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The information content of bankruptcy filing on securityholders of the bankrupt firm: An empirical investigation

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Abstract

This paper captures the information content of bankruptcy announcements on stockholders and three different classes of debtholders using daily excess returns. Significant negative stock price reaction to the filing announcement is documented. More interestingly, the secured debtholders are unaffected by the announcement. However, the unsecured and the convertible debt classes exhibit significant adverse price reaction. During the event period, the secured debt group gains significantly while all other classes experience substantial losses. Cross-sectional analysis reveals that the complexity of the reorganization process, the security of the debt issue, and to some degree the anticipation of the bankruptcy filing are important determinants of bond excess returns. It is also found that leverage plays a significant role in preserving firm value by forcing the firm to confront reorganization sooner.

Keywords: Information content; Bankruptcy filings; Bondholder and stockholder wealth; Reorganization

JEL classification: G33; G34

1. Introduction

Bankruptcy filing conveys information about the cash flow prospects of the firm leading to a reassessment of the true value of its assets. There is a substantial

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body of evidence in the finance literature documenting a strong negative information content of Chapter 11 filing on the firm's stock price [1]. A recent study by Lang and Stulz (1992) investigates the effect of Chapter 11 bankruptcy announcements on the equity values of the rival firms. On average, they find that the information revealed through the bankruptcy filing also has a significant negative price impact on the rival firms' equity. However, very little is documented about the information content of Chapter 11 bankruptcy announcements on the remaining securityholders of the bankrupt firm. This study examines how the firm-specific information about the cash flow prospects revealed by the bankruptcy announcement is interpreted by the three classes of bondholders (secured, unsecured and convertible), and stockholders of the filing firm.

This study provides an interesting new angle to the evidence provided by Lang and Stulz (1992). By examining the information content of bankruptcy announcement on the rival firm's stock, they attempt to capture the industry-wide effect of the announcement. [2] In complement to their evidence, we document the firm-specific effect of the information revealed by the announcement on the various securityholders of the bankrupt firm.

It cannot be assumed that all securityholders would react similarly to the announcement. First, the bankruptcy announcement need not convey the same degree of bad news to all classes of securityholders of the firm. Although the stockholders are residual claimants and lower down in the priority structure, it does not necessarily follow that they will react more adversely to the information conveyed by the announcement, given that absolute priority rules are frequently violated in favor of stockholders (Franks and Torous, 1989). Even within debtholder classes, the secured debtholders exclusively enjoy certain advantages. As a result, the information content of the bankruptcy announcement is not necessarily ex-

[1] Aharony, Jones and Swary (Aharony et al., 1980) document that the difference between the risk adjusted return of the portfolio of bankrupt firms and that of the control sample is significantly negative for various holding periods preceding the week of filing. Clark and Weinstein (1983) examined the impact of bankruptcy filing announcement on the stock prices of 36 bankrupt firms and report that during the three days centered around the announcement the stock return is significantly negative with a range of -22% and -47%. Both these studies used data prior to the passage of the Bankruptcy Reform Act of 1978 and hence may not be quite representative of the impact of bankruptcy filing under the current law. Morse and Shaw (1988) provide a comparative study of the risk and return characteristics of bankrupt firm stocks in the period preceding and succeeding the Bankruptcy Reform Act. Although they find that the systematic risk remains unaffected during the post-Bankruptcy Act period, the three year average residual stock returns after bankruptcy filing are close to zero.

[2] On average, they find that the information content of bankruptcy filing also has a significant negative price impact (-1%) on the rival firms' equity. However, the positive competitive effect is found to be dominant for the sample of rival firms with low leverage and low degree of competition while for rival firms with high leverage and high degree of competition, the information content of the bankruptcy announcement is significantly negative with the contagion effect dominating.

pected to be the same for all types of debtholders. For example, during the bankruptcy process the secured debtholders benefit from the advantageous interest accrual treatment which is not provided to the unsecured debt categories. Second, bankruptcy filing confers several benefits on the firm [see Wruck (1990)]. For instance, bankruptcy provides the firm with the ability to unilaterally abrogate on contractual obligations with suppliers, customers, employees, and retirees. It also allows the firm to 'put' the unfunded pension obligations to the *Pension Benefit Guaranty Corporation.*

If the firm reneges on onerous executory contracts in an attempt to improve its cash flow, then the secured creditors stand to benefit as their collateral becomes more valuable. However, the unsecured creditors are not likely to gain as much from such actions (Levine, 1991). Such benefits are expected to ameliorate the negative effect of the informational content of the announcement for secured bondholders. Furthermore, absolute priority is almost always maintained by the bankruptcy court with respect to secured creditors (Weiss, 1990) while the norm is for priority to be violated for other creditors (Eberhart et al., 1990; and Weiss, 1990). Given the arguments presented above, it is an empirical question as to how different classes of securityholders interpret the information content revealed through the bankruptcy announcements.

Our examination of daily bond and stock excess returns around bankruptcy announcements also enables us to provide evidence on the empirical validity of some of the proposed theories related to bankruptcy. Franks and Torous (1989) argue that the longer the reorganization process, the greater the destruction of bondholder wealth. This creates an incentive for the bondholders to reduce the length of time to emerge from bankruptcy by purchasing the stockholders option-to-delay by accepting deviations from the absolute priority rule. We find that lengthening the reorganization process not only destroys wealth for the bondholders, but also for the stockholders (who hold the option to lengthen the process). We also measure the complexity of the bankruptcy process by the number of debt issues outstanding scaled by total assets and find that it has a significant adverse effect on bondholder wealth.

The information content of the Chapter 11 filing is expected to be stronger if there was no preceding evidence (signal) of any financial distress. We interpret a prior default on debt as a signal which is expected to have a dampening effect on the adverse valuation effect on the securityholders of the firm at the time of the filing. We provide evidence indicating that bondholders who had no such prior warning of a forthcoming financial distress are impacted more adversely. We also postulate that the more senior/secure the debt issue, the smaller the expected impact of the bankruptcy announcement. Finally, we test an implication of Jensen's (1986) proposition that leverage is valuable as it provides financial discipline and monitoring. In the face of financial distress, erosion of firm value is checked in the presence of leverage which forces earlier default and efficient reorganization. Therefore, to the extent that financial distress is endogenously

driven, we would expect the firm's leverage and security excess returns to be positively related. Our results support this proposition.

Studies by Warner (1977) and Betker (1992) examine bond returns around bankruptcy filings using monthly bond price data. Warner (1977) examines bond returns around bankruptcy filing month by selecting 20 bankrupt railroads during the period 1930–1955. He reports that there is, on average, a −9.2% bond return net of the control portfolio in the bankruptcy filing month. In a more recent study, Betker (1992), also using monthly data, examines the returns to different classes of securityholders for 78 Chapter 11 reorganizations during the period 1982–90. His findings show that there is substantial deviation from absolute priority benefiting equity and unsecured bonds at the expense of secured and bank debt. He also reports that bonds have lower returns in the month of default than in the month of the bankruptcy filing. In addition to examining the information content of the Chapter 11 bankruptcy filing on the different classes of securityholders of the firm immediately surrounding the announcement, our study departs from prior studies by using daily stock and bond transaction price data enabling us to provide stronger statistical tests to validate our conclusions. We also use in this paper the more refined daily bond event study methodology familiarized by Handjinicolaou and Kalay (1984) which adjusts for the common problem of infrequent bond trading and any shifts in the term structure of interest rates.

Our bond event study results show that the information content of bankruptcy filing is different for different bondholder classes. Most interestingly, the cumulative excess bond return for the three-day period surrounding the bankruptcy announcement is insignificant for the secured debt group which is in contrast to Betker's (1992) finding. However, the excess returns are significantly negative for convertible and unsecured debt issues. Common stockholders lose the most during the three-day announcement period but significant price recovery is documented in the post-filing period. Cross-sectional analysis reveals that the complexity of the bankruptcy process, the degree of anticipation of the bankruptcy filing and the security of the debt issue are significant determinants of bond excess returns. In congruence with Jensen's (1986) proposition, our analysis documents that leverage plays an important role in preserving value for the firms that go bankrupt.

The following section delineates the Chapter 11 reorganization process under the Bankruptcy Reform Act of 1978. Section 3 reports the sample selection criteria and sample description. The event study methodologies are detailed in section 4. Section 5 reports the empirical findings from the event study and cross-sectional analyses. The paper is concluded with section 6.

2. Background of reorganization under Chapter 11

The Bankruptcy Reform Act confers on the debtor significant protection against creditors under Chapter 11. An important feature of Chapter 11 is that the debtor's

management (debtor-in-possession) retains control of the firm's assets unless it can be shown that management is incompetent or committed fraud; in which case, a trustee is appointed by the bankruptcy court [Section 1104]. The Bankruptcy Reform Act eliminates constraints that existed under the Chandler Act by allowing the debtor/trustee to divest the firm's assets or close inefficient operations while the firm is in the reorganization process. In addition, the Code imposes an automatic stay on all creditors by preventing them from collecting their claims or foreclosing on their collateral. In the post-petition period, an insolvent debtor halts all payments of principal and interest, although interest for fully secured (unimpaired) debt accrues until the reorganization is complete. Unsecured (impaired) creditors do not accrue interest unless the firm becomes solvent while undersecured creditors begin accruing interest when the collateral securing the bonds exceeds the principal amount (Levine, 1991).

The debtor is entitled to propose a plan of reorganization during the first 120 days after the filing and has another 60 days to obtain acceptance by creditors [Section 1121(b)]. However, the bankruptcy court frequently extends this period. After the expiration of the 180 day exclusivity period, if the debtor's proposed plan has not been approved by creditors, then any interested party can file a reorganization plan [Section 1121(c)]. However, unlike the debtor's plan, a creditor plan is costly because creditors are required to support their valuation of the firm's assets via appraisal. The 1978 Act allows *all* impaired classes (including stockholders) to vote on the reorganization plan while unimpaired creditors are ineligible to vote. Approval of the plan requires a majority vote by each impaired class. A majority represents half of the creditors in number and two-thirds of the value of the debt issue. If agreement could not be reached by all impaired classes, the bankruptcy court can enforce the "cram down" procedure whereby the plan is confirmed over the objection of the impaired class if that class receives at least as much under the plan as it would in a liquidation. However, this procedure is rarely used.

3. Sample selection and description

A preliminary sample of bankruptcies is compiled from *Predicast's F&S Index of Corporate Change* listing of companies that filed a bankruptcy petition between January 1980 and December 1989. This list is cross-checked with the *Wall Street Journal Index (WSJI)* to confirm the date of bankruptcy. Firms were eliminated from the bond sample if they do not have public debt outstanding or whose public debt is thinly traded. Additionally, a firm's debt issue has to trade both before and after the announcement day to be included in the sample. The final sample contained 37 firms which had stock and/or bond price data available. The selection process resulted in 5 secured, 45 unsecured and 7 convertible debt issues belonging to 30 firms. The stock return data were available for 29 of the 37 firms

which filed for Chapter 11. [3] The *CRSP* master tape was used to retrieve stock return data.

We collected the daily bond prices for the 57 sample bond issues from the *Wall Street Journal (WSJ)* for 11 trading days before and 10 days after the announcement day. Treasury bond prices with matching coupons and maturities as those of the sample bonds were also collected from the *WSJ*. Bond returns were adjusted for daily coupon interest until the bond begins to trade flat.

In contrast to the bond data used in this study, Betker (1992) uses S&P Bond Guide price data which contains end-of-month trade price, bid price, ask price or desk price whichever is available in that order. However, Hand, Holthausen and Leftwich (Hand et al., 1992, p. 736) point out the advantages of using *only* transaction prices. They mention that large reversals are common in bond price series if bid and transaction prices are included. They also point out that bid prices adjust with a lag to any news announcements. In addition, Warga and Welch (1990) illustrate using a sample of leveraged buyouts that S&P bond prices are inferior to bond dealer quotes.

Panel A of Table 1 reports the distribution of the sample of bankrupt firms by year. The panel also documents the distribution of the sample bonds and sample stocks by year. Although all bankruptcies in the sample start as Chapter 11 filing, two firms (5.41%) were eventually liquidated. Panel B shows that 30 of the 37 sample firms (81.08%) remained independent and four firms (10.81%) were acquired by another firm. For one firm, no information on the outcome was available up to the present. These figures are similar to prior studies (Weiss, 1990; Morse and Shaw, 1988). Panel C of Table 1 provides the trading distribution of the sample bonds.

Table 2 presents the financial characteristics of the sample. The financial variables are obtained from *Moody's Manuals* for the fiscal year-end immediately preceding the bankruptcy and the year-end of the bankruptcy. The mean (median) book value of assets in the year of the bankruptcy year are $1,777.0 million ($554.7 million). [4] Our sample firms are highly leveraged with a mean ratio of total liabilities to total assets (book values) of 82.35 percent in the year preceding the bankruptcy and 113.2 percent in the year of the bankruptcy. The increase in

[3] One sample firm, North American Car, was a subsidiary without any stock traded while another firm, Resorts International, was privately owned although it had public debt trading. The remaining firms' stock trading was suspended before the bankruptcy date due either to the firm's request or failure to meet exchange listing requirements.

[4] The mean of total assets is heavily influenced by the bankruptcy of Texaco. Without Texaco, the mean value of total assets becomes $1330.7 million which is in line with Brown et al. (1991) sample of financially distressed firms. Our sample firms are larger than those analyzed by Gilson (1990). This is probably due to the fact that Gilson's sample is composed of firms that have been consistently unprofitable while a sample of bankrupt firms contains firms catapulted into bankruptcy because of high debt before much erosion in value.

Table 1
Descriptive statistics of 37 bankruptcies over 1980–1989 period

Panel A: Distribution of sample firms, bonds and stocks

Year	80	81	82	83	84	85	86	87	88	89	Total
No. of firms	1	2	5	2	3	5	7	4	5	3	37
No. of bonds	1	0	5	2	4	2	17	7	13	6	57
No. of stocks	1	2	4	1	2	5	6	2	4	2	29

Panel B: Outcome of bankruptcy

Outcome of bankruptcy	Number of firms	Percent of firms
Independent	30	81.08
Acquired	4	10.81
Liquidated	2	5.41
Not known	1	2.70
Total	37	100.00

Panel C: Frequency of bond trades during the 21-day event window

Number of trades during event window	Number of bonds	Percent of bonds
trades > 18	20	35.09
18 ≥ trades > 15	6	10.53
15 ≥ trades > 12	1	1.75
12 ≥ trades > 9	23	40.35
9 ≥ trades > 6	7	12.28
Total	57	100.00

Table 2
Financial characteristics of 37 sample firms that filed for Chapter 11 between 1980 and 1989 measured at the year-end prior to bankruptcy and the year of bankruptcy

Financial variables [a]	Year relative to the bankruptcy			
	Year −1		Year 0	
	Mean	Median	Mean	Median
Book value of total assets [b] (in $mil)	$ 2,228.70	$ 789.50	$ 1,777.06	$ 554.73
Book value of common stock [c] (in $mil)	608.30	152.21	231.43	34.11
Total debt to total assets (%)	82.35	81.00	113.22	99.70
Current assets to current liabilities	1.33	1.20	2.54	2.33
Return on assets (%)	−10.63	−5.91	−50.80	−28.63

[a] Income statement and balance sheet items are obtained from *Moody's Manuals*.
[b] Mean value of total assets is $1,330.7 in year −1 and $857.5 million in year 0 when excluding Texaco Inc. which was worth $34.9 billion in year −1 and $34 billion in year 0.
[c] Mean value of common stock is $226.1 in year −1 and $−16.9 million in year 0 when excluding Texaco Inc.

the debt ratio is statistically significant with a t-statistic of -4.82. Bankrupt firms seem to be able to secure lines of credit shortly after filing for bankruptcy as evidenced by increase in liquidity from the prior year. The current ratio increases significantly from 1.33 in the year prior to bankruptcy to 2.54 in the year of the bankruptcy ($t = -4.46$). Finally, although the sample firms are unprofitable in both years, the firms' earning performance as reflected in return on assets (net income/total assets) deteriorated significantly from the year that predates the bankruptcy, -10.63%, to the bankruptcy year, -50.80%, ($t = 3.86$).

4. Bond and stock event study methodology

We estimate bond excess returns using Handjinicolaou and Kalay's (1984) mean adjusted returns methodology. To adjust for changes in the term structure of interest rates, each corporate bond is matched with a treasury bond according to maturity and coupon rate, and the adjusted bond return ($\mathrm{ABR}_{i,d}$) is calculated as the holding period bond return for firm i for day d ($\mathrm{BR}_{i,d}$) minus the return over the same period for an equivalent treasury bond ($\mathrm{TBR}_{i,d}$). The holding period return ($\mathrm{BR}_{i,d}$) for corporate bond i for day d is calculated as follows:

$$\mathrm{BR}_{i,d} = \ln[F_{i,d}/F_{i,d-1}] \tag{1}$$

where $F_{i,d}$ = flat price for corporate bond i for day d. [5]

A nine-day interval immediately prior to the event is used to estimate the comparison and announcement period returns. The day of the announcement of Chapter 11 filing in the *WSJ* was identified as day 0 in event time. The comparison period is day $t-10$ to day $t-2$. The mean comparison period return ($R_{i,cp}$) for firm i is as follows:

$$R_{i,cp} = \frac{1}{9}\Sigma_{cp}\frac{\mathrm{ABR}_{i,d}}{d_k - d_{k-1}} \tag{2}$$

where $(d_k - d_{k-1})$ is the number of trading days that elapsed between two successive trades. Since bond returns are a series of single and multiple day returns they are adjusted to yield equivalent *single day* returns and standardized as follows:

$$\mathrm{SER}_{i,d} = \frac{[\mathrm{ABR}_{i,d} - R_{i,cp}d_k - d_{k-1}]}{S_i\sqrt{d_k - d_{k-1}}} \tag{3}$$

[5] Flat price is calculated as follows: $F_{i,d} = P_{i,d} + (C_i/180)N_i$ where, $P_{i,d}$ is the closing price for bond i on day d, C_i is the semi-annual coupon payment for bond i and N_i is the number of days that elapsed since the last coupon payment.

where $\mathrm{SER}_{i,d}$ is the daily standardized excess return for firm i and S_i is the estimated standard deviation of the comparison period returns for firm i computed as follows:

$$S_i^2 = \frac{1}{8}\sum_{k_i=2}^{K}\left[\frac{\mathrm{ABR}_{i,d}}{\sqrt{d_k - d_{k-1}}} - R_{i,cp}\sqrt{d_k - d_{k-1}}\right]^2 \tag{4}$$

where K is the number of trading days for bond i during the event period.

The standardized mean excess return (SMER_d) for the portfolio of bonds for day d is then estimated over the entire 21 day period and is given by:

$$\mathrm{SMER}_d = \Sigma_i \frac{\mathrm{SER}_{i,d}}{q} \tag{5}$$

where q is the number of bonds trading on day d. Assuming that individual standardized excess bond returns are Student-t distributed with mean 0 and $k-2$ degrees of freedom (where k is the number of business days in which a particular bond traded), it follows from the central limit theorem that the standardized portfolio mean excess return for any event day is normally distributed with mean 0 and variance $1/n_t$ (where n_t is the number of observations on day t). However, as suggested by Handjinicolaou and Kalay (1984) [6], we report the crude dependence test statistics (distributed as Student-t) for the daily standardized portfolio mean excess returns since the cross-sectional independence between individual bond excess returns cannot be guaranteed. This t-statistic for any event day as can be computed as follows:

$$t\text{-statistic} = \frac{\mathrm{SMER}_d}{s_p} \tag{6}$$

where s_p is the standard deviation of the portfolio excess return.

In the event of bankruptcy, a possible bias may arise in the form of underestimation of the comparison period returns if indeed there exists a downward drift in bond prices (like downward drift in stock prices found in Aharony et al. (1980)) in partial anticipation of the bankruptcy announcement. It is appropriate to point out that if the comparison period returns are, in fact, biased downwards due to the downward drift in bond prices, it is expected that the excess returns would be biased upwards hence leading to more conservative estimates of the negative excess returns. To determine the stock price reaction to bankruptcy filing announcements, we use the mean-adjusted excess return methodology. The comparison period is the same as that used for the bond samples.

[6] For a complete discussion of the test statistics, see Handjinicolaou and Kalay (1984, pp. 45–46).

5. Empirical results

5.1. Event study results

Table 3 reports the daily bond excess returns for the whole sample of 57 bonds and for the sub-sample which includes only one bond per firm. In both cases, we find significantly negative announcement day bond excess returns of −8.13% and −9.96%, respectively. Table 4 presents the bond and stock price reaction to bankruptcy filing announcements over various intervals. The three-day announcement period (−1, 0, +1) stock excess return is a statistically significant −33.75%. The corresponding cumulative excess returns for the secured, unsecured and convertible debt categories are 0.92%, −11.32% and −11.50%, respectively. Except for the secured debt class which remains insignificant (perhaps, reflecting some of the advantages they exclusively enjoy in bankruptcy as mentioned earlier) the two other debt categories experience significant negative reactions. Our result for the secured debt category must be interpreted with caution, however, as the sample size for this category is small.

Table 3
Daily portfolio bond excess returns (BER) and cumulative bond excess return (CBER), due to bankruptcy filing announcements during the period 1980–1989

Event day	Multiple bonds per firm ($N = 57$)				One bond per firm ($N = 30$)			
	BER	t-statistics	CBER	%NEG	BER	t-statistics	CBER	%NEG
−10	0.009	0.577	0.009	0.54	0.051	0.478	0.051	0.62
−9	0.071	0.479	0.080	0.44	0.113	1.062	0.163	0.42
−8	−0.201	−1.447	−0.120	0.54	−0.163	−1.533	0.001	0.50
−7	−0.022	−0.154	−0.142	0.53	0.084	0.790	0.085	0.47
−6	0.059	0.422	−0.083	0.45	0.126	1.190	0.211	0.40
−5	−0.047	−0.334	−0.130	0.52	−0.023	−0.221	0.187	0.53
−4	−0.001	−0.009	−0.131	0.50	−0.010	−0.092	0.178	0.47
−3	0.073	0.524	−0.058	0.35	−0.032	−0.303	0.145	0.40
−2	−0.033	−0.232	−0.091	0.51	−0.154	−1.451	−0.009	0.57
−1	**−1.060**	**−7.187**	**−1.151**	**0.59**	**−0.677**	**−6.376**	**−0.686**	**0.58**
0	**−8.128**	**−61.108**	**−9.279**	**0.81**	**−9.957**	**−93.742**	**−10.642**	**0.81**
1	**−1.252**	**−8.851**	**−10.531**	**0.64**	**−0.462**	**−4.742**	**−11.104**	**0.53**
2	0.539	3.770	−9.992	0.37	0.350	3.298	−10.754	0.38
3	3.444	24.597	−6.548	0.29	1.994	18.778	−8.760	0.43
4	0.531	3.718	−6.017	0.53	0.615	5.802	−8.143	0.53
5	−1.839	−13.263	−7.856	0.52	−3.191	−30.046	−11.335	0.52
6	0.647	4.578	−7.209	0.56	0.705	6.637	−10.630	0.52
7	0.061	0.435	−7.148	0.52	0.908	8.545	−9.722	0.47
8	−0.640	−4.571	−7.788	0.41	−1.290	−12.150	−11.012	0.37
9	−0.244	−1.725	−8.032	0.40	1.612	15.182	−9.400	0.31
10	0.041	0.434	−7.991	0.55	−1.134	−10.681	−10.534	0.62

Table 4
Bond and stock excess returns over different event windows for 37 bankrupt firms during the period 1980–1989 (t-statistics in parentheses)

Event window	Secured class ($N = 5$)	Unsecured class ($N = 45$)	Convertible class ($N = 7$)	Common stock ($N = 29$)
$-10, -2$	0.209 *	−0.110	−0.016	−9.012 ***
	(1.69)	(−0.34)	(−0.27)	(−3.44)
$-1, 0$	0.060	−10.847 ***	−4.879 ***	−32.701 ***
	(0.45)	(−71.68)	(−10.85)	(−26.45)
$-1, 0, +1$ [@]	0.917	−11.319 ***	−11.502 ***	−33.753 ***
	(1.34)	(−61.08)	(−20.88)	(−22.28)
$+2, +10$	2.090 **	1.621 ***	3.596 ***	9.450 ***
	(2.49)	(5.05)	(3.77)	(3.60)
$-10, +10$	3.216 **	−9.808 ***	−8.164 ***	−33.324 ***
	(2.26)	(−20.00)	(−5.60)	(−8.31)

[@] Only 40% of secured issues had negative reaction while 93.33% of unsecured issues, all convertible issues and 90% of stocks reacted negatively.
*, **, *** Significant at the 0.10, 0.05 and 0.01 levels, respectively.

Betker (1992) finds that secured debtholders experience a negative return during the month of the bankruptcy filing. On examination of the S&P Bond Guide prices for the 19 secured issues in Betker's sample we find that for the sub-sample of firms with available trade prices the average raw return is positive. However, when returns are computed for all bonds (with either trade, bid, ask or desk prices) the average monthly return becomes negative. Perhaps, Betker's (1992) result for the secured debt class is influenced by his use of the month-end S&P Bond Guide's bid/ask/desk prices which seem to produce a downward bias in the average monthly returns. As mentioned earlier, Hand et al. (1992) identify the problems associated with using bid prices rather than transaction prices to analyze bond returns. They also point out the advantage of using daily prices to isolate the announcement effect on bond prices.

The convertible debt group reacts similarly to the information revealed by the announcement as the unsecured class as they can be viewed as *de facto* unsecured straight debtholders when the firm is in bankruptcy reorganization. For all securityholder groups, except for the secured debt class, the nonparametric binomial sign tests produced z-statistics that are statistically significant indicating the absence of outliers affecting our results. These findings imply that, on average, bankruptcy announcements have not been fully anticipated by securityholders and that the information content of bankruptcy announcements is negative for all securityholders except for secured debtholders. It is noteworthy that the stock excess returns are similar for all event windows in terms of magnitude and significance when the *market-adjusted* mean excess returns are calculated. This

indicates that any bias in the results due to any downward drift in security prices during the comparison period is minimal.

Post-bankruptcy filing period (days +2, +10) excess returns reveal that the secured debt class gains a statistically significant 2.09%. For the entire 21-day event window, secured debt category gains a significant 3.22%. This is the only security group that experiences gains over the entire event window while the stockholders, convertible bondholders and unsecured debtholders lose −33.32%, −8.16% and −9.81%, respectively. This finding may be attributed to various advantages that are enjoyed exclusively by secured creditors as discussed in section 2. Interestingly, significant price reversal is reported for the unsecured debt, convertible debt and common stock during the post-filing period (+2, +10). This price recovery may be due to uncertainty resolution after the Chapter 11 filing and/or market over-reaction to the filing announcement.

Our two-day announcement period stock excess return is similar to that found by Lang and Stulz (1992) who report a statistically significant two-day stock excess return of −21.43% around the bankruptcy filing date. It should be noted here that stock prices of financially distressed firms are generally very low and thus their bid-ask spread is a large percentage of the price hence introducing the measurement error in computing their returns (Morse and Shaw, 1988). This problem is comparatively less severe for bond returns as their price base is much higher with the average bond price two days prior to bankruptcy filing being $245.

Warner (1977) reports a −9.2% bond return over that of a control portfolio for the month of the bankruptcy filing for a sample of 20 railroad firms. His result is similar to the 21-trading day event period (equivalent to one month centered around the filing announcement) cumulative returns of −9.81% and −8.16% for unsecured and convertible debt classes reported in this study. This comparison, however, must be taken with caution as he does not separate secured from unsecured issues. Betker (1992) documents a raw return of −25.41% for convertible bondholders and −25.41% for subordinated bondholders in the month of the bankruptcy filing.

5.2. *Cross-sectional regression analysis*

To explain the securityholder excess returns in the event of bankruptcy filing we estimate different versions of the following regression model.

$$\mathrm{ER}_{-1,0} = a_0 + a_1\mathrm{TIME} + a_2\mathrm{ISSUES} + a_3\mathrm{DEFAULT} + a_4\mathrm{SRD} + a_5\mathrm{DR} + e \tag{7}$$

where, $\mathrm{ER}_{-1,0}$ is the two-day (−1,0) cumulative excess bond or stock return. Estimates of the bond and stock models are presented in Table 5. We estimate two bond regressions. Model 1 includes multiple bonds per firm while model 2 is estimated using one bond per firm.

Table 5
Results of ordinary least squares regressions of bond and stock excess returns for event period (−1,0) for 37 bankrupt firms, 1980–1989 (*p*-values in parentheses)

Independent variables	Bond models [1]		Stock model
	Model 1	Model 2	Model 3
Intercept	24.712	20.550	−3.045
	(0.084)	(0.136)	(0.440)
TIME [a]	−0.015 * * *	−0.018 * *	−0.015 *
	(0.004)	(0.034)	(0.068)
ISSUES [b]	−3.6E7 *	−3.2E7	−7.8E7 *
	(0.087)	(0.206)	(0.075)
DEFAULT [c]	7.777 * *	8.807	6.617
	(0.028)	(0.113)	(0.187)
SRD [d]	15.536 * *	17.565 *	–
	(0.012)	(0.066)	
DR [e]	19.025 * *	29.460 * *	−4.192
	(0.013)	(0.014)	(0.429)
Adjusted R^2	0.193	0.212	0.138

[1] Model 1 includes all 57 bonds, i.e. multiple bonds per firm while model 2 includes only one bond per firm.

Variable definitions:

[a] TIME is the number of days the firm spent in reorganization.

[b] ISSUES is the number of bond issues outstanding at the time of bankruptcy scaled by the firm's total assets at year-end preceding the bankruptcy filing.

[c] DEFAULT takes a value of 1 if the firm defaulted on interest and/or principal prior to filing bankruptcy and 0 otherwise.

[d] SRD takes a value of 0 when the issue is secured and 1 otherwise.

[e] DR is the ratio of book value of total debt to book value of total assets at the year-end prior to the bankruptcy announcement obtained from Moody's Manuals.

The degree of complexity of the reorganization has implication on how long the firm remains in the reorganization process. Clearly, the more complex the reorganization process, the greater the dissipation of bondholder wealth. We use two measures to proxy for the complexity of the reorganization: the length of time spent (in days) in reorganization (TIME) and the number of bond issues outstanding at the time of bankruptcy scaled by total assets (ISSUES). We scale the number of debt issues by total assets since large firms typically have more debt issues outstanding. A negative relation is expected between bondholder excess return and these two complexity measures.

In the bond regressions, the variable TIME is significant with *p*-values of 0.004 and 0.034, respectively. This indicates that the more complex the reorganization as represented by the time spent in bankruptcy, the greater the negative impact on securityholders. This finding is consistent with the Franks and Torous (1989) argument that the longer the reorganization process, the greater the destruction of bondholder wealth. This in turn creates an incentive for the bondholders to accept

deviations from the absolute priority rule as a payment to the stockholders thereby purchasing the stockholders' option to lengthen the process. Interestingly, we find that the length of the bankruptcy process also has a significant negative impact on the stockholders with a coefficient of −0.015. Our results indicate that the longer it takes to emerge from bankruptcy the greater the wealth loss, not only for the bondholders, but also for the stockholders. Furthermore, this finding reflects that *a priori* market participants are able to distinguish between those firms that spend longer time in reorganization from those that emerge sooner.

Another proxy for complexity, ISSUES, is significant in model 1 (bonds) and model 3 (stocks). [7] Thus, in general the complexity of the reorganization process (captured by TIME and ISSUES variables) is significant in determining the wealth impact on the various securityholder classes around the announcement. In addition, the complexity of the reorganization process is not merely a function of the complexity of the financial structure but also of the nature of the firm's economic problems, such as, the degree of competition in the industry, whether the firm is operating in a distressed industry, the degree of conflict of interest between creditor groups, litigation by third parties, etc. [8]

The greater the degree of anticipation of the bankruptcy filing, via the signal of prior default on debt, the smaller the expected adverse valuation impact of the filing on any security class. We measure the surprise factor implicit in the bankruptcy announcement by differentiating between firms that have previously defaulted on interest and/or principal payments from those firms that went bankrupt without prior default on debt. Clearly, for the first group the bankruptcy announcement is less of a surprise and hence we would expect the securityholders to be affected less by the filing. The dichotomous variable, DEFAULT, takes a value of 1 if the firm has been in default prior to its bankruptcy filing and 0 otherwise. This variable has positive coefficient estimates in all three models indicating that securityholders of firms that had not defaulted on debt obligations prior to the bankruptcy filing are impacted more adversely. However, it is statistically significant only in bond model 1.

The various classes of debtholders are expected to be impacted differently by the bankruptcy depending on their seniority/priority status. It is expected that the more senior the debt, the less the effect of the bankruptcy announcement. To the extent that priority claims are (expected to be) violated in bankruptcy, the weaker the expected relationship between the seniority of debt claims and bond excess return. We measure the seniority of debt claims (SRD) with a categorical variable that takes a value of 1 if the debt issue is secured and 0 otherwise. We observe in the bond models (models 1 and 2) that the coefficient estimates of SRD are

[7] We find that the coefficients of the absolute number of debt issues (unscaled by total assets) are insignificant in our regression models.

[8] The correlation between the variables TIME and ISSUES is insignificant.

positive and significant, suggesting that the secured bondholders are impacted less by the bankruptcy than the remaining debtholders. This result is perhaps due to some exclusive advantages enjoyed by the secured creditors in bankruptcy as mentioned in section 2.

According to Jensen (1986), leverage creates value by providing discipline and monitoring functions which are not available to an all-equity firm. In the face of financial distress when firm value is eroding, high leverage leads to an earlier default leading to conservation of firm value by providing claimholders with an incentive to reorganize quickly and efficiently when the alternative is a continued deterioration of value. However, in cases of bankruptcies caused by exogenous shock, leverage may not be as effective a mechanism. If an exogenous shock were the primary cause of distress, high debt will not necessarily preserve value. Therefore, to the degree that financial distress is endogenously driven, the firm's leverage and security excess returns are expected to be positively related. We measure leverage as the ratio of total book value of debt to book value of total assets (DR) at the year-end preceding the bankruptcy announcement.

As expected the coefficient estimates of the debt ratio variable, DR, are positive and significant with p-values of 0.013 and 0.014 for bond models 1 and 2, respectively. This result indicates that higher levels of debt act as a stop-loss measure for the bondholders by forcing the firm into bankruptcy sooner. The result is in support of an implication of Jensen's (1986) argument that leverage acts as a firm value preserver. It is also possible, however, that firms with high leverage experience large accounting losses in the past which results in the book value of their equity to be very small. Furthermore, if large losses signal financial distress, then market participants would have already bid down the prices. If this argument holds then the leverage variable should also be significantly positive in the stock model. However, we find that this variable has a negative and insignificant coefficient in the stock model. This seems to suggest that any benefits from early bankruptcy filing due to high leverage accrue to bondholders as investors consider them to be *de facto* residual claimants in this special situation.

6. Summary and conclusions

This study documents the effect of the information released by bankruptcy announcement on stockholders and three different classes of bondholders of the filing firm. Significant adverse stock price reaction to the announcement is reported. More interestingly, it is reported that the different classes of debtholders react differently to the information revealed by the bankruptcy announcement. The secured debtholders are unaffected by the announcement. However, the unsecured and the convertible debt classes exhibit significant adverse price reaction to the announcement. Furthermore, substantial price recovery is observed in the post-filing period for all security groups. This may be due to substantial uncertainty

resolution and/or investor overreaction to the bankruptcy announcement. Another notable observation is that the secured debtholders gain significantly during the entire 21-day event period while substantial losses are reported for all other securityholder groups. This gain for the secured class may be rationalized by the fact that secured creditors are afforded favorable interest accrual treatment which is not provided to the unsecured creditors and also the benefits of improved collateral value of the secured creditors if the debtor-in-possession attempts to improve its cash flow position by rejecting onerous executory contracts.

Cross-sectional analysis shows that the length or complexity of the reorganization process has a significant adverse effect on bond excess returns. The results also indicate that market participants are able to distinguish *ex ante* between the firms that spend longer time in the reorganization process from those that emerge sooner. The signal of prior default on debt obligations is found to have a significant dampening effect on *all* security price reactions to Chapter 11 filing. The secured status of a debt issue is found to play a significant role in protecting the secured debtholder from adverse valuation impact of the Chapter 11 filing announcement. The analysis also reveals that leverage plays a significant role in preserving firm value by forcing the firm to confront bankruptcy sooner. This finding is in support of Jensen's (1986) argument in favor of leverage.

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