Alberto M. Musy

The Economic Efficiency of Bankruptcy Procedures: an International Comparison
1 SOME ECONOMIC PROBLEMS OF BANKRUPTCY

1.1 Introduction

Giving a precise definition of “bankruptcy” is not easy, since this is different according to the legislation of the firm's country. Generally, we can say that a firm goes bankrupt if it cannot meet a current obligation. When this happens, insolvency legislation indicates what has to be done with the firm's assets and which are the rights of the debtor and the creditors.

It is important to notice that there would be no need for insolvency legislation in a perfect world: debt contracts could specify everything about the distribution of the assets of the debtor among the creditors under every contingency that brings to insolvency. Unfortunately, this is practically impossible in the real world and even if it were possible, the costs would be much higher than the benefits of avoiding the imperfections that insolvency legislation introduces in the economy.

When a firm goes bankrupt, a process of adjudication of creditors' claims starts: a number of imperfections are present with respect to the ideal case of instantaneous and predetermined adjudication. The process takes time and is costly and the goals to achieve are sometimes in conflict; consequently different kinds of bankruptcy procedures put different emphasis on the different goals to achieve.

The goals that a good bankruptcy procedure should achieve are essentially three: ex post, the value of the firm should be maximized, so that the "pie" that is divided among the creditors is as big as possible, and the priority of claims among the creditors should be respected. Ex-ante, no distortions on the management decisions should be introduced and the right incentives should be provided so that the costs of bankruptcy are considered when the business strategies are chosen: this wouldn't be the case if these costs were borne only by creditors and not shared with the management.

The first objective implies that a firm should not be automatically liquidated when it goes bankrupt: this should be the case only if it is worth more piecemeal than as a going concern or, similarly, when it does not produce enough cash-flow.

We will later see why the ex-post and the ex-ante goals can be in conflict: for the moment we just observe that value maximization sometimes requires the firm to go on as a going concern under the incumbent management, who has superior information with respect to a new management, but not punishing the management in case of bankruptcy implies that this does not have the incentives to avoid it. The legislations of the different countries adopt different solutions with respect to this problem: some of them put more emphasis on protecting the creditors' claims even if in some cases this implies liquidations of healthy firms; some other consider ex-post value maximization as priority accepting the risk of wrong incentives for the management as a consequence.
Some difficulties in reaching the objectives above are analyzed in the following: we can call these economic problems of bankruptcy because they represent problems that either are not present when the firm is financially healthy (problems related to ex-post value maximization) or would not be present if there were no risk of the firm falling bankrupt (problems related to ex-ante effects of insolvency law).

### 1.2 Asset grabbing in a receivership system

Examples of how certain kinds of financial structures may create incentives for premature and inefficient liquidations of companies are given by Bulow and Shoven (1978), Jackson (1982, 1986) and Webb (1991). This last author shows that if debenture-holders have claims on a common pool of assets this may lead to an inefficient equilibrium of the prisoner's dilemma kind in which the assets are prematurely liquidated.

Suppose a company undertakes some investment at date $t=0$, financed by the issue of ordinary shares and debenture capital secured by a floating charge on the firm's assets. Suppose also there is no fixed charge on the firm's assets. For simplicity, assume there are only two debenture-holders, $i$ and $j$, who are compulsively owed $R_1$ at time $t=1$ and $D_2$ at time $t=2$. At time $t=1$, additional information becomes available and if the payment $R_1$ is not made, debenture-holders can choose whether to hold on or to appoint a receiver for their claim.

Assume the payment of $R_1$ is not made and the expectation at time $t=1$ of the value of the firm at time $t=2$ is the following: with probability $p$ the company will be worth $V_2$ (with $V_2 > D_2 + R_1$) and with probability $(1-p)$ it will only be worth $L$ (with $L < D_2 + R_1$). Alternatively, the firm can be liquidated at time $t=1$ at price $L$. The problem is that of deciding whether the debenture-holders will choose to hold on or they will appoint a receiver.

Indicating with $B_1 = p \ V_2 + (1-p) \ L$ the expected value at time $t=1$ of the company at time $t=2$ (we ignore discounting for simplicity) and with $\alpha = (D_2 + R_1) / (D_2 + R_1)$ debenture-holder's $i$ share of the total payment, the pay-off matrix is the following:

<table>
<thead>
<tr>
<th>Player j</th>
<th>Apport receiver</th>
<th>Hold on</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apport receiver</td>
<td>$\alpha \ L ; (1-\alpha) \ L$</td>
<td>$D_2 + R_1 ; L - (D_2 + R_1)$</td>
</tr>
</tbody>
</table>
For both players, appointing a receiver is a dominant strategy and this results in liquidation of the company even if holding on could be more profitable (there is a positive probability that the firm be worth \( V_2 > L \) if the players wait until \( t=2 \)). The loss that is caused by asset grabbing is \( p (V_2 - L) \).

A number of deviations from this simple framework may avoid liquidation: first of all it could be argued that debenture-holders may co-operate in order to reach an agreement not to press their claims prematurely: this is evident in our simple two-player example, but the extension to the many players case is not always possible. Aivazan and Callen (1980) have used core-theoretic arguments to show that such agreements may be unstable if the number of creditors is high.

Moreover, liquidation is the result in the one-shot game: if the game is repeated, under some conditions players may be able to reach the efficient result through implicit collusion (Kreps, Milgrom, Roberts, Wilson 1982).

The company could also borrow money to repay the debenture-holders, therefore eliminating the inefficiency through trade. However, also this is not always possible, given that the company should raise \( D_2 + R_1 \) which could exceed the expected value of revenues \( B_1 \).

Finally, insolvency law can be used to constrain asset grabbing: this is the case if individualistic asset grabbing is automatically suspended when the company is put into liquidation.

The pay-off matrix in fact becomes:

<table>
<thead>
<tr>
<th>Player i</th>
<th>Hold on</th>
<th>( L - (D_2 + R_1) ; D_2 + R_1 ) ( \alpha ) ( B_1 ); ( 1-\alpha ) ( B_1 )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Player j</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appoint receiver</td>
<td>( \alpha ) ( L ); ( 1-\alpha ) ( L )</td>
<td>( \alpha ) ( L ); ( 1-\alpha ) ( L )</td>
</tr>
<tr>
<td>Hold on</td>
<td>( \alpha ) ( L ); ( 1-\alpha ) ( L )</td>
<td>( \alpha ) ( B_1 ); ( 1-\alpha ) ( B_1 )</td>
</tr>
</tbody>
</table>

and holding on is now a weakly dominant strategy. This is what happens for example in the U.K. where, by the 1986 Insolvency Act, the appointment of an administrative receiver suspends individual asset grabbing. Similar provisions are contained in other countries' legislations.

An opposite kind of problem may arise when there are unsecured creditors, who are junior to other creditors with a floating charge (typically banks): the latter will not exercise their charge at the optimum moment, that is the moment that would maximize the value of the firm, because they are not interested in that part of value of the firm exceeding the value of their claims. For this
reason, these creditors may support the firm too long, even if it is making losses, as long as doing so does not endanger their claims: the result is that there may be no value left for the unsecured creditors. In recent years in France and in Germany banks have been sued by unsecured creditors for causing them additional losses by supporting companies too long (Webb 1991).

1.3 The Underinvestment Problem

Myers (1977) showed that there may be cases in which managers of bankrupt firms acting in shareholders’ interest have incentives not to invest in projects with positive net present value.

An example adapted from Franks and Torous (1989) is the following: suppose that the firm has initially the following balance sheet:

\[
\begin{array}{|c|c|}
\hline
\text{Assets in place} & 70 \\
\hline
\text{Debt (face value 100)} & 70 \\
\text{Equity} & 0 \\
\hline
\end{array}
\]

Suppose a growth opportunity is known with certainty: this requires an investment of 35 and has a present value of 50. In this case there is no incentive to invest for the managers, if these act in the interest of shareholders, because the net present value of the project would go to remunerate the debtholders who have a senior claim. In fact, the balance sheet after the firm has issued new shares for 35 in order to finance the investment would be:

\[
\begin{array}{|c|c|}
\hline
\text{Assets in place} & 70 \\
\hline
\text{Debt (face value 100)} & 100 \\
\text{Present value of investment} & 50 \\
\text{Equity} & 20 \\
\hline
\end{array}
\]

The investment would therefore cause a loss of 15 to those who financed it, since the present value of the investment after the senior debt has been repaid is 20. As a result the investment opportunity will not be exploited even if it is profitable.

A way out of this problem is made possible by the possibility of re-contracting the financial claims with the creditors in order to provide the incentives to invest to the management: if the creditors agreed to write down the face value of their claims to 80, the balance sheet in case of investment would be:

\[
\begin{array}{|c|c|}
\hline
\text{Assets in place} & 70 \\
\hline
\text{Debt (face value 80)} & 80 \\
\text{Present value of investment} & 50 \\
\text{Equity} & 40 \\
\hline
\end{array}
\]

and the management would indeed have the incentive to invest, since the net present value of the investment for those who finance it is still positive. As a result, both creditors and shareholders are better off, with respect to the case of no investment.

Strict priority is not respected in this case: indeed, since the shareholders have the power of deciding whether to invest or not, the deviation from strict priority with redistribution of the
proceeds of the investment is the price creditors have to pay to the management in order to have them take the right decision.

Re-negotiation of the creditors' claims happen very frequently in reorganizations conducted under Chapter 11 of the American Bankruptcy Code.

A very similar problem is present when new debt is issued to finance the investment of a bankrupt firm: the proceeds from the investment would go to remunerate old debt and no investor would be willing to lend funds under these conditions. Supra-priority must therefore be accorded to the new debt in order to the financing of the profitable investment to be possible.

1.4 Bankruptcy Costs and Capital Structure

The Modigliani and Miller theorem (1958) states the irrelevance of the capital structure for the value of the firm in a taxless world. This result is later reconsidered by allowing for the introduction of taxes (Modigliani and Miller 1963): the consequence is that the value of the firm increases with debt financing, due to the tax shield this provides, and all firms should be all-debt. Subsequently, Stiglitz (1974) has shown that this result holds even in presence of costless bankruptcy.

However, bankruptcy is unlikely to be a costless event: both direct and indirect costs are associated with bankruptcy, the first including payments to all parties for legal fees, professional services, trustees' fees and filing fees and the second being mainly represented by lost investment opportunities. Attempts to measure these costs have been made by Warner (1977), Ang, Chua and McConnell (1982), Altman (1984a) and Weiss (1990).

Once we introduce the costs of bankruptcy in the models, an optimal debt-equity ratio can be derived: among the authors that reach this result are Kraus and Litzenberger (1973), Scott (1976) and Kim (1976). The argument is basically the following: given that bankruptcy is a costly event, the value of the firm will be decreased by the presence of an expected cost of bankruptcy. This expected cost is found considering the size of bankruptcy costs (which depends, among other factors, by the insolvency legislation of the firm's country) and the probability of the firm falling bankrupt, which increases when the firm increases its debt-equity ratio. The effect of increasing the leverage ratio is therefore twofold: on the one hand it increases the value of the firm, because it increases the tax shield, on the other hand it decreases the value of the firm, because it increases the expected cost of bankruptcy. The optimal capital structure of the firm will be found at that point where the marginal benefit of increasing the tax shield equals the expected marginal cost of bankruptcy. The final effect of the presence of bankruptcy costs will be a wealth effect borne by the
owner of the firm, since creditors anticipate the possible costs of bankruptcy and higher margins have to be paid on funds borrowed (Kraus and Litzenberger (1973) give a proof of this).

Similar results are reached in the analysis by Jensen and Meckling (1976), in which bankruptcy costs are seen as one component of the agency costs associated with debt, the other two being the opportunity wealth loss caused by the impact of debt on the investment decision and the monitoring and bonding expenditures. According to these authors, however, the importance of bankruptcy costs should not be overstressed, as they specify the ...belief that bankruptcy costs themselves are unlikely to be the major determinant of corporate capital structure.

The relevance of bankruptcy costs and insolvency legislation to the choice of the capital structure of the firm is challenged by Haugen and Senbet (1978). Their argument is that if investors are rational, they will realize ex-ante that bankruptcy costs can be avoided by an informal re-organization of the capital structure just before bankruptcy comes about: new shares will be issued and the proceeds will be used to repurchase the excessive debt. The only costs this re-organization implies are the transaction costs of issuing shares and buying debt and unless these are higher than bankruptcy costs it will be profitable to re-organize in order to avoid bankruptcy. The result is that bankruptcy will never occur and the costs of bankruptcy are therefore not relevant to the choice of the capital structure. Obviously, the hypothesis of perfect capital markets is needed.

Webb (1987) shows that the bankruptcy cost argument needed for determining the optimal capital structure of the firm can be saved if we introduce incomplete information: the bargaining game which is played by shareholders and debtholders to share the surplus implied by the difference between bankruptcy costs and re-organization costs (often simply considered as being zero) may have no solution if some kind of uncertainty about the firm's type or the behaviour of the court is introduced\(^1\).

Finally, Altman (1984b) points out that the demand and the operating costs of a firm may be influenced by the probability of bankruptcy and therefore indirectly by the capital structure of the firm: the first factor is particularly important for some industries of durable goods, where the ability of the firm to maintain the assistance services and the supply of spare parts and complement products (let's think of the example of software and hardware), is strictly dependent on it not falling

\(^1\)The argument is the following: let \( L \) be the liquidation value of the firm, \( C \) the cost of bankruptcy, \( V \) the continuation value of the firm and \( D \) the claim of debtholders. Consider the case \( D>V>L \), so that liquidation is not profitable and the firm stays in business after a re-negotiation of the claim. In the following bargaining game, debtholders must get at least \((V-C)\). Suppose debtholders think the court would allocate them a share \( \alpha \) of the continuation value net of costs \((V-C)\), while shareholders think they would be allocated \( \beta \), with \( \alpha \) and \( \beta \) inconsistent (that is \( \alpha+\beta>1 \)). When during the negotiation the debtholders are proposed a lower share \( \alpha_1 \) they will refuse if

\[
\alpha_1 V < \alpha (V-C)
\]
bankrupt. On the other hand higher operating costs may depend by the higher wages that have to be paid to executives, given their having to bear the risk of becoming unemployed.

**1.5 Costs of Bankruptcy and Management Behaviour**

Starting from the observation of separation between ownership and control, it has been pointed out that since the decisions relative to the capital structure of the firm are taken by the management, the costs that are relevant to understand capital structure policies are those borne by the management itself and not by the firm as a whole.

This raises a problem: often, ex-post maximization of the value of the firm requires this to go on as a going concern under the incumbent management, because it has superior information and experience with respect to an hypothetical new management (not to mention the case in which a change of management would imply the firm to be run by an "administrator" named by the court). On the other hand, once the incumbent management is allowed to stay on, the costs it bears in case of bankruptcy are much lower: even if a wrong strategy is chosen, which brings about bankruptcy, a second chance to re-organize the firm will be given.

As a consequence, letting the incumbent management run the firm during bankruptcy in order to maximize its ex-post value implies accepting the risk of wrong incentives to the management in the normal running of the business, because the event bankruptcy is not perceived as costly.

Evidence on this is provided by Friend and Lang (1988), who show that the higher the costs for the managers whose firms are in financial distress, the more they will implement prudent strategies and choose conservative values of debt for their firms in order to avoid these costs, which typically include losing their job and not being able to find an occupation for a period of time.

The presence of costs of financial distress for managers is therefore also important in explaining management behaviour whose first objective is that of reducing the variability of operating cash flows, such as the purchase of insurance and other financial hedges, or other strategies, like diversification into new lines of business by conglomerate merger (Gilson 1989).


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and a symmetric equation holds for shareholders. The conditions under which no agreement can be reached are easily found solving the two equations. A similar result can be obtained by introducing uncertainty relative to the liquidation and continuation values of the firm.
1.6 Conclusions

A number of factors have to be taken into account in the choice of an insolvency legislation: some of them are conflicting with each other so that the choice of how to balance the different needs is not an easy one.

On the one hand, the appropriate framework must be set for the continuation of the business by the bankrupt firm, when this is beneficial to the creditors: special provisions must consider the problem of the financing of the bankrupt firm, when this has profitable investment opportunities and other provisions must avoid that individualistic considerations prevail on the general interest, bringing to liquidation in cases in which continuation of the business should be preferred. This is the case if the need of giving a high degree of protection to the creditors degenerates into allowing them to liquidate the firm's assets as soon as some symptoms of insolvency appears.

On the other hand, it is to be avoided that this framework allows a bankrupt firm which should not be kept as a going concern to continue accumulate losses, causing additional damage to the creditors.

The right balance between ex-post value maximization and ex-ante effects should be found, so that excessive ex-ante costs due to lack of ex-post protection of creditors are avoided. As we have seen high costs of bankruptcy and deviations from strict priority can be anticipated by creditors, resulting in higher costs of financing also for healthy firms.

Last but not least, insolvency legislation should be such that all costs of bankruptcy are internalized when the business strategies are chosen: this is not the case if agency problems are not taken into consideration. The management will take distorted decisions unless the right incentives to avoid bankruptcy are provided ex-ante: a big problem arises in that wrong incentives can be the result of the conflicting need of maximizing the value of the firm ex-post.

In the following we briefly discuss how different countries have chosen to tackle the bankruptcy problem.
INTERNATIONAL COMPARISON

2.1 The UK Bankruptcy Code

UK insolvency legislation (1986) outlines three procedures for the formal reorganization necessary after a firm becomes insolvent: liquidation, receivership or administrative receivership, and administration. It also establishes that a director must declare insolvency as soon as there is no longer a reasonable prospect of avoiding an insolvent liquidation: failure to do so can lead to disqualification for up to fifteen years from the board of any company.

Alternatively, a firm can reorganize its liabilities through voluntary agreements.

2.1.1 Liquidation

A liquidator is nominated after request by any creditor or by the company itself and only in compulsory liquidations the appointment requires the permission of the Court in Chancery. The petition can be opposed by the company or by any other creditor.

A liquidator has the role of selling sufficient of the firm's assets in order to satisfy all creditor's claims and he is responsible to all creditors in order of priority of their claims. The assets can be sold in whole or piecemeal. The liquidator must also supervise the distribution of funds to the creditors and an orderly winding up of the business.

The liquidator can also keep the firm as a going concern, but his powers in this case are inferior to those of the receiver.

2.1.2 Receivership

A receiver can only be appointed by a creditor who has a particular type of security on the firm's assets, that is a fixed or a floating charge. A receiver must be an insolvency practitioner.

The difference between a receiver and an administrative receiver is that the former is appointed with respect to a particular asset while the latter is appointed with respect to all of the firm's assets. Consequently, a receiver has the role of selling the asset over which he has been appointed, in order to pay the claim of the creditor who appointed him, while the administrative receiver can decide whether to sell the firm's assets or to keep it as a going concern. Generally, if the realizable value of the firm exceeds its value as a going concern, it will be sold; in the opposite case it will be kept alive.

A receiver cannot be appointed in the absence of a secured creditor and the presence of a liquidator does not preclude the appointment of a receiver; however when a receiver and a

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Footnote 2: Brief descriptions of the U.K. insolvency legislation can be found in Franks and Torous (1992) and in Webb (1991), while detailed analysis of the receivership and of the administration procedures are respectively in Milman and Rushworth (1987) and in Woolridge (1987)
liquidator are acting together, it will be hard for the former to keep the firm as a going concern: for this reason, when an administrative receiver believes that it is in the creditors' interest to keep the firm alive, he will try to prevent the appointment of the liquidator, either by convincing the other creditors not to appoint one or by buying some creditors' claims.

2.1.3 Administration

The position of the Administrator has been introduced by the 1986 Insolvency Act after the Report of the Review Committee on Insolvency Law and Practice (known as the Cork Report) presented in 1982 recommended changes in the UK insolvency legislation in order to reduce the number of premature liquidations.

The administrator, like the receiver, must be an insolvency practitioner. The administrator is appointed by the Companies Court, which is part of the Court of Chancery, after request by any creditor or by the company itself. The administrator represents all creditors' claims and this reduces the potential for conflicts of interest present in the case of a receiver.

The administrator has greater powers in keeping the firm as a going concern than the receiver: for example he has more powers in raising funds and in delaying creditors' claims and he is not liable for liabilities taken on after his appointment (while the receiver is). Moreover, no liquidator or receiver can be appointed while the administrator is in charge, that is until the administration order is not cancelled by the court, while the position of a receiver can be weakened by the simultaneous presence of a liquidator. The only case in which no administrator can be appointed is when a creditor with a floating charge has already appointed an administrative receiver.

The administrator has the task of proposing a reorganization plan for the company, which will then be accepted or refused by the creditors. When this last case happens, the creditors may vote the end of the administration period: liquidation will then follow.

2.1.4 Workouts

Workouts constitute an alternative to a formal reorganization conducted according to the insolvency legislation. In this case the insolvency problems of the firm are solved by reaching an agreement with the principal creditors.

In order to avoid future litigation with the creditors that may arise from a voluntary agreement, a firm can enter a Scheme of arrangement: in this case the court supervises the whole process and gives its approval to the reorganization plan, provided 75% of the creditors in each creditors class are in favour of the agreement.
2.2 The UK bankruptcy Code: a Comment

The main objective of the UK insolvency legislation is that of protecting creditors' claims when the firm becomes insolvent. For this reason it is said to be creditor oriented. On the other hand, the conflicting need of keeping the firm as a going concern receives less attention and premature liquidations constitute the main drawback.

Analyzing the factors that bias the English receivership system towards liquidation it has to be noticed that, even if a receiver can decide whether to sell the firm piecemeal or to keep it as a going concern, the decision must often be taken quickly and in absence of precious information: selling the firm is therefore an easier decision, considering also that the receiver is personally liable for any post-appointment liabilities (Franks and Torous 1992).

Even when the receiver is indeed willing to keep the firm as a going concern, a number of factors make the objective of value maximization through sale to the highest willingness-to-pay bidder hard to achieve, as underlined among the others by Aghion, Hart and Moore (1992). First of all, it frequently happens that the highest bid is that of the incumbent management, which has the advantage of superior information with respect to other potential buyers and can therefore better evaluate the business. Other potential buyers would in fact need time to collect information and give a more accurate evaluation of the business, but this is in conflict with the preference for a quick sale by the receiver (Jack 1992). Moreover, preparing a bid is a costly and time consuming process (Burrough and Helyar 1990): all bidders bear costs but only the winner can recoup them. An equilibrium cannot be excluded in which only one bidder enters the auction and wins with a low price, while all potential competitors are refrained from bidding by the costs this implies. Last but not least, there are financing problems, as stressed by Ritter (1987).

Other problems in the U.K. receivership system are caused by the fact that the receiver, even when he is appointed over all the firm's assets, is chosen and put in charge by one single creditor: this raises the doubt that creditors who are junior to the appointor may be disadvantaged in cases where their interests are conflicting with those of the appointer: this is the case if a quick sale would realize enough money to repay the appointor and the senior creditors but would not leave any money for the junior creditors, while keeping the firm as a going concern would probably produce more money but would expose the appointor and the senior creditors to some risk. A good example of this is given in Franks and Torous (1992).

All these factors determine that the choice of the receiver between selling or running the firm is biased towards the former case: the only factor that may restrain the receiver from too quick a sale of the business is a loss of reputation, meaning that a receiver who is perceived not to have performed his duty in the proper way may endanger his possibility of being appointed again in the
future (Franks and Torous 1992). However, it does not seem that these career considerations are enough for the decision between sale and maintenance of the business as a going concern to be considered unbiased: as the same authors conclude... *the strong impression gained from insolvency practitioners is that there is less risk for the receiver in a rapid sale of assets than there is in raising new funds to maintain the business as a going concern.*

As said above, the position of the administrator has been introduced in 1986, in response to the need of modifying the insolvency legislation with the objective of reducing the number of bankrupt companies which were prematurely liquidated and increasing the number of firms who were kept as a going concern. Contrary to what expected, relatively few administrators have been appointed and the lack of specific knowledge by the administrators who, as said above, are insolvency practitioners like the receivers, is one of the explanations.

Summarizing, the fact that the board of directors loses control of the company when a liquidator, a receiver or an administrator is appointed is a crucial feature of the U.K. insolvency legislation: creditors' claims are better protected but continuation of the business is made harder by the inferior information that a receiver or an administrator has with respect to the original board of directors. This crucial feature also implies that the cost for the managers of the firm going bankrupt is very high. This should induce the management to implement less risky and more conservative strategies and for this reason the english insolvency legislation is said to be "hard" on management.

Finally, the direct costs associated with the bankruptcy process are not very high in the English case, since the claims are usually settled quite quickly and strict priority is usually respected (Franks and Torous 1992): on the other hand indirect costs, meaning essentially lost investment opportunities, are much higher, given the frequency of premature liquidations. As previously said, direct and indirect costs of the bankruptcy process are important in that they influence the margins that the firm pays on the funds it borrows: the fastest are claims settled in case of insolvency and the stricter is adherence to priorities, the lower will be interest margins.

### 2.3 The US Bankruptcy Code

The US bankruptcy legislation is based on the 1978 Bankruptcy Code. The two main procedures are illustrated in the Chapters 7 and 11 of the Code: Chapter 7 is dedicated to the sole purpose of liquidation, while Chapter 11 contains rules directed to the scope of allowing the firm to remain in operation while a reorganization plan is agreed with the creditors.

#### 2.3.1 Chapter 7

When a firm files for bankruptcy under Chapter 7, a trustee is appointed with the task of supervising the sale of the firm's assets and the distribution of the proceeds to the creditors.
according to the priority of their claims. The assets can be sold piecemeal or as a going concern, but the same problems discussed with reference to the English system of receivership bias the procedure in favour of piecemeal liquidations.

2.3.2 Chapter 11

The provisions included in Chapter 11 protect a company from its creditors while it works out a plan of reorganization.

The debtor retains control of the business, even if sometimes the court can appoint a trustee in order to supervise the firm's operations (this generally happens when the insolvency is due to fraudulent behaviour by the incumbent management) and the creditors have the right to ask for a change of management. While the firm is in Chapter 11, all payments of interests and principal are suspended and almost no creditor can take any action against the debtor.

The debtor has the exclusive right to propose a reorganization plan within 120 days after filing under Chapter 11 and the approval of the plan by the creditors must be reached within the following 60 days. However, the court can extend this exclusivity period many times, unless the creditors oppose. If the exclusivity period is terminated by the court, any interested party has the right to propose another reorganization plan to the court and the other creditors.

A reorganization plan separates creditors in different classes, according to the seniority of their claims; equity is also a separate class. Approval of the plan requires a majority of every and each class of creditors by number, and two-thirds by face value of claims. Under some circumstances the proposer of the plan can use “cram-down” procedures in order to prevent some classes from holding out: in this case the non assenting classes are forced to accept proceeds equivalent to what they would get in an hypothetical liquidation under absolute priority of claims (the hypothetical liquidation value is established by the court through a valuation hearing). This cram-down procedure is sometimes used as a threat in order to convince some class to accept the plan, but it is rarely carried out.

Creditors receive protection in Chapter 11 through the possibility of petitioning for immediate liquidation of the firm when it files for Chapter 11; they can also file an involuntary bankruptcy petition against a firm, but this does not happen very frequently.

2.3.3 Workouts

Most firms enter Chapter 11 only after attempting an informal reorganization outside the bankruptcy process. Workouts have the advantage of requiring much less time than a formal reorganization under Chapter 11. However, it is easier to reach an agreement on a reorganization plan if the firm is in Chapter 11, given the protection that is given to the debtor in possession and
the non-unanimity requirements for the decisions (on the other hand, by the Trust Indenture Act of 1939, changing the principal amount, interest rate or maturity date of a publicly held bond requires approval of 100% of the bondholders, this makes it very hard to reach an agreement out of Chapter 11). Moreover, a reorganization under Chapter 11 also has some fiscal benefits with respect to an informal workout.

For all these reasons some firms try to combine the low administrative costs of a workout with the non-unanimity requirements and fiscal benefits of Chapter 11, by filing a "pre-packaged" bankruptcy petition. In this case, the firm that files for Chapter 11 has a reorganization plan which has been approved by the required majority ready: filing for bankruptcy and filing a plan of reorganization occur simultaneously.

2.4 The US Bankruptcy Code: A Comment

From a general point of view, we can say that the American insolvency legislation is highly debtor oriented: its first objective is that of allowing a firm to reorganize its debts so that liquidation can be avoided. The main drawback of this is opposite to that of the English system: liquidations are often deferred. Moreover, even when the reorganization is successful, the average time spent under Chapter 11 is very high, almost four years (see, for example, the study by Franks and Torous (1989), but similar results are also in Flynn (1989), LoPucki and Whitford (1992) and Gilson, John and Lang (1990)).

Aghion, Hart and Moore (1992) point out a relevant theoretical problem with a procedure of the kind of Chapter 11: it mixes two decisions together: the decision of who should get what (i.e. whose debt should be forgiven, and by how much), and, the decision of what should be done with the firm (should be liquidated or reorganized, and, if reorganized, who should manage it and what should be its new financial structure).

The same authors make further criticisms of Chapter 11. Placing decisions in the hand of representatives, that is the committees of creditors and shareholders who are effectively involved in the bargaining process, creates agency problems, since these will not devote the socially efficient level of effort in the negotiation. This is due to the fact that the share of equity and debt effectively involved in the bargaining process is limited. There is the risk that the judges abuse their supervisory powers. Moreover Chapter 11 procedure appears to be soft on management, since this remains in charge almost without limitations during the reorganization. This raises a doubt whether the cost of bankruptcy for American managers is high enough, so that too risky behaviour is implicitly given incentives.
Contrary to this view are the result found by Gilson (1989, 1990): even if the management is not substituted during the reorganization, only 46% of the managers are still in charge two years after the reorganization has been implemented (Gilson 1990), and it is very hard for managers who resign to find another job (no manager in the sample in Gilson (1989) was subsequently employed by any exchange listed firm for at least three years).

Both direct and indirect costs of Chapter 11 are very high: direct costs are very high because the process is very lengthy and a lot of day to day reporting between the court and the creditors is needed (which brings huge legal expenses). Indirect costs are high because cases of firms kept as a going concern, even if they were worth more if liquidated, are not rare. Weiss (1991) presents the case of Eastern Airlines, in which the effort of saving the firm cost over $3 billion, that is 80% of the value of the firm at the moment it entered Chapter 11. Other studies of the indirect costs of financial distress include Altman (1984a), Baldwin and Mason (1983) and White (1983). As already stressed in analyzing the English system of receivership, the consequence of high costs of bankruptcy may be represented by the firm having to pay higher margins on funds borrowed.

This last point is reinforced by the observation (see Franks and Torous (1989) and Weiss (1990)) that the lengthy process of negotiation implied by Chapter 11 procedure often brings to deviations from strict priority in the distribution of funds among creditors, favouring shareholders and some creditors: explanations for this include the high bargaining power that Chapter 11 confers to the debtor in possession and the possible interest for the senior creditors to recombine with the old shareholders (see Baird and Jackson 1988).

2.5 The Italian Insolvency Legislation

The Italian insolvency legislation outlines four procedures for the cases of firms who are not able to meet their obligations: the "fallimento" by a firm is the formal process of bankruptcy and can end either with the liquidation of the firm or with a "concordato fallimentare", that is an agreement with the creditors in order to avoid liquidation.

Three more procedures are directed to the aim of avoiding the opening of a formal bankruptcy process: the "concordato preventivo" is similar to the "concordato fallimentare", but implies the agreement to be reached before the formal opening of the bankruptcy procedure, the "amministrazione controllata" gives a firm in temporary difficulties the possibility of recovering its financial situation within a period of less than two years. Last, the experimental "amministrazione

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1 For an extended discussion of the Italian insolvency legislation see Provinciali (1988)
straordinaria" introduced special provisions for firms with more than three hundred employees and a particularly severe financial distress.

2.5.1 Fallimento and Concordato Fallimentare

The formal state of bankruptcy (fallimento) can be declared by the court in its official capacity or after request by any creditor or by the debtor. When this happens, all individual actions by creditors are suspended.

A trustee ("curatore") is named with the task of making a list of the creditors admitted to the distribution of the debtor's assets, liquidating these and supervising the process of distribution of the proceedings.

As a rule, all firm's activities end when bankruptcy is declared: the trustee can only temporarily keep the firm as a going concern and needs the authorization of the creditors' committee in order to do this.

However, once the formal process of bankruptcy is opened, the debtor can still avoid the liquidation of his firm's assets: after the list of creditors has become enforceable but before the sale of the assets begins, he can propose to the junior creditors an agreement ("concordato fallimentare"), offering to pay a fraction of the debt (at least 25% in order to be discharged from bankruptcy) in exchange for the remission of the remaining debt. This is important in that, if the assets are liquidated instead, the creditors do not lose the right to act in the future for the unpaid fraction of the debt.

The proposal is made only to junior creditors because senior creditors have to be paid in full: consequently only the junior creditors have the right to vote on the decision, besides eventual senior creditors who give up their charges. A majority is required by number of creditors and by two-thirds of face value of claims: this is a tacit majority in that creditors who do not express their vote are considered as favouring the proposal.

The intervention by a third party in the "concordato" is allowed by the law: in this case he takes over the firm by paying the obligations rising from the agreement.
2.5.2 Concordato preventivo

The "concordato preventivo" (preventive agreement) is a procedure with the objective of avoiding the liquidation of a firm in financial distress. The main difference with respect to the "concordato fallimentare" just discussed is that the latter refers to firms whose state of bankruptcy has already been officially declared by the court, while the former has the objective of avoiding the opening of the formal procedure.

Under this agreement, the debtor proposes to pay the senior creditors in full and the junior creditors for at least 40% of their claims within six months in exchange for the remission of the remaining fraction of their claims. Alternatively, he can propose the transfer of all his assets to the creditors, with the presumption that the proceeds from their sale will be enough to repay the senior creditors in full and the junior creditors for at least 40% of their debt (but the debtor is not responsible if then the proceeds are lower than expected).

Like in the case of the "concordato fallimentare", the majority required is by number of junior creditors and by two thirds of face value of their claims, and senior creditors can vote only if they relinquish their charges: the only difference is that every vote has to be explicitly expressed.

If the proposal is refused, the formal state of bankruptcy is declared.

2.5.3 Amministrazione controllata

The aim of avoiding the opening of the formal bankruptcy procedure is pursued in this case by allowing firms whose financial distress is thought to be temporary to delay their obligations to the creditors. The decision of whether or not to admit the firm to this procedure is taken by the court and must be approved by the creditors (a simple majority of face value of claims is required).

If this happens, a period of up to two years is conceded in which the debtor retains control of the business under the supervision of a "commissario giudiziale" named by the court and no individual action by the creditors is allowed.

If the firm is still insolvent at the end of this period, or if at any time the court thinks the procedure cannot be usefully continued any longer, a formal bankruptcy procedure is opened, unless the firm is admitted to a "concordato preventivo". The procedure also ends if the firm overcomes its insolvency state before the end of the period, in which case all creditors are paid.

2.5.4 Amministrazione straordinaria

This procedure, introduced experimentally in 1979, only refers to firms with more than three hundred employees with an insolvency towards banks and social security institutions of at least five times their capital: the court, instead of declaring the "fallimento" of the firm, simply declares that the firm is insolvent.
Consequently, the Minister of the Industry can decide to subject the firm to the "amministrazione straordinaria" procedure (extraordinary administration): he'll then appoint one or three administrators with the aim of submitting a re-organization plan. The government can also intervene guaranteeing, in whole or in part, the debts of the firm.

The experimental nature of this procedure has as implied a progressively rarer utilization.

2.6 The Italian Insolvency Legislation: A Comment

With reference to the general debtor- or creditor-orientation of the legislation, the Italian case can be seen as intermediate with respect to the English and the American ones.

Agreements between the debtor and the creditors are strongly encouraged by the law at different stages of the bankruptcy procedure: favourable conditions are provided by the law for the conclusion of the agreements before and after the opening of the formal bankruptcy procedure (for an example of the favour towards these agreements, notice that a "concordato fallimentare" can be concluded with a tacit majority).

The possible actions by the debtor to avoid bankruptcy are multiple and do not exclude each other: nothing prevents a firm from filing under controlled administration, then, if insolvency is not solved after two years, filing for a preventive agreement; even if this is refused and a formal bankruptcy procedure is opened, there is a third chance of avoiding bankruptcy by proposing the creditors a "concordato fallimentare". Moreover, as Galgano (1991) notices, the requisites for the admission of the firms to the procedures directed to avoid liquidation are usually judged with benevolence by the courts, reflecting the preference for agreements rather than liquidation. Last but not least, a very explicit preference towards saving the firm is present in the “amministrazione straordinaria” procedure, which has as its very first aim that of avoiding employment reductions in the distressed firms. We said that this procedure has not been used very frequently in the last years; its presence nonetheless testifies that the protection of creditors’ interests cannot be considered as prioritary under the Italian system.

This tendency to avoid liquidation has in the past degenerated into a kind of "socialization of insolvency" (see again Galgano 1991), reflected in the creation (1971) of a State Company with the aim of maintaining and increasing employment by industrial firms in temporary difficulties (this was set aside a few years later).

On the other hand, no deviations from strict priority are allowed under the Italian system and no chance to save the business is given to debtors who do not have enough resources to repay in full the secured creditors and the unsecured creditors for at least 25% of their claims (or 40% in case of a “concordato preventivo”). This is a factor that greatly reduces the possibility of restructuring the
debtor's liabilities and strongly enforces the protection for creditors with a charge. The consequence is that firms with low liquidity have little hope to save the business.

Due to the facts above and noting that the legislation never considers the hypothesis of a substitution of the management during the procedure (unless “amministrazione straordinaria” applies), this appears to be quite soft on management: some problems of distorted incentives during the normal running of the business may arise.

The degree of ex-post protection of the creditors is very different depending on whether secured or unsecured creditors are considered. The former are very well protected, in that no firm can escape liquidation unless all secured creditors are paid in full, while the latter have a very poor protection: the management is indeed given both many possibilities to save the business and a high degree of bargaining power in the negotiation process that brings to the agreement (basically, the debtor is given the possibility to make a "take it or leave it" offer, which strongly favours it, particularly in situations in which the firm's assets are hard to liquidate profitably). The consequence of these bankruptcy provisions should be an over-utilization of charges; alternatively, very high margins should be required for the financing of the firm’s activities when charges are not conceded.

Studies estimating the costs of the Italian insolvency procedures are not available: nevertheless, we can say that the higher bargaining power given to the management through the possibility of doing a "take or leave it" offer reduces the direct costs and the length of the negotiation process, so that the direct costs of the Italian system appear to be lower than those of the American one. The estimate of some Italian trustees we talked to is that an average time for concluding a concordato could well be around six months (but the smaller average size of Italian firms may play a role). The price that has to be paid for this is the very low degree of protection for unsecured creditors, who may be "forced" to accept very low payments when liquidation is not profitable.

Indirect costs are instead much higher, because of the multiple possibilities that are given to unprofitable firms to continue their activities accumulating losses.

Summarizing the critical issues, multiple possibilities are conceded to the debtor to save the business and also a favourable position is attributed in the ex-post negotiation, but no possibility is given to those creditors who cannot at least repay the secured creditors in full. Also, deviations from strict priority are never allowed. Due to this, the agreements reached to avoid bankruptcy have in a sense a less discretionary content, or, put it another way, there is less to bargain on under the Italian system.

As a consequence, the direct costs are probably lower, as well as the times required to reach an agreement are shorter.
2.7 The French Insolvency Legislation

The French insolvency legislation is based on the 1985 reform, known as the Badminter Reform, which introduced the a new procedure which has the aim of saving the firm whenever this is possible.

The procedure is usually started by the court, after request by the debtor or by any creditor, but the court can also open the procedure in its official capacity. At the opening of the procedure, the court appoints an administrator and a representative of the creditors; it also asks the workers to appoint a representative of themselves. The administrator can ask the court to appoint one or more experts in business administration in order to help him in analyzing the possibilities for the future of the firm.

The task of the administrator, together with the debtor and the eventual experts, is that of formulating a report on the causes of the financial difficulties of the firm and proposing a plan about the future of the firm: this can essentially entail the firm to be kept as a going concern in the debtor’s hands after a restructuring of its liabilities, the sale of the firm as a going concern or, if no possibility of saving the firm appears as feasible, the liquidation of the firm’s assets.

This plan must be submitted to the court before the end of the “observation period” which lasts from three to twelve months starting from the opening of the procedure: during this “observation period” no individual action is allowed by the creditors: the representative of the creditors is the only one that can act in their interest. As a rule, all firm’s activities continue under supervision by the administrator, but the court can remove the management from the running of the business and give this task to the administrator. The court also has the power to stop all firm’s activities at any moment and order the liquidation of the firm.

The decision on the firm’s future is taken by the court after hearing the administrator, the debtor and the representatives of the creditors and of the workers. The court also has great powers in implementing the plan as proposed by the administrator: for example it can impose the substitution of one or more members of the management if this is thought necessary by the administrator; it can also limit the voting rights of the shares owned by the management or even force the management itself to sell their shares at a pre-fixed price.

The French legislation gives a special protection to the workers’ credits: no restructuring of the workers’ credits is ever allowed and all workers’ credits must be paid within ten days from the opening of the procedure, if there are funds available; even if there aren’t, a minimum of one month pay must be paid within the above period (eventually these funds will be provided by the State).
If no chance of saving the firm in debtor’s hands appears as feasible, the court can order the sale of the firm, possibly as a going concern or any way trying to keep alive as many branches of activities as possible. To this aim, all offers by potential buyers must be made to the administrator during the observation period and these will be considered in the final report.

Only when there are no chances of saving the firm the court will order the liquidation of the firm: in this case a liquidator will be appointed (usually the creditors’ representative) and a standard liquidation procedure will then start: even in this case, very high protection is given to the workers’ credits, which are senior to any other class of credits (even the credits arising from the costs of the procedure).

Last but not least it has to be noticed that the legislation considers the possibility of sanctions against the managers of firms who enter the procedure: they can be made responsible for part of the firm’s liabilities if they acted with “dolus” or “culpa” and they can be prohibited from sitting on any company’s board for a minimum period of five years.

2.8 The French Insolvency Legislation: A Comment

The very first aim of the French legislation is that of avoiding the liquidation of the firm in order to satisfy the interests of the workers and guarantee national employment and production.

The interests that are considered as priority by the procedure are those of the workers and not those of the creditors: liquidation is the very extreme solution and will only be implemented when there are no other possibilities. This means that even in those cases in which liquidation could produce more money than keeping the firm as a going concern, the latter will be chosen if it appears as feasible. The principle of ex-post value maximization directed to satisfying the creditors in the best possible way does not apply to the French case.

For this reason, the degree of protection for creditors is low; indeed, their interests are considered as inferior to those of the workers (notice for example that workers have the right of choosing their representative, while the creditors’representative is chosen by the court). Consequently the indirect costs of this kind of procedure are quite high and this should increase the interest margins that are paid on borrowed funds. On the other hand direct costs are low: the procedure is in fact pretty fast (not more than one year before the final decision is taken). No deviation from strict priority is allowed and we already noticed that the very first priority is given to the workers’credits.

Moving to the ex-ante effects on management, the French procedure is hard on management, in that it doesn’t have the chance of taking decisions on the future of the firm once this has become
insolvent. In fact, the court has the power to substitute the management during the observation period and even when this doesn’t happen, all final decision are up to the court. Last but not least we’ve seen that special sanctions apply not only to those managers that acted with “dolo” but also to those who acted with “colpa”. As a consequence, distortions in the managers’ incentives during the normal running of the firm do not seem to apply to the French case.

The main problem with the French procedure, as stressed by Aghion, Hart and Moore (1992) is that a lot of power is placed in the hands of the administrator and the court: the first may lack the specific knowledge for running a firm and proposing a re-organization plan (but the debtor and some experts help him in this) and the second may lack the required experience for taking the right decision on the future of the firm. Moreover, both the administrator and the court have no financial incentive for taking the right decision.

Concluding this comment on the French insolvency legislation, it is clear that this is largely biased towards saving the firm: indeed its explicit objective is that of maintaining the employment levels that are threatened by the financial difficulties the firm is facing. Liquidation is considered as an extreme solution for those cases in which this is not possible. As a consequence, too few liquidation will be implemented with respect to the ideal case of ex-post maximization of the value of the firm. Indeed, ex-post value maximization is not the objective of the French insolvency legislation.

2.9 The Economic Problems of Bankruptcy in the Above Legislations

Going back to the economic problems illustrated in the first chapter, we can now say that some of them find a common solution in the legislations illustrated above while some other get a different treatment.

First of all, what has been called the “individual asset grabbing” problem finds a solution which is common to all the legislations above: when any kind of insolvency procedure is started, individual actions by the creditors are suspended and the possibility of a race to liquidate the firm’s assets by the creditors is therefore avoided. The English legislation appears to be the only one in which some form of asset grabbing may still be present, in that the appointment of a receiver does not suspend the possibility of individual actions (only the appointment of an administrative receiver would); no asset grabbing is possible under the other three legislations.

The “under-investment problem” is again easily solved by giving supra-priority to the funds that are borrowed after insolvency has become evident. The legislations differ in the degree of favour that they give to keeping the firm as a going concern as opposed to liquidating it and consequently
they differ in the powers in raising new funds that are given to the administrator or to the management of a bankrupt firm. Nonetheless, there is no doubt that all legislations agree on the solution to this problem.

With reference to the relationship between costs of bankruptcy and capital structure, the argument of the costs of bankruptcy providing the main incentive to using shares instead of debt is not entirely convincing. At least there must be other factors other than the cost of bankruptcy that act as a compensation for the advantages of the tax shield of debt and have an influence on the capital structure of a firm: at least some of these are probably more important than the costs of bankruptcy.

The problem that has not yet been solved and as a consequence receives different treatment in the different legislations is that of the link between management behaviour and bankruptcy procedure: there is no doubt that in most of the cases the incumbent management would be the best placed to save the firm (it enjoys superior information with respect to a potential administrator), as well as the most interested in so doing (in order to save their jobs). On the other hand there is also little doubt that if we allow the management run the re-organization process, it has a smaller incentive to avoid this and therefore too risky strategies could be the consequence.

It is important to notice that this is sub-optimal even if the management then succeeds in saving the firm: the restructuring process is in fact costly and and creates prejudice to the creditors who suffer from the re-negotiation of the firm’s liabilities.

Since it is not realistic to assume that the creditors be systematically worse off in a country where the management keeps control of the business during the bankruptcy procedure, we must accept that the creditors react to the lack of ex-post protection. The easiest way for them to do so is to raise the interest margins required to finance the firm’s activities (see Kraus and Litzenberger 1973).

The choice is therefore between systems in which the superior information by the incumbent management is exploited in trying to save the firm (American system and in some cases the Italian system, too), even if the price for this could be that firms become insolvent too often, and systems (England, France) in which the management loses control of the business when this becomes insolvent. The latter should entail a lower percentage of successes in the efforts of saving financially distressed firms, but also a lower number of firms who reach the insolvency state.

We’ve seen that the argument of distorted incentives to the management in the case it is allowed to run the firm during the bankruptcy procedure is challenged by Gilson (1989, 1990): this author argues that sanctions in this case come from the labour market instead of from the legislation. The fear of losing its job in the case of insolvency should substitute the fear for legal sanctions.
If Gilson is right, or, better, if the sanctions that come from the labour market are adequate, a system of the Chapter 11 kind could indeed be optimal: the right (instead of an excessive) degree of riskiness is chosen in the business strategies, because the management fears losing the job in case of insolvency and in the unlucky case this happens, the best effort is done by the management in order to save the firm (and possibly the job). Unfortunately, no studies of Gilson’s kind are available for the other countries considered, so that it is not possible to conclude whether Gilson’s argument is right or not.

In the following, we first sketch a model in order to understand why the ex-post objective of maximizing the value of an insolvent firm can be in conflict with the ex-ante incentives during the normal running of the business and we also show why Gilson’s argument can provide a solution to this problem.

We will then move to a last argument that challenges the optimality of a Chapter 11 kind of procedure: this is usually very lengthy and costly and there are no evident reasons to understand why this happens. Put it another way, it is not clear why the renegotiation of claims between the debtor and the creditors takes so long and is consequently so costly. We will therefore sketch a model to try to understand why Chapter 11 takes a great deal of time, as well as why other systems can find a solution to the insolvency situation in a faster and cheaper (but not necessarily more efficient) way. The focus of the model will therefore be on the costs that are implied by the bargaining process between the debtor and the creditors implied by the re-negotiation of the debt.
3 AN ECONOMIC MODELLING OF CHAPTER 11 INEFFECTIVITIES

3.1 Ex-Post Bargaining and Ex-Ante Incentives: an Example

We now provide an example of a context in which the possibility of re-contracting the debt in case of insolvency provides the management with distorted incentives during the normal running of the business. This results in a situation which may be worse than if no ex-post bargaining were possible.

We show this in a model where the management maximizes the expected value of the firm to the shareholders, say because their remuneration is linked to it. In each period the management decides which investment opportunities to undertake: if in any moment the firm becomes insolvent, but has investment opportunities with positive net present value, the existing debt is re-contracted and as a result of this, part of the existing debt is forgiven (otherwise it would not be possible for the firm to raise funds to finance the new investment by the firm and the creditors would be worse off.)

We assume the managers have two available investment strategies: one is low risk and the other is high risk. If the former is implemented, $I_L$ is invested and one period later this will give revenues $R_L$ with probability $p$ or revenues $R_L$ with probability $(1-p)$. We assume

$$ X_L = pR_L + (1-p)R_L - (1+r)I_L \geq 0 $$

so that the investment opportunity has a positive net present value and it is worth being taken. Nonetheless, we assume

$$ R_L < (1+r)I_L $$

so that the firm will be insolvent at the end of period one with probability $(1-p)$. We think of $p$ as close to one: if the low risk investment strategy is chosen, the probability of the firm going bankrupt is small.

The other investment opportunity is high risk: $I_H$ is invested and this will give revenues $R_H$ with probability $q$ or revenues $R_H$ with probability $(1-q)$. We assume the high risk investment strategy to have lower net present value than the low risk one (and we do not exclude the case in which the former has negative net present value):

$$ pR_L + (1-p)R_L - (1+r)I_L \geq qR_H + (1-q)R_H - (1+r)I_H $$

In order to simplify notation we will refer to this inequality as

$$ X_L \geq X_H $$

Nonetheless, $R_H$ is very high, so that we can think of the high risk strategy as providing a very high payoff with a relatively low probability.
We assume that the management has private information: the creditors do not know which are the investment opportunities available and therefore they cannot monitor in order to have the right strategy implemented. Moreover, even after the firm has become insolvent, the creditors cannot distinguish whether the management took the optimal investment opportunity in the previous period and they cannot punish based on this.

We consider a two period game: the management chooses a strategy at the beginning of the game and then at the beginning of the second period. If the firm is insolvent at the end of the first period, economic activity can continue only if the management proves that the firm has a good investment opportunity (that is one with a positive net present value). For this reason, in order to have the existing debt re-contracted, the management must reveal the creditors and then undertake an investment opportunity with positive net present value: the debt is restructured in that a fraction \( \alpha \) of the debt is forgiven in order to make it possible to exploit investment opportunities with positive net present value in the second period.

To make life simple, we assume that the investment opportunities are the same in both periods so that an insolvent firm will always be restructured: in fact, at least the low risk investment opportunity has a positive net present value. Moreover, the firm “dies” after period two. For this last reason, we have no distortion on management’s decisions in the second period: once the firm is “dead”, it is not possible to re-contract the existing debt with the creditors, because the latter have no incentive to do so (there are no further investment opportunity to undertake). As a result, managers realise that they will not be forgiven part of the debt if things go wrong and they will always choose the low risk investment opportunity in period two since this maximizes the net present value of the investment.

The decision by the management on which strategy to choose depends on the comparison between the expected value of the firm to the shareholders in the two cases. If the low risk strategy is chosen in the first period this is:

\[
X_L (1 + \frac{1}{1+r}) + \alpha (1-p) \left[ I_L (1+r) - R_L \right]
\]

that is the net present value of the investment for both of the periods plus, in the unlikely case of insolvency after the first period, the fraction of the debt which would be forgiven in order to make further investment possible.

The payoff from the high risk strategy would instead be:

\[
X_H + \alpha (1-q)(I_H(1+r) - R_H) + X_L \left( \frac{1}{1+r} \right)
\]

Clearly, the second is greater than the first if:

\[
X_H + \alpha (1-q)(I_H(1+r) - R_H) > X_L + \alpha (1-p)(I_L (1+r) - R_L)
\]
which may be true even if \( X_H < X_L \) by assumption, because the amount of debt which has to be forgiven by the creditors in the case of the high risk investment strategy is greater and might overcompensate the other term.

In this context, ex-post bargaining introduces the possibility of wrong incentives ex-ante because the management realises that it is optimal for the creditors to forgive part of the debt if the firm has accumulated a loss in the first period. In other words, managers realise that, whatever investment strategy they choose, they are going to bear only the fraction \((1-\alpha)\) of the loss this may produce, because recontracting will cancel a fraction \(\alpha\) of the accumulated debt in order to make it possible to undertake further investment. This introduces a distortion in management’s decision which may favour too risky projects.

Clearly, ex-post bargaining is a good thing in that it allows the firm’s activities to continue in case the low risk strategy is chosen but the unlucky (and unlikely) event of low revenues \( R_L \) comes about. The problem is that once the possibility of re-contracting the debt is introduced, the low risk investment strategy may not be optimal any more for a “selfish” management: the high risk investment strategy may be chosen in order to exploit the possibility of ex-post bargaining.

In fact, the result of our simple model is that, if the inequality (7) holds, a management which has the objective of maximizing the value of the firm to the shareholders will choose the high risk investment strategy even if this does not maximize the net present value of the investment. The firm will become insolvent after the first period with probability \( q > p \) (\( p \) would be the probability if the low risk investment strategy were chosen). Ex-post bargaining was introduced with the objective of keeping as a going concern insolvent firms with good investment opportunities: this is indeed the case, but a distortion arises in that more firms become now insolvent as a result of the possibility of recontracting the debt.

Taking this consideration into account, introducing ex-post bargaining is still a good thing to do in our model only if the distortion it introduces is less important than than the advantage it brings, that is the possibility to undertake the low risk investment strategy in the second period if the managers behaved “honestly” in the first period but they were unlucky. Formally,

\[
X_L + \frac{1}{1+r} p X_L \geq X_H + \frac{1}{1+r} X_L
\]

must hold in order for the introduction of ex-post bargaining to improve the starting situation. In this inequality, the left hand side is the expected value of the firm in case of no ex-post bargaining: the right strategy is chosen in the first period but the firm cannot make the positive net present value investment in the second period if the unlucky case of low revenues in the first period
happens. On the right hand side, instead, we have the expected value of the firm in case of ex-post bargaining and high risk strategy in the first period.

The results above depend strictly on the unobservability of management’s behaviour: if this were not the case, the management could be punished in case it was discovered to have chosen a wrong investment strategy and the low risk strategy would always be chosen in order to avoid this.

We think it is realistic to assume that the management has superior information than the creditors, in that there is no doubt that the former has a better knowledge of the different investment opportunities: as a consequence we do not believe it would be appropriate to assume that the creditors could prove that the management chose too risky a strategy in the previous period and punish it based on this. Notice that in many cases the risky strategy may not be too bad a strategy, in that it might have positive net present value, too: the creditors should not simply prove that a bad investment was undertaken, but that better investment opportunities were available. For this reason, we think it is realistic to assume that the creditors are not able ex-post to distinguish perfectly whether insolvency is due to bad luck (the “right” low risk strategy had been chosen, but the unlikely case of low revenues has happened) or to misbehaviour by the management (the “wrong” high risk strategy had been chosen and this has given the likely result of low revenues.)

The argument by Gilson (1989, 1990) may help us to solve the problem of wrong incentives in the normal running of the business due to the introduction of ex-post bargaining in case of insolvency: even if the creditors are not able to understand whether the managers took the right decision or not, and therefore they are not able to punish the management in case of insolvency, some kind of sanction to the management may come from the labour market.

Our model assumes that bankruptcy is costless for the managers, but this may not be the case. As Gilson shows, only few managers succeed in saving their job even if the firm is successfully restructured in Chapter 11. For this reason we modify our model assuming that a manager incurs a penalty $F$ with probability $t$ in case its firm goes bankrupt.

We interpret this “sanction from the labour market” widely: for example it may mean that the manager is fired after some periods. This may happen if the creditors eventually take control of the firm and decide to get rid of him after his superior information has been exploited. Alternatively, the manager’s reputation may suffer from having been involved in a bankruptcy process: this may make it more difficult to look for another job once the bankrupt firm ceases its activities. In our particular model no lay-off is possible, since the creditors always have the incentive not to fire the managers in order to undertake the investment opportunity in the second period; we will therefore interpret the sanction as the difficulty in finding another job after the firm for which the manager is working at the present time dies. In other words, $F$ in our model is the cost of a bad reputation: if
the firm goes bankrupt, there is a probability $t$ that the reputation of a manager will suffer from that. In this case, it will be hard for him to find another job and this is captured by $F$.

If the managers understand this risk of negative consequences on their future career from being involved in a bankruptcy, and there is no reason why they should not, they will consider this factor in their choice of strategy: assuming they explicitly maximize their expected remuneration, that is a fraction $\beta$ of the value of the firm to the shareholders less the expected cost of being fired, the choice between the two strategies will now depend on the comparison between the two payoffs:

\[
\beta \left( X_L + (1-p)(1-\alpha)\left[ R_L - I_L(1+r) \right] \right) - (1-p)TF
\]

in case of the low risk investment strategy, and

\[
\beta \left( X_H + (1-q)(1-\alpha)\left[ R_H - I_H(1+r) \right] \right) - (1-q)TF
\]

in case the high risk strategy is chosen. Clearly, since $(1-p) < (1-q)$, the probability of losing the job is higher if the risky strategy is chosen and this should compensate for the possibility of extracting some payoff to the creditors during the renegotiation of the debt contracts following insolvency.

As a consequence, the risk of sanctions from the labour market might be a factor that compensates for the possibility of the management running the firm during the reorganization process following insolvency. A procedure of the Chapter 11 kind may not be as “soft on management” as it is usually thought to be if there is a cost for the management from their company being bankrupt, and the evidence by Gilson shows that this is the case. At least, it shows that Chapter 11 is not soft on a “non-myopic management” which understands all future consequences from being involved in a bankruptcy process.

Unfortunately, we cannot give a precise evaluation of the relative importance of the two crucial factors in managers’ payoffs above, that is the increase in expected payoff caused by the introduction of ex-post bargaining and the reduction in it due to the expected cost of being fired. For this reason, we cannot claim to have shown that the fear of losing the job is big enough a factor to induce the management to implement the right strategy. What we can say, based on Gilson’s evidence cited in a previous paragraph, is that the expected personal cost to a manager from being involved in a bankruptcy process should be quite high, so that the argument is at least worth being given further attention.

Moreover, comparisons between the personal costs of bankruptcy for the management involved under different bankruptcy procedures are not available, so that we cannot say whether the results presented by Gilson extend to other countries or they reflect some peculiarity of the American system. If the consequences on the manager’s future career turned out to be harder under other systems, Chapter 11 would still be a softer procedure in that the negative consequences in case of
bankruptcy are incurred with probability \( t \leq 1 \) instead of with certainty, as it happens in systems where the management is immediately removed in case of insolvency. Obviously, the argument would lose much of its potential if this were the case.

In other words, it would be interesting to research the consequences of bankruptcy on future managers’ careers under more creditor oriented systems, like the English or the Italian ones. This would allow us to understand whether under these systems all managers suffer from being removed due to the start of a bankruptcy procedure, or only some of them do. In the latter circumstances the other managers may be “forgiven” the involvement in bankruptcy in that they are not considered so responsible. Only in this second case Gilson’s argument would maintain its validity because otherwise Chapter 11 would still be “softer” on management.

We now move to another problem associated with a Chapter 11 kind of procedure, that is the costs of the very lengthy process of negotiation which is usually needed to reach an agreement between the debtor and the creditors: even if Gilson’s argument were right, so that no distortion on ex-ante incentives is introduced by the possibility of re-contracting the debt once the firm is insolvent, the costs that are associated with the bargaining process remain an important drawback of this kind of procedure.

### 3.2 A Model of Bargaining with Optimal Delayed Agreement

#### 3.2.1 Introduction

We have seen that one of the main features of agreements reached under American Chapter 11 procedure is that they are usually reached after very long negotiations. Given the need of frequent reporting between the court, the debtor and the committee of creditors, this implies that the procedure is very costly and it often happens that a considerable part of the value of the firm has to be spent to pay the direct costs of the procedure. Moreover, deviations from strict priority are frequently part of the agreement and this increases what can be called the “ex-ante costs” of the procedure (that is the costs that derive from the lack of ex-post protection for creditors in case of bankruptcy).

These features of the agreements concluded under Chapter 11 are in contrast with the results by standard bargaining models: these usually reach the result of no delay in the conclusion of the agreement, so that no costs are incurred in the equilibrium (see for example the game of alternating offers by Rubinstein (1982)). This result is explained by the fact that the parties realize that bargaining is costly (at least in the preference for a rapid agreement implied by the presence of discounting): any agreement concluded later than round one of negotiation could not be optimal.
because it could be improved by an agreement reached at round one that gave to each party what they would get in the delayed agreement, plus a fair distribution of the additional resources available at round one (available must in this case be interpreted widely, reflecting for example discounting). The agreement being reached at round one of negotiation, that is immediately, does not mean that the way bargaining would evolve in later rounds of negotiation is not important. On the contrary, the effects of extended bargaining are in a sense reflected in the agreement reached with no delay.

In the following we try to sketch a model that explains why this may not happen in a Chapter 11 negotiation framework, that is why the debtor and the creditors do not anticipate the costs of bargaining, concluding immediately an agreement similar to the one that would be reached later but dividing ex-ante the fraction of assets that would be “burned” in the negotiation process.

### 3.2.2 The general framework

The general framework of the model is the following: a debtor and a group of creditors who act cohesively must reach an agreement on how to divide the assets of the firm. The firm as a going concern is worth \( V^* \): this is less than what the creditors are owed (\( D \)) but is more than what the creditors would get liquidating the firm (\( L \)). The fact that \( V^* < D \) implies that the firm is bankrupt, while \( V^* > L \) implies that the optimal decision is not to liquidate the firm.

We start the discussion considering the perfect information case, even if this is not realistic in our opinion.

#### 3.2.3 The Perfect Information Case

If both the debtor and the creditors knew with certainty \( V^* \), a fair distribution of the firm's assets could be found with the Nash bargaining solution of this problem (Nash 1950): according to this the debtor and the creditors get the payoff they would get if no agreement were reached (respectively 0 and \( L \)) plus a fair distribution of \((V^*-L)\), that is the surplus of resources with respect to the case of no agreement. The higher payoff in case of no agreement gives the creditors a stronger position than the debtor in the implicit bargaining process.

What remains to be specified is the exact meaning of the word fair: by this is meant that the additional utility that the parties get with respect to the case of no agreement is divided equally. Assuming both parties are risk-neutral, so that their utility functions are simply \( u(X)=X \), and indicating \( X_D \) and \( X_C \) as respectively what the debtor and the creditors get in the agreement, the Nash bargaining solution is:

\[
\begin{align*}
X_D \text{ } X_C \text{ such that } & \quad \text{Max } X_D \ (X_C - L) \\
\text{s.t. } & \quad X_D + X_C \leq V^*
\end{align*}
\]
\[X_C \geq L\]
\[X_D \geq 0\]

Of course, one could argue that this is not a fair agreement, because the creditors get less than what they are owed and nonetheless the debtor gets a positive payoff (hence the deviation from strict priority): there is no doubt that, from this point of view, the agreement is not fair. It is fair on the other hand if we consider that the debtor and the creditors divide fairly what they would get if no agreement were reached. This agreement is therefore fair if we consider it ex-post, that is after the event bankruptcy has occurred, but it is not fair ex-ante, that is from the point of view of a debtor that chooses his financing policies taking into consideration the costs of the different strategies. As noticed earlier, increasing the debtor's possibilities to save the business when it goes bankrupt implies accepting the risk of wrong incentives in the normal of the business.

Moreover, even if no doubt were present about the fairness of this kind of agreement, we must consider that \(V^*\) is a discounted value of future profits, so that the case in which \(V^*\) can only be realized with the cooperation of the debtor cannot be excluded, due for example to the superior information that the incumbent management enjoys with respect to a hypothetical new management: the deviation from strict priority is in this framework the price the creditors have to pay to ensure the debtor's cooperation. Without this the firm would only be worth \(L\).

The result so far is that an agreement between the debtor and the creditors should be reached immediately and this should entail a deviation from strict priority.

3.2.4 The Imperfect Information Case

There is a very unrealistic assumption in what has been sketched above and removing this is a first step towards understanding why the agreement is reached with delay. This assumption is that of symmetric information: we believe a negotiation process under Chapter 11 is better modelled assuming that the debtor has superior information with respect to the creditors.

We therefore now model a Chapter 11 bargaining process as a bargaining process between an informed party (the debtor) and an uninformed party (the creditors).

Moreover, we assume that information is valuable, that is more information implies an advantaged bargaining position: this implies that the creditors have an incentive to acquire information. We model the process according to which the creditors get more information about the value of the firm as a search process. The particular type of process of search we adopt has been inspired by Stigler (1961), who applied this to a problem of optimal search for low prices by an imperfectly informed consumer.
The starting situation is the following: the debtor knows \( V^* \), while the creditors only know that the true value of the firm is between a lower bound \( V \) and an upper bound \( \overline{V} \) with a density probability function \( f(v^*) \). The creditors can hire experts and ask them for an evaluation of the value of the firm: we assume that these evaluations provide the creditors with more accurate estimates for the lower bound of the firm’s value. We also assume that in the bargaining process after the search, the creditors get the lower bound they are able to prove. This means that when the creditors are given by their experts \( n \) evaluations of the firm’s value, they then get the highest of these values. Since more rounds of search (i.e. more evaluations) imply a higher probability of proving a high value of the firm, the creditors have an incentive to do more rounds of search. These assumptions are made in order to simplify the argument: we will later see that allowing for the possibility of evaluations of its upper bound does not change the main result.

On the other hand, searching is costly, because each round of search both costs a fixed amount \( k \) (this cost is borne by the creditors) and it implies delaying the agreement for one period (with the preference for a fast agreement represented by a discount factor \( q \) which also captures the costs of the bargaining process due to the needs of reporting between the court, the debtor and the creditors).

We model an evaluation given to the creditors by an expert as a drawing from the interval \((V, V^*)\) with probability density function \( g(v/V^*) \). Successive evaluations are assumed as independent, so that nothing guarantees the debtor that asking for one more evaluation will provide a higher lower bound for the value of the firm.

Summarizing the framework: the debtor knows \( V^* \), the true value of the firm, while the creditors do not. Their knowledge about \( V^* \) is represented by a density probability function \( f(v^*) \) with lower bound \( V \) and upper bound \( \overline{V} \). The creditors can get more information asking for more accurate evaluations of the value of the firm: each evaluation costs \( k \), implies a delay in the agreement of one period and provides a new lower bound for the value of the firm: if the evaluation \( \hat{v} \) is given, the creditors know for sure that the value of the firm is at least \( \hat{v} \). Asking for an evaluation is like extracting a value from the density probability function \( g(v/V^*) \), which has lower bound \( V \) and upper bound \( V^* \) (unknown to the creditors).

We now derive the (ex-ante) optimal number of rounds of search for the creditors.

\[
E(v/V^*, n) = \int_{V}^{V^*} nG(v/V^*)g(v/V^*)vdv
\]

where \( nG(v/V^*) \) is the probability that \((n-1)\) out of \( n \) rounds of search give a value lower than \( v \) (since we are only interested in the maximum value from \( n \) extractions).

Since the creditors do not know \( V^* \), we must integrate this expected value with respect to \( V^* \):
When $n$ rounds of search are done, with $n$ taking obviously only integer values, the expected payoff to the creditors is:

$$X_c = q^n E(v/n) - kn$$  \hspace{1cm} (13)$$

The creditors will choose $n$ in order to maximize this expression. We indicate with $X_c^*$ the expected payoff to the creditors from the ex-ante optimal strategy implying $n^*$ rounds of search$^4$.

$$X_c^* = q^n E(v/n^*) - kn^*$$  \hspace{1cm} (14)$$

The result reached until now is that, based on the information they have and making an optimal use of their search possibilities, the expected payoff to the creditors is $X_c^*$. This payoff is obtained after $n^*$ rounds of search are carried out, so that a cost of search equal to $kn^*$ is borne and the “pie” divided with the debtor is only a fraction $q^{n^*}$ of the “pie” at the beginning of the negotiation process. For this reason, $n^*$ rounds of search will not be necessarily be implemented: the incentive for both parties to avoid the costs implied by the search process might bring them to reach a more efficient result.

In fact, if we consider the solution that would be reached after the $n^*$ rounds of search, we see that both parties would be better off if they could replicate the same kind of agreement before the search process, splitting fairly the surplus

$$S = V^* - q^{n^*} V^*$$  \hspace{1cm} (15)$$

We assume this surplus is split fairly by a Nash bargaining solution kind of agreement of the form:

$$\text{Max } (X_c - X_c^*)(X_d)$$  \hspace{1cm} (16)$$  
\text{s.t. } X_c \geq X_c^* \hspace{1cm} X_d \geq 0 \hspace{1cm} X_c + X_d \leq V^*$$

We indicate with $X_c^0$ and $X_d^0$ respectively what the creditors and the debtor would get according to this solution.

As a consequence of all this, the creditors will be ready to close negotiations without doing any round of search if they are allocated the expected value from the ex-ante optimal number of rounds of search plus a fair fraction of the resources that are saved by avoiding the costs of search and

$^4$ The optimal rounds of search effectively carried out will not necessarily be $n^*$, because the information collected in the previous rounds of search may make optimal a higher or lower number of rounds of search. In other words, $n^*$ is the number of rounds of search that optimizes the ex-ante expected payoff, while the effective optimal number of rounds of search would be determined by a sequential rule, that is checking after each round of search whether one more search, given the information until now available, would increase or decrease the expected payoff.
negotiation (which add up to $X^0_c$). Their alternative, that is carrying out the optimal search process, would in fact yield them a lower expected payoff.

We must now consider whether it is optimal for the debtor to concede $X^0_c$: in order to understand this, we must compare what the debtor would get at round 0 (that is before any round of search is carried out) with the expected value of what they would get after one round of search by the creditors. We have seen that the debtor could close negotiations at round 0 getting

\[ X^0_c = V^* - X^0_c \]

We now compute the expected value (for the debtor) of the creditors’ expected payoff after one round of search: for this reason, we define $h(v)=g(v/V^*) f(V^*)$ as the probability density function representing creditor’s knowledge about the probability of getting $v$ as result of one round of search at the beginning of the game (and therefore getting $v$ as payoff). Similarly, we indicate with $h(v/v_1)$ the probability density function representing creditors’ knowledge about getting $v$ as result of the second round of search, after the first round of search has given $v_1$. The idea is that creditors use the results of their past searches to improve their knowledge of the value of the firm and their possibilities to learn about that. This process implies that if the creditors could do an infinite amount of searches, they would at the end get to know $g(v/V^*)$ and therefore the true value of the firm; in our model they do not because acquiring information is costly. Nonetheless after each round of search, the result they get allows them to improve their knowledge and better estimate the results of future rounds of search.

The expected value of the amount that will have to be paid to the creditors in order to close negotiations after one round of search can be computed repeating the argument that allowed us to derive $X^0_c$. The creditors would derive a new optimal number of searches yet to do:

\[ \text{Max } E(X_c / v_1, n) = \text{Max } \int nH(v / v_1)h(v / v_1)vdv - kn = X_c(v_1) \]

If $X_c(v_1)$ is the amount to be paid to the creditors to settle negotiations at round 1, the payoff to the debtor can be found with the following Nash Bargaining solution:

\[ \text{Max } (X_c - X_c(v_1))(X_d) \]

\[ \text{s.t. } X_c \geq X_c(v_1) \]

\[ X_d \geq 0 \]

\[ X_c + X_d \leq V^* \]

We indicate with $X_c(v_1)$ the expected payoff to the debtor if the result of the first search by the creditors is $v_1$. Since the debtor knows the true probability of the different values of $v_1$ being
extracted he can compute the expected value of his payoff if he lets the debtor do one round of search:

$$E(X^1_d) = \int_{V^*} X_d(v_i) g(v_i / V^*) dv_i$$

And the debtor will agree to close negotiations before any round of search is carried out if

$$X^{0}_d \geq E(X^1_d)$$

On the other hand, if the inequality above does not hold, it will be profitable for the debtor to let the creditors do one round of search, bargaining will then occur based on the result of that round of search and the debtor will then decide whether to close negotiation at that point or to let the creditors do one more round of search following the same argument described above.

We can explain what goes on as follows: the creditors’ knowledge at the beginning of the game gives them $h(v) = g(v/v^*) f(v^*)$, a probability density function between a lower bound $V$ and an upper bound $\overline{V}$ for the results of their search process and therefore for the possibility of showing that the firm is high value. On the other hand the debtor knows the true probability of the creditors picking up a certain value $v$ in their search process, because he knows $V^*$ and therefore $f(v/V^*)$.

Based on the information available at the beginning of the game, the creditors formulate an expectation of what they would get if they carried out an optimal search process: they are ready not to carry it out if they are given the amount $X^{0}_d$. This happens because the creditors realize that their optimal strategy is costly and carrying it out (instead of simply threatening it) would reduce their payoff.

The debtor exploits his superior information by predicting and averaging what would happen if the creditors did the first round of search: if the value of the firm is in truth low, so that the creditors tend to overestimate it due to their lack of information, the payoff they ask in order to conclude negotiation without doing any round of search will be too high to be profitable for the debtor. He will let them do the first round of search, since this will presumably give them bad information on the value of the firm. This process will therefore reduce the amount requested by the creditors in order to conclude negotiations one round later by “worsening” the probability density function representing their knowledge of the possible results of the search process (by “worsening” we mean that low values of the firm will become more likely in creditors’ knowledge and high values will become less likely): the debtor will choose to let the creditors do the search even if this is costly and implies a delayed agreement. We can see this as a cost of convincing the creditors that the value of the firm is indeed low.

If on the other hand the value of the firm is high, a round of search by the creditors is likely to provide them with positive information on the value of the firm and therefore to increase the
amount requested to close negotiations one period later: the debtor will then agree to close negotiations immediately (indeed for this to be true it is sufficient that the creditors expected payoff one round of search later is not low enough to compensate for the costs of delaying the agreement).

The result of the model is that deviations from strict priority occur: this does not only depend on our assumption that the creditors only get the lower bound they are able to prove or an expected value of this lower bound derived from the potential search process (plus a fair distribution of the savings from avoiding search and negotiation costs). Indeed, deviations from strict priority continue to be part of the equilibrium as long as some kind of inferior information by the creditors is present in the framework. In fact, no agreement will be concluded by the debtor unless this provides him with a non-negative payoff and it may very difficult and/or too costly for the creditors to discover exactly the real value of the firm, so that at a certain point it becomes profitable for them to save on the search costs and to leave part of the value of the firm to the debtor.

The simplifying hypothesis that the creditors in their search process never overestimate the value of the firm, and then get the lower bound of value they are able to prove, could be removed by assuming that the creditors required some expected value of $V$ based on their knowledge which incorporates the results of past rounds of search (under- or overestimating the value of the firm). A positive number of rounds of search would still be needed to “worsen” the creditors’ expected value of the firm in the case $V^*$ is indeed low: the main result of delayed agreement would still apply.

We discussed the model with our simplifying hypothesis because we think it is realistic to assume that the debtor cannot refuse to pay a value which has been proved to be correct and it is helpful to assume that the search process give results that are known to be correct (in that they never overestimate the value of the firm).

Summarizing the results of the model, ex-post bargaining between an informed debtor and uninformed creditors may determine an optimal delayed agreement when the debtor needs to prove to the creditors that the search process they are “threatening” cannot give the results they are expecting from it.

3.2.5 Two objections to the model

We now introduce two objections to the model and discuss some possible solutions to them.

The first one is the following: in the above model, creditors should realize that they should never close negotiations when the debtor is ready to do so. The latter in fact takes his decision based on his private information, which tells him whether more rounds of search would improve or worsen
the conditions at which to conclude the agreement. This may complicate the solution to this bargaining problem.

We suggest two kind of solutions for this problem: on the one hand we can simply assume, as in a way we did in the model, that the bargaining process implies some kind of proposal by the creditors to the debtor, who then chooses whether to accept or not. The problem with this is that it is exactly the opposite of what happens under American Chapter 11, where the debtor makes a proposal and the creditors decide whether to accept it or not. Nonetheless, we can save the argument if we are ready to accept that the debtor learns during the meetings with the committees of creditors the conditions at which they would be ready to close negotiations at the different stages of the procedure and on this basis he decides when to formulate an offer which is compatible with creditors’ requests (that is at the moment such that further rounds of search would presumably decrease his expected payoff).

We keep the second kind of solution for later, when we will discuss it together with the solution to a second objection we now put forward.

In the model above, delayed agreements are only possible when the value of the firm is indeed low and no delay should ever be optimal when the value of the firm is high.

What we are going to claim now is that a delayed agreement may be optimal even in those cases in which the firm is indeed high value, if we introduce some imperfect information by the debtor regarding the search process and in particular the search costs by the creditors. In fact, notice that the equilibrium reached above strictly relies on the possibility for the debtor to work out the creditors’ optimal strategies, so that at each point he knows at which conditions the creditors are ready to conclude negotiations and also at which conditions they are likely to be willing to conclude in the future.

We now remove the debtor’s perfect knowledge about the creditors’ search possibilities: we model his imperfect information assuming that he knows there are two groups of creditors in the economy, one with low cost of search and one with high cost of search. Before negotiations start the debtor does not know which type of creditors he is going to face and during the negotiation process he acquires knowledge about the type of creditors he is facing: for simplicity we assume that the debtor knows which type of creditors he faces after round one (that is, after the creditors have done one round of search: we can justify this assuming that the debtor needs to let the creditors do one round of search to understand how much they learned and, from this, what is their cost of learning).

Nonetheless, before the search process starts, the debtor only knows that the creditors could have low costs of search with probability \( p \) or high costs of search with probability \( 1-p \).
Clearly, these simplifying assumptions are not crucial in that we could instead specify a continuum of costs of search and a density probability function between a lower and an upper bound. We could also specify a more complex process of learning by the debtor about creditors’ types, similarly to what we did above. However, we chose these simpler assumptions because they allow us to derive results which are qualitatively analogous to the ones that would be reached with more realistic assumptions.

As a consequence of the setup just introduced, and of a learning process by the creditors similar to the one considered above, there is a probability \( p \) that the creditors are not ready to conclude negotiations without doing any round of search unless they are given \( X_{c,L}^0 \), while with probability \((1-p)\) the amount \( X_{c,H}^0 \) is sufficient to conclude negotiations (with \( X_{c,L}^0 > X_{c,H}^0 \)). Moreover, in order to concentrate on the problem of imperfect information about creditors’ types, we assume that it would be profitable to conclude negotiations immediately with both kind of creditors (formally \( X_{d,L}^0 > X_{d,L}^1 \) and \( X_{d,H}^0 > X_{d,H}^1 \), where these four values are worked out by the debtor considering the optimal search strategies by the two types of creditors). This case can be seen as representing a situation in which the firm is high value and it would be optimal for the debtor not to let the creditors do any round of search.

We now work out the optimal strategy for the debtor in this case. Technically, what we need to find is a separating perfect Bayesian equilibrium.

If the debtor were ready to concede \( X_{c,L}^0 \) or more, both kinds of creditors would be ready to close negotiations immediately, but this is unlikely to be the optimal strategy for the debtor, since a gift would be made to the creditors with high cost of search. On the other hand, creditors with low cost of search will not close negotiations for less, so that no offer between \( X_{c,L}^0 \) and \( X_{c,H}^0 \) can be optimal (a gift would be made again to the high cost creditors, who are ready to accept \( X_{c,H}^0 \) and no deal with the low cost ones would be closed). The optimal offer, subject to a condition that we discuss in the following, is \( X_{c,H}^0 \), so that negotiation is closed at first round only with the high cost creditors. Later there will be a second round of negotiation with the low cost creditors and the deal will closed with them after the first round of search.

The condition under which it is optimal for the debtor to separate the two types of creditors is the following:

\[
(1-p) (X_{d,H}^0 - X_{d,L}^0) > p (X_{d,L}^0 - E(X_{d,L}^1))
\]

where in obvious notation \( X_{d,H}^0 = V^*-X_{c,H}^0 \) and \( X_{d,L}^1 = qV^*-X_{c,H}^1 \).
The rationale behind this inequality is the following: we have on the left hand side the “expected gift” to the high cost of search creditors and on the right hand side the expected cost from delaying the agreement with the low cost of search creditors. If the former is greater than the latter, the debtor will choose to delay the agreement with the low cost of search creditors. This means that the debtor is better off in the separating equilibrium just outlined than in a pooled equilibrium where agreement is reached at round one with both kinds of creditors offering \( X_{c}^{0} \); the result is that a number of rounds of search higher than optimal must be allowed by the debtor in order to separate the two types of creditors.

The simplicity of the inequality above is due to our assumption of perfect knowledge about creditors types after the first round of negotiation. If instead we formulated some more complex process according to which the debtor learns about the creditors types, the qualitative features of the result would not change: we would still have a problem of choice between a rapid agreement in which high cost of search creditors could mimic the low cost ones (and therefore get more than if they were known to be high cost) and a delayed agreement in which more information is available about creditors’ types: this allows the debtor to separate them but the costs of a delayed agreement are incurred.

This argument also provides a second solution to the objection we raised earlier: this concerned the fact that the optimality of our first delayed agreement was depending on the creditors making some kind of proposal and the debtor choosing whether to accept it or not. Now the delayed agreement is reached after a bargaining process in which the debtor explicitly makes proposals to the creditors.

The optimality of a delayed agreement in this second setting comes from the fact that the debtor gets some advantage from letting the creditors do some rounds of search in that this provides some information about the creditors types. As long as this more than compensates the costs of delaying the agreement and the possible increase in creditors’ payoff deriving from the more accurate knowledge of the firm, it is optimal for the debtor to delay the agreement.

The result can be seen as a Spence type equilibrium in which the low cost of search creditors must “overinvest” in search in order to differentiate from the high cost ones.

All negotiations close at round two in the model just sketched above, so that no agreement reached afterwards can be optimal. However, this is clearly a result of the very restrictive assumptions about the creditors characteristics (we assumed only two types of groups of creditors) and the process of learning by the debtor on these characteristics (we assumed perfect knowledge by the debtor starting from round two of negotiation). Less extreme assumptions on these crucial aspects of the model could give us the result of even more extended negotiations, as those occurring
under Chapter 11 of the U.S. bankruptcy code (we noticed above that the average time spent by a firm under Chapter 11 is three-four years).

3.3 Towards a Faster Agreement

The main result of the previous sections is that a bankruptcy procedure of the Chapter 11 kind, based on simple bargaining between the involved parties, may be inefficient because in presence of asymmetric information delayed agreements may be the consequence of optimal maximizing behaviour by the parties. For this reason we believe it is important that the bankruptcy procedure gives some structure to the bargaining process: the objective is that of avoiding such costly delays in the final agreement.

One way to avoid that negotiation goes on for too long can be observed in the Italian legislation: here, liquidation of the insolvent firm can be avoided if the parties reach an agreement (called "concordato"), in which all secured creditors are re-paid in full and unsecured creditors are re-paid for at least 40% of their claims. No delays are possible in that the proposal by the debtor is a "take it or leave it" proposal: if creditors do not accept the proposal, they go on liquidating the firm's assets.

The problem with this kind of provision is that it is more efficient than a less structured bargaining process of the Chapter 11 kind under some points of view, but it is even more inefficient under other points of view. As said, it avoids that the firm is kept in the bankruptcy procedure for several periods, producing a definitive decision on the future of the firm at an earlier stage and therefore reducing the costs of the procedure, but on the other hand it may force the creditors to take a decision before all the relevant information is collected. More generally, the right to make a “take it or leave it” offer gives a further advantage to the debtor, who already enjoys superior information: in such a situation, a rational debtor will never pay the creditors more than the liquidation value of the firm. To understand this, notice that rational creditors will never refuse an agreement in which they get more than the liquidation value: in the limit, the creditors will be indifferent between liquidating and not liquidating the firm, and the debtor will appropriate all the surplus, that is the difference between the value of the firm as a going concern and its liquidation value.

This "concordato" procedure can be seen as an application of the general principle which states that in cases of asymmetric information the efficient result can be reached giving the power to take the decision to the informed party (Tirole 1988), but in this particular case a very large inefficiency

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5this is slightly incorrect in that in some cases another agreement can be reached later on in the procedure. See our earlier discussion on the Italian bankruptcy procedures for the details.
arises in that the proceeds from the efficient decision are split very unfairly between the parties, with prejudice for the creditors who should instead be protected by the procedure.

Giving the debtor the right to make a take it or leave it offer is therefore a way to shorten the time required in order to reach an efficient agreement⁷, but this further reduces the degree of creditors' protection. Imposing some minimal requirements for the agreement to be acceptable, as the Italian legislation does, helps to reduce the importance of this problem but it also prevents the reaching of the optimal solution when the value of the firm is not high enough to meet all the requirements needed to make the agreement acceptable (in the Italian case, no firm can avoid liquidation unless the value of the firm is high enough to re-pay all secured creditors in full).

Last but not least, there is a danger in imposing such minimal requirements: the structure of a firm's debt may be ex-ante influenced by the presence of such requirements. Giving a very high protection to secured debt may produce the result of an excessively high fraction of the debt being in secured form, following the creditors' effort of protecting themselves in case of bankruptcy. The risk is that in such a case, the possibilities of restructuring the firm's liabilities in case of insolvency would be reduced to a great extent and so it would be much harder to save it in case of financial distress.

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⁶To be precise, this liquidation value is a “perceived liquidation value”, that is the value that the imperfectly informed creditors think they would get in case of liquidation.

⁷We call the agreement “efficient” because it respects the principle of ex-post value maximization.
4 RECENT DEVELOPMENTS IN THE LITERATURE

4.1 Introduction

There have been some recent proposals in the literature, directed to the aim of improving the existing bankruptcy procedures and eventually outline an optimal bankruptcy procedure to be adopted by the countries in Eastern Europe in the context of their reform process. In the following we illustrate in some detail the proposal by Aghion, Hart and Moore in its two versions (1992, 1994) and we then discuss its merits and some problems that its application may imply. We will end the discussion trying to understand whether this proposal could indeed be "the optimal bankruptcy procedure" we are looking for and we will underline some general points on which we believe the optimal bankruptcy procedure should be based.

4.2 Aghion, Hart and Moore First Proposal

The first proposal by Aghion, Hart and Moore is based on the observation that bankruptcy procedures currently in place are vitiated by a big distortion in that the decision on the future of the firm is often taken by a wrong group of voters. In fact, allowing all creditors to vote, as current procedures do, implies that the interests of the creditors are not homogeneous: creditors who have little hope to be repaid favour too risky projects, which give a very high payoff with a very low probability, because these projects represent their only chance to be at least partially re-paid. Very senior creditors, on the other hand, favour “too safe” projects, because they do not enjoy the upward potential of the firm. Sub-optimal decisions are the consequence of this problem each time one class of creditors or the other has enough power to bias the decision towards its particular interest. In other words, under current bankruptcy procedures the interests of the voters not being homogeneous imply that there is no matching between the distribution of the voting rights and that of the stream of benefits from the decision to be taken and sub-optimal decisions will be the consequence.

A crucial problem with a bankruptcy procedure is therefore that of allocating the voting rights in such a way that allows to reach the optimal solution.

The procedure proposed by AHM goes on as follows: when a firm goes bankrupt, all of its debts are cancelled and a judge is appointed to supervise the bankruptcy procedure. The judge has two immediate tasks: soliciting bids for the firm and allocating rights to equity in the new firm (which is all equity). A strict time horizon is allowed for the completion of these two tasks: three months.

8from now on, AHM.
Both cash and non-cash bids are allowed: this means that anyone can participate in the auction for the firm either proposing a price at which to buy the shares from the current shareholders or proposing them a re-organization plan to be implemented. This allows the incumbent management to propose a re-organization plan (as they would do under Chapter 11). The difference with respect to Chapter 11 is that the proposal by the incumbent management now competes with the other bids for the firm and will be implemented only after an explicit vote by the creditors-shareholders favours it over all other proposals.

In order to allocate equity rights in the new firm, creditors are first divided in classes according to the priority of their claims. After this has been done, Bebchuk's scheme (1988) is used to achieve respect of absolute priority despite the problem of uncertain value of the firm. This scheme works as follows: suppose we have $n$ classes of creditors: the most senior class is owed $D_1$, the most junior class is owed $D_n$ and similarly for the other classes. The most senior class of creditors is initially allocated 100% of the equity and junior classes of creditors are given options to buy shares at a price reflecting the claim of the more senior classes of creditors. This means that the second class of creditors in order of priority would be allowed to buy shares at a price of $D_1$ per 100%, the third class of creditors would be allowed to buy shares at a price of $(D_1 + D_2)$ per 100% and, more generally the $i$th class would be allowed to buy shares at a price of

$$\sum_{k=1}^{i-1} D_k \text{ per 100\%}$$

Moreover, the judge has the power to redeem the shares from the creditors at a price reflecting their claims: he collects the proceeds from the trade in the options and uses these to buy back the shares from the creditors, in decreasing order of priority.

An example can help to clarify this mechanism: suppose there are three classes of creditors: the most senior class of creditors is owed 100, the second is owed 150 and the third is owed 200. Suppose also for simplicity that each class of creditors is composed by 100 individuals, each with the same claim: in this case, each creditor in the most senior class would be given one share in the new firm, each creditor in the second class would be given an option to buy one share at the price of 1 (so that if all creditors in this class decided to exercise the option, 100 would be collected to re-buy the shares from the most senior creditors and these would be fully re-paid). Similarly, the creditors in the third class would be given an option to buy shares at the price of 2.5, so that if all of them decided to exercise the options, enough would be collected to repay in full the creditors in the two more senior classes. What happens under Bebchuk's scheme is that creditors are given the right to buy out more senior creditors if they think that the value of the firm exceeds the total amount of credits senior to their own credits. It is important to stress that this trade in shares and options
happens at a decentralised level: it does not require agreements within classes so that one entire class of creditors buys out another entire class of senior creditors, but each individual creditor can decide whether or not to exercise its option.

At the end of this trade in the shares of the firm, we will have a firm which is all equity and the creditors who will end owning the shares will have homogeneous interests: a shareholders' meeting will be held in order to take a decision by simple majority vote on which of the bids to accept.

We now summarize the timing of the procedure: as soon as bankruptcy is declared, all debt are cancelled and a judge is appointed to supervise the procedure. The judge fixes a deadline for the bids for the firm (three months), which can be both cash or non-cash bids. Also within three months the rights to shares in the new firm and the relative options are allocated among the creditors of the insolvent firm. After three months the bids for the firm are announced and a further month is allowed for the trade in the options. At the end of this, an homogeneous class of shareholders is identified which votes on the bid to be accepted and the firm exits bankruptcy.

4.3 Aghion, Hart and Moore Revised Proposal

The same authors have subsequently revised their proposal in Aghion, Hart and Moore (1994). This second version integrates the procedure outlined above in the context of current UK procedures, that is the receivership and administration procedures. The idea is that both AHM and current procedures should be available: either the current procedures would be the standard ones and AHM procedure could be invoked if one of the parties felt that its interests were being prejudiced or the latter could be the standard one, with the current standard procedures available to the parties at Court's discretion.

The differences between the first proposal and the revised one are the following: first of all, under the revised proposal, secured debt up to an appraised value of the fixed charge assets is left in place, so that the debt/equity swap is minimum: the argument is that as long as the fixed assets provide adequate security, there is no danger of the company remaining insolvent if such debt is left in place and therefore there is no need to convert this debt into equity.

A second difference is that in this second version the judge (i.e. the insolvency practitioner who currently acts as Receiver or Administrator) has full discretion to run the company in such a way to maximize the company's equity throughout the procedure, while in the first version the case of the incumbent management running the firm during the procedure was not excluded.

The third difference concerns the timing for the bids for the future of the company: in the revised proposal \( \text{the IP draws up a plan for the future of the company. The plan is put to a compulsory} \)
shareholders' meeting on a prespecified date, not sooner than the date on which options expire.....Anyone else can put forward a plan at this meeting. The decision as to which plan to approve is taken by a vote among the new shareholders.

There is a difference in that there is no explicit period between when the bids are made public and when the decision is taken at the creditors' meeting, and it is not explicitly stated that the trade in options is made after the bids are made public. Indeed, since the bids can be simply put forward at the creditors' meeting, which has to be after the period for the trade in options has expired, it may happen that the bids are not known by the creditors when they trade the options.

We will later explain why we think this is a very important change and why instead all bids should be made public before the trade in options starts. We now move to some general considerations on the merits and the eventual problems with this proposal.

4.4 Aghion, Hart and Moore Proposals: A Comment

The proposal by AHM has several merits, first of all that of dealing with the problem of the contrast between ex-ante incentives for the management and ex-post maximization of the value of the firm. Ex-post value maximization is achieved because the decision on the future of the firm is taken by a group of shareholders who are homogeneously interested in maximizing the value of the firm. The crucial point is the substitution of the limited claims of the creditors with the unlimited right of the shareholders to the stream of benefits from the firm: making the creditors shareholders in a 100% equity firm implies that they will receive the full stream of benefits from their decisions and guarantees that these will indeed be optimal.

Moreover, also the problem of distortion in the management's incentives during the normal running of the business should be reduced, since, as already observed, the debtor's proposal now competes with all other bids, so that the debtor is not favoured inside the bankruptcy procedure. Once insolvency has occurred, managers can save their jobs only if they convince the creditors that the proposed re-organization plan is the best possibility available for the future of the firm and this may not be an easy thing to do since the same managers have just brought the firm into insolvency. This is a big difference with respect to Chapter 11, where the exclusive right for the incumbent management to propose a re-organization plan creates a playing field which favours the management in case of bankruptcy. For this reason, AHM proposed procedure should not create big distortions in management incentives in the normal running of the business.

Another big improvement with respect to Chapter 11 is represented by the respect of priority rights among the creditors: here Bebchuk's mechanism guarantees that the proceeds from the trade
in the options are used to re-pay creditors' claims in order of priority and for this reason no creditor can be re-paid unless all creditors senior to him are repaid in full. On the other hand, this is not true under Chapter 11 agreements: here the only guarantee for the creditors is that they will be paid at least as much as they would get in case of liquidation\(^9\) but the sharing of the surplus with respect to the liquidation value does not require the respect of absolute priority.

For these reasons AHM proposal satisfies the three main objectives for a bankruptcy procedure we identified at the beginning of our analysis: it maximizes the value of the firm ex-post because an homogeneous (in term of interests) group of shareholders chooses the best bid for the future of the company; it guarantees the respect of absolute priority because the proceeds from Bebchuk's mechanism are used to re-pay the creditors in order of the priority of their claims. Last, it should not create big problems in terms of distortion in the management's incentives because this is not favoured once the event bankruptcy has occurred.

Some problems with AHM proposal could arise in its implementation in the real world: even if the results of this procedure are theoretically very neat, it has to be checked whether they would be robust to the application to real cases of bankruptcy. A first objection could be that Bebchuk's mechanism is theoretically very ingenious, but it may be too complex to be used in real cases. This argument is considered by AHM and indeed their paper contains some simpler alternatives for the allocation of voting rights. However, all these alternative mechanisms start from the separation of creditors in vertical classes, but this could turn out not to be an easy task in some cases. The structure of a firm's debt can sometimes be very complex and this might make it very hard, other than time consuming, to divide the creditors in the vertical classes considered by AHM proposal. We believe this may be harder than under Chapter 11 because the latter requires agreement by every single class for a plan to be accepted. Under AHM proposal instead, the final decision is only taken by those creditors who own the shares at the end of the trade process and the initial separation of creditors in vertical classes is fundamental in determining which creditors will end up owning the shares: this may give rise to lengthier litigation among creditors than under Chapter 11. It is true that AHM proposed procedure could go on if litigation is limited to a minor fraction of the claims, as the authors claim, but litigation over a major fraction of the claims cannot be excluded in case of firms with a complex capital structure and this is a factor that may delay the rest of the procedure and bring to a period required for the allocation of the voting rights much longer than the three months initially planned.

\(^{9}\)This is true because under Chapter 11 a plan must be agreed by every class of creditors, but the judge has the power to impose a "cram-down" procedure: this prevents a class of creditors from blocking a plan if this gives it at least as much as it would get in case of liquidation.
Another criticism is related to the fact that what AHM proposal does is essentially a double auction for the firm: a first auction is made to allocate the voting rights in the new firm, and a second auction is then made for the future of the firm, in which both cash and non-cash bids are allowed. It may not seem immediate that Bebchuk's mechanism can be compared to an auction, but we believe this is indeed the case: in fact the main purpose of the mechanism is to allocate the shares to those creditors who value them most in order to re-pay the highest possible fraction of debt. The similarity is even more evident if we consider the possibility of the judge making a market in the options, as AHM suggest in order to ease eventual liquidity problems for the creditors. If this is the case, the shares still end up being owned by those who value them most, but they are not necessarily creditors any more: this makes Bebchuk's mechanism very similar to an auction.

For this reason, most of criticisms to procedures based on auctions apply to this case: allowing for the possibility of non-cash bids eases the financing problems for potential bidders with liquidity problems but all problems related to "thin" auctions still apply. In all those cases in which preparing a bid is very costly (say for the need of collecting a lot of information), the case in which few bidders actually take part in the auction, reducing the efficiency of the solution, cannot be excluded. Nonetheless, it is still true that AHM proposal is a more comprehensive procedure than the ones currently available, in that it allows basically everything that is currently allowed under either American Chapters 7 and 11 or the UK Bankruptcy Code and it improves on them. For this reason, even if the solutions produced by AHM procedure may be sub-optimal under certain circumstances, it always allows for a solution at least as good as the ones that would be reached under the procedures currently available and therefore it improves on them.

A third criticism, which we believe is the most important one, is related to the introduction of imperfect information in the setting. If we explicitly consider asymmetric information and in particular superior information for the debtor, we see that the incumbent management has an advantage in formulating its re-organization plan, in that it saves on the costs of collecting the information needed. This is not a big problem: if a new potential management is more efficient than the incumbent one, it may still be able to make a better offer and therefore gain control of the firm. All is needed is that the increase in value determined by a more efficient management is high enough to compensate for the costs incurred in collecting information.

A more important problem may be determined by the lack of information by the creditors when they decide whether to exercise their options or not. Clearly, the mechanism should be studied in such a way to maximize the knowledge of the creditors: the more the creditors know about the firm, the more the decision whether to exercise the options rights will be taken efficiently. We already
said that we can see the trade in options as an auction for the shares in the new firm, since at the end of the trade the shares will be in the hands of those who value the shares most, independently on the degree of priority of the creditors:\textsuperscript{\textcircled{\text{10}}} a well known result of auction theory (see Milgrom and Weber 1982) is that in an auction of an object of uncertain value, the expected price increases with the information available to the bidders. This is due to the danger of a "winner's curse" problem:\textsuperscript{\textcircled{\text{11}}} if all bidders have an unbiased estimate of the value of the object and they formulate their bid based on this estimate, on average the highest bidder overestimates the value of the object and therefore incurs a loss. For this reason the less the bidders know on the value of the object, the more they will bid prudently, because they realize the high risk of incurring a loss if they win, and more prudent behaviour by the bidders will bring to a lower expected price for the object. This is exactly what may happen here: if the creditors do not know much about the true value of the firm, they will be prudent in exercising their options, because they realize the risk of overestimating the value of the firm and incurring a loss which adds to the non repaid credit.

For this reason, one requisite the optimal bankruptcy procedure must satisfy is that it must maximize the amount of information available to the creditors, because the procedure will be more efficient, the more the decision on the exercise of the options is based on accurate information.

Let's analyze the different sources of information for the creditors in our context: first of all, some information is given to the creditors by the administrator who runs the company during the bankruptcy procedure, but we believe it would be unrealistic to assume that the latter is able to collect all relevant information about the firm in just a few months (remember that the administrator is an insolvency practitioner and not an expert in business administration). Secondly, the creditors can do some search on the value of the firm privately. The problem with this is that creditors have conflicting interests, which makes co-operation among them a bad idea: if a creditor knows that the firm is worth more than the claims senior to his own, he has a strong incentive not to share this information with junior creditors, since he gets a higher payoff if he is not bought out by them and this is exactly what would happen if the information were shared. For this reason private search is a very costly way of acquiring information for the creditors in aggregate.

However, there is another class of agents who need to collect information on the firm, that of the bidders, and the information they collect can be made freely available to the creditors. For this to be true it is just necessary that the trade in options is carried out after all the bids have been made public. This increases the information for the creditors and therefore increases the expected amount

\textsuperscript{\textcircled{\text{10}}}Notice that in presence of imperfect information, different creditors may value the shares differently: the presence of a market in the options means that if senior creditors value the shares more than the junior ones they have the possibility of re-buying the shares even if they have been previously bought out by junior creditors.
collected from such trade that goes to remunerate the old creditors and the general efficiency of the procedure. It is important to stress that it is unlikely that such information will be made public by the bidders unless they are forced to do so: if they are allowed to announce their bids after the trade in options has expired, as they are in the revised proposal, they will do so, because they are interested in both the value of the firm staying low in the auction for the shares and in not giving an advantage to the other potential bidders through the release of information that could be used in preparing competing bids.

An objection to the argument above, claiming that the lack of information for the creditors reduces the efficiency of the procedure, could be that the decision on the future of the firm is taken efficiently independently on who ends up owning the shares, and therefore inefficiencies in the trade in the options do not influence the overall efficiency of the procedure. We believe this is incorrect: even if the final decision on the future of the firm is taken efficiently, the total payment to the creditors strictly depends on the amount collected during the trade in options and this is a very important factor for the efficiency of the procedure.

For this reason we think there is a very big difference between the first AHM proposal and the revised one: in the first one it is very explicit that all bids have to be made public before the trade in options starts, so that creditors can use this information when making their decisions on whether or not to exercise the options. In the revised proposal this is not explicit: indeed, as we cited earlier, all bidders are allowed to put forward their bids at the shareholders' meeting, which cannot be held before the end of the trade in the options. We believe that in this second case no bidder would make its bid public before the meeting in order, first, not to give an advantage to other competing bidders and, second, to keep the value of the firm low: the creditors would have to trade the options with much less information available. The result would then be a lower amount collected during this trade and therefore fewer creditors would be re-paid.

This effect is due to what has been called in the literature "the winner's curse": when bids at an auction have to be made based on imperfect information, bidders act prudently, because they know that there is a high probability of making a loss in case they win the auction. Since nobody is interested in winning the auction if this implies incurring a loss, bids are more prudent than if more information were available.

We believe that AHM proposal has a lot of merits, in that it allows to make the three main objectives for a bankruptcy procedure compatible, but that attention has to be paid to the information problem. The introduction of imperfect information in the analysis can have destructive

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11 Examples of other contexts in which the “winner’s curse” may arise can be found in Riordan (1992) and Capen, Clapp and Campbell (1971).
consequences on the results of the procedure, because the efficiency of the trade in the options is a crucial factor for the efficiency of the procedure, in that it determines the size of total payment to be shared among the creditors. It is true that the subsequent decision on the future of the firm would be taken correctly any way, so that the value of the firm ex-post would indeed be maximized, but the proceeds from this would not go to remunerate the generality of the old creditors any more, but would only go to those creditors who own the shares at the end of the trade in options. Inefficiencies in the process of trade in the options, due to the presence of imperfectly informed and/or risk averse creditors, may systematically favour most senior creditors. This happens because the way the procedure is structured, all but the most senior creditors are exposed to the risk of incurring an additional loss if they exercise the options but overestimate the value of the firm.

Creditors’ lack of information when they trade the options is therefore a factor that reduces the general efficiency of the procedure and, to avoid this, a bankruptcy procedure should deal with the problem of providing the creditors with as much information as possible at the lowest possible cost. Strange enough, this can be achieved quite easily in the present context: it is just necessary to force all bidders to make their bids public before the trade in options start.

4.5 The Optimal Bankruptcy Procedure: A General Comment

We started our discussion identifying three main objectives for a bankruptcy procedure and in the following we observed that the bankruptcy procedures currently adopted fail to satisfy these general principles together. In the analysis of both the bankruptcy procedures currently in place and the recent proposal by AHM directed to improving them, we noticed that one main problem is represented by the asymmetric information present in the setting. We now put forward some general principles in order to deal with the final aim of improving the resolution of claims implemented by a bankruptcy procedure.

First of all, we believe that the final choice on what to do with the future of the firm should be taken by the creditors, who are the agents who have the real interest is making the right choice. For this reason we are not convinced by those procedures in which the decision is imposed by a judge or, more generally, by someone named by the court with no real interest in the future of the firm.

Since the creditors must make the choice, it is important that this is an informed choice. We believe that a good bankruptcy procedure should be structured in such a way to maximize the information available to the creditors at a minimal cost: an approach of the kind of Chapter 11 is not correct in that the debtor has no incentive to release information to the creditors and they are therefore forced to do privately some search on the value of the firm in order to get more in the
following bargaining process. No information is made available to the creditors by the structure of the bankruptcy procedure and this is its main drawback.

One way to make information available to the creditors is to incentivize the debtor, who enjoys superior information, to release it, and the simplest way to induce the debtor to release information is to make it formulate an offer. However, unless this offer is competing with other offers, the amount of information released will be limited, because the debtor tries to exploit its information advantage. This is the reason why an approach similar to the Italian “concordato” fails to give the result looked for: if the debtor knows all the alternatives available to the creditors, it will be easy for him to formulate an offer which is slightly better than the available alternatives (essentially liquidation), but still maximizes his payoff subject to this constraint. This is a criticism that also applies to American Chapter 11, where the exclusive right for the debtor to formulate a reorganization plan (up to a limited period of time, but the judges usually extends this period many times) allows the debtor to release as little information as it can.

The only way to make the debtor release more information is to make his offer compete with as many offers as possible and this is what AHM proposal does: since the debtor does not know the other offers that will be available to the creditors and therefore he does not know which will be the minimal offer in order to keep control of the firm, the creditors will get a higher payoff.

Of course, many times the number of bids for the firm will be limited, in that it would be unrealistic to expect every auction to have a high number of bidders: nonetheless the simple possibility for others to put forward a competing bid is a factor that increases debtor's risk to lose control of the firm and therefore him induces it to propose a better plan than if an exclusive right to make a proposal were guaranteed.

Based on this kind of argument, we are not convinced by those procedures that solve the problem of asymmetric information simply making the debtor, who enjoys the information advantage, extraneous to the procedure. We believe that, in a world of imperfect information, it is a mistake not to exploit an information source available, simply because this "source" tends not to release information unless induced to do so. We do not believe that giving the responsibility to prepare a reorganization plan to an administrator appointed by the court, who has no experience on the firm and who, as already stressed, has little incentive to take the right decision is the proper thing to do. We do not think that a procedure that forgoes the idea of exploiting the debtor's information can be optimal: more research is needed with the aim of finding other ways of inducing the debtor to release its superior information.

AHM proposal achieves this in that an auction for the future of the firm is made: in this, not only the debtor but everyone else is allowed to put forward any kind of proposal for the future of the
firm, re-organization plans, cash bids or whatever else. The objective is that of having the highest possible number of potentially competing bids, which increases the efficiency of the solution. As we already stressed earlier, the main doubt we have on this procedure in its revised form is that bids would not made public to the creditors and therefore the whole procedure would suffer from lack of information on which to base the decisions in the "first auction" for the shares. This risk can be avoided simply returning to the timing originally set in the first proposal, when all bids had to be made public before the trade in the options started.

Alternatively, keeping the idea of an auction for the firm at which both cash and non-cash bids are allowed, other mechanisms could be imagined to insure a fair distribution of the proceeds from the following auction for the firm. We noticed that Bebchuk's mechanism is theoretically very neat, but it is doubtful whether it could be profitably applied to concrete cases of bankruptcy and maybe some of the simpler alternative methods proposed by AHM could be used instead: for example the shares could be originally allocated on the basis of the highest cash bid\(^\text{12}\) or, when no cash bid has been put forward, this could be done on the basis of an estimate of the value of the fixed assets of the firm. Following this, a proper auction could be run for the shares, starting the trade from a price reflecting the value of the claim of those who have been allocated shares. The amount collected with this auction in the shares could then be shared among the creditors based on the priority of their claims. This is a mechanism very similar to Bebchuk's mechanism, but it avoids to separate explicitly the creditors in vertical classes and to introduce the options for the shares to be allocated to the classes of creditors and therefore it simplifies on it.

Nonetheless, the result should be very similar, in that the shares end up in the hands of those who value them most (independently on the fact that they are old creditors or not, as would happen any way under Bebchuk's mechanism once the judge makes a market in the options): this allows to maximize the proceeds from this trade which can be later used to re-pay the old creditors of the firm in order of priority of their claims. The problem with explicitly doing an auction for the shares of the future firm is that, like all auctions, this is likely to give efficient results when the number of agents interested in taking part in the auction is high, but inefficient results may arise when the auction is thin. Still, these “inefficient” results are likely to be more efficient than those reached by bankruptcy procedures currently in place, because many of the distorting factors individuated in the above analysis have been corrected.

\(^{12}\) Notice that, again, this would require all bids to be made public before the creditors start trading shares.
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