

Determinants of Bondholder Wealth Following Corporate Takeovers (1980-1988)

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Abnormal returns earned by nonconvertible bondholders following corporate takeovers are related inversely to issuer default risk. High quality bonds (rated A or above) tend to earn negative abnormal returns, and low quality bonds (rated BBB or below) tend to earn positive abnormal returns. A significant amount of variation also is observed in the returns earned by target and acquiring firm bondholders. Target firm bond returns are related inversely to issuer default risk and changes in issuer leverage. In contrast, acquiring firm bondholders earn higher returns following unrelated mergers and acquisitions that increase the firm's leverage ratio. Finally, this study examines the importance of indenture covenants. While high quality senior bonds with few restrictive covenants often lose following corporate takeovers, subordinated bondholders generally gain.

INTRODUCTION

Empirical research indicates that target firm stockholders earn positive abnormal returns following corporate takeovers, and acquiring firm stockholders earn normal or negative abnormal returns (Jensen and Ruback, 1983; Jarrell, Brickley, and Netter, 1988). The method of payment, however, is an important determinant of shareholder wealth; target and acquiring firm stockholders generally earn larger excess returns following cash rather than stock offers (Wansley, Lane, and Yang, 1983; Huang and Walkling, 1987; Travlos, 1987; Wansley, Lane, and Yang, 1987; and Franks, Harris, and Mayer, 1988). Differences in tax treatment, asymmetric information, and acquisition-induced changes in leverage are identified as three possible explanations.¹

In contrast, the determinants of bondholder wealth have not been tested extensively. Instead, most researchers conduct an event study that examines only the reaction of bond prices to merger announcements. Based on the finding that nonconvertible bondholders tend to earn normal returns around the announcement date, researchers often hypothesize that managers increase firm leverage or risk (incentive effects) to offset the gains that otherwise would accrue to bondholders as a result of synergy or the coinsurance effect. For example, Rathinasamy, Philippatos, and Shrieves (1991) conclude that managers often neutralize wealth transfers from stockholders to bondholders by employing greater lever-

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¹ Researchers hypothesize that acquiring firms pay larger premiums in cash transactions to compensate target firm shareholders for incurring an immediate tax liability. If the target firm is acquired for stock, on the other hand, taxes are deferred until the stock is sold. In addition, Myers and Majluf (1984) claim that stock exchanges have an adverse effect on the acquiring firm's stock price because investors typically perceive stock issues as a signal of bad news. The payment method also can affect stockholder wealth, however, by changing the acquiring firm's capital structure. Yook and McCabe (1990) and Travlos and Papaioannou (1991) conclude that the signal communicated by the payment method is relatively more important than the change in firm leverage. Trifts (1991) finds that the coefficients of both variables are statistically significant.

age. Asquith and Kim (1982) and Dennis and McConnell (1986) reach a similar conclusion, but they also suggest that restrictive bond covenants effectively protect bondholder wealth. Dennis and McConnell (1986) hypothesize that mergers will not be completed unless each type of security gains (or at least does not lose).

Most event studies, however, do not differentiate between acquisitions that increase incentive effects and transactions that decrease issuer risk. As a result, the finding that takeover announcements have no noticeable impact on bondholder wealth does not indicate necessarily that bond returns are invariant to incentive effects. If two firms with different cash flow variances merge, for example, Shastri (1982) argues that the bonds issued by the riskier firm should earn higher returns than the bonds issued by the lower risk firm. If the returns on the two bonds are averaged (i.e., the heterogeneity in the bond sample is ignored), then the gain on the higher risk bond would tend to offset any loss on the lower risk bond. While the empirical test would support the conclusion that bondholders earn normal returns on average, the methodology does not test the hypothesized inverse relationship between incentive effects and changes in bondholder wealth specifically.

The purpose of this study is to test whether excess bond returns are related systematically to one or more underlying variables. A regression model is developed to explain excess bond returns around the takeover announcement date. The independent variables include the issuer's bond rating, the change in the issuer's leverage ratio, and dummy variables that indicate industry relatedness and the presence of bond covenants.² The regression model tests four hypotheses:

- Low-rated bonds gain more from synergy and the coinsurance effect than do highly rated bonds;
- Bond returns are related inversely to changes in the issuer's leverage ratio;
- Industry relatedness (same two digit SIC code) is an important variable; and
- Bond covenants are an important determinant of bondholder wealth.

The results indicate that bond returns exhibit greater variability following corporate takeovers than the conclusions drawn from previous studies would suggest. Although bondholders do not gain or lose in the aggregate, bond returns are related inversely to issuer default risk. Low-rated bonds tend to gain from takeovers, and high quality bonds tend to lose. Target firm bond returns also are related inversely to changes in leverage. Consequently, the gains from synergy and the coinsurance effect do not offset necessarily the losses caused by incentive effects for individual bond issues.

The findings of this study may not be directly comparable to previous studies, however, because the time periods are different. Previous studies analyze mergers announced primarily during the 1960s and 1970s, but this study examines acquisitions completed during the 1980s. Because hostile cash tender offers increased in frequency during the latter

² Smith and Warner (1979) explain how indenture covenants can reduce conflicts between stockholders and bondholders. Asquith and Wizman (1990) and Walker (1991) find that bond covenants are an important determinant of bondholder wealth following leveraged buyouts.

period, one would expect the takeovers examined in this study to be associated with larger incentive effects.³

PREVIOUS RESEARCH

Financial theory indicates that mergers can have a positive or negative impact on bondholder wealth. Based on Lewellen's (1971) argument that a conglomerate merger can result in greater debt capacity if the cash flows of the two merging firms are not perfectly positively correlated (the coinsurance effect), Higgins and Schall (1975) and Galai and Masulis (1976) show how mergers can transfer wealth from the firm's stockholders to its bondholders. Jensen and Meckling (1976), on the other hand, show how managers can transfer wealth from the firm's bondholders to its stockholders by increasing firm leverage or by accepting risky investment projects. If a merger results in synergy, the stockholders and the bondholders both can gain. The gain to each type of security depends on the relative size of the coinsurance effect (for stocks) and the incentive effects (for bonds).

Empirical studies indicate that bondholders generally earn normal or positive abnormal returns around the merger announcement date. For example, Kim and McConnell (1977), Asquith and Kim (1982), and Dennis and McConnell (1986) use an event study methodology and find that bondholders neither gain nor lose following mergers.⁴ Bondholders earn normal returns regardless of bond rating or issuer status (i.e., acquiring or target firm). The authors conclude that managers often neutralize wealth transfers to bondholders by increasing firm leverage, but they do not test this hypothesis directly. Instead, Asquith and Kim (1982) and Dennis and McConnell (1986) test whether bond returns are related negatively to the issuer's stock return (evidence of incentive effects) or the correlation between the stock returns of the two merging firms (evidence of the coinsurance effect). Neither variable is statistically significant.

Sweeney (1991) examines the sequence of events implied by the increased debt capacity hypothesis as a motive for conglomerate merger. The merger should:

- Decrease the earnings variability of the acquiring firm;
- Increase the firm's leverage ratio; and
- Not reduce shareholder wealth.

He finds that only eight of the 23 conglomerate mergers he examines meet all of these conditions (a proportion too low to support the increased debt capacity hypothesis).

The following studies examine conglomerate and nonconglomerate mergers. Settle, Petry, and Hsia (1984) find that bondholders gain when the combined premerger debt ratio of the merging firms is greater than 20 percent. Bondholders earn normal returns when this ratio is less than 20 percent. The combined premerger debt ratio is defined as the sum of the long-term debt of both merging parties divided by the sum of their total assets.

³ Walker (1990) finds that managerial resistance to takeover bids has a negative impact on the wealth of the target firm's bondholders. He concludes that hostile bids, which generally involve a cash payment, create larger incentive effects than negotiated mergers (which often involve an exchange of stock).

⁴ The first two studies examine conglomerate mergers; Dennis and McConnell (1986) examine conglomerate and nonconglomerate mergers.

They do not test the impact of leverage changes on bondholder wealth for individual firms.

Eger (1983) finds that bondholders earn positive abnormal returns following pure stock exchange mergers. She hypothesizes that bondholders gain because pure stock exchange mergers are associated with lower incentive effects than mergers that involve cash or new debt securities. In contrast, Travlos (1987) finds that the nonconvertible bondholders of acquiring firms earn normal returns following cash offers and negative abnormal returns following stock exchanges. He argues that these results are consistent with the Myers and Majluf (1984) signalling hypothesis.

Rathinasamy, Philippatos, and Shrieves (1991) use the premerger debt ratios, the cash flow variances, and the cash flow correlations of the merging firms to estimate the potential debt capacity of merging pairs. They find that bondholders earn normal returns when actual debt levels are greater than potential debt capacity and positive abnormal returns when actual debt levels are below potential.

All of the studies previously cited use an event study methodology. Most studies also use an event study methodology to analyze various subsamples. For example, Settle, Petry, and Hsia (1984) differentiate between low debt and high debt merging pairs, Rathinasamy, Philippatos, and Shrieves (1991) divide their sample by potential debt capacity, and Travlos (1987) and Eger (1983) group bondholders by payment method (cash or stock). These subsamples, however, represent only indirect tests of incentive effects.

This study differs from previous research in three important ways. First, the focus is on mergers announced during the 1980s. Second, the hypothesized inverse relationship between changes in bondholder wealth following corporate takeovers and the presence or absence of incentive effects is tested. Third, the ability of indenture covenants to protect bondholder wealth is examined.

DATA AND METHODOLOGY

This study examines mergers and acquisitions announced between 1980 and 1988. The sample was drawn from all of the firms on the Compustat industrial annual research file with a deletion code of 01 (acquisition or merger) and a file code of 11 (primary industrial file and in the S&P industrials index) or 01 (primary industrial file and not in the S&P industrials index). *Standard & Poor's Bond Guide* was checked to see if either the acquiring or the target firm (or both) had nonconvertible bonds outstanding at the announcement date. The *Wall Street Journal Index* was used to identify the announcement date of each acquisition. Data also were obtained from the Compustat tapes and *Moody's Industrial Manual*.

The sample contains 33 acquired firms and 59 acquiring firms that had outstanding bonds listed in *Standard & Poor's Bond Guide*.⁵ The bond prices of both the acquiring and the target firm are available for 27 takeovers. There are 32 mergers in which only the acquiring firm has outstanding bonds and six mergers in which only the target firm has outstanding bonds. As a result, the final sample contains 65 takeovers involving 92

⁵ The acquiring and target firms could not be identified clearly in three mergers involving six sample firms. The firm that employed the CEO of the merged firm prior to acquisition was selected as the acquiring firm.

Table 1—Data: Summary Statistics

Covenants	No. of Bonds	No. of Firms	Average Issue Size (\$ mil) ¹	Average Time To Maturity (years) ²	Average Firm Size (\$ mil) ³	Average Bond Rating
Negative Pledge Clause	122	58	\$116.8 (124; 76)	16.7 (8; 17.3)	\$9,071 (14,245; 4,481)	A+
Senior Bonds With Dividend, Total Debt, or Secured Covenants	92	40	52.3 (54; 35)	13.0 (8; 12.1)	6,348 (15,620; 2,535)	A-
Subordinated Bonds	46	26	117.2 (209; 46)	11.5 (7; 10.5)	4,591 (7,625; 1,420)	BB+
Total Sample	260	92				

¹Issue size is reported as average amount outstanding per bond (standard deviation; median) at the announcement date

²Time to maturity is reported as average length of time remaining to maturity (standard deviation; median) at the announcement date

³Firm size is reported as average total assets (standard deviation; median) of firms with at least one bond outstanding with the specified covenant. Firm size is estimated using total assets for the year-end prior to the announcement date

firms. Thirty-two mergers are classified as related (the acquiring and target firms have the same two digit SIC code), and 33 acquisitions are unrelated.⁶ The results in Table 1 indicate that the sample bonds differ in terms of covenant protection, issue characteristics, and issuer financial strength. Because this study examines determinants of bondholder wealth, a discussion of these characteristics is warranted.

The 92 sample firms have a total of 260 bond issues outstanding (Table 1). The bonds are grouped into three mutually exclusive categories: senior bonds with only a negative pledge clause; senior bonds with a dividend, total debt, or secured covenant; and subordinated bonds. A negative pledge clause restricts only the firm's ability to issue secured debt, a dividend covenant restricts the firm's ability to pay dividends, a total debt covenant restricts the firm's ability to issue debt unless net tangible assets after issuance are greater than or equal to a specified percentage of funded debt, and a secured covenant indicates that a lien exists on specific assets to pay the bondholders if the firm defaults.

The results in Table 1 indicate that subordinated bonds and senior bonds with more restrictive covenants tend to have smaller issue sizes and shorter times to maturity than senior bonds with only a negative pledge clause. For example, the median issue size of negative pledge clause bonds is \$76 million, but the median issue size of senior bonds with more restrictive covenants is \$35 million. (The mean issue sizes are \$117 million

⁶ Using this classification system, Scanlon, Trifts, and Pettway (1989) find that acquiring firm stockholders earn larger abnormal returns in related acquisitions.

and \$52 million, respectively.) Firms that issue bonds with more restrictive covenants tend to have smaller asset book values and lower bond ratings. The average bond rating at the announcement date is measured using Standard & Poor's bond ratings (AAA = 1, AA+ = 2, AA = 3, ... CCC+ = 17) and is based on the number of firms with the specified covenant. For each variable, the null hypothesis that the median value for senior bonds with only a negative pledge clause is equal to the median value for bonds with more restrictive covenants (either subordinated or senior with dividend, total debt, or secured covenants) is rejected at the .10 level or better.⁷

Table 2 compares the debt ratios, leverage changes, and bond ratings for each covenant category, acquiring firms, and target firms. Firms that issue bonds with more restrictive covenants tend to have higher leverage ratios (defined as long-term debt divided by total assets) than firms that are protected with only a negative pledge clause. For example, the average leverage ratio of firms that issue bonds with only a negative pledge clause is .1657, but the average leverage ratio of firms that issue subordinated bonds is .2567. The null hypothesis that these averages are equal is rejected at the .01 level. (See footnote 7 for a description of the test.) Firms that issue senior bonds with only a negative pledge clause have lower debt ratios than firms that issue senior bonds with more restrictive covenants.

These results are consistent with the findings of Malitz (1986), who concludes that large firms with low leverage ratios are less likely to issue bonds with dividend covenants and total debt restrictions than smaller firms with higher leverage ratios. She claims that bond investors do not require large firms with a history of non-expropriation to write explicit contracts. In contrast, investors require more restrictions from smaller firms that have not developed a long-standing relationship with the bond market.

The results in Table 2 also indicate that incentive effects (as measured by the increase in the issuer's leverage ratio) vary across the covenant categories. The average increase in the leverage ratios of firms that issue bonds with only a negative pledge clause is 79 percent, but the average increase for firms that issue senior bonds with more restrictive covenants is 33 percent. The difference is significant at the .10 level using both a median and a means test. In contrast, increases in leverage are similar for firms that issue negative

⁷ The median test is described in Siegel (1956, p. 111). Comparisons also are conducted using a two sample test for differences in population means:

$$(\bar{X}_2 - \bar{X}_1) / [(s_1^2/n_1 + s_2^2/n_2)]^{1/2}$$

where:

- $\bar{X}_1$ and $\bar{X}_2$ = Sample averages;
- n_1 and n_2 = Sample sizes; and
- s_1^2 and s_2^2 = Sample variances.

In contrast to the median test, two null hypotheses could not be rejected using the means test:

- Subordinated and negative pledge clause bonds have similar issue sizes; and
- Firms that issue senior bonds are comparable in size (total assets) regardless of covenant protection.

Outliers, however, affect the mean more than the median.

Table 2—Incentive Effects: Subsample Results

Covenants	No. of Firms	Initial Leverage Ratio ¹	Average	Change in Leverage ² Range	Average Bond Rating
Bond Covenants					
Negative Pledge Clause	58	.1657 (.08; .16)	79% (147; 28)	-51% to 710%	A+
Senior Bonds With Dividend, Total Debt, or Secured Covenants	40	.2017 (.11; .17)	33% (112; 10)	-71% to 653%	A-
Subordinated	26	.2567 (.16; .18)	43% (86; 31)	-73% to 377%	BB+
Firms					
Acquiring Firms	59	.1817 (.10; .17)	55% (118; 14)	-66% to 710%	A
Target Firms	33	.2225 (.15; .18)	62% (146; 23)	-73% to 653%	A-

¹The initial leverage ratio is reported as the average (standard deviation; median) of long-term debt divided by total assets for firms with at least one bond outstanding with the specified covenant. The initial leverage ratio is calculated for the year-end prior to the announcement date

²The average percentage change (standard deviation; median) in the firm's leverage ratio is calculated from the year-end prior to the announcement date to the year-end after the completion of the merger. The leverage ratio equals long-term debt divided by total assets. Positive (negative) numbers represent an increase (decrease) in the firm's leverage ratio

pledge clause bonds and firms that issue subordinated bonds, and for acquiring firms and target firms. In addition, no significant differences are observed in the initial debt ratios of target and acquiring firms. The results of the median and the means test are similar for each pairwise comparison.

An increase in leverage does not result necessarily in bondholder losses. The issuer's financial strength, as well as the gains from synergy and the coinsurance effect, could offset any potential losses due to incentive effects. This study employs two different statistical tests. First, an event study methodology is used to examine the reaction of bond prices to takeover announcements. Second, a regression model is developed to examine the determinants of merger-related changes in bondholder wealth.

EVENT STUDY METHODOLOGY

The monthly abnormal return for each bond i at month t (AR_{it}) is estimated using a duration matching technique that immunizes interest rate risk (Fortier, 1989):

$$(1) AR_{it} = R_{it} - R_{gt},$$

where:

R_{it} = The actual return for bond i at month t , which includes accrued interest; and

R_{gt} = The actual return for a U.S. government bond at month t that has similar duration as bond i .

If a company k has more than one bond issue outstanding, an average abnormal return (AR_{kt}) is calculated for the company. The weight of each bond is based on the amount outstanding on the takeover announcement date. As a result, each firm is represented only once in the event study.

The null hypothesis of no abnormal return is examined using standard event study methodology (Brown and Warner, 1985). The test statistic for month t is given by:

$$(2) \frac{\overline{AR}_t}{s(\overline{AR}_t)},$$

where:

$$(3) \overline{AR}_t = \left(\frac{1}{N_t} \right) \sum_{k=1}^{N_t} AR_{kt},$$

$$(4) s(\overline{AR}_t) = \sqrt{(1/14) \sum_{t=-17}^{-3} (\overline{AR}_t - AR^*)^2},$$

$$(5) AR^* = (1/15) \sum_{t=-17}^{-3} \overline{AR}_t,$$

and N_t equals the number of firms in the sample at time t . The estimation period contains 15 months (from $t = -17$ to $t = -3$), and the event period contains 15 months (from $t = -2$ to $t = +12$). The test statistic will be distributed as a Student- t under the null hypothesis of no abnormal return if the AR_{it} s are independent, identically distributed, and normal.

Financial researchers have used a wide variety of techniques to examine the impact of mergers on bond prices (e.g., mean-adjusted returns, matching bonds, bond indices, and U.S. government securities). This study uses U.S. government securities as a benchmark because bondholders often incurred indirect losses during the 1980s due to increased event risk (Zimmer, 1990). If the announcement of large, debt-financed acquisitions adversely affected the corporate bond market, then methodologies that use corporate bonds to estimate abnormal returns understate bondholder losses.

A reviewer observed that a duration-matching technique might overstate the returns of low rated bonds because it ignores the default risk premium. If the bias is significant, then one would expect to observe an upward drift in the cumulative abnormal returns (CARs) earned by low rated bonds over the estimation period. The CAR was calculated

for each of the 31 low rated issuers (BBB or below) over the estimation period ($t = -17$ to $t = -3$), the average CAR was computed, and the null hypothesis that the average CAR is equal to zero was tested. The null hypothesis cannot be rejected at conventional levels (the average CAR = -.0154, and $t = -1.07$). Ignoring the default risk premium, therefore, should not bias the results of this study.⁸

REGRESSION METHODOLOGY

This study also tests the determinants of bondholder wealth following corporate takeovers. The dependent variable is defined as the cumulative abnormal return for each firm k (CAR_k) over the period beginning two months before the takeover announcement and ending with the completion date ($t=end$):⁹

$$(6) CAR_k = \prod_{t=-2}^{t=end} (1 + AR_{kt}) - 1$$

Financial theory and previous empirical studies indicate that issuer leverage, changes in issuer leverage, industry relatedness, and issuer default risk are important factors that affect bondholder wealth. The following basic model is tested for both acquiring and target firms:¹⁰

$$(7) CAR_k = \beta_0 + \beta_1 * LEV_k + \beta_2 * CHG_k + \beta_3 * LOW_k + \beta_4 * SIC_k,$$

where:

LEV_k = the issuer's initial leverage ratio (long-term debt divided by total assets at the year-end prior to the announcement date);

CHG_k = the change in the issuer's leverage ratio (calculated from the year-end prior to the announcement date to the year-end after the completion of the takeover);

LOW_k = 1 if the firm's bonds are rated BBB or below; 0 otherwise; and

⁸ A reviewer suggested the following alternative methodology:

$$AR_{it} = R_{it} - R_{gt} - (\bar{R}_i - \bar{R}_g),$$

where:

$(\bar{R}_i - \bar{R}_g)$ = The average abnormal return for bond i during the estimation period.

The results using this technique are essentially the same as those reported in the paper.

⁹ The average length of this interval for the 92 sample firms is 6.6 months (standard deviation = 2.8 months; median = 6 months).

¹⁰ Because leverage decreases are capped at -100 percent (a levered firm is unlevered), but leverage increases can be infinitely large, a variable was included to test whether bond returns are more sensitive to leverage decreases. Although the coefficient of this variable is large in magnitude (particularly for target firms), it is not statistically significant. The results are essentially the same as those reported in the paper.

$SIC_k = 1$ if the two digit SIC codes of the acquiring and target firm are equal; 0 otherwise.

The intercept term (β_0) implicitly assumes an unrelated merger, an unlevered firm with bonds rated A or above, and a takeover that does not change the issuer's leverage ratio. The coefficient of the bond rating dummy variable (β_3) represents the change in CAR because a bond is rated BBB or less.

The impact of bond covenants on bondholder wealth is examined using the following model:

$$(8) CAR_{kj} = \beta_0 * PLEDGE_{kj} + \beta_2 * CHG_k + \beta_3 * LOW_k + \beta_4 * SIC_{kj} + \beta_5 * COVE_{kj} + \beta_6 * SUBORD_{kj}$$

where:

CAR_{kj} = the average cumulative abnormal return for the bonds issued by firm k with indenture covenant j;

$PLEDGE_{kj}$ = 1 if the bonds are senior bonds and have at most a covenant that restricts the firm's ability to issue secured debt; 0 otherwise;

$COVE_{kj}$ = 1 if the bonds are senior bonds and the indenture contains a dividend, total debt, or secured covenant; 0 otherwise; and

$SUBORD_{kj}$ = 1 if the bonds are subordinated; 0 otherwise.

The model has three mutually exclusive intercept terms (β_0 , β_5 , β_6), one for each type of indenture covenant. For example, the intercept β_0 implicitly assumes a high quality senior bond (with only a negative pledge clause) that is involved in an unrelated takeover that does not change the issuer's leverage ratio. Because some firms have multiple bonds outstanding with different indenture covenants, the number of observations is 124. Fifty-eight firms have senior bonds outstanding with only a negative pledge clause; 40 firms have senior bonds outstanding with a dividend, total debt, or secured covenant; and 26 firms have subordinated bonds outstanding (Table 2).

RESULTS

EVENT STUDY RESULTS

The results of the event study indicate that, on average, nonconvertible bondholders neither gain nor lose following corporate takeovers. None of the monthly abnormal returns around the announcement date is significant at conventional levels for acquiring firms, acquired firms, or the total sample (Table 3). The results for months 7 through 12, which are insignificant, are not shown. The results also indicate that acquiring firm bond

Table 3—Event Study Results: Total Sample, Acquired Companies, and Acquiring Firms (1980-1988)

Month	Total Sample (N=92)			Acquired Companies (N=33)		
	AR	t-stat	CAR	AR	t-stat	CAR
-2	-.0003	-.08	-.0003	-.0012	-.18	-.0012
-1	.0006	.15	.0003	.0047	.70	.0035
0	.0031	.75	.0034	.0083	1.23	.0118
1	-.0004	-.09	.0030	.0000	.01	.0118
2	.0020	.49	.0050	-.0006	-.09	.0112
3	.0037	.90	.0087	.0059	.88	.0171
4	.0030	.74	.0117	-.0004	-.06	.0167
5	.0006	.13	.0123	-.0121	-1.81*	.0046
6	.0000	-.01	.0123	.0026	.39	.0072

Acquiring Companies						
Month	Cash Offers (N=35)			Stock Offers (N=12)		
	AR	t-stat	CAR	AR	t-stat	CAR
-2	.0023	.25	.0023	-.0052	-.42	-.0052
-1	.0018	.19	.0041	-.0055	-.44	-.0107
0	-.0073	-.77	-.0032	.0139	1.12	.0032
1	.0002	.02	-.0030	-.0028	-.23	.0004
2	.0015	.16	-.0015	.0091	.73	.0095
3	.0014	.15	-.0001	.0123	.99	.0218
4	.0015	.16	.0014	-.0043	-.35	.0175
5	.0080	.85	.0094	.0128	1.03	.0303
6	.0001	.01	.0095	.0029	.24	.0332

Acquiring firm bondholders also earn normal returns around the takeover announcement date when the target firm is acquired for a combination of stock and cash (N=12 firms)

*Significant at the .10 level

holders earn normal returns regardless of the payment method (cash or stock) that is used to acquire the target firm.

Previous researchers often conclude that mergers have no noticeable impact on bondholder wealth because managers use incentive effects to neutralize wealth transfers from stockholders to bondholders, and because bond covenants effectively protect bondholder wealth. Together these statements imply that bond returns should exhibit little variation around the merger announcement date. The results of this study, however, indicate that bond returns exhibit a significant amount of variation following corporate takeovers (Table 4). The excess bond returns for the total sample vary from -17.7 percent to +29.5 percent. Approximately one-third of the sample firms lose more than 2 percent, one-third gain more than 2 percent, and one-third earn between -2 percent and +2 percent.

The cumulative abnormal returns reported in Table 4 are calculated for the period beginning two months before the initial announcement date and ending with the completion date.¹¹ While the results indicate that bondholders experience normal returns on average, issuer default risk is an important variable. Bonds rated A or above earn cumula

¹¹ The test is similar to the approach used by Asquith (1983), who examines stock returns from the merger announcement date to the completion date.

Table 4—Frequency Distribution of Cumulative Abnormal Returns: Preannouncement Period to Outcome Date (1980-1988)

CAR	Total Sample	Bonds Rated A or Above	Bonds Rated BBB or Below	Acquiring	Target
Less than -14%	2	2	-	1	1
-12 to -14	2	2	-	-	2
-10 to -12	1	1	-	1	-
-8 to -10	2	2	-	1	1
-6 to -8	5	4	1	5	-
-4 to -6	7	4	3	5	2
-2 to -4	13	11	2	6	7
-2 to 2	33	23	10	24	9
2 to 4	8	5	3	5	3
4 to 6	5	3	2	5	-
6 to 8	7	2	5	3	4
8 to 10	2	-	2	1	1
10 to 12	1	1	-	1	-
12 to 14	1	-	1	1	-
Greater than 14%	3	1	2	-	3
Total firms	92	61	31	59	33
CAAR	.0022	-.0141	.0343	-.0013	.0087
t-statistic	.32	-1.83*	2.74**	-.21	.55

CAAR = The cumulative average abnormal return earned over the period beginning two months before the announcement date and ending with the completion date

* Significant at the .10 level

** Significant at the .05 level

tive average abnormal returns (CAARs) of approximately -1.41 percent ($t = -1.83$, which is significant at the .10 level). In contrast, bonds rated BBB or below earn positive CAARs of approximately 3.43 percent ($t = 2.74$, which is significant at the .05 level). Twenty-six firms with bonds rated A or above (42 percent) earn excess returns less than -2 percent. Only six firms with bonds rated BBB or below (19 percent) earn excess returns less than -2 percent. As a result, low rated bonds tend to benefit more from corporate takeovers than do high quality bonds (which often lose). Separate statistical tests also were conducted for acquiring and target firm bondholders. For each subsample, the null hypothesis that the CAAR is equal to zero could not be rejected at conventional levels.

Bond rating changes that occur within 18 months of a takeover announcement support the conclusion that high quality bonds often lose (Table 5). While the bonds of 32 firms rated A or above (52.5 percent) were downgraded, the bonds of only seven firms rated BBB or below (23 percent) were downgraded. A separate analysis was conducted for the 27 mergers in which both the acquiring and target firms had publicly traded debt (Table 5). The bonds of the higher rated issuer were downgraded in 14 cases (67 percent), whereas the bonds of the lower rated company were downgraded in only five cases (24 percent).

REGRESSION ANALYSIS

Approximately 24 percent of the variation in target firm bond returns is explained by issuer default risk and changes in firm leverage (Table 6). Because the issuer's debt ratio

Table 5—Standard & Poor's Bond Rating Changes Within 18 Months of a Takeover Announcement (1980-1988)

	Initial Bond Rating		Initial Bond Rating	
	#	A or Above %	#	BBB or Below %
Upgrade	8	13.1%	10	32.3%
No Change	19	31.1	14	45.1
Downgrade	32	52.5	7	22.6
Called	2	3.3	-	-
Total Firms	61	100.0%	31	100.0%

**Bond Rating Changes:
A Comparative Analysis of 27 Merging Pairs**

	Higher Rated Bond		Lower Rated Bond		Same Rating	
	#	%	#	%	#	%
Upgrade	3	14.3%	10	47.6%	-	-
No Change	4	19.1	6	28.6	3	50.0%
Downgrade	14	66.6	5	23.8	3	50.0
Total Firms	21	100.0%	21	100.0%	6	100.0%

Table 6—Determinants of Bondholder Wealth: Acquiring and Target Firms (1980-1988)

Model	# of Obs	Intercept β_0	Initial Leverage Ratio β_1	Change in Leverage β_2	Rated BBB or Below β_3	Related Mergers β_4	Adj R^2	F
Target Firms								
1	33	-.0232 (-.51)	.1029 (.71)	-.0179 (-1.58) ^a	.0492 (1.43)*	.0018 (.06)	.224	3.32**
2	33	.0020 (.07)		-.0210 (-2.03)*	.0606 (2.00)**	-.0070 (-.24)	.238	4.33**
Acquiring Firms								
3	59	.0118 (.70)	-.0901 (-1.23)	.0052 (.89)	.0324 (2.21)**	-.0197 (-1.53) ^a	.075	2.17*
4	59	-.0048 (-.47)		.0077 (1.40) ^a	.0259 (1.88)**	-.0184 (-1.43) ^a	.066	2.37*

*, **, and *** indicate significance at the .10, .05, and .01 levels, respectively. The significance levels for β_3 are based on a one-tailed test. The significance levels for the remaining coefficients are based on a two-tailed test

^a.10 < p-value < .20

and bond rating are correlated (Table 2), two models are shown. In the first model both the bond rating and the initial leverage ratio are included. In the second model the issuer's leverage ratio is excluded. Because the explanatory power increases when the initial leverage ratio is dropped (model 2), there is reason to believe multicollinearity is present in model 1. The results in model 2 indicate that bonds rated BBB or less earn approximately 6 percent more than higher rated bonds. Excess bond returns also are related inversely to changes in firm leverage. If the target firm's leverage ratio increases 100 percent, the coefficient indicates that bond returns decrease approximately 2.10 percent ($t = -2.03$, which is significant at the .10 level). The coefficient for industry relatedness (β_4) is not statistically significant.

In contrast, the regression model explains only 7 percent of the variation in acquiring firm bond returns. There is some evidence that bondholders of acquiring firms earn larger excess returns when mergers increase firm leverage ($\beta_2 = .0077$ and $t = 1.40$, which is significant at the .20 level). This result is more consistent with the Myers and Majluf (1984) signalling hypothesis than the incentive-intensity hypothesis. There is also weak evidence that acquiring firm bondholders earn lower returns when the acquiring and target firms have the same two digit SIC code [$\beta_4 = -.0184$ and $t = -1.43$ (.10 < p-value < .20)]. One would expect the coinsurance effect to be larger when firms in unrelated industries merge. Finally, bonds rated BBB or below earn approximately 2.6 percent more than high quality bonds ($t = 1.88$, which is significant at the .05 level).

Table 7 examines the impact of bond ratings, indenture covenants, leverage changes, and industry relatedness on bondholder wealth. The three models address different issues. Model 5 examines bond performance by covenant category. High quality senior bonds with only a negative pledge clause (β_0) earn negative abnormal returns of approximately 2 percent ($t = -2.35$, which is significant at the .05 level). High quality senior bonds with more restrictive covenants earn normal returns ($\beta_5 = -.0099$ and $t = -.91$). Bonds rated BBB or below earn positive abnormal returns of approximately 3.86 percent more than high quality bonds ($t = 2.91$, which is significant at the .01 level). Because the results in Table 1 indicate that subordination status and bond rating are correlated, the bond rating variable was excluded in model 6. The results indicate that negative pledge clause bonds lose approximately 1.31 percent ($t = -1.53$, which is not significant at conventional levels (.10 < p-value < .15)). Subordinated bonds gain approximately 2.8 percent ($t = 2.19$, which is significant at the .05 level). Because the adjusted R^2 declines from .097 to .041, bond rating and subordination status should both be included in the model.

When leverage changes are included (model 7), issuer default risk is the only significant variable. The coefficients of the bond dummy variables, however, now reflect takeovers that do not change the issuer's leverage ratio.

FIRMS THAT HAVE MULTIPLE BONDS OUTSTANDING WITH DIFFERENT INDENTURE COVENANTS

The importance of bond covenants can be tested more directly by analyzing the returns of firms that have two types of senior bonds outstanding: senior bonds with only a negative pledge clause, and senior bonds with a dividend, total debt, or secured covenant included in the bond indenture. If the losses due to incentive effects are larger than the gains due to synergy and the coinsurance effect, then one would expect restrictive

Table 7—Determinants of Bondholder Wealth: Covenant Categories (1980-1988)

Model	# of Observations	Pledge β_0	Change in Leverage β_7	Rated BBB or Below β_3	Related Mergers β_4	Cove β_5	Subord β_6	Adj R^2	F
5	124	-.0204 (-2.35)**		.0386 (2.91)***		-.0099 (-.91)	-.0002 (-.01)	.097	5.38***
6	124	-.0131 (-1.53) ^a				.0026 (.26)	.0280 (2.19)**	.041	3.60**
7	124	-.0083 (-.69)	-.0027 (-.59)	.0363 (2.70)***	-.0149 (-1.27)	-.0012 (-.09)	.0084 (.50)	.098	3.66***

*, **, and *** indicate significance at the .10, .05, and .01 levels, respectively. The significance levels for β_3 are based on a one-tailed test. The significance levels for the remaining coefficients are based on a two-tailed test

^a.10 < p-value < .20

covenants to protect bondholder wealth. There are ten takeovers in which the senior bonds earn negative CARs. Define $D_i = X_{1i} - X_{2i}$, where X_{2i} = the abnormal return for the senior bonds of company i that are protected with a negative pledge clause, and X_{1i} = the abnormal return for the senior bonds issued by company i with more restrictive covenants. The null hypothesis that the two classes of senior bonds earn similar CARs is rejected at the .05 level ($D = .0366$ and $t = 1.89$). Senior bonds with more restrictive covenants earn approximately 3.66 percent more than senior bonds of the same issuer that do not have these restrictions. The t -statistic is calculated using a test of the difference in two populations means, $\mu_2 - \mu_1$, when the two samples are matched (Neter, Wasserman, and Whitmore, 1988, p. 407).

CONCLUSIONS

This study uses an event study methodology to examine the reaction of bond prices to corporate takeovers announced during the 1980s. In addition, a regression model is developed to test the determinants of bondholder wealth. The independent variables include the issuer's bond rating, the change in the issuer's leverage ratio, and dummy variables that reflect industry relatedness and the presence of bond covenants. While the results indicate that nonconvertible bondholders do not gain or lose in the aggregate, bond returns are related inversely to issuer default risk. Low quality bonds (rated BBB or below) tend to gain from takeovers, and high quality bonds (rated A or above) tend to lose.

A significant amount of variation also is observed in the returns earned by target and acquiring firm bondholders. The regression model explains approximately 24 percent of the variation in target firm bond returns. Bond returns are related inversely to issuer default risk and changes in firm leverage, but industry relatedness is not a significant variable. In contrast, the regression model explains only 7 percent of the variation in acquiring firm bond returns. While bond returns are related inversely to issuer default risk, there is some evidence that bondholders earn larger excess returns when mergers increase the firm's leverage ratio. This result is more consistent with the Myers and Majluf (1984) signalling hypothesis than with the incentive-intensity hypothesis. There is also weak evidence that acquiring firm bondholders earn larger returns when mergers involve firms in unrelated industries (presumably because the coinsurance effect is larger).

Finally, this study examines the relationship between bond returns and indenture covenants. High quality senior bonds that are protected only by a negative pledge clause are particularly vulnerable to corporate takeovers. These securities usually are issued by relatively large firms with low debt ratios. Moreover, firms that issue senior bonds with few restrictive covenants tend to engage in mergers that create larger incentive effects (as measured by the increase in issuer leverage). In contrast, low rated bonds generally earn positive abnormal returns following mergers. These securities are often subordinated bonds issued by relatively small firms with high debt ratios.

The findings of this study support the conclusion that bond returns are related systematically to the presence or absence of incentive effects associated with corporate takeovers. When incentive effects dominate, there is evidence that total debt, dividend, and secured covenants reduce bondholder losses. Only 43 percent of the senior bonds, however, are protected by these covenants.

Previous researchers often have used an event study methodology to examine the impact of mergers on bond prices. Based on the finding that bondholders earn normal returns around the announcement date, researchers often conclude that managers neutralize wealth transfers from stockholders to bondholders by employing greater leverage and that bond covenants effectively protect bondholder wealth. This study explores an alternative hypothesis: bondholders earn normal returns on average, but bond returns are related systematically to the incentive effects associated with corporate takeovers. The evidence for the 1980s supports the latter interpretation.

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