

THE EFFECTS OF CHAPTER 11
AND DEBT RENEGOTIATION
ON EX ANTE CORPORATE DECISIONS

Lucian Arye Bebchuk

Discussion Paper No. 104

12/91

Program in Law and Economics
Harvard Law School
Cambridge, MA 02138

The Program in Law and Economics is supported by
a grant from the John M. Olin Foundation.

Last Revision: 12/91

THE EFFECTS OF CHAPTER 11 AND DEBT RENEGOTIATION
ON EX ANTE CORPORATE DECISIONS

Lucian Arye Bebchuk*

*Harvard University and the National Bureau of Economic Research.

I am grateful to Howard F. Chang for his invaluable assistance; to Oliver Hart, Christine Jolls, Marcel Kahan, Louis Kaplow, Reinier Kraakman, Randy Picker, Steve Shavell, Michelle White and participants in workshops at the University of Chicago, Harvard, Michigan and the University of Tel-Aviv for their helpful comments; and to the National Science Foundation and the John M. Olin Foundation for their financial support.

Abstract

Once a firm is insolvent or close to insolvency, its equityholders may attempt to renegotiate the firm's debt, that is, to induce the debtholders to agree to accept less than full payment even though the equityholders receive some value. The equityholders' power to put the firm in Chapter 11 substantially increases the equityholders' power to obtain such concessions from the debtholders. This paper analyzes how the ex post availability of Chapter 11 (and more generally, anything that increases the ex post ability of equityholders to extract concessions from debtholders) affects management decisions that are made prior to the onset of financial distress. It is shown that the availability of Chapter 11 aggravates the moral hazard problem concerning project choice -- that is, increases the equityholders' incentive to prefer risky projects over safe ones. The availability of Chapter 11 aggravates the moral hazard problem also with respect to other types of management decisions, such as those regarding dividend policy and borrowing. Consequently, although the availability of Chapter 11 may ex post benefit equityholders, it may actually reduce the ex ante value of equity and thus be against the interests of equityholders.

I. INTRODUCTION

The legal rules governing financial distress and insolvency, as well as the strategic advantages resulting from the equityholders' control over the company, often enable the equityholders of an insolvent or financially distressed company to obtain some value even while the debtholders are not paid in full. One important way in which the equityholders can obtain such value is by putting (or threatening to put) the company in Chapter 11 (Ch. 11) of the Bankruptcy Code. Under the provisions of the Code, once the company is put in Ch. 11, there is an "automatic stay" -- the debtholders cannot obtain any value until the bankruptcy court confirms a reorganization plan, and the equityholders' approval of such a plan greatly facilitates its confirmation. As observers of the reorganization process have recognized, the power of the equityholders to prevent or delay the adoption of a reorganization plan generally leads the debtholders to agree to a plan that provides the equityholders with some value even though the debtholders are not paid in full.¹

To evaluate whether the availability of Ch. 11 is desirable from the perspective of either shareholders or efficiency, it is necessary to understand the ex ante effects of Ch. 11.

¹This feature of the reorganization process has been long noticed by legal scholars, and economists have recently also devoted attention to it. Eberhart, Moore and Roenfeldt (1990), Franks and Torous [1989] and Weiss [1990] provide empirical evidence confirming that such deviations from "absolute priority" are common. Other recent papers develop bargaining models to analyze the sources of the equityholders' power to obtain value even if the debtholders are not paid in full. See Baird and Picker [1990], Bebchuk and Chang [1991], Bergman and Callen [1990], Brown [1989], and Kaiser [1991]. The equityholders' power results from the fact that, as long as a company is in Ch. 11, the debtholders cannot obtain any value unless a reorganization plan is adopted. By withholding their consent to proposed reorganization plans, the equityholders can much delay or even prevent the adoption of such a plan. As Bebchuk and Chang [1991] identify, there are three reasons why the power to delay or even prevent the adoption of a plan enables equityholders to bargain for value. First, the firm would incur financial distress costs while in Ch. 11. (For empirical investigations of the size of financial distress costs, see Cutler and Summers [1988], Lang and Stulz [1990], and Warner [1977]). Second, if the value of the firm's assets is sufficiently volatile over time, then delay may create some probability that the firm's value would much appreciate. Third, delay may eventually lead to a Chapter 7 liquidation, which may entail a loss in value.

In examining these effects, it is useful to distinguish between decisions that are made at two different time periods. To start with, going from the commencement of insolvency proceedings one step back in time, there are decisions made after the firm entered the zone of financial distress but before the commencement of any insolvency proceedings. Some research has already been done on the effects that the availability of Ch. 11 has on decisions made in this period of pre-bankruptcy financial distress. In particular, researchers have analyzed investment decisions made during this financial distress period, as well as participants' decisions during this period whether to attempt a "workout" outside bankruptcy, to reorganize under Ch. 11, or to liquidate under Chapter 7. (See Aivazian and Callen [1983], Berkovitch and Israel [1991], Gertner and Scharfstein [1991], Giammarino [1989], Titman [1984], Webb [1987], and White [1983, 1989]. This research has shown that the availability of Ch. 11 may have beneficial effects on decisions made during the period of financial distress.

But, in evaluating the consequences of Ch. 11, we should also go one further step back in time to the period prior to the onset of financial distress. (It may be asked when does financial distress start; Section III.C will suggest an analytical criterion for drawing the line between the periods prior to and after the onset of financial distress.) This paper explores the effect that Ch. 11 has on ex ante corporate decisions made *prior* to the onset of financial distress. The analysis shows that this effect is negative. Consequently, whether Ch. 11 is desirable depends on whether this negative effect is outweighed by whatever beneficial effects Ch. 11 may have on decisions made after the onset of financial distress.

As is now well recognized, the presence of debt creates a moral hazard problem even in firms that are not in financial distress: the equityholders, seeking to increase their fraction of the corporate pie, may make "inefficient" management decisions concerning investment, distribution of dividends, and financing (see Jensen and Meckling [1976]). For this reason, bonds and bank loans often are accompanied by covenants -- contractual provisions restricting what the company may do (see Smith and Warner [1979]). Problems

of observability and verification, however, render it impossible to design covenants that would prevent equityholder opportunism (inefficient actions aimed at diverting value from the debtholders) without also preventing some efficient actions. As a result, covenants can reduce but generally cannot eliminate the moral hazard problem. As will be shown, the presence of Ch. 11 aggravates this moral hazard problem and increases its efficiency costs.

Consider, for example, the type of ex ante management decision on which the formal model in this paper focuses: the choice among investment projects. As is now well recognized, the presence of debt creates a moral hazard problem that distorts this choice (see Jensen and Meckling [1976], Green [1984]). In particular, the equityholders' decisions would be biased in favor of riskier investments. The equityholders (and managers seeking to maximize the value of equity) may favor a risky project over a safer one even if the risky project offers a somewhat lower expected return. The literature often refers to this problem as the "asset substitution effect" (see, e.g., Harris and Raviv [1991]). This effect arises because the returns from favorable outcomes of the risky project would be captured by the equityholders, whereas the losses from its unfavorable outcomes would be partly borne by the debtholders.

As this paper shows, the possibility of putting the company in Ch. 11, with its implications for the ex post distribution of value, strengthens the above distortion in favor of risky projects. That is, it increases the amount of expected return that the equityholders would be willing to forego in choosing a risky project. The intuition underlying this result can be explained as follows. Assume for a moment that the introduction of Ch. 11 would not affect the nominal interest rate. In such a case, the only effect of Ch. 11 would be to increase what the equityholders would receive in bad times and thus the fraction of the downward risk that would be borne by the debtholders. This increase would aggravate the distortion in favor of risky projects, because it is the prospect of shifting downward risk to debtholders that creates this distortion.

Ch. 11 does change the nominal interest rate, however, and the analysis below therefore takes this change into account in examining how Ch. 11 affects the moral hazard

problem. The introduction of Ch. 11 increases the nominal interest rate. This increase in the nominal rate is shown to worsen the distortion in favor of risky projects, because such an increase lowers the attractiveness of safe projects more than it lowers the attractiveness of risky projects. (With a risky project, the likelihood that the increased nominal rate would actually be paid is smaller than with a safe project.) Therefore, the change in the nominal interest rate produced by Ch. 11 operates to strengthen the distortion in favor of risky projects.

Thus, with respect to corporate decisions made prior to the onset of financial distress, Ch. 11 creates some efficiency costs. Who bears these costs? If debtholders anticipate this behavior, the nominal interest rates will take this behavior into account, the expected return on bank loans and bonds will be competitive, and debtholders will not be hurt. Thus, the identified efficiency costs will be borne by the equityholders. Therefore, although the option to use Ch. 11 improves the position of equityholders ex post, its effects on decisions made prior to the onset of financial distress imply that this option may actually worsen the equityholders' position and reduce the ex ante value of their shares. (As Section III will explain, however, existing law does not enable companies to bind themselves contractually not to use Ch. 11.)²

Before proceeding, one should note two points about the generality of the results established by the model. First, while the model focuses on how Ch. 11 aggravates the extent to which project choices are distorted by moral hazard, the model's logic also suggests that

²The moral hazard effects of Ch. 11 on management decisions made prior to the onset of financial distress have not been modelled or identified previously.

Two recent papers do consider the effects of Ch. 11 on decisions made prior to the onset of financial distress, but not on the management decisions that are the focus of this paper. Bergman and Callen [1991] suggest that the prospect of renegotiation ex post establishes a ceiling on the amount of debt that can be raised ex ante; with too much debt, the probability of financial distress and renegotiation is too high for the equityholders to make a credible promise of providing competitive returns on the amount borrowed. Bebchuk and Picker [1991] analyze the effects of Ch. 11 on investments in firm-specific human capital and in manager-specific assets.

Ch. 11 aggravates the extent to which other management decisions -- concerning distribution of dividends and taking extra debt -- are distorted by moral hazard. Second, while the model focuses on the ex ante moral hazard effect of Ch. 11, the same kind of ex ante effect would arise from any expectation of debt renegotiation ex post -- whether or not due to Ch. 11 -- that would enable the equityholders to obtain some value even while the debtholders are not paid in full. The concluding discussion will develop these two points.

The analysis is organized as follows. Section II.A presents the model's assumptions. Section II.B analyzes behavior and share value in a "no-reorganization" regime, in which equityholders receive value ex post only if debtholders are paid in full. Section II.C analyzes behavior and share value under the "reorganization" regime and compares them to those under the "no-reorganization" regime. Finally, Section III concludes with remarks on the generality of the results established by the model, on the model's implications for the question of whether Ch. 11 is desirable, and on the empirical work that is suggested by the model.

II. THE MODEL

A. Framework of Analysis

The sequence of events in the model is as follows. At time $t = 0$, a company borrows an amount $D > 0$. At time $t = 1$, the equityholders will make a choice between two projects (or business strategies) in which the firm's assets (including the borrowed funds) can be deployed: one is "safe," the other is "risky." Finally, at time $t = 2$, the firm's final output W is realized, and this output is divided between the equityholders and the debtholders.

1. The Initial Debt Contract: It is assumed for simplicity that all participants are risk-neutral. Let i denote the interest rate set by the participants at $t = 0$ for the period between the raising and payment of debt; that is, at $t = 2$ the company will owe its debtholders the amount $D(1+i)$. Let i_0 denote the corresponding riskless interest rate. Given risk neutrality, the parties must choose $i \geq i_0$ such that the expected return to the debtholders

is at least i_0 . We assume that potential debtholders compete to offer the interest rate i most favorable to the equityholders, subject to the debtholders' "individual rationality" constraint that the expected payment to the debtholders is at least $D(1+i_0)$.

2. The Management Decision: At $t=1$, the management decision of project choice is made. (This decision is assumed to be consistent with whatever covenants the debt contract may include; while covenants sometimes rule out certain projects, they generally leave some freedom of project choice.) As is common in the literature on the moral hazard problem between equityholders and debtholders, we assume that this management decision is made by the equityholders -- or, equivalently, by managers seeking to serve the interests of the equityholders (at least as far as the considered management decision is concerned).³ We also assume that the equityholders' choice of project is not verifiable, so that it cannot be specified in the initial debt contract.

If the equityholders choose the "safe" project, then the final output W will be S , where $S > D(1+i_0)$. If they choose the risky project instead, then the final output W will be θR , where R is the expected return, which is positive, and θ is a random variable with expected value equal to 1. Let θ be distributed continuously with positive density throughout the interval $(0, \bar{\theta})$, where $\bar{\theta} > 1$. At $t = 1$, the equityholders observe R , but the value θ is realized at $t = 2$.

At $t = 0$, all the participants know that at $t = 1$, the equityholders will have to make a choice between a safe project and a risky project. Not all the details of this choice, however, are known in advance. For concreteness, it is assumed that given the information available at $t = 0$, the parties know S but only the distribution of R . The risky project may offer a higher or lower expected return than the safe project. Specifically, let R be distributed

³This assumption is clearly appropriate in the case of companies with a dominant shareholder-manager, and such companies constitute a major fraction of the companies going through a corporate reorganization (see Baird and Picker [1991]). In large companies managed by professional managers, however, principal-agent problems between the managers and the equityholders are likely to be present; Section III.F will discuss the implications of such problems for the paper's results.

continuously with positive density throughout the interval $(0, R)$, where $R > S$. The moral hazard problem is that at $t = 1$ the equityholders may choose the risky project even if $R < S$.⁴

3. The Final Period: At $t = 2$, the final output W is realized and then divided between the equityholders and the debtholders. This division depends upon whether the option of filing for Ch. 11 is available. As explained earlier, the availability of Ch. 11 substantially increases the equityholders' power to induce the debtholders to make concessions -- that is, to agree to receive less than full payment even while leaving the equityholders with some value. For simplicity, we will assume for now that getting such concessions is possible only with Ch. 11.

Thus, under the regime in which Ch. 11 is not available, the equityholders will not be able to extract concessions from the debtholders. If the firm is insolvent, $W < D(1+i)$, then its assets will be sold as a going concern through a Chapter 7 (Ch. 7) liquidation, and the proceeds will be applied first to cover the firm's debt. Thus, under this regime, the equityholders will receive $\max[W - D(1+i), 0]$, and the debtholders will receive only $(1-\alpha)W < D(1+i)$. Thus, under the Ch. 11 regime, the equityholders will receive $\max[W - D(1+i), 0]$, and the debtholders will receive $\min[D(1+i), W]$.

In contrast, under the Ch. 11 regime, the equityholders will be able to obtain some value regardless of how small W turns out to be. Specifically, even if $W < D$ (the firm is "insolvent") and the equityholder's "contractual right" is 0, the shareholders, by filing for Ch.

⁴Note that while the safe project in our model does not involve any uncertainty, this assumption is made for simplicity and is not essential for the paper's results. For example, the paper's results would be the same if we were to assume that the safe project yields, say, S with a probability of 50% and θR with a probability of 50%. The assumptions necessary for the paper's results are only ones ensuring that the "safe" project -- the project that involves less output uncertainty -- has a smaller likelihood of producing insolvency or near-insolvency. In the present model, this is ensured by the assumption that $S > D(1+i_0)$. Section II.C will consider situations (which may well arise if the firm's fortunes have sufficiently deteriorated) in which the safe project has a greater likelihood of leading to insolvency or near-insolvency than the uncertain project; it will be shown that in such situations the effect identified by the model will be reversed.

11 or threatening to do so, will be able to obtain αW (where $\alpha > 0$).⁵ Moreover, the equityholders, be using or threatening to use Ch. 11, will be able to obtain more than their contractual right if the firm is sufficiently close to "insolvency" -- that is, if W exceeds D by an amount that is sufficiently small.⁶ Specifically, it is assumed that the equityholders will be always able to get at least αW even if their "contractual right" of $W - D(1+i)$ is less than that. That is, if $0 < W - D(1+i) < \alpha W$, the equityholders will get αW while the debtholders will not get full payment but only $(1-\alpha)W < D(1+i)$. Thus, under the Ch. 11 regime, the equityholders will receive $\max[W - D(1+i), \alpha W]$, and the debtholders will receive $\min[D(1+i), (1-\alpha)W]$.⁷

Note that we assume that under either regime, the value to be divided is the same, W . The only difference between the two regimes is that the equityholders may get a greater share of W with Ch. 11 than without it. We make this assumption in order to focus on the ex ante effects of these ex post distributional consequences of Ch. 11. As Section III.C will discuss, there are some who believe that Ch. 11 produces some ex post efficiency benefits; they argue, for example, that a Ch. 7 sale of an insolvent company may yield less than W . As will be discussed, to the extent that Ch. 11 has some ex post benefits, they must be traded

⁵Bebchuk and Chang [1991] model the bargaining process in Ch. 11 and analyze how the fraction of value that the equityholders can obtain depends on the characteristics of the firm in Ch. 11 and on the legal rules of Ch. 11 (see also Baird and Picker [1991]). For our purposes, which are to understand how the ability to extract some value affects certain ex ante decisions, it seems appropriate to use a simple, reduced-form representation of the outcome in the Ch. 11 bargaining.

It should be noted that an assumption made later on is that $\alpha < [S - D(1+i)]/S$. This assumption will be made to simplify the analysis by ensuring that only the risky project (but not the safe project) may lead to bankruptcy.

⁶see Bebchuk and Chang [1991, pp. 28-29] for an analysis of how Ch. 11 can enable equityholders to obtain more than their contractual right in situations of "near-insolvency".

⁷An alternative formulation that I considered was to assume that the availability of Ch. 11 enables the equityholders to get in insolvency or near-insolvency the amount of $\min[\alpha W, \alpha D(1+i)]$ -- even if their "contract right" of $W - D(1+i)$ is less than that. This alternative formulation would yield the same ultimate results.

off against the ex ante costs that are the focus of this model.

4. The Initial Equity Value: Let V_0 be the ex ante value of the equity, that is, the expected value of the equity -- and thus the market price of the equity -- at $t = 0$. The question to be addressed is whether V_0 is higher with or without Ch. 11. The debtholders in this model cannot be "cheated" by Ch. 11 -- they will always capture an expected return i_0 . Therefore, the question of which regime implies a higher V_0 is equivalent to the question of which regime leads to more efficient management decisions.

Let V_0^* denote the first-best value for V_0 . Then:

$$V_0^* = [\Pr(R \leq S)] S + [\Pr(R > S)] E[R | R > S] - D(1+i_0). \quad (1)$$

As will be shown, however, this first-best value cannot be obtained under either regime.

B. The No-Reorganization Regime

We will analyze the outcome under the no-reorganization regime in three steps: (1) Given any agreement between the parties on the value of i , how would the equityholders decide at $t = 1$ between the projects? (2) Given the expected management decision by equityholders, what i would be chosen ex ante at $t = 0$? (3) Given that particular i , what project would the equityholders choose, and what V_0 would that choice imply?

1. The Equityholders' Choice Given an Interest Rate

First consider the choice of a project at $t = 1$ under a regime without Ch. 11. Given i , once the equityholders observe R , they will choose the risky project if and only if:

$$E_0 \max[\theta R - D(1+i), 0] \geq \max[S - D(1+i), 0]. \quad (2)$$

Note that the left-hand side is weakly increasing in R . The right-hand side, however, is independent of R . Thus, if (2) holds for some R' , it also holds for any $R'' > R'$, and if (2) fails to hold for some R' , it also fails to hold for any $R'' < R'$.

Let $R_N(i)$ denote the smallest nonnegative value of R that makes the left- and right-hand sides of (2) equal. There always exists such an R . The above discussion implies that the equityholders will choose the risky project if and only if $R \geq R_N(i)$.

Using Jensen's inequality and the convexity of the max function in (2), one can show that if a risky project with $R = S$ does not always lead to insolvency, that is, $\bar{\theta}S > D(1+i)$, then the left-hand side of (2) is strictly greater than its right-hand side for $R = S$. Furthermore, if $D(1+i) \geq S$, then the right-hand side of (2) equals 0, and $R_N(i) = 0$. It follows that for any given i :

$$R_N(i) < S. \quad (3)$$

Inequality (3) implies that the equityholders may choose the risky project even if $R < S$. This result is the familiar moral hazard problem (see, e.g., Jensen and Meckling [1976]). The equityholders may choose the risky project inefficiently, because they have more to gain from a favorable outcome for this project than they have to lose from an unfavorable outcome.

2. The Equilibrium Interest Rate

Let i_N be the interest rate set by the parties at $t = 0$ under the no-reorganization regime. Let $F_N(i)$ be the expected payment to debtholders for any given i under the no-reorganization regime. Thus:

$$F_N(i) = \Pr[R < R_N(i)] \min[D(1+i), S] + \Pr[R \geq R_N(i)] E_R\{ E_{\theta} \min[D(1+i), \theta R] | R \geq R_N(i) \}. \quad (4)$$

Let us assume that there exists some i that satisfies the debtholders' constraint, $F_N(i) \geq D(1+i_0)$, and provides the equityholders with a positive expected value.⁸ It can be easily shown that the equityholders will always strictly prefer the lowest i that satisfies the

⁸If the moral hazard problem is sufficiently severe, such an i might not exist. In such a case, the moral hazard problem would prevent the firm from borrowing the amount D .

debtholders' "individual rationality" constraint.⁹ Thus, the equilibrium interest rate i_N will satisfy:

$$F_N(i_N) = D(1+i_0). \quad (5)$$

Note that our assumption that there exists such an i_N that leaves the equityholders with a positive expected value implies that this i_N allows some positive probability of solvency. Thus, i_N satisfies $D(1+i_N) < \overline{\theta R}$, or $i_N < (\overline{\theta R}/D) - 1$.

3. The Initial Value

Let V_0^N be the ex ante value of the equity under the no-reorganization regime. As (5) reveals, the debtholders in this case capture an expected return i_0 . Therefore:

$$V_0^N = \Pr[R < R_N(i_N)] S + \Pr[R \geq R_N(i_N)] E[R | R \geq R_N(i_N)] - D(1+i_0). \quad (6)$$

Note that since $R_N(i_N) < S$ (see (3)), the V_0^N in (6) falls short of the first-best value V_0^* in (1). Specifically, V_0^N is lower than V_0^* by the difference: $\Pr[R_N(i_N) \leq R < S] E[S - R | R_N(i_N) \leq R < S]$.

C. The Reorganization Regime

We now analyze the reorganization regime and compare it to the no-reorganization regime. In so doing, we will follow the same three steps as in the preceding analysis of the no-reorganization regime. Accordingly we start with the question of how the equityholders will choose between the projects given an interest rate.

1. The Equityholders' Choice Given an Interest Rate

⁹To see this, note that, for any given i , equityholders can expect at $t = 0$ to receive:

$$E_R \max\{ E_e \max[\theta R - D(1+i), 0], S - D(1+i), 0 \}. \quad (*)$$

Notice that (*) is weakly decreasing in i , and that, as long as (*) is positive, it is strictly decreasing in i .

Consider the choice of a project at $t = 1$ under a regime with Ch. 11. Given i , once the equityholders observe R , they will choose the risky project if and only if:

$$E_i \max[\theta R - D(1+i), \alpha \theta R] \geq \max[S - D(1+i), \alpha S]. \quad (7)$$

Note that the left-hand side of (7) is strictly increasing in R , but the right-hand side of (7) is independent of R .

Let $R_R(i)$ denote the unique value of R that makes the left- and right-hand sides of (7) equal. There always exists such an R . For reasons similar to those given above with respect to (2), the equityholders will choose the risky project if and only if $R \geq R_R(i)$.

By the same type of argument used to derive (3), one can show that if a risky project with $R = S$ does not always lead to Ch. 11 (that is, $\bar{\theta}S - D(1+i) > \alpha \bar{\theta}S$), then the left-hand side of (7) is strictly greater than its right-hand side for $R = S$. Therefore:

$$R_R(i) < S, \quad \forall i < [\bar{\theta}S(1-\alpha)/D] - 1. \quad (8)$$

Inequality (8) implies that the equityholders may choose the risky project even if $R < S$, which is again the familiar moral hazard problem described above.

We can now compare the project choices at $t = 1$ under the two regimes for any given i . As the following proposition indicates, for any given $i \leq [S(1-\alpha)/D] - 1$,¹⁰ the availability of Ch. 11 makes the equityholders more likely to choose the risky project:

Proposition 1: $R_R(i) < R_N(i)$, for any $i \leq [S(1-\alpha)/D] - 1$.

Remark: Under both regimes, the equityholders have an inefficient incentive to invest in risky projects. The availability of Ch. 11, however, increases this incentive (holding fixed the interest rate) because it increases the attractiveness of a risky project for the equityholders. Under both regimes, the equityholders capture the benefits of a favorable outcome from the

¹⁰Under this condition concerning i , only the risky project, but not the safe project, may lead to corporate reorganization.

risky project, whereas the debtholders bear part of the costs of an unfavorable outcome. With Ch. 11, however, the debtholders bear a larger fraction (and the equityholders bear a smaller fraction) of the downside risk, which makes the risky project more attractive for the equityholders (relative to the situation without Ch. 11).

Proof: For any i satisfying the condition of the proposition, the right-hand sides of (2) and (7) are equal (because choosing the safe project would never result in the equityholders' using Ch. 11). Recall that θ can be arbitrarily close to 0 with some positive probability, which implies:

$$0 < \Pr[D(1+i) > \theta R(1-\alpha)] = \Pr[\alpha \theta R > \theta R - D(1+i)]. \quad (9)$$

Therefore, the left-hand side of (7) is strictly greater than the left-hand side of (2). Furthermore, if $R = R_N(i)$, then the left-hand side of (2) is equal to the right-hand side of (2), which is equal to the right-hand side of (7). To make (7) an equality then, R must be reduced below that level: $R_R(i) < R_N(i)$. ■

The fact that $R_R(i)$ is less than $R_N(i)$ might suggest that the moral hazard problem is more severe under the reorganization regime. We cannot, however, compare the efficiency of the two regimes using Proposition 1 alone, because the equilibrium i might be affected by the availability of Ch. 11. Therefore, let us now turn to the equilibrium interest rate under the reorganization regime.

2. The Equilibrium Interest Rate

Let i_R be the interest rates set by the parties at $t = 0$ under the reorganization regime. Let $F_R(i)$ be the expected payment to debtholders for any given i under the reorganization regime. Thus:

$$F_R(i) = \Pr[R < R_R(i)] \min[D(1+i), S(1-\alpha)] + \Pr[R \geq R_R(i)] E_R\{ E_\theta \min[D(1+i), \theta R(1-\alpha)] | R \geq R_R(i) \}. \quad (10)$$

Let us assume that there exists some i that satisfies the debtholders' constraint, $F_R(i) \geq D(1+i_0)$.¹¹ As before, it can be shown that the equityholders will always strictly prefer the lowest such i satisfying the debtholders' constraint.¹² Thus, the equilibrium interest rate i_R will satisfy:

$$F_R(i_R) = D(1+i_0). \quad (11)$$

Let us also assume that $S(1-\alpha)/D$ is large enough to ensure that the debtholders' constraint can be satisfied by some $i \leq [S(1-\alpha)/D] - 1$, so that $i_R \leq [S(1-\alpha)/D] - 1$. This assumption implies that i_R is small enough to ensure that the safe project will not lead to Ch. 11 (only a risky project will).

Proposition 2: The equilibrium interest rate is higher under the reorganization regime than under the no-reorganization regime: $i_R > i_N$.

Remark: Imagine that we move from the no-reorganization regime to the reorganization regime but maintain the interest rate i_N , which under the no-reorganization regime was just sufficient to give the debtholders competitive returns. The debtholders now would receive less than before for two reasons. First, the equityholders would be more inclined to choose a risky project (Proposition 1). Second, the debtholders would expect to get a smaller fraction of the final output in the event of insolvency or financial distress. For both reasons, introducing Ch. 11 and keeping i_N would give the debtholders less than competitive returns.

¹¹Again, if the moral hazard problem is sufficiently severe, such an i might not exist, in which case the moral hazard problem would prevent the firm from borrowing the amount D . Indeed, because Ch. 11 aggravates the moral hazard problem (as will be shown below), Ch. 11 makes it more likely that the firm would be unable to borrow the amount D .

¹²To see this, note that, for any given i , under the reorganization regime the equityholders at $t = 0$ can expect to receive:

$$E_R \max \{ E_0 \max [\theta R - D(1+i), \alpha \theta R], S - D(1+i), \alpha S \}. \quad (*)$$

Notice that $(*)$ is weakly decreasing in i , and over the range in which i affects the expected payoffs to either equityholders or debtholders, $(*)$ is strictly decreasing in i .

Therefore, a higher interest rate than i_N will be necessary to offer the debtholders the same competitive expected return $D(1+i_0)$.

Proof: Recall that i_N will be the smallest value meeting the constraint that the debtholders are offered no less than a competitive return, which by (5) will be binding. Thus, any smaller i must fail to satisfy the relevant constraint:

$$F_N(i) < F_N(i_N), \quad \forall i < i_N. \quad (12)$$

Therefore, if we suppose, contrary to the proposition, that $i_R \leq i_N$, then:

$$F_N(i_R) \leq F_N(i_N). \quad (13)$$

Furthermore, because i_R satisfies $D(1+i) \leq S(1-\alpha)$, a comparison of (4) and (10) reveals that:

$$F_R(i_R) < F_N(i_R). \quad (14)$$

Together, (13) and (14) imply that $F_R(i_R) < F_N(i_N)$, which contradicts the implication of (5) and (11) that $F_R(i_R) = F_N(i_N)$. ■

3. The Initial Value

Let us now consider the initial equity value under the reorganization regime and compare it to the value under the no-reorganization regime. Let V_0^R denote the ex ante value of the equity under the reorganization regime. As (11) reveals, the debtholders capture an expected return i_0 , and thus:

$$V_0^R = \Pr[R < R_R(i_R)] S + \Pr[R \geq R_R(i_R)] E[R | R \geq R_R(i_R)] - D(1+i_0). \quad (15)$$

Note that since $R_R(i_R) < S$ (see (8)), V_0^R in (15) falls short of the first-best value V_0^* in (1) by the difference: $\Pr[R_R(i_R) \leq R < S] E[S-R | R_R(i_R) \leq R < S]$.

As in the case of the no-reorganization regime, the initial value (and how far it falls short of the first best) depends upon the expected investment decisions given the equilibrium

interest rate. Thus, to compare V_0^R and V_0^N , we must begin with a comparison of $R_R(i_R)$ and $R_N(i_N)$, which is provided by the following proposition.

Proposition 3: The likelihood that a risky project will be chosen is greater under the reorganization regime than under the no-reorganization regime: $R_R(i_R) < R_N(i_N)$.

Remark: As the proposition indicates, the availability of reorganization aggravates the moral hazard problem. With reorganization, the equityholders would be more inclined to choose the risky project -- that is, they would be willing to forego more expected return to choose the risky project. There are two reasons that the prospect of Ch. 11 aggravates the moral hazard problem. First, as Proposition 1 indicates, even if the equilibrium interest rate were the same, the equityholders would be more inclined to choose the risky project, because Ch. 11 shifts more downside risk from the equityholders to the debtholders. Second, as Proposition 2 indicates, the equilibrium interest rate is higher under the reorganization regime. This higher interest rate further exacerbates the moral hazard problem, because it makes the safe project less attractive compared to the risky project.

Proof: First, it will be useful to establish the following inequality:

$$R_N'(i) < 0, \quad \forall i < (S/D) - 1. \quad (16)$$

Note that if $D(1+i) < S$, then the right-hand side of (2) is simply $S - D(1+i)$, and $R_N(i)$ is defined by the equality:

$$E_\theta \max[\theta R_N - D(1+i), 0] = S - D(1+i),$$

or equivalently:

$$E_\theta \max[\theta R_N, D(1+i)] = S. \quad (17)$$

Note that $\theta R_N < D(1+i)$ with some positive probability, because by assumption, θ can be arbitrarily close to 0 with some positive probability. Therefore, the left-hand side of (17) is

strictly increasing in i . Note also that $\theta R_N > D(1+i)$ with some positive probability -- otherwise, the equality in (17) could not possibly hold, because $D(1+i) < S$ by assumption. Therefore, the left-hand side of (17) is also strictly increasing in R_N . The right-hand side of (17), however, is independent of both i and R_N . Therefore, if i increases, then to maintain the equality in (17), R_N must decrease, which proves (16).

Given that i_R is assumed to satisfy $D(1+i) \leq S(1-\alpha)$, Proposition 1 implies that:

$$R_R(i_R) < R_N(i_R). \quad (18)$$

Furthermore, Proposition 2 and (16) together imply that:

$$R_N(i_R) < R_N(i_N). \quad (19)$$

Together (18) and (19) yield Proposition 3. ■

Our result, that the moral hazard problem is more severe if Ch. 11 is available, leads us to the next proposition, which concludes that the equity's ex ante value is lower when Ch. 11 is available:

Proposition 4: The initial equity value is lower under the reorganization regime than under the no-reorganization regime by the difference:

$$\Pr[R_R(i_R) \leq R < R_N(i_N)] E[S - R | R_R(i_R) \leq R < R_N(i_N)]. \quad (20)$$

Remark: The equityholders bear the cost of any inefficient behavior, because the debtholders take the ex post opportunism of equityholders into account ex ante. More inefficient project choices are expected under the reorganization regime (Proposition 3). Therefore, V_0^R is lower than V_0^N by the cost of the additional inefficient project choices.

Proof: Subtracting (15) from (6) yields (20), which is positive, because $0 < R_R(i_R) < R_N(i_N) < S$. ■

III. CONCLUDING DISCUSSION

A. Other Types of Management Decisions

The model suggests that Ch. 11 affects not only the ex ante choice between safe and risky projects but also other ex ante management decisions, because the moral hazard problem afflicts not only the choice between projects but also other important types of decisions. In addition to the "asset substitution" problem (the moral hazard problem concerning project choice), the presence of debt also creates the problems of "asset dilution" and "claim dilution" (see Smith and Warner [1979]). The asset dilution problem concerns decisions about distributions to equityholders -- the equityholders have an incentive to take more value out of the firm in the form of dividends or salaries than is efficient. The claim dilution problem concerns decisions to take extra debt when some debt is already in place -- the equityholders have an incentive to take more such extra debt than is efficient. Again, while contractual provisions often impose restrictions on distributions and the taking of extra debt, such provisions do not generally eliminate the moral hazard problems of asset dilution and claim dilution. (Due to problems of observability and verification, contractual provisions cannot eliminate asset dilution and claim dilution without creating their own efficiency costs, and the adopted provisions are therefore often underinclusive.)

The presence of Ch. 11 aggravates the asset dilution and claim dilution problems for the same reason that it aggravates the asset substitution problem. Equityholders tend to withdraw too many assets and take on too much debt because some of the costs resulting from these actions in the event of unfavorable resolutions of uncertainty would fall upon debtholders. The presence of Ch. 11 increases the fraction of the cost borne by the debtholders in such unfavorable outcomes, and it therefore worsens both of these moral hazard problems.

B. Debt Renegotiation Outside Ch. 11

Once the company is insolvent or close to insolvency, the equityholders may renegotiate its debt -- that is, induce the debtholders to agree to less than full payment -- not only inside Ch. 11 but also outside it. For one thing, the equityholders may be able to do so by threatening to invoke Ch. 11 (see Brown [1989]). Furthermore, even if the equityholders did not have the power to invoke Ch. 11, their control over the firm provides them with other powers that might enable them to extract some concessions from the debtholders. (See Bergman and Callen [1990] for a model suggesting that the equityholders can force concessions from the debtholders by threatening to run down the firm's assets.)

The ex ante effect identified in the model would result not only from the possibility of renegotiation inside Ch. 11 but also from any possibility of renegotiation outside Ch. 11. It is clear from the analysis that the identified moral hazard effect would follow from any prospect that the final output will be divided so that the equityholders would obtain value even while the debtholders are not paid in full. As just explained, although the availability of Ch. 11 increases the ability of equityholders to extract value (both inside and outside Ch. 11), they would retain some ability to do so even in the absence of Ch. 11. Thus, the identified ex ante moral hazard effect would exist, though to a lesser degree, even if Ch. 11 were eliminated.

C. Project Choice When the Safe Project Involves A Higher Likelihood of Bankruptcy Proceedings

In showing that Ch. 11 strengthens the distortion in favor of risky projects, it was critical to have assumptions ensuring that the safe project, the one that involves less output volatility, is associated with lower likelihood of insolvency or near-insolvency. This appears to be an assumption that is applicable, at any given point in time, to most companies. In particular, it appears to be an assumption that is plausible for most companies that are safely distant from financial distress.

Once the fortunes of a firm deteriorate, however, it may reach a situation in which a safe investment policy would produce a greater likelihood of insolvency or near-insolvency

than would a riskier policy. The paper's analysis of project choice can be adjusted to such situations, and can show that in such situations Ch. 11 is likely to have an opposite effect to the one on which we have focussed: in such situations, Ch. 11 may well operate to reduce the moral hazard distortion in favor of risky projects.¹³

To see this point, consider a situation in which the safe project's return is $S < D(1+i)$. In this case, if the safe project is chosen, the company will surely reach insolvency. Consequently, if Ch. 11 is not available the distortion would be substantial -- the equityholders have nothing to lose and something to gain from choosing a risky project; therefore, they will choose any risky project, whatever its expected return, as long as it offers some chance of solvency. Thus, $R=0$. In contrast, with Ch. 11, the equityholders can expect to get something in the event of insolvency, and it is thus no longer the case that they have nothing to lose if they choose a risky project with a very low expected return. Consequently, they will now choose the risky project only if its expected return exceeds a certain threshold.

The above discussion suggests a criterion for defining the point in time in which a firm enters the zone of financial distress. The firm is not in financial distress as long as choosing riskier projects (i.e., increasing output volatility) would produce a higher likelihood of insolvency or near-insolvency. But when higher likelihood of insolvency or near-insolvency would be produced by a conservative investment policy (i.e., decreasing output volatility), then the firm has entered the zone of financial distress.¹⁴

¹³This possible positive effect of Ch. 11 is identified also by Gertner and Scharfstein [1991, p. 1215].

¹⁴ It should be possible to construct a model in which both types of situations -- those in which the safe projects leads to lower likelihood of bankruptcy proceedings and those in which safe projects lead to a higher such likelihood -- would be present. One way to do this is to assume that at $t=1$, S may take different values. Alternatively, one could assume that there are two stages in which projects are chosen. If the results of the first project choice are sufficiently unfavorable, then in the second stage choosing a safe project will lead to a smaller likelihood of bankruptcy. It is not clear, however, that such a model would add much to the understanding produced by the present model. For the present model does already suggest that there is a tradeoff between the positive effect of Ch. 11 on project choices made prior to the onset of financial distress and its negative effect on project choices made after the onset of financial distress. And the more complex model that would include both effects at once would be unlikely to show

D. The Ex Post Benefits of Ch. 11

The model has focused on the adverse consequences that Ch. 11 has on decisions made prior to the onset of financial distress. To focus on these efficiency costs, it has abstracted from the potential efficiency benefits that Ch. 11 may produce following the onset of financial distress.

First, as was just analyzed, after the onset of financial distress and prior to the commencement of any bankruptcy proceedings, the company may well be in a situation in which "playing safe" would produce a lower likelihood of solvency than "gambling" would. In such situations, the presence of Ch. 11 would operate to reduce the moral hazard distortion in favor of risky projects.

Second, to the extent that the equityholders have control over the commencement of bankruptcy proceedings, Ch. 11 may provide shareholders with incentive to do so rather than seek to delay the bankruptcy process (see Baird [1991]).

Finally, there are some observers who believe that, if bankruptcy proceedings are to take place, Ch. 11 may produce a greater value for division among the participants. Recall that in the model it was assumed that the value available for distribution was the same, W , whether or not Ch. 11 was available. But there are some who believe that a sale of the company's assets through Ch. 7 would produce a significant loss.¹⁵

To the extent that Ch. 11 does produce efficiency benefits in the event of insolvency

more than that.

¹⁵The view that Ch. 11 can produce a greater value than Ch. 7 has been challenged by Baird [1986] and Jackson [1986, Ch. 9], who argue that Ch. 11 is unlikely to produce any significant surplus over a Ch. 7 sale. In any event, even if one needs a corporate reorganization to realize a surplus, it is not essential for reorganizations to enable the equityholders to extract value from the debtholders. While such ex post transfers arise under the existing rules of Ch. 11, and indeed would arise under any rules require the consent of the equityholders for the adoption of a reorganization plan, they would not necessarily arise under any method of corporate reorganization. Bebchuk (1988) puts forward a reorganization method, based on the distribution of certain options to participants, under which all participants would obtain values equal to their contractual rights.

or financial distress, then its desirability remains of course an open question. A full evaluation would balance these benefits of Ch. 11 against the ex ante costs identified by this paper. Even if Ch. 11 provides efficiency benefits in the event of insolvency or financial distress, its ex ante effect might on the whole make it inefficient and contrary to the interests of equityholders.

E. Contractual Responses to Ch. 11

1. More restrictive Covenants. As already noted, debt contracts often include covenants, contractual provisions restricting the decisions that the company may make. As is generally recognized, such restrictions cannot eliminate the moral hazard problem. The reason for this is that, due to problems of observability and verification, it is not possible to draft covenants that would rule out only inefficient actions but not efficient actions. Consequently, the efficient contract includes a given restriction only if the "inflexibility costs" that it would create are smaller than the gains it would produce in checking opportunistic behavior by equityholders. (Cf. Smith and Warner [1979])

Because Ch. 11 increases the equityholders' incentives to engage in opportunistic behavior, and thus increases the costs of leaving the shareholders unconstrained, it likely leads to the adoption of more restrictive covenants than those that would be adopted in the absence of Ch. 11. Thus, the efficiency costs that Ch. 11 produces include both the efficiency costs of the equityholders' more opportunistic behavior and the inflexibility costs of the more restrictive covenants that are adopted to counter this opportunistic behavior.

2. Provisions Opting out of Ch. 11 ? The analysis of this paper has suggested that, because of the ex ante costs of Ch. 11, the equityholders' ability to put the company in Ch. 11 may actually worsen the ex ante situation of equityholders and lower the ex ante value of the shares. Yet we do not observe companies committing themselves by contract not to invoke Ch. 11. One might suggest that the absence of such contractual clauses implies that the ex post benefits of Ch. 11 generally exceeds its ex ante costs. No such inference can be

drawn, however, because the law does not permit companies to opt out of Ch. 11. The Bankruptcy Code imposes the provisions of Ch. 11 as mandatory rules, so that courts would give no effect to any contractual provisions in which a company promises not to invoke Ch. 11. (The analysis in this paper, however, raises the possibility that the interests of equityholders and efficiency would be served by allowing such provisions.)

F. Principal-Agent Problems between Managers and Equityholders

The analysis has assumed, as is done in much of the literature about the equityholders-debtholders conflict, that the company's management decisions are made in the interest of the equityholders. This assumption is clearly appropriate in companies with a dominant shareholder-manager, and such companies constitute a major fraction of those companies going through corporate reorganization (see Baird and Picker [1991]). In large companies managed by professional managers, however, principal-agent problems between managers and equityholders are likely to arise. In such cases, there are two reasons why the managers may be less inclined to choose risky projects than the equityholders would like them to do.

First, even assuming that the managers are solely concerned with the value of shares, the managers may well exhibit a greater degree of risk-aversion than the equityholders (who are assumed in the model) to be risk-neutral. The managers may have a significant fraction of their wealth tied to the value of the firm's stock, whereas the shareholders may be diversified. Because the managers will take into account the risk-bearing costs imposed by risky projects, they may find risky projects less attractive than would the equityholders. Moreover, insolvency may be costly to the managers not only due to the accompanying reduction in equity value but also due to the increased risk of replacement associated with it. This private cost again makes risky projects less attractive to the managers than to the equityholders.

If the above factors are sufficiently substantial, they may fully counterbalance the

moral hazard problem and may eliminate the distortion in favor of risky projects; indeed, they may produce project choice that is overly conservative. Whether these factors are sufficiently substantial is of course an unsettled question whose investigation is beyond the scope of this paper; but it is worth noting that many researchers do hold the view that these factors are not sufficiently strong to eliminate the moral hazard distortion in favor of risky projects.

Furthermore, it should be emphasized that the above considerations do not affect the paper's conclusion that Ch. 11 leads to more risky projects being chosen. As long as the managers care somewhat about the value of equity, then, as has been demonstrated, Ch. 11 increases the attractiveness of risky projects for them.¹⁶ Thus, the introduction of managerial moral hazard does not affect the basic conclusion that Ch. 11 leads to more risky projects being chosen.

The introduction of managerial moral hazard, however, makes it no longer clear whether this effect of Ch. 11 is desirable. This depends on whether, in the absence of Ch. 11, managerial decisions are likely to be distorted by the moral hazard problems of asset substitution, asset dilution and claim dilution. If this is the case, as a substantial body of literature holds, then the effect of Ch. 11 will be to make these moral hazard problems worse. But if managers' private interests lead them to be too conservative in their decisions concerning project choice, distributions, and borrowing, then the effect of Ch. 11 will be to move managers' decisions closer to efficiency.

G. Suggested Empirical Work

This paper has identified the ex ante moral hazard effects of Ch. 11 (and of debt renegotiation more generally). Subsequent empirical work might assess the magnitude of

¹⁶Moreover, though this is not part of the paper's model, Ch. 11 reduces somewhat the risk or replacement that is associated with insolvency; this consequence, by reducing the private costs to the managers from insolvency, again increases the attractiveness of risky projects to the managers.

these effects and compare them to whatever ex post efficiency benefits Ch. 11 may produce. One possible approach would be to examine how the adoption of Ch. 11 in 1978 affected the market values of debt and equity. The 1978 reform greatly increased the ability of equityholders to extract value in the event of insolvency or financial distress.¹⁷ Thus, one would expect the 1978 adoption of Ch. 11 to have reduced the value of outstanding debt, because the new law increased the likelihood of ex post extraction of value from the debtholders without any compensating increase in the interest rate. The more interesting question, however, concerns the effect of the 1978 reform on the market value of equity. If the value of equity did not experience a gain equal to or exceeding the loss in the value of debt -- which would imply an overall negative effect on the total stock market value of firms -- then this finding would suggest that the market perceived the ex ante moral hazard effects of Ch. 11 to be large enough to outweigh any ex post efficiency benefits that Ch. 11 may produce.¹⁸

¹⁷Until 1978, corporate reorganizations had to conform to the "absolute priority" standard, under which debtholders must receive full payment if equityholders obtain any value. The 1978 reform enabled reorganization plans which provide debtholders with less than the absolute priority standard as long as they are approved by the required majority of the debtholders. See Trost [1979, pp. 1336-37].

¹⁸Another interesting empirical study concerns the effect of the 1978 reform on debt covenants. As explained above (Section E.1), an increase in the equityholders' ability to extract value should lead to the adoption of more restrictive covenants. Therefore, it would be interesting to examine whether post-78 covenants were indeed more restrictive than pre-78 covenants.

REFERENCES

- Aivazian, Varouj A. and Jeffrey L. Callen (1983), "Reorganization in Bankruptcy and the Issue of Strategic Risk," Journal of Banking and Finance, Vol. 7, 119-133.
- Baird, Douglas G. (1986), "The Uneasy Case for Corporate Reorganizations," Journal of Legal Studies, Vol. 15, 127-147.
- Baird, Douglas G. (1991), "The Initiation Problem in Bankruptcy," International Review of Law and Economics, Vol. 11, 223-232.
- Baird, Douglas G. and Randal C. Picker (1991), "A Simple Noncooperative Bargaining Model of Corporate Reorganizations," Journal of Legal Studies, Vol. 20, 311-349.
- Bebchuk, Lucian A. (1988), "A New Approach to Corporate Reorganizations," Harvard Law Review, Vol. 101, 775-804.
- Bebchuk, Lucian A. and Howard F. Chang (1991), "Bargaining and the Division of Value in Corporate Reorganization," National Bureau of Economic Research, Technical Working Paper No. 97, forthcoming in Journal of Law, Economics, and Organization.
- Bebchuk, Lucian A. and Randy Picker (1991), "Bankruptcy Rules, Managerial Entrenchment, and Managerial Human Capital," Harvard University and University of Chicago, mimeo.
- Bergman, Yaacov Z. and Jeffrey L. Callen (1991), "Opportunistic Behavior in Debt Renegotiations and an Interior Optimal Capital Structure of the Firm Without Deadweight Costs," Journal of Financial Economics, Vol. 2, 109-123.
- Berkovitch, Elie and Ronen Israel (1991), "The Bankruptcy Decision and Debt Contract Renegotiation," University of Michigan, mimeo.
- Brown, David T. (1989), "Claimholder Incentive Conflicts in Reorganization: The Role of Bankruptcy Law," Review of Financial Studies, Vol. 2, 109-123.
- Cutler, David N, and Lawrence G. Summers (1988), "The Costs of Conflict Resolution and Financial Distress: Evidence from the Texaco-Pennzoil Litigation," Rand Journal of Economics, Vol. 19, 157-172.
- Eberhart, Allan C., William T. Moore and Rodney L. Roenfeldt (1990), "Security Pricing and Deviations from the Absolute Priority Rule in Bankruptcy Proceedings," Journal of Finance, Vol. 45, 1457-1469.
- Gertner, Robert and David Scharfstein, (1991) "A Theory of Workouts and the Effects of Reorganization Law," Journal of Finance, Vol. 46, pp. 1189-1222.
- Green, R.C. (1984), "Investment Incentives, Debt, and Warrant", Journal of Financial Economics, Vol. 13, pp. 115-136.

- Franks, Julian R. and Walter N. Torous, "An Empirical Investigation of U.S. Firms in Reorganization," Journal of Finance, Vol. 44, 747-769.
- Giammarino, Ronald M. (1989), "The Resolution of Financial Distress," Review of Financial Studies, Vol. 2, 25-47.
- Harris, Milton and Artur Raviv (1991), "The Theory of Capital Structure," Journal of Finance, Vol. 46, pp. 297-355.
- Jackson, Thomas H. (1986), The Logic and Limits of Bankruptcy Law (Cambridge, Mass.: Harvard University Press).
- Jensen, Michael C. and William H. Meckling (1976), "Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure," Journal of Financial Economics, Vol. 3, 305-360.
- Kaiser, Kevin M.J. (1991), "A Bargaining Model of Chapter 11 Reorganization," Northwestern University, J.L. Kellogg Graduate School of Management, mimeo.
- Lang, Larry and Rene M. Stulz (1990), "Does Bankruptcy Lead to Inefficient Investment?," New York University and Ohio State University, mimeo.
- Smith, Clifford W., Jr. and Jerold B. Warner (1979), "On Financial Contracting: An Analysis of Bond Covenants," Journal of Financial Economics, Vol. 7, 117-161.
- Titman, S. (1984) "The Effect of Capital Structure on a Firm's Liquidation Decision," Journal of Financial Economics, Vol. 13, 137-151.
- Trost, J. Ronald (1979), "Business Reorganizations Under Chapter 11 of the New Bankruptcy Code," The Business Lawyer, Vol. 34, 1309-1346.
- Warner, Jerold B. (1977), "Bankruptcy Costs: Some Evidence," Journal of Finance, Vol. 32, 337-347.
- Webb, David C. (1987), "The Importance of Incomplete Information in Explaining the Existence of Costly Bankruptcy," Economica, Vol. 54, 279-288.
- Weiss, Lawrence A. (1990), "Bankruptcy Resolution: Direct Costs and Violation of Priority of Claims," Journal of Financial Economics, Vol. 13, 137-151.
- White, Michelle J. (1983), "Bankruptcy Costs and the New Bankruptcy Code," Journal of Finance, Vol. 38, 477-488.
- White, Michelle J. (1989), "The Corporate Bankruptcy Decision," Journal of Economic Perspectives, Vol. 3, 129-151.