THE JOURNAL OF FINANCE • VOL. XXXVIII, NO. 2 • MAY 1983

THE BEHAVIOR OF FIRMS IN FINANCIAL DISTRESS

Presiding: JEROLD B. WARNER†

Bankruptcy Costs and the New Bankruptcy Code

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BANKRUPTCY COSTS are the deadweight economic costs of firms going bankrupt. They include both *ex post* bankruptcy costs incurred after a firm's bankruptcy filing, such as transactions costs, and *ex ante* bankruptcy costs incurred before the filing, such as those resulting from creditors' attempts to reduce their losses if bankruptcy occurs and/or managers' attempts to raise the expected return to equity by increasing the firm's risk.[1] This paper has two purposes. First it proposes a model of bankruptcy costs which focuses on the costs of inefficient decision making before the firm's actual bankruptcy filing. The model implies upper bound expressions for total bankruptcy costs. Second, the new U.S. Bankruptcy Code[2] went into effect late in 1979 and made important changes in bankruptcy reorganization procedures. The paper poses the question of whether the changes made under the new Code tend to raise or lower aggregate U.S. bankruptcy costs. We approach this question by calculating the upper bound expressions suggested by the model, using parameter values from both before and after the new Code took effect.

From an economic standpoint, the most important changes instituted under the new Bankruptcy Code had the effect of making it more difficult to reorganize firms in bankruptcy. Previously, it was common for failing firms to file for bankruptcy, but for prior management to continue to operate the firm in much the same form as before. The bankruptcy filing prevented unpaid creditors from suing the firm while a reorganization plan was arranged which cut back most debts. From an economic standpoint, such a procedure was anomalous, since we learn in basic economics that competition in the long-run should cause inefficient firms to go out of business. As long as failing firms are more likely to be inefficient than firms in general, it would seem to be rewarding inefficiency and offsetting

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* New York University, Graduate School of Business Administration. I am grateful to Hal Varian and Roger Gordon for helpful comments, to Herve Bousset for research assistance and to the Sloan Foundation and the National Science Foundation, Law and Social Sciences Program, grant number SES 82-08930, for research support.

[1] There has been debate in the literature as to whether bankruptcy costs are high or low. See Haugen and Senbet [5], Warner [14], and Gordon and Malkiel [4].

[2] The Bankruptcy Reform Act of 1978, called the "Code," replaced the Chandler Act of 1938.

the beneficial effects of competition systematically to aid the survival of failing firms. The new Code preserves reorganization as an option for failing firms, but makes it more difficult to use the procedure and introduces some new alternatives. We argue that it therefore increases economic efficiency, measured as a decrease in aggregate bankruptcy costs.[3]

In section 1, I discuss bankruptcy law and procedures, both before and after the new Code. In section 2, I model the determination of *ex ante* bankruptcy costs. In section 3, calculations of aggregate bankruptcy cost levels are presented.

I. Bankruptcy Procedures

There are two separate bankruptcy procedures: liquidation and reorganization under bankruptcy court protection.

A. Liquidation

When a firm files for bankruptcy liquidation, a trustee is appointed to shut it down and to liquidate its assets. The proceeds net of transactions costs (or *ex post* bankruptcy costs) are distributed to creditors in order of priority. Claims are paid off dollar for dollar, so that creditors (except the last) are either paid in full or not paid at all. Claims due in the future are accelerated to the present at face value.

The priority rule in liquidation is the absolute priority rule (APR). It gives priority first to the transactions costs of the bankruptcy process, second to taxes, rent and wages, third to unsecured creditors (trade creditors, bondholders and often banks), and last, to equity. One important group is outside the APR ordering: secured creditors. These creditors have a lien on a specific asset owned by the firm such as a building, equipment, inventory or accounts receivable. In the event of liquidation, they can reclaim the asset or its value.

Bankruptcy liquidation is an inefficient procedure in terms of agency costs. Since managers are displaced and equity becomes worthless, managers have an incentive to resist liquidation as long as possible. As the firm's financial situation becomes precarious, bankruptcy can be postponed by converting maturing short-term debt from unsecured to secured status. Unsecured creditors (usually banks or finance companies) that would otherwise not roll over their loans to the firm often will do so if they can reduce their own risk by acquiring a lien on some asset. This protects the creditor in the event of bankruptcy. But increasing the amount of secured debt allows failing firms to incur total liabilities often well in excess of their assets. This is likely to be economically inefficient, since it prolongs the operation of firms that in many cases *should* liquidate because they are high cost producers or are in industries with excess supply. It also means that

[3] Firms which have durable capital equipment which has no alternative use should from an efficiency standpoint continue to operate as long as revenues exceed variable (but not fixed plus variable) costs. This necessitates a bankruptcy filing since fixed cost creditors could otherwise foreclose on their lien assets as soon as default occurs. However bankruptcy law does not distinguish between those firms having specialized capital and those which do not.

unsecured creditors receive little or no payoff in bankruptcy. As shown below, this distorts managers' incentives and raises *ex ante* bankruptcy costs.

This process of failing firms delaying bankruptcy by converting unsecured to secured debt means that when they do file for bankruptcy, their liabilities are likely to have priority in chronological order—the most recent loans rank highest because they are secured while earlier loans rank lower because they are unsecured. This differs from the "me-first" priority rule associated with Fama and Miller [3], in which claims take priority in *reverse* chronological order. The me-first rule assumes, first, that all loans are unsecured and, second, that they are all covered by subordination agreements which specify that subsequent loans must rank lower in priority. In practice, the me-first rule is violated whenever a firm replaces an unsecured with a secured claim. Also, some unsecured claims (such as trade creditors' claims) are generally not covered by subordination agreements and therefore rank at the bottom regardless of age.

B. Reorganization

Under the old (pre-1979) Bankruptcy Act (called the "Act"), failing firms could file for a reorganization in bankruptcy, but continue operating in essentially the same form with the same management.[4] Management would propose a settlement with creditors which specified a cutback in unsecured debt claims. Equity remained intact, but with no dividends paid until all obligations under the reorganization plan were met. Secured creditors were prevented by the bankruptcy filing from foreclosing on their lien assets. (Some rent or interest was paid to them, although not necessarily as much as the firm had agreed to pay before the bankruptcy filing.) The plan had to be approved by majority vote of all unsecured creditors' classes. Creditors had little alternative to voting in favor of management's reorganization plan, since only managers had the right to propose a plan and the only alternative to accepting their plan was liquidating the firm. Managers were not allowed to sell any substantial part of the firm's assets in reorganization.

Reorganization under the old Act solved the agency problem in bankruptcy by allowing existing management to continue operating the firm. However this was an economically costly solution since it required that the firm continue operating in basically the same form. Since at least some failing firms are inefficient and should liquidate, any procedure which encourages failing firms in general to continue operating must be preserving some which from an economic standpoint should shut down and release their resources to move to higher value uses.

The new Bankruptcy Code made it more difficult for firms to reorganize in bankruptcy, both by changing the requirements for adopting a reorganization plan and by introducing a new alternative. For example, the voting requirements for adopting a reorganization plan were stiffened by changing the margin from a simple majority to two-thirds in amount of each class voting in favor and by requiring that secured as well as unsecured creditors' classes approve the plan if

[4] This description is of Chapter XI of the old Bankruptcy Act. See White [16] and [17] for further detail. Another reorganization procedure under the Act, Chapter X, is not considered here since it was used very infrequently.

their claims are adversely affected. Also, managers have lost the exclusive right to propose the plan. This means that creditors can propose their own plans and are no longer faced with a take-it-or-leave-it choice between management's plan or piecemeal liquidation. Another new alternative is that if no plan is agreeable to all parties, the firm can continue operating while a buyer is sought for all or part of it as a going concern, thus often obtaining a better price than if its assets were sold piecemeal. In the latter case, the proceeds are distributed to creditors according to the APR.[5] Finally, the new Code removes the restriction that firms reorganizing must continue in the same form. Any or all of the firm's operations can be shut down and/or sold.[6]

The greater flexibility of reorganization procedures under the new Bankruptcy Code probably enhances the economic efficiency of bankruptcy by restricting the power of managers to continue intact what are often economically inefficient enterprises. Managers and equity holders generally have a stronger incentive than economic efficiency considerations would justify to avoid liquidation, both because they lose their jobs and/or their shares and because the firm also loses its net operating loss carryover (often its most valuable asset). The new Code, however, allows the firm formally to reorganize and to retain its loss carryforward, but actually to liquidate by selling off the most viable part of its operation while shutting down the rest. Managers are more likely to cooperate because some jobs may be preserved and because there is a more gradual transition. The result of these changes is likely to increase the proportion of bankrupt firms which liquidate.

II. Ex ante Bankruptcy Costs

In this section we develop a model of *ex ante* bankruptcy costs.[7] Suppose the firm is already failing. It faces three possibilities, liquidation, reorganization, or continuation (i.e., remaining out of bankruptcy completely). The non-stochastic liquidation value of the firm's assets (whether sold piecemeal or as a going concern) is L and the transactions costs of liquidation are T_q. The expected present value of future earnings of the firm in continuation is C and in reorganization is R. We assume here that $C = R$.[8] The transactions costs of reorganization are T_r.

We assume a two period model. The firm has unsecured loans due in time $t = 1$ and $t = 2$ of principal amounts U_1 and U_2 and secured loans due in $t = 2$ of S.

[5] Legally this procedure is a "cramdown" reorganization under the Code, but from an economic standpoint we treat it as a liquidation.

[6] Note that changes made under the new Code may have varying effects on different firms, depending on size and other considerations. For example, whether the right of creditors to propose their own reorganization plan has any impact depends on whether their claims are large enough to make it worthwhile to represent them actively in negotiations over the plan.

[7] *Ex ante* bankruptcy costs also arise because of bankruptcy-induced distortions in investment incentives. See Higgins and Schall [6], Jensen and Meckling [7], Myers [10], Bulow and Shoven [2], and White [15].

[8] This is assumed since no information is available concerning the effect of a firm's bankruptcy filing on its earnings.

For simplicity we assume both the interest rate and the discount rate are zero. We also assume that secured loans are riskless because they are tied to assets having market value equal to the amount of the loan.[9] The firm's earnings in $t = 1$ are P_1 and in $t = 2$ are $P_2 + g$, where g is a random variable distributed normally with mean 0 and variance σ_g^2. Thus we have $C = P_1 + P_2 + E(g) = P_1 + P_2$.

Management, representing equity, is assumed to choose among the three states according to which one maximizes the value of equity. The value of equity if liquidation occurs in $t = 1$ is:

$$\max[(L - T_q - S - U_1 - U_2), 0]. \tag{1}$$

Because of limited liability, (1) cannot be negative, but it may be zero.

Turn now to continuation. If continuation occurs in $t = 1$, the firm must pay U_1 to unsecured debt in $t = 1$. Since its earnings in period 1, P_1, may be less than U_1, it must borrow $U_1 - P_1$. We assume that failing firms can only obtain new loans if they are secured, therefore the firm can continue only if $U_1 - P_1 \leq L - T_q - S$. The value of equity in continuation is therefore:

$$f(g) \int_b^\infty [P_2 + g - U_2 - S - S^*]dg, \tag{2}$$

where $S^* = U_1 - P_1$. If $U_1 > P_1$, then equity receives nothing in $t = 1$. In $t = 2$, it receives earnings net of debt payments, if these are positive, or else zero. If net earnings are negative in $t = 2$, then the firm liquidates. The minimum level of earnings necessary to avoid bankruptcy in $t = 2$ is $P_2 + g = U_2 + S + S^*$. This cutoff level of g is denoted b.[10]

Turn now to reorganization. Here the firm's unsecured liabilities are cut back to $r\%$ of their previous level. Also the firm must pay T_r in transactions costs in $t = 1$. Since earnings are the same as under continuation, the firm's outflows in $t = 1$ are $T_r + rU_1$. It can reorganize in $t = 1$ if earnings, P_1, exceed this amount or if it can obtain a new secured loan. The condition for the latter is $rU_1 + T_r - P_1 \leq L - T_q - S$. The value of equity under reorganization is

$$f(g) \int_{b'}^\infty [P_2 + g - rU_2 - S - S^{**}]dg, \tag{3}$$

where $S^{**} = rU_1 + T_r - P_1$, the amount borrowed in $t = 1$. Equity again receives nothing in $t = 1$. In $t = 2$ it receives earnings net of debt payments as cut back under the reorganization plan, if these are positive, or else zero. The minimum level of earnings necessary to avoid bankruptcy in $t = 2$ is $P_2 + g = rU_2 + S + S^{**}$. This cutoff level of g is denoted b'.

Under these assumptions, managers of failing firms may have incentives to make economically inefficient decisions and therefore to generate *ex ante* bankruptcy costs. From an economic efficiency viewpoint, the best use of the firm's

[9] In reality, secured claims can be adversely affected by a reorganization plan, but we ignore this possibility in the model.

[10] Repeated rescues are possible, but are ignored here. Note that the longer the failing firm continues out of bankruptcy, the higher the ratio of secured to total liabilities.

assets is that alternative having the highest value among the choices $L - T_q$, C, or $R - T_r$. Thus liquidation is preferred if $L - T_q > \max [C, R - T_r]$ and similarly for reorganization. But management has an incentive to choose continuation, liquidation or reorganization depending on which maximizes the value of equity, i.e., whether (3), (2) or (1) has the highest value. If the alternative having the highest value is the one that also maximizes the value of equity, then management has an incentive to make economically efficient decisions and *ex ante* bankruptcy costs are zero. (There may still be *ex post* bankruptcy transactions costs, however.) But if a different alternative maximizes the value of equity than maximizes overall value, then management has an incentive to make inefficient decisions and *ex ante* bankruptcy costs are generated, equal to $\max[L - T_q, C, R - T_r]$ minus the value of the firm's assets in the alternative chosen.

Bankruptcy costs occur in the model if continuation or reorganization occurs when from an efficiency viewpoint the firm should liquidate. Examine first the choice at $t = 1$ between liquidation and continuation. Liquidation is economically efficient if $L - T_q > C$. But continuation is preferred by management if (2) exceeds (1). These two conditions together imply that:

$$L - T_q - C < \int_b^\infty f(g)[P_2 + g - U_2 - S - S^*]\, dg - (P_1 + P_2 - S - U_1 - U_2). \quad (4)$$

Define $F(b)$ as the cumulative probability of bankruptcy in $t = 2$, where $[1 - \mathrm{F(b)}] = \int_b^\infty f(g)\, dg$. Also $u_b < 0$ is the expected value of g given bankruptcy and u_c the expected value of g given no bankruptcy. Since the overall mean of g is zero, the conditional means are related by the expression $u_c[1 - F(b)] = -u_b[F(b)]$. Using this and (4), we get,

$$L - T_q - C < -F(b)[P_2 + u_b - U_2 - S - S^*]. \quad (5)$$

The l.h.s. of (5) is *ex ante* bankruptcy costs. The r.h.s. is the expected value of the shortfall in earnings relative to liabilities given bankruptcy in $t = 2$, where $P_2 + u_b$ is expected earnings given bankruptcy. If there were no limited liability, this loss would be borne by equity. However, since limited liability applies and since secured debt is riskless, unsecured debt bears the loss, and the r.h.s. of (5) is the expected level of unpaid unsecured debt claims given bankruptcy.[11]

Similarly, if we compare liquidation and reorganization, *ex ante* bankruptcy costs are generated if the firm chooses reorganization when liquidation is the economically efficient choice. $F(b') = \int_{-\infty}^{b'} f(g)\, dg$ is the cumulative probability of bankruptcy in $t = 2$ given reorganization in $t = 1$. Also $u_{b'} < 0$ is the expected value of g given bankruptcy. Then following the same procedure as above, the two conditions for reorganization to be chosen when liquidation is economically efficient imply that:

$$(L - T_q) - (R - T_r) < -F(b')[P_2 + u_{b'} - S - S^{**} - rU_2] + (1 - r)(U_1 + U_2). \quad (6)$$

[11] Note that (5) remains the same regardless of whether the value of equity in liquidation, from (1), is positive or zero.

The l.h.s. of (6) is *ex ante* bankruptcy costs. On the r.h.s. of (6), the first term is the expected value of the shortfall in payments to unsecured debt after the cutback specified in the reorganization plan. The second term is the amount of unsecured debt forgiven under the reorganization plan.

Expressions (5) and (6) relate distributional effects to efficiency costs. The right hand sides of (5) and (6) are the expected amounts redistributed away from unsecured debt in continuation and reorganization. These are upper bounds on the level of deadweight costs if an inefficient choice is made. Note that the more secured debt the firm has, the tighter are the upper bound expressions. Conversely, the more unsecured debt the firm has and the more debt forgiven under the reorganization plan, the looser are the upper bound expressions.[12]

III. Bankruptcy Cost Estimates

Table 1 gives data from samples of firms which liquidated or reorganized in the Southern District of New York both under the old Bankruptcy Act and under the new Code.[13] The category "firms liquidating" under the Code includes some firms which formally reorganized, as long as the bulk of their assets were sold. The data suggest that firms liquidating tend to have higher levels of secured liabilities relative to assets than firms reorganizing (.77 versus .20 for the Act samples and .89 versus .48 under the Code). Thus the amount of secured debt relative to assets remains an important determinant of whether bankrupt firms will liquidate or reorganize. Firms liquidating also have higher levels of total liabilities relative to assets than firms reorganizing (2.26 versus 1.09 under the Act and 1.62 versus 1.32 under the Code). The payoff rates to unsecured creditors are also substantially lower for firms liquidating than for firms reorganizing (2 to 3% for firms liquidating versus about 36% for firms reorganizing under the Act and 32% for firms reorganizing under the Code).[14] An important change under the Code is the increase in the relative importance of liquidation, for reasons discussed above. The proportion of liabilities of failing firms involved in reorganizations falls from 48% to 35%.[15] Finally, the average size of firms liquidating and reorganizing, measured by average total liabilities, appears to have fallen under the Code.

Turn now to the *ex post* or transactions costs of bankruptcy, given in Table 1

[12] (5) and (6) are equalities if managers are indifferent between liquidation and either continuation or reorganization. In that case the distributional effects are exact measures of bankruptcy costs.

[13] The Act samples include all firms whose cases were closed during 1978–79 for which complete information could be found. All of the reorganization cases in the Act sample are Chapter XI cases. The Code samples include all firms whose cases were filed in 1980. None of the Code liquidation cases are formally closed. Thus the information available for the Code cases consists of data generated at the time of the bankruptcy filing (assets and liabilities) and data generated when the reorganization plan is adopted (payoff rates). Transactions costs data is unavailable since it is generated at the time of closing of the case. See White [17].

[14] The payoff rate data include both cash and installment payments. The latter are undiscounted, so that payoff rates are biased upward.

[15] Comparisons between the characteristics of firms liquidating versus reorganizing need to be made with care since there is selectivity bias if healthy firms are more likely to reorganize and less healthy firms to liquidate.

Table 1

Characteristics of Firms in Bankruptcy

	Firms filing for bankruptcy under the Act (Before 1980)		Firms filing for bankruptcy under the Code (1980)	
	Firms liquidating	Firms reorganizing	Firms liquidating	Firms reorganizing
Number of firms	90	96	88	33
Secured liabilities/total assets	.77	.20	.89	.48
Total liabilities/total assets	2.26	1.09	1.62	1.32
Secured liabilities/total liabilities	.34	.18	.55	.36
Payoff rate to unsecured creditors	.02	.36	.03	.32
Ex post bankruptcy costs/total liabilities	.013	.016	—	—
Ex post bankruptcy costs/amount paid to creditors	.22	.06	—	—
Total liabilities (millions)	$1.6	$2.6	$1.4	$2.0
Percent of total liabilities of failed firms involved in reorganizations	48%		35%	

for the Act sample. These costs are very low as a percent of the total liabilities of bankrupt firms—1.3% for firms liquidating and 1.6% for firms reorganizing. They are higher but still relatively low if expressed as a proportion of the amount paid to creditors—22% for firms liquidating and 6.0% for firms reorganizing. However, low *ex post* bankruptcy costs do not generally imply low bankruptcy costs in total. Transactions costs in bankruptcy cases are set by formula as a small percent of the value of assets liquidated by the trustee or of the amount paid to creditors under the reorganization plan. Thus if a liquidation case is difficult, for example, the trustee will abandon the firm's assets rather than selling them and therefore earn a low fee. But this reduces the return to unsecured creditors and therefore raises *ex ante* bankruptcy costs. Similar considerations apply in reorganization.[16]

We can use the data given in Table 1 and aggregate bankruptcy data to estimate the level of bankruptcy costs. To do this we need an estimate of aggregate liabilities of firms filing for bankruptcy in a sample year. For all of 1980, 33,700 firms filed for bankruptcy liquidations and 5,900 firms filed for bankruptcy reorganizations.[17] From Table 1, average liabilities of firms liquidating and reorganizing in 1980 in our sample were $1.4 million and $2.0 million respectively. We therefore estimate that the aggregate level of liabilities of firms filing for bankruptcy in 1980 was (33,700)($1.4 million) + (5,900)($2.0 million) or $59.0 billion per year.

Turn first to estimating aggregate *ex post* bankruptcy costs. For the Act sample, Table 1 says that 48% of failed liabilities are attributable to firms reorganizing

[16] See Warner [13] for a discussion of transactions costs in a sample of railroad reorganization cases.

[17] Dun and Bradstreet failure data are not used here since they include only short-term liabilities of firms failing. The data on number of firms filing for bankruptcy come from Administrative Office of the U.S. Courts [1].

and 52% to firms liquidating. Using the data given in Table 1 on *ex post* bankruptcy costs as a proportion of total liabilities, our estimate of aggregate *ex post* bankruptcy costs under the old Act is [(.52)(.013) + (.48)(.016)] ($59.0 billion) or $850 million per year.

We cannot construct a fully independent estimate of what *ex post* bankruptcy costs in 1980 would be under the Code, since transactions costs data are not available for the Code sample of cases. However suppose transactions costs remain about the same as a proportion of total liabilities. Then we can predict the new level of *ex post* bankruptcy costs reflecting the greater relative number of liquidations under the Code. The resulting figure is [(.65)(.013) + (.35)(.016)] ($59.0 billion) or $830 million. Thus the increase in the proportion of liabilities in liquidation under the Code has by itself had little effect on *ex post* bankruptcy costs.

Turn now to *ex ante* bankruptcy costs, those due to firms making inefficient decisions vis-a-vis continuing, reorganizing or liquidating. Equations (5) and (6) provide upper bounds on these costs. Examining (5) first, it says that for firms continuing that should liquidate, bankruptcy costs are bounded from above by the expected level of unsecured liabilities not paid in liquidation for firms that continue but should liquidate. Assume again that aggregate liabilities of firms failing in 1980 were $59.0 billion and that 52% of failed liabilities for the Act sample were of firms liquidating. Suppose, arbitrarily, that the level of liabilities of firms which continue but should liquidate is equal to the level of liabilities of firms which do liquidate, or $30.7 billion per year. Of these, suppose 66% are unsecured (the actual level for the sample of liquidating firms), so that the level of unsecured liabilities of firms which should liquidate is $20.2 billion. Given the Act payoff rate in liquidation of 2%, our upper bound estimate of *ex ante* bankruptcy costs for firms that continue but should liquidate is (1 − .02)($20.2 billion) or $19.8 billion.

To estimate this term for the Code sample, we assume that the level of liabilities of firms which continue but should liquidate is unaffected by the adoption of the new Code. Thus this level is again assumed to be $30.7 billion per year. Then the upper bound estimate on *ex ante* bankruptcy costs under the Code for firms that continue but should liquidate is $30.7 billion multiplied by the percent of Code liabilities of liquidating firms which are unsecured (45%) times one minus the payoff rate in liquidation (3%) or $13.4 billion. Thus *ex ante* bankruptcy costs attributable to firms continuing that should liquidate have fallen under the Code.

Turn now to *ex ante* bankruptcy costs due to firms reorganizing which should liquidate. The upper bound is given by equation (6) which is the sum of unsecured debt forgiven under the reorganization plan, $(1 - r)(U_1 + U_2)$, plus the expected shortfall in payments to unsecured debt in reorganization.

To estimate this upper bound expression, we make the extreme assumption that all firms which reorganized should have liquidated. Examine the debt forgiveness term first. If the total level of failed liabilities is $59.0 billion per year and 48% of failed liabilities are due to firms reorganizing in the Act sample, then the total level of liabilities of reorganizing firms is $28.3 billion per year. Of this, 82% or $23.2 billion is unsecured. Since the average payoff rate for unsecured debt in reorganization is about 36%, our estimate of the expression $(1 - r)(U_1 -$

U_2) is (1 − .36)($23.2) = $14.9 billion per year for the Act sample. For the Code sample of reorganized firms, the calculation is ($59.0)(.35)(.64)(.68) = $9.0 billion. Since relatively fewer firms are reorganizing under the Code, bankruptcy costs due to firms reorganizing are smaller.

The second term on the r.h.s. of equation (6) is the expected shortfall in payments to unsecured debt as specified under firms' reorganization plans. We have no separate data on failure characteristics of firms which have reorganized. Suppose these firms will liquidate if they fail again. Then our estimate of aggregate *ex ante* bankruptcy costs for firms liquidating should already include bankruptcy costs generated by firms which have previously reorganized and later default on their reorganization obligations. We therefore ignore this term for both the Act and Code samples.

Totalling our estimates of *ex post* and *ex ante* bankruptcy costs, we get $.85 + $19.8 + $14.9 = $35.6 billion per year as our estimate of total bankruptcy costs in 1980 given parameter values prevailing under the Act. The figure for total bankruptcy costs in 1980 given parameter values under the Code is $.83 + $13.4 + $9.0 = $23.2 billion per year. The estimates suggest that the upper bound on total bankruptcy costs has fallen substantially. The decline is attributable to decreases in *ex ante* bankruptcy costs both from fewer firms continuing that should liquidate and fewer firms reorganizing that should liquidate. It is also of interest that *ex post* bankruptcy transactions costs are only about 2 to 4 percent of the upper bound level of total bankruptcy costs. Thus the results suggest that it is impossible to infer from data on bankruptcy transactions costs alone whether total bankruptcy costs are high or low, since the former are only a very small part of the latter. See Table 2.

These results suggest that bankruptcy costs are much higher than they would appear if *ex post* bankruptcy transactions costs alone are considered. But if bankruptcy costs are high, then it is of interest to consider policy measures which might lower them. The most obvious approach would view bankruptcy costs as the deadweight cost of the corporate income tax favoring use of debt over equity.[18] Then reducing bankruptcy costs could involve reducing the corporate income tax rate or exempting dividends from personal income taxes. An alternative policy approach might limit firms' use of secured debt at the margin, perhaps by preventing firms from using inventory or accounts receivable as collateral. This would make it more difficult for failing firms to transfer assets from early unsecured lenders to late secured lenders as a means of avoiding bankruptcy.[19]

To summarize, we have argued that the main economic effect of the new Bankruptcy Code has been to reduce the likelihood of reorganization of firms in bankruptcy. Since reorganization implies that firms which are likely to be economically inefficient continue to operate in basically the same form, this change probably enhances economic efficiency by speeding the transfer of resources from less valuable to more valuable uses. The change is reflected in a lower estimate of aggregate bankruptcy costs using parameter values under the

[18] This argument has been made by Scott [12], Kim et al [9] and Gordon and Malkiel [4].

[19] Prior to the adoption of the Uniform Commercial Code, assets other than buildings or long lived equipment were not used as collateral. See Schwartz [11].

Table 2

Aggregate Bankruptcy Costs per Year under the Old Bankruptcy Act Versus the New Bankruptcy Code (Upper Bound Estimates Calculated for 1980)

	Act	Code
Ex post bankruptcy costs	$.85 billion	$.83 billion
Ex ante bankruptcy costs		
Firms continuing that should liquidate	$19.8 billion	$13.4 billion
Firms reorganizing that should liquidate	$14.9 billion	$9.0 billion
Total	$35.6 billion	$23.2 billion

Code than using values prevailing before the Code. The estimates for the upper bound on total bankruptcy costs as of 1980 are $23.2 billion per year using parameter values prevailing under the new Code versus $35.6 billion per year using values prevailing under the old Act. These estimates are based on a small sample of bankrupt firms and they require many somewhat speculative assumptions. However the estimates suggest strongly that bankruptcy costs are higher than has previously been thought and that further research and rethinking is needed in this area.

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