Bond and Stock Market Response to Unexpected Earnings Announcements

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Abstract

This study examines whether earnings changes convey information in bond markets and finds a significant positive (negative) reaction to unexpected earnings increases (decreases). The results are consistent whether earnings announcements precede or follow dividend announcements. Thus, earnings surprises convey information to bond markets and changes in firm value are split among bondholders and stockholders. This is in contrast to evidence from studies examining unexpected dividend announcements where bond price reaction is asymmetric. Cross-sectional analysis reveals that bond excess returns are positively related to earnings surprises.

I. Introduction

Stock market reaction to earnings announcements has received significant attention in the finance and accounting literature. Ball and Brown (1968), Brown (1978), Watts (1978), Aharony and Swary (1980), and Fried and Givoly (1982) are some of the studies that observe a revision of stock prices associated with the release of earnings information. Lev (1989) provides a survey of research in this area. The explanation for the above empirical findings is that unexpected earnings provide new information about future cash flows. Furthermore, the classical discounted cash flow model predicts a revision in firm value that is the present value of expected future cash flows. Whether this increased firm value accrues to stockholders and bondholders is an empirical issue. Past research on the information content of earnings has focused solely on stock price behavior and finds at least part of the benefits accrue to stockholders.

In this study, we examine the bond market reaction to unexpected quarterly earnings announcements. The study is unique for several reasons. First, dividends, repurchases, and earnings are considered primary mechanisms used by management to convey information about future cash flows to securityholders. Recent

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studies by Handjinicolaou and Kalay (1984) and Jayaraman and Shastri (1988) examine bond market response to quarterly and special dividends changes, and Vermaelen (1981) and Bartov (1991) document bond price reaction to stock repurchases. Bond price response to earnings announcements has not been documented thus far. Second, if earnings changes convey new information about expected cash flows then bond markets should respond to these changes since the information is relevant for all participants in capital markets. If the mean of future cash flows changes, stock and bond values change in the same direction. However, if the variance of expected cash flows changes in the option pricing framework, stock and bond returns are expected to adjust in opposite directions. The measure of unexpected earnings used in this study accounts for changes in both mean and variance of earnings expectations.

Furthermore, Handjinicolaou and Kalay (1984) find an asymmetric bond price response to dividend changes. They document that bond price reaction to dividend increases is not significant while the reaction to dividend decreases is negative and significant. One possible explanation for these asymmetric results is the presence of dividend restricting covenants in bond indentures that may protect the bondholders from potential wealth expropriation in the event of unexpected dividend increases. A potential problem with examining bond price reaction to dividend increases (decreases) is the possibility of confounding results, where the positive (negative) impact of dividend signalling may be offset by the negative (positive) effect of wealth transfer from (to) bondholders to (from) stockholders. This study circumvents these problems by examining bond price reaction to quarterly earnings surprises.

Third, we isolate the expected and the unexpected or "surprise" components of the earnings announcement, since only the unexpected component has information content. Typically, studies examining the effect of dividend announcements use naive models to identify the unexpected component of the announcement based on the difference between past and current dividends. We use the mean analysts' forecast as a proxy for the market expectation. Thus, the unexpected component of the announcement is the difference between the actual earnings announced and the analysts' mean expectations at that time.

Finally, we differentiate between earnings announcements that precede dividends from those that are made following dividend announcements. Kane, Lee, and Marcus (1984) suggest the existence of a corroborative relationship between dividend and earnings announcements. They conclude that "investors give more credence to unanticipated dividend increases and decreases when earnings are also above or below expectations, and vice versa." Thus, the sequence/timing of earnings and dividend announcements per se may provide additional information.

This study documents a significant positive reaction in bond markets to positive earnings surprises and significant negative reaction to unexpected earnings decreases. Furthermore, these results are consistent for earnings announcements both preceding and following dividend announcements. We find a symmetric bond and stock price response to unexpected earnings changes. These results suggest that earnings announcements have information content for both stock and bond markets. Moreover, changes in firm value are split among bondholders and stockholders. Previous studies examining the effect of dividend announcements on

bond prices (Handjinicolaou and Kalay (1984) and Jayaraman and Shastri (1988)) were inconclusive in testing the information content hypothesis in bond markets due to an insignificant bond price reaction to unexpected dividend increases.

Another related research area that has received significant attention in the literature is the relationship between earnings changes and security returns. In general, these studies have yielded modest results with low to negligible correlations between stock returns and unexpected earnings. Previous research for stock markets, summarized in Lev (1989) and Brennan (1991), estimates earnings response coefficients by regressing stock returns on earnings changes to evaluate the usefulness of earnings information to investors. We use cross-sectional regression analysis to examine the impact of unexpected earnings on bond returns. The analysis shows a significant positive relation between the announcement day excess bond returns and unexpected earnings change after controlling for bond ratings and market return. The explanatory power of our model is significantly larger than that found for a majority of stock studies. The rest of the paper is organized as follows: Section II describes the sample selection process, the data sources, and the bond and stock event study methodologies; the empirical results are presented in Section III; and the paper is concluded in Section IV.

II. Data and Empirical Methods

A. Sample Selection

The sample is comprised of firms with large quarterly unexpected earnings announcements during the period October 1984 to August 1990. The Institutional Brokers' Estimate System (IBES) database provided by I/B/E/S Inc. is used to identify firms with unexpected earnings announcements. The IBES database provides earnings forecasts by more than 2,500 analysts for 3,400 stocks trading on the major U.S. and Canadian exchanges. The database provides high, low, mean, and median forecasts. Furthermore, the standard deviation of forecasts, the number of analysts following the firm, and the actual earnings per share are also reported. For a more detailed description of the IBES data, see Philbrick and Ricks (1991).

Studies by Brown and Rozeff (1978) and more recently Brown, Hagerman, Griffin, and Zmijewski (1987) show that analysts' forecasts are more accurate predictors of earnings expectations than mechanical time series models since analysts have access to broader and more current information sets. The standardized unexpected earning (SUE) is used as a measure for the unexpected information content of the earnings announcement. The SUE is defined as

$$\text{SUE}_{i,t} = \left(\text{AE}_{i,t} - F_{i,t}\right) / \sigma_{i,t}, \tag{1}$$

where $\text{SUE}_{i,t}$ is standardized unexpected earnings for firm i at quarter t,
$\text{AE}_{i,t}$ is actual quarterly earnings announced by firm i at quarter t,
$F_{i,t}$ is the mean analysts' forecast for firm i at quarter t, and
$\sigma_{i,t}$ is the standard deviation of the analyst forecasts.

The IBES tapes are used to identify an initial sample of firms with an absolute value of SUE greater than or equal to one and followed by at least three analysts.

This restricts the sample to the largest earnings surprises, thus limiting the noise in the data. The initial sample is comprised of 841 unexpected earnings increases and 879 unexpected earnings decreases. After eliminating firms with no publicly traded debt on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX), the sample is reduced to 302 earnings increases and 293 earnings decreases. Next, firms with no earnings or dividend announcement in the *Wall Street Journal* or with announcements within five days of each other are eliminated from the sample to isolate the two events. The mean interval between dividend and earnings announcements is 26 days in our sample. This yields a sample of 187 earnings increases and 215 earnings decreases.

The final sample is obtained after eliminating observations that do not have at least one straight debt issue trading during a 31-day interval around the announcement. In our sample, the minimum number of trades during the interval is five.[1] The final sample is comprised of 250 announcements by 135 different firms. The distribution of the sample by type of event is reported in Table 1. There are 119 unexpected earnings increases and 131 unexpected earnings decreases. In the unexpected earnings increase sample, nine announcements are preceded by actual dividend increases. For the earnings decrease sample, there are no firms that announced dividend decreases before the earnings announcement. On a daily basis, there does not appear to be a time clustering problem.

TABLE 1

Distribution of Earnings Announcements by Event
(Number of Firms in Parentheses)[1]

Event	Number of Announcements
1. *Earning Announcement Precedes Dividend Announcement*	174
a. Unexpected Earnings Increase	89 (56)
b. Unexpected Earnings Decrease	85 (69)
2. *Dividend Announcement Precedes Earning Announcement*	76
c. Unexpected Earnings Increase	30 (24)
d. Unexpected Earnings Decrease	46 (33)
TOTAL	250

[1]The number of firms is not additive since companies have multiple announcements across samples. There are 135 different firms in the sample.

B. Other Data Sources

Daily corporate bond and matching Treasury bond prices are from the *Data Resources Inc.* (DRI) database.[2] These prices are then randomly cross-checked for

[1]Moreover, there must be at least one trade before the announcement day, if a dividend announcement precedes the earnings announcement, and one trade after the announcement day, for the subsample in which a dividend announcement follows the earnings announcement.

[2]Prices for bonds traded on the NYSE and AMEX markets are for odd-lot trades and are prone to be somewhat less accurate. A majority of the previous studies have used similar data, for example, see Eger (1983).

accuracy with prices quoted in the *Wall Street Journal* (WSJ). In order to compute daily returns from bond prices, with accumulated daily coupon interest, *Moody's Bond Record* is used to identify the interest payment dates, coupon rates, and maturity dates for the sample of bonds. The stock and market returns are from the University of Chicago's *Center for Research in Security Prices* (CRSP) daily returns tape.

C. Methodology

1. Bond Methodology

The mean adjusted returns methodology developed in Masulis (1980) and adapted for bonds in Handjinicolaou and Kalay (1984) is used to estimate excess returns. In order to adjust for changes in term structure of interest rates, adjusted bond return ($ABR_{i,n}$) is calculated as follows,

$$ABR_{i,n} = BR_{i,n} - TBR_{i,n}, \tag{2}$$

where $BR_{i,n}$ is the bond return for firm i over n days and $TBR_{i,n}$ is the return over the same period for a matching Treasury bond.[3] A 31-day interval around the event is used to estimate the comparison and announcement period returns. When earnings precede dividends, the comparison period is day -29 to day -1. The comparison period is day +2 to day +30 when dividends precede earnings. This method eliminates the problem of contamination of the comparison period by the dividend announcement. The comparison period average daily return ($R_{i,cp}$) for firm i is then

$$R_{i,cp} = \left[\Pi_{cp}\left(1 + ABR_{i,n}\right)\right]^{1/k} - 1, \tag{3}$$

where k is the number of returns in the comparison period. Since bond returns are a series of single and multiple day returns, they are adjusted to yield equivalent single day returns and standardized. Thus,

$$SER_{i,t} = \left(ABR_{i,n} - n \cdot R_{i,cp}\right) / S_i\sqrt{n}, \tag{4}$$

where $SER_{i,t}$ is the daily standardized excess return for firm i and S_i is the estimated standard deviation of the comparison period returns for firm i.[4] The standardized mean excess return ($SMER_t$) for the portfolio of bonds is then estimated over the entire 31-day period and is given by

$$SMER_t = \sum_i SER_{i,t}/N \tag{5}$$

[3]Treasury bonds with the closest maturity and coupon combination are used in the analysis. First, the set of Treasury issues with the closest maturity is identified, and then the bond with the closest coupon is used for the adjustment.

[4]There is a potential problem of estimating the standard deviation of the comparison period return from four or five returns. However, in our sample, there are only 11 such bonds.

where N is the number of bonds trading on day t. Assuming that the individual standardized excess bond returns are cross-sectionally independent,[5] the appropriate test statistic is

$$Z_t = \sqrt{N}\,(\mathrm{SMER}_t). \tag{6}$$

If a bond does not trade on the announcement day or day +1, the next trading day is assumed to be the announcement day. This correction is necessary since bonds may not trade daily and information may be incorporated in security returns on the announcement day or the following trading day.

2. Stock Methodology

Standard event study methodology is used to determine market-adjusted excess returns for the sample. The market model parameters are estimated on daily returns from 250 to 121 days preceding the event day. The daily excess return for firm j on day t is defined as

$$\mathrm{ER}_{jt} = R_{jt} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{mt}\right), \tag{7}$$

where R_{jt} is the return for security j for day t, R_{mt} is the return on the equal-weighted market index, and $\hat{\alpha}$ and $\hat{\beta}$ are the ordinary least squares estimates of firm j.

The average excess returns over all firms in the sample are computed as follows,

$$\mathrm{AER}_t = \sum_{j=1}^{N} \mathrm{ER}_{jt}/N, \tag{8}$$

where N is the number of firms in the sample.

Tests of statistical significance of the excess returns are based on daily standardized excess returns, which are defined as

$$\mathrm{SER}_{jt} = \mathrm{ER}_{jt}/S_{jt}, \tag{9}$$

where

$$S_{jt} = S_j \left[1 + 1/T + (R_{mt} - R_m)^2 \Big/ \sum_{i=1}^{T} (R_{mi} - R_m)^2\right]^{1/2}, \tag{10}$$

S_j^2 is the residual variance of the market model for firm j, T is the number of days in the estimation period (120 to 61 days preceding the event date), and R_m is the mean market return over the estimation period.

The mean standardized excess return is

$$\mathrm{SMER}_t = \sum_{j=1}^{N} \mathrm{SER}_{jt}/N. \tag{11}$$

[5] In four cases, there are three announcements on the same day and in 31 cases, there are two announcements on the same day. All other announcements are on different calendar days.

Assuming that the standardized excess returns are cross-sectionally uncorrelated, the appropriate statistic is

$$Z_t = \sqrt{N}\,(\mathrm{SMER}_t), \tag{12}$$

which is approximately distributed unit normal. The Z-statistic for the cumulative excess returns over various intervals from t_1 to t_2 is

$$Z_{t1,t2} = \sum_{t=t_1}^{t_2} Z_t / \sqrt{t_2 - t_1 + 1}. \tag{13}$$

III. Results

A. Bond and Stock Price Response to Unexpected Earnings

Table 2, Panel A presents the bond and stock price response to unexpected earnings increase and decrease announcements when earnings precede dividends. For the increase announcements, the bond excess return on the announcement day is 1.00 percent, which is the largest one-day return over the entire 31-day event period. The Z-statistic is 9.38 and is significant at the 1-percent level. Eighty percent of the bonds have positive returns and the Z-statistics for the nonparametric sign test and Wilcoxon signed rank test are 5.62 and 6.09, respectively. Both are significant at the 1-percent level suggesting that the results are not driven by outliers and are robust to the distributional assumptions of bond returns. The cumulative preannouncement period return from day -29 to the day before the announcement is 0.15 percent and is not significant.

The stock sample has an announcement day excess return of 1.02 percent with an accompanying Z-statistic of 6.85, which is significant at the 1-percent level. The sign test and Wilcoxon signed rank Z-statistics are 3.50 and 4.23, respectively, and again both are significant at the 1-percent level. The preannouncement period cumulative returns are not significant. These results show that earnings increase announcements convey positive information to both bond and stock markets.

For the unexpected earnings decrease sample, the announcement day excess bond return is -1.70 percent with a Z-statistic of -15.69, which is significant at the 1-percent level. Only 9 percent of the bonds have positive returns. The accompanying Z-statistics of the sign test and the Wilcoxon signed rank test are -7.48 and -7.18, respectively, both being significant at the 1-percent level. Consistent with the earnings increase sample, there appears to be no significant preannouncement bond cumulative returns. The stock market, as expected, responds negatively with an excess return of -1.39 percent with a Z-statistic of -9.64, which is significant at the 1-percent level. For the stocks, 32 percent of the observations have positive returns. The results of the nonparametric sign test and Wilcoxon signed rank test are significant at the 1-percent level.

When earnings follow dividend announcements, the bond price reaction to earnings changes remains positive and significant. The results are presented in Table 2, Panel B. The bond price reaction for the announcement day is 1.56 percent with a Z-statistic of 8.52, and is significant at the 1-percent level. Eighty-seven

TABLE 2

Cumulative Excess Returns for Stocks and Bonds around Unexpected Earnings Announcements for Different Intervals (*Z*-Statistics in Parentheses)

		Interval			Summary Measures Day 0 Returns		
Sample	*N*	Pre/Post Ann Period Return[1]	Ann Period Return [0, 1]	Ann Day Return [0]	Percent Positive	Sign Test *Z*-Statistic	Wilcoxon Signed Rank *Z*-Statistic
A. Earnings Precede Dividends							
Earnings Increase Ann	89						
Bonds		0.15 (0.28)	1.00** (6.64)	1.00** (9.38)	80	5.62	6.09
Stocks		0.40 (0.60)	1.33** (6.51)	1.02** (6.85)	69	3.50	4.23
Earnings Decrease Ann	85						
Bonds		0.38 (0.62)	−1.47** (−9.58)	−1.70** (−15.69)	9	−7.48	−7.18
Stocks		−3.54** (−4.18)	−1.64** (−5.57)	−1.39** (−9.64)	32	−3.36	−4.25
B. Earnings Follow Dividends							
Earnings Increase Ann	30						
Bonds		−0.04 (−0.05)	1.30** (5.08)	1.56** (8.52)	87	4.02	4.19
Stocks		−1.88 (−1.69)	0.59** (2.43)	1.04** (4.86)	70	2.19	2.48
Earnings Decrease Ann	46						
Bonds		−0.05 (−0.08)	−0.86** (−4.29)	−1.25** (−8.48)	17	−4.42	−4.67
Stocks		−2.13* (−1.97)	−1.06** (−3.92)	−0.94** (−5.08)	35	−2.06	−2.81

** Significant at the 1-percent level.
* Significant at the 5-percent level.
[1] The preannouncement period is used when earnings precede dividends and the interval is day −29 to −1. The post announcement period is used when dividends precede earnings and the interval is day +2 to +30.

percent of the bonds in this sample have positive returns on the announcement day. The results of the sign test and Wilcoxon signed rank test are significant at the 1-percent level. For the stock sample, the announcement day excess return is 1.04 percent with a Z-value of 4.86, which is significant at the 1-percent level. Seventy percent of the stocks have positive returns and both the sign test and the Wilcoxon signed rank test are significant at the 5-percent and 1-percent levels, respectively.

Nine firms in the above sample announced actual dividend increases preceding unexpected earnings increases. Thus, in this case, the unexpected earnings increase information is preceded by a positive dividend signal. To discriminate between unexpected earnings announcements that are preceded by a positive signal and those that are not, the sample was further divided into announcements with prior dividend increases and those that have no prior dividend increase. Though the results are not reported in the table, nine firms with prior dividend increases have an announcement day bond return of 2.42 percent with a Z-value of 7.25. There are eight bonds with positive returns and one with a negative return. The announcement day stock return is 0.75 percent with a Z-value of 2.15. Thus, the evidence from the bond market supports the "corroboration" effect found by Kane, Lee, and Marcus (1984). They conclude that in the stock market, dividends and earnings

announcements are interpreted in relation to each other. However, the small sample size for this group precludes any firm conclusions.

For the unexpected earnings decrease announcements, the excess bond return is −1.25 percent with a Z-statistic of −8.48 and only 17 percent of the bonds have positive returns. The nonparametric sign test and Wilcoxon signed rank test have Z-values of −4.42 and −4.67, respectively, and both are significant at the 1-percent level. The stock returns for this subsample are symmetric with the bond returns. None of the firms in this sample announced dividend decreases preceding the unexpected earnings decrease announcement. The above results suggest that bondholders and stockholders derive significant information from unexpected earnings increase and decrease announcements.

B. Cross-Sectional Regression Analysis

The relationship between earnings changes and security returns has received significant attention in the literature. Past research for stock markets, summarized in Lev (1989) and Brennan (1991), regresses stock returns on earnings changes to evaluate the usefulness of earnings information.[6] In general, these studies have yielded modest results with low to negligible correlations between stock returns and unexpected earnings. We use cross-sectional regression analysis to evaluate the usefulness of earnings information to bond investors as measured by the relation between the announcement day excess bond returns (SER_0) and the unexpected earnings (SUE).

Various versions of the following basic linear model are tested in this study,

$$(14) \qquad SER_0 = \alpha_0 + \alpha_1(SUE) + \alpha_2(SAR) + \alpha_3(MKTRET) + \alpha_4(SUE*DUMD) + \alpha_5(SUE*DUMR) + \varepsilon,$$

where SER_0 is the standardized announcement day excess return for a nonconvertible bond,

SUE is the standardized unexpected earnings being announced,

SAR is the announcement day stock abnormal return,

MKTRET is the announcement day return on the value-weighted stock market index from the CRSP NYSE/AMEX file,

DUMD takes a value of 1 if a dividend increase occurs prior to earnings announcement, and 0 otherwise,[7]

DUMR is a dummy variable for bond rating, which takes a value of 1 if the bond is rated BB or below, and 0 otherwise.[8]

The model attempts to capture the relationship between the standardized announcement day bond excess return (SER_0) and the standardized unexpected

[6]Beaver, Lambert, and Ryan (1987) and Collins and Kothari (1989) use reverse regressions to estimate earnings response coefficients. Their analysis regresses earnings changes on stock returns (causality not implied) and estimates a return response coefficient that is the reciprocal of the earnings response coefficient.

[7]In the unexpected earnings increase sample, nine announcements are preceded by actual dividend increases. For the earnings decrease sample, there are no firms that announced dividend decreases prior to the earnings announcement, perhaps reflecting the reluctance of managers to cut dividends (see Kalay (1980)).

[8]In our sample, there are 24 noninvestment grade bond issues rated BB or below.

earnings measure (SUE). Moreover, if stocks and straight bonds exhibit a symmetric price response to earnings changes, one should observe a positive cross-sectional relation between the announcement day bond and stock returns. Hence, the announcement day stock return (SAR) is used as an independent variable in the model. We control for market-specific factors that may influence the bond returns by including the return on the value-weighted stock market index from the CRSP tapes (MKTRET). Firm-specific variables are excluded since Lanen and Thompson (1988) show that in cross-sectional tests of security price reaction and observable firm characteristics, inferences about the sign of the relationships are not possible.

An interaction term between SUE and the dummy variable DUMD is included in the model. The DUMD variable captures the effect of a dividend increase announcement prior to the earnings change. The interaction term captures the effect of the announcement on the abnormal bond return conditioned on whether the prior dividend announcement releases a positive signal about the earnings announcement. Thus, it is possible to test the "corroboration effect" between dividend and earnings announcements in bond markets. The other interaction term included is SUE*DUMR, which conditions the bond price reaction to the unexpected earnings based on whether the bond issue is investment grade or not. DUMR takes a value of 1 if the bond is rated BB or below.

The results of the cross-sectional analysis are presented in Table 3. Model 1 examines whether the SUE variable captures the surprise component of earnings. To reduce the influence of outliers, SUE values greater than 5 or less than -5 are winsorized to 5 or -5 respectively. Several studies, such as Bernard and Thomas (1990) and Dann, Masulis, and Mayers (1991), use a similar procedure. The coefficient for SUE is positive with an accompanying t-statistic of 9.22, which is significant at the 1-percent level.[9] The R^2 is usually not important in hypothesis testing. However, in this case it provides a measure of the extent to which investors use earnings information. The adjusted R^2 is 0.26 and the overall F-statistic for the model is 85.06. This finding is significant since Lev ((1989), p. 155), reports that "the correlation between earnings and stock returns is very low and sometimes negligible.... These findings suggest that the usefulness of quarterly and annual earnings to investors is very limited." The typical R^2 reported for stock studies with narrow event windows is in the range of 0.02 to 0.05. The results for our study are stronger than for stock studies, we feel, due to noise reduction by selecting a sample based on values of SUE exceeding 1. The results of this analysis support the hypothesis that SUE captures the earnings surprise.

The cross-sectional relation between bond and stock abnormal returns due to the unexpected earnings announcement is examined in Model 2. The primary hypothesis of this study is that if earnings changes convey new information about expected cash flows, then both bond and stock markets should symmetrically respond to these changes since the information is relevant for all participants in capital markets. In studies examining unexpected dividend announcements, bond and stock price response is not symmetric. These prior studies do not observe a

[9]When the SUE variable is not winsorized the t-statistic is 2.61. This is lower than the winsorized value due to the presence of outliers.

TABLE 3

OLS Cross-Sectional Regression Estimates for Aggregate Sample
(237 Observations)

Model: $SER_0 = \alpha_0 + \alpha_1(SUE) + \alpha_2(SAR) + \alpha_3(MKTRET) + \alpha_4(SUE*DUMD) + \alpha_5(SUE*DUMR) + \varepsilon$

	Regression Models								Corrected
Variable	Model 1	*t*-Stat	Model 2	*t*-Stat	Model 3	*t*-Stat	Model 4	*t*-Stat	*t*-Stat[1]
Intercept	−0.054	−0.41	−0.201	−1.39	−0.065	−0.49	−0.180	−1.26	−1.25
SUE	0.353**	9.22			0.339**	8.15			
SAR			0.247**	4.90			0.229**	4.57	4.24
MKTRET					−0.296*	−2.24	−0.316	−2.18	−1.75
SUE*DUMD					0.328	1.76	0.539**	2.70	3.40
SUE*DUMR					0.062	0.56	0.292*	2.58	2.37
F-Statistic	85.06**		24.01**		23.76**		11.28**		
ADJ-R^2	0.26		0.09		0.28		0.15		
White Test Chi-Sq	0.60		4.27		7.44		9.84		

**Significant at 1-percent level.
*Significant at 5-percent level.

Variable Definitions:
SER_0 is the standardized announcement day excess return for a nonconvertible bond.
SUE is the standardized unexpected earnings being announced.
SAR is the announcement day stock abnormal return.
MKTRET is the announcement day return on the value-weighted market index from the CRSP NYSE/AMEX file.
DUMD takes a value of 1 if a dividend increase occurs prior to earnings announcement and 0 otherwise.
DUMR is a dummy variable for bond rating, which takes a value of 1 if the bond is rated BB or below and 0 otherwise.

[1] *t*-value corrected using White's (1980) consistent covariance estimator.

significant bond price reaction to dividend increases.[10] This may be due to the presence of dividend restricting covenants that protect bondholders from wealth expropriation or the possibility of confounding results where the positive signal of future cash flow increases conveyed by the unanticipated dividend increase is neutralized by the negative effect of the potential for wealth transfer from bondholders to stockholders. An unexpected dividend increase may lead to a wealth transfer if the increase is financed by issuing new debt (of equal or higher seniority than existing debt) or by liquidating a portion of the firm's assets (reducing the collateral of the bondholders). In this study, we investigate the effect of unexpected earnings announcements, thus the possibility of wealth transfer is eliminated and is not tested. The regression coefficient for the announcement day stock return (SAR) is positive and significant at the 1-percent level with a *t*-statistic of 4.90.[11] Thus, the empirical evidence supports the inference that for earnings announcements the stock and bond price response is symmetric.

Model 3 in Table 3 presents the results of the complete cross-sectional regression, excluding the SAR variable. The SAR variable is excluded because it is correlated with SUE.[12] As in Model 1, the SUE coefficient is positive and significant. The coefficient for MKTRET is negative and significant with a *t*-statistic of −2.24. The coefficients for the interaction terms are not significant. The SAR

[10] See Handjinicolaou and Kalay (1984) and Jayaraman and Shastri (1988).

[11] After adjusting for risk by including bond rating as an independent variable in the model, the SAR variable remains positive and significant with a *t*-statistic of 5.03. The bond rating variable, though positive, is not significant.

[12] A separate regression is run to examine the relation between SAR and SUE controlling for MKTRET, SUE*DUMD, and SUE*DUMR. The regression coefficient for SUE is positive and significant with a *t*-statistic of 5.40. The coefficient for the MKTRET variable is also positive and significant with a *t*-statistic of 2.21. The coefficients for SUE*DUMD and SUE*DUMR are positive though not significant.

variable is introduced in Model 4, while the SUE variable is eliminated due to the multicollinearity problem discussed above. The regular and corrected t-statistics are also reported in the table. The t-statistics are corrected using the White (1980) asymptotically consistent standard error estimates. In this model, the coefficients for SAR, SUE*DUMD, and SUE*DUMR are positive and significant. The significance of the SUE*DUMD interaction term suggests that firms with prior dividend increase announcements have higher returns than firms that do not. Thus, if there is a large earnings surprise that is preceded by a dividend increase, the bond price reaction is stronger than if there is no prior positive signal. This is also consistent with the argument that bond markets do not respond to dividend increases due to the confounding effect of positive information that is offset by a negative wealth transfer effect. However, the results of this analysis are to be interpreted with caution due to the small sample size for this group of firms. The significant positive coefficient for the SUE*DUMR variable suggests that the unexpected earnings announcements have a greater impact on lower-rated bonds. The adjusted R^2 for the model is 0.15 with an overall F-statistic of 11.28.

The results from the cross-sectional analysis support the event-study results that unexpected earnings announcements have a significant impact on the announcement day bond excess returns. Furthermore, we find that there is a significant positive cross-sectional relation between the announcement day abnormal returns for bonds and stocks. The regression results also reveal that unexpected earnings conditional on prior dividend increases have a significant positive impact on the abnormal bond return. This result is in conformity with the "corroboration effect" between dividend and earnings announcements for stocks, reported in Kane, Lee, and Marcus (1984).

IV. Conclusions

This study examines bond and stock market reaction to unexpected earnings announcements. The empirical results show that bondholders react positively (negatively) to unexpected earnings increases (decreases). These results do not change when dividend announcements precede or follow earnings. This provides evidence for information content of earnings announcements in bond markets. Results for stock markets are consistent with those of earlier studies.

Cross-sectional analysis of bond excess returns shows that the standardized unexpected earnings measure is positively related to bond price reaction and that bond and stock price response to unexpected earnings announcements is symmetric. Moreover, dividend and earnings announcements provide corroborating information to bond markets.

A major difficulty in testing for dividend information in bond markets is the fact that dividend announcements may imply information signalling or wealth transfer effects, for bondholders. Empirical evidence from past studies shows that bond price reactions to dividend increases are not significant, suggesting the possibility of confounding effects; the positive impact of dividend signalling may be offset by the negative effect of wealth transfer from bondholders to stockholders. The evidence from this study shows that unexpected earnings changes do convey significant information to bond markets and that the price response to earnings

increases (decreases) is significant. Thus, examining bond price reaction to earnings announcements avoids the potential problems associated with examining bond price response to dividend changes.

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