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Do Changes in Dividends Signal the Future or the Past?

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ABSTRACT

Many dividend theories imply that changes in dividends have information content about the future earnings of the firm. We investigate this implication and find only limited support for it. Firms that increase dividends in year 0 have experienced significant earnings increases in years −1 and 0, but show no subsequent unexpected earnings growth. Also, the size of the dividend increase does not predict future earnings. Firms that cut dividends in year 0 have experienced a reduction in earnings in year 0 and in year −1, but these firms go on to show significant increases in earnings in year 1. However, consistent with Lintner's model on dividend policy, firms that increase dividends are less likely than nonchanging firms to experience a drop in future earnings. Thus, their increase in concurrent earnings can be said to be somewhat "permanent." In spite of the lack of future earnings growth, firms that increase dividends have significant (though modest) positive excess returns for the following three years.

THE IDEA THAT CHANGES in dividends have information content is an old one. Lintner's (1956) famous investigation of dividend policy stresses that firms only increase dividends when management believes that earnings have *permanently increased*, meaning that a dividend increase implies a rightward shift in (management's perceived) distribution of earnings. A bit later, Miller and Modigliani (1961) explicitly suggest that dividends can convey information about future cash flows when markets are incomplete. Indeed, as demonstrated by Miller and Rock (1985), through the sources and uses of funds identity, the dividend decision could reveal information about current earnings to the market. Building on the notion of asymmetric information, Bhattacharya (1979), Miller and Rock (1985), John and Williams (1985), and others go further. In these theories, dividend changes are not actions that just happen to have information content. Rather, these are explicit signals about future earnings, sent intentionally and at some cost by management to the firm and

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its stockholders.[1] The idea that changes in dividends have information content remains the received wisdom in corporate finance. For example, in the latest revision of their leading textbook, Brealey and Myers (1996) devote a short subsection to the topic "The Information Content of Dividends." They report Lintner's description of dividend policy, in which changes in dividends depend on current and past earnings, but then go on to say: "We would also expect managers to take future prospects into account when setting the payments. And that is what we find."

What is the empirical support for this view that dividends provide information about future cash flows? There is, surely, much evidence that the market treats changes in dividends as newsworthy. When dividends are increased or initiated, prices tend to go up, and when dividends are (less often) cut or omitted, prices fall.[2] Much less is known, however, about the actual realization of future earnings. Do earnings indeed increase, as the market seems to expect? Despite the crucial role this implication has for dividend policy theories, the evidence is far from conclusive. Watts (1973) was among the first to examine the relation between current dividends and future earnings. Using 310 firms during the period 1946 to 1967, Watts regresses the next year's earnings on this year's dividends. While the average coefficients (across firms) are positive, the average *t*-statistics are very low. Gonedes (1978) has similar results. Also, Penman (1983) finds that after controlling for management's future earnings forecast, there is not much information conveyed by the dividend changes themselves.

Somewhat more in line with the theory are Healy and Palepu's (1988) results. For their sample of 131 firms that initiate dividend payments, earnings increased rapidly in the past *and* continue to increase for the following two years. However, for their sample of 172 firms that omit a dividend payment, the results are the opposite of what signaling theory would predict. Earnings decline in the year in which the omission announcement takes place, but then improve significantly in the next several years. For a sample of 35 firms that increased their dividends by more than 20 percent, Brickley (1983) finds a significant earnings increase in the year of and the year after the dividend increase, and Aharony and Dotan (1994) find that earnings continue to increase for at least four quarters after the dividend change.

In sum, there is not much evidence to support the claim that dividend changes inform us about future earnings changes. Miller (1987) summarizes the empirical findings this way: ". . . dividends are better described as lagging earnings than as leading earnings." Why then do the signaling-based theoretical treatments of dividends remain? Perhaps theorists are unconvinced by the early Watts (1973) study which, of necessity, relied on a limited number of firm

[1] Several costs associated with dividend payments have been proposed. Bhattacharya's (1979) model takes the cost of issuing new shares as the cost of the signal. Miller and Rock's (1985) model assume that the signaling cost is the forgone investment, and John and Williams (1985), and Bernheim (1991) take the higher taxes on dividends relative to capital gains as the signaling costs.

[2] See for example Charest (1978), Aharony and Swary (1980), Brickley (1983), Asquith and Mullins (1983), Healy and Palepu (1988), and Bajaj and Vijh (1990).

years. Similarly, the Healy and Palepu (1988) article also relies on a small number of data points and only considers the extreme cases of initiations and omissions, which could be special. Given the importance of this question, we believe it is time for a more comprehensive investigation of this issue.

Unlike many of the previous studies, we utilize a large number of firms and events. We also control for many other factors that can create spurious relationship between dividends and subsequent earnings changes. What we find is that there is a very strong lagged and contemporaneous correlation between dividend changes and earnings (when dividends are increased, earnings *have* gone up), but we are unable to find much evidence of a positive relationship between dividend changes and future earnings changes. In the two years following dividend increases, we find that earnings changes are essentially unrelated to the sign and magnitude of the dividend change. For dividend decreases, the results are stronger but perverse. Similar to Healy and Palepu's (1988) results for dividend omissions, we find a clear pattern of earnings increases in the two years following dividend cuts.

Could dividend changes signal something other than the expected value of future earnings growth? One possibility is that dividend increases are a signal about a permanent shift in earnings (as Lintner (1956) suggests), rather than a signal about future earnings growth. To this end, we compare two sets of firms that experienced a similar earnings changes in a given year: the first group of firms also changed their dividends and the second did not. We find some support for Lintner's view.

We also investigate the long-term return behavior of dividend-changing firms. Consistent with past research, we find that firms that increase dividends display positive excess returns on the announcement, while firms that decrease dividends suffer negative returns at the announcement. This suggests that the market does treat dividend changes as having information content. To see whether these short-run returns are quickly dissipated, we also compute long-term excess returns for the three years following the events. For the firms that cut dividends we find no significant excess returns, but for the firms that increase dividends there are significant (though modest) positive excess returns for three more years. This implies that if firms are sending a signal, (a) it is not a signal about future earnings growth and (b) the market doesn't "get it." Why firms would burn money to send a signal that is not received is, indeed, a mystery.

The article is organized as follows: In Section I we describe our data and provide some information about the main variables. Section II presents empirical tests and results. In Section III we consider the possibility that dividends signal something other than earnings growth, and in Section IV we perform some robustness checks. In Section V, using an analysis of their postannouncement returns, we further examine whether dividend changes tell us something about the future prospects of firms. Section VI contains the discussion and conclusion.

I. Research Design and Data Requirements

A. Research Design

How can we determine whether changes in dividends have information content about earnings? First, we must define unexpected earnings for a firm year as the difference between the actual earnings in that year and the earnings we would have predicted using all the relevant information other than the change in dividends. Then, information content implies the following:

1. Firms that increase (decrease) dividends in year 0 will have positive (negative) unexpected earnings in years 1, 2, etc.
2. Among firms that increase dividends, the larger the dividend increase, the greater the unexpected earnings in the following years.

Prediction 2 follows because if signaling is costly, then the larger the signal, the greater the cost. (It must cost more to increase the dividend by a dollar than by a penny.)

We devote a large part of this article to testing these two predictions of the signaling models. What makes the task difficult is knowing how to model unexpected earnings. To give the theory every possible chance, we use many different approaches. We begin by examining simple raw earnings, where the implicit model is that earnings are a random walk. In this approach we compare the earnings of firms that change dividends in a given year to those that do not. We control for possible industry trends by directly comparing firms that changed their dividend to firms that did not change their dividend and are in the same industry. In addition, we control for a possible earnings drift documented in the accounting literature (Foster, 1977) in two ways: We subtract the five-year earnings drift from each firm's earnings; and we compare dividend-changing firms to nondividend-changing firms with similar earnings growth rates between years -5 and -1 and between -2 and -1 (i.e., long- and short-run earnings growth rates). We also use these measures of unexpected earnings to compare the dividend-increasing firms to each other in order to test Prediction 2.

In addition to these categorical analyses, we also use regression analysis. Here, the basic approach is to regress earnings in year t on all relevant data that were available before the dividend was announced. We then add the dividend change variable (for year 0) and see whether the dividend announcement helps to explain future earnings.

These two approaches determine our data requirements. For the categorical approach, we need only basic earnings data for a number of years. For the regression analyses, we need additional accounting data that might help explain future earnings changes.

B. Sample Selection

Using the Center for Research in Security Prices (CRSP) and COMPUSTAT tapes (PST, full, and the research files), we collect all companies that trade on the New York Stock Exchange (NYSE) or on the American Stock Exchange (AMEX) for at least two years during the period 1979–1991. We exclude all foreign companies from the sample (usually traded as American Depository Receipts). To remain in the sample, a firm must meet the following criteria:

1. It must have a December fiscal year end.
2. It must pay four quarterly dividends (code No. 1232 on the CRSP tape) in at least two consecutive years. (We need two years of dividend payments to calculate the change in dividends. Note that this criterion excludes dividend initiation and omission events. These are discussed separately, using data on initiations and omissions from Michaely, Thaler, and Womack, 1995.)
3. The COMPUSTAT files contain information on the firm's income before extraordinary items (COMPUSTAT annual item No. 18) for the five years around the dividend payment year (years −2 through +2) and for the fifth year before the dividend payment year. (We use the earnings information from year −5 to estimate the long-term earnings growth rate.)

The resulting sample contains 1025 firms and 7186 firm-year observations. (Henceforth we refer to this as the main sample.)

For the regression analyses we need additional COMPUSTAT data. For this purpose, we form a set of firm-year observations (labeled as the secondary sample) in which we control for several of the firms' characteristics. In addition to the criteria applied to the main sample, we require each observation in the secondary sample to have information about additional variables (listed in Appendix A). The choice of these control variables is based on the analysis of Ou and Penman (1989). For our study, 4996 firm-year observations have complete information on all the control variables.

C. Variables' Definitions and Descriptive Statistics

The two main variables in our investigation are the firm's earnings[3] and its dividends. For earnings, we primarily study the change in income before extraordinary items. We use income before extraordinary items to eliminate the transitory components of income. This variable is deflated by the market value of equity at the beginning of the announcement year. As reported in Table I, Panel A, the median earnings (as a percentage of market value) is 10 percent, which implies a median P/E ratio of ten for the firms in our sample. Table I also shows values for each dividend-change subsample.

We define the annual dividend as four times the last quarterly dividend. (The reference point is the announcement date. Thus, a dividend declared on December 26, 1989 with an ex-date of January 10, 1990 is considered a 1989 dividend.) We define a dividend change as the difference between the year t annual dividend and year $t-1$ annual dividend. To make the cross-sectional

[3] All the results we report in the article are based on earnings, but we have replicated our analyses using cash flows and find very similar results.

Table I

Descriptive Statistics

Our sample contains 7186 dividend announcements made by New York Stock Exchange/American Stock Exchange (NYSE/AMEX) firms during the period 1979–1991. This table shows several of the sample characteristics: Panel A reports the cross-sectional distribution of the dividends and earnings variables; Panel B describes the distribution of the dividend announcement throughout the years; and Panel C reports the distribution of the dividend events within the months of the year. For each variable in Panel A, P1 is the 1st percentile of the distribution (i.e., 1% of the observations have a lower value), P10 is the tenth percentile, Q1 is the first quartile, Q3 is the third quartile, P90 is the 90th percentile, and P99 is the 99th percentile. Δ in earnings is the annual change in earnings before extraordinary items as a percentage of the market value of the firm at the beginning of the year. Earnings are measured before extraordinary items as a percentage of the market value of the firm. Dividends are defined as 4 times the last quarterly dividend per share (CRSP code 1232) announced within the year—as a percentage of the price per share at the beginning of the year. Δ in dividend is four times the difference between the last quarterly U.S. dividend per share for year −1 and the last quarterly dividend for year 0 as a percentage of the price per share at the beginning of year 0. Δ in dividend per share deflated by dividend is the difference between the last quarterly U.S. dividend per share for year −1 and the last quarterly dividend for year 0 as a percentage of the last quarterly dividend per share for year −1. All variables are adjusted for stock splits.

Panel A: Distributions of Variables Expressed as Percentage of Market Value on December 31 of the Preceding Year (n = 7186 NYSE/AMEX Firms Over 1979–1991)

Variable	P1	P10	Q1	Med.	Q3	P90	P99
Δ in earnings	−31.49	−6.96	−1.61	0.83	2.67	6.53	29.38
Earning: all	−26.36	2.44	6.66	9.97	14.44	19.83	32.52
Decreases	−67.90	−22.78	−8.34	2.47	8.39	15.52	23.01
No-change	−33.78	−1.54	4.32	8.14	12.05	16.78	32.00
Increases: quintile 1	−8.30	5.65	8.13	10.58	13.79	18.72	26.58
Increases: quintile 2	−2.24	5.54	7.66	11.01	15.83	20.46	29.61
Increases: quintile 3	−3.29	6.21	8.24	11.27	16.59	21.54	30.98
Increases: quintile 4	0.89	6.11	8.06	11.50	16.16	20.81	32.06
Increases: quintile 5	0.59	6.33	8.30	12.60	18.79	26.74	47.02
Dividends	0.64	1.83	3.00	4.49	6.67	8.78	13.71
Δ in dividend: decreases only	−10.58	−6.05	−4.38	−3.33	−2.12	−1.22	−0.26
Δ in dividend: increases only	0.08	0.18	0.28	0.44	0.70	1.08	3.23
Δ in div. per share deflated by div. rather than price: decreases only	−90.91	−75.00	−58.33	−49.43	−37.84	−24.00	−9.33
Δ in div. per share deflated by div. rather than price: increases only	1.96	4.17	6.98	11.11	18.18	28.57	100.00

Panel B: The Frequency of Dividend Changes by Year (n = 7186)

Year	Number of Decreases	Number of No-Changes	Number of Increases	Total for Year
1979	12	76	341	429
1980	23	186	479	688
1981	12	186	415	613
1982	39	252	264	555
1983	26	230	282	538
1984	11	217	285	513
1985	12	226	264	502
1986	13	202	267	482
1987	7	199	340	546
1988	15	186	360	561
1989	17	197	346	560
1990	22	252	323	597
1991	46	273	283	602
Total for category	255	2682	4249	7186

Table I—*continued*

Panel C: The Frequency of Dividend Changes by Month (n = 4504)

Month	Number of Dividend Changes	Percent of Dividend Changes
January	562	12.48%
February	593	13.17%
March	260	5.77%
April	498	11.06%
May	309	6.86%
June	181	4.02%
July	401	8.90%
August	308	6.84%
September	181	4.02%
October	473	10.50%
November	408	9.06%
December	330	7.33%
Total	4,504	100.00%

comparison more meaningful, we scale each dividend change by either the year $t - 1$ annual dividend, or by the beginning of year t price. (The latter results are reported in the robustness section.):

$$\Delta \mathrm{Div}_{i,0} = \frac{D_{i,0} - D_{i,-1}}{D_{i,-1}},$$

where $D_{i,0}$ is four times the last quarterly dividend in year 0 for firm "i" and $D_{i,-1}$ is four times the last quarterly dividend in year -1.

We note that an alternative measure of an annual dividend is the sum of all quarterly dividends in that year. However, this measure results in dividend changes when changes do not occur. We illustrate this point with the following example: A firm announces a dividend increase from \$1 to \$2 in July 1989. The sum of its quarterly dividend in 1988 is \$4, \$6 in 1989, and \$8 in 1990. Thus one true dividend change (between 1988 and 1989) results in two changes in the annual dividend: One between 1988 and 1989 and another between 1989 and 1990. Using the last quarter dividend (multiplied by four) avoids this problem.

Table I, Panel A, also reports the summary statistics on dividend yield and the two dividend-change measures. The median annual dividend payment is \$1.32, and the median annual yield is 4.5 percent.[4] The median percentage change is 11 percent for firms increasing dividends and -49 percent for those cutting dividends. Finally, Appendix Table A.1 provides the 27 control variables definitions and descriptive statistics.

[4] This result is similar to that of Michaely and Vila (1996), who use a sample of dividend-paying stocks that were not subject to the potential biases inherited in the COMPUSTAT data. Michaely and Vila report a mean quarterly dividend yield of 1 percent for a sample of over 150,000 ex-dividend days.

The number of dividend events and the number of decreases, increases, and no-changes in dividends are widely spread over the 13 years of the sample, as shown in Panel B. We have also computed, but do not show, the market capitalization distribution of the firm-year events in our sample. Since firms that pay dividends (and thus, firms that change dividends) tend to be larger than average, more than half our sample comes from the three highest market value deciles on CRSP.

We also tabulated the frequency of dividend changes by month in Panel C of Table I. This information is important for our investigation: Dividends declared at the beginning of the year can have different informational content about current earnings, relative to dividends declared at the end of the year. For example, a December increase in dividend might not have much informational content about current-year earnings (since three quarterly earnings announcements have already been made), unlike a beginning-of-the-year-announcement of dividend increase. January, February, and April show the highest number of dividend changes declarations, with 12.48 percent, 13.17 percent, and 11.06 percent, respectively, occurring in those months.

The timing of the variables we study in as follows: The changes in dividends are measured from year -1 to year 0. The earnings changes for year 0 (the year of the dividend change) are measured from year -1 to year 0; the earnings changes for year 1 from year 0 to year 1; and the earnings changes for year 2 from year 1 to year 2. To ensure that we measure the control variables only from data available to investors at the time the earnings changes are announced, we use data available prior to that event. In fact, many of these variables are based on financial information that is only released in the annual report. Thus we construct these variables by using data from years -2 and -1. For example, when the 1990 earnings are announced, the current ratio for 1990 is not yet available to the public. Therefore, we use the current ratio for 1989.

II. Empirical Results

We divide our empirical tests into two parts. In the first part we use a simple categorical analysis, and then report the regression analyses.

A. Categorical Analyses

As the first step of our investigation, we calculate the dividend changes for each firm-year in our sample. We then divide the sample into seven groups according to the dividend change: Firm-year events experiencing a dividend increase are divided into quintiles according to the magnitude of the dividend changes. Quintile 1 is the group with the lowest dividend increase, and quintile 5 is the group with the highest dividend increase. Because of the small number of observations, we group together all the dividend-decreasing firms. The last group contains all the no-change-in-dividends events.

We then calculate the unexpected earnings changes for the current calendar year (year 0) and the two subsequent years (years 1 and 2) for each firm-year. We estimate unexpected earning changes in four ways. First, we measure the annual change in earnings computed as a percentage of market value of equity:

$$UE_{i,t} = (E_{i,t} - E_{i,t-1})/MV_{i,0},$$

where $UE_{i,t}$ is the unexpected earnings of firm-year i in year t, $E_{i,t}$ is its earnings in year t, and $MV_{i,0}$ is the market value of equity on the first trading day of year zero.

Table II, Panel A reports the means (and t-statistics) and medians of the unexpected earnings across all firm-years. The t-statistics we calculate are based on the difference in the mean unexpected earnings between the group of stocks that did not change their dividends in year 0, and those groups of stocks that did change their dividends (five dividend-increasing groups and one dividend-decreasing group).

$$t = (\overline{UE}_1 - \overline{UE}_2)/\sqrt{s^2((1/n_1) - (1/n_2))},$$

where $\overline{UE}_1$ is the mean unexpected earnings for the dividend-changing firms as defined above, $\overline{UE}_2$ is the mean unexpected earnings for nondividend-changing firm, s^2 is the pooled (cross-sectional) variance, n_1 is the number of dividend-changing firms, and n_2 is the number of nondividend-changing firms.

We look first at the results for year 0. For the firms that chose not to change dividends that year, earnings are flat; the mean change is a decline of 0.84 percent (to a level of 8.1 percent). (Recall that we scale earnings by year 0 market value, so these numbers are essentially return on equity, in percent, using a stale price.) In comparison, firms that increase dividends do quite well in that year. The larger the increase in the dividend, the better they do. All the dividend-increasing firms have significantly larger increases in earnings than the no-change group. For the firms with the largest dividend increases, earnings in year 0 jump by 3.85 percent. Firms that cut dividends experience an even larger drop in earnings in year 0, down by −8.11 percent. It is clear from this first analysis that the relation between dividend changes and concurrent earnings is very strong.

To get a sense of the magnitude of the earnings changes shown in this table, consider the following examples. The median change in earnings for the dividend reducing firms is −5.44 percent (see Table II, Panel A), and the median level of earnings is 2.47 percent (see Table I, Panel A). Thus, the decline in earnings is more than twice the level of earnings. Likewise, the median change in earnings for the largest quintile of dividend increases is 2.15 percent (see Table II, Panel A), and the median level of earnings is 12.60 percent (see Table I, Panel A). Thus, earnings go up by 17 percent.

In comparison to these very dramatic changes in earnings in year 0, the picture for years 1 and 2 is quite different. None of the groups of increasing dividends firms shows significantly faster earnings growth than the no-change

Table II
Earnings Changes Following Dividend Changes

This table presents changes in earnings in the year of and the years following dividend changes. Each firm-year in the sample is categorized into either one of the dividend increasing quintiles, no change in dividends, or a dividend reduction. Dividend changes are defined as the difference between the last quarterly dividend per share for year −1 and the last quarterly dividend for year 0, deflated by the last quarterly dividend per share for year −1. In Panel A, Raw earnings changes are defined as the annual change in earnings before extraordinary items, deflated by the beginning of year 0 market value. In Panel B, we account for industry trends in earnings. Therefore, industry-adjusted earnings changes are defined as the difference between the deflated earnings changes for the dividend changing firms and the average (or median) deflated earnings change for the respective industry and year. The industry average (or median) is based on firms with the same two-digit Standard Industrial Classification (SIC) code and unchanged dividend. (Because several firms could not be matched with industry peers, the sample size in Panel B is smaller than the sample size in Panel A.) In Panels C and D we adjust earnings for prior earnings growth rates. In Panel C, earnings changes are defined as the annual change in earnings before extraordinary items minus the average drift from year −5 to year −1, deflated by the beginning of year 0 market value. In Panel D we also adjust for the one-year earnings drift. In this case earnings changes, controlling for the five-year and one-year drifts, defined as the difference between the deflated earnings changes for the dividend changing firms and the average (or median) deflated earnings change for a control group of nondividend-changing firms. The control group has the same quintile of deflated five-year earnings drift (year −5 to year −1) *and* the same quintile of deflated one-year earnings drift (year −2 to year −1). In addition, earnings for the dividend-changing firms and the control group are for the same year.

Dividend Change	(Mean Dividend Change)	Firm Yrs.	Year 0: Mean	Year 0: Median	Year 1: Mean	Year 1: Median	Year 2: Mean	Year 2: Median
Panel A: Raw Earnings Changes (n = 7186)								
Decreases	(−0.49)	255	−8.11##	−5.44##	6.10##	2.71##	0.64	1.60
No change	(0.00)	2682	−0.84	−0.38	−0.15	0.64	0.91	1.05
Increases: quintile 1	(0.04)	842	0.16##	0.46##	0.36	0.57	0.22	0.68#
Increases: quintile 2	(0.08)	857	0.80##	0.76##	−0.02	0.73	0.56	0.95
Increases: quintile 3	(0.11)	850	1.21##	1.23##	0.26	0.93	0.55	1.10
Increases: quintile 4	(0.17)	926	1.85##	1.43##	0.15	0.90	−0.27#	0.93##
Increases: quintile 5	(0.45)	774	3.85##	2.15##	−0.78	0.99	−0.52	0.70##
Panel B: Industry-Adjusted Earnings Changes (n = 6885)								
Decreases		240	−5.13**	−3.84**	5.04**	1.67**	0.20	0.16
No change		2682	0.00	0.00	0.00	0.00	0.00	0.00
Increases: quintile 1		796	0.08	0.28*	0.20	−0.45**	−0.48	−0.24*
Increases: quintile 2		786	0.94**	0.80**	0.52	−0.54**	−0.71	−0.52**
Increases: quintile 3		833	1.77**	1.39**	1.40**	0.27	−0.55	−0.43**
Increases: quintile 4		659	2.02**	1.66**	1.01**	0.33*	−0.62	−0.87**
Increases: quintile 5		889	3.38**	2.18**	−0.70	−0.07	−0.37	−0.33*
Panel C: Earnings Changes Minus the 5-Year Drift (n = 7186)								
Decreases		255	−7.06**	−5.10**	7.15**	3.22**	1.70	2.03**
No change		2682	−0.69*	−0.84**	0.00	0.37*	1.06**	0.75**
Increases: quintile 1		842	−0.44*	−0.11*	−0.24	0.04	−0.38	0.11
Increases: quintile 2		857	−0.10	−0.08	−0.92**	−0.08*	−0.34	0.17
Increases: quintile 3		850	0.16	0.26**	−0.78**	0.05*	−0.50	0.18
Increases: quintile 4		926	0.60**	0.34**	−1.10**	−0.07**	−1.52**	−0.06**
Increases: quintile 5		774	2.37**	0.80**	−2.25**	−0.15**	−1.99*	−0.43**
Panel D: Earnings Changes Controlling for the Five-Year and One-Year Drifts (n = 7186)								
Decreases		255	−8.01**	−5.42**	4.90**	1.58**	−0.80	1.77
No change		2682	0.00	0.00	0.00	0.00	0.00	0.00
Increases: quintile 1		842	1.65**	0.80**	0.67*	0.05	0.15	0.21*
Increases: quintile 2		857	2.94**	1.74**	0.36	0.25*	0.64*	0.26
Increases: quintile 3		850	3.13**	2.21**	0.82**	0.60**	−0.20	0.28
Increases: quintile 4		926	4.16**	2.64**	0.67*	0.58**	−0.17	−0.34*
Increases: quintile 5		774	6.73**	3.58**	−0.59	0.43*	−0.41	−0.01

*, ** Significantly different from 0 at the 0.10 and 0.01 levels using a two-tailed Student's t-test for the means and a two-tailed Wilcoxon test for the medians.

#, ## Significantly different from the no-change group at the 0.10 and 0.01 levels using a two-tailed Student's t-test for the means and a two-tailed Wilcoxon test for the medians.

group, nor does the largest increase group grow faster than the smallest increase group. In year 2 some of the observations are significantly different from the values for the no-change group, but the differences are in the wrong direction: The fourth and fifth quintiles have median earnings growth that is significantly lower than the earnings growth for the no-change firms. The firms that cut dividends have even more anomalous earnings in year 1: The mean and median earnings changes are significantly positive and much greater than those of the control firms.

These first results are based on the implicit assumption that earnings follow a random walk. One adjustment is to compare firms that change their dividend with no-dividend-change firms in the same industry. This adjustment means that we assume that the expected earnings of a firm in year t are the same as the earnings in year $t - 1$ plus the average change in earnings for the firms in the industry that did not change their dividend:

$$UE_{i,t} = \frac{E_{i,t} - E_{i,t-1}}{MV_{i,0}} - \frac{1}{J}\sum_{j=1}^{J}\frac{E_{j,t} - E_{j,t-1}}{MV_{j,0}},$$

where $j = 1, \ldots, J$ are all firms that did not change their dividend in year t and are in the same industry (two-digit Standard Industrial Classification (SIC) code) as firm i, $UE_{i,t}$ is the unexpected earnings of firm-year i in year t, $E_{i,t}$ is its earnings in year t, and $MV_{i,0}$ is the market value of equity on the first trading day of year 0.

Panel B, Table II, shows the results of this analysis. Once again we find that dividend changes are strongly correlated with concurrent unexpected earnings: The firms that cut dividends have large negative unexpected earnings in the year of the cut, and the firms that increase dividends have positive unexpected earnings. The unexpected earnings increase monotonically with the increase in dividend. Signaling theories predict that unexpected earnings in years 1 and 2 are positive for firms that increase their dividends and negative for those that cut their dividends. The results for years 1 and 2, however, do not support this prediction. Unexpected earnings are strongly positive in year 1 for the dividend decrease sample. For the dividend-increase quintiles, most of the entries are not significantly different from zero, and of the observations that are more than two standard errors from zero, most are of the wrong sign.

Another approach to modeling expected earnings is to assume a random walk with drift. We implement this model in two ways. The first way assumes that earnings in year 0 will be the same as in year -1 plus the average growth rate of earnings from years -5 to -1. Thus, unexpected earnings can be expressed as:

$$UE_{i,t} = \frac{(E_{i,t} - E_{i,t-1}) - (E_{i,-1} - E_{i,-5})/4}{MV_{i,0}},$$

where $UE_{i,t}$ is the unexpected earnings of firm-year i in year t, $E_{i,t}$ is its earnings in year t, and $MV_{i,0}$ is the market value of equity on the first trading day of year zero. We call these the five-year drift corrected unexpected earnings. The second method attempts to control both for the long-term (five-year) growth rate and the growth rate in the year before the dividend change, as well as for market-wide earnings trends. To do this, we first form two groups of firm-quintiles for each year based on the growth rate in earnings from years -5 to -1 and the growth rate in earnings from years -2 to -1. Then for each firm that changes dividends, we calculate expected earnings in year t as the earnings in year $t - 1$ plus the average change in earnings for firms that did not change dividends and are in the same quintile of firms for both five-year and one-year earnings growth rates:

$$UE_{i,t} = \frac{E_{i,t} - E_{i,t-1}}{MV_{i,0}} - \frac{1}{Q}\sum_{q=1}^{Q}\frac{E_{q,t} - E_{q,t-1}}{MV_{q,0}},$$

where $q = 1, \ldots, Q$ are all firms in the same quintile of one-year earnings growth rate and the same quintile of the five-year growth rate. (Note that the firms in the control sample did not change their dividend in year 0.) $UE_{i,t}$ is the unexpected earnings of firm-year i in year t, $E_{i,t}$ is its earnings in year t, and $MV_{i,0}$ is the market value of equity on the first trading day of year t. We call these the $5 - 1$ drift corrected unexpected earnings.

Results using these drift corrections appear in Panels C and D. The five-year drift correction makes the results even less friendly to the signaling theory. Most of the unexpected earnings in years 1 and 2 have the wrong sign, and many are significant. Using the $5 - 1$ drift correction produces results similar to those in Panels A and B. As above, the concurrent relation between dividend changes and earnings is as predicted by signaling theories, but not in years 1 and 2.

To summarize, the strongest result thus far is that firms that cut dividends have strongly positive unexpected earnings in year 1.[5] The dividend-increasing firms show no obvious pattern of unexpected earnings in years 1 and 2, and there is no hint of a positive relationship between the size of a dividend increase and future unexpected earnings.

B. The Timing of the Dividend Change

What we have seen so far is that dividend changes are strongly correlated with concurrent earnings changes. Could there be some information content in the dividend change for current year earnings? One way to address this question is to divide the sample by the quarter in which the dividend change announcement is made. Then, using the $5 - 1$ drift adjustment, we do the same

[5] It is important to note that while previous research (DeAngelo *et al.*, 1992) documents that firms with losses tend to recover, our findings (especially those presented in Panel D) indicate that firms with losses that also reduce dividends, show an even greater rate of earnings recovery.

calculations we did for Panel D of Table II. To get a better picture of the information time flow, we have added the year before the dividend announcement (year − 1) to the table.

The results of this analysis reinforce the view that dividend changes contain little information about future earnings. The data for concurrent (year 0) earnings (see Table III) show clearly that the later in the year the dividend is announced, the stronger the association between dividend changes and current earnings becomes. For example, the mean change in year 0 earnings for the highest quintile of dividend change firms is 3.8 percent if the dividend announcement occurs in the first quarter, 6.84 percent if the announcement happens in the second quarter, 7.87 percent if in the third quarter, and 8.52 percent if in the fourth quarter. The same pattern emerges for each of the dividend changes quintiles: the later in the year that the dividend change occurs, the greater the increase in income in the concurrent year. Thus, the positive association between dividend changes and year 0 earnings changes that we have previously documented is, to a large extent, produced by the dividend changes that occur after at least some of the earning information is already known. Much of the positive association between concurrent earnings and dividend changes is because earnings lead dividends, and not vice versa.

This assertion is also supported by the relation between dividend changes and earnings changes in year −1, i.e., the year before the dividends are announced. For all of the dividend-increasing groups, prior earnings changes are positive and significant, especially for those firms in the top three quintiles (those with the largest dividend increase). For the dividend-decreasing firms, the year −1 earnings are negative and significant. Moreover, the association of the dividend change with year −1 earnings is stronger for those firms that announce their dividends in the first part of the year. For example, for the dividend-decreasing firms, year 1 earnings are −8.27 percent, −7.02 percent, −3.28 percent, and −1.25 percent for dividend announcements occurring in the first, second, third, and fourth quarters, respectively. Again, it seems that to a large extent dividends are reacting to current and past earnings changes, rather than acting as predictors of future earnings.

C. Regression Analyses

The categorical analyses presented in Tables II and III are based on simple models of expected earnings. We now ask if our results would change if a more sophisticated approach to predicting earnings were utilized. Thus, we examine regression analyses using our smaller secondary sample of firms, from which we are able to obtain more complete accounting data. Our approach is to regress the change in earnings in year 0, 1, or 2 (scaled by price at the beginning of year 0, as usual) on a host of variables including past changes in dividends. This enables us to see whether dividend changes add explanatory power. The results appear in Table IV.

The regressions in Panel A use only past earnings information and changes in dividends. We capture past earnings information through nine dummy

Table III

The Relationship Between Current Earnings and the Timing of the Dividend Change

We examine the relation between current earnings changes and the timing of the dividend change. Each firm-year in the sample is categorized into either one of the dividend increasing quintiles, no change in dividends, or a dividend reduction. Dividend changes are defined as the difference between the last quarterly dividend per share for year −1 and the last quarterly dividend for year 0, deflated by the last quarterly dividend per share for year −1. The sample is then divided further by the quarter in which the dividend change occurred. Earnings changes are defined as the difference between the deflated earnings changes for the dividend-changing firms and the average (or median) deflated earnings change for a control group of nondividend-changing firms. The control group has the same quintile of deflated five-year earnings drift and the same quintile of deflated one-year earnings drift. In addition, earnings for the dividend changing firms and the control group are for the same year.

Dividend Change	Number of Firm-Years	Year −1		Year 0		Year 1		Year 2	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
Panel A: Earnings Changes for Dividend Changes Occurring During the 1st Quarter (n = 1415)									
Decreases	51	−8.27*	−6.39**	0.68	−0.37	3.68*	1.43*	−2.60	0.62
Increases: quintile 1	284	1.95**	0.72**	1.16*	1.06**	0.71	−0.11	−0.03	0.18
Increases: quintile 2	280	2.82**	1.21**	1.93**	1.26**	−0.09	0.20	0.41	0.22
Increases: quintile 3	264	3.13**	1.59**	2.93**	2.15**	0.87*	0.76**	0.83	0.48
Increases: quintile 4	321	3.89**	1.98**	3.57**	2.10**	1.16**	0.67**	−0.48	−0.58*
Increases: quintile 5	215	6.60**	2.95**	3.80**	2.17**	−0.82	−0.38	−0.54	−0.07
Panel B: Earnings Changes for Dividend Changes Occurring During the 2nd Quarter (n = 988)									
Decreases	49	−7.02**	−5.81**	−8.11**	−6.15**	7.82**	2.61**	−2.79	−0.40
Increases: quintile 1	182	1.81**	0.89**	1.98**	0.81**	0.56	0.10	0.52	0.52
Increases: quintile 2	189	2.86**	1.59**	3.14**	2.21**	0.82	0.29	0.19	−0.00
Increases: quintile 3	203	3.10**	1.60**	3.51**	2.44**	0.16	0.42	−0.68	0.06
Increases: quintile 4	212	3.87**	1.75**	4.17**	2.52**	−0.33	0.26	−0.68	−0.23
Increases: quintile 5	153	7.21**	3.51**	6.84**	3.36**	−0.82	−0.08	−0.77	0.12
Panel C: Earnings Changes for Dividend Changes Occurring During the 3rd Quarter (n = 890)									
Decreases	56	−3.28**	−1.92**	−11.6**	−6.39**	4.30	0.71	−4.65	2.47
Increases: quintile 1	156	1.15**	0.62**	1.42**	0.55**	0.52	−0.08	0.12	0.28
Increases: quintile 2	144	2.50**	1.21**	3.53**	1.73**	0.05	−0.02	1.78*	0.75
Increases: quintile 3	168	2.49**	1.53**	2.81**	1.83**	0.91	0.43	0.05	0.59
Increases: quintile 4	189	3.60**	2.11**	4.67**	3.36**	0.74	0.77*	−0.48	−0.12
Increases: quintile 5	177	5.37**	3.12**	7.87**	4.83**	−0.39	0.73	0.51	0.44
Panel D: Earnings Changes for Dividend Changes Occurring During the 4th Quarter (n = 1211)									
Decreases	99	−1.25	−0.56	−10.4**	−8.13**	4.43*	1.58*	3.28*	2.94**
Increases: quintile 1	220	1.38**	0.47**	2.17**	0.80**	0.81	0.22*	0.11	0.17
Increases: quintile 2	244	2.01**	1.09**	3.60**	1.77**	0.71	0.41*	0.57	0.18
Increases: quintile 3	215	2.88**	1.60**	3.26**	2.38**	1.30*	0.53*	−1.22	0.28
Increases: quintile 4	204	2.67**	1.88**	4.63**	3.09**	0.88	0.62**	1.13	−0.34
Increases: quintile 5	229	4.90**	3.00**	8.52**	4.54**	−0.37	1.29**	−0.76	−0.20

*, ** Significant at the 0.10 and 0.01 levels using a two-tailed Student's t-test for the means and a two-tailed Wilcoxon test for the medians.

Table IV

Do Dividend Changes Contain Information About Future Earnings Growth?

In the regression models, the dependent variable, $\Delta E_{i,t}/_{P_{i,-1}}$, is the annual change in earnings before extraordinary items, deflated by the market value at the end of year -1. Observations with an absolute studentized residual of 2 or more are excluded to minimize the effect of outliers. $\Delta \text{Div}_{i,0}$ is the difference between the last quarterly dividend per share for year -1 and the last quarterly dividend for year 0. This variable is deflated by $\text{Div}_{i,-1}$, which is the last quarterly dividend per share for year -1. $I_{i,0}\downarrow$ is a dummy variable that takes the value of 1 for dividend decreases and 0 otherwise. β is the OLS estimate of the coefficient. γ is a vector of coefficients on a vector of nine Dummy variables. The values of the dummy variables correspond to the decile of the earnings drift from year -5 to year -1 deflated by the market value of the firm. The fifth dummy variable, for example, is set to 1 when the decile of the earnings drift is 5 and 0 otherwise. δ is a vector of coefficients on a vector of accounting descriptors X. Variables whose significance level is less than 0.10 are excluded using a stepwise estimation. The dividend change variables and the drift dummies, however, are included regardless of their significance.

Year (N)	β_1 (t)	β_2 (t)	Adj-R^2 (p-value)	Increase in R^2 Due to Div[(a)] (p-value)
Panel A: Coefficient Estimates for the Univariate Regression Model $\frac{\Delta E_{i,t}}{P_{i,-1}} = \alpha + \beta_1 * \frac{\Delta \text{Div}_{i,0}}{\text{Div}_{i,-1}} + \beta_2 * I_{i,0}\downarrow * \frac{\Delta \text{Div}_{i,0}}{\text{Div}_{i,-1}} + \gamma * \text{Dummy}_{i,0} + \varepsilon_{i,t}$				
Zero ($n = 7081$)	0.0764	0.0740	0.1867	0.1004
	(19.7150)	(8.6330)	(0.0001)	(0.0001)
One ($n = 7043$)	0.0055	−0.0805	0.0153	0.0101
	(1.6640)	(−8.4290)	(0.0001)	(0.0001)
Two ($n = 7023$)	−0.0037	−0.0158	0.0038	0.0005
	(−1.0480)	(−1.4710)	(0.0001)	(0.0719)
Panel B: Coefficient Estimates for the Multivariate Regression Model $\frac{\Delta E_{i,t}}{P_{i,-1}} = \alpha + \beta_1 * \frac{\Delta \text{Div}_{i,0}}{\text{Div}_{i,-1}} + \beta_2 * I_{i,0}\downarrow * \frac{\Delta \text{Div}_{i,0}}{\text{Div}_{i,-1}} + \gamma * \text{Dummy}_{i,0} + \delta * X_{i,-1} + \varepsilon_{i,t}$				
Zero ($n = 4864$)	0.0761	0.0498	0.2747	0.0847
	(17.4930)	(5.1439)	(0.0001)	(0.0001)
One ($n = 4804$)	0.0070	−0.0808	0.0368	0.0122
	(2.1656)	(−7.7865)	(0.0001)	(0.0001)
Two ($n = 4776$)	0.0009	−0.0143	0.0155	0.0002
	(0.2828)	(−1.2649)	(0.0001)	(0.4407)

[(a)] The increase in R^2 due to the dividend variables is obtain by calculating the adjusted R^2 with the dividend variables included minus the R^2 without the dividend variables.

variables that correspond to the decile of the earnings drift from years -5 to -1. For example, the fifth dummy variable is set to one when the decile of the earnings drift is five, and zero otherwise. These variables enable us to control for the information contained in the past earning pattern. To this we add a variable measuring the percentage change in dividend in year 0 plus a slope dummy equal to one if the firm cuts the dividend in year 0. Thus we can test whether increases in dividends have explanatory power that is different from decreases.

The first regression—year 0—shows the now-familiar positive relation between concurrent dividends and earnings changes. Both dividend increases and decreases help explain (or are explained by) concurrent earnings changes; adding these variables to the past earnings growth dummies increases the R^2 from 0.09 to 0.19. In contrast, dividend changes in year 0 are little help in explaining earnings changes in years 1 and 2, and the only significant relation (between dividend change in year 0 and earnings change in year 1) has the wrong sign.

In Panel B we add the 27 control variables that Ou and Penman (1989) found helpful in predicting earnings changes (see Appendix A for details). To these we add the same dividend change variables used in Panel A. The results indicate that dividend reductions are very helpful in predicting future changes in earnings, but again the sign is the opposite of what the theory implies. For the dividend-increasing firms, we find that the dividend coefficient is positive for year zero (0.076) and highly significant. For year 1, the dividend coefficient is positive and significant for both the dividend-decreasing and the dividend-increasing groups, although the point estimate on the dividend increase variable is smaller by an order of magnitude than the dividend-decreasing variable. Nevertheless, it is important to note that this is the first (and only) instance that we find evidence that does not contradict the signaling theories prediction of positive association between dividend changes and subsequent earnings changes.

D. Initiations and Omissions

Our analysis so far has not covered firms that begin paying a dividend for the first time (initiations) or that cut the dividend payment to zero (omissions). These actions are the most extreme versions of dividend increases and decreases and so are of some interest. Healy and Palepu (1988) investigate these actions using a sample of 131 dividend-initiating firms and 172 dividend-omitting firms. For the dividend-omitting firms, Healy and Palepu report a significant drop in earnings in year 0 and an increase in earnings in the years following the omission. This pattern is similar to what we find for dividend decreases. However, Healy and Palepu's results for dividend-initiating firms differ from the results we obtain for increases. While we find little evidence of earnings growth in the years following a dividend increase, they report a substantial increase in earnings for the initiating firms in the two years after the initiation.

To investigate this discrepancy, we have extended the categorical analysis shown in Panel A, Table II, for a the sample of initiations and omissions used by Michaely, Thaler, and Womack, (1995). Our results (not shown) replicate those of Healy and Palepu. Firms that omit dividends show strong earnings reversals in years 1 and 2 (similar to those that cut dividends), but firms that initiate dividends also show strong earnings growth in years 1 and 2, consistent with signaling. We cannot explain why dividend initiations should be so different from dividend increases, nor can we think of a reason why a signaling model would make this prediction. Perhaps a firm can only send the dividend signal once.

III. Do Changes in Dividends Signal Something about the Present?

We have found little evidence to support the view that changes in dividends portend changes in earnings. However, there is another sense in which changes in dividends could have information content. Suppose that, as suggested by Lintner (1956), firms increase dividends only when management believes that earnings have increased permanently (see also Fama and Babiak (1968) for support of this view). Then changes in dividends do tell us something: earnings are unlikely to fall. We investigate this possibility two ways.

Our first method uses the same approach as Panel A of Table II, where earnings are assumed to follow a random walk. However, here we are concerned about controlling for the *earnings changes in year 0*; the year the dividend was changed. We therefore compare firms that have changed their dividend to other firms that left their dividend unchanged but experienced the same rate of growth of earnings in year 0. To this end we form a control group for each of our dividend increase quintiles (and one for the dividend-decreasing firms). We choose as control firms those that did not change their dividends but experienced a year 0 earnings change that is ± 2 percentage points from the mean of the respective dividend change group. For example, the mean year 0 earnings change for the quintile of firms that announced the smallest dividend change was 0.16 percent, so we form a portfolio of all the firms that did not change dividends in year 0 but experienced a change in earnings between -1.84 to $+2.16$ percent. A separate control group is formed for each dividend increase quintile; the composition of these control groups is partially overlapping. The results of this analysis are shown in Panel A of Table V.

Inspection of the results for year 1 reveals that we have some support for the Lintner view. While firms that have increased dividends do not experience earnings growth in year 1, the comparison firms that had similar earnings increases in year 0 and no change in dividends experience earnings reductions. On average, in all of the five quintiles of dividend change groups, firms have better earnings in year 1 than the comparison no-change-in-dividend firms. The difference is significant in all but the fifth quintile (largest increase). In the second year after the dividend increase, there is no difference in earnings changes between those firms that increase their dividends and those that did not.

Our second approach uses the 5-1 drift correction used in Panel D of Table II. Using this method, we simply ask whether firms that have increased dividends are less likely to experience a fall in earnings relative to other firms with similar past earnings growth. For each group of firms (decreases, no changes, and five levels of increases) we compute the percentage that had negative unexpected earnings. The results are shown in Panel B of Table V.

Table V

Changes in Dividends as Indicators of Earnings' Stability

In Panel A, we compare sets of firms that experienced similar earning change in year 0. The first group of firms did not change their dividends in year 0 and the second group of firms did experience a dividend change (7186 observations). The first group (no change in dividends) was selected as those firms with year 0 raw earnings changes within two percentage point of the mean for the respective dividend change group. Dividend changes are defined as the difference between the last quarterly dividend per share for year −1 and the last quarterly dividend for year 0, deflated by the last quarterly dividend per share for year −1. In Panel A, earnings changes are defined as the annual change in earnings before extraordinary items, deflated by the beginning of year-0 market value. Panel B reports the probability of an earnings decrease for firms decreasing or increasing dividends in the year of, and in the years following, the dividend change. Earnings changes are categorized as increases or decreases based on the difference between the raw earnings changes for the dividend-changing firms and the average change for a control group of nondividend-changing firms. The control group has the same quintile of deflated five- and one-year earnings drift. (See Table II for more details).

Panel A: Raw Earnings Changes

Dividend Change	(Mean Dividend Change)	Firm (Yrs.)	Year 0 Mean	Year 0 Median	Year 1 Mean	Year 1 Median	Year 2 Mean	Year 2 Median
Decreases: all	(−0.49)	255	−8.11	−5.44	6.10**	2.71**	0.64	1.60
Nochange: losses	(0.00)	234	−7.91	−7.73	0.51	2.22	1.20	1.37
Nochange: gains Q1	(0.00)	943	0.19	0.20	−1.78	0.18	0.77	0.72
Nochange: gains Q2	(0.00)	917	0.66	0.57	−1.64	0.31	0.59	0.71
Nochange: gains Q3	(0.00)	870	0.97	0.89	−2.04	0.32	1.15	0.73
Nochange: gains Q4	(0.00)	775	1.47	1.33	−2.21	0.36	0.93	0.67
Nochange: gains Q5	(0.00)	441	3.47	3.23	−1.49	0.74	0.46	0.56
Nochange: all	(0.00)	2682	−0.84	−0.38	−0.15	0.64	0.91	1.05
Increases: quintile 1	(0.04)	842	0.16	0.46	0.36**	0.57**	0.22	0.68
Increases: quintile 2	(0.08)	857	0.80	0.76	−0.02**	0.73**	0.56	0.95
Increases: quintile 3	(0.11)	850	1.21	1.23	0.26**	0.93**	0.55	1.10*
Increases: quintile 4	(0.17)	926	1.85	1.43	0.15**	0.90**	−0.27*	0.93
Increases: quintile 5	(0.45)	774	3.85	2.15	−0.78	0.99	−0.52	0.70

Panel B: The Probability of an Earnings Decrease

Dividend change	Number of Firm-years	Probability for Earnings Decrease Year 0	Year 1	Year 2
Decreases	255	67.45**	39.61*	47.06
No change	2682	46.46	47.73	48.73
Increases: quintile 1	842	27.79**	46.79	47.03
Increases: quintile 2	857	21.82**	42.12**	47.14
Increases: quintile 3	850	20.00**	40.00**	47.65
Increases: quintile 4	926	13.61**	39.52**	49.78
Increases: quintile 5	774	13.31**	44.96	50.65

*, ** Significantly different from the respective no-change group at the 0.10 and 0.01 levels using a 2-tailed t-test for the means and a Wilcoxon test for the medians.

Again we obtain results that offer some support to the Lintner view. Firms that increase their dividend in year 0 are somewhat less likely to experience negative unexpected earnings (as defined by the 5-1 expected earnings model) than the no-change firms. While 47.73 percent of the no-change firms have negative unexpected earnings, all five of the dividend increasing quintiles had lower rates of earnings drops, significantly so for the middle three quintiles.

This pair of analyses suggests one way in which increases in dividends can be said to have information content. Firms that increase dividends are signaling that the increase in earnings they have experienced in the past year and current year are somewhat more likely to be permanent than the earnings increases of firms that have not increased dividends.

IV. Robustness

There are several possible questions about the results presented so far. First, could a significant part of our results be explained by the fact that dividend-increasing firms have less earnings to plow back? Second, how sensitive are the results to different definitions of dividend changes? It is possible that managers (and the market) judge dividend changes relative to price rather than to the level of past dividends? Third, do our selection criteria bias the results? For example, one of the criteria for an event to be included in the sample is that the CRSP tape reports four quarterly dividend announcements in each year. Does this criterion bias the sample and affect our result? How does the requirement of five years of earnings data affect our results?

A. Accounting for the Potential Return on the Reinvested Dividends

When a firm increases (or decreases) its dividend, subsequent earnings are affected directly in that the firm has less (more) money to invest. This mechanical effect could explain our results. However, some "back-of-the-envelope" calculations reveal that this is implausible: the return on the change in the dividend cannot amount to much. Still, for the sake of completeness, we recalculated the numbers in Table II, Panel D, with an adjustment that adds back the money that the firms would have earned on the extra dividend had it retained it. (We assume a marginal rate of return on investment of 12 percent.) As expected, the numbers do not change substantively, and thus are not reported in detail. For example, the mean unexpected earnings for quintile 5, year 1, are -0.59 percent in Table II, Panel D. When we adjust for forgone earnings on the dividend payout, the unexpected earnings figure is now -0.42 percent.

B. The Change-in-Dividend Definition

So far, we have analyzed the relation between dividends and earnings changes under the assumption that the appropriate measure of the magnitude of the dividend change is relative to past dividends (i.e., we deflated the change by prior-year dividends). Perhaps another measure would be better. Of course, no matter how we normalize the change in dividend the three basic categories (increases, decreases, and no-change) will remain the same. However, the question of whether larger changes in dividends send a stronger signal might depend on how the signal is measured. To answer this question, we first normalize the change in the dividend by share price rather than by prior dividend. This has no appreciable effect on the results.

Second, we try categorizing the dividend increases by the market reaction, rather than by the size of the dividend change. The idea behind this is that the market reaction should be a good proxy for the unexpected change in the dividend and thus might be a better signal of future earnings changes. We first compute two-day excess returns around each announcement of a quarterly dividend change (on the day the announcement is recorded by CRSP, and the day before). Then we calculate excess return as the raw return minus the return on the value-weighted index. Unexpected earnings are computed using same 5-1 drift adjustment as in Table II, Panel D. These results are shown in Table VI.

The evidence for signaling is not much different. As before, there is a strong relation between year 0 earnings and dividend changes, but the predictive power of these changes is weak. Once again dividend decreases reliably predict an increase in earnings in year 1. For dividend increases, we find significant positive mean earnings surprises only for the first and third quintiles (and fifth for medians). No significant earnings surprises are observed in year 2.

C. Selection Biases

The questions we address here are whether our sample selection procedures causes us to ignore a significant number of dividend changes, or whether survivorship biases could affect our results.

The first issue is the restriction that both the event year and the year before the event must contain exactly four quarterly dividend announcements. It can happen, especially in the case of dividends reductions, that the dividend announcement is delayed (see Kalay and Loewenstein, 1986). If this announcement happens to occur at the end of the year, it can result in only three dividends being announced in that year, and either four or five announcements in the following year. We therefore repeat the discrete categorical analysis reported in Table II, but we change the criteria for inclusion from four dividend announcements in year t and four in year $t - 1$, to either eight or nine in the two years combined. This change increases the total sample size by 201 firm years (a 2.8 percent increase) but did not materially affect any of the results (and so they are not reported).

The second issue of the robustness tests is the effect of the restriction that only firm-year events with earnings data available on COMPUSTAT for years -5, -2, -1, 0, 1, and 2 enter the sample. We examine if the delisting of firms in years 1 and 2 contributes to our results. First, we consider the firms that decrease dividends, since these are more likely to cease trading. Though it is not possible to know what happens to firms that disappear, we perform two

Table VI

Earnings Changes Following Dividend Changes: Using Returns to Classify the Magnitude of Dividend Increases (n = 7182)

This table presents changes in earnings during and after dividend changes. Each firm-year in the sample is categorized into either one of the dividend-increasing quintiles, no change in dividends, or a dividend reduction. Dividend changes are the difference between the last quarterly dividend per share for year −1 and the last quarterly dividend for year 0. This variable is deflated by the last quarterly dividend per share for year −1. Dividend increases are categorized into five quintiles based on the *two day market-adjusted stock return* around the dividend announcement (days −1 and 0). Adjusted return is the two-day market adjusted return for firm i surrounding the dividend change announcement. The event window is day −1 and day 0, and the market return is based on the value-weighted New York Stock Exchange/American Stock Exchange (NYSE/AMEX) index. (The sample size is slightly smaller than our main sample because four observations are missing two-day returns around the dividend announcement.) Earnings changes are defined as the difference between the deflated earnings changes for the dividend-changing firms and the average deflated earnings change for a control group of nondividend-changing firms. The control group has the same quintile of deflated five-year earnings drift (year −5 to year −1) and the same quintile of deflated one-year earnings drift (year −2 to year −1). In addition, earnings for the dividend-changing firms and the control group are for the same year. The market value at the end of year minus one is used as a deflator.

		Year 0		Year 1		Year 2	
Dividend Change[(b)]	Firm Years	Mean[(c)]	Median	Mean	Median	Mean	Median
Dividend decreases	255	−8.01**	−5.42**	4.90**	1.58**	−0.80	1.77
No change	2682	0.00	0.00	0.00	0.00	0.00	0.00
Dividend increases:							
quintile 1 of market adj. ret.	845	3.73**	2.15**	0.69*	0.48**	−0.25	−0.11*
quintile 2 of market adj. ret.	850	3.48**	2.01**	0.18	0.15	0.66*	0.31*
quintile 3 of market adj. ret.	850	3.00**	1.92**	0.90**	0.33**	−0.05	0.25
quintile 4 of market adj. ret.	850	3.57**	2.03**	0.36	0.33*	−0.49	0.13
quintile 5 of market adj. ret.	850	4.61**	2.63**	−0.10	0.58**	0.13	0.11

*, ** Significant at the 0.10 and 0.01 levels using a two-tailed Student's t-test for the means and a two-tailed Wilcoxon test for the medians.

checks. To see whether the results for year 0 are influenced by the firms that drop out thereafter, we redo the analysis for year 0 without the requirement that earnings are known for years 1 and 2. The results are not very different. Mean unexpected earnings in year 0 are −7.77 percent (instead of −8.11 percent) and the median is −4.51 percent (instead of −5.44 percent). Next we investigate how many firms drop out of the sample in years 1 and 2. There were only 12 observations with earnings available in year 0 but not in year 1 (3.48 percent of the sample), and another 17 firm-year observations with earnings available in year 1 but not in year 2 (4.9 percent of the sample). Given the relatively small portion of the sample with missing future earnings, survivorship bias seems unlikely to cause the significant increase in future earnings to become negative.

The potential survivorship bias is not as problematic for the dividend-increasing sample. If firms drop out because of bankruptcies, then those lost observations are for firms that would have reported even lower earnings, making the case for signaling worse. On the other hand, if firms disappear because of mergers, then our results could be biased the other way. For example, a successful firm increases its dividends and its earnings are about to increase, but the firm is acquired by another firm before we have the chance to observe the earnings increase. In an attempt to examine the severity of this problem, we check to see how many of the firms in our sample were delisted (and why). We find that liquidations are very rare. While most of the delistings are due to mergers, there do not seem to be enough to substantially affect our results. Of the firms that do not change dividends in year 0, 3.46 percent disappear due to merger in year 1. Just 2.49 percent of the firms that increase dividends in year 0 are lost for the same reason. Even in the quintile of firms with the largest dividend increases, only 3.10 percent merge in year 1. The results for year 2 are similar.

D. Earnings in Years 3 and 4

Finally, we examine the sensitivity of our results to the length of the horizon. Perhaps the signal is about earnings more than two years out. This is a relevant concern, especially in light of the findings of Yoon and Starks (1995), and DeAngelo *et al.* (1996). Both articles present evidence that on average, when firms increase dividends they also significantly increase their capital expenditures. It could be that the increase in capital expenditures is the reason why we do not find an increase in earnings in the years subsequent to the dividend increase. The increase in capital expenditure has two possible effects on earnings. The first is that by putting resources into capital expenditure, a firm could have less revenue in the short run. The second is that the firm has higher depreciation, which in turn reduces the reported earnings (but not the cash flow).

We therefore extend our investigation two more years. The earnings pattern in years 3 and 4 continues in the same direction as the previous two years (and so is not reported in detail): Those firms that decrease dividends experience an earnings increase. Those firms that increase their dividend do not show significant numbers of positive earnings surprises, and sometimes even have a significant number of negative earnings surprises. Thus, the increase in capital expenditure does not seem to be the reason for the lack of earnings growth in the years after dividend increases.

V. Returns Following Dividend Changes

It is well established that the market reacts favorably to announcements of dividend initiations and increases and negatively to announcements of decreases and omissions (see, for example, Charest (1978), Aharony and Swary (1980), Ofer and Siegel (1987), among many others). Yet we have seen that with the exception of initiations, there seems to be little information about future earnings in these dividend-change announcements. This raises the obvious question of whether the initial reactions are reversed over time. In the case of initiations and omissions we know the answer. Michaely *et al.* (1995) report that the initial 3.4 percent (three-day) positive reaction to initiations and −7.0 percent negative reactions to omissions is followed by additional long-term excess returns in the same direction. Over the next three years, firms that initiate dividends have market-adjusted excess returns of 15.6 percent, while those that omit a dividend underperform the market by 15.3 percent. We investigate whether the same pattern holds for increases and decreases.

Of course, increases and decreases are much less dramatic events than initiations and omissions, and the immediate price reactions are also smaller. The average three-day excess returns for the decreases in our sample are −2.53 percent while the excess returns for the increases are 0.81 percent (but 1.32 percent for the quintile of firms announcing the largest dividend increases). Since these initial reactions are smaller than the reactions to the initiations and omissions, one might expect the subsequent drift to also be less pronounced. To evaluate the long-run performance of the firms in our increases and decreases samples before and after the change announcements, we calculate the returns from a buy-and-hold strategy.[6] We compare those returns to the buy and hold returns for firms of the same size decile. More precisely, for each stock we define the excess return as the geometrically compounded (buy-and-hold) return on the stock minus the geometrically compounded return on the appropriate CRSP market-capitalization decile,

$$ER_{j(\text{a to b})} = \prod_{t=a}^{b}(1 + R_{jt}) - \prod_{t=a}^{b}(1 + MR_{jt}), \tag{1}$$

where

$ER_{j(\text{a to b})}$ = Excess return for firm j from time period a to b. For the 36-month period, for example, a is the first month after the dividend announcement has occurred and b is the 36th month.

R_{jt} = raw return for observation firm j on month t.

MR_{jt} = return on the market capitalization decile on month t.

The average excess returns for each period are then:

$$\overline{ER} = \frac{1}{N}\sum_{j=1}^{N} ER_j. \tag{2}$$

For the sake of comparison, we also calculate returns for the twelve months up to and including the month of the event. For this calculation, we form

[6] As a reliability check, we also computed size adjusted cumulative abnormal returns (CARs). The results are virtually identical to the buy and hold returns reported here. All excess returns that we report as statistically significant are also significant using CARs.

Table VII

Buy and Hold Returns for Corporations Changing Their Cash Dividends

Buy-and-hold returns are calculated from (i) the one year before to three years after the dividend-change event, and (ii) from the day before to the day after the event. The returns for year -1 and years one through three are calculated separately so that at the beginning of year 1, exactly one dollar is invested in both the security and the benchmark portfolio. The long-term returns compare the security return to the return on firms in the appropriate market capitalization decile (based on the Center for Research in Security Prices (CRSP) New York Stock Exchange/American Stock Exchange (NYSE/AMEX) size-decile returns), and the event returns uses the value weighted market index as the benchmark. Specifically,

$$ER_{j(\mathrm{a\ to\ b})} = \prod_{t=a}^{b}(1 + R_{jt}) - \prod_{t=a}^{b}(1 + MR_t)$$

where $ER_{j(\mathrm{a\ to\ b})}$ = Excess Return for firm j from a month a to month b (daily data for the event return), R_{jt} = raw return for firm j for month t, and MR_t = return on the benchmark portfolio for month t.

Months Relative to Calendar Month End Date of Change	Dividend Decreased ALL (n = 255)	Dividend Increases: Quintile 1 (n = 842)	Dividend Increases: Quintile 2 (n = 857)	Dividend Increases: Quintile 3 (n = 850)	Dividend Increases: Quintile 4 (n = 926)	Dividend Increases: Quintile 5 (n = 774)	Dividend Increases: ALL (n = 4,249)
Panel A: Long-Term Size-Adjusted Returns							
−12	−0.2810**	−0.0218**	0.0334**	0.0660**	0.1276**	0.2349**	0.0863**
−6	−0.1916**	−0.0018	0.0239**	0.0398**	0.0741**	0.1229**	0.0510**
0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
6	0.0216	−0.0065	−0.0015	0.0103*	0.0206**	0.0299**	0.0104**
12	0.0462*	0.0040	0.0033	0.0287**	0.0374**	0.0315*	0.0211**
18	0.0526	0.0146	0.0024	0.0344**	0.0400**	0.0398*	0.0262**
24	0.0156	0.0437**	0.0179	0.0723**	0.0556**	0.0382	0.0458**
30	0.0254	0.0548**	0.0342*	0.0883**	0.0717**	0.0494	0.0600**
36	0.0144	0.0693**	0.0543**	0.1182**	0.1036**	0.0506	0.0801**
Panel B: Three-Day Market-Adjusted Returns Around the Event							
Days −1, 0, and 1	−0.0253**	0.0032**	0.0078**	0.0088**	0.0077**	0.0132**	0.0081**

*, ** Significantly different from 0 at the 0.10 and 0.01 levels using a two-tailed Student's t-test.

equally-weighted portfolios at the beginning of the month twelve months before the event. This number provides an indication of how much money an investor would have made or lost in these stocks in the year before the event. The portfolios are rebalanced at the beginning of the month following the event.

The results are reported in Table VII. Firms that cut their dividend have experienced the significant negative excess returns that one would expect. In the twelve months up to the event, these firms have lost 28.1 percent relative to their size-matched portfolios. However, in the three years following the cut in dividends, there are no significant excess returns. After 36 months, the cumulative excess return of the decreases portfolio is just 1.1 percent. This is in sharp contrast to the −15.3 percent excess returns in the three years following dividend omissions.

Again, as would be expected, firms that increase dividends have been doing well in the year before the event. As a group, all the increasing firms had an average of an 8.6 percent excess return in the year before the dividend change. Furthermore, the prior year excess return increases monotonically with the size of the dividend change: indeed, the quintile of firms that announce the smallest dividend increases actually have negative excess returns of 2.2 percent in the year before the event, while the quintile of firms announcing the largest changes had positive excess returns of 23.5 percent.

In the three years following dividend increases, we observe some drift in excess returns. For the entire group of dividend-increasing firms, the three-year excess return is a significant 8.0 percent. Four of the five quintiles of firms also experience small but significant positive excess returns, but the quintile announcing the largest dividend increases earns only 5.1 percent above the market over the three years, which is not significantly greater than zero.

The drift we have found here is in the same direction, but smaller in magnitude, as the post-repurchase announcement drift (Ikenberry *et al.* (1995)). This is consistent with the hypothesis that firms that are more undervalued choose to convey this information through repurchases rather than dividend increase (Ofer and Thakor, 1987). In both cases, however, the evidence indicates that the market underreacts to the information contained in those corporate actions.

In summary, we do not observe a significant drift following dividend decreases, but following dividend increases we observe a small but significant positive drift.

VI. Discussion and Conclusions

We know that most firms pay dividends, even though doing so is costly in various ways. And we know that the market reaction to dividend changes implies that dividends are good, and more is better. It is not surprising, then, that many theories assume or imply that dividends provide information to the market.

We have undertaken a systematic attempt to discover whether the information content of a dividend announcement has something to do with future earnings. Consistent with the early findings of Watts (1973), we are unable to find any evidence to support the view that changes in dividends have information content about future earnings changes. While there is a strong past and concurrent link between earnings and dividend changes, the predictive value of changes in dividends seems minimal. Indeed, the only strong predictive power we can find is that dividend cuts reliably signal an *increase* in

Table A.1

Descriptive Statistics on the Distributions of the Control Variables (n = 4996)

For each variable, P1 is the 1st percentile of the distribution (i.e., 1% of the observations have a lower value), P10 is the tenth percentile, Q1 is the first quartile, Q3 is the third quartile, P90 is the 90th percentile, and P99 is the 99th percentile. The relative change in a variable is defined as the annual change in the variable relative to the value at the previous year.

Variable	P1	P10	Q1	Med.	Q3	P90	P99
Relative Δ in current ratio	−0.47	−0.23	−0.12	−0.02	0.08	0.21	0.81
Relative Δ in quick ratio	−0.55	−0.28	−0.15	−0.02	0.12	0.30	1.08
Relative Δ in inventory turnover	−0.39	−0.16	−0.06	0.01	0.09	0.19	0.67
Inventory/total assets	0.01	0.02	0.05	0.15	0.25	0.34	0.51
Relative Δ in (inventory/total assets)	−0.47	−0.19	−0.10	−0.02	0.07	0.18	0.76
Relative Δ in inventory	−0.48	−0.15	−0.04	0.07	0.19	0.37	1.36
Relative Δ in sales	−0.32	−0.07	0.01	0.09	0.17	0.27	0.71
Relative Δ in depreciation	−0.29	−0.04	0.04	0.10	0.19	0.31	0.91
Relative Δ in (depreciation/plant assets)	−0.38	−0.13	−0.05	0.02	0.08	0.18	0.69
Return on opening equity	−0.17	0.05	0.10	0.15	0.19	0.25	0.47
Δ in Return on opening equity	−0.30	−0.09	−0.04	−0.00	0.02	0.07	0.29
Relative Δ in (capital expenditures/total assets)	−0.75	−0.41	−0.21	0.00	0.26	0.62	2.71
One-year lag of relative Δ in (capital expenditures/total assets)	−0.76	−0.42	−0.21	0.01	0.28	0.66	2.87
Debt-equity ratio	0.26	0.55	0.82	1.26	1.92	2.53	6.52
Relative Δ in debt-equity ratio	−0.46	−0.18	−0.08	−0.00	0.10	0.29	1.47
Relative Δ in (sales/total assets)	−0.38	−0.14	−0.07	−0.00	0.06	0.13	0.44
Return on total assets	−0.06	0.02	0.04	0.06	0.08	0.11	0.18
Return on closing equity	−0.20	0.05	0.10	0.14	0.17	0.21	0.36
Gross margin ratio	0.05	0.16	0.22	0.29	0.38	0.48	0.73
Relative Δ in (pretax income/sales)	−5.24	−0.65	−0.22	−0.03	0.12	0.46	4.44
Sales to total cash	2.85	4.55	5.69	7.09	9.25	12.65	102.34
Relative Δ in total assets	−0.21	−0.03	0.02	0.08	0.15	0.26	0.87
Cashflow to debt	−0.02	0.09	0.13	0.19	0.28	0.42	0.81
Working capital/total assets	−0.09	−0.01	0.05	0.17	0.32	0.43	0.63
Operating income/total assets	0.01	0.09	0.12	0.15	0.20	0.25	0.36
Repayment of LT debt/total LT debt	0.00	0.03	0.06	0.13	0.27	0.55	2.95

future earnings. We also find some evidence that dividend-increasing firms are less likely to have subsequent earnings decreases than firms that do not change their dividend despite similar earnings growth. In this sense, changes in dividends do signal something about the present: the current increase in earnings is permanent.

The conclusion we draw from this analysis is that Lintner's model of dividends remains the best description of the dividend setting process available. Changes in dividends mostly tell us something about what *has* happened. Earnings have gone up quickly in year −1 and 0, and dividends are adjusted to reflect that. If there is any information content in this announcement, it is that the concurrent change in earnings is permanent rather than transitory.

Appendix A

Operational Definitions for the Control Variables

The article's primary objective is to determine whether dividend changes convey any additional information about subsequent earning changes. The task becomes complicated because firms are different not only in the changes in their dividend policy, but in many other aspects as well. In order to isolate the relation between dividends and earnings, we try to control for many of those aspects. We do it by introducing several control variables.

We use the COMPUSTAT files to construct data for these variables. It is useful to note that all variables are measured one year prior to the measurement of the dependent variable (i.e., earnings) because at the time of the year t earnings announcement, the year t values for the control variables are not yet publicly available. For example, when the 1990 earnings are announced, the current ratio for 1990 is not yet available. Therefore, we use the "current" ratio for 1989. Descriptive statistics on these variables are presented in Table A.1.

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