Optimal Judicial Decision Making in Corporate Bankruptcy Cases

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The fundamental question in any corporate bankruptcy case is whether the bankrupt firm should be liquidated or continued (and how). This paper provides a generic model as to how this question can be addressed by the bankruptcy judge who does not know at the outset whether the management of the firm is of efficient type (continuation value exceeds liquidation value) or of inefficient type (liquidation value exceeds continuation value). A screening mechanism is proposed such that efficiency is preserved in bankruptcy decision making. A first best result in contract theory is obtained and applicability in actual corporate bankruptcy decision makings discussed.

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1. Introduction

Corporate Bankruptcy Law is best seen as a solution to a collective action problem as pointed out by Baird (1987). The collective action problem arises when there are many creditors to a debtor firm. In case of a default by the debtor the problem arises as a race by the creditors to seize the debtor’s assets and socially inefficient dismantling of assets or renegotiation of the debt. The Law gives a procedure under which the collective action problem and the externalities can be internalized by a

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single agency, operating under an orderly manner. An automatic stay is brought against the claims of the different creditors and the company is left in charge of a bankruptcy procedure for a fixed period within which matters are to be sorted out and the company is either reorganized or liquidated and the proceeds distributed to creditors according to bankruptcy rights, and not according to pre-bankruptcy entitlements. Thus as Jackson (1986) has noted, corporate bankruptcy is an ex post procedure to settle the different claims on the firm. Bankruptcy procedure may vary as follows:

First is the receivership where the receiver decides whether to liquidate or reorganize the firm. Next, the incumbent management decides whether to enter reorganize chapter or liquidation. Finally, Tribunal tries to reorganize the firm and if not successful then appoints an official liquidator.

The law is of paramount importance in keeping the credit system, and the banking system going and in the utilization of efficient allocation and reallocation of scarce capital resources. Without a properly functioning corporate bankruptcy law, a significant fraction of bank credit may be immobilized due to lengthy bankruptcy litigation and bank credit cannot be reallocated efficiently into other high return investments. In developing and developed economies dominated by banks and institutional credit rather than market based finance (see Allen and Gale (2000)), this would lead to high losses for the banks and if banks engage in significant credit rationing in response to reduction in their capital bases then it could lead to a systemic crisis (see Frexias and Rochet (1997)) and a collapse of the financial system. Further, inefficiency in corporate bankruptcy law and judicial decision making could lead to possibilities of sick and unviable firms continuing operations which are loss accumulating and clearly inefficient. Unpaid debt by sick firms under bankruptcy could cause further indebtedness of their creditors and suppliers and debt defaults could spread like contagion. Soon the economy could be caught in a significant and deep recession. The situation could be amplified by resulting high unemployment in different industrial sectors.

The process of economic development could thus be seriously jeopardized. Savers might divert funds from the banking system and banks may charge excessively high rates of interest and ration credit. The high possibility of getting away from non-repayment of bank loans might induce entrepreneurs and firms to engage in schemes of asset and income diversion, fraudulent activities, window-dressing of balance sheets and profit and loss accounts. Employment might be discouraged and
inefficiency in labor contracts could arise. But most importantly, capital which cannot be reallocated may cause the growth process to be thwarted.

The emerging markets crisis and the Enron scandal in the recent past, and the more recent bankruptcy of Lehmann Brothers and some other financial institutions, the subprime crisis and the ensuing worldwide recession have pointed out some basic respects in which financial systems are underdeveloped even in developed economies (see Allen and Gale (2007)) and have underscored the importance of having an efficient bankruptcy law and efficient corporate bankruptcy judicial decision making (see Hart 1995)).

Corporate bankruptcy primarily arises due to excess leverage resulting from high risk taking. Financial systems may have a high proportion of risky borrowers which get bank funding due to overoptimistic evaluation of their prospects (influenced by macroeconomic prospects and forecasts), the need for banks to make large amount of quick money while the good times last, bank funding avenues open due to side payments to bank officials made by would be borrowers and so on. These risky borrowers may go bankrupt with slight disturbances in the macro economy, in their respective industries and firm-specific shocks. The banks which finance them also get into difficulties. Banks also invest in securities traded in financial markets and can become insolvent from undervalued investments and trading losses. Banks may also experience runs due to fundamentals changing or due to self-fulfilling expectations of panics. Insolvency may also arise from these factors. Thus, even with a robust underlying economy, the financial system may become fragile and can cause adverse real effects. The question naturally arises whether, given the robustness of the underlying economic parameters, the insolvent firms and financial institutions can be rescued. On introspection, it turns out that rescue operations can only be partial. There are two reasons for this. The first stems from moral hazard literature which tells us that insuring or rescuing corporate institutions would precipitate their risk taking behavior since they do not bear the negative consequences of loss making and insolvency. The second reason is that when financial system causes real losses, the fundamentals of the economy change, and if this means a full scale recession, only a fraction of firms and financial institutions can be rescued with taxpayer money. Those corporate entities which cannot be rescued through insurance payouts, bailouts and tax revenue financed restructurings come under corporate bankruptcy law which is analyzed in this paper.
Here, I briefly review some efficiency principles regarding substantive and procedural law relating to corporate bankruptcy. Essentially, the corporate bankruptcy judicial decision involves two issues. First, what happens to the assets of the firm and who is in control, and second, who among the claimants gets what and in what order.

Let me briefly review the second issue. Some corporate bankruptcy scholars have noted that violation of absolute priority should be seen as an ex ante risk sharing mechanism between creditors and equity holders but Adler (1992) and Hart (1995) have shown that violation of absolute priority rule is suboptimal. There is a large literature regarding the welfare implications on the violation of absolute priority rights. Adler (1992) has argued that violation of absolute priority rights may lead to ex interim inefficient incentives to precipitate bankruptcy while Hart (1995) has shown that this may weaken the commitment of management (through the issuance of senior debt) not to finance inefficient projects and has pointed out that that such violation may lead to ex ante inefficiency by raising the cost of credit which leads to cancellation of financing some good investment projects. Hart (1995) and Bebchuk (1988) have outlined how the second issue can be settled without violating absolute priority rights. Essentially, they propose to start the company afresh and to allocate equity of the new company to senior creditors such that the junior creditors are given options to buy equity. Thus irrespective of what happens to the firm and who is in control, efficient decisions can be taken on the liability side of the company balance sheet.

However, the first issue of what should happen to a bankrupt firm and who should remain in control is not completely solved by bankruptcy theory. Essentially efficiency requires that ex post value of the firm assets is maximized. Thus the warranted procedure requires that, continuation of the firm under bankruptcy proceedings should happen when the continuation value is greater than the liquidation value of the firm and liquidation should occur when the liquidation value is greater. Hart (1995) notes a problem with auctions with respect to the problem of adequate cash mobilization and proposes a cash cum equity auction such that the absolute priority rule and the bonding role of the management is preserved (the management is penalized sufficiently in bad states) and optimal decision regarding liquidation or reorganization takes place. Baird and Rasmussen (2001) argue that management equity should be preserved when management and shareholders cannot be easily separated even though creditors should be effectively in control in bankruptcy states. These two papers highlight the need for characterizing the
incentive-penalty schemes for management under bankruptcy and for selecting the right management team. However, they are silent about the fact that the management has inside information about the true value of the firm under reorganization and that the value of the firm is contingent on the ability of the manager. This information problem may lead to inefficiencies like (a) liquidation when continuation value is greater (b) continuation when liquidation value is greater. Note that, even with an efficient law in place, things could go wrong due to this asymmetric problem facing the judge deciding the corporate bankruptcy case. A sound judicial principle is needed to solve the problem.

This paper provides focuses on this problem and provides a generic model as to how this question can be addressed by the bankruptcy judge who does not know at the outset whether the management of the firm is of efficient type (continuation value exceeds liquidation value) in which case the management should continue under efficient reorganization or the management of the firm is of inefficient type (liquidation value exceeds continuation value) in which case the firm should be sold out and the management should be induced to exit from the firm. A screening mechanism is proposed such that efficiency is preserved and expected asset value is maximized.

It should be clarified at the outset that here the judge is representing the unpaid creditors of the firm and therefore expected asset value maximization is the welfare objective of the judge. The screening mechanism is such that the separating menu that induces exit of the inefficient managers is welfare improving since continuation of the firm under the inefficient management leads to less expected asset value than proceeds from liquidation. So, unlike the offering of two menus to two types in standard incomplete information models with participation constraints and incentive constraints satisfied for each type, this mechanism offers a participation contract for efficient type and a non-participation contract for the inefficient type with respective incentive compatibility constraints such that no type has any incentive to mimic the other type. Further, even if we had n types of managers and m (m < n) efficient types, the result would have been extended in the sense that the menus would have been designed in a way that for (n - m) inefficient managers, their participation constraint would have not have been satisfied and they would have had to exit.

Basically, the judge needs to subject the incumbent management of the bankrupt firm to a mechanism through which she can induce each type of manager to self-select and reveal their respective types so that efficiency in judicial decision making can be
achieved. Note that we have two types of management: for the first one, net value from reorganization (continuation) exceeds liquidation value and for the second one, maximum net revenue from reorganization is lower than liquidation value. The judge gets to know the parameters and the liquidation value but she does not know prior to screening, the type of the incumbent management. Thus, the mechanism consists of a pair of contracts: target revenue from reorganization and compensation meant for each type management. Given the complexity and multidisciplinary issues involved in corporate bankruptcy litigation, the judge works with a team of experts. The judge works together with an industry expert, a technical expert, a statistician, and a financial expert. She first finds out the values of all relevant revenue and cost parameters and cost functions (cost of each type of management is an increasing and convex function of revenue to be achieved) of each type of management by statistical estimation from historical records of the firm and the industry. The judicial team also estimates statistically the liquidation value of the firm from comparable liquidation values within the industry and outside the industry. Given these data, the expected asset value can be estimated for each reorganization scheme (given by a target revenue) and for each management (represented by a cost function) type. Thus the optimal mechanism can be devised and expected asset value maximized by offering two pairs of target revenue and management compensation contracts subject to participation constraint for the efficient type, non-participation constraint for the inefficient type and the incentive compatibility constraints.

2. The Model

Consider a firm whose debt to creditors exceeds the ability to repay in full at a certain time. This triggers a bankruptcy proceeding filed either by the creditors or the management of the firm. Assume that a bankruptcy judge is appointed through some mechanism. I assume that absolute priority is preserved under bankruptcy and equity holders remain residual claimants without control rights. Consider a bankruptcy judge who induces ex post value maximization of the firm on behalf of the creditors by some mechanism. She has to take the decision whether the firm should be liquidated or be allowed to continue under some reorganization scheme. Consider further, that her decision making is constrained by her inability to know the type of the incumbent management. Bankruptcy may have been triggered by negative shocks to firm cash flows even with an efficient type of management. Or, bankruptcy may have been caused by inefficient management. Both possibilities are there and neither can be ignored probabilistically. If the management is of efficient type then continuation value is greater than the liquidation value and the firm should be
continued under some feasible reorganization plan. On the other hand, when the type of
the management is inefficient then liquidation value is greater than continuation
value and the firm should be liquidated. Let us assume that the judge assigns a
probability \( p \) to the management being of efficient type and \( (1 - p) \) being the
probability assigned to the management being of an inefficient type. Though the
judge does not know the type of the management at the outset, she knows the nature
of each type in terms of revenue and cost functions. Thus demand and technology of
each type of manager is known to the judge.

For an efficient bankruptcy decision, it matters a great deal what is the type of the
firm management. Let \( R_i \) be the target revenue which can be extracted from
reorganization by type \( i \) and \( d_i(R_i) \) the management cost of obtaining \( R_i \) where is \( L_v \)
the liquidation value. Let \( i = 1 \ (i = 2) \) be the efficient (inefficient) type. Then I make
the following standard assumption

**Assumption 1.**

(a) the cost is lower for the efficient type: \( d_2(R_i) \geq d_1(R_i) \geq 0 \ \forall \ i \)
(b) the cost function is convex for each type: \( 0 < d'_i(R_i) \) and \( d''_i(R_i) > 0 \)

For the efficient type of management (type 1, indicated by the subscript 1), the
following condition holds: \( \forall \ i, \text{Max} \ (R_i - d_i(R_i)) > L_v \). This implies that the firm
should be continued with such efficient type of management since ex post reorganization always dominates ex post liquidation in value terms. On the other
hand, for the inefficient type of management, the liquidation value always exceeds
reorganization value and the following condition holds: \( \forall \ i, \text{Max} \ (R_i - d_2(R_i)) < L_v \). Thus with this (inefficient) type of management, the firm should be liquidated and
the management should be provided incentive for exiting. As assumed in the
beginning, the judge does not know the type of the management. However, the judge
can use screening devices available to her, in order to sort out the different types and
take the right decision.

One screening device available to her is target revenue \( R_i \) and compensation \( S_i \)
contract combinations for \( i \) type of management. She offers \( (R_1, S_1) \) contract for type
1 (efficient) management and \( (R_2, S_2) \) contract for type 2 (inefficient) management.

Consider the following program:
\[ \text{Max } \Pi(R_1 - S_1) + (1 - \Pi)L_v \]  \hspace{1cm} (1) \\

with respect to \( R_1, R_2, S_1 \) and \( S_2 \) subject to the following participation constraint constraints for the efficient type (PC1) and non participation constraint for the inefficient type (NPC2): \\
\[ S_1 - d_1(R_1) \geq 0 \] \hspace{1cm} (2) \\
\[ S_2 - d_2(R_2) = - \epsilon < 0 \] \hspace{1cm} (3) \\

This implies maximization of the sum of the surplus rent from the efficient type and the value of liquidation from the inefficient type of management. \\

PC1 is standard and says that the participation constraint of the efficient type of management has to be satisfied. On the other hand, NPC2 says that participation constraint of the inefficient type of management has to be violated through offering a negative net payoff from participation so that he walks out from the firm. 

Set \( R_2 = 0 \) and assume that \( d_2(R_2) = 0 \) without any loss of generality, since the inefficient type manager is not participating anyway. Note that also \( d_1(R_2) = 0 \) since there is no activity.

Now consider the following incentive compatibility constraints for the efficient type of management (IC1) and the inefficient type of management (IC2): \\
\[ S_1 - d_1(R_1) \geq S_2 - d_1(R_2) = - \epsilon \] \hspace{1cm} (4) \\
\[ S_2 - d_2(R_2) \geq S_1 - d_2(R_1) \] \hspace{1cm} (5) \\

Now let us consider PC1 in (2) and IC1 in (4). According to the maximization problem of the Judge, only one of them should be binding subject to the fact that both should be satisfied. \\
\[ S_1 - d_1(R_1) = \max (0, - \epsilon) = 0 \]
So,

\[ S_1 = d_1(R_1) \quad (6) \]

On the other hand, NPC2 is binding so we have to only ensure that the incentive constraint of the inefficient type of management is satisfied, or in other words, the inefficient type of management has no incentive to mimic the efficient type:

\[
S_2 - d_2(R_2) \geq S_1 - d_2(R_1)
\]

\[
\Rightarrow -\epsilon \geq d_1(R_1) - d_2(R_1)
\]

\[
\Rightarrow d_2(R_1) - d_1(R_1) \geq \epsilon
\]

Let \( \min [d_2(R_1) - d_1(R_1)] = \delta \). So, set \( \epsilon < \delta \). Thus IC2 is satisfied and we get a range values for \( \epsilon \) such that NPC2 holds also.

Now the objective function in (1) can be rewritten as,

\[
\text{Max } \Pi(R_1 - d_1(R_1)) + (1- \Pi)L_v
\quad (1a)
\]

The first order condition is given as,

\[
1 = d_1'(R_1)
\]

The second order condition is satisfied by the assumption of convexity of cost for each type.

In this way, the screening mechanism achieves the objective of expected asset value maximization. The optimal target revenue for reorganization by the efficient type is derived from the first order condition. Full efficiency is obtained as the negative externality imposed by the possible participation of the inefficient type of management is ruled out and there is no rent extraction-efficiency tradeoff that is usually found in contract theory (see Laffont and Martimort (2006) for a discussion of principal-agent model with hidden information). Due to the non-participation of the inefficient type, the judge can ensure that the participation constraint of the efficient type binds and thus efficient type cannot get any informational rent. Of
course, with many types and at least two efficient types, the mechanism would be more complex (and the problem of degeneracy of the mechanism to a single point will disappear) but the underlying principles behind the mechanism should be the same. However, the first best cannot be achieved in that case as at least one efficient type would get informational rent.

Notice that the bankruptcy procedure or mechanism outlined can be applied to all three types of procedures described briefly in section 1 as long as bankruptcy decision maker correctly devises the participation and incentive constraints. In UK type of bankruptcy procedure where the receiver is the bankruptcy decision maker, she (together with her team of experts) has to correctly devise the participation and non-participation constraints and the incentive constraints. In US type of procedure with features like chapter 7 (liquidation) and chapter 11 (reorganization), the chapters should be so reconstructed, that the efficient type self-selects chapter 11 and the inefficient type opts for liquidation. In other systems, the same principles should apply.

3. Conclusion

It should be noted that the kind of screening mechanism underlying the corporate judicial decision making will increase the efficiency of the economic system and lead to economic development in diverse ways. Banks will lend more to firms with efficient management and high expected cash flows even if these firms have temporary liquidity shortages. On the other hand, firms in declining industries will be credit rationed and liquidation capital will be reallocated to firms and industries with high future potential. This will lead to efficient growth paths and high loan recovery by banks. With higher growth through efficient capital allocation and reallocation due to an efficient corporate bankruptcy system, there will be concomitant growth in employment, investments in human capital (which high-technology sectors with high potential will require) and high value research and development. There will be higher incentives for savings to flow into the banking system.

I end with a comment on a possible extension of the paper. This paper characterizes efficient bankruptcy procedure on the asset side of the firm balance sheet when type of management is not known to the bankruptcy judge. Future research should focus on solving the asset and liability problem simultaneously and characterize the optimal procedure which aligns creditor information and interests with asset side
efficiency. In other words, future research should focus on the problem of “dispersed information” (a bankruptcy judge representing the creditors may know something about the firm that the management may not know and the converse being true also).

References


