veto* game  $(V_1, V_2, V_3)$ . The optimal equity proposal and the outcome of the game are easily determined once the payoffs in the *veto* game are established.

In the veto game, each class may make up to one proposal. The cost to a party of making a proposal is denoted by  $X$ . The bankruptcy judge determines the order in which the parties are allowed to make proposals. For the purposes of this analysis it is assumed that the judge randomly determines the order of the proposals. If none of the proposals are passed, the firm is liquidated.

Since each party can ensure its cram down payoff,  $C_b$ , the veto game is modeled as an allocation of  $G$ , where  $G = V_r - V_c$ . The net payoffs in the veto game are denoted  $(V_1, V_2, V_3)$  where  $V_1 + V_2 + V_3 = G$ . The gross payoffs are  $V_i + C_i$ .

The outcome of the veto game depends on the order in which the proposals are considered. The class which proposes last has an advantage, since if its proposal is rejected, the classes receive their liquidation payoffs. The veto game, unlike the formal game, has a simple solution because only a finite number of proposals are allowed. It is solved by backward induction.

**Proposition 3.** *The class proposing last (third) in the sequence proposes a plan giving it  $G$  and the other classes zero. This plan receives unanimous approval.*

*Proof.* The classes not proposing accept any plan offering them  $V_i \geq 0$ , since rejection results in  $V_i = 0$ . The optimal plan in this set of plans that will be accepted allocates all of  $G$  to the class with proposal rights at the last stage. ■

Since the class proposing last can ensure itself  $G - X$  by vetoing all the other plans proposed, it will not accept another proposal offering it less. The only successful proposals at the earlier stages offer the class with the last proposal rights  $G - X$ , leaving at most  $X$  for the class proposing. However, net of proposal costs, this leaves at most 0 for a party proposing plans before the last stage. It is assumed that a class that is indifferent between making a proposal and accepting the last proposal does not make a proposal. Hence, the entire value of the veto game goes to the class with last proposal rights.

Since proposing first, second, or third are equally likely, the expected

payoffs in the veto game are  $\{(G - X)/3, (G - X)/3, (G - X)/3\}$ . Given these payoffs in the veto game, the solution to the formal game is straightforward.

**Theorem 2.** *In the formal game when  $V_i < D$ , equity initially proposes  $\{C_1, C_2 + (G - X)/3, V_r - C_1 - C_2 - (G - X)/3\}$ , which is unanimously accepted.*

*Proof.* The only credible strategy for junior debt is to veto if  $P_2 < C_2 + (G - X)/3$  and to accept if  $P_2 \geq C_2 + (G - X)/3$ . Senior debt automatically accepts  $C_1$  because it is unimpaired. Thus, the optimal equity proposal accepted by junior debt is  $\{C_1, C_2 + (G - X)/3, V_r - C_1 - C_2 - (G - X)/3\}$ . This accepted proposal provides a higher payoff than in the veto game. ■

In summary, the impairment rule on voting, the agenda rules, and the cram down rule are the key elements that determine the outcome of reorganization. The cram down rule reduces the bargaining space by allowing claimants to guarantee payoffs they cannot in liquidation. Although cram down is off the equilibrium path it is important strategically but seldom used in practice. The impairment rule eliminates the veto power of classes that receive at least  $D_i$ . The value of the firm is the only upper bound on the payoffs to any class in the private game. The agenda rules, allowing equity the right of first proposal, led to a unique solution when  $V_i > D$ . Equity makes the proposal that gives each class the minimum amount it must receive.

In the case where  $V_i < D$ , equity's first proposal must leave at least one class impaired. The optimal first proposal is to leave the most junior classes impaired. The veto game defines junior debt's payoff if the plan is rejected. The optimal plan provides junior debt with its veto game payoffs.

The impairment rule and, to a lesser extent, the cram down rule reduce the bargaining space from the large set of potential equilibria in the private game. Solutions are reached immediately in bargaining games where the claimants have full information about the payoffs and each others' discount factors. Costly delays occur when claimants strategically use their private information. In the presence of private information the rules mitigate these incentives to delay by shrinking the bargaining space.

In addition, the proposal process in the bargaining game in the formal process, the veto game, differs greatly from unstructured bargaining where players make proposals until the surplus is gradually eliminated. In the veto game only a finite number of proposals are allowed and if the last is rejected, liquidation is imposed by the court. This further mitigates incentives to hold out.

## 2.4 The games in sequence

To this point we have treated the private and formal games in isolation. Now, the interaction between the two is considered. The two games are

played in sequence, and the expected outcome of the formal game influences the behavior of the claimants in the private game. The two sequential games can be collapsed into a single game by backward induction. Conditional on the filing of a formal petition, the outcome of the formal game is known to all classes. Since any class can unilaterally initiate a bankruptcy proceeding, the outcome of the formal game replaces the liquidation constraint as the minimum an individual claimholder class will accept.

**Theorem 3.** *Claimants will unanimously agree to accept, prior to filing a petition, the plan that would be chosen if the proceedings went into bankruptcy court.*

*Proof.* The outcome of the reorganization if the claimants go to court (Theorems 1 and 2) is an element of the Pareto set. Thus, no other feasible plan exists that does not give at least one class less. Since any class can file a petition the only plan proposed in the informal setting that will not be vetoed is the plan that is identical to the outcome of the formal game. Thus, the claimants will settle on this plan immediately. ■

In practice firms do file petitions. Two possible explanations are provided. First, as with any court case, relaxation of the common knowledge assumption would lead to a filing in some cases [see Gould (1973) and Giammarino (1986)]. Second, Mooradian (1988) argues that provisions of the code independent of the bargaining game give equity an incentive to file a petition in certain situations. In either case, the expected payoffs in bankruptcy strongly influence private negotiations.

## 2.5 Bankruptcy costs

At this point, the argument of Haugen and Senbet (1978) can be examined in the context of a formal model of reorganization. Haugen and Senbet argue that the costs of reorganization in a legal setting can be avoided by having one class of claimants acquire all other outstanding claims in the capital market. Similarly, a party other than the claimholders of the reorganizing firm could acquire all the outstanding claims through a merger. The costs of eliminating bargaining through capital market transactions are an upper bound on the bankruptcy costs of a formal reorganization.

In the model of Haugen and Senbet, claimholders naively tender their claims acting as price takers and ignoring their rights to participate in the reorganization negotiations. An offer to buy claims is equivalent to a proposal on the Pareto surface in the private game. From Proposition 2, we know that claimholders may have an incentive to hold out in the private game. Thus, reorganizations using capital market purchases are in part facilitated by a bankruptcy code that overcomes holdout problems.

Not only are capital market purchases enhanced by the existence of a bankruptcy code, but the only successful bid to buy out the claimants is identical to the outcome of the formal game. Any other bid must leave at least one claimholder class with less than it would receive if the proceed-

ings moved into the formal game. Since any claimant can force the proceedings to move into the formal game, they would be unwilling to sell their claims for less. Every claimant is indifferent between selling at the bid that is identical to the outcome of the private game and reorganizing.

## 2.6 Ex post efficiency

Bulow and Shoven (1978) and White (1980) have addressed the issue of whether the bankruptcy process, in particular the absolute priority rule, is efficient. The process is “ex post” efficient if continuation, rather than liquidation, occurs if and only if the value of the firm as an ongoing concern exceeds its value in liquidation. Bulow and Shoven and White find that me-first and absolute priority rules are not sufficient for ex post efficiency.

In the Bulow and Shoven framework, a coalition of bank lenders decides whether to liquidate or to continue. The bank provides the funds to facilitate the continuation. A third party, debt, is assumed to not participate in the decision. Continuation occurs when the payoffs to the bank-equity coalition are greater in continuation than in liquidation. Their continuation payoffs depend on (1) the total value of the firm in continuation and (2) the payoffs to debt in continuation. The continuation value being greater than the liquidation value is equivalent to the payoffs to the bank-equity coalition being larger in continuation if and only if the payoffs to debt are identical in continuation and liquidation. Therefore, the bank-equity coalition makes the ex post efficient choice if and only if the payoffs to debt are invariant to the choice of liquidation or continuation. This invariance condition is not met by the absolute priority rule.

Two assumptions which are inconsistent with the actual bankruptcy process drive this inefficiency result. First, reorganization requires unanimous approval, not just approval of the bank-equity coalition. Second, rather than one outcome in continuation, a set of outcomes or reorganization plans are feasible in continuation.

With the requirement of unanimous approval, reorganization occurs only if  $P_i > L_i$  for all  $i$ . Thus, a necessary condition for continuation is  $V_r > V_l$ . Continuation when liquidation is optimal ( $V_l > V_r$ ) cannot occur. Since any plan that satisfies  $\sum_{i=1}^n P_i \leq V_r$  is feasible,  $V_r > V_l$  implies that at least one plan exists that makes all classes better off in reorganization. It must be demonstrated that holdout problems can be overcome before  $V_r > V_l$  is sufficient for reorganization. Given that the arguments in this article show that legal mechanisms overcome holdout problems, continuation occurs if and only if  $V_r > V_l$ .

## 3. Summary and Conclusions

Financial contracts and corporate charters specify property rights which require that in certain situations decisions are to be reached by consent of different classes of claimholders. Reorganization conditional on default is one example of a claimants’ collective action problem.

This article systematically analyzes the reorganization process and yields the following results. When a firm's value decreases dramatically, the existing set of contracts do not provide incentives consistent with firm value maximization. Thus, gains from reorganization exist. Conflicting incentives of the claimholder classes make reorganization difficult. Specifically, the private game is likely to result in extensive dissipation of the firm's assets. The claimant's private incentives in the reorganization are conflicting.

The bankruptcy laws layer on additional constraints to the private game structure. The solution to the formal reorganization process involves little dissipation relative to the private game. Specifically, equity's first proposal is accepted in the formal game. When the two games are modeled in sequence, the outcome of the formal game dictates the solution to the entire reorganization process.

The solution to the process closely approximates the absolute priority rule, which has certain desirable properties. The analysis of Section 2 indicates that claimholders are unable to achieve an absolute priority solution in the absence of outside intervention. The bankruptcy judge provides this intervention.

This analysis of the bankruptcy process assumes that all the parameters of the game and claimants' actions are common knowledge. This is undoubtedly unrealistic. This article assumes that there is no way that claimholders can affect the value of the firm outside of the reorganization plan chosen. For example, there is no opportunity to affect the value of the assets by altering the mix of investment projects. Bergman (1987) shows that if there are such actions available, equity has an incentive, in some cases, to threaten to take actions which will reduce the value of the claims. This forces debtholders to agree to a renegotiation of the contracts that is favorable to equity.

The appointment of a trustee in the formal bankruptcy proceedings can be motivated as a mechanism to preclude equity's dissipation strategy. However, if the trustee cannot observe all of equity's actions, the potential for such a strategy exists.

In addition, the model assumes the court-assigned payoffs are known with certainty. The court imposes the liquidation and cram down constraints. These payoffs are not known with certainty, and they may be viewed as lotteries. Thus, the costs to risk-averse claimants of the liquidation and cram down procedures may be understated.

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