ANATOMY OF FINANCIAL DISTRESS:
AN EXAMINATION OF JUNK-BOND ISSUERS

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ABSTRACT

This paper examines the events following the onset of
financial distress for 102 public junk bond issuers. We find
that out-of-court debt relief mainly comes from junk bond
holders; banks almost never forgive principal, though they do
defer payments and waive debt covenants. Asset sales are an
important means of avoiding Chapter 11 reorganization; however,
they may be limited by industry factors. If a company simply
restructures its bank debt, but either does not restructure its
public debt or does not sell major assets or merge, the company
goes bankrupt. The structure of a company's liabilities affects
the likelihood that it goes bankrupt; companies whose bank and
private debt are secured as well as companies with complex public
debt structures are more prone to go bankrupt. Finally, there is
no evidence that more profitable distressed companies are more
successful in dealing with financial distress; they are not less
likely to go bankrupt, sell assets, or reduce capital expenditures.

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1. Introduction

What are the costs of financial distress? There are as many answers as models. In truth, no one knows, though these costs are presumed to be a central component of capital structure decisions. Indeed, we do not even know much about what companies do when they get into financial trouble. This paper begins to fill this gap -- first by documenting how companies cope with financial distress, and second by analyzing what implications these findings have for understanding the costs of financial distress.

Our study is based on a sample of 102 companies that issued high-yield "junk" bonds, during the 1970s and 1980s and subsequently got into financial trouble. These companies deal with distress in one or more ways. They: (i) restructure their bank and private debt through direct negotiations; (ii) restructure their public debt with an ex- change offer of cash and securities; (iii) get an infusion of new capital; (iv) sell major assets or merge; (v) reduce capital expenditures; and (vi) file for Chapter 11 reorganization.

There are a number of striking facts that emerge:

(1) Outside of formal bankruptcy proceedings, banks almost never (there is one exception) forgive principal on their loans and they rarely provide new financing. They often waive covenants and defer principal and interest payments, buy they also often force accelerated payments and increase their collateral.

(2) Asset sales are an important means of avoiding bankruptcy; only 3 out of 21 companies that sell over 20% of their assets go bankrupt. But, asset sales are limited by industry factors. Consistent with Shleifer and Vishny's (1991) model, companies in poorly performing industries or in industries with high leverage (so that there is less debt capacity in the industry to finance an acquisition) are less likely to sell assets.

(3) Public debt restructurings through exchange offers are also crucial for avoiding bankruptcy. Every company in the sample that simply restructures its bank debt, but either fails to restructure its public debt or does not sell major assets or merge, goes bankrupt.

(4) The structure of a company's liabilities affects the likelihood that it goes bankrupt. In particular, companies whose bank and private debt is secured as well as companies with complex public debt structures are more prone to end up seeking bankruptcy protection.

(5) There is no evidence that companies with better performance are more successful in dealing with financial distress. Better companies (measured by operating income and cash flow shortages) are not less prone to go bankrupt, sell assets, or reduce capital expenditures.

(6) Capital expenditure reductions are large. 83% of the firms reduce capital expenditures from the year before the onset of distress to the year after. Industry factors and company downsizing account for much, but not all, of the reduction.

We conclude that banks do not play much of a role in resolving financial distress. This is despite the view that one of the benefits of borrowing from a bank is that the bank is in a better position by virtue of its relationship with the firm to assist it in financial distress. Nevertheless, companies that restructure their bank debt are just as likely to go bankrupt as those that do not. Real debt relief -- when it is obtained -- comes from subordinated public creditors.

In our view, banks play such a limited role because of the presence of subordinate public debt. The reason is that bank-led bailouts primarily benefit the subordinated creditors since they are the residual claimants. Also, because the banks are always senior -- and in many cases secured -- they stand to do quite well in bankruptcy. Therefore their incentive to take unilateral steps to help the company are quite limited; this is a variation on the familiar debt overhang problem identified by Myers (1977). Thus it is not surprising that we find that companies whose private debt is secured are more prone to file for Chapter 11.

What is in some ways more puzzling is why there aren't more comprehensive debt restructurings of both the bank debt and the public debt. These would avoid costly Chapter 11 filings that occur so often in our sample. The answer must be either that

Chapter 11 is not very expensive, or that there are substantial impediments to comprehensive out-of-court restructurings. Our finding that companies with complex debt structures are more prone to go bankrupt is consistent with the latter view.[1]

This evidence is indirect support for the notion that financial distress is costly. So is our finding that operating performance does not seem to affect whether or not a company files for bankruptcy. As Jensen (1989) has suggested one would expect good companies that get into trouble just because of high leverage to be able to restructure (almost) costlessly out of court; there is too much to lose by not doing so. But, this apparently is not the case. Moreover, the fact that asset sales are limited by industry factors adds to the costs of distress. Firms might prefer to bear the costs of an expensive restructuring to selling assets below their intrinsic value.

The remainder of the paper is organized as follows. The next section describes our sample selection and data sources. Sections 3 and 4 provide summary sample statistics on the causes and severity of financial distress in our sample and describe the variations in debt structure. Sections 5-9 contain analyses of bank restructurings, public debt restructurings, asset sales, capital expenditures, and bankruptcy, respectively. Section 10 is a brief conclusion.

2. Sample Selection and Data Description

Our sample selection procedure is motivated by our desire to include firms that get into financial distress because of high leverage rather than poor operating performance. For this reason, we choose to look at firms which issued high-yield public bonds ("junk" bonds) since these companies have significantly higher leverage than average companies. In addition, the incidence of distress, as measured by default, is large.[2] One potential disadvantage of restricting attention to junk-bond issuers is that these firms

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[1]   See Bulow and Shoven (1978), White (1980), Roe (1987), and Gertner and Scharfstein (1991) for theoretical arguments for this view.

[2]   Our ample is drawn from the universe of firms that issued high-yield public debt in the 1970s and 1980s, the sample analyzed by Asquith, Mullins, and Wolff (1989).

all have significant public debt in their capital structure, so our results may apply only to firms with public debt. This is a caveat that should be kept in mind throughout and we will remind the reader when it seems most relevant.

We do not select distressed firms on the basis of market performance, since market performance measures presumably include some information about the ability of a firm to cope with financial distress. If the market perceives that a particular company will be able to resolve its financial distress costlessly, the market reaction to the distress will not be severe. Therefore, a sample based on stock market returns will be biased to firms with relatively costly financial distress.

We define financial distress based on interest coverage ratios. A firm is classified as financially distressed if in any two years after issuing junk bonds, its earnings before interest, taxes, depreciation, and amortization (EBITDA) is less than its reported interest expense, or if in any one year EBITDA is less than 80% of its interest expense. We do not include a firm if it has an interest coverage ratio between 0.8 and 1.0 in one year. This is because the several firms that satisfy this condition took no discernable actions in response to distress, having sufficient liquid funds to meet their interest payments. In addition, firms may have especially high interest expense in the year they issue public debt because fees may be included in interest expense and the company may not have fully invested the proceeds of the issue. They may use some of these proceeds to pay first year's interest.

In addition, we eliminate firms which list a financial industry as their primary SIC code.[3] We require that firms have publicly-traded equity, in order to have access to full financial and market data. Thus, there are no LBOs in the sample.[4]

The resulting sample consists of 102 firms. For each of these firms, we collect data from a variety of sources. Financial accounting data comes from Compustat and individual 10-K filings with the Securities and Exchange Commission. Market return data

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[3] This does not eliminate all firms with significant financial components; there are a few home builders in the sample which own a financial subsidiary.

[4] For information on the incidence of financial distress in LBOs, see Kaplan and Stein (1991).

comes from CRSP at The University of Chicago. We also do extensive searches on the Nexis database which includes the *Wall Street Journal Index, The New York Times*, other newspapers, trade journals, business journals, and press releases.

We collect data along four basic dimensions: operating performance, including industry-adjusted performance; capital structure; asset sales; and financial restructurings. Our basic measure of performance is earnings before interest, taxes, and depreciation, although we also collect from Compustat and 10-Ks data on sales, book value of assets, cash holdings, working capital, book value of equity, and capital expenditures.

Industry performance controls, capital structure and size comparisons are collected by matching the sample firm's principal 4-digit SIC code from Dun and Bradstreet's *Million Dollar Directory* with other public firms with the same principal SIC code.[5] The data for these firms are then collected from Compustat. We derive deviations from industry medians for firms in the sample.

Capital structure information on Compustat is insufficiently detailed for our analysis, so we collect this information directly from 10-Ks. In particular, we collect a great deal of information on private debt, including the extent to which it is secured by the firm's assets, the number of lines of credit, whether the debt is bank debt or not, and whether the bank debt is syndicated. We collect similar detailed information on the public issues, paying close attention to the number of different issues, the number of levels of subordination of the public debt, and its maturity structure. We feel that many of these details may affect the incentives of creditors to renegotiate their claims and the efficiency of the bargaining process outside of bankruptcy, so if we wish to study how capital structure affects the resolution of distress, it is necessary to collect data at this level of detail.

Asset sales are the most difficult information on which to get consistent data across firms. The main source of this information is in the notes to the 10-Ks and press releases

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[5] We use the *Million Dollar Directory's* classification instead of Compustat's because Compustat only lists the most recent SIC code. Since distressed companies move in and out of industries quite often, it is important to have an accurate industry classification at the time of distress.

obtained from Nexis. Although firms do seem to report major asset sales regularly, they do not report standard information about these sales. When possible, we collect the cash component of the sale, and then separately collect the stated value of securities or other consideration given the selling firm. Finally, information about financial restructurings including covenant waivers, exchanges, and bankruptcies are taken from the 10-Ks and Nexis.

3. Sources of Financial Distress

The coverage shortfall criterion for financial distress can be met for three broad reasons: an industry downturn, high interest expense, or poor firm operating performance relative to its industry. In this section, we discuss the importance of these three factors for triggering financial distress. Table 1 contains some relevant summary statistics. Firms in our sample have approximately twice the interest expense of the median firm in their industry; junk- bond issuers are, not surprisingly, highly-leveraged. The median firm in the sample barely has positive EBITDA in the first year of financial distress and the mean return on assets is 0.12 less than the industry median. Only 5 firms outperform the industry median firm in year 0. In the first year of financial distress, the average firm's industry performs slightly worse than in the previous year.

We make the following three calculations for each firm in order to allocate the importance of the three factors in causing financial distress: (1) How much would cash flow improve in year 0 if the firm did as well as the median firm in its industry? (2) How much would the firm's cash flow improve in year 0 if it had the same ratio of interest expense to assets as the median firm in its industry? (3) How much would the firm's cash flow improve in year 0 if it did as well relative to industry as it actually did, but the industry did as well as it did in the previous year? The percentage of distress cause we allocate to firm operating performance is the answer to (1) divided by the sum of (1)-(3), the percentage we allocate to leverage is (2) divided by the sum of (1)-(3), and the percentage we allocate to industry performance is (3) divided by the sum of (1)-(3).

Panel B of Table 1 shows that firm performance is the most important factor, accounting for 60% of the initial cash flow shortage, the high leverage of our sample is responsible for 24% of cash flow shortage, and industry performance accounts for the remaining 16%. Only 9 firms have high leverage as the primary cause of distress and 15 have poor industry performance as the primary cause.

Thus, our attempts to generate a large sample of financially distressed companies that are not economically distressed is not entirely successful. Even among junk-bond issuers, the majority of firms that suffer from financial distress under-perform other firms in their industry significantly.

4. Debt Structure

A sizable portion of our analysis deals with the relation between the details of capital structure and the resolution of distress. Before proceeding, it is useful to have a picture of how the liabilities of the sample are structured before they get into trouble. Table 2 provides summary statistics on the debt structure of the sample companies. The data are from year -1, one year before the initial coverage shortfall. In almost all cases, companies have not yet begun any financial restructuring at this time.

As the table indicates, total debt is divided about evenly between public and private sources -- 51.5% is publicly-held issues while 48.5% is private debt held by banks and other financial institutions. The public debt is typically subordinate in right of payment to the bank and institutional debt, which comprise most of a company's senior debt.

Of the public debt, only a small fraction is secured. Further, the numbers in Table 2 probably overstate the degree of security of public debt because in many cases the public debt has only second or third liens on assets, behind the liens of private lenders.

On average, the sample companies have more than 2 public debt issues outstanding. Although these issues are all subordinate to the senior debt, they may have different rankings relative to each other. Most companies only have one tier of subordinated

debt, but there are 37 companies with at least two tiers.[6]

Of the private debt, 61.0% is bank debt; the remainder is usually held by insurance companies and other non-bank financial institutions. In almost all cases the company has a main credit facility with a bank from which it draws funds on a revolving basis. This facility comprises a large portion of the bank debt.

5. Bank Debt Restructurings

Of the 76 companies in our sample that react to financial distress by restructuring their assets or liabilities significantly, 59 (78%) restructure their bank debt in some way. Bank debt restructurings are most often triggered by a covenant violation, an omitted debt payment to the bank, or the recognition that either will soon occur. There are 43 covenant violations in the sample and 21 instances in which the company fails to make a payment to the bank.

Usually, covenants are written so that if the borrower violates a covenant or misses a debt payment, the bank can call the loan.[7] Typically banks do not fully exercise these contractual rights, choosing instead to restructure the debt. In every case in which a firm either violates a covenant or misses a debt payment there is some restructuring, though it is often a limited restructuring. The incentive to restructure is clear if there are substantial deadweight costs of bankruptcy. Bargaining takes place in the shadow of these potential costs and the threat point is the bank's right to call the loan and trigger bankruptcy.

A bank debt restructuring can take many forms. But, one form that it rarely takes is forgiveness of principal. It is clear why a senior -- possibly secured -- bank lender would not *unilaterally* forgive principal. By simply deferring principal and interest pay-

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[6] We determine the number of tiers based upon the priority suggested by the names of the securities. It is possible that we under-measure the number of tiers because two debentures with the same title may have unequal ranking.

[7] There are some instances in which covenant violations trigger an increase in the interest rate.

ments the bank can easily let the company stay in business. But, by not reducing its full claim, the bank does not compromise its claim in bankruptcy.

The more puzzling question is why we do not see principal forgiveness of senior bank debt as part of a comprehensive debt restructuring which includes the subordinated public debt. Zapata is the only such case in our sample. Zapata's principal bank lender agreed to take a package of cash, debt, and equity in exchange for $595 million of its original unsecured debt as part of a comprehensive restructuring which included as asset sale and an exchange of the subordinated public debt. In many ways the restructuring resembles a Chapter 11 reorganization. But, this is the only such case.

The other bank debt restructurings that we observe are more modest in scope. Restructurings can take one of two broad forms: banks can "loosen the screws" by waiving covenants, delaying principal and interest, or reducing the interest rate. Alternatively, banks can "tighten the screws" by reducing lines of credit or increasing their collateral. Most often, banks simultaneously loosen the screws in one way and tighten them in another. For example, when Kenai violated a covenant in its bank loan agreement, the bank waived the covenant but converted its otherwise unsecured line into a secured line. Similarly, Digicon's bank waived the covenant violation, but forced them to pay down $79 million on their $60 million revolver.

In our sample there are 35 cases in which a bank waives covenant out of a total of 43 covenant violations. By itself, a covenant waiver does not constitute much of a restructuring. In many of these cases, the covenant is waived for a short period until the technical default can be cured or the debt can be restructured. In the 8 cases in which the bank did not waive a covenant, the maturity of the debt was extended without an explicit waiver in 2 cases, the line of credit was reduced in 5 cases, and in another case the firm filed for Chapter 11 reorganization shortly afterwards.

In 28 cases, banks permit companies to delay debt payments, often converting a revolving line of credit into a term loan. Sometimes they simultaneously lower interest rates although in other cases interest rates are increased.

In 21 instances, a bank with a revolving line of credit tightens the screws by either reducing the amount available on the line or forcing the firm to pay down outstanding balances. There are 11 cases in which a bank takes new collateral on an outstanding loan. In some cases the collateral increase is combined with the bank reducing its exposure; in others, the collateral increase is compensation for allowing the company to delay its principal and interest payments.

The incentive to loosen or tighten the debt contract depends on a number of factors. First, one might expect banks to be more lax with better performing companies or those with better prospects. We find no evidence for this. Second, banks should be more reluctant to loosen the screws when they have only a small portion of the debt; the other creditors reap much of the benefit. Again there is no evidence to support this view.

Finally, the bank's security status should affect its restructuring incentives; here the date are more enlightening. Banks whose loans have collateral well in excess of their outstanding balance have little to lose by loosening the screws: even if the firm does poorly there is a deep cushion to protect the bank. If they tighten the screws, they risk bankruptcy, in which case they are likely to be paid in full, but may bear costs in pursuing their claim. In addition, sometimes bankruptcies have a life of their own, so there is always some risk that the deep cushion may disappear. Secured banks with small cushions have the opposite incentives. If firm value improves they gain nothing since they are already secured; if it falls, they bear most of the costs. We should see these banks be most aggressive in pursuing their claims.

The incentives of unsecured banks are more complicated. Since they typically hold short-term debt, they have some implicit seniority, to the extent that they are paid before others outside of bankruptcy. But, by extending maturity they give up some of their implicit seniority; their unsecured status means they are likely to do worse in a Chapter 11 reorganization than a secured creditor. Thus, we should see banks with unsecured, short-term loans tighten the screws by either pulling money out of the firm or by trying to increase their security status.

The data are generally in line with this prediction. In cases where the bank extends maturity, on average 65% of the private debt is secured, whereas when the bank does not extend maturity, 51% is secured. The medians are 79% and 51% respectively. The difference of the means is statistically significant at the 5% level. For banks that reduce lines of credit the results are less clear. The differences in the ratios are consistent with the theory, but the differences are small and not statistically significant.

In addition to restructuring existing debt, banks sometimes -- though not often -- provide new financing. This happens for 7 firms. The new money is an average of 20% of the original loan. In 4 of the cases -- National Healthcare, Zapata, Kenai, and Radice -- the bank provides new financing in exchange for securing its previously unsecured loan. In these cases, even though the new secured loan might not be profitable for the bank, taken as a package, the security on the old debt may make the transaction profitable by improving the bank's position in bankruptcy. There is no discernable pattern in the other 3 cases. In the case of Cardis, the new money was loaned as part of restructuring of a secured loan in which payments are deferred. In another case, Hardwicke simultaneously pays down part of the loan with an asset sale and borrows some more to finance working capital. And finally Documation increases its unsecured revolver substantially, only to violate covenants shortly afterwards. The company was then acquired.

6. Public Debt Restructurings -- Exchange Offers

While bank debt restructurings are usually the result of direct negotiation, the principal mechanism through which public debt is restructured is an exchange offer: the firm offers a package of cash and securities in exchange for some or all of its outstanding debt.[8] The offer is usually contingent on the tender of a minimum fraction of the debt. Restructuring takes this form rather than a direct renegotiation with large debt-

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[8] The terms of an exchange are often the outcome of negotiation between the firm and large debtholders.

holders or a trustee because the Trust Indenture Act of 1939 prohibits any voting mechanism (except unanimity) to alter the interest and principal payments on public debt. Thus, debtholders cannot include in the indenture a provision that allows them to reduce principal, if, for example, two-thirds subsequently agree to do so.[9] The only ways to restructure public debt are either agreements with individual debtholders or tender offers which exchange the old debt for securities which effectively lead to reductions of principal or longer maturity.

As Roe (1987) and Gertner and Scharfstein (1991) point out, however, exchange offers present problems of their own. If debtholders all have small stakes, no individual debtholder has an incentive to forgive principal or take a more junior claim such as equity or even longer maturity debt. He has no effect on whether the exchange goes through; if the offer is successful, others bear the cost, and he retains his full claim. If the exchange does not go through, his tender decision is irrelevant. So, there can be severe holdout problems, and as a result we may not expect to see many exchanges.

However, exchanges are quite common -- 34 companies successfully complete exchanges, many for more than one debt issue and some at more than one time. There are a total of 93 public debt issues exchanged. There are two explanations. First, debenture holders, in some instances, have large stakes and presumably take into account their effect on the outcome of the exchange offer. For example, First Executive Corporation held 82% of FPA's 12 5/8% senior notes and 87% of its 14 1/2% subordinated debentures. The exchange that occurred in July 1990 was more a negotiated restructuring than an arms-length transaction.

Second, as pointed out in Gertner and Scharfstein (1991) exchange offers can be structured to eliminate the holdout problem by offering debtholders more senior securities or, when it is available, cash. For example United Merchants and Manufacturers offered each holder of $1000 of its 15% subordinated debentures, $950 of 3% senior sub-

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ordinated debentures, with a second lien on all assets of the company except accounts receivable. Consider the decision facing a small debtholder. If everyone else tenders, he owns a junior claim that is potentially worthless in bankruptcy.[10] The prospect of being further subordinated in the debt structure induces debtholders to tender even if they are made no better off (and possibly worse off) as a group. The holdout problem is transformed into a "hold-in" problem in which debtholders rush to exchange. Such exchanges are quite common: of the 93 successful exchanges, at least 38 offer a more senior security as part of the exchange and 9 addition exchanges offer just cash.

Completing an exchange is a key determinant of whether a firm can avoid Chapter 11. Two facts make this clear. Of the 13 companies that try an exchange and fail, 12 later file for bankruptcy protection. The only one that does not, Electro-Audio Dynamics, liquidates itself outside of Chapter 11 over several years.

Moreover, of the 34 companies that complete an exchange, just 9 go bankrupt. This is lower than the 33 bankruptcies among the 42 companies that do some restructuring other than an exchange.[11] Of these 9 companies that avoid Chapter 11, 7 are acquired and the 2 others sell a large fraction of their assets. This points out the importance of public debt exchange offers relative to bank debt restructurings for keeping companies out of bankruptcy court.

Finally, there is an important difference between the exchanges of companies that avoid Chapter 11 and those that ultimately file. In the former case, most -- 14 out of 20 companies on which we have data -- provide some permanent relief by reducing principal and offering equity in an exchange. By contrast, of the 10 exchanging companies that eventually go bankrupt, only 3 offer such relief.[12]

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[10] Shortly after the exchange, United Merchants filed for bankruptcy. In the reorganization plan, holders of the old debentures are to be paid substantially less than debtholders who tendered.

[11] If we include in the denominator, companies that weather distress without any restructuring or major asset sales, the percentage of firms that do not attempt an exchange that go bankrupt is 55% which is still larger than the 29% of firms that complete an exchange. In addition, because we include as successful exchanges, any exchange in which the debtor accepts some securities, the category contains some exchanges that the debtor would undeniably call a failure.

[12] Relief may come in other ways such as a reduction and deferral of interest payments, interest payments in common stock, elimination of restrictive covenants, or elimination of a sinking fund pay-

7. Asset Sales and Mergers

One of the most natural ways for a financially distressed company to generate cash is to sell off some or all of its assets. There are three potential barriers to use of asset sales. First, management and equity may have little incentive to sell assets. When a firm is in serious financial distress, it is likely that the liquidation value of the firm is less than the firm's liabilities.[13] When this is the case, the only value of equity is its option value. Even if the firm's assets are worth more than its liabilities, the option value may be an important component of equity's value. By selling assets, equity is giving up the option value of those assets. Thus, equity will not have much incentive to sell assets. Management, to the extent that they act as agent's of equity will also have reduced incentives. The incentives of a manager who considers his own career in addition to (or instead of) equity's interests may wish to sell assets to avoid stigma associated with bankruptcy, but may also wish to maintain as large an organization as possible.

Second, Shleifer and Vishny (1991) point out that industry factors may limit the ability of companies to sell assets at a reasonable price. If a financially distressed company is in a financially distressed industry, natural industry buyers may not have sufficient to cash to buy the asset. And, given debt overhang and asymmetric information problems, it may be difficult and costly for them to raise funds externally. The same argument can be made for companies in good industries but which have high leverage.

Finally, private and public debt covenants may put severe restrictions on the ability of firms to sell assets and on the use of proceeds from any asset sales that are not prohibited. An individual creditor will be concerned that the firm will sell assets to pay back other creditors, pay dividends, or use as working capital. Moreover, proceeds from the sale of assets which secure a loan will typically need to be used to pay back the principal on the secured debt. Therefore, if an asset is worth less than the face value

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ment. We have not yet collected information on this although we plan to do so.

[13] By liquidation value, we do not necessarily mean piecemeal liquidation, but include the possibility of sell the entire firm or divisions as going-concerns.

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of the claim that it secures, a sale of that asset will not service unsecured debt nor provide funds for operations.

Thus, some creditors -- particularly secured creditors -- may seek to force asset sales and others may wish to block them. Sometimes an asset sale may benefit all creditors since they can extinguish equity's call option on the assets. And, management may in some cases want to sell assets for good economic reasons. Thus, it seems important to think of asset sales, not as unilateral decisions by management, but as negotiated agreements with private, and perhaps public, creditors.

Measuring asset sales is quite difficult since there is no standard way that companies report them and one cannot get reliable numbers from Compustat. Most companies report major asset sales in the notes to their financial statements in 10-Ks. They invariably report the cash component of the sale, but often give only sketchy details on other consideration received such as securities and assumption of liabilities of the seller. We include the value of the non-cash portion of the deal when it is reported. Moreover, some asset sales take the form of piecemeal liquidation of capital and shut-downs. If they are not reported in the notes of financial statements, we do not include them in asset sales. We only include asset sales prior to Chapter 11, for those companies that go bankrupt.

Our measure of asset sales is the total (cash and non-cash) proceeds of the sale divided by the book value of assets in year -1. Note that we normalize a market value number by a book value number; this has some obvious limitations. One alternative would be to use the book value of the assets sold, but we could not get such information. The other possibility would be to normalize by the market value of all assets, but it is virtually impossible to measure the market value of most debt.

Overall, asset sales play a fairly important role in restructurings. On average, companies sell 12% of their assets. Twenty-one companies sell more than 20% of their assets, and the median level among these twenty-one firms is 48%. Although the use of proceeds from asset sales is difficult to follow directly, there is some indication that

much of it goes to pay off senior private debt. The median percentage reduction of non-public debt from year -1 to year 1 for firms that sell at least 20% of their assets is -61% while the median percentage change in non-public debt over the same period for firms that sell less than 20% of their assets is a 34.6% increase. The same numbers for public debt are a 10% decrease for the median asset seller and no change for the median non-asset seller.

Summary statistics on the relation between asset sales and a variety of variables are reported in the first two columns of Table 4. Firms that sell assets are considerably less likely to go bankrupt -- only 14% (three out of twenty-one) compared to 49% of the non-asset sellers. Firms that sell a large fraction of their assets are more likely to complete a successful exchange -- 62% (13 of 21) versus 28% (22 of 79) for non-asset sellers. And, as we discuss in more detail below, asset sellers are in less highly leveraged industries than non-asset sellers. There are no other statistically significant differences in the means.

The first column of Table 5 reports probit results where the dependent variable is a dummy equal to one if the firm sells at least 20% of its assets. Operating performance variables are statistically insignificant as are degree of distress and firm capital structure variables. The number of public debt issues outstanding is marginally significant and positive. We do not have a good explanation for its relevance to asset sales.

The two significant variables are both industry variables: industry leverage and industry Tobin's q. Although statistically significant, the economic magnitude of the coefficients is not particularly large. A one standard deviation increase in industry leverage reduces the likelihood of significant asset sales by .06 and a one standard deviation increase in the reciprocal of industry Tobin's q, also reduces the likelihood of significant asset sales by .06.

These estimates are consistent with Shleifer and Vishny (1991) who argue that the market for assets of financially distressed firms may be quite illiquid because the potential buyers who value the assets most may also be suffering from distress. Additionally,

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high industry leverage will make asset sales more difficult since industry participants will be constrained in their ability to take on new debt to buy the division.

Thirteen firms in our sample are bought in their entirety by other firms. In many respects, a merger is analogous to an asset sale of 100% of the company. However, there are some differences. First, the incentives of managers to merge may be very different from their incentives to sell off a significant fraction of their assets. Major asset sales may be designed so that management can keep their jobs. In contrast, they may lose their jobs in a merger. Second, an asset sale permits equity holders to maintain some of their option value, but the option disappears with a merger.

Third, in a merger the acquirer often assumes the debt of the target, reducing the default risk of the debt dramatically. A potential acquirer would like to avoid making this transfer to the debenture holders. However, public debtholders have a very strong incentive to hold out in any exchange which offers less than full value; if they hold out and the acquisition goes through, their debt will be assumed. One way around this problem is to require a large supermajority in the exchange, thereby making most debtholders pivotal. This, of course, makes it less likely that the deal will go through. Otherwise, it seems that this problem implies that mergers will be more likely if the public debt is not dispersedly-held or if the merger takes place before the value of the public debt falls much below its face value.

The last two columns of Table 4 compares a variety of variables for firms that merge and firms that do not. There are very few significant differences. Note that although asset sales are strongly associated with exchange offers, mergers are not. This is consistent with the view that hold-out problems may be even more severe in mergers. However, there is no evidence that firms that merge are performing better or are in less severe financial distress than other firms.

The second column of numbers in Table 5 reports estimates from a probit on mergers and the third column has estimates from a probit where the dependent variable equals one if either the firms sells at least twenty percent of its assets or it merges. The

merger only regression demonstrates a significant and positive coefficient of the number of public debt issues outstanding, which we still do not have a good explanation for. In addition, the firm leverage coefficient is negative and statistically significant. More highly leveraged firms may find mergers less attractive because there is a greater likelihood that there will be nothing left for equity holders. The combined asset sales/merger regression looks very much like the asset-sales-only regression.

Our overall conclusion is that industry factors are significant in affecting the ability of firms to do distressed asset sales. Mergers appear to be qualitatively somewhat different than asset sales. The lack of a relation between exchange offers and mergers and the relative low leverage of merging firms is some evidence for the view that it is difficult to induce public creditors to forgive debt and that the incentive of equity holders to maintain their option value acts as a deterrent to mergers.

8. Capital Expenditures

Capital expenditures are one of the few discretionary uses of cash for a financially distressed firm. Thus, a significant cost of financial distress may be the firm's failure to make necessary and valuable investments. The firm may not have sufficient cash after making interest payments and it is likely to be very difficult to raise significant capital from outsiders because of the debt overhang problem.[14] For example, it is popularly believed that a large cost of financial distress to Southland was its inability to invest in the upkeep and improvement of its Seven-Eleven stores and a large cost to Interco was its inability to advertise and promote its Converse sneakers.[15] In this section we explore the impact that financial distress has on capital expenditures.

Table 6 provides information on capital expenditures. One striking fact is that capital expenditures do indeed drop dramatically when a firm finds itself in financial distress. Most of this impact does not appear until the year following the initial coverage

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[14] See Myers (1977). For a discussion on how bankruptcy rules, priority structure and exchange offers interact with the debt overhang problem. see Gertner and Scharfstein (1991).
[15] Neither firm is in our sample because they are both LBOs.

shortfall. The median decline in capital expenditures from the year before the initial coverage shortfall to the year after is 66%. Only 17% percent of the firms increase capital expenditures over this two year period. Correcting for industry capital expenditure growth rates, the effects are somewhat mitigated, but still very large.

Looking first at the ratio of capital expenditures to assets in Panel B, we see that the median ratio goes from .072 in year -1 to .025 in year 1. However, when we adjust for industry changes, the effect becomes considerably smaller; the median difference goes from 0 to -0.013. In Panel A we see that the median growth rates also decline from year -1 to 1 both with and without industry adjustment.

There are two interpretations of these capital expenditure reductions with very different implications. The first one, already mentioned above, is that distressed firms are constrained from investing efficiently. The second interpretation is that financially distressed firms are largely in trouble because they are performing poorly, are in bad industries, and are poorly managed. Therefore, it may be efficient to reduce capital expenditures. The concurrent reduction in industry capital expenditures indicates that the second interpretation has some merit.

To explore this issue in more detail, it is useful to see if we can explain the differences in industry-adjusted capital expenditures with performance, degree of distress, and, capital structure variables. Table 7 contains OLS regression estimates for capital expenditures in year 1. The results, unfortunately, are at best, inconclusive. The only two significant variables are preceding year's industry-adjusted operating income and industry-adjusted leverage. A positive coefficient on operating income is consistent with both interpretations, since better performance probably implies better investment opportunities, but it also indicates more cash flow to use for investment. We should lean toward the efficiency interpretation if industry-adjusted Tobin's q is statistically significant, but it is not. We should lean toward the constrained-investment interpretation if cash stock or cash flow shortage are statistically significant, but they are not.[16] It

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[16] Note we subtract previous period's capital expenditures in measuring the cash flow shortage to

is unclear why industry-adjusted leverage is positive. Regressions on year-0 capital expenditures are even less illuminating, so we do not report them.

9. Bankruptcy

In our sample of 102 financially distressed firms, 42 file for bankruptcy, all under Chapter 11 of the U.S. Bankruptcy Code. The ostensible goal of Chapter 11 is to give firms the time and breathing room to develop a consensual restructuring with creditors while maintaining firm value. In Chapter 11, firms are able to continue operating with current management, all debt payments are stayed, secured creditors cannot take possession of collateral, executory contracts can be rejected or assumed, and new borrowing usually has priority over all pre-bankruptcy claims. The debtor has the exclusive right to propose a reorganization plan for the first 120 days of the bankruptcy. The judge has the power, regularly used, to extend the exclusivity period. All operations of the firm are overseen by the court, and creditors are able to object to major business decisions. Creditors can try to force a resolution of a bankruptcy by seeking an end to exclusivity in order to propose their own plan and secured creditors' can attempt to lift the automatic stay in order to take possession of their collateral. The bankruptcy continues until a reorganization plan is approved or the company is liquidated.

Chapter 11 is usually considered to be costly and inefficient because of administrative costs (legal, consulting, accounting), the potential loss of valued customers and employees, the distraction of management, and the court's influence on operating decisions. Warner (1977), Altman (1984), and Weiss (1990) document the direct administrative costs of Chapter 11 bankruptcies. They estimate that direct costs are significant but not sufficiently large to make direct bankruptcy costs a key determinant in capital structure decisions. For example, Weiss (1990) finds that direct costs average 3.1% of the book value of debt plus the market value of equity at the end of the year prior to bankruptcy.[17] The other studies find slightly larger costs. Nonetheless, except in rare

avoid spurious correlation, given that last year's capital expenditures were a choice of the firm.

circumstances, a prolonged Chapter 11 bankruptcy must be less efficient than the same restructuring outside of bankruptcy since the same restructuring could theoretically be achieved without many of the costs associated with bankruptcy.[17] Of course, bankruptcy law will determine the threat points in the restructuring negotiations, and thereby determine the form of restructuring.

If the debtor and creditors are symmetrically informed and there are no transaction costs that impede restructuring negotiations, the Coase theorem implies that restructurings should be efficient and financial distress costless -- the parties will agree to a capital structure and operating policy that maximize firm value.[19] But the incidence of bankruptcy seems to be inconsistent with this view: fully 42% of the firms in our sample file for Chapter 11. This compares to the 34% of the sample that restructure out of court. Thus, 55% of the firms that restructure in some way, do so in bankruptcy.[20] It is hard to reconcile the high rate of bankruptcy with costless distress unless bankruptcy costs are insignificant. A more plausible explanation is that there are inefficiencies in the restructuring process.

As we have noted in the previous sections, it does appear that companies try to avoid bankruptcy by restructuring in other ways. Table 8 compares the means and medians of financial ratios and restructuring events for Chapter 11 and non-Chapter 11 firms. The table shows that firms that eventually file for Chapter 11 are significantly less likely to sell assets. As already indicated, of the 21 companies that sell more than

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[17] This is based on a sample of large firms. Since there are probably significant economies of scale in direct bankruptcy costs, this percentage would be higher for smaller companies. Studies on smaller companies are consistent with this.

[18] There may be some tax advantages to a bankruptcy restructuring compared to the same out-of-court restructuring. Pre-packaged bankruptcies, which are growing in popularity may not be more costly than an out-of-court restructuring. In a pre-packaged or "1126-b" bankruptcy, a firm files for bankruptcy with a reorganization plan already agreed upon to by creditors. The main benefit of a pre-packaged plan relative to an out-of-court restructuring is that it can compel all the creditors in a class to accept the will of a 2/3 majority of the class. In contrast, the Trust Indenture Act requires unanimity to restructure interest or principal payments on public debt. Crystal Oil is the only pre-packaged bankruptcy in our sample.

[19] Haugen and Senbet (1978) make this argument.

[20] This number is much larger than bargaining breakdowns in other settings such as union labor negotiations or pre-trial litigation negotiations.

20% of their assets only 3 go bankrupt. And, Chapter 11 firms are much less likely to have completed an exchange.

Bank debt restructurings seem to have much less impact on Chapter 11. There is no relation between bankruptcy filings and line of credit reduction, collateral increases, or new money infusions. By contrast, banks extend debt and interest payments with greater frequency for firms that eventually go bankrupt. There need be no causal link between the two; maturity extensions may only signal that the company is in serious distress and are more likely to require a restructuring. Overall, this evidence on bank debt restructurings and bankruptcy confirms our findings discussed in Section 5 on the limited role of bank debt restructurings.

The central issue here is why these other forms of restructuring are not more successful at keeping companies out of bankruptcy court. The answer must lie in understanding the bargaining breakdowns that lead to Chapter 11. For example, Jensen (1989) argues that highly-leveraged companies that are in financial distress should have an easier time restructuring out of court. Because of their high leverage they get into trouble before much value is dissipated. Thus, creditors realize that there is a lot to lose by not restructuring efficiently and have strong incentives to do so.

By contrast, much of the theoretical work on bankruptcy focuses on bargaining failures stemming for the existence of public debt and large numbers of creditors. Bulow and Shoven (1978) and White (1980) derive inefficiencies by assuming that it is impossible to negotiate with public creditors. Gertner and Scharfstein (1991) extend this work by showing that similar inefficiencies persist even when firms are capable of restructuring public debt with exchange offers. Gertner (1990) shows how increasing the number of parties can increase bargaining inefficiencies under asymmetric information.

Tables 8 and 9 display comparisons of sample means and probits designed to address this issue. The specifications of the regression equations include both financial and operating performance variables. We use capital structure variables at $t = -1$, the year before the first cash flow shortfall, since we wish to look at financial structure

prior to any distress-related restructuring. Our performance measure -- the deviation of operating income before depreciation, interest, and taxes (EBITDA) from industry median EBITDA is taken in year 0. In addition to industry-adjusted performance, we wish to get a measure of the severity of financial distress. We use the cash flow shortfall (interest expense minus EBITDA) normalized by interest expense at year 0.

We run two types of probits. The first includes all firms in the sample. The second adds industry-adjusted performance and cash flow shortage in year 1. Since a number of firms file for Chapter 11 in year 1 and performance may be affected by a filing, we drop these firms from our second specification.

The results reported in Tables 8 and 9 shed some doubt on the view that better performing, higher leverage companies should be more likely to achieve an out-of-court restructuring. There is no strong evidence that operating performance has a significant impact on the likelihood of bankruptcy. The coefficient of industry-adjusted operating income is not statistically significant (nor is the difference in means in Table 8). This is also true in the probit that includes performance the year following distress. The point estimates also suggest little economic significance, so the problem is more than one of insufficient sample size and variation. The impact of a one standard deviation increase in the year-0 industry-adjusted operating income decreases the probability of bankruptcy less than 1% in the first specification and less than 7% in the second specification.[21]

Moreover, the coefficient of percentage cash shortfall is statistically insignificant and the incorrect sign in year 0.[22] In year 1, the coefficient is statistically significant at the 10% level. A one standard deviation increase in year-1 cash shortfall increases the probability of subsequent bankruptcy by 0.23. This provides some weak evidence that

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[21] The size of these effects depend upon what values of the variables we start from. All calculations are done based on sample means.

[22] Since the sample selection criterion is based on cash shortfall in year zero, it is possible that some bias may creep in here.

continued cash shortages over a period of two years increases the likelihood of bank-ruptcy.

In addition, the coefficient of industry-adjusted leverage is also statistically insig-nificant in both specifications. This indicates, once again, the failure to find evidence that better, more highly-leveraged distressed firms are more likely to resolve financial distress without bankruptcy and have lower distress costs.

Our next set of results relates to how debt structure affects the probability of bank-ruptcy. First, we find, somewhat surprisingly, that the coefficient of the fraction of debt that is public is statistically insignificant. As discussed above, much of the theoretical work on bankruptcy suggests that public debt is a major impediment to efficient re-structuring. Additionally, Gilson, John, and Lang (1990) provide empirical evidence that the presence of public debt increases the likelihood of bankruptcy relative to an out-of-court restructuring. The best way to explain the discrepancy in the results is that the Gilson, John, and Lang sample includes companies with no public debt. It makes sense that the mere presence of any significant public debt complicates the negotiation process considerably, while variations in the fraction of public debt conditional on its presence has little effect. This interpretation both reconciles our study with Gilson, John and Lang's and indicates that one reason why the incidence of bankruptcy is so high in our sample is because of the presence of public debt for all our companies.

By contrast, the number of public debt issues outstanding has a positive and statis-tically significant coefficient; a one standard deviation increase in the number of debt issues outstanding increases the probability of bankruptcy by 0.12 and 0.16 in the two probits, respectively. This variable measures the complexity of the public debt. If there are more issues outstanding the coordination needed for a restructuring is greater and the incentives for debtholders to free-ride on forgiveness of other creditors may in-crease. Therefore we interpret this result as being consistent with a bargaining ineffi-ciency view of bankruptcy and financial distress. We have collected two other measures of debt structure complexity: the number of priority tiers in the public debt and a Her-

findahl index to correct the number of public issues for variations in size. All three variables are very highly correlated and the results are not much different depending upon which one we use.

Our final result, and perhaps the most interesting, relates to the coefficient of the fraction of private debt (bank and non-bank) that is secured. We find a statistically significant positive relation between this variable and bankruptcy. A one standard deviation increase in this variable increase the likelihood of bankruptcy by 0.12 and 0.09 in two regressions, respectively. A shift from none of the debt secured to all of it secured increases the estimated probability of bankruptcy by 0.34 and 0.25, respectively.

One explanation of this result is that secured creditors do well in bankruptcy; they are likely to be paid in full, or nearly in full.[23] Thus, secured creditors have strong incentives to pull the plug and trigger bankruptcy when they fear that their collateral is threatened or when they fear that cash is going to be distributed to less senior creditors.

This explanation, however, is seemingly at odds with the earlier result that secured banks are more likely to extend maturity on a loan. In one case, they appear to be more prone to tighten the screws, in another, to loosen the screws. The difference, in our view, may be one of timing. Secured banks may be lax early on to the extent that their loans are more than fully collateralized. Extension of maturity costs the bank nothing in the long run, so long as its cushion remains deep enough to be paid in full. But, when the value of its security falls near the level of the loan, they have stronger incentives and greater ability than an unsecured creditor to pull the plug as quickly as possible. By contrast, an unsecured private creditor may be willing, at this point, to restructure in exchange for an increase in collateral.

We conclude by noting that it is possible that there is an exogenous factor which determines both bankruptcy and capital structure choices. Although it is hard to tell a plausible story of this form for debt complexity, it may be possible to tell one for securi-

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[23] This statement was more true prior to the Supreme Court decision in *United Savings Association of Texas v. Timbers of Inwood Forest Asssociates, Ltd.* 484 U.S. 365 (1988). The decision reduced the ability of undersecured creditors to receive interest payments during bankruptcy proceedings.

ty. Although we do not have a satisfactory explanation for variation in the presence of secured debt, it is possible that firms with more liquid assets have more secured debt because it is easier to foreclose and resell. It is also possible that creditors are more likely to force a firm with a high liquidation value into bankruptcy since bankruptcy costs may be lower. If this is the case, there may be no causal link between secured debt and bankruptcy.

10. Conclusion

Our paper is part of a growing empirical literature on bankruptcy and financial distress. We conclude by briefly reviewing this literature and discussing its relation to our work. Two other studies compare Chapter 11 reorganizations to out-of-court restructurings. Gilson, John, and Lang (1990), which we discussed above, shows that firms with more public debt and creditors are less likely to restructure out of court. Franks and Torous (1991) compare deviations in absolute priority in out-of-court restructurings and bankruptcy reorganizations. These papers differ from ours in that they restrict their focus to debt restructurings and Chapter 11s. In addition, they select their samples based upon the outcomes of financial distress and reductions in market values. By using coverage ratios, we feel that we are likely to avoid some of the selection biases potentially introduced by their procedures.

Flynn (1989) analyzes a large sample of Chapter 11 filings. He shows a positive, but weak relation between the time spent in bankruptcy and the ratio of assets to liabilities prior to filing among firms that successfully reorganize. This finding is consistent with the idea that better performing firms do not necessarily have lower costs of financial distress. In contrast to our results, Hoshi, Kashyap, and Scharfstein (1990) demonstrate that Japanese firms that have close ties to a bank appear to suffer less in financial distress than firms that do not. One reason that Japanese banks may play such an important role in restructuring is that, until recently, there was no real public debt market in Japan. Finally, Gilson (1989) and (1990) document the effects of financial distress on

managers and corporate governance, respectively, two reactions to distress that we do not consider. He finds that banks often gain control of the company and managerial turnover is high. But, given our results, this may be more to protect their own interests at the expense of the company.

Taken together, these papers and ours help to piece together an anatomy of financial distress. We doubt whether anyone will ever be able to measure the costs of financial distress accurately. But this anatomy should be helpful in identifying what these costs may be, identifying how firms can structure their debt to avoid them, and pointing to the practical difficulties firms face in dealing with financial distress.

Table 1

Sources of Coverage Shortfall for Sample of 102 Distressed Junk-Bond Issuers with Earnings Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

Panel A: Sources of Coverage Shortfall in First Year of Financial Distress (t = 0)

	Mean	Median	Standard Error of Mean	Number of Observations
INTEREST EXPENSE / ASSETS				
Sample Firms	0.075	0.068	0.004	101
Industry Median	0.039	0.036	0.002	102
Deviation from Industry Median	0.036	0.028	0.004	101
EBITDA / ASSETS				
Sample Firms	-0.031	0.004	0.014	101
Industry Median	0.097	0.109	0.007	102
Deviation from Industry Median	-0.127	-0.102	0.016	99
INDUSTRY MEDIAN CHANGE IN EBITDA / ASSETS FROM T = -1 TO T = 0	-0.030	-0.018	0.005	100

Panel B: Normalized Sources of Coverage Shortfall in First Year of Financial Distress (t = 0)

Factor	Mean %	Median %	Standard Deviation %	Number of Firms with Primary Cause
Leverage	0.239	0.198	0.312	9
Industry Operating Performance	0.157	0.083	0.371	15
Firm Operating Performance	0.603	0.704	0.398	66

Table 2

Structure of Debt Obligations for Sample of 102 Distressed Junk Bond-Issuers with Earnings Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

All debt summary statistics are for year -1, the fiscal year-end prior to a company's first coverage shortfall.

	Mean	Standard Deviation	Number of Companies
PUBLIC DEBT / TOTAL DEBT	0.515	0.262	100
SECURED PUBLIC DEBT / PUBLIC DEBT	0.105	0.267	95
NUMBER OF PUBLIC ISSUES	2.45	2.27	100
TIERS	1.46	0.881	100
PRIVATE DEBT / TOTAL DEBT	0.485	0.262	100
NON-BANK PRIVATE DEBT / PRIVATE DEBT	0.399	0.32	100
SECURED NON-BANK DEBT / NON-BANK PRIVATE DEBT	0.406	0.218	99
BANK DEBT / PRIVATE DEBT	0.601	0.32	100
SECURED BANK DEBT / BANK DEBT	0.562	0.768	90
MAIN FACILITY / PRIVATE DEBT	0.438	0.35	99

Table 3

Summary of Types of Default and Methods of Financial Restructuring for 76 Junk-Bond Issuers Who Do Some Form of Restructuring

Outcome	# of Firms	Fraction of 76 Firms	# of Firms Ch. 11	Fraction of Firms Ch. 11
DEFAULT:	59	0.78	36	0.61
Technical Covenant Violation	42	0.55	27	0.64
Miss principal and/or interest	40	0.53	25	0.63
Miss principal and/or interest on public debt only	19	0.25	12	0.63
Miss principal and/or interest on bank debt only	4	0.05	1	0.25
Miss principal and/or interest on both	17	0.36	12	0.71
PRIVATE DEBT RESTRUCTURING:	59	0.78	33	0.56
Covenant Waiver	37	0.49	20	0.54
Maturity Extension	28	0.37	16	0.57
Reduction in main credit facility	22	0.29	14	0.64
Increase in collateral	11	0.14	6	0.55
No private debt restructuring	17	0.22	9	0.53
PUBLIC DEBT RESTRUCTURING:	34	0.45	10	0.29
Successful Exchange Offer	34	0.45	10	0.29
Failed Exchange Offer	13	0.17	12	0.92
Do not attempt exchange	31	0.41	22	0.71

Note: Fraction of Firms Ch. 11 column represents the fraction of firms that file for Chapter 11 that satisfy the criterion for inclusion in the row. It is the the third column divided by the first column.

Table 4

Determinants of Asset Sales and Mergers -- Comparison of Mean Financial Ratios and
Restructuring Event Incidence in a Sample of 102 Junk-Bond Issuers with Interest Coverage
Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

Variable	Asset Sales > 20% Mean (S.E.) N = 21	Asset Sales < 20% Mean (S.E.) N = 81	Merger Mean (S.E.) N = 13	No Merger Mean (S.E.) N = 89
(EBITDA / Assets) - Industry Median (EBITDA / Assets) at t = 0	-0.165 (0.043)	-0.118 (0.017)	-0.179 (0.065)	-0.120 (0.016)
Debt / Assets at t = -1	0.519 (0.050)	0.51 (0.018)	0.449* (0.035)	0.520* (0.019)
(Interest Expense - EBITDA) / Interest Expense at t = 0	1.279 (0.320)	1.319 (0.137)	1.520 (0.484)	1.270 (0.126)
Cash Balances / Interest Expense at t = 0	1.846 (0.684)	1.115 (0.164)	0.691** (0.184)	1.347** (0.209)
Fraction of bank and private debt secured at t = -1	0.531 (0.082)	0.558 (0.043)	0.497 (0.110)	0.563 (0.040)
Fraction of debt that is publicly held at t = -1	0.524 (0.050)	0.523 (0.030)	0.546 (0.066)	0.511 (0.029)
Number of public debt issues at t = -1	2.810 (0.486)	2.390 (0.260)	3.154 (0.697)	2.345 (0.239)
Industry Median (Debt / Assets) at t = 0	0.262*** (0.039)	0.373*** (0.017)	0.301 (0.044)	0.354 (0.017)
Industry Median (1 / Tobin's q) at t = 0	0.723 (0.125)	0.949 (0.068)	0.957 (0.109)	0.889 (0.066)
Chapter 11 Dummy	0.143*** (0.078)	0.494*** (0.057)	0.000*** (0.000)	0.472*** (0.053)
Successful Exchange Offer Dummy	0.619*** (0.109)	0.278*** (0.051)	0.385 (0.140)	0.337 (0.050)
Bank Maturity Extension Dummy	0.238 (0.095)	0.304 (0.052)	0.077** (0.077)	0.315** (0.050)
Bank Collateral Increase Dummy	0.095 (0.066)	0.114 (0.036)	0.077 (0.077)	0.112 (0.034)
New Money From Any Source Dummy	.381 (0.109)	0.354 (0.054)	0.538 (0.144)	0.337 (0.050)

Note: * denotes significance at 10% level, ** at 5% level, and *** at 1% level.

Table 5

Determinants of Asset Sales and Mergers -- Probit Regressions in a Sample of 102 Junk-Bond Issuers with Interest Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

Dependent variable is a dummy equal to 1 if firm sells more than 20% of its assets. Model 1 dependent variable is a 1 if the firm sells more than 20% of its assets and does not merge. Model 2 dependent variable is a 1 if the firm merges. Model 3 dependent variable is a 1 if either the firm sells more than 20% of its assets or it merges. The fraction of asset sales is the market value of assets sold divided by book value of assets at t=0. t-statistics are in parentheses.

Variable	Model 1: Asset Sales Only Coefficient (t-statistic)	Model 2: Merger Only Coefficient (t-statistic)	Model 3: Asset Sales or Merger Coefficient (t-statistic)	Mean (Std. Dev.)
Fraction of bank and private debt secured at t = -1	-0.137 (-0.285)	-0.043 (-0.080)	-0.177 (-0.424)	0.54 (0.37)
# of public debt issues outstanding at t = -1	0.140 (1.698)	0.18 (1.951)	0.131 (1.766)	2.50 (2.29)
Fraction of debt that is public at t = -1	-0.713 (-1.018)	-0.504 (-0.659)	-0.502 (-0.624)	0.52 (0.26)
Debt/Assets at t = -1	0.010 (-0.009)	-3.907 (-2.182)	-1.006 (-1.011)	0.51 (0.17)
(EBITDA/Assets) - Industry Median (EBITDA/Assets) at t = 0	-1.263 (-0.844)	-1.343 (-0.793)	-0.161 (-0.123)	-0.13 (0.16)
(Interest Expense - EBITDA) / Interest Expense at t = 0	-0.088 (-0.448)	-0.14 (-0.681)	-0.004 (-0.025)	1.31 (1.28)
Cash Balances / Interest Expense at t = 0	0.0179 (0.164)	-0.499 (-1.537)	-0.095 (-0.852)	1.171 (1.515)
Industry Median (Debt / Assets)	-2.199 (-1.997)	-0.605 (-0.416)	-2.081 (-2.079)	0.35 (0.16)
Industry Median (1 / Tobin's q)	-0.679 (-2.181)	-0.249 (-0.714)	-0.551 (-2.032)	0.91 (0.61)
Constant	0.397 (0.472)	1.321 (1.236)	1.212 (1.483)	
Dependent Variable: Asset Sales Dummy Asset Sales Only Mergers Only Asset Sales or Merger				0.19 0.11 0.28
Number of Observations Chi^2	94 13.31	96 12.25	94 11.71	

Table 6

Capital Expenditures -- Summary Statistics in a Sample of 102 Junk-Bond Issuers with Interest Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

Panel A: Median Capital Expenditure Growth

From t =	To t =	Median Growth Rate	Fraction Negative	Median Industry-Adjusted Growth Rate	Fraction Negative
-1	0	-0.185	0.63	-0.082	0.64
0	1	-0.522	0.77	-0.296	0.74
-1	1	-0.658	0.83	-0.38	0.77

Notes: $t = 0$ is the first year of coverage shortfall. Capital expenditure growth rates are calculated as capital expenditures in the end year less capital expenditures in the start year divided by capital expenditures in the start year. Industry adjusted growth rates are the firm growth rate less the median industry growth rate.

Panel B: Median Capital Expenditures / Assets

Year: t =	Median Capital Expenditures / Assets	Median Industry-Adjusted Capital Expenditures / Assets
-1	0.072	0
0	0.05	0
1	0.025	-0.013

Notes: $t = 0$ is first year of coverage shortfall. Industry adjusted capital expenditures / assets is firm capital expenditures divided by assets minus median industry capital expenditures / assets.

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Table 7

Capital Expenditures -- Regression in a Sample of
102 Junk-Bond Issuers with Interest Coverage Less than 1.0 for
Two Consecutive Years or Less than 0.8 for One Year

Dependent variable is capital expenditures divided by assets minus median industry capital expenditures divided by assets in year t = 1, the first year after coverage shortfall. t-statistics are in parentheses.

Variable	Coefficient (t-statistic)	Mean (Std. Dev.)
Capital Expenditures / Assets - Median Industry Capital Expenditures / Assets at t = 0	0.180 (1.723)	0.071 (0.068)
Fraction of bank and private debt secured at t = -1	0.010 (0.804)	0.53 (0.369)
# of public debt issues outstanding at t = -1	-0.001 (-0.191)	2.425 (2.147)
Fraction of debt that is public at t = -1	0.008 (0.444)	0.514 (0.274)
Debt/Assets - Industry Median (Debt/Assets) at t = -1	0.065 (2.674)	0.192 (0.207)
(EBITDA/Assets) - Industry Median (EBITDA/Assets) at t = 0	0.111 (1.925)	-0.097 (0.104)
(Interest Expense - EBITDA - Capital Expenditures) / Interest Expense at t = 0	0.003 (0.709)	-0.120 (1.641)
Cash Balances / Interest Expense at t = 0	0.004 (1.485)	1.286 (1.602)
(1 / Tobin's q) - Industry Median (1 / Tobin's q) at t = 0	0.001 (0.410)	-0.176 (2.314)
Constant	-0.042 (-2.901)	
Dependent Variable: (Capital Expenditures / Assets) - Industry Median (Capital Expenditures / Assets) at t = 0		-0.137 (0.040)
Number of Observations **R^2**	73 0.215	

Table 8

Determinants of Chapter 11 -- Comparison of Mean Financial Ratios and Restructuring Event Incidence in a Sample of 102 Junk-Bond Issuers with Interest Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

The first two columns contain mean, standard error of the mean, and median values for financial ratios and restructuring event incidence for companies that do not file for Chapter 11 bankruptcy. The final two columns provide the same measures for companies that do file for Chapter 11 bankruptcy.

Variable	No Ch. 11 Mean (S.E.) N = 60	No Ch. 11 Median N = 60	Ch. 11 Mean (S.E.) N = 42	Ch. 11 Median N = 42
(EBITDA / Assets) - Industry Median (EBITDA / Assets) at t = 0	-0.125 (0.022)	-0.103	-0.131 (0.023)	-0.09
(EBITDA / Assets) - Industry Median (EBITDA / Assets) at t = 0*	-0.045 (0.007)	-0.03	-0.026 (0.007)	-0.02
(Debt / Assets) - Industry Median (Debt / Assets) at t = -1	0.173 (0.023)	0.14	0.192 (0.033)	0.14
(Interest Expense - EBITDA) / Interest Expense at t = 0	1.293 (0.178)	0.87	1.309 (0.168)	1.079
Cash Balances / Interest Expense at t = 0	1.435 (0.235)	0.675	1.035 (0.304)	0.635
Cash Balances / Interest Expense at t = 1	1.697 (0.451)	0.792	1.972 (0.863)	0.468
Fraction of bank and private debt secured at t = -1**	0.482 (0.048)	0.49	0.657 (0.056)	0.79
Fraction of debt that is publicly held at t = -1	0.509 (0.036)	0.48	0.524 (0.039)	0.53
Number of public debt issues at t = -1*	2.080 (0.218)	1	2.980 (0.438)	2
Industry Median (1 / Tobin's q) at t = 0	0.866 (0.074)	0.81	0.943 (0.096)	0.91
Successful Exchange Offer Dummy**	0.433 (0.065)	0	0.214 (0.064)	0
Asset Sales / (Assets at t = -1)*	0.155 (0.030)	0.02	0.078 (0.029)	0
Asset Sales / (Assets at t = -1) > 0.2 Dummy***	0.310 (0.061)	0	0.071 (0.040)	0
Bank Maturity Extension Dummy*	0.217 (0.054)	0	0.381 (0.076)	0
Bank Collateral Increase Dummy	0.083 (0.036)	0	0.143 (0.055)	0
New Money From Any Source Dummy	0.400 (0.064)	0	0.310 (0.072)	0

Note: * denotes significance at 10% level, ** at 5% level, and *** at 1% level.

Table 9

Determinants of Chapter 11 -- Probit Regressions in a Sample of 102 Junk-Bond Issuers with Interest Coverage Less than 1.0 for Two Consecutive Years or Less than 0.8 for One Year

Dependent variable is a dummy variable equal to 1 if firm files Chapter 11. Model 1 contains all firms in the sample for which we have the necessary data. The column to its right contains mean and standard deviation of the variable. Model 2 contains all firms except those firms that file for Chapter 11 within one year of initial coverage shortfall. t-statistics are in parentheses

Variable	Model 1: All Firms	Mean (Std. Dev.)	Model 2: Exclude Early Ch. 11	Mean (Std. Dev.)
Fraction of bank and private debt secured at t = -1	0.741 (1.972)	0.55 (0.37)	0568 (1.090)	0.53 (0.37)
# of public debt issues outstanding at t = -1	0.138 (1.894)	2.47 (2.28)	0.291 (2.312)	2.51 (2.36)
Fraction of debt that is public at t = -1	-0.119 (-0.210)	0.51 (0.26)	0.259 (0.326)	0.51 (0.27)
Debt/Assets - Industry Median (Debt/Assets) at t = -1	0.050 (0.062)	0.18 (0.19)	-1.800 (-1.374)	0.17 (0.19)
(EBITDA/Assets) - Industry Median (EBITDA/Assets) at t = 0	0.528 (0.424)	-0.13 (0.16)	-2.968 (-0.809)	-0.10 (0.08)
(EBITDA/Assets) - Industry Median (EBITDA/Assets) at t = 1			0.363 (0.072)	-0.08 (0.08)
(Interest Expense - EBITDA) / Interest Expense at t = 0	0.059 (0.164)	1.29 (1.27)	-0.374 (-1.307)	1.12 (1.03)
(Interest Expense - EBITDA) / Interest Expense at t = 1			0.645 (1.477)	0.74 (1.21)
Cash Balances / Interest Expense at t = 0	-0.295 (-2.107)	1.179 (1.503)	-0.205 (-0.523)	
Cash Balances / Interest Expense at t = 1			-1.110 (1.907)	
Constant	-0.609 (-1.429)		-0.869 (-1.199)	
Dependent Variable -- Chapter 11 Dummy		0.42		0.34
Number of Observations	96		73	
Chi²	15.68		32.46	

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REFERENCES

Altman, E., "A Further Investigation of the Bankruptcy Cost Question," *Journal of Finance*, 39, 1984, 1067-1089.

Asquith, P., D. Mullins, and E. Wolff, "Original Issue High Yield Bonds: Aging Analyses of Defaults, Exchanges, and Calls," *Journal of Finance*, 44, 1989, 923-952.

Bulow, J. and J. Shoven, "The Bankruptcy Decision," *Bell Journal of Economics*, 9, 1978, 436-445.

Coffee, J. and W. Klein, "Bondholder Coercion: The Problem of Constrained Choice in Debt Tender Offers and Recapitalizations," Working Paper #53, Center for Law and Economic Studies, Columbia University, 1991.

Flynn, E. "Statistical Analysis of Chapter 11," working paper, Statistical Analysis and Reports Division, Administrative Office of the United States Court, Bankruptcy Division, 1989.

Franks, J. and W. Torous, "How Firms Fare in Workouts and Chapter 11 Reorganizations," working paper, University of California, Los Angeles, 1990.

Gertner, R. and D. Scharfstein, "A Theory of Workouts and the Effects of Reorganization Law," *Journal of Finance*, 46, 1991, 1189-1221.

Gertner, R., "Inefficiency in Three-Person Bargaining," manuscript, University of Chicago, 1990.

Gilson, S., Management Turnover and Financial Distress," *Journal of Financial Economics*, 25, 1989, 241-262.

Gilson, S. "Bankruptcy, Boards, Banks, and Blockholders: Evidence on Changes in Corporate Ownership and Control when Firms Default," Journal *of Financial Economics*, 27, 1990, 355-387.

Gilson, S., K. John, and L. Lang, "Troubled Debt Restructurings: An Empirical Study of Private Reorganization of Firms in Default," *Journal of Financial Economics*, 27, 1990, 315-353.

Haugen, R. and L. Senbet, "The Insignificance of Bankruptcy Costs to the Theory of Optimal Capital Structure," *Journal of Finance*, 33, 1978, 383-393.

Hoshi. T., A. Kashyap, and D. Scharfstein, "The Role of Banks in Reducing the Costs of Financial Distress in Japan," *Journal of Financial Economics*, 27, 1990, 67-88.

Jensen, M., "Active Investors, LBOs and the Privatization of Bankruptcy," *Journal of Applied Corporate Finance*, 2, 1989, 35-44.

Kaplan, S. and J. Stein, "The Evolution of Buyout Pricing and Financial Structure in the 1980s," working paper, University of Chicago, 1991.

Myers, S., "Determinants of Corporate Borrowing," *Journal of Financial Economics*, 5, 1977, 147-176.

Roe, M., "The Voting Prohibition in Bond Workouts," *Yale Law Journal*, 97, 1987, 232-279.

Shleifer, A. and R. Vishny, "Asset Sales and Debt Capacity," manuscript, University of Chicago, 1991.

Warner, J., "Bankruptcy Costs: Some Evidence," *Journal of Finance*, 32, 1977, 337-347.

Weiss, "Bankruptcy Resolution: Direct Costs and Violation of Priority of Claims," *Journal of Financial Economics*, 27, 1990, 285-314.

White, M., "Public Policy toward Bankruptcy: Me-First and Other Priority Rules," *Bell Journal of Economics*, 11, 1980, 550-564.