CORPORATE MERGERS AND THE IMPACT OF PRE-MERGER VARIANCE, LEVERAGE AND MATURITY OF BONDS ON WEALTH TRANSFERS

R. S. Rathinasamy*, Ronald E. Shrieves**, C. R. Krishnaswamy***

Abstract

This paper addresses several hypotheses concerning wealth transfers among bondholders and stockholders in two firms which merge. In so doing, several refinements relative to the previous research in this area are introduced. We find evidence which supports the presence of diversification effects (coinsurance) to some bondholders, incentive effects (risk increases) to other bondholders, and wealth transfers between stockholders and bondholders. This study examines the impact of 49 industrial mergers between 1970 through 1984 on the returns to bondholders and stockholders of the merging firms. Results indicate that bondholders of the acquired firm group gain significantly in the announcement month, suggesting a diversification effect for acquired firm bondholders. Acquiring firm bondholders suffer significant losses in the pre-announcement month supporting the incentive effects hypothesis for the acquiring firm bondholders. Further analysis indicates that abnormal returns to bondholders are greater for firms with high variance and high leverage pre-merger. We do not find any direct evidence that differences in maturity of merging firms' bonds have a significant impact on merger-related bondholder returns. We find evidence of wealth transfers between stockholders and bondholders of merging firms and some support for the theory that bondholder returns are negatively related to the pre-merger correlation between cash flows of the merging firms. In total, the empirical findings enable more definitive conclusions regarding the wealth effects of mergers on important classes of claimholders of merging firms, and buttress the theoretical developments relating to wealth transfers among those claimholders.

Keywords: mergers, bondholders, stockholders, incentive and diversification effects

**Professor of Finance, Department of Finance & Insurance, Ball State University, Muncie, IN 47306, Phone: (765)-285-1660, Fax: (765)-285-4314, E-mail: rsrathin@bsu.edu*
***Professor of Business and Finance, Department of Finance, University of Tennessee, Knoxville, TN 37996*
****Associate Professor of Finance, Department of Finance and Commercial Law, Haworth College of Business, Western Michigan University, Kalamazoo, MI 49008*

1. Introduction

This paper addresses several hypotheses concerning wealth transfers among bondholders and stockholders in two firms which merge. In so doing, several refinements relative to the previous research in this area are introduced. We find evidence which supports the presence of diversification effects (coinsurance) to some bondholders, incentive effects (risk increases) to other bondholders, and wealth transfers between stockholders and bondholders.

1.1. Wealth Transfer Phenomena Associated With Mergers

Mergers and acquisitions continue to be important phenomena in the U.S. economy. Empirical evidence indicates that acquired firm stockholders obtain significant positive abnormal returns (Mandelker, 1974; Langeteig, 1978; Dodd, 1980; Asquith and Kim, 1982; Asquith, 1983). Stockholders of the acquiring firms obtain insignificant or significant small positive or negative abnormal returns (Mandelker, 1974; Langeteig, 1978; Dodd, 1980; Asquith and Kim, 1982; Asquith, 1983; Malatesta, 1983; Eckbo, 1983; Asquith, Bruner and Mullins, 1983).

The relevance of considering the impact of managerial decisions on all constituents of the firm has been emphasized by Fama (1980) and Fama and Jensen (1983). A number of studies have taken this approach to heart in the context of merger events by including an analysis of the event effects on fixed income security holders, as well as common stockholders. Interest has been focused on wealth transfers between bondholders (or preferred stockholders) and common stockholders. The coinsurance or diversification effect of mergers (Higgins and Schall, 1975; Galai and Masulis, 1976; Kim and McConnell, 1977) refers to the decrease in

risk stemming from the less than perfect correlation of cash flows of the firms engaged in the merger, which induces a transfer of wealth from stockholders to bondholders. The coinsurance hypothesis predicts increase in the senior security values at the expense of stockholders. The incentive effects hypothesis or redistribution effects hypothesis (Galai and Masulis, 1976; Jensen and Meckling, 1976; Myers, 1977) posits that stockholders would engage in high risk projects, in this case merger, to expropriate wealth from bondholders to themselves. The redistribution hypothesis and diversification effect predict a negative relationship between stockholder and bondholder returns, even when synergies are present.

The coinsurance (diversification) effect and redistribution (incentive) effect may impact both firms in a merger differently. It has been hypothesized that the diversification effect is likely to be more pronounced for acquired firms due to their passive nature and due to the fact that those firms are small in size (Asquith and Kim, 1982) and therefore, it is likely that they would benefit more from the post-merger dominance of cash flows over pre-merger cash flows; one additional reason is that acquired firms may also have a significantly higher proportion of speculative grade bonds and therefore are likely to have higher levels of variance and leverage pre-merger and are the most likely candidates for maximum reduction in default risk. The incentive effect is likely to be more pronounced for acquiring firm bonds due to the fact that acquiring firms are more active in merger and much larger in size and likely to have a higher proportion of investment grade bonds which points towards a low variance and low leverage levels pre-merger.

The coinsurance and incentive effects arising on account of mergers attributable to Galai and Masulis (1976) [hereafter G-M] assume equal variances and equal leverage ratios of the merging firms pre-merger. Furthermore, G-M assume one pure-discount bond and one common stock issue outstanding. Shastri (1983) has extended the original G-M analysis of the effects of mergers on corporate security values by allowing the two merging firms to have different variances, different debt ratios and different debt maturities. Under the variance effect, there are three cases. In the first case, the variance of the cash flows of the combined entity is less than that of the target as well as bidding firm; this is the G-M case where there is a transfer of wealth from stockholders to bondholders. In the other two cases the variance of the combined firm is greater than that of one of the firms and lower than that of the other. In these two cases, bondholders of the firm with pre-merger lower variance lose while bondholders of the firm with pre-merger higher variance gain. As one component of common stock is better off while the other is worse off, the wealth transfer effects on the combined stock are ambiguous.

As far as the leverage effect, Shastri (1983) identifies two cases involving wealth transfers from stockholders to bondholders. If the acquiring firm's original leverage ratio is greater than the leverage ratio of the acquired firm, their merger lowers the leverage related risk for the bondholders of the acquiring firm. This is because of the fact that the leverage ratio of the combined firm, a weighted average of the merging firms, is lower vis-à-vis that of the acquiring firm. Therefore, bondholders of the acquiring firm experience positive wealth transfer effect. These results are derived under the assumption that neither bond is subordinated. In another case, the original leverage ratio of the acquired firm is greater than that of the acquiring firm and the merger lowers the leverage related risk of the bonds of the acquired firm leading to positive wealth transfer effect for their bonds. For both cases, stockholders suffer negative wealth transfer effects. With regard to maturity effect, short-term debt holders gain over long-term debt holders as the claims of short-term debt holders are paid off sooner.

1.2. Empirical Evidence on Wealth Transfer Phenomena

Kim and McConnell (1977) study the transfer of wealth from stockholders to bondholders consequent on a conglomerate merger. They find positive average and cumulative residuals accruing to bondholders, but the residuals are not statistically significant. Asquith and Kim (1982) test for the diversification effect (Higgins and Schall, 1975; Galai and Masulis, 1976; Kim and McConnell, 1977) and the incentive effect (Jensen and Meckling, 1976; Myers, 1977; Galai and Masulis, 1976). They find no evidence to support either hypothesis. Eger (1983) studies transfer of wealth from stockholders to bondholders in a sample of pure exchange (common stock) mergers for the period 1958 to 1980 and finds that holders of risky debt experience statistically significant gains. By confining her sample to pure exchange mergers, she avoids the leverage effects. However, she does not group the firms according to Shastri's design.

Dennis and McConnell (1984) study returns accruing to various classes of securities (common stock, convertible and nonconvertible preferred stock, and convertible and nonconvertible bonds) of both the acquired and acquiring companies. They examine three different hypotheses: the investment hypothesis, coinsurance hypothesis and incentive effects hypothesis. The investment hypothesis posits that each class of security holders gains in a merger (or at the minimum does not lose). Their results are consistent with the investment hypothesis. However, the coinsurance hypothesis is only partially supported, and they find no evidence to support the incentive effect. They do not group the firms by the Shastri design and they do not control for leverage effects.

Settle, Petry and Hsia (1984) examine the incentive effect and diversification effect. Their

results indicate that the wealth of bondholders is affected positively by merger, implying synergies and/or diversification effect. They find no evidence for increase in leverage after the merger; there is no support found for the incentive effect. They do not examine stockholder returns. Also, they do not look at bondholder groups along the lines indicated by Shastri (1983).

1.3. Objectives of This Study

The objective of this study is to empirically test several hypotheses concerning the wealth transfer effects of mergers. Benefits of merger are addressed in a total value framework with explicit consideration of redistribution effects of wealth among the security holders. Effects of differences in variance, leverage of the merging firms and maturity structure of bonds are explicitly incorporated.

We test the hypothesis that mergers lead to diversification effects (Hypothesis No. 1) to acquired firm bondholders and incentive effects to acquiring firm bondholders (Hypothesis No. 2) (Asquith and Kim, 1982). The bondholder studies to date do not look at differing variances, leverage ratios and maturity of bonds pre-merger. Shastri's findings that high variance, high leverage and short maturity bonds benefit most on account of the merger lead to our Hypothesis No. 3: the higher the variance of corporate cash flow, the higher the leverage ratio and lower the maturity of bonds, the higher would be the excess returns accruing to bondholders. We intend to test this hypothesis using a multiple regression approach. An alternative approach to test this hypothesis is based on bond rating categories. We therefore test the hypothesis (Hypothesis No. 4) that the excess returns accruing to speculative grade bonds (bonds rated Ba and lower) would be significantly higher than the excess returns accruing to investment grade bonds (bonds rated higher than Ba). The premise here is that speculative grade bonds are more likely to have high variance and high leverage pre-merger compared to the investment grade bonds.

Summarizing, we test for diversification effects to acquired firm bondholders and incentive effects to acquiring firm bondholders (Asquith and Kim, 1982). Also, we are hypothesizing that the higher the pre-merger variance of cash flow and the leverage, and the shorter the maturity of bonds, the higher will be the wealth transfers accruing to bondholders.

2. Data And Methodology

2.1. Sample Selection

This study examined mergers during the period 1970-84 between U. S. firms listed on the New York Stock Exchange[1]. An initial sample of mergers was constructed based on the data from the Conference Board's announcement of mergers in Mergers and Acquisitions Journal (1970-1984). The criteria used to further screen the mergers were:

1.The book value of the assets of the smaller firm must be at least 5% of the book value of the larger firm.

2.The merger has to be complete. That is, the common stock of the acquired company has to be purchased entirely by the acquiring company and debentures of the acquired company if outstanding should be assumed by the acquiring company. Terms of the merger as well as the information on the assumption of debentures were gathered from Moody's Industrial Manuals and CCH Capital Changes Reporter.

3.At least one of the merging companies had long-term publicly traded bonds outstanding 24 months before and after the merger.

4.The acquiring company has not engaged in any other major merger 24 months before and after the date of the merger referred to in the Mergers and Acquisitions Journal as effective date of merger.

5.Mergers involving firms in regulated industries (banks, railroads and utilities) were excluded.

6.Data for both the acquired and acquiring firms is available in the CRSP and COMPUSTAT data files.

7.The announcement of the merger was found in the Wall Street Journal Index.

8.In those cases where the acquiring company has prior holdings of 25% or more of the common stock of the acquired company, the merger was excluded from the sample.

Information on the total assets of the merging firms is provided in Table 1. Total assets of [see appendices, Table 1] all firms are greater than $10 million. The mean of total assets for acquired firms is $490.2 million while that of the acquiring firm is $2507.2 million.

2.2. Bond Price Data Sources

Month-end bond prices were collected from Moody's Bond Guide monthly. When price quotes were not available in the Moody's Bond Guide, the Bank Quotation Record was used to find price quotes for missing months. In a few cases where the quotes from the two sources differed widely, that particular bond issue was excluded from the sample. [2, 3]

Table 2 provides information on the 146 bonds included in the study. Multiple bonds from a given merger in either of the acquired and/or acquiring company are included in the sample. Of [see appendices, Table 2] the 146 bonds, 29 bonds (19.86%) are of the acquired firm and 117 bonds (80.14%) are of the acquiring firm. A look at the convertibility feature reveals that 22 bonds (22.07%) are convertible while 124 bonds (84.93%) are of nonconvertible type. A substantial proportion of nonconvertible bonds were callable[4,5].

2.3. Monthly Returns on Bonds and Abnormal Returns to Bondholders

Following the method of Handjinicolau and Kalay (1983), bond returns were adjusted for the term structure of interest rates. After adjusting for the term structure, comparison means were used to compute the abnormal returns to bondholders. Therefore, the procedure can be described as term structure adjusted comparison mean approach. Specifically, consider the corporate bond return:

$$R_{Cit} = \frac{(P_{Cit} - P_{Cit-1}) + M_{ivt}((k/D) * 1000)}{P_{Cit-1} + M_{ivt-1}((k/D) * 1000)} \quad (1)$$

Where,

R_{Cit} Corporate bond i's one month holding period return for month t,

P_{Cit} is the price of the corporate bond i in month t,

P_{Cit-1} is the price of the corporate bond i in month t-1,

k is the annual coupon rate,

D is a divisor and its value equals 12 for annual coupon payment bonds and its value equals 6 for semiannual coupon payment bonds,

M_{ivt} is the number of months from the last coupon to the tth month,

M_{ivt-1} the number of months from the last coupon payment to the t-1 month.

Matching T-bond monthly returns were obtained from the CRSP Government bond file[6]. These T-bond returns have been computed in a fashion similar to the computation of returns on corporate bonds. Letting the T-bond monthly return equal to R_{Tit}, we can define the term structure adjusted excess monthly corporate bond return, i.e., for the t th month as:

$$R_{Eit} = R_{Cit} - R_{Tit} \quad (2)$$

Now, defining the event month as the announcement month of merger, preannouncement and post announcement bond comparison means were computed as follows:

$$R_{prebi} = \sum_{M=-12}^{-2} R_{Eit}/11, \text{ and} \quad (3)$$

$$R_{posbi} = \sum_{M=2}^{12} R_{Eit}/11, \quad (4)$$

where M is the index of month(s) with reference to the announcement month.

Months -1, 0, +1 have been excluded in computing the comparison period means.

The excess return to the bondholders for bond i for the t th month was computed as follows:

$$EXRTN_{it} = R_{Eit} - \text{comparison mean} \quad (5)$$

The comparison mean equals R_{prebi} for M = -12 to M = -1 and equals R_{posbi} for M = 0 to +12.

The average residuals for a given month are computed as:

$$AVRS_t = \sum_{i=1}^{n} EXRTN_{it}/n \quad (6)$$

Where, n is the number of non-missing bonds in a given month.

As already indicated, bonds trade infrequently and therefore, the observed abnormal returns may not have the same variability of returns.

To compute the standardized abnormal returns, average residuals were standardized by dividing the residuals by the standard deviation of the average residuals pre and post-announcement period. For this, defining:

$$\sigma_{i,pre} = (1/11)\left(\sum_{t=-12}^{-2} [EXRTN_{it} - AVR_{ipre}]^2\right) \text{ with } t < 0 \quad (7)$$

$$\sigma_{i,pos} = (1/11)\left(\sum_{t=2}^{12} [EXRTN_{it} - AVR_{ipos}]^2\right) \text{ with } t \ni 0 \quad (8)$$

Where,

$\sigma_{i,pre}$ is the standard deviation of $EXRTN_i$ for the pre-announcement period for the ith bond,

$\sigma_{i,pos}$ is the standard deviation of $EXRTN_i$ for the post-announcementperiod for the ith bond

$EXRTN_{it}$ is the excess return of i th bond for the t th month

AVR_{ipre} is the mean of i th bond for preannouncement period

AVR_{ipos} is the mean of i th bond for the post-announcement period.

Then, the standardized residual for the i th bond would be:

$$SEXRTN_{it} = \frac{EXRTN_{it,}}{\sigma_{is'}} \text{ with}$$

s = Pre for t < 0 for the preannouncement period and

s = Pos for t ∋ 0 for the post-announcement period. (9)

The standardized average residuals for a given month t are computed as:

$$SAVR_t = \sum_{i=1}^{n} SEXRTN_{it}/n \quad (10)$$

Cumulative Average Residuals (CARS) and Cumulative Standardized Average Residuals (CSAVRS) are computed by scanning over desired monthly intervals as follows:

$$CAR = \sum_{t=bm}^{em} AVR_t \quad (11)$$

$$CSAVR = \sum_{t=bm}^{em} SAVR_t \quad (12)$$

Where,

CAR is the cumulative average residual

AVR_t is the average residual for the tth month

bm stands for beginning month

em stands for ending month

CSAVR is the cumulative standardized average residual

$SAVR_t$ is the standardized average residual for the t th month

Defining the variance of excess return for month t:

$$\sigma^2_{EXRTN,t} = \sum_{i=1}^{n} (EXRTN_{it} - AVRS_t)^2/(n-1)$$

Where,

$AVRS_t$ is the cross-sectional mean excess return on month t and equals $\sum_{i=1}^{n} EXRTN_{it}/n$ (13)

The t-statistic for $AVRS_t$ is computed as:

$$^tAVRS = AVRS_t / (\sigma 5_{EXRTN_t}/n)^2 \quad (14)$$

The t-statistic for SAVRS was computed appropriately based on σ^2 of $SEXRTN_{it}$.

Defining,

$$\sigma^2_{CAR(b,e)} = \sum_{t=b}^{e} \sigma^2_{EXRTN,t}/n$$

Where,

$\sigma^2_{CAR(b,e)}$ is the variance of CAR in the interval beginning in month b and ending month e, then, the t-statistic for CARS is defined as:

$$^tCAR(b,e) = \left[\frac{CAR(b,e)}{/ \sigma^2 CAR(b,e)} \right] \quad (15)$$

t-statistic for CSAVRS was computed similarly using the $SEXRTN_t$ and σ of $SEXRTN_t$.

This procedure for computation of t-statistics of CARS has been used by Eger (1983) and Asquith and Kim (1982).

The t-statistic for CARS assumes that the monthly excess returns are independently distributed. However, once significant positive (negative) CARS are reached for a given month, the succeeding CARS would also be significantly positive (negative).

That is, there is a certain degree of dependency of CAR/S over time and therefore the t-statistics for CARS need to be interpreted with caution.

2.4. Abnormal Returns on the Common Stock of the Acquired and Acquiring Firms

Abnormal returns of the acquired and acquiring firm were computed based on the following market model

$$(R_{jt} - R_{ft}) = \alpha_j + \beta_j (R_{Mt} - R_{ft}) + e_{jt} \quad (16)$$

Where,

R_{jt} is the rate of return for the acquired/acquiring firm stock for month t, R_{ft} is the return on riskless asset surrogated by the return on 90 day T-bill, R_{Mt} is the rate of return on a value weighted market portfolio and α_j and β_j are regression coefficients for the jth firm. β_j was computed using 60 months of data from -72 to -13 with respect to the t th month for which β_j is being computed.

Define excess return as:

$$u_{jt} = (R_{jt} - R_{ft}) - \hat{\beta}_j (R_{Mt} - R_{ft}) - \hat{\alpha}_j \quad (17)$$

Average residuals for the kth month for a given sample was computed as:

$$a_k = \sum_{i=1}^{n} u_{ik}/n \quad \text{for } k \in (-12, +12) \quad (18)$$

Where, n is the number of observations in the sample.

Cumulative average residuals from t = -12 month to the kth month were computed as:

$$a_k = \sum_{-12}^{T} a_k, \; k = -12 \text{ to } T \text{ with } T \neq 12 \quad (19)$$

T-statistics for stockholder AVRS and CARS were computed using the same procedures described above for bondholder AVRS and CARS.

3. Results And Discussion

3.1. Diversification and Incentive Effects

3.1.1. Abnormal Returns to bondholders

In this section, we are exploring the hypotheses #1 and #2: diversification effects to acquired firm bondholders and incentive effects to acquiring firm bondholders. Table 3 presents [see appendices, Table 3] the average residuals to bondholders for months -12 to +12 relative to the merger announcement month. Results are presented for acquired firms and acquiring firms[7].

Considering the acquired firms, the significant month of interest is the announcement month with an average residual of 4.86%, significant at the 1% level. It is unlikely that the significant negative average residual in month -12, or even the significant

positive residual in month -2 are related to the merger announcement.

For acquiring firms, the significant months of interest are -1 and 0. It is quite possible that investors anticipate acquisitions for bidding (acquiring) firms some months prior to the merger announcement (see Jensen and Ruback, 1983).

Thus, it is not unreasonable to attribute the significant negative 1.13% average residual in month -1 to anticipation of the impending merger event.

The significant average residuals in months +3 and +9 (with average residuals of 0.8434% and -1.70%, respectively) may or may not be merger related.

The results of the acquired and acquiring firms considered separately seem to indicate that while acquired firms reap positive wealth transfer effects in the announcement month, acquiring firms suffer negative wealth transfer effects in month -1. Asquith and Kim (1982) have argued that given that acquiring firms initiate the merger, incentive effects may be stronger for acquiring firms. In an incentive effect scenario, acquiring firm stockholders engage in the merger to increase the risk of the firm's asset portfolio, thereby transferring wealth from bondholders to stockholders. Asquith and Kim also argue that given the passive nature of acquired firms, incentive effects would not be relevant for them and only the diversification effect would be relevant. In this scenario, acquired firm bondholders would reap positive abnormal returns while acquiring firm stockholders reap negative abnormal returns. The results obtained seem to support this scenario, with incentive effects evidenced for acquiring firm bondholders while diversification effects are indicated for acquired firm bondholders[8]. Some of the bonds may have traded more frequently than others.

To adjust for this difference between bonds and to maintain homogeneity of variances in the sample, standardized residuals were computed by dividing the excess return of each bond in the preannouncement periods ($t\varepsilon[-12,-1]$) by the standard deviation of excess returns for that bond during the preannouncement period (equation (7)); likewise, announcement period and post-announcement period ($t\varepsilon[0,12]$) abnormal returns were standardized using the bond's post-announcement period standard deviation (equation (8)) post-merger separately. This procedure has been used by Handjinicolau and Kalay (1984) and Settle, Petry and Hsia (1984). The results of standardized average (SAVRS) residuals are not shown since they are very much consistent with results in Table 3. It is of some interest to ascertain the role of the conversion feature of bonds in determining the observed wealth effects from merger events. We repeated the average residuals analysis for the subset of bonds which were non-convertible.

The results are shown in Table 4. Qualitatively, the [see appendices, Table 4] results were the same for non-convertibles as for the entire sample. It appears that the positive average residuals for acquired firm's bonds were not limited to convertibles. We explore the role of convertibility further in the regression analysis reported later in the paper.

Results of bondholder AVRS and SAVRS, so far, indicate significant effects occurring in the preannouncement and announcement months. Therefore, the abnormal returns for the 2 month interval, [-1,0], were added to arrive at the 2 month combined residuals. These are presented in Table 5. In panel A, results for acquired and acquiring firm bonds appear; in panel B, results of [see appendices, Table 5] acquired firm bonds are presented and in panel C, results for acquiring firm bonds appear.

In each panel, column i) presents results of 2 month non-standardized Combined Average Residuals (COAVRS) and column ii) presents the results of 2 month Combined Standardized Average Residuals (COSAVRS).

First, considering the COAVRS, for the acquired firm bonds, they amount to 4.53% significant at 5% level, while the COAVRS for the acquiring firm bonds show a loss of -1.304% also significant at 5% level. The COAVRS for the combined acquired and acquiring firm group bonds amount to -2.86% and the same is not significant. The results of COSAVRS show a similar pattern.

Thus, the results of 2 month residuals (COAVRS and COSAVRS) are very much in agreement with earlier separate preannouncement and announcement month results.

The results reported so far, include multiple bonds per firm. It was decided to include the multiple bonds per firm due to limited sample size. Nevertheless, including multiple bonds may introduce a degree of dependency among observations on different bond issues of a given firm. The weighted average residuals (WAVRS) were computed as a value-weighted average of excess returns of bonds of a given firm for a given month. The results of WAVRS for the pre announcement and announcement months separately were computed, and shown in Table 6. The WAVRS for the acquired firm bonds are significantly positive in the announcement month and the [see appendices, Table 6] combined 2 month interval. The WAVRS of acquiring firm bondholders are negative both in the pre-announcement month and in the combined 2 month period, but those results are not significant.

3.1.2. Abnormal Returns to Stockholders

Average Residuals (AVRS) and Cumulative Average Residuals (CARS) for the acquired firm stockholders appear in Table 7. As far as the AVRS are concerned, they are predominantly [see appendices, Table 7] positive; AVRS in month 0 is highly significant: the abnormal return on month 0 is 33.052% with a t-value of 7.70. The CARS become significant at the 5% level in months -1 and 0. Given

that actual merger is consummated a few months after the announcement (the average time between the announcement and merger dates for the firms in the sample amounted to 4-1/2 months), data was available after the announcement month for some acquired firms, and therefore CARS are presented through +5 month for a reduced sample. A look at the CARS shows that the CARS continue to be significant at the 1% level in months +1 through +5. These results for acquired firm stockholders are consistent with the results of earlier merger studies
AVRS and CARS for acquiring firms are also presented in Table 7. AVRS are significantly positive in months -7 and -4, but significantly negative in month -6. The announcement month average residual is negative, though not significant. The results for announcement effects on acquiring firms are also consistent with earlier merger studies (Jensen and Ruback, 1983).

The significant positive residuals to acquired firm stockholders indicate significant premia being paid to acquired firms. In a diversification effects scenario, in the absence of any real synergies, combined stockholder returns would be negative around the merger announcement time. The observance of positive residuals to acquired firm stockholders does not necessarily rule out diversification effects; any positive wealth transfer effects on account of synergies may have exceeded the losses accruing to stockholders in a diversification effects context leading to a net positive effects here[9].

3.2. Analysis of Variance, Leverage and Maturity Effects Using Multiple Regression

As pointed out in the introduction, Shastri's analysis indicates that the wealth effects of merger on bondholders and stockholders are quite complex, and involve the relative risk, leverage and debt maturity characteristics of the merging firms. In this section, we test for the impact of these effects on wealth transfers to bondholders using a multiple regression approach. Given that we found significant merger-related returns in both the preannouncement and announcement months, the standardized average residuals (SAVRS) of these two months were added together to form combined 2 month standardized average residuals (COSAVRS)[10]. These returns are related to the characteristics of the merging firms through the following regression equation (expected signs of the regression coefficients are indicated in parentheses below each coefficient):

$$COSAVRS_i = a + b\underset{(+)}{(D/E)_{own\,i}} + c\underset{(-)}{(D/E)_{other\,i}} + d\underset{(+)}{(CV)_{own\,i}} + e\underset{(-)}{(CV)_{other\,i}} + f\underset{(-)}{(DUR)_{own\,i}} + g\underset{(+)}{(DUR)_{other\,i}} + h\underset{(+)}{(CON)_i} + i\underset{(-)}{(CORRADAG)_i} + j\underset{(?)}{(WT)_i} + e_i$$

Where, a, b, c, d, e, f, g, h, i, and j are regression coefficients to be estimated, and $COSAVR_i$ is the combined two month standardized excess return, D/E is the total debt (long-term debt + short-term debt) to equity ratio pre-merger, CV is the coefficient of variation of the cash flow of the firm pre-merger computed from 6-10 years of pre-merger data, MAT is the duration of the risky bond. Sinking fund provisions are taken into account in computing the duration and the yield to maturity pre-merger is used to discount the cash flows. CON is a dummy variable for convertibility feature: its value equals 1 for convertible bonds and 0 for nonconvertible bonds, CORRADAG is the correlation coefficient of the cash flows of the merging firms over ten years prior to the merger, WT is the market value of a given bond to the sum of market value of all bonds of a given firm, e_i is regression error term for firm i.The subscripts "own" and "other" refer to own and other firm ratios: for example, for an acquired firm bond, "own" firm ratios are that of the acquired firm and the "other" firm ratios are from the acquiring firms.

Note that, in addition to the leverage, variance and maturity effects suggested by Shastri, we have included three variables which should control for other systematic differences in bonds (CON and WT) or which affect the overall level of returns to bondholders in the merger (CORRADAG). The rationale for the expected signs of coefficients b through g have been explained already based on Shastri's findings. Finding of significant coefficients of the hypothesized signs for the leverage, variance and maturity variables in the above equation would lend support to Shastri's conclusions and indicate that studies of the wealth effects of mergers for various classes of security holders should incorporate such factors into their analysis.

The coefficient h is expected to be positive, as the convertibility feature has an added attraction and therefore convertibles should yield a higher AVRS than nonconvertibles.

The coefficient i for CORRADAG should be negative due to diversification effects as lower CORRADAG would lead to more reduction in default risk and a higher COSAVRS. The coefficient j is hypothesized to be positive on the belief that larger size issues would trade more frequently and in general respond more quickly to the announcement of the merger.

Multiple regression results for the overall sample of 132 bonds for which all required data is available are presented in Table 8. In mergers where only one[20] firm had bonds outstanding, the [see appendices, Table 8] maturity variable is irrelevant, so the regression results are presented with and without the maturity variables. However, even when only one of the merging firms has bonds outstanding, the relative leverage and variance of the merging firms would still be expected to impact bondholder

welfare, as would the correlation variable, convertibility feature, and relative size of the bond issue[11]. Panel A of Table 8 presents results without the maturity variables for 132 bonds of acquired and acquiring firms. Panel B presents results for those mergers where both firms had outstanding bond issues included in the sample, so that the maturity variable could be included.

Considering panel A results first, the coefficient of "other" firm leverage ratio is negative and significant at 1% level, and the "own" company variance effect coefficient is positive, also significant at 1%. Thus, the own firm variance effect and other firm leverage effect are able to significantly explain the excess returns accruing to the bondholders, as explained by Shastri. The convertibility feature is significantly positively associated with the two-month returns, as postulated. The correlation measure and bond size variable had the hypothesized signs, but neither were statistically significant.

Going from panel A to panel B, the "other" firm leverage effect is still present, upholding the hypothesized leverage effect noted in panel A. Although the results for the "own" firm risk measures has the hypothesized sign, it is insignificant and the "other" firm risk measure has the opposite sign to that hypothesized, and is significant. Neither the "own" nor "other" firm maturity variables, are statistically significant. The results for the convertibility feature, and the correlation and bond size measures are qualitatively similar to those in panel A, with the correlation variable becoming statistically significant at the 10% level. This latter result lends support to the coinsurance hypothesis.

As a further test of the stockholder-to-bondholder wealth transfer phenomenon, the weighted average abnormal return to common stockholders of acquiring and acquired firms was included as an additional explanatory variable in the regressions. If there are significant wealth transfers occurring, then this variable should enter with a negative coefficient (the relative leverage, variance, and maturity and the convertibility feature are being "controlled for" by the other explanatory variables). These results are presented in Table 9, which follows the same format as Table 8.

Note the decline in sample size relative to Table 8, due to the additional requirement that stock return data for both parties to a merger must be available for either firm's bonds to be included in the samples.

The major result of these regressions is that the coefficient for the [see appendices, Table 9] weighted common stock returns is negative and highly significant, giving very strong evidence in support of the wealth transfer phenomenon. The relative leverage factor retains its hypothesized role in the regression which includes the debt maturity variables (panel B). The relative risk factor appears to have exactly the opposite impact than hypothesized, and is significant in panel B. The correlation and relative bond size variables continue to have the hypothesized signs, and become statistically significant.

3.3. Test of Variance, Leverage effects based on Bond Rating Categories

An alternative way of testing for leverage and variance effects on bondholder excess returns would be to look at AVRS based on bond rating groups. Speculative grade bonds (bonds rated Ba and lower) are more risky and are more likely to have high variance and high leverage pre-merger and are the most likely candidates for reduction in default risk and would be most likely to benefit on account of the merger. The opposite is true of investment grade bonds (bonds rated higher than Baa) which are likely to have low variance and low leverage pre-merger, so that the magnitude of reduction in default risk is likely to be small compared to that of the speculative bond group.

Sample means of excess returns to bondholders for investment and speculative grade bond groups are compared in Table 10 using Duncan Grouping techniques[12]. For the preannouncement month for the combined acquiring and acquired firm bonds (Panel 1), the 2 group means are not significantly different. For the announcement month, however, we do observe a statistically significant differential in bonds based on rating category, with the speculative bonds benefiting significantly more than investment grade bonds. This differential between rating categories is also [see appendices, Table 10] present when we consider preannouncement month average residuals for acquiring firm bonds only. In this instance, the standardized average residuals indicate losses to bondholders, but the losses are larger for investment grade bonds, although the differential is not statistically significant.

The clearest evidence of the role of the speculative vs. investment grade dichotomy is in the results for acquired firm bonds (Panel 4). The sample was evenly divided between the two rating groups, with the investment grade group having negative average standardized residual, and the speculative group a large positive average residual. The difference in group means was highly significant. The results from comparison of ratings categories strongly support the presence of some combination of variance and leverage effects which determine the wealth transfers among merging firms' security holders.

4. Summary of Empirical Findings

4.1. General findings

This paper has analyzed the determinants of merger related wealth effects on the bondholders of acquiring and acquired firms. Specifically, the

differences among bonds with respect to issuing firm leverage and risk, as well as bond maturity were examined. Wealth effects to bondholders were measured using a term-structure-adjusted mean return approach. Average residuals to the 146 debentures in the sample were computed from -12 to +12 months with respect to the merger announcement month.

Separate pre- and post-merger variances were utilized for evaluating significance levels for observed abnormal returns to bondholders. Given the change in default risk of bonds with the announcement of merger, there is an imperative need to do this. The market model approach was used to compute the residuals accruing to stockholders during the same period.

The analysis of average merger related returns supported the hypotheses of diversification effects to acquired firm bondholders and incentive effects to acquiring firm bondholders.

In a diversification effects scenario, due to less than perfect correlation of cash flows of the merging firms, there is a reduction in the variance of the cash flow of the merged firm, thereby lowering the default risk for the bonds of the firm. This results in transfer of wealth from stockholders to bondholders. In an incentive effects case, stockholders engage in a high risk project (namely, merger) to increase the variance of the cash flow of the firm involved and thereby expropriate wealth from bondholders to themselves.

Since acquired firms are much smaller in size and are often passive in nature in a merger setting, diversification effects are likely to be more pronounced for acquired firm bondholders (Asquith and Kim, 1982). In addition, acquired firm bond issues are smaller in size and are more likely to belong to speculative grade rating group (Eger, 1983) with high variance and high leverage pre-merger, and therefore would be the most to benefit from any reduction in default risk.

On the other hand, acquiring firms are much larger in size and are active in a merger setting and therefore incentive effects would be more likely for them (Asquith and Kim, 1982).

Also, acquiring firm bond issues are much larger in size and are likely to belong to low variance and low leverage pre-merger.

While the foregoing results regarding the dichotomy between acquired and acquiring firm bondholders receive strong support as generalizations, the regression and bond rating category results indicate that the specific characteristics of issuing firms determine the relative wealth effects which will be observed in a given merger.

That is to say, not all acquiring firm bondholders will necessarily suffer from a merger, and not all acquired firm bondholders will benefit. The specific findings of the paper are summarized below.

4.2. Specific Findings

Hypothesis #1: Diversification Effects to Acquired Firm Bondholders

The hypothesis of diversification effects to acquired firm bondholders as a group was tested by computing the AVRS from -12 to +12 month of the announcement the merger and checking to see whether the AVRS observed were significantly positive at the announcement month. The AVRS of the acquired firm bondholders in the announcement month amounted to 4.861%, significant at the 1% level. Therefore, the hypothesis of diversification effects to acquired firm bondholders can not be rejected. The accrual of positive residuals may also have been due to synergies in merger. Synergies arise on account of economies of scale in production, distribution and management. Thus, the observed significant positive residuals to the acquired firm bondholders are explained by diversification effects and or synergies.

Since acquired firm bondholders showed negative though nonsignificant residuals in the preannouncement month, a combined 2 month average residuals COAVRS) was also computed. The COAVRS were significantly positive, reinforcing the evidence for the diversification effects to acquired firm bondholders.

Hypothesis #2: Incentive Effects to Acquiring Firm Bondholders

The incentive effects to acquiring firm bondholders as a group was tested by computing the AVRS from -12 to +12 month of announcement and running t-tests to see whether the AVRS observed were significantly different from 0. The merger related average return to acquiring firm bondholders in the announcement month was negative, but not statistically significant. However, the preannouncement month return was negative and statistically significant. On the basis of these results we could not reject the incentive effects hypothesis for acquiring firm bondholders.

Observance of significant residuals in the preannouncement month to acquiring firm bondholders can be explained by the strong possibility fact the market may in fact anticipate future acquisitions by acquiring firms. The combined 2 month non-standardized residuals (COAVRS) and standardized residuals (COSAVRS) were also significantly negative providing additional evidence for the incentive effects to acquiring firm bondholders.

Hypothesis #3: Multiple Regression Approach to Variance, Leverage and Maturity Effects on the Wealth Transfers to Bondholders

The variance, leverage and maturity effects on the wealth transfers to bondholders (Shastri (1981)), were explored using a multiple regression approach. In a portfolio context, given less than perfect correlation of cash flows of the merging firms, a firm with high variance in relation to the other firm in a

merger pair realizes a lower variance following the merger, reducing the variability of cash flow and the default risk of bonds involved. Bondholders of a firm with low pre-merger variance may in fact find themselves facing higher cash flow variance after the merger. Similarly, divergence in the pre-merger leverage ratios of merging firms should impact the relative wealth consequences of merger for bondholders of the participating firms, with the more highly levered firm's bondholders gaining relative to those of the less highly levered firm. Finally, bondholders with relatively low maturity obligations should gain relative to those with longer maturities.

For the overall sample of 146 bonds, where the maturity effects are not considered, multiple regression analysis lent support to the leverage and variance effects. For a sub sample of 63 bonds where maturity effects are considered in addition to the variance and leverage effects, we found no strong evidence that the maturity effect was significant in determining relative returns to bondholders.

When the value weighted abnormal returns to stockholders were included as an explanatory variable in regressions explaining bondholder returns, we found a strong negative association. This reinforces the evidence of incentive and coinsurance effects, both of which will generally involve wealth transfers between bondholders and stockholders of merging firms.

Hypothesis #4: Bond Ratings Groupings and Wealth Transfers to Bondholders

The variance and leverage effects on wealth transfers to bondholders were also examined using bond rating categories. The premise here is that speculative grade bonds have high variance and high leverage while investment grade bonds have low variance and low leverage pre-merger. The merger related returns of the speculative and investment grade bonds were significantly different from one another with speculative grade bonds out-earning the investment grade bonds several times. These results also provide support for the variance and leverage effects on wealth transfers to bondholders.

5. Conclusions

This study addressed the question of wealth effects of 49 industrial mergers to bondholders and stockholders. Compared to prior studies, we introduced several refinements. For the first time, we provide empirical evidence of diversification effects to acquired firm bondholders and incentive effects to acquiring firm bondholders.

We also explicitly considered the impact of pre-merger variance, leverage and maturity of bonds (Shastri, 1983) on the wealth transfers to bondholders. Using a multiple regression approach, we showed that pre-merger variance and leverage influence the abnormal returns accruing to bondholders. Analysis of bondholder returns by broad rating categories lent further support to the role of individual bond characteristics as determinants of wealth effects of mergers on bondholders.

Strong inverse association between bondholder and stockholder merger-related returns supports a conclusion that wealth transfers between these classes of investors do occur. This does not deny the presence of synergies, but rather emphasizes that they will not dominate the effects of merger on bondholders.

By undertaking a number of refinements, we have reached more definitive conclusions on the wealth transfer phenomena associated with merger activity. This is an important aspect of and contribution to the understanding of the positions of the various constituent groups in the market for corporate control.

References

1. Asquith, P. "Merger Bids, Uncertainty, and Stockholder Return," Journal of Financial Economics, 1983, pp. 51-83.
2. Asquith, P., Robert F. Bruner, and David W. Mullins, "The Gains to Bidding Firms from Merger," Journal of Financial Economics, 1983, pp. 121-39.
3. Asquith, P. and Han Kim. "The Impact of Merger Bids on the Participating Firm's Security Holders," Journal ofFinance, December, 1982, pp. 1209-1228.
4. Dennis, D. K. and J. J. McConnell. "Corporate Merger and Security Holder Returns: Tests of Investment Hypothesis, the Incentive Hypothesis, and the Co-Insurance Hypothesis," Journal of Financial Economics, 1986, pp. 143-185.
5. Dodd, P. "Merger Proposals, Management Discretion and Stockholder Wealth," Journal of Financial Economics, 1980, pp. 107-138.
6. Eckbo, B. E. "Horizontal Mergers, Collusion and Stockholder Returns: An Empirical Analysis," Journal of Financial Economics, 1983, pp. 241-274.
7. Eger, C. E. "An Empirical Test of the Redistribution Effect in Pure Exchange Mergers," Journal of Financial and Quantitative Analysis, December, 1983, pp. 547-572.
8. Fama, E. F. and M. Jensen. "Separation of Ownership and Control," Journal of Law & Economics, 1983, pp. 301- 325.
9. Fama, E. F. "The Effects of a Firm's Investment and Financing Decisions on the Welfare of Its Security Holders," American Economic Review, June 1978, pp. 272-284.
10. Fama, E. F. "Agency Problems and the Theory of the Firm," Journal of Political Economy, 1980, pp. 288-301.
11. Galai, D. and R. Masulis. "The Option Pricing Model and the Risk Factor of Common Stock," Journal of Financial Economics, 1976, pp. 53-82.
12. Handjinicolau, George and Avner Kalay,"Wealth redistributions or changes in firm value: An analysis of returns tobond holders and stock holders around dividend announcements,"

Journal of Financial Economics, March, 1984, pp. 35-64.
13. Higgins, R. C. and L. D. Schall. "Corporate Bankruptcy and Conglomerate Merger," Journal of Finance, 1975, pp. 93-113.
14. Jensen, M. C. and R. S. Ruback. "The Market for Corporate Control, The Scientific Evidence," Journal of Financial Economics, 1983, pp. 5-50.
15. Jensen, M. C. and W. Meckling. "Theory of the Firm: Management Behavior, Agency, Costs, and Ownership Structure," Journal of Financial Economics, 1976, pp. 305-360.
16. Kim, E. H., and J. McConnell. "Corporate Mergers and the Co-Insurance of Corporate Debt," Journal of Finance, May, 1977, pp. 349-363.
17. Langeteig, T. "An Application of Three-factor Performance Index to Measure Stockholder Gains From Merger," Journal of Financial Economics, 1978, pp. 365-383
18. Malatesta, P. H. "The Wealth Effect of Merger Activity and the Objective Functions of Merging Firms," Journal of Financial Economics, 1983, pp. 155-182.
19. Mandelker, Gershon. "Risk and Return: The Case of Merging Firms," Journal of Financial Economics, 1974, pp. 303-335.
20. Myers, S. C. "Determinants of Corporate Borrowing," Journal of Financial Economics, November, 1977, pp. 147-176.
21. Nunn, Kenneth P., Jr., Joanne Hill and Thomas Schneewis. "Corporate Bond Price Data Sources and Return/Risk Measurement," Journal of Financial and Quantitative Analysis, June 1986, pp. 197-208.
22. Schipper, K. and R. Thompson. "The Gains to Bidding Firms from Merger," Journal of Financial Economics, 1983, pp. 85-120.
23. Settle, J. W., G. H. Petry, and C. Hsia. "Synergy, Diversification, and Incentive Effects of Corporate Merger on Bondholder Wealth: Some Evidence," 1984, Journal of Financial Research, Volume 7, No. 4 (Winter 1984), pp.329-39.
24. Shastri, K. "The Differential Effects of Mergers on Corporate Security Values," University of Pittsburgh, Working Paper #561, 1983.

Endnotes

1. The period 1968-1970 witnessed several important events which may have changed the merger climate significantly: The 1968 Williams Act and its 1970 amendments, Accounting Principles Board Opinions 16 and 17, and the Tax Reform Act of 1969. The period from 1970 through 1984 was chosen to provide homogeneity of sample with regard to the general climate affecting merger activity.
2. Bonds trade infrequently. Therefore, whenever settlement price was available, settlement prices were collected. If no settlement price was available for a given bond in a month, then bid price was used. If neither the settlement price nor the bid price was available, then ask price was used.
3. Nunn, Hill and Schneewis (1986) compare Moody's bond quotes with Merrill Lynch bond data sources and claim the latter to be a better source of bond price quotes. However, in actuality the Merrill Lynch quotes are not market determined bid and ask and settlement prices. Those prices are generated from a matrix system based on comparable bonds in terms of coupon, maturity, etc. In fact, the exact procedure of generation of prices is not a publicly available information. Given our interest in studying the impact of merger announcement (event study), we decided to use the Moody's quotes rather than Merrill Lynch generated quotes used to price institutional holdings.
4. Both the coinsurance and incentive effect analyses have assumed nonconvertible bonds. However, both effects may affect any senior security including convertible debt. To see this, consider two firms with a common stock issue and another convertible debt outstanding. If these two firms merge and if there are no synergies, then with diversification effects, of necessity, the aggregate market value of convertible debt will increase, while the aggregate market value of common stock will decrease. Also, the price of convertible bond does not have to move in the same direction as that of the common stock. It is quite conceivable that due to coinsurance effects, the price of the common stock and convertible debt may move in opposite direction in a merger.
5. Convertible bonds were included in the sample only if they were convertible into the common stock of the acquired/acquiring firm. In the case of the acquired firm, after the merger, the bonds should be convertible into the common stock of the acquiring company according to the terms of merger. This was done to maintain homogeneity of the convertible bond group.
6. Matching was done on the basis of term to maturity, coupon rate, and callability features.
7. Due to the non-availability of matching T-bond returns in some months for some bonds, the sample is reduced. For example, in the announcement month, acquiring firm bonds sample gets reduced from 117 to 114 and acquired firm bonds sample size is 28 bonds instead of 29.
8. The existence of incentive effects does not necessarily rule out synergies from the merger, since the negative residuals observed may be net of synergies if synergies are present.
9. In results available from the authors upon request, the combined dollar value gain to acquiring and acquired firm stockholders over the [-1,0] interval was estimated to be $220.85 million, and statistically significant at 5%. Combined dollar losses to acquiring and acquired firm bondholders were estimated to be $0.436 million over the same period. These results indicated the presence of substantial synergies in the 49 mergers which constitute our sample. Recall that our sample includes relatively large acquired firms due to the requirement that they have outstanding bond issues, so these results will in general not be directly comparable to other merger studies.

10. The standardized average residuals have the advantage of homoskedasticity relative to the non-standardized average residuals.
11. There will still be wealth transfers between bondholders and other classes of creditors, but since these other debt obligations are not traded, they could not be included in the analysis.
12. Again, we utilize standardized residuals for these comparisons in order to ensure homogeneity of variances between groups.

Appendices

Table 1. Asset Characteristics of Sample Firms

Variable	*n*	*Mean*	*Standard Deviation*	*Minimum Value*	*Maximum Value*
TOTAD	49	490.2	916.1	11.9	5993.6
TOTAG	49	2507.2	3610.0	91.6	14109.3

TOTAD: Total Assets of the Acquired Firms/s. TOTAG: Total Assets of the Acquiring Firms/s.

Table 2. Characteristics of Bonds in the Monthly Study

	Acquired Firm #	*Acquiring Firm #*	*Total #*
Convertible	10	12	22
Non-Convertible	19	105	124
Total #	29	117	146

Table 3. Monthly Average Residuals to Bondholders (Overall Sample of 146 Bonds)

Acquired Firms			*Acquiring Firms*		
Month	*Average Residuals*	*t-statistic*	*N*	*Average Residuals*	*t-statistic*
-12	-0.02888535	-2.04**	111	-0.00413000	-0.80
-11	-0.00514000	0.59	111	0.00144040	0.18
-10	-0.00566590	-0.54	111	-0.00742737	-1.50
-9	0.01424243	1.28	112	-0.00644735	-1.23
-8	0.00069340	0.10	113	0.00533034	1.10
-7	0.00513362	0.64	113	-0.00459872	-1.14
-6	-0.00184075	-0.19	116	0.00147694	0.20
-5	-0.0221033	-1.37	115	0.00735781	1.18
-4	0.00220078	0.18	114	0.00322567	0.64
-3	0.00417296	0.41	114	0.00126785	0.35
-2	0.02649633	2.73**	115	-0.00083941	-0.22
-1	-0.01231575	-1.34	115	-0.01131512	-2.27**
0	0.04861318	3.94***	114	-0.00299071	-1.64
1	-0.01032530	-0.78	115	0.00237574	0.48
2	-0.00942707	-0.90	115	-0.00413015	-0.93
3	0.00588155	0.64	115	0.00843466	2.14**
4	0.01931113	1.53	115	0.00519057	1.33
5	0.01018841	1.21	115	-0.00469911	-1.03
6	0.00680099	-0.73	115	0.00056814	0.13
7	-0.00009262	-0.01	116	0.01260519	1.75
8	-0.03334598	-3.06***	116	0.00017406	0.04
9	0.01236857	0.80	116	-0.01700400	-2.44**
10	0.00667607	0.48	114	-0.00612467	-0.95
11	-0.01992150	-2.07**	116	0.00580547	1.11
12	0.01737657	1.22	116	-0.003998811	-0.77

**Significant at the 5% level.
***Significant at the 1% level.

Table 4. Monthly Average Residuals for Nonconvertible Bonds (Overall Sample of 146 Bonds)

(A) Acquired and Nonconvertible Bonds				*(B) Acquiring and Nonconvertible Bonds*		
Month	*n*	*AVRS*	*T-Statistic*	*n*	*AVR*	*T-Statistic*
-12	17	-0.02506213	-1.15	100	-0.00343994	-0.68
-11	17	-0.00052660	-0.04	101	0.00150384	0.18
-10	18	0.00462712	0.40	101	-0.00502995	-1.03
-9	19	0.00037661	0.04	101	-0.00867181	-1.69
-8	19	-0.00204034	-0.28	102	0.0025776	0.57
-7	19	0.01248793	1.33	102	-0.00232551	-0.57
-6	19	0.00628873	0.52	105	0.00313881	0.40
-5	19	-0.02355423	-1.06	104	0.00625566	1.04
-4	19	0.00578793	0.61	103	0.00209192	0.46
-3	19	-0.00376220	-0.03	103	0.00138105	0.38
-2	19	0.02171196	1.76	103	0.00113616	0.29
-1	19	-0.00724727	-0.62	103	-0.01450160	-2.94***
0	19	0.02901246	2.58***	103	0.00102204	0.20
1	19	-0.00825806	-0.68	103	0.00060282	0.12
2	19	-0.00605857	-0.47	104	-0.00440635	-0.95
3	19	0.00569555	0.46	104	0.00798858	1.99**
4	19	0.01665708	0.96	104	0.00584929	1.47
5	19	0.01098129	1.06	104	-0.00558443	-1.24
6	19	-0.01901918	-1.87	104	0.00124351	0.30
7	19	0.00286984	0.21	105	0.00425705	0.76
8	19	-0.02794920	-2.06	105	-0.00005409	-0.01
9	19	0.01564890	0.68	105	-0.01369729	-2.54***
10	19	-0.00270122	-0.13	104	-0.00599511	-0.88
11	19	-0.02716313	-2.23**	105	0.01038823	1.85
12	19	0.03434097	0.099	105	-0.00040573	-0.08

**Significant at the 5% level.
***Significant at the 1% level.

Table 5. Combined 2 Month Residuals to Bondholders

	A) Acquired and Acquiring		*(B) Acquired*		*(C) Acquiring*	
	(i) Nonstandardized Residuals (COAVRS)	(ii) Standardized Residuals (COAVRS)	(i) Nonstandardized (COAVRS)	(ii) Standardized (COAVRS)	(i) Nonstandardized Residuals (COAVRS)	(ii) Standardized Residuals (COAVRS)
n	137	144	29	29	114	115
Mean	-0.0028644	-0.13900506	0.04533189**	0.84353346***	-0.01304358**	-0.38677564***
S.D.	0.0776	1.00	0.102	1.00	0.0678	1.00
t-statistic	0.742	-1.67	2.35	4.54	-2.07	-4.15

**Significant at 5% level.
***Significant at 1% level.

Table 6. Weighted Average Residuals (WAVRS) to Bondholders

	(A) Pre-announcement Month		*(B) Announcement Month*		*(C) Preannouncement and Announcement Month Combined*	
	(i)Acquired	(ii) Acquiring	(i)Acquired	(ii) Acquiring	(i) Acquired	(ii) Acquiring
n	18	41	18	41	18	41
Mean	-0.00665362	-0.00861810	0.04400017***	0.00114672	0.03734655**	-0.00747138
S.D.	0.0336	0.0441	0.0577	0.0467	0.0779	0.0567
t-Statistic	-0.84	-1.25	3.24	0.16	2.04	-0.84

**Significant at 5% level.
***Significant at 1% level

Table 7. Average Residuals (AVRS) and Cumulative Average Residuals (CARS) for Acquired and Acquiring Firm Stockholders

Panel (A) Acquired Firm Stockholders						*Panel (B) Acquiring Firm Stockholders*				
Month	*AVR*	*n*	*t-statistic*	*CAR*	*t-statistic*	*AVR*	*n*	*t-Statistic*	*CAR*	*t-Statistic*
-12	0.01091	34	0.64	0.01091	0.64	0.00351	43	0.35	0.00351	0.35
-11	0.00454	34	0.27	0.01545	0.65	-0.00362	43	-0.28	-0.00011	-0.01
-10	-0.00594	33	-0.47	0.00951	0.35	0.01434	42	1.35	0.01423	0.72
-9	0.00749	34	0.40	0.01701	0.52	0.00919	42	0.85	0.02342	1.04
-8	0.02829	34	0.90	0.04530	0.50	0.01715	43	1.17	0.04058	1.53
-7	0.02201	34	1.57	0.06731	1.41	0.03398	43	2.71***	0.07457	2.54***
-6	0.02038	32	1.06	0.08770	1.67	-0.02712	42	-2.11**	0.04744	1.47
-5	-0.01586	34	-1.10	0.07184	1.35	-0.01787	43	-1.76	0.02957	0.88
-4	-0.00490	34	-0.28	0.06693	1.20	0.02079	43	2.13**	0.05036	1.44
-3	0.01707	32	0.94	0.08401	1.39	0.01934	41	1.61	0.06971	1.85
-2	0.02711	33	1.38	0.11113	1.77	-0.01361	42	-1.23	0.05609	1.44
-1	0.03633	34	1.91	0.14746	2.28**	0.01468	41	1.52	0.07077	1.74
0	0.33052	34	7.70***	0.47799	6.16***	-0.00497	43	-0.62	0.06580	1.63
1	0.03484	33	1.51	0.51283	6.25***	0.00464	42	0.53	0.07045	1.68
2	0.00459	33	0.26	0.51743	4.68***	-0.03883	44	-1.28	0.03161	0.62
3	0.00573	19	0.36	0.52316	4.04***	-0.00586	41	-0.51	0.02574	0.48
4	0.06122	12	1.78	0.58438	4.03***	0.01182	43	1.06	0.03756	0.7
5	0.03213	11	1.41	0.61652	3.5***	0.02999	42	2.32**	0.06756	1.21

**Significant at the 5% level. ***Significant at 1% level.

Table 8. Multiple Regression:Two-Month Standardized Excess Bond Returns (COSAVRS)

(A) Overall Sample: 146 Bonds			*(B) Subsample: 63 Bonds*	
Variable	*Coefficient*	*t-Statistic*	*Coefficient*	*t-Statistic*
Intercept	-1.3904***	-2.73	4.1364*	1.7
D/Eown	-0.0631	-0.96	-1.2723	-1.12
D/Eother	-0.3953***	-3.34	-3.8380***	-3.28
Cvown	1.5691**	2.17	-0.1144	-0.09
Cvother	1.0510	1.87	2.4437***	2.08
CORRADAG	-0.0694	-0.18	-1.0398	1.64
Con	1.8430***	3.79	3.1827***	3.54
WT	0.3963	0.85	1.0765	31.57
DUR own			-0.0644	-0.46
DUR other			-0.1425	-0.88
Overall F-Value	4.59***		3.7280	
Adj. R-square	15.98%		32.49%	
Sample Size	132		61	

*Significant at 10% level. **Significant at the 5% level. ***Significant at 1% level.

Table 9. Multiple Regression: Two-Month Standardized Excess Bond Returns (COSAVRS) With Weighted Common Stock Returns (WTCST)

(A) Overall Sample:146 Bonds			*(B) Sub-sample: 63 Bonds*	
Variable	*Coefficient*	*t-Statistic*	*Coefficient*	*t-Statistic*
Intercept	0.7538	0.80	4.9310*	1.85
D/E own	-0.1370	-0.18	-0.4822	-0.41
D/E other	-0.7238	-1.18	-3.0330**	-2.51
CV own	-0.6657	-0.73	-2.2607**	-2.01
CV other	0.3394	0.52	2.1083	2.12
CORRADAG	-0.7323	-1.61	-1.3953***	-2.64
Con	2.7739***	3.71	3.6271***	3.95
WT	1.2114**	2.14	0.9222	1.59
MAT own			0.0638	1.64
MAT other			-0.2291	-1.52
WTCST	-5.2394***	-2.96	-7.589***	-3.99
Overall F-Value	6.46***		6.453	
Adj. R-Square	37.10%		54.24	
Sample Size	74		57	

*Significant at 10% level. **Significant at the 5% level. ***Significant at 1% level.

Table 10. Investment and Speculative Grade Bonds Means of Standardized Residuals (SVARS) For the Overall Sample of 146 Bonds[a]

1) For the Pre-Announcement Month (t=-1) (Acquired and Acquiring Firm Bonds)			*2) For the Announcement Month (t=0) (Acquired and Acquiring Firm Bonds*			*3) For the Pre-Announcement Month (t=-1) (Acquiring Firm Bonds)*			*4) For the Announcement Month (t=0) (Acquired Firm Bonds)*			
Bond Type	*Mean*	*Duncan* Grouping*	*n*	*Mean*	*Duncan* Grouping*	*n*	*Mean*	*Duncan* Grouping*	*n*	*Mean*	*Duncan* Grouping*	*n*
1) Investment	-0.5012	A	95	0.0123	A	95	-0.4342	A	81	-0.03402	A	13
2) Speculative	-0.0159	A	43	0.7111	B	43	-0.102	A	30	2.4472	B	14
Alpha		0.05				0.05			0.05		0.05	
Critical		0.6037			0.614			0.7355			1.182	
Difference					376			1			48	
D.F.		131			104			104			20	

[a]Due to the non-availability of ratings for some bonds in the sample, the total investment and speculative grade bonds do not add up to 146.
*Means with the same letter are not significantly different.