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How Long Do Junk Bonds Spend in Default?

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ABSTRACT

This paper analyzes junk bond defaults during 1980 to 1991 to determine which factors affect the length of time spent in default. Bondholder holdouts are not a significant problem, as firms with proportionately more bonds have shorter default spells. In contrast, bank debt is associated with slower restructurings. Bargaining problems arising from contingent liabilities, lawsuits, and size delay the process, although multiple bond classes do not. Neither information problems nor firm value appear to matter. HLTs do not resolve their defaults at a significantly faster pace. Defaults tend to take less time in the 1990s, despite Drexel's disappearance from the market.

THE PLAN TO REPAY THE CREDITORS of the LTV Corporation was confirmed in June 1993, marking the end of the longest bond default of the modern junk bond market. LTV's bondholders had endured nearly seven years of negotiations that started when the steel company filed for Chapter 11 in the summer of 1986. What caused the renegotiation of LTV's debt to take so long? Why could other firms, such as Seaman Furniture, resolve their defaults in only a few months?

Theory suggests that bargaining and coordination problems may slow down the restructuring process (e.g., Giammarino (1989), Gertner and Scharfstein (1991), Mooradian (1994), and Roe (1987)). A larger or more disperse group of creditors would add to the opportunities for bargaining. Moreover, bondholders in particular are believed to face a holdout problem in exchange offers, which could to lead to several rounds of offers. Evidence from Gilson, John, and Lang (1990) that firms with more bank debt tend to restructure out of court suggests that banks help lead their clients out of default more quickly. Asquith, Gertner, and Scharfstein (1994), however, do not find such a strong role for banks; and Chatterjee, Dhillon, and Ramirez (1996) find

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that bank debt is associated with greater use of traditional bankruptcy compared to prepacks and workouts. Negotiations may also be protracted when there are more information asymmetries or nebulous claims (such as unfunded pension liabilities) whose values might be disputed.

Average default spells may be affected by the institutions that exist to resolve default. For example, Jensen (1991) argues that Drexel was a facilitator of exchange offers, which typically take less time. And prepackaged bankruptcies, which have become more popular in recent years, offer a speedier alternative to traditional bankruptcy filings.

Jensen (1991) and Wruck (1990) posit that creditors of leveraged buyouts and other highly leveraged transactions (HLTs) are spurred to resolve defaults quickly to preserve firm value. However, although some costs of distress may rise with time in default (such as direct legal and advisory fees, lost sales, and costs due to lack of management focus on operations), Andrade and Kaplan (1996) find no relationship between time in distress and lost sales.

This paper examines defaults of junk bond issuers to determine which defaults are quickly resolved and which are not. The investigation is based on a sample of defaults and troubled exchange offers on original-issue high yield bonds between 1980 and 1991.[1] Because of the high default rate in 1990 to 1991, a large fraction of this sample exhibits more modern characteristics, such as prepackaged bankruptcies and vulture investors. Moreover, unlike most previous studies, the data include failed leveraged buyouts and other private firms. This study is also different in that it focuses on the time required to restructure, rather than on whether or not the firm files for bankruptcy.

My analysis shows that size, lawsuits over the allocation of the value of the firm, and the presence of contingent claims are significant factors that lengthen the default spell, suggesting that bargaining concerns are an important consideration in financial distress. However, the number of bond classes and whether the debt is publicly held do not appear to present particularly severe bargaining hurdles. Moreover, counter to Gilson et al. (1990), but consistent with Asquith et al. (1994), banks in this sample do not facilitate the process, and even appear to slow down the renegotiations. In contrast, a large fraction of the liability structure in the form of junk bonds appears to speed up the process considerably, despite the theoretical proposition that junk bonds should suffer from the holdout problem. There is some evidence of a holdout problem among banks, however. The data show little support for the view that firms try to preserve value by avoiding lengthy periods of financial distress. Finally, firms that renegotiated their debt with the help of Michael Milken may have ended their default spells earlier.

The remainder of the paper is organized as follows: Section I reviews the previous empirical research that is related to the topic of how long defaults

[1] Moody's (1997) shows that the vast majority of bond defaults occur among speculative-grade credits, especially original-issue junk bonds.

last. Section II describes the data, as well as basic statistics on the default spells. Section III lists the variables used to explain how long defaults last and Section IV presents the empirical estimations. Section V is the conclusion.

I. Previous Empirical Literature

Several studies present statistics on how long bond defaults or Chapter 11 cases last, without necessarily explaining why the default spells vary. Altman and Eberhart (1994) and Betker (1994) find that bond defaults typically last 2 to $2\frac{1}{2}$ years. McMillan, Nachtmann, and Phillips-Patrick (1991), Altman (1993), and Hotchkiss (1995) estimate that bankruptcy typically lasts from $1\frac{1}{2}$ to $2\frac{1}{2}$ years, with cases at the short end of the range accounted for by smaller firms. Andrade and Kaplan (1996) detail the period of distress for firms that were involved in HLTs.

Another set of studies researches the differences between firms that file for Chapter 11 and those that renegotiate out of court. Gilson, John, and Lang (1990) discover that firms with more bank debt, fewer classes of debt, and less tangible assets tend to renegotiate privately. In their sample the median workout takes only eleven months, whereas the median firm that eventually files for Chapter 11 spends twenty-one months restructuring (in total). Franks and Torous (1994) find that healthier firms avoid Chapter 11.

Asquith et al. (1994) study junk bond issuers that became distressed, and among other things, consider the propensity to file for Chapter 11. In contrast to previous research, they find no relationship between firm value and the probability of filing for bankruptcy; nor do they find that banks facilitate the restructuring process.

Chatterjee et al. (1996) examine the propensity to file a prepackaged Chapter 11 relative to workouts and traditional bankruptcy filings, and report that the firms most likely to use a traditional Chapter 11 are less healthy, smaller, and have more bank debt.

II. The Data

The data set is based on a list of all original-issue junk bonds that went into default between 1980 and 1991, compiled by Salomon Brothers High Yield Research Group (1992). The list of defaults compiled by Salomon only includes bonds that were rated speculative-grade or unrated at issuance. Moreover, it only includes bonds originally offered in the public high yield market and private placements with registrations that entered the public market prior to default. A bond is considered in default for the purposes of the study not only if an interest payment is missed, but also if a troubled exchange or tender offer is announced (including 3(a)(9) exchange offers). Though the determination of whether the exchange offer is troubled depends on the judgment of the Salomon staff that compiled the list, they seem to follow Moody's rule quite closely—exchanges are considered defaults when-

ever (1) the issuer offers bondholders a new security or package of securities containing diminished financial obligation and (2) the exchange had the apparent purpose of helping the borrower avoid default (see Moody's (1997)).

The Salomon Brothers list includes 262 firms, of which 250 were not affiliated with another company on the list. Ten companies are deleted from the sample because they had questionable defaults, such as paying the interest within the grace period. Firms are deleted if they were subject to different bankruptcy rules (9 foreign and 26 firms in highly regulated industries).[2] Firms that defaulted on less than $35 million of original-issue high yield debt (55 firms) are excluded from the study because of the dearth of information on such firms, as are 4 larger firms that had insufficient information on the length of time in default and 19 larger firms that did not have financial data in any period within six months of the default. The final sample includes 127 firms and 129 defaults because two firms defaulted twice (ALC Communications and Sunshine Mining). (Other firms defaulted twice, but the second default did not occur before 1992.)

Many of the firms that lack data are private firms, leading to a bias in the sample against inclusion of private firms. Of the 23 larger firms excluded for insufficient data, 16 are privately owned, including 11 leveraged buyouts.

The default experiences of the firms are investigated through a search of the financial press and financial databases.[3] These sources, particularly Nexis, are also used to determine the bank debt owed at the time of default. Leveraged buyouts and recapitalizations are identified from the sources mentioned above, as well as from Securities Data Corporation's database on mergers and acquisitions and a database provided by Moody's Investors Service. Data sources for the operating performance/firm value variables include COMPUSTAT, Compact Disclosure, Moody's Industrials and other Moody's manuals, and analysts' research reports on distressed bonds. Data on financial variables are from the time of default. If data are not available at the time of default, data within six months of default are used instead (usually prior to the date of default).

A. The Default Spells

The time spent in default is defined as the number of months between the default announcement month and the month bondholders receive funds. I choose months in default rather than days because of imprecise information

[2] U.S. subsidiaries of foreign firms that file for bankruptcy in the United States or complete exchange offers without being affected by the bankruptcy of their parents' are not excluded.

[3] The sources include *The Wall Street Journal*, *Bloomberg Business News*, *Mergers and Corporate Policy*, *The Bankruptcy Yearbook and Almanacs of 1992 and 1993*, *Forbes, The New York Times, Investment Dealers Digest*, research reports by Salomon Brothers, Merrill Lynch, First Boston, and Delaware Bay, Standard & Poor's *Creditweek* and *High Yield Quarterly*, Moody's Investors Service's *Bond Survey* and *Corporate Credit Research* reports, and financial press reports available in Nexis.

Table I

Time in Default by Type of Restructuring

The sample includes defaults on original-issue junk bonds that occurred during 1980 to 1991. Default spells are measured in months, starting with the first month in which the bondholders knew a coupon or maturity payment would not be made and ending with the month in which the bondholders knew the disposition of their claims. "Prepacks" are prepackaged bankruptcy filings where the plan of reorganization has been accepted by most creditors prior to filing. "Out of court" defaults are cases in which the firm never filed for bankruptcy protection.

	All Firms	Prepacks	Other Chapter 11	Out of Court
Average number of months in default	20.1	19.4	30.5	7.7
Median number of months in default	18	18	34	6
Longest default spell (in months)	83	34	83	25
Shortest default spell (In months)	1	6	8	1
First quartile of default spells (in months)	8	13	21	3
Third quartile of default spells (in months)	29	26	36	12
Number of defaults	129	26	57	46

on the resolution date for many firms. By 1995, all of the firms had resolved their defaults. For most of the 129 defaults (81), the end of the default spell occurs when the firm emerges from bankruptcy, including 27 firms that emerge from a prepackaged bankruptcy. The next most common resolution to default (42 cases) is an agreement by a majority of bondholders to exchange their bonds for new securities, cash, or combination of the two. The remaining firms were either acquired (4) or liquidated (2).

The analysis here deals only with the period from default to acceptance of new securities or emergence from bankruptcy, and disregards subsequent financial distress or subsequent efforts to restructure the firm. At the time that the default period ended, most bondholders were sufficiently convinced of the viability of the new capital structure to vote in favor of it. Thus, even though some firms subsequently suffered further financial distress, it was not clear to bondholders then that the firm needed further restructuring.

Table I shows the distribution of default spells by the type of restructuring undertaken. The typical bond default lasts about $1\frac{1}{2}$ years. The longest default belongs to LTV, which emerged from bankruptcy after nearly seven years (83 months), and several firms tied for the shortest default by completing exchange offers in a month. The resolution of the default is usually a lengthier process for firms that enter bankruptcy. Traditional Chapter 11 cases took more than 30 months from default to resolution, in comparison to out-of-court restructurings that lasted less than eight months, on average. Prepackaged bankruptcies, being a hybrid of the two types of restructuring, fall in the middle.

The typically longer process for firms that file Chapter 11 does not necessarily reflect the sluggishness of the courts. In actuality, few firms in the sample begin their default spells by filing for bankruptcy. All but five of the

firms that filed Chapter 11 did so more than one month after default and nearly half of them entered Chapter 11 after spending six months or more in default. Five firms, Calton, General Homes, Republic Health, Sharon Steel, and USG, were in default for more than two years before finally filing for bankruptcy. Moreover, the time spent in Chapter 11 can be quite short—the fastest bankruptcy in the sample is two months (Memorex-Telex's prepackaged bankruptcy), which was preceded by five months in default. The shortest time spent in default among the Chapter 11 filers was six months (Trump Plaza, also a prepackaged filing).

III. Explanatory Variables

Opportunities for bargaining among claimants, the holdout problem, and information problems are believed to make the restructuring process more difficult, thereby delaying the renegotiation process. Additionally, Jensen (1989, 1991) and Wruck (1990) posit that bondholders of firms with ongoing-concern value (e.g., leveraged buyouts and other HLTs) have an incentive to speed up the negotiations to preserve firm value. Wruck notes that Chapter 11 can serve as a device to preserve the jobs of entrenched managers, who thus have an incentive to delay the process. Finally, institutional considerations may vary over time. Summary statistics for the explanatory variables are presented in Table II.

A. Bargaining Opportunities

Many theoretical analyses of the renegotiation process emphasize the role of different securities and creditors in the bargaining outcome (Giammarino (1989), Gertner and Scharfstein (1991), Mooradian (1994), Roe (1987), Bulow and Shoven (1978), and White (1980)). Roe points out that multicreditor bargains are difficult to strike for several reasons. Each creditor class must ensure that its decision to take partial payment benefits the firm (and thus himself) rather than other creditors. Moreover, various claimants prefer liquidation to continuation or greater investment, depending on where they stand in the rankings of creditors. Bondholders and trade creditors may pose additional problems if they are diffuse groups of claimants who play a passive role in the negotiations. Kahan and Tuckman (1993), however, present evidence suggesting that bondholders are not passive agents.

A.1. Complexity of the Capital Structure

Bargaining opportunities are expected to slow down the restructuring process to a greater extent as the number and types of claimants involved increases. Because this sample is defined by firms that defaulted on public corporate bonds that had been issued as junk bonds, all of the firms have at least one class of bondholders. Then, capital structures that would invite greater bargaining in this sample are those where the firm also has bank

Table II

Summary Statistics of the Explanatory Variables

The sample includes 129 defaults on original-issue junk bonds that occurred during 1980 to 1991. Bond classes are counted using data on priorities of original-issue junk bonds. Contingent liabilities are unfunded pension liabilities or environmental liabilities that are 10 percent or more of total liabilities at default. Lawsuits include actual and threatened lawsuits between creditors. Syndicated loan is 1 for firms with ten or more banks, firms whose loans are described as syndicated, and firms whose bank group is estimated at 9.5 banks or higher. R&D indicator is set to 1 for firms that report having any R&D expenditures, 0 otherwise. HLTs (highly leveraged transactions) are leveraged buyouts and leveraged recaps. Drexel-supported firms defaulted by 1989 and used Drexel as underwriter on their bonds. EBITDA/liabilities is earnings before interest, taxes, depreciation, and amortization divided by liabilities near the time of default. Industry market-to-book is calculated from COMPUSTAT at the four-digit SIC code level.

	1980–85	1986	1987	1988	1989	1990	1991
Number of firms defaulting in year(s)	15	8	8	11	13	40	34

Indicator Variable	Sum
Several bond classes	45
Contingent liabilities	13
Lawsuit	24
Syndicated loan	70
R&D	10
HLT	50
Drexel supported	15
No bank debt	21
Real estate/housing industry	9

Continuous Variable	Mean	Median
Size (liabilities in $millions)	1035	517
Original-issue high yield bonds/total liabilities	39.2%	37.7%
Industry market/book	1.49	1.34
EBITDA/liabilities	4.8%	5.3%
Bank debt/total liabilities	22.6%	20.0%

debt, more than one class of public bonds, privately placed bonds, unfunded pension liabilities and other contingent claims, trade claims, and preferred stock.

Specific data on the entire liability structure of these firms are often difficult to obtain, however, making it impossible to count these various creditor classes in either number or amount. The Salomon Brothers default study provides very reliable data on the original-issue junk bonds on which the firm defaulted, including their seniority and amount outstanding at default. This allows us to determine the number of classes of junk bonds and how much debt was owed to junk bondholders.

Another proxy for the complexity of the capital structure is size, as larger firms typically have more creditor classes and are more likely to have securities issued by both the holding and operating companies. Also, larger firms may have a variety of assets whose valuations offer an opportunity for bargaining. We measure size as liabilities at the time of default because asset write-downs and declining firm value make assets and sales poor measures of size, and because liabilities are closest to the value of the claims submitted in bankruptcy.

A.2. Contingent Claims

Opportunities for negotiating a favorable outcome for a particular creditor at the expense of another creditor are greater when there is uncertainty about the value of some creditors' claims. Two types of claims are typically unknown at the time of default because of their contingent nature: claims for environmental problems and claims for underfunded pensions. If these claims are substantial, the restructuring of the firm cannot proceed until a compromise is reached on their size. Among environmental claims, asbestos claims are particularly complicated because the number of people who suffered from exposure to asbestos is unknown. An indicator variable for firms with contingent liabilities of at least 10 percent of liabilities is included to assess the effects of these complications (separate effects for each type of contingent liability could not be estimated because of small samples).

A.3. Lawsuits

Lawsuits between creditors, such as those based on fraudulent conveyance or equitable subordination, present opportunities to debate the rankings of the creditors' claims. Fraudulent conveyance lawsuits have been threatened, and, less often, filed in failed LBOs and leveraged recapitalizations on the grounds that the sponsors and advisors of these HLTs should have known that the company did not have sufficient capital. Typically, junior bondholders argue in these lawsuits that banks' senior claims should be paid after their own. Equitable subordination lawsuits and other intercreditor suits are another method of rearranging the capital structure. An example is the case of Ames Department Stores, in which the trade creditors argued that the inventory belonged to the operating subsidiary whereas the holding company bondholders believed it was an asset of the holding company. An indicator variable for the presence of such lawsuits estimates the effects of these bargaining issues.

B. The Holdout Problem

As pointed out by Roe (1987) and Gertner and Scharfstein (1991), the process of restructuring publicly held debt is stymied by the holdout problem. Bondholders have an incentive not to participate in an out-of-court restructuring because the untendered bonds of the holdouts will be paid in

full at maturity on the original terms.[4] Likewise, a syndicated loan may involve a holdout problem if some banks in the syndicate reject softer terms or new credit lines (McConnell and Servaes (1991)).

The successful exchange offers in this sample typically had participation rates of more than 85 percent, and most set the required level in advance of the exchange at a similar level. When a firm cannot achieve such participation rates in its exchange offers, the next step is bankruptcy, where the required level of approval is only two-thirds of the face value and 51 percent of the bondholders in number. Thus, holdouts lengthen the restructuring process when firms that fail to capture the required vote are obliged to next proceed to bankruptcy to force the vote on the holdouts. One proxy for the holdout problem is how much public debt the company has in its liability structure, as public debt has a greater potential for a holdout problem than bank loans or private placements. Also, the number of banks that extended a loan to the firm is a measure of the holdout problem facing syndicated loans.[5]

C. Information Problems

Giammarino (1989) suggests that differential information between managers and creditors or between various creditor classes may lead to bargaining problems, which may require the intervention of the courts or multiple rounds of offers. Also, differences in information may spur the less informed claimants to wait until the results of decisions and investments have appeared before accepting a plan of reorganization. Information problems occur more often among firms with high growth opportunities, which are proxied for by expenditures on research and development and the ratio of market to book value of assets. Information asymmetries may be less of a concern among larger firms, given that they tend to have more analysts covering them.

D. Incentives to Hasten or Delay the Restructuring Process

The factors cited above potentially complicate the restructuring process, which, in turn, will likely lead to delays. In this section we consider more direct reasons for the speed with which the renegotiations are completed.

Jensen (1991) and Wruck (1990) argue that troubled LBOs and other intentionally highly leveraged firms are likely to be fundamentally profitable companies at the time of distress because less equity has been eroded by the

[4] The Trust Indenture Act of 1939 prevents the participating bondholders and the firm from changing the terms of the bond with the consent of the holdouts. See John (1993) for a more detailed description of the problem.

[5] The data for this variable are incomplete for some firms, so their bank group size is estimated. For example, the press reports may state merely that the firm owes $100 million to its banks. All but three firms have at least some data on the number of banks owed, and the number is known exactly for 69 firms. The data from this latter group of firms are used to estimate the number more precisely for the remaining firms.

time distress occurs. Indeed, in this sample the firms that were involved in HLTs reported considerably higher profit margins (EBITDA/sales) than the other firms in the sample, and had smaller declines in sales growth in the year prior to default. If distress costs rise with the time spent in default (because of lost sales, diverted management time, or inefficient investment decisions) then the desire to preserve value may motivate creditors to minimize bargaining costs and move forward.

The simplest variable to differentiate firms according to value at the time of default is an indicator variable for HLTs—all else constant, an HLT firm that defaults should have been losing money for less time and therefore is likely to have more going concern value.

The firm value that creditors are spurred to preserve includes the value of assets in place and the value of growth opportunities. EBITDA (earnings before interest, taxes, depreciation, and amortization) is a good measure of the value of assets in place, as it captures the stream of profits on existing investments without the biases of capital structure choices that occur with the use of net income. EBITDA is scaled by liabilities to account for differences in size. Growth opportunities are the same factors that are cited as potential information problems, except that Jensen (1991) and Wruck (1990) predict that these variables will have the opposite effect on time in default.

Entrenched managers may also cause a delay in the restructuring process if they wish to avoid optimal liquidations (Wruck (1990)). Managers are more likely to be entrenched when shareholders are a diffuse group with little power to dismiss the managers in bankruptcy (Hotchkiss (1995), Gilson (1989), and Betker (1995a) find management often does not turn over upon default.) In addition to having higher firm value, HLT firms are less likely to have entrenched managers because of their highly concentrated equity ownership.

E. Institutional Factors

A number of institutional factors may have complicated or facilitated the resolution of bond defaults over the sample period. For example, Jensen (1991) argues that institutional changes have made exchange offers less likely to succeed in recent years. In 1990, Judge Burton Lifland ruled that certain claims in the LTV case filed by bondholders that had participated in a previous exchange offer were not as large as had generally been believed, thereafter making bondholders wary of participating in exchange offers. Though the ruling was contested and later reversed, its impact on exchange offers would likely have lengthened the average time in default in 1990 and 1991. Also in 1990, the tax code was revised so that taxes on cancellation of indebtedness income became more difficult to avoid outside of bankruptcy.

Hotchkiss and Mooradian (1997) and Betker (1995a) report an increase over time in the number of distressed firms whose restructurings involved vulture funds. Moreover, they note that legal clarifications following the reorganization of Allegheny International in 1990 allowed a larger role for

vulture funds in reorganizations. Although we are not able to determine when vulture funds entered the restructuring process, press reports and 13-D filings indicate that vultures own bonds or bank debt (typically the former) for at least 85 firms in the sample.

To control for these various changes over time, indicator variables are included in the estimation for each of the years 1986 to 1991. Defaults that occurred in years prior to 1985 are too few in number for a reliable estimate of the coefficients, so they are pooled. Thus, the left-out category for the year indicators is 1980 to 1985. LTV risk and tax changes would make the coefficients for 1990 and 1991 positive, but vulture funds would be expected to make the coefficients more negative as time goes on.

Michael Milken and his associates at Drexel may have been able to facilitate workouts of high-yield bond issuers that encountered financial trouble (see Jensen (1991)). Drexel Burnham Lambert (1989) states that the firm was advisor on 275 exchange offers and recapitalizations during the 1980s, including 80 troubled exchange offers. Many of these troubled exchanges are not in the sample because the firms are too small, and others cannot be identified as Drexel clients because Drexel was not the underwriter on their bonds. To examine Milken's role, an indicator variable is included which is set to one for the firms in this sample whose bonds were underwritten by Drexel that defaulted before Drexel's troubles in 1989, zero otherwise.

IV. Estimates of the Time Spent in Default

The effects on the time spent in default of bargaining, holdouts, information problems, firm value, and institutional factors are estimated using ordinarily least squares regression. The regression estimates presented in Table III are not qualitatively different from estimates obtained from proportional hazard function estimates, which are not reported.[6]

The estimates of the model in column (1) of Table III show that size, contingent liabilities, and lawsuits slow down the restructuring process, suggesting that bargaining issues are an important factor in financial distress. The number of creditor classes, however, is not significant, although it has the expected positive sign. Unexpectedly, a greater fraction of public junk bonds in the capital structure is associated with a faster resolution of default. This suggests that bondholders are not a particularly difficult group to negotiate with compared to banks and private debtholders, and they may even facilitate the restructuring process. Furthermore, this result shows that there is no evidence of a bondholder holdout problem.[7]

[6] Survival analysis may be more appropriate for this study because the dependent variable is a spell of time, although (coincidentally) there are no censored observations in this sample.

[7] John (1993) notes that the holdout problem analysis assumes that bondholders do not collude. Anecdotally, there is evidence in the press reports in this sample that bondholders may collude, as they typically form a bondholder committee when default occurs, and, occasionally, they make involuntary Chapter 11 filings and offer competing plans of reorganization.

Table III

Time in Default Regressions

The sample includes 129 defaults on original-issue junk bonds that occurred during 1980 to 1991. The dependent variable is the number of months spent in default. Bond classes are counted using data on priorities of original-issue junk bonds. Size is total liabilities in millions. Contingent liabilities are unfunded pension liabilities or environmental liabilities that are 10 percent or more of total liabilities at default. Lawsuits include actual and threatened lawsuits between creditors. Junk bonds/total liabilities is calculated using data on original-issue junk bonds. Syndicated loan is 1 for firms with ten or more banks, firms whose loans are described as syndicated, and firms whose bank group is estimated at 9.5 banks or higher, 0 otherwise. R&D indicator is set to 1 for firms that report having any R&D expenditures, 0 otherwise. Industry market-to-book is calculated from COMPUSTAT at the four-digit SIC code level. HLTs (highly leveraged transactions) are leveraged buyouts and leveraged recaps. Drexel-supported firms defaulted by 1989 and used Drexel as underwriter on their bonds. EBITDA/liabilities is earnings before interest, taxes, depreciation, and amortization divided by liabilities near the time of default. Real estate indicator is set to 1 for firms in home-building or other real-estate industries, 0 otherwise. Figures in parentheses are *t*-statistics.

	Model					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	33.09	30.61	23.76	34.23	33.26	32.49
	(8.04)	(7.06)	(5.61)	(6.55)	(8.12)	(8.00)
Bargaining opportunities						
Several bond classes	2.37	1.79	1.49	1.29	1.90	1.02
	(0.98)	(0.74)	(0.60)	(0.53)	(0.78)	(0.42)
Size	0.003	0.002	0.003	0.002	0.003	0.003
	(2.77)	(2.66)	(3.52)	(2.52)	(2.79)	(3.12)
Contingent liabilities	10.61	10.83	12.02	11.64	11.98	12.00
	(2.86)	(2.95)	(3.19)	(3.12)	(3.22)	(3.27)
Lawsuit indicator	7.38	7.15	7.65	6.94	7.70	8.10
	(2.62)	(2.56)	(2.69)	(2.49)	(2.74)	(2.91)
Bargaining/holdout problem						
Junk bonds/liabilities	−15.53	−13.87	–	−14.27	−10.69	−8.90
	(−2.79)	(−2.47)		(−2.55)	(−1.81)	(−1.51)
Bank debt/total liabilities	–	–	12.33	–	–	–
			(2.00)			
Holdout problem						
Syndicated loan indicator	–	3.70	3.60	3.92	–	–
		(1.70)	(1.56)	(1.80)		

Information problems/direct incentives						
R&D indicator	−3.20	−3.13	−2.86	–	−3.15	−2.41
	(−0.76)	(−0.75)	(−0.67)		(−0.75)	(−0.58)
Industry market/book	–	–	–	−2.74	–	–
				(−1.31)		
Direct incentives						
EBITDA/liabilities	−9.39	−9.41	−14.72	−6.33	−10.61	−7.19
	(−0.56)	(−0.57)	(−0.89)	(−0.39)	(−0.64)	(−0.43)
HLT indicator	−0.89	−1.57	−3.04	−1.48	−0.92	−0.60
	(−0.34)	(−0.61)	(−1.18)	(−0.57)	(−0.36)	(−0.23)
Institutional factors						
Drexel support	−6.61	−6.83	−6.02	−7.23	−5.60	−5.56
	(−1.58)	(−1.64)	(−1.41)	(−1.77)	(−1.32)	(−1.33)
1986 default	−8.62	−7.95	−10.08	−8.02	−9.81	−9.95
	(−1.64)	(−1.52)	(−1.87)	(−1.57)	(−1.87)	(−1.92)
1987 default	−5.49	−5.11	−7.10	−4.12	−7.16	−7.10
	(−1.03)	(−0.97)	(−1.31)	(−0.79)	(−1.34)	(−1.34)
1988 default	−8.20	−8.34	−9.31	−7.40	−9.34	−10.25
	(−1.63)	(−1.68)	(−1.83)	(−1.48)	(−1.86)	(−2.06)
1989 default	−10.95	−9.78	−9.98	−9.06	−10.78	−11.78
	(−2.18)	(−1.95)	(−1.92)	(−1.80)	(−2.12)	(−2.33)
1990 default	−13.12	−12.72	−14.47	−12.30	−14.30	−15.68
	(−3.17)	(−3.09)	(−3.47)	(−3.01)	(−3.44)	(−3.77)
1991 default	−16.75	−16.13	−17.42	−15.96	−17.73	−18.61
	(−3.94)	(−3.81)	(−4.05)	(−3.79)	(−4.18)	(−4.42)
No bank loan indicator	–	–	–	–	−5.95	−6.62
					(−1.98)	(−2.22)
Real estate indicator	–	–	–	–	–	8.28
						(1.97)
	$n = 129$	$n = 129$	$n = 125$	$n = 129$	$n = 126$	$n = 126$
	$R^2 = 0.40$	$R^2 = 0.41$	$R^2 = 0.40$	$R^2 = 0.42$	$R^2 = 0.41$	$R^2 = 0.42$

The estimates in column (1) show no effects on the time in default from information problems or incentives based on the value of the firm. Neither R&D expenses nor operating profits (EBITDA) are significant, although each has a sign consistent with the notion that claimants are motived by a desire to preserve value. Although R&D's insignificance could be attributed to the mixed effects of incentives to preserve value and the problems associated with asymmetric information, the same insignificance of the measure of assets in place suggests otherwise.[8] Likewise, the indicator variable for HLTs also has the correct sign to be consistent with a role for firm value, but is not significant.

Institutional factors, as measured by the passage of time, appear to matter considerably as the sample period progresses. The coefficients for year indicators in 1989 to 1991 are significantly negative and suggest a reduction in the default spell of about a year. This is consistent with Hotchkiss and Mooradian's (1997) view that vulture funds make restructurings more efficient, particularly in recent years when they gained more powers in the bankruptcy court. The trend over time may also reflect the recent tendency for courts to allow competing plans of reorganization (i.e., plans not offered by management). Although the Drexel variable is not quite significant at standard levels, the sign and magnitude of the coefficient is consistent with the view that Milken played a strong role as a facilitator of workouts.

The regression estimates shown in column (2) are from a model that also includes an indicator variable for syndicated bank loans. The syndicated loan variable is 1 for firms that are known or estimated to owe money to ten or more banks, 1 for firms known to owe money to a syndicate of banks, and 0 otherwise. The estimates in column (2) show that owing money to a syndicate of banks significantly slows down the restructuring process by an average of 3.7 months. Additional estimates (not shown) indicate that this result is not sensitive to the definition of the syndicate. The coefficients of most of the other variables in the model are approximately unchanged from the prior specification, except for the proportion of liabilities owed to junk bondholders, which is now less negative. This suggests that part of its significance is the result of problems associated with bank loans.

The estimates in column (3) shed further light on the relationship between the time in default and the amount of liabilities owed to junk bondholders. In this specification, the proportion of claims owed to banks (bank debt/liabilities) replaces junk bonds/liabilities. The estimates basically show the inverse of the previous result: the greater the fraction of debt owed to banks, the slower the renegotiation process.

The set of coefficients and *t*-statistics presented in column (4) comes from a model where the firms' growth opportunities and their information problems are measured by the market-to-book ratio of the industry, rather than an indicator variable for R&D expenses. Many of the firms in the sample are

[8] Variations on EBITDA are not significant either: they include EBITDA scaled by sales, scaled by long-term debt, and adjusted for profitability of the industry.

private, making it impossible to calculate their market-to-book ratio. A substitute used by Smith and Watts (1992) is the industry market-to-book ratio. This variable has an insignificant negative sign.[9]

The results presented in columns (5) and (6) of Table III help us to further understand the negative coefficient of the proportion of claims owed to original-issue junk bondholders. First, we replace the syndicated loan variable with an indicator variable for firms that do not owe any money to a bank (there are 21 such firms in the sample). Whether it reflects the simplicity of the capital structure or the difficulties of negotiating with banks, the firms that do not have banks as claimants on the firm spend a significantly shorter time in default.

Though this result is at odds with much of the existing literature, press reports about one of the defaults in the sample suggest anecdotally that banks can be a hindrance in restructuring. NVR, an East Coast home builder that defaulted in late 1990, had a loan with a syndicate of banks led by Citibank and Pittsburgh National Bank. In at least one plan of reorganization, their claims were unimpaired, yet the banks splintered into two groups, with one offering its own plan of reorganization, and they moved to replace the management of NVR. In August 1992 Bloomberg reported that NVR indicated "it will be easier to put together a reorganization plan now that its three major bank lenders have sold their notes in NVR."[10]

The last column of Table III includes a dummy variable for whether the defaulting company operated in an industry related to housing or real estate. This was the only industry variable that was significant in the estimations. The additional eight months spent in default by real estate firms may reflect delays from banks with significant real estate-related problems and their pressures to meet regulatory capital requirements. (Note that the retail industry is not significantly slower, despite the possibility that its extra reliance on trade credit typically adds another set of creditors.) Notably, the coefficient of the ratio of junk bonds to liabilities in column (6) drops sharply compared to its value in column (1) and it is no longer significant at standard levels.

V. Conclusions

The time spent in default varies widely among firms that issued junk bonds, from as short as a month for the quickest of the firms that successfully complete exchange offers to as long as 83 months for the extraordinarily long LTV bankruptcy. As has been found in previous studies, the longer

[9] Regression estimates (not shown) using other measures of growth opportunities do not reveal a significant role either. These measures include plant, property, and equipment/liabilities; secured debt as a fraction of liabilities; market-to-book calculated using the market value of bonds and estimates for equity for private firms; and the growth rate of sales prior to default.

[10] Although the report did not say who bought the notes, there is a good chance they were sold to vultures.

default spells are those involving traditional Chapter 11 cases, followed by the hybrid prepackaged bankruptcy, with the shortest spells occurring when out-of-court offers are successful. Nevertheless, there is considerable overlap among the time periods associated with each type of workout.

The results of this investigation suggest that the variation in these restructurings is related in large part to bargaining issues. Firms with contingent liabilities, such as asbestos-related damages and unfunded pension liabilities, take considerably longer to end their default spells, as do large firms and companies whose creditors' claims are in such doubt as to generate lawsuits over their position in the capital structure. Evidence against bargaining factors, however, is the insignificance of multiple bond classes in the regression.

The estimations show no evidence of a holdout problem among bondholders. In fact, a greater fraction of claims owed to bondholders is associated with a significantly faster restructuring. This likely reflects the role of banks in this sample. Remember that all firms in the sample owe money to bondholders, so that those that also owe banks have more complicated capital structures. Beyond that fact, banks still appear to slow down the process. Like Asquith et al. (1994), this result paints a picture of banking that sharply contrasts with that in Gilson et al. (1990). The finding that loans to firms operating in the real estate industry sharply lengthens the default spell supports the notion that banks' regulated status hinders the resolution of bond defaults.

The estimations show no significant effect of firm value or lost growth opportunities on the time in default. Most of the coefficients have the correct sign for this theory, but none is significant. This is also true of the indicator for whether the firm was involved in an HLT. Perhaps this reflects the lack of a clear relationship between time in default and decreases in firm value.

The institutions involved in bond defaults have changed over the years, and, although this is hard to measure, appear to have important effects on the length of the average default spell. Michael Milken and his associates at Drexel likely helped their clients emerge faster. Despite the demise of Drexel, the LTV ruling, and taxes on out-of-court workouts, the trend over time in this sample is toward faster negotiations. This may be the result of the role of vulture funds or the increased ease with which firms can complete prepackaged bankruptcies.

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