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Earnings and Dividend Announcements: Is There a Corroboration Effect?

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ABSTRACT

We examine abnormal stock returns surrounding contemporaneous earnings and dividend announcements in order to determine whether investors evaluate the two announcements in relation to each other. We find that there is a statistically significant interaction effect. The abnormal return corresponding to any earnings or dividend announcement depends upon the value of the other announcement. This evidence suggests the existence of a corroborative relationship between the two announcements. Investors give more credence to unanticipated dividend increases or decreases when earnings are also above or below expectations, and vice versa.

IT SEEMS FAIR TO SAY that there is today a wide consensus that either favorable earnings or dividend announcements can, by themselves, induce positive abnormal stock returns. The effect of earnings announcements on stock price changes has been documented by Ball and Brown [2], Foster [9], Brown [5], Watts [18], and Rendleman et al. [16]. The dividend announcement effect was first highlighted by Pettit [14, 15]. Recent studies by Charest [6] and Aharony and Swary [1] corroborate the existence of an information content of dividend announcements. Finally, Miller and Scholes [13], in a study focused primarily on dividends and taxes, find significant evidence of a dividend announcement effect.

These studies have for the most part attempted to measure the separate effects of either dividends or earnings. In general, the effect of the other announcement has been treated as a statistical nuisance that muddies the waters and introduces methodological complications. Consequently, these studies necessarily leave unanswered the question of whether investors evaluate dividend and earnings announcements in relation to each other. Earnings figures can be manipulated by clever accounting practices, and so may be interpreted with skepticism by the investment community (Kaplan and Roll [11]). Similarly, dividend announcements are only a crude way to convey information to capital markets.

While both earnings and dividend data have been shown to influence stock performance, one would expect that, in view of the noise associated with either announcement, the capital market would be interested in the consistency of the stories told by earnings and dividend announcements. This might lead to a corroboration effect on stock prices. Empirical evidence of such an interaction effect would be consistent with the hypothesis that the announcements convey useful but imperfect information.

Unfortunately, by isolating the separate effects of dividend and earnings announcements, the statistical procedures utilized in previous studies have pre-

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cluded the measurement of a corroboration effect. This effect is the focus of this study. We select firms for which dividends and earnings announcements are separated by less than 10 days. The abnormal return surrounding this "joint announcement" is measured and the separate as well as interactive effects of the dividend and earnings announcements are estimated.

Our empirical results, presented in Section III, clearly support the hypothesis of an interaction between dividend and earnings announcements. Although regressions of cumulative abnormal stock returns on unanticipated dividends and earnings yield highly significant coefficients on each variable, once terms that capture the interaction between the announcements are added to the regression, the interaction terms are at least as statistically significant as the level effects. These results indicate that the effects of earnings and dividend signals depend upon the value of the other variable. Each announcement is evaluated with respect to the information contained in the other.

I. Data and Sample Selection

Our sample consists of 352 observations of quarterly earnings and dividend announcements between the fourth quarter of 1979 and the second quarter of 1981. The selection criteria of these firm cases are as follows.

1. The firm is listed in both the University of Chicago CRSP tapes and the Standard and Poor's Quarterly COMPUSTAT tapes for the 1973–1981 period.
2. The firm's main business line is in manufacturing (SIC codes 2000 to 3999).
3. The firm's earnings and dividend announcements were reported in the *Wall Street Journal* during the sample period.
4. The two announcements occurred within 10 days of each other.
5. The firm's fiscal year ends in March, June, September, or December.

Nonmanufacturing industries were excluded from the sample because they tend to contain many regulated firms whose dividend decisions might be constrained. In order to obtain a sample that was roughly balanced with regard to the composition of positive, zero, and negative earnings and dividend surprises, we utilized the following procedures: First, all firms satisfying requirements 1–5 above were sampled from the fourth quarter of 1979 and the second quarter of 1981. This procedure resulted in a sample of 256 observations, dominated by cases with zero change in quarterly dividends. (188 of the 256 observations had zero dividend change.) We next scanned the COMPUSTAT tape for all fiscal quarters between 1980:1 and 1981:1 to identify all eligible firms which had a dividend increase or decrease of at least five cents per share. (Firms with extra dividends were excluded from the sample.) This procedure yielded 96 additional observations, although only 22 of these were dividend decreases. The final composition of the sample with respect to the sign of dividend and earnings changes is presented in Table I.[1]

[1] Earnings per share excluding extraordinary items and discontinued operations were obtained from the COMPUSTAT tapes. Both earnings and dividend figures were adjusted for stock dividends and splits.

Table I

Classification of Data

Dividend Surprise	Earnings Surprise		Total
	Positive	Negative	
Positive	78	61	139
Zero	85	103	188
Negative	4	21	25
Total	185	167	352

Note: Definition of expected dividend and earnings are given in Equations (1) and (2), respectively.

The selection of announcements that are closely timed (criterion 4) improves the ability to statistically discern a corroboration effect. To detect an interaction between earnings and dividends, abnormal returns must be measured over a period encompassing both announcements. If those announcements were widely separated, then the abnormal return would need to be calculated over a long intermediate period, during which no relevant event would occur. The extra noise introduced by returns during that period would make it difficult to measure precisely the effects of announcement per se.

II. Methodology

In order to measure unanticipated dividends and earnings, models of expectation formation are required. Rather than building our own models of such expectations, we rely on models that have been tested elsewhere. The validity of an expectational model will be considered to be confirmed if an earlier study has demonstrated a link between unanticipated dividend or earnings derived from that model and subsequent abnormal stock price performance.

A. Dividend Expectation Model

Aharony and Swary [1] demonstrate that a simple dividend forecasting model can successfully predict abnormal stock performance. The model forecasts no change in dividends from one quarter to the next:

$$D_q^* = D_{q-1} \tag{1}$$

where D_q equals the ordinary dividend per share in the q^{th} quarter and the asterisk denotes an expectation operator. The model is consistent with the hypothesis that managers are reluctant to change dividends in either direction unless they believe that the prospects of the firm have significantly improved or deteriorated.[2] Aharony and Swary report that this model was as successful as the more sophisticated one of Fama and Babiak [8] in predicting abnormal performance. The model is ultimately validated by the strong evidence that stock

[2] Such a model probably would fare poorly with extra dividends, which are paid explicitly on a one-time-only basis. Laub [12] found that firms changed regular dividends in only 25% of sampled quarters. This infrequency of dividend change suggests that the simple model might capture expectations to a first approximation.

performance was above normal following positive dividend announcements and below normal for negative announcements. Our measure of unanticipated dividends, denoted by D^u, is therefore computed as the percentage change in dividends from the previous quarter:

$$D_q^u = D_q/D_q^* - 1 = D_q/D_{q-1} - 1$$

B. Earnings Expectation Model

The time series properties of quarterly earnings data have been extensively studied. Benston and Watts [3] and Watts [18] examine several Box-Jenkins [4] models and find that the specification used by Foster [9] has the best predictive power and that forecast errors derived from the Foster model are most closely related to abnormal stock market returns. We therefore use this model to generate earnings expectations:

$$E_q^* = E_{q-4} + a + b(E_{q-1} - E_{q-5}) \tag{2}$$

where subscripts q denote quarters. The earnings model allows for seasonal dependence in earnings, for trend growth (via a), and for business cycle effects (via $E_{q-1} - E_{q-5}$). We fit Equation (2) separately for each firm in the sample to generate earnings forecasts one period ahead for each firm and took as our measure of unanticipated earnings, E^u, the percentage error in the earnings forecast:

$$E_q^u = E_q/E_q^* - 1$$

C. Measurement of Abnormal Stock Price Performance

Abnormal returns are calculated over a period beginning 10 days prior to the first announcement of dividends or earnings and ending 10 days subsequent to the second announcement. The abnormal returns are calculated using the capital asset pricing model:

$$AR_{jt} = R_{jt} - [R_{ft} + B_j(R_{mt} - R_{ft})]$$

where

AR_{jt} = the abnormal return in day t for firm j,
R_{jt} = total return in day t for firm j,
R_{mt} = market return in day t, as measured by the S&P 500 stock price index,
R_{ft} = Treasury bill rate in day t, and
B_j = beta for stock of firm j,

Beta is computed from a market model regression using one year of weekly data prior to the first announcement. We use the CAPM to measure abnormal returns rather than the market model, because the intercept of the market model is an ex post result that cannot be taken as a predictor for future periods. A firm with above-expected returns in one period should not necessarily be expected to generate superior returns in following periods. Use of the ex post intercept would

impose this expectation on returns for future periods. However, our approach requires that the CAPM hold as an equilibrium model of security returns.

For each firm in the sample, indexed by j, cumulative abnormal returns (CAR) are calculated as

$$\mathrm{CAR}_j = \sum_{t=T_{1j}-10}^{T_{2j}+10} AR_{jt}$$

where T_{1j} is the date of the first announcement and T_{2j} is the date of the latter announcement for firm j.[3]

The CAR over the joint announcement period should not depend on the announcement order. The new information released to the market after both announcements are made is identical, regardless of their order. Therefore, the total abnormal return should be identical over the period containing both announcements. For example, consider a large positive earnings signal followed by a small increase in dividend. The first announcement would likely generate a large return, while the second could conceivably generate a *negative* abnormal return because, *conditional* on the first announcement, the dividend signal is disappointing. If the announcements were reversed, the dividend signal would generate a small positive return and the large earnings increase would generate only a small positive abnormal return because, conditional on the earlier positive dividend signal, earnings are only slightly above expectation. The total effect of the two announcements in either order should be identical, since after both announcements are released, the information available to the market is identical.[4]

D. Specification

We follow Pettit [14] in testing the earning and dividend interactions in a nonparametric framework. Pettit combines stocks into positive and negative earnings surprise groups and then compares the abnormal stock performances for each subclass of dividend surprises within each earnings group. This is a nonparametric test in the sense that only the signs of the announcement surprises are used in forming the portfolios. His procedure is roughly equivalent to regressing abnormal returns on dummy variables which take values of zero or one depending on the signs of the forecast errors.

Our regression takes the form

$$\mathrm{CAR} = b_0 + b_1 D^u + b_2 E^u + b_3 I(-\,0) + b_4 I(-\,+) + b_5 I(+\,-) + b_6 I(+\,0) + b_7 I(+\,+) \quad (3)$$

where $I(+\,-)$ is an interaction dummy variable that takes value 1 if the earnings

[3] Some authors have found a tendency for abnormal returns to persist for long periods after the earnings announcement. However, even in these studies, the bulk of the CAR occurs within the few days surrounding the announcement. For example, in Rendleman et al. [16], more than two-thirds of the CAR typically appeared within the 20 days surrounding the earnings announcement. Aharony and Swary [1] and Divecha and Morse [7] report that the effect of the dividend announcement generally is impounded into stock prices within the 20-day period surrounding the announcement.

[4] We tested this hypothesis and found that our empirical results were unaffected by announcement order. For detailed results, see Kane et al. [10].

signal is positive and dividend signal is negative and 0 otherwise, and where the other dummy variables are defined analogously.[5] Since the $I(-\ -)$ variable is excluded for reasons of collinearity of the six possible dummies with the intercept, the base case has the interpretation of a negative signal in both earnings and dividends and the intercept is thus expected to be negative if interaction effects are relevant. Under the hypothesis that interactions are unimportant, the dummy variables should be jointly insignificant. The intercept b_0 should be zero, and the slope coefficients, b_1 and b_2, should capture the entire effect of dividend and earnings announcements. The effects of the two announcements would simply be additive.

Conversely, if announcements are corroborative, then the grouping procedure represented by the dummy variables will be important, and the coefficients of the dummies will be significant. In this case, the coefficients b_1 and b_2 still might be positive since the dummies cannot capture the magnitude of any announcements, but their significance levels should be lowered.

III. Empirical Results

Table II presents estimates of regression specifications that exclude interaction terms, in the spirit of traditional studies, and of Equation (3), which includes interaction dummy variables. The Column (1) estimates confirm that our sample produces results similar to those reported in the literature. The coefficients of both the earnings and dividend announcements are uniformly positive and significant at better than the 1% confidence level. These results suggest that earnings or dividend surprises can, by themselves, induce abnormal stock returns. A 1% surprise in earnings or dividends leads to a 0.034 or 0.07% increase in stock price, respectively.

Column (2) of Table II presents estimates of Equation (3), which includes E^u, D^u, and qualitative dummy variables to capture interaction effects.[6] Because the $I(-\ -)$ dummy is suppressed, the base case (represented by the intercept) has the interpretation of the worst-news scenario (negative surprises in earnings and dividends). The coefficients of the other dummy variables thus represent the incremental return over the $(-\ -)$ case resulting from placement in another group. These coefficients are all positive and generally highly significant. For the most part the magnitudes of the coefficients increase as one moves down the table from $I(-\ 0)$ to $I(+\ +)$, which reflects the increasing "good-news nature" of the announcements. The only exception to this rule surrounds the transition from $(-\ +)$ to $(+\ -)$, which is the only pair of events which cannot be naturally

[5] We experimented with several other functional forms. Following Rendleman et al. [16], we tried standardizing the regression variables by their standard deviations. In addition, we considered functional forms in which the magnitudes of D^u and E^u were used in the construction of the interaction terms. These procedures yielded results broadly similar to those presented below, and can be found in Kane et al. [10].

[6] We tested our specifications for heteroskedasticity using the procedure suggested by White [19]. These specifications showed virtually no evidence of heteroskedasticity; the chi-square statistics obtained in all cases were less than one-half the critical value corresponding to a 5% confidence level.

Table II

Regression Results (Dependent Variable: CAR)

Independent Variable	(1)	(2)
Constant	−0.005	−0.083
	(1.12)	(3.47**)
Earnings Surprise	0.034	0.015
	(4.51**)	(1.55)
Dividend Surprise	0.070	0.029
	(4.16**)	(1.24)
$I(-\ 0)$		0.068
		(2.84**)
$I(-\ +)$		0.079
		(2.84**)
$I(+\ -)$		0.057
		(1.22)
$I(+\ 0)$		0.092
		(3.38**)
$I(+\ +)$		0.103
		(3.48**)
F-statistic, First-Order		2.08
F-statistic, Interaction		2.65*
R^2 (adjusted)	0.124	0.144

Note: t-statistics are in parentheses.

* (**) denotes coefficient significantly different from zero at 5% (1%) level.

$I(-\ +)$ denotes interaction dummy with value 1 if E^u is negative and D^u is positive. The other dummies are defined analogously.

ordered. The coefficients of the (+ 0) and (+ +) dummies both exceed the intercept, which reflects the unambiguous good-news nature of those scenarios, while the coefficient of the (− 0) dummy is of lower magnitude than the intercept. The coefficients of the (+ −) and (− +) dummies are of lower magnitude than the intercept, indicating that a negative surprise in either dividends or earnings is sufficient to induce negative stock performance.

The coefficients on the magnitudes E^u and D^u are still positive, as one would expect. However, when the dummies are included, the size of the coefficients falls by a factor of more than 2 relative to Column (1), and the coefficients lose statistical significance. This pattern is consistent with the hypothesis that the earnings and dividend announcements are interpreted jointly, so that the interaction dummies are the key explanatory variables.

The acid test of the corroboration hypothesis is given by the F-statistics reported for the Column (2) regression. The first-order F-statistic tests the joint significance of D^u and E^u taken together. The interaction F-statistic tests the joint significance of the right-hand-side dummy variables. The significance of the interaction F-statistic presented in Table II is supportive of the corroboration

hypothesis.[7] In contrast, the earnings and dividend surprise variables are jointly insignificant.[8] The interaction terms seem to be better able to explain abnormal stock performance than the levels of E^u and D^u. This evidence suggests that the two announcements are not evaluated in isolation.

IV. Conclusion

We have examined the corroborative relationship between earnings and dividend announcements. We first demonstrated that our sample is similar to those of earlier researchers, who found that unexpected dividend and earnings announcements appear in and of themselves to be able to induce abnormal stock returns. However, once a more general specification that allowed for interaction effects between the two announcements was estimated, empirical results indicated that the announcements are indeed interpreted in relationship to each other. This interaction or corroborative effect was statistically significant.

[7] The F-statistics were computed using sums of squared residuals from constrained and unconstrained regressions. The degrees of freedom for the first-order statistics are (2, 344) and for the interaction statistics (5, 344); the corresponding critical values for a 5% confidence level are 3.02 and 2.24.

[8] This pattern was obtained in most, but not all, of the alternative specifications considered. See Kane et al. [10].

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