Article

The security price effects of public debt defaults.

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Research was conducted to analyze the effect of bond **defaults** on corporate value. A sample of 249 **public debt defaults** in the period covering 1982 to 1991 was examined using stock and bond **price** behavior. The firms included all companies receiving a D rating from Standard and Poor's due to three reasons, namely, the announcement of an intention to miss an interest payment, bankruptcy filing or a payment default. Results indicate that the tax advantages of Chapter 11 are increased by a tax law change and that a workout is a cheaper alternative to a bankruptcy filing.

I. Introduction

This study documents the effect of bond **defaults** on firm value. I examine 249 **public debt defaults** that occurred between 1982 and 1991, and measure excess returns to bonds and stocks at the **debt** default and resolution of the default, defined as the month the default is cured, or the firm is acquired, completes a workout, or files for bankruptcy. Prior research, such as Warner (1977b), Bradley and Rosenzweig (1992), and Lang and Stulz (1992), focuses on the **security price effects** of bankruptcy filing announcements. By examining bond and stock **price** behavior around a sample of bond **defaults,** only some of which lead to bankruptcy, I provide new evidence on the costs and benefits of formal bankruptcy compared with out-of-court workouts. Evidence from **security** returns implies that bankruptcy is more costly than a workout, but that the cost differential is reduced for firms with large net operating loss carryforwards (NOLs). The evidence is also consistent with the argument that equity has greater option value in a workout compared with bankruptcy.

Some bond **defaults** occur because the firm files for bankruptcy. In other cases, firms default and later restructure either in or out of court. **Security** returns around the default and the resolution of the default differ depending on whether the firm completes a workout or files bankruptcy. Among bankrupt firms, I find substantially different **security** returns, depending on whether the firm's default coincides with or precedes its bankruptcy filing.

Analysis of **security** returns around the default and resolution yields two main results. First, among bankrupt firms, bonds that default before the bankruptcy filing lose 32 percent in the default month but only 3 percent in the bankruptcy filing month. Bonds of firms that simultaneously default and file bankruptcy lose 35 percent in the filing month. In contrast, stocks of firms that default before filing bankruptcy lose about 20 percent in both the default and filing months, while stocks of firms that simultaneously default and file lose 41 percent in the filing month. The fact that bonds realize most of their losses at the default, while total losses to stock are split equally between the default and bankruptcy filing, suggests equity has greater option value in a workout compared with bankruptcy. I find that **public debt defaults** result in bankruptcy over 80 percent of the time. Thus, both bonds and stocks might be expected to realize most of their losses at the default. Franks and Torous (1994) demonstrate that equityholders receive larger deviations from absolute priority in workouts than in bankruptcy, and they interpret this as evidence that equity's bargaining power is greater in a workout than in bankruptcy. The relatively large losses to stocks compared with bonds in the filing month may represent the loss of this bargaining power once the firm files for bankruptcy.

The second finding regarding **security** returns is that default- and resolution-month **security** returns are significantly higher for nonfiling firms compared with firms that default and later file bankruptcy. Gilson, John, and Lang (1990) also find that workout firms have higher stock returns at the default and resolution. Their result may indicate that financial distress costs are lower in workouts than in Chapter 11, or that workouts transfer wealth from bondholders to stockholders. Franks and Torous's (1994) finding that equity's deviation from absolute priority is larger in workouts than

in bankruptcy suggests the latter possibility. However, my finding that both bond and stock returns are higher in workout firms supports the "costly bankruptcy" explanation.

I next estimate multivariate regressions to analyze cross-sectional differences in **security** returns. After controlling for the **price effects** of the default, I find that filing for Chapter 11 does not always reduce **security prices,** and that completing a workout does not always result in positive returns. For example, among firms that have already defaulted, one-third of bankrupt firms earn positive excess bond returns at the Chapter 11 filing, while one-quarter of workout firms earn negative excess returns at the completion of the workout. By relating **security** returns to firm characteristics, I provide additional insight into the costs and benefits of bankruptcy.

NOLs are often a significant asset of distressed firms, and preserving them is an important goal of many **debt** restructurings. Before 1986, it was easy to preserve tax attributes in a **debt** restructuring. The Tax Reform Act of 1986 made it generally more difficult to preserve NOLs, but it also made it relatively easier to do in Chapter 11 than in a workout. This suggests that after 1986 firms with large tax loss carryforwards may benefit from bankruptcy. Consistent with this argument, I find. that before 1986, **security** returns are positively related to tax loss carryforwards at the resolution of the default. However, after 1986, **security** returns in the resolution month are negatively related to NOLs for workout firms but unrelated to NOLs for bankrupt firms. This result suggests that the tax law change significantly increased the tax advantages of Chapter 11. In other words, although bankruptcy is costlier than a workout, the cost difference is reduced for firms with large NOLs. Gilson, John, and Lang (1990) and Franks and Torous (1994) compare firm characteristics in workouts and bankruptcies, but neither study considers firms' tax attributes. The evidence in this study indicates that **securityholders** react to the firm's tax status when the firm resolves its bond default.

II. Data and Methodology

Sample Selection and Data Sources

The sample contains every firm that received a D rating on a **publicly** traded unsecured bond from Standard & Poor's (S&P) from 1982 to 1991. A D rating can occur because of a payment default, bankruptcy filing, or announcement by the firm that it intends to miss an interest payment. I identified firms from S&P's Creditwatch, which reports changes in **debt** ratings. Firms whose **debt** rating was changed from CCC or lower to not rated (NR) were also investigated for later bond **defaults.** This method identified 257 firms in default. Details of the firms' workout attempts and bankruptcy cases were obtained from financial statements, the Wall Street Journal, the Bankruptcy DataSource, the Capital Changes Reporter, S&P's Credit Week, and the NEXIS database. These data sources did not provide enough information to determine how 8 firms resolved their default, leaving 249 firms in the sample.

I obtained bond **prices** from S&P's Bond Guide. S&P reports the end-of-month sale **price,** bid **price,** ask **price,** or matrix **price,** in that order. Bond **prices** were not available for 38 firms, leaving 211 firms with 532 bond issues in the sample. Because of high correlation between bonds of the same firm, treating each bond as a single sample point overstates significance levels in empirical tests. The average correlation between the returns on bonds of the same firm is 0.61. Therefore, following Eberhart and Sweeney (1992), I average returns of all bonds from the same firm and treat this equally weighted portfolio as a single sample point. This procedure understates significance levels since it assumes a firm's bond returns are perfectly correlated. Results throughout the study are qualitatively unchanged if instead one bond is picked at random for each firm.

Monthly stock **prices** were obtained from several sources, beginning with the Center for Research in **Security Prices** (CRSP) data files. If firms are dropped from CRSP, I used the Bank and Quotation Record or S&P's Bond Guide, which reports monthly stock **prices** for firms with convertible bonds. I found 59 firms did not have **publicly** traded equity, leaving 190 stocks in the sample.

Bond **price** quotes were unavailable for 3 firms in the month the firms defaulted and 32 firms in the month the default was resolved (the firm cures the default, is acquired, completes a workout, or flies for bankruptcy). Stock **prices** were missing for 29 firms in the default month and 46 firms in the resolution month. Firms with missing data tend to be small and insolvent. Thus, reported returns may be overstated, since the securities that performed the worst often do not have **price** data available. For example, bonds with **price** data in the resolution month ultimately received 43.2 cents on the dollar when the firm reorganized, compared with 29.3 cents on the dollar for firms with missing data. Although missing data are not likely to cause a sign reversal, comparisons between subsamples may be affected if missing data are more prevalent in one group. This missing data bias is noted, when appropriate.

Event Study Methodology

I analyze market-adjusted returns. Stock returns are measured net of the return on the S&P 500 index, while bond returns are measured net of the return on the Blume, Keim, and Patel (1991) index of low-rated **debt.** Although the S&P 500 index return does not include dividends, this is unlikely to affect inferences regarding stock returns. The dividend yield on the S&P 500 over the sample period ranged from 3 percent to 4.5 percent per year, or about 0.25 percent to 0.37 percent per month. This is small compared with the average stock return surrounding a **debt** default or bankruptcy filing. Results that follow are also essentially unchanged if I adjust for risk when computing abnormal returns.

Default Resolution and Time in Distress

Table 1 summarizes the outcome of the **debt** default for the sample firms. Filing bankruptcy caused 80 firms to receive a D rating. The other 169 firms defaulted without immediately filing for Chapter 11. Of these firms, 35 "successfully" resolved the default. **Defaults** are resolved successfully if: (a) the firm completes an exchange offer that, as of June 30, 1996, was not followed by [TABULAR DATA FOR TABLE 1 OMITTED] another default or restructuring (18 firms),(1) (b) the firm is acquired (12 firms), or (c) the firm cures the default (5 firms). Acquired firms either used the sale proceeds to pay off the defaulted **debt** or had the acquirer assume the **debt.** Firms that cured their default were able to generate the cash needed to make a missed interest payment.

The remaining 134 firms were unsuccessful in resolving the default. An unsuccessful resolution is defined as later filing for bankruptcy without first attempting an exchange offer (86 firms), or completing an exchange offer that was followed by another **debt** restructuring (48 firms). The 48 firms that restructured again either completed a second exchange offer (12 firms), filed for Chapter 11 (27 firms), or completed a second exchange offer and later filed for Chapter 11 (9 firms). Thus, of the 249 firms in the sample, 202 (81 percent) eventually filed for bankruptcy. Gilson, John, and Lang (1990) also find that a high proportion of firms with **public debt** fail to restructure out of court.

The results in Table 1 indicate that the first exchange offer for defaulted **public debt** usually does not resolve the firm's financial distress. Of the sixty-six initial exchange offers completed by sample firms, forty-eight (73 percent) were followed by another restructuring, and thirty-six firms (55 percent) ended up in bankruptcy. Hotchkiss (1995) notes the frequency of repeat Chapter 11 cases; this study offers evidence on the "failure rate" of exchange offers. Also, the definition of a successful restructuring used here is weak. If a firm restructures by exchanging all its **debt** for equity, no future **debt** exchange is needed. Yet, this firm may have poor operating performance.(2)

Resolving financial distress through an exchange offer may be preferable if it takes less time and incurs lower direct costs than bankruptcy. Resolving default quickly is also desirable if the indirect costs of financial distress are a function of time in distress.(3) Table 1 shows the time from the default date to the date the firm completes its reorganization. The completion date is the date the default is cured, the firm is acquired, or old securities are exchanged for new in a restructuring. Time in distress is lowest for firms that cure the default (four months), followed by firms that are acquired (eight months). Successful exchange offers average fifteen months from default to the exchange date. However, exchange offers fail so frequently that once the firm **defaults,** the mean time from default to completion of the restructuring is actually lower if the firm files for bankruptcy without first attempting an exchange offer. The mean time from default to completion of the restructuring is thirty-four months if an exchange offer is attempted, but only twenty-nine months if the firm files for Chapter 11 without attempting an exchange offer.

III. Excess Returns in the Default and Resolution Months

In this section I examine the **security price** reactions to two important events during financial distress: the bond default and the default resolution. Previous research examines **security price** reactions to the filing of a bankruptcy petition. Financial distress generally begins well before filing for Chapter 11. For example, Warner (1977b) and Gilson, John, and Lang (1990) find negative abnormal returns to bonds or stocks as long as five years before the bankruptcy filing. One signal of financial distress is a bond default. The sample contains 211 firms with bond **price** data: 72 defaulted and filed a bankruptcy petition in the same month, 100 defaulted before the bankruptcy filing, and 39 defaulted but never filed for bankruptcy ("nonfiling" firms). Of the 190 firms with **publicly** traded equity, 69 defaulted and filed simultaneously, 90 defaulted before filing, and 31 defaulted but never filed. Panel A in Table 2 reports mean excess bond and stock returns in the default month for these three subsamples. Median returns are similar in magnitude and statistical significance and so are not reported. Panel B reports excess **security** returns in the resolution month for all bankrupt firms, as well as for firms that defaulted before filing and for firms that did not file.

Returns for all bankrupt firms in the month of the bankruptcy filing in Panel B are similar to those reported in earlier studies. In this study, unsecured bonds lose 18.8 percent in the filing month. In comparison, Warner (1977b) and Bradley and Rosenzweig (1992) report bankruptcy filing month returns of -9.2 percent and - 18.4 percent for their bond portfolios. Stocks in this sample lose 30.6 percent in the filing month. Lang and Stulz (1992) report an abnormal stock return of -28.3 percent in the eleven days around the bankruptcy filing.(4)

Because some of the firms defaulted and filed for Chapter 11 in the same month, while others defaulted before filing, looking only at filing-month returns understates the wealth effect of financial distress. For the 100 firms that defaulted before filing for Chapter 11, bonds lose 32.1 percent in the default month and 3.2 percent in the filing month. Thus, total losses around the default and filing for this subsample are about 35 percent (mean bond returns during the period between the default and the filing are not significantly different from zero). Bonds of firms that simultaneously default and file lose 35 percent in this month. Bondholder losses around the default and filing for all bankrupt firms thus average about 35 percent, or twice the average loss in the bankruptcy filing month alone. Similarly, total stockholder losses in the default and filing months average 40 percent for firms that default before filing, and 41 percent for firms that default and file simultaneously. Yet, stockholder losses in the filing month alone average 30.6 percent.

These results imply that studies of **security** returns around bankruptcy filings (e.g., Bradley and Rosenzweig (1992)) understate **securityholder** losses at the onset of financial distress, since most bondholder losses are realized at the default rather than the bankruptcy filing. Bradley and Rosenzweig cumulate bond [TABULAR DATA FOR TABLE 2

OMITTED] and stock returns from eleven months before the filing to six months after the filing. However, in this sample, 50 of the 202 firms that file bankruptcy (25 percent) default more than one year before filing. More generally, event studies that condition on bankruptcy filing announcements should control for firms that default at the filing and firms that default before filing, since the bankruptcy filing month return differs dramatically for these two subsamples.

Bond and stock **prices** react differently to **defaults** and bankruptcy filings. For the subsample of firms that default before filing bankruptcy, total losses to bondholders are realized almost entirely in the default month. In contrast, losses to stockholders in the default month(-20.4 percent) are similar to those in the filing month (-19.6 percent).(5) Since **public debt defaults** result in bankruptcy over 80 percent of the time, both bonds and stocks might be expected to realize most of their losses at the default. Franks and Torous (1994) demonstrate that equityholders receive larger deviations from absolute priority in workouts than in bankruptcy. They interpret this as evidence that equity's option value is greater in a workout than in bankruptcy.(6) The relatively large losses to stocks compared with bonds in the filing month may represent the loss of this option value once the firm files for bankruptcy.

Finally, **securityholders** can distinguish between firms that will complete workouts and those that will file for bankruptcy. Default- and resolution-month **security** returns are significantly higher for firms that did not file than for firms that defaulted and later filed bankruptcy. Gilson, John, and Lang (1990) and Chatterjee, Dhillon, and Ramirez (1996) also find that default- and resolution-month stock returns are higher for workout firms than for bankrupt firms. Their results can be interpreted as evidence that financial distress costs are lower in workouts than in Chapter 11, or that workouts transfer wealth from bondholders to stockholders. Franks and Torous's (1994) finding that equity's deviation from absolute priority is larger in workouts than in bankruptcy, suggests the latter possibility. However, since in this sample both bond and stock returns are higher in workout firms, the recontracting cost explanation is supported; that is, I find no evidence of a wealth transfer from bondholders to stockholders in the resolution month. Additional evidence on this point can be obtained by looking at the correlation between the resolution month returns on bonds and stock of the same firm. A wealth transfer from bondholders to stockholders would result in a negative correlation between bond and stock returns. In fact, this correlation is 0.67 (p-value [less than] 0.01), which provides further support for the recontracting cost explanation.

IV. Cross-sectional Analysis of Excess **Security** Returns

This section presents a multivariate regression analysis of excess **security** returns. The results in Table 2 indicate considerable variability in resolution-month **security** returns. For example, among firms that default before resolution, one-third of bankrupt firms earn positive excess bond returns at the Chapter 11 filing, while one-quarter of workout firms earn negative excess bond returns at the completion of the workout. By relating **security** returns to firm characteristics, I provide additional evidence on the costs and benefits of bankruptcy compared with workouts.

NOLs are often a valuable asset of reorganized firms, and preserving them is an important aspect of many restructurings. As an example, the October l, 1985, disclosure statement of Baldwin-United States, **"Debtor's** projections regarding the reorganized company's future viability . . . are based, in significant part, upon the continued availability of . . . NOL carryovers and other tax attributes" (p. 74). Solomon and Saret (1992, p. 169) note, "It quickly becomes apparent that net operating loss carryforwards often play an important, if not critical, role in business workouts. NOLs are very valuable because they can be used to offset future income and thus reduce the future income tax burden of the troubled **debtor."** Before the default, firms in this study have a mean (median) value of NOLs equal to 55 percent (22 percent) of the book value of assets. The firm with the largest NOLs is Texas American Oil, with tax loss carryforwards equal to more than nine times the book value of its assets. The favorable treatment of tax attributes in Chapter 11 is cited as a source of value for distressed firms (e.g., Altman (1992)), which suggests that **security** returns may be affected by the firm's tax status. Gilson, John, and Lang (1990) and Franks and Torous (1994) compare firm characteristics in workouts and bankruptcies, but neither study considers firms' tax attributes.

Preservation of NOLs Following a Reorganization

The use of NOLs following a reorganization is governed by Section 382 ([section]382) of the Internal Revenue Code. Before the Tax Reform Act of 1986, the conditions for preserving tax loss carryforwards in a **debt** restructuring were easy to meet. As long as the firm continued its historic business, NOLs were not affected. If the business changed, NOLs were eliminated only if ownership changed. An ownership change occurred in a workout if old shareholders owned less than half of the equity in the reorganized firm. In bankruptcy, an ownership change occurred if short-term creditors (maturity less than five years) owned more than half the new equity. NOLs could thus be preserved in bankruptcy by giving more than half the stock in the new firm to long-term creditors, old shareholders, or new investors.

The Tax Reform Act of 1986 substantially altered [section]382 (see McQueen and Crestol (1990) for details). It is now more difficult for distressed firms to preserve NOLs. Firms can no longer preserve NOLs just by continuing their historic business. The Act also redefined an ownership change in bankruptcy, and, as a result, it is now more likely that use of NOLs will be restricted by an ownership change. An ownership change now occurs if old shareholders and qualifying creditors own less than half of the reorganized firm. Qualifying creditors are those who have held claims for more than eighteen months, or incurred them in the ordinary course of business (e.g., trade creditors). New [section]382 thus restricts NOLs if a new investor purchases more than half of the equity in the reorganized firm. Under new [section]382, annual use of NOLs after an ownership change is restricted to the equity value of the firm times the long-term federal tax-exempt rate (historically, around 7 percent). An important benefit of bankruptcy under new [section]382 is that, in a

workout, the equity value of the firm is measured before the **debt** exchange, while in bankruptcy, it is measured after the **debt** exchange. Since pre-exchange equity values are usually small, allowed usage of NOLs after a workout may be minimal. The annual limitation on NOL use imposed after a bankruptcy can be substantially larger than the limitation caused by a workout.(7)

Before 1986 it was easy to preserve NOLs in a distressed restructuring. After 1986 tax loss carryforwards were less valuable to financially distressed firms. However, NOLs were easier to preserve, and subject to a less severe annual limitation, in bankruptcy compared with workouts.(8)

Specification of Regression Equations

The dependent variables in the regressions are the excess **security** returns in default and resolution months examined earlier. The explanatory variables are:

NOLC = the sum of the firm's NOLs and investment tax credits, divided by the book value of assets, at the year-end before the event month (default month or resolution month);

WONOL86 = zero if the firm completed a workout before August 14, 1986, and NOLC if it privately restructured after that date - August 14 was the cutoff date for tax treatment under the old or new [section]382 rules;

BKRNOL86 = zero if the firm filed for Chapter 11 before August 14, 1986, and NOLC if it filed for bankruptcy after that date;

SIZE = total assets at the fiscal year-end before the firm's default;

SIZE SQUARED = the square of total assets;

TIME = number of months from the event date to the completion of the reorganization - i.e., the date the firm completed its workout or emerged from bankruptcy and began making distributions to creditors;

RECOVERY RATE = for bond holders, RECOVERY RATE is the value of new securities received in the restructuring, expressed as a percentage of the face value of **debt** outstanding - for stocks, it is the percentage of new equity owned by old shareholders;

DEFAULT BEFORE FILING = one if the firm defaulted before filing for Chapter 11 and zero otherwise; and

DEFAULT AT FILING = one if the firm defaulted and filed for Chapter 11 and zero otherwise.

The effect of NOLs on **security** returns before the Tax Reform Act is measured by the coefficient on NOLC, while the effect after 1986 is measured by WONOL86 and BKRNOL86. Considering the preceding discussion, NOLC should be positively related to **security** returns at the resolution of the default. Resolving the default informs the market that a valuable asset will be preserved; when the asset is more valuable, the **price** reaction is expected to be greater. Since the Tax Reform Act reduced the value of NOLs to distressed firms, the expected sign on both WONOL86 and BKRNOL86 is negative. However, after 1986, Chapter 11 allowed advantageous treatment of NOLs relative to workouts. Therefore, the coefficient on WONOL86 should be smaller (more negative) than the coefficient on BKRNOL86.

The other explanatory variables are intended to control for information unrelated to taxes that might be revealed by the default or resolution. SIZE and SIZE squareD measure the complexity, and hence the expected costs, of the restructuring. To the extent that scale economies exist in the restructuring process, both SIZE and SIZE squareD may explain some return variation. Warner (1977a) and Betker (1997) find that direct restructuring costs increase with SIZE but decrease with the SIZE squareD, which is consistent with scale economies. When the firm files for bankruptcy, **security prices** should be reduced by the increase in expected present value of bankruptcy costs. Resolution-month returns should therefore be negatively related to SIZE but positively related to SIZE squareD.

TIME is also related to the complexity of the restructuring. Complex cases should take longer and presumably incur higher direct and indirect financial distress costs. However, longer cases may benefit equityholders at the expense of bondholders, as equityholders use their option to delay the reorganization process to extract concessions from bondholders (Franks and Torous (1994)). If so, TIME may have a positive effect on shareholder returns and negative effect on bondholder returns.

RECOVERY RATE measures a **securityholder's** payoff at the completion of the restructuring. It is a function of (a) the bond's priority; (b) the firm's solvency, which determines what each claimholder class receives under absolute priority rules; and (c) the bargaining power of the **security** class, which determines the classes' absolute priority deviation. If the default or resolution reveals new information about these payoffs, RECOVERY RATE should be positively related to **security** returns. Although TIME and RECOVERY RATE are not observed until after the restructuring is over, I assume

investors can make unbiased forecasts of these variables. Warner (1977b) and Eberhart and Sweeney (1992) find no evidence of abnormal returns to bonds or stocks during bankruptcy, suggesting that **securityholders** can make unbiased forecasts of bankruptcy settlements. The dummy variables DEFAULT BEFORE FILING and DEFAULT AT FILING permit different intercept terms for workout firms, bankrupt firms that default and file simultaneously, and bankrupt firms that default before filing. These variables capture the effect of omitted variables that affect the three subsamples differently.

Table 3 reports summary statistics for the explanatory variables. Firms that do not immediately resolve the default by filing for Chapter 11 continue to perform poorly. For example, median pre-default NOLs are 18 percent of assets for bankrupt firms. By the time the firm files for bankruptcy, median NOLs are 37 percent of assets. Similarly, median workout firms' NOLs grow from 21 percent to 38 percent of assets between the default and the completion of the workout. Bond recovery rates average 40 percent, while stock recovery rates average only 22 percent. For nonfiling firms, however, bond (stock) recovery rates average 57 percent (61 percent). [TABULAR DATA FOR TABLE 3 OMITTED] Franks and Torous (1994) also find that, compared with bankrupt firms, workout firms are more solvent and have higher recovery rates for bondholders and stockholders.

Results

Both regressions are estimated separately on bond returns and stock returns. Since all of the independent variables except RECOVERY RATE are firm specific, estimating the bond equations with one observation per bond would overstate significance levels. Instead, I create a single bond observation for each firm using the mean event month bond return as the dependent variable and mean bond recovery rate as one of the explanatory variables. The estimated regression coefficients are in Table 4. White's (1980) method is used to generate heteroskedasticity-consistent t-statistics.

Panel A reports results from the default-month equation. Bond returns are positively related to NOLs before 1986, but in general the tax variables do not measurably affect **security prices** in the default month. None of the other explanatory variables yields significant results in the bond equation.

Consistent with the results in Table 2, stock returns at the default are significantly higher if the default is not accompanied by a bankruptcy filing. The significantly positive coefficient on RECOVERY RATE in the stock equation indicates that the **debt** default provides useful information about stockholders' future payoffs. Stocks that retain more value when the firm completes its reorganization have higher returns when the firm **defaults.**

Panel B reports results from the resolution-month equations. NOLC is statistically significant (p [less than] 0.01 for stocks, p [less than] 0.05 for bonds) in both the bond and stock equations. As noted above, before 1986 it was easy to preserve tax loss carryforwards in a **debt** restructuring. If the outcome of the default is not fully anticipated, it provides new information about the likelihood of preserving tax benefits. Before the Tax Reform Act, securities of firms with larger NOLs had higher returns at the resolution. This effect appears economically significant as well. The regression estimates imply that, holding other factors constant, an increase in NOLs from one times assets to two times assets would result in bond (stock) returns that were 5 (6) percentage points higher in the resolution month.(9)

After 1986, the effect of NOLs on **security** returns depends on whether the firm completed a workout or filed for bankruptcy. For bonds, the sum of the coefficients on NOLC and WONOL86 is -0.17 (significant at the 10 percent level), while the sum of NOLC and BKRNOL86 is -0.04. Results are similar for the stock equation. These results indicate that, after 1986, NOLs were negatively related to [TABULAR DATA FOR TABLE 4 OMITTED] resolution-month returns for workout firms. In contrast, after 1986, NOLs had no effect on bankrupt firms' returns. These results are consistent with the argument that the Tax Reform Act reduced the value of NOLs to distressed firms, but that the effect was more severe for workouts than bankruptcies. In other words, the Tax Reform Act introduced a tax advantage to bankruptcy that did not exist before 1986. Of course, this does not suggest that bankruptcy is the best option for all firms with large NOLs, since the direct and indirect costs of bankruptcy may still exceed the tax benefits. The coefficients on DEFAULT BEFORE FILING and DEFAULT AT FILING indicate that both bonds and stocks of bankrupt firms have lower resolution-month returns than securities of workout firms. These results imply that although bankruptcy is more costly than a workout, the cost difference is mitigated for firms with large NOLs.

SIZE is negatively related to bond returns in the resolution month, while SIZE squareD has a positive coefficient. Recall that SIZE proxies for the complexity and cost of the restructuring. SIZE and SIZE squareD are shown to account for direct bankruptcy costs. With the bankruptcy filing, incurring bankruptcy costs becomes certain, and **security prices** should fall by the increase in expected present value of these costs.

TIME is negatively related to bond returns in the resolution month, which is consistent with TIME as a proxy for complexity or equity's option value in bankruptcy.(10) A positive coefficient on TIME in the stock equation would support the latter interpretation. However, stock returns are unrelated to TIME in the resolution month.

Finally, bonds with higher recovery rates have higher returns in the resolution month. This indicates that bondholders receive information in the resolution month that is useful in predicting the payoff they will receive when the firm restructures its **debt.** This finding complements the results of Eberhart and Sweeney (1992), who find that bond **prices** at the end of the bankruptcy filing month are unbiased predictors of ultimate bankruptcy settlements.

V. Conclusions

In this study I examine **security** returns around 249 **public debt defaults** during 1982-91. I analyze **security** returns around the **debt** default and the resolution of the default (curing the default, being acquired, completing a workout, or filing for bankruptcy). Some bankrupt firms default and file bankruptcy in the same month, while others default before filing. **Price** reactions to the bankruptcy filing differ for these two subsamples. For firms that default before filing, total losses to bondholders around the default and filing average 34 percent, but most of these losses are realized in the default month. Total losses to stockholders average 40 percent but are divided equally between the default month and the filing month. This is consistent with equity having greater option value in a workout than in bankruptcy. Returns to both bonds and stocks are larger in workouts than in bankruptcy, implying bankruptcy is costlier than a workout.

Next, I examine cross-sectional differences in bond and stock returns. Preservation of NOLs is often cited as a benefit of Chapter 11. I explore the effect of the firm's tax characteristics on **security** returns during financial distress. Cross-sectional regressions indicate that before 1986, bond and stock returns in the default resolution month are positively related to NOLs. This relation changes after the Tax Reform Act of 1986, which made it more difficult for distressed firms to preserve tax benefits. After 1986, **security** returns in the resolution month are negatively related to NOLs for workout firms but unrelated to NOLs for bankrupt firms. This suggests that the tax law change significantly increased the tax advantages of Chapter 11. That is, although bankruptcy is more costly than a workout, the cost differential is reduced for firms with large NOLs.

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1 Firms complete successful exchange offers if they have not restructured again as of June 30, 1996. The sample is therefore censored since I cannot tell if any of these firms will restructure in the future. However, as of June 30, 1996, the median length of time since completion of the eighteen successful exchange offers was 6.4 years (minimum 13 months, but the next shortest time since completion is 32 months). In contrast, for the 48 firms that restructured twice, the median length of time from the end of one restructuring to the beginning of the next is 22 months, and only three of these firms spent more than 6.4 years between restructurings. Thus, if the successful exchange offers needed further restructuring, the second restructuring would likely have taken place by June 30, 1996 (assuming the experience of the failed exchange offer sample is a good guide). Thus, the possible **effects** of censoring in the sample are likely to be small.

2 Hotchkiss (1995) analyzes the post-bankruptcy operating performance of firms that reorganized in Chapter 11. She finds that on average firms fail to meet their own financial projections, and underperform relative to their industry as well.

3 Direct distress costs are legal, professional, and administrative fees, while indirect costs are the opportunity costs of lost customers, suppliers, etc. Gilson, John, and Lang (1990) report that the direct costs of an exchange offer average 0.65 percent of total assets. Betker (1997) reports that the direct costs of bankruptcy average 4 percent of the book value of assets. Opler and Titman (1994), among others, analyze indirect costs. Measurement of indirect costs is problematic, but they are estimated to range from 9 percent to 15 percent of firm value.

4 I do not separately consider returns to firms that file for prepackaged bankruptcy. In the period studied here, only sixteen firms filed for prepackaged bankruptcy ("prepacks"). Of these sixteen firms, only eleven have bond **price** data and four have stock **price** data, which does not allow me to draw strong inferences about the wealth **effects** of a prepack filing. Results do not differ if I omit the prepacks. Tashjian, Lease, and McConnell (1996) and Chatterjee, Dhillon, and Ramirez (1996) analyze stock and bond **price** reactions to prepack filings.

5 Since more firms are missing resolution-month returns than default-month returns, the difference in bond or stock returns between these months may be overstated. For example, in the subset of firms that defaulted before filing, no missing bond returns occurred in the default month but seventeen missing returns occurred in the resolution month.

6 An absolute priority violation occurs when a junior claim receives some payment even though senior claims are not paid in full. Franks and Torous (1994) and Betker (1995), among others, provide evidence on the frequency and magnitude of absolute priority violations. Strictly speaking, absolute priority rules must be applied only in a Chapter 7 liquidation (absolute priority rules may also be applied in Chapter 11, either by agreement of all parties involved, or by the bankruptcy judge in a "cram-down"). However, absolute priority provides a useful benchmark for assessing which parties in a **debt** restructuring gain and lose, relative to their contractual agreements.

7 Bankrupt firms may also elect treatment under the "bankruptcy exception" of 382(1)(5). Under the bankruptcy exception, annual use of NOLs is unrestricted, but NOLs are reduced by: (1) one-half of(face value of canceled **debt** minus market value of new equity) plus (2) the interest accrued (even if not paid) on canceled **debt** for the past three years. Furthermore, NOLs are eliminated if another ownership change occurs within two years of the reorganization.

8 One of the tax provisions that allowed bankrupt firms to retain more NOLs than workout firms (the **"stock-for-debt** exception") expired in January 1995. Only time will tell whether this will change the relation between taxes and **security** returns.

9 The presence of firms with very high values of NOLs/assets suggests that I should analyze high-influence observations in the regression models. The "influence" diagnostics in SAS identified one influential observation in the bond equations and none in the stock equations. When the influential bond observation (Mission Insurance Group, with NOLs of five times assets) is omitted from the bond equations, the signs of the of the coefficients on the tax variables do not change, and the magnitude of the coefficients is not substantially different. In the resolution-month equation, WONOL86 remains insignificant, while BKRNOL86 is significant at the 5 percent level. I thank the referee for suggesting this robustness check.

10 Although both TIME and SIZE can be interpreted as measures of complexity, the two variables are not highly correlated ([Rho] = 0.15). Correlations among all the explanatory variables are generally low. SIZE and SIZE squareD are, of course, highly correlated ([Rho] = 0.94), but the only other simple correlation that exceeded 0.20 was between RECOVERY RATE and TIME for the second stock equation ([Rho] = 0.34). However, re-estimating that equation without TIME did not change the sign or significance of any remaining variables. As a further check for problems with multicollinearity, 1 computed the variance inflation factor (VIF) for each explanatory variable. This is essentially equivalent to regressing each explanatory variable on the other explanatory variables and examining the adjusted [R.sup.2]. Although no formal criterion dictates what constitutes a high VIF, a rule of thumb is that a VIF of 10.0 indicates that multicollinearity may be a problem (Myers (1986)). The only variables with VIFs that exceed 5.0 are SIZE and SIZE squareD, which is consistent with the observation that they have a high simple correlation. The t-statistics on these two variables, therefore, may be reduced because of the inflation in their standard errors caused by multicollinearity.

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