The Information Content of Dividend Changes: Cash Flow Signaling, Overinvestment, and Dividend Clienteles

Author(s): David J. Denis, Diane K. Denis, Atulya Sarin


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The Information Content of Dividend Changes: Cash Flow Signaling, Overinvestment, and Dividend Clienteles

David J. Denis, Diane K. Denis, and Atulya Sarin*

Abstract

We examine the cash flow signaling, overinvestment, and dividend clientele explanations for the information content of dividend change announcements. After simultaneously controlling for the standardized dividend change, dividend yield, and Tobin’s Q, we find that announcement period excess returns are positively related to the magnitude of the standardized dividend change and to the dividend yield, but unrelated to Tobin’s Q. We provide further evidence on the cash flow signaling and overinvestment hypotheses by examining revisions in analysts’ earnings forecasts and changes in capital expenditures following dividend change announcements. We find that analysts significantly revise their earnings forecasts following dividend changes and that Q < 1 firms actually increase their capital expenditures following dividend increases and decrease them following dividend decreases. Overall, our findings support the cash flow signaling and dividend clientele hypotheses for stock price reactions to dividend change announcements, but provide little support for the overinvestment hypothesis.

I. Introduction

It is well documented that there is a positive association between dividend change announcements and stock price changes. Three potential explanations for this phenomenon have received attention in the recent literature.

First, numerous dividend signaling models predict that dividend changes convey information about cash flows; i.e., a dividend increase (decrease) conveys favorable (unfavorable) information about the current and/or future cash flows of the firm (Bhattacharya (1979), John and Williams (1985), Miller and Rock (1985)). Empirical evidence on earnings behavior following dividend changes

*Denis and Denis, R. B. Pamplin College of Business, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061; Sarin, Leavey School of Business and Administration, Santa Clara University, Santa Clara, CA 95053. The authors thank Anup Agrawal, Tom Carroll, Rob Hansen, Jay Ritter, Larry Lang, Meir Schneller, Dilip Shome, Marc Zenner, an anonymous JFQA referee, and participants at the finance workshop at Virginia Polytechnic Institute for their helpful comments. This work has been partially supported by summer research grants from the Pamplin College of Business at Virginia Polytechnic Institute.

provides support for this hypothesis. Healy and Palepu (1988) find abnormal changes in earnings following dividend initiations and omissions, while Ofer and Siegel (1987) and Carroll (1992) document significant analyst forecast revisions following dividend changes.

Second, Lang and Litzenberger (1989) suggest that a dividend change may convey information regarding a firm’s future investments. Jensen (1986) hypothesizes that free cash flow may be used to fund negative NPV projects. According to this overinvestment hypothesis, a dividend increase by a firm with free cash flow problems will reduce the market’s estimate of the amount of cash that will be wastefully invested, thereby increasing firm value. Similarly, a dividend decrease by such a firm will signal that more negative NPV projects will be undertaken, causing a decrease in firm value. Lang and Litzenberger (1989) attempt to distinguish empirically between the cash flow signaling and overinvestment hypotheses by using Tobin’s Q as an indicator of the expected profitability of future investment: firms with Q < 1 are overinvestors. They find that firms with Q < 1 have greater price reactions, on average, to dividend changes than do Q > 1 firms. They also find that the median elasticity of the change in analysts’ earnings forecasts with respect to the change in dividends is zero. They argue that their results support the overinvestment hypothesis and, contrary to the above studies, are inconsistent with the cash flow signaling hypothesis.

Finally, Bajaj and Vijh (1990) suggest that the existence of dividend clienteles may partially explain price reactions to dividend change announcements. Under this hypothesis, the price reaction to a firm’s dividend change announcement is influenced by the yield preferences of the marginal investor in that firm’s shares. Investors in low-yield firms, who have a relatively high aversion to dividends, will view an increase in dividends negatively, ceteris paribus, while investors in high-yield firms, who place a higher value on dividends, will react positively. Consequently, the market reaction to a dividend change will be related to the firm’s dividend yield. Bajaj and Vijh (1990) use preannouncement dividend yield as a proxy for anticipated yield and find that the magnitude of the stock price reaction to a dividend change announcement is greater the higher the anticipated yield. They interpret this as evidence in favor of the dividend clientele hypothesis.

In this paper, we integrate the cash flow signaling, overinvestment, and clientele hypotheses into a single testing framework in order to address the conflicting evidence to date regarding the relative importance of each explanation. This is particularly important in light of recent evidence of an inverse relation between dividend yield and various measures of growth opportunities (Brickley, Coles, and Nam (1987), Gaver and Gaver (1993), and Smith and Watts (1992)). Tobin’s Q is one frequently used measure of growth opportunities, suggesting that, on average, the dividend yields of Q > 1 firms will be lower than those of Q < 1 firms. We provide evidence in this paper that Q and dividend yield are, in fact, negatively correlated in our sample. Consequently, the observed negative relation between Tobin’s Q and the stock price reaction to dividend changes may be a byproduct of a negative relation between dividend yield and Tobin’s Q. This can happen in two ways. First, according to Bajaj and Vijh’s (1990) clientele hypothesis, the stock price reaction to dividend changes will be greater for high-yield (i.e., low Q) stocks than for low-yield (i.e., high Q) stocks. Second, Christie (1987) demon-
strates that, if changes in equity value are proportional to unexpected dividend changes, percentage changes in stock prices (excess returns) must be functions of unexpected changes in dividend per share deflated by the market price of the firm’s shares. Since an equivalent percentage change in the dividend of a high-yield firm will result in a greater change relative to the market value of the firm’s equity than that of a low-yield firm, dividend changes of high Q and low Q firms are likely to generate different stock price responses simply because the dividend changes of high Q (low-yield) firms are likely to be smaller than those of low Q (high-yield) firms.

Using a sample of 6,777 large dividend changes over the period 1962–1988, we find that announcement period excess returns are positively related to the magnitude of the standardized dividend change and to dividend yield but unrelated to Tobin’s Q. These findings support the cash flow signaling and dividend clientele hypotheses but fail to provide support for the overinvestment hypothesis. Furthermore, the results of a more refined test of the overinvestment hypothesis using the interaction of Tobin’s Q with a measure of undistributed cash flow also fail to support the overinvestment hypothesis.

We provide further evidence on the cash flow signaling and overinvestment hypotheses by examining revisions in analysts’ earnings forecasts and changes in capital expenditures following dividend change announcements. Consistent with previous studies and with the cash flow signaling hypothesis, we find that analysts significantly revise their earnings forecasts following dividend changes. In addition, we find that Q < 1 firms actually increase their capital expenditures following dividend increases and decrease them following dividend decreases, directly opposite the predictions of the overinvestment hypothesis. These results hold for three alternative proxies for the level of investment that would have been expected in the absence of the dividend change.

The remainder of the paper is organized as follows. In Section II, we discuss the various dividend change hypotheses. Section III documents the abnormal returns associated with dividend change announcements. Revisions in analysts’ earnings forecasts and changes in capital expenditures are examined in Section IV. Section V concludes.

II. Cash Flow Signaling, Overinvestment, and Dividend Clientele

Dividend signaling models typically predict that unexpected changes in dividends convey information regarding the level of current and future cash flows. Consequently, changes in the firm’s equity value surrounding dividend announcements are directly proportional to the unexpected dividend. This implies that excess returns around dividend announcements will be functions of unexpected changes in dividend per share deflated by the market price of the firm’s shares (Christie (1987)). Asquith and Mullins (1983) find empirical support for this proposition in a sample of dividend initiations and subsequent dividend increases.

To see this, consider two firms with dividends per share of $1. Firm A’s stock price is $10, while Firm B’s price is $20. If each firm increases dividends by 10 percent, the change will be equal to 1 percent of Firm A’s stock price and 0.5 percent of Firm B’s stock price.
Under the cash flow signaling hypothesis, therefore, announcements of dividend increases will be met with positive abnormal stock returns, on average, and negative abnormal stock returns will follow announcements of dividend decreases. Furthermore, the magnitude of the stock price response will be positively related to the size of the dividend change relative to the value of the firm’s equity, which we refer to as the standardized dividend change. In addition, if dividend changes signal changes in future cash flows, analysts should revise their forecasts of cash flows in the same direction following announcements of dividend changes.

Lang and Litzenberger’s (1989) overinvestment hypothesis suggests that unexpected dividend change announcements by those firms that are overinvestors convey information regarding the firms’ levels of future investment. A dividend increase suggests to the market that the firm will invest less in the future than was expected. This is good news because the firm was expected to invest wastefully, i.e., in negative NPV projects. By the same token, a dividend decrease in a firm that was expected to invest unprofitably increases the market’s assessment of the amount that will be wastefully invested, leading to a decrease in firm value.

Tobin’s Q, defined as the ratio of the market value of a firm to its replacement value, is one indicator of the profitability of new investment opportunities. Lang and Litzenberger (1989) show that with scale-expanding investments and diminishing returns to capital, Tobin’s Q less than one is a sufficient condition for a firm to be overinvesting. Conversely, a Tobin’s Q greater than one is a necessary but not sufficient condition for a firm to be at the value-maximizing level of investment. Under the overinvestment hypothesis, then, only Q < 1 firms are expected to experience abnormal stock price changes following dividend change announcements. However, because Tobin’s Q measures a firm’s marginal Q with error, we may still observe abnormal stock price changes for some Q > 1 firms. Nevertheless, if our estimates of Tobin’s Q are directly related to the true marginal Q, the overinvestment hypothesis predicts that the absolute abnormal stock price changes associated with dividend change announcements will be greater, on average, for Q < 1 firms than for Q > 1 firms.

The overinvestment hypothesis also has clear implications for changes in the level of investment by Q < 1 firms following dividend changes. Under this hypothesis, Q < 1 firms experience positive excess returns following dividend increase announcements because the increase reduces the market’s expectation of the amount of cash that will be wastefully invested. Thus, the overinvestment hypothesis predicts that the capital expenditures of Q < 1 firms will be less than previously expected following dividend increases and greater than previously expected following dividend decreases.

Finally, the dividend clientele hypothesis suggests that, ceteris paribus, the stock price response to an unexpected dividend change announcement will be related to the dividend preferences of the marginal investor in that firm. If high-yield firms attract investors with a preference for higher dividends, a dividend increase will be better news for high-yield firms than for low-yield firms. Similarly, dividend decreases will result in less severe stock price drops for low-yield firms since investors in low-yield stocks prefer lower dividend payments. Thus, the absolute magnitude of the stock price response to a dividend change announcement will be positively related to the dividend yield of the firm.
These three hypotheses can be jointly tested by examining abnormal stock price responses to dividend change announcements. The cash flow signaling hypothesis predicts that stock prices will respond positively to dividend increases and negatively to dividend decreases, holding constant Tobin’s Q and dividend yield. The magnitude of the stock price response should increase with increases in the standardized dividend change. The overinvestment hypothesis predicts that the absolute magnitude of the stock price response to dividend changes is larger for Q < 1 than for Q > 1 firms, ceteris paribus. Finally, the dividend clientele hypothesis predicts that the absolute magnitude of the stock price response to dividend change announcements will be positively related to dividend yield, holding constant Tobin’s Q and standardized dividend change.

Additional tests using analysts’ forecast revisions and capital expenditure changes can provide further evidence on the cash flow signaling and overinvestment hypotheses. The cash flow signaling hypothesis predicts that dividend changes will lead analysts to revise their forecasts of cash flows in the same direction as the dividend change. The overinvestment hypothesis implies that Q < 1 firms will reduce their capital expenditures below the previously expected level following dividend increases and increase them above the previously expected level following dividend decreases.

III. Dividend Announcements and Excess Returns

A. Sample Description

Our sample is obtained by first searching the CRSP NYSE/AMEX Daily Master File for all firms with absolute changes in consecutive regular quarterly dividends per share of greater than 10 percent. We require that no other type of distribution was made over the period between the two quarterly dividends. Thus, firms that paid stock dividends or special dividends and firms that split their shares during the quarter in question are not included in the sample. In addition, we obtain dividend omissions by identifying firms on the Daily Master File that fail to record a regular dividend payment. We include these firms in the sample if the Wall Street Journal Index includes an announcement that a regular quarterly dividend was omitted. We restrict the sample to those firms for which we can calculate Tobin’s Q from the National Bureau of Economic Research (NBER) Manufacturing Sector Master File. This results in a sample of 5,992 dividend increases and 785 dividend decreases over the period 1962–1988. On average, the sample dividend changes represent a 20-percent change in the level of the dividend and are equal to 0.15 percent of the firm’s stock price. Dividend announcement dates are obtained from the Wall Street Journal Index for dividend omissions and from the CRSP Daily Master File for the remaining announcements. Daily excess returns are obtained from the Daily Excess Returns File.

We begin by replicating the basic results of previous empirical studies using our sample. Panel A of Table 1 indicates that announcements of dividend increases

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3Tobin’s Q is defined as the ratio of the market value of the firm to its replacement value, where market value and replacement value are taken from the NBER’s file.
are met with excess returns averaging 1.25 percent while dividend decrease announcements are associated with an average excess return of \(-5.71\) percent. These results are significant at the 0.01 level. In addition, we divide the sample according to whether each standardized dividend change is greater than or less than the median change for the sample. Consistent with prior studies (e.g., Asquith and Mullins (1983)), Panel A indicates that announcements of dividend changes of larger than median absolute value are met with larger excess returns than are announcements of smaller than median changes, 2.87 percent versus 0.66 percent, respectively. This difference is significant at the 0.01 level. Thus, larger dividend changes are associated with larger stock price changes.

Panel B of Table 1 replicates the basic Lang and Litzenberger (1989) tests using our larger sample. Overall, the dividend changes in the sample are associated with an average 2.15-percent excess return for Q < 1 firms and an average 0.94-percent excess return for Q > 1 firms. The difference is significant at the 0.01 level. The average excess return around dividend increases is 1.50 percent for Q < 1 firms and 0.77 percent for Q > 1 firms; this difference is significant at the 0.01 level. These findings are consistent with Lang and Litzenberger (1989) and with the overinvestment hypothesis. Dividend decrease announcements result in an average \(-5.81\)-percent excess return for the low Q firms and an average \(-4.99\)-percent excess return for high Q firms. This difference is not significantly different from zero, however.

Finally, Panel C of Table 1 addresses the dividend clientele hypothesis. Dividend yield, measured as the most recent ordinary cash dividend preceding the sample announcement divided by the market value of the firm’s equity as of two days prior to the sample announcement, is used as a proxy for anticipated yield. The results indicate that the absolute value of the average reactions to dividend changes are greater for firms with preannouncement yields that are greater than the sample median than for firms with lower than median yields, 2.46 percent versus 1.07 percent, respectively. This difference is significant at the 0.01 level. These results are consistent with the findings of Bajaj and Vijh (1990) and with the dividend clientele hypothesis.

Table 2 examines the relation between Tobin’s Q, dividend yield, and the magnitude of the sample dividend changes. In Panel A, we divide the sample into quartiles on the basis of dividend yield. Within each dividend yield quartile, we report the number of observations in the Q < 1 and Q > 1 samples. Consistent with Brickley, Coles, and Nam (1987), Gaver and Gaver (1993), and Smith and Watts (1992), we observe a negative correlation between Tobin’s Q and dividend yield. Of the 4,607 observations in the Q < 1 sample, 2,958 (64 percent) are in the upper two quartiles of dividend yield. In contrast, 1,740 of the 2,170 observations (80 percent) in the Q > 1 sample are in the lower two quartiles of dividend yield. Overall, the average dividend yield is 1.10 percent for Q < 1 firms and 0.64 percent for Q > 1 firms. However, their Q > 1 dividend decrease sample contains only eight observations.
Table 1
Mean Two-Day Announcement Period Percentage Excess Returns for a Sample of 6,777 Dividend Changes over the Period 1962–1988

<table>
<thead>
<tr>
<th></th>
<th>All Changesb</th>
<th>Dividend Increase</th>
<th>Dividend Decrease</th>
<th>Difference in Absolute Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(6,777)</td>
<td>(5,992)</td>
<td>(785)</td>
<td></td>
</tr>
<tr>
<td>CHNG &lt; Median</td>
<td>0.66%***</td>
<td>0.65%***</td>
<td>-2.13%*</td>
<td>1.48%</td>
</tr>
<tr>
<td>(3,388)</td>
<td>(3,376)</td>
<td></td>
<td>(12)</td>
<td></td>
</tr>
<tr>
<td>CHNG &gt; Median</td>
<td>2.87%***</td>
<td>2.01%***</td>
<td>-5.77%***</td>
<td>3.76%***</td>
</tr>
<tr>
<td>(3,388)</td>
<td>(2,615)</td>
<td></td>
<td>(773)</td>
<td></td>
</tr>
<tr>
<td>Difference</td>
<td>-2.21%***</td>
<td>-1.36%***</td>
<td>3.64%***</td>
<td></td>
</tr>
</tbody>
</table>

Panel B. Excess Returns by Tobin’s Q

| Q < 1.0              | 2.15%***     | 1.50%***          | -5.81%***         | 4.31%***                    |
| (4,607)              | (3,912)      |                   | (695)             |                             |
| Q > 1.0              | 0.94%***     | 0.77%***          | -4.99%***         | 4.22%***                    |
| (2,170)              | (2,080)      |                   | (90)              |                             |
| Difference           | 1.21%***     | 0.73%***          | -0.82%            |                             |

Panel C. Excess Returns by Dividend Yield

| YLD < Median         | 1.07%***     | 0.63%***          | -4.71%***         | 4.08%***                    |
| (3,387)              | (3,019)      |                   | (368)             |                             |
| YLD > Median         | 2.46%***     | 1.88%***          | -6.60%***         | 4.72%***                    |
| (3,384)              | (2,969)      |                   | (415)             |                             |
| Difference           | -1.39%***    | -1.25%***         | 1.89%***          |                             |

\[b\]The sample is partitioned on the basis of the absolute value of the standardized dividend change (CHNG) in Panel A, Tobin’s Q (Q) in Panel B, and preannouncement dividend yield (YLD) in Panel C. Percentage excess returns are listed with number of observations in parentheses. Standardized dividend change is defined as the dividend change divided by the firm’s stock price two days prior to the dividend announcement. Tobin’s Q is defined as the ratio of the market value of the firm to its replacement value and is obtained from the National Bureau of Economic Research’s Manufacturing Sector Master File. Dividend yield is defined as the most recent quarterly dividend divided by the market value of equity two days prior to the dividend announcement.

\[b\]Average excess returns in the “All Changes” column are calculated using the negative of the excess returns following dividend decreases.

***, **, * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

percent for Q > 1 firms. The difference in average yield between the two samples is significant at the 0.01 level.

A similar pattern emerges when we classify the sample on the basis of the magnitude of the dividend change rather than the level of dividend yield. In Panel B, we divide the sample into quartiles on the basis of the absolute value of the standardized change in dividend, defined as the absolute value of the dollar difference in dividend per share divided by the firm’s stock price two days prior to the sample announcement. We again report the number of observations in the Q < 1 and Q > 1 samples within each quartile. The results in Panel B indicate a strong negative correlation between the size of the dividend change and Tobin’s Q. In the Q < 1 sample, 2,981 out of the 4,607 observations (65 percent) are in the upper two quartiles of standardized dividend change, while 1,761 of the
TABLE 2
The Relation between Tobin's Q, Dividend Yield and Size of Dividend Change\(^a\)

<table>
<thead>
<tr>
<th>Panel A. Dividend Yield(^b)</th>
<th>Yield Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Firms</td>
<td>Lowest Quartile</td>
</tr>
<tr>
<td>Percentage Yield</td>
<td>0.42</td>
</tr>
<tr>
<td>Q &lt; 1.0</td>
<td>4,607</td>
</tr>
<tr>
<td>Q &gt; 1.0</td>
<td>2,170</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel B. Dividend Change(^c)</th>
<th>Size of Dividend Change Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Firms</td>
<td>Lowest Quartile</td>
</tr>
<tr>
<td>Dividend Change</td>
<td>0.06</td>
</tr>
<tr>
<td>Q &lt; 1.0</td>
<td>4,607</td>
</tr>
<tr>
<td>Q &gt; 1.0</td>
<td>2,170</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Panel C. Correlation Matrix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobin's Q</td>
</tr>
<tr>
<td>1.000</td>
</tr>
<tr>
<td>Dividend Change</td>
</tr>
<tr>
<td>P-Value</td>
</tr>
<tr>
<td>Dividend Yield</td>
</tr>
<tr>
<td>P-Value</td>
</tr>
</tbody>
</table>

\(^a\)Panels A and B report the number of Q > 1 and Q < 1 firms in each of the four quartiles of dividend yield and size of dividend change, respectively. Panel C is a correlation matrix. Our sample consists of 6,777 large dividend change announcements over 1962–1988.

\(^b\)Dividend yield is defined as the most recent regular quarterly dividend divided by the market value of equity two days prior to announcement.

\(^c\)Dividend change is the absolute change in dividend divided by the market value of equity two days prior to the dividend announcement.

2,170 Q > 1 observations (81 percent) are in the lower two quartiles. The average standardized dividend change is 0.30 percent in the Q < 1 sample and 0.13 percent in the Q > 1 sample. The difference is significant at the 0.01 level.

In Panel C, we present Pearson correlation coefficients between Tobin's Q, dividend yield, and the size of the dividend change. The results provide statistical confirmation of the patterns documented in Panels A and B. There is a correlation of -0.49 between Tobin's Q and dividend yield, a correlation of -0.48 between Q and the size of the dividend change, and a correlation of 0.63 between dividend yield and the size of the dividend change. All correlations are significant at the 0.01 level.

B. Stock Returns Tests

The findings reported in Table 2 underscore the importance of simultaneously controlling for Tobin's Q, the standardized dividend change, and dividend yield when examining dividend announcement returns. To do so, we divide the sample
of dividend announcements into quartiles on the basis of standardized dividend change, into quartiles on the basis of dividend yield, and according to whether \( Q < 1 \) or \( Q > 1 \). For dividend decreases, we use the negative of the observed excess return and of the standardized dividend change.\(^7\) The results are reported in Table 3.

<table>
<thead>
<tr>
<th>TABLE 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Two-Day Announcement Period Percentage Excess Returns for a Sample of 6,777 Dividend Changes over the Period 1962–1988(^a)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yield Category</th>
<th>All Firms (1)</th>
<th>Lowest Quartile (2)</th>
<th>Second Quartile (3)</th>
<th>Third Quartile (4)</th>
<th>Highest Quartile (5)</th>
</tr>
</thead>
</table>

**Panel A. Lowest Quartile of Change in Dividend**

- \( Q < 1 \)
  - 0.42***
  - 0.36*
  - 0.44**
  - 0.54
  - NA\(^b\)
- \( Q > 1 \)
  - 0.58***
  - 0.51***
  - 0.81***
  - 0.85
  - NA\(^b\)

\( (Q < 1) – (Q > 1) \)

- -0.16
- -0.15
- -0.37
- -0.31

**Panel B. Second Quartile of Change in Dividend**

- \( Q < 1 \)
  - 0.86***
  - 0.22
  - 0.73***
  - 0.78***
  - 1.70***
- \( Q > 1 \)
  - 0.68***
  - 0.60**
  - 0.58***
  - 0.80***
  - 2.41**

\( (Q < 1) – (Q > 1) \)

- 0.18
- -0.38
- 0.15
- -0.02
- -0.71

**Panel C. Third Quartile of Change in Dividend**

- \( Q < 1 \)
  - 1.51***
  - 1.38***
  - 0.85***
  - 1.34***
  - 1.87***
- \( Q > 1 \)
  - 1.33***
  - 0.49
  - 0.92**
  - 1.67***
  - 2.26***

\( (Q < 1) – (Q > 1) \)

- 0.18
- 0.89
- -0.07
- -0.33
- -0.39

**Panel D. Fourth Quartile of Change in Dividend**

- \( Q < 1 \)
  - 4.33***
  - 4.32***
  - 4.26***
  - 3.93***
  - 4.57***
- \( Q > 1 \)
  - 4.13***
  - 3.98***
  - 4.19***
  - 3.23***
  - 5.40***

\( (Q < 1) – (Q > 1) \)

- 0.20
- 0.34
- 0.07
- 0.70
- -0.83

**Panel E. All Dividend Changes**

- \( Q < 1 \)
  - 2.15***
  - 1.35***
  - 1.48***
  - 1.90***
  - 3.10***
- \( Q > 1 \)
  - 0.94***
  - 0.63***
  - 0.90***
  - 1.44***
  - 3.57***

\( (Q < 1) – (Q > 1) \)

- 1.21***
- 0.72***
- 0.58***
- 0.46*
- -0.47

---

\(^a\)Firms are assigned to quartiles based on the standardized change in dividend and to quartiles based on the level of dividend yield. The negative of the excess returns and standardized dividend changes is used for dividend decreases. Change in dividend is the absolute change in dividend divided by the market value of equity two days prior to the dividend announcement. Dividend yield is defined as the most recent quarterly dividend divided by the market value of equity two days prior to the dividend announcement.

\(^b\)NA means there is no observation in this cell.

***, **, and * denote significance at the 0.01, 0.05, and 0.10 levels, respectively.

\(^7\)We have also tabulated the excess returns for dividend increases and decreases separately. For dividend increases, there are no cells in columns (2)–(5) of Panels A–D in which the excess returns of \( Q < 1 \) firms are significantly greater than those of \( Q > 1 \) firms. For dividend decreases, excess returns for \( Q < 1 \) firms are significantly more negative than those of \( Q > 1 \) firms in columns (3) and (4) of Panel C. However, because there are fewer decreases, the sample size in some of the cells is too small to make any meaningful inferences for the dividend decrease sample. We present regression results separately for dividend increases and decreases in Table 4.
Consistent with the cash flow signaling hypothesis, column (1) of Table 3 reports that the magnitude of the stock price reaction increases with the size of the dividend change in both the Q < 1 and Q > 1 samples. Excess returns range from 0.42 percent in the lowest dividend change quartile (Panel A) to 4.33 percent in the highest quartile (Panel D) for Q < 1 firms and from 0.58 percent to 4.13 percent for Q > 1 firms. An analysis of variance (ANOVA) indicates that the hypothesis of equal excess returns across dividend change quartiles can be rejected at the 0.01 level in both samples. In addition, after controlling for the size of the dividend change, the relation between Q and announcement effects disappears. Contrary to the predictions of the overinvestment hypothesis, high Q firms’ average announcement effects do not differ significantly from those of low Q firms in any dividend change quartile.

Columns 2–5 of Table 3 present excess returns by dividend yield quartile. The Panels A–D results indicate that, after simultaneously controlling for dividend yield and the dividend change, there is no evidence supporting the overinvestment hypothesis. The excess returns of Q < 1 firms do not differ significantly from those of Q > 1 firms in any of the 16 dividend change/dividend yield subsamples. In contrast, consistent with the cash flow signaling hypothesis, excess returns continue to increase nearly monotonically with the size of the dividend change.

The results presented in columns 2–5 of Panel E are consistent with the dividend clientele hypothesis. The absolute magnitude of the average abnormal stock price response to dividend change announcements increases with increasing dividend yield for both Q > 1 and Q < 1 firms. The relationship between dividend yield and excess returns is weaker, however, after controlling for the standardized dividend change in Panels A–D. Excess returns increase monotonically across dividend yield quartiles for both Q > 1 and Q < 1 firms in the lowest dividend change quartile, for Q < 1 firms in the second dividend change quartile, and for Q > 1 firms in the third dividend change quartile. The increase is not strictly monotonic for Q > 1 firms in the second dividend change quartile, for Q < 1 firms in the third dividend change quartile, or for Q < 1 or Q > 1 firms in the highest dividend change quartile.

In Table 4, we report the results of cross-sectional regression tests of excess returns surrounding dividend change announcements. In Model (1), we regress two-day announcement period excess returns on the standardized dividend change (CHNG), dividend yield (YLD), and a dummy variable denoting Q > 1 (QDUM). We present the results for the full sample of dividend changes in Panel A, where again we use the negative of excess return and standardized dividend change for dividend decreases. The results for dividend increases and decreases are reported separately in Panels B and C.

Model (1) of Panel A shows that excess announcement returns are significantly related to the standardized dividend change (t = 26.38) and to dividend yield (t = 7.13). Contrary to the overinvestment hypothesis, however, the announcement returns of Q > 1 firms do not differ from those of Q < 1 firms after controlling for the standardized dividend change and dividend yield.8

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8 The correlation between the independent variables in Models (1) and (2) raises the question of the influence of multicollinearity on the statistical estimates. While the size of our sample should mitigate the effects of these correlations somewhat, we also performed several diagnostic tests and found that
TABLE 4

Estimates of Cross-Sectional Regressions Relating the Magnitude of the Stock Price Reaction to Dividend Changes to the Standardized Dividend Change (CHNG), Dividend Yield (YLD), Undistributed Cash Flow (CFLOW), and a Dummy Variable (QDUM) Taking on a Value 1 if Tobin’s Q is Greater Than 1 and 0 if Tobin’s Q is Less Than 1

<table>
<thead>
<tr>
<th>Intercept</th>
<th>CHNG</th>
<th>YLD</th>
<th>CFLOW</th>
<th>Q×CFLOW</th>
<th>QDUM</th>
<th>R²adj</th>
<th>F-Stat.</th>
</tr>
</thead>
</table>
| **Panel A. Full Sample (6,777 announcements)**
| (1)     | -0.14  | 434.33*** | 91.11*** | -0.06  | (0.63) | 0.139 | 364.4  |
|         | (0.99) | (26.38)  | (7.13)  |         |       |       |         |
| (2)     | 0.07   | 419.27*** | 89.65*** | -2.80** | 2.53  | -0.23 | 0.137  | 212.7  |
|         | (0.43) | (24.40)  | (6.96)  | (2.06)  | (1.27) |       |         |
| **Panel B. Dividend Increases (5,992 announcements)**
| (1)     | -0.89*** | 511.31*** | 129.35*** | 0.31** | (2.82) | 0.078 | 169.5  |
|         | (6.36)  | (10.87)  | (9.31)  |         |       |       |         |
| (2)     | -1.01*** | 513.37*** | 129.73*** | 1.63   | -1.39 | 0.40** | 0.078  | 100.6  |
|         | (5.85)  | (10.86)  | (9.24)  | (1.24)  | (0.71) |       |         |
| **Panel C. Dividend Decreases (785 announcements)**
| (1)     | -3.45*** | 187.92*** | -60.39 | 0.34   | (0.34) | 0.034 | 10.1   |
|         | (6.20)  | (3.59)   | (1.08)  |         |       |       |         |
| (2)     | -3.70*** | 181.56*** | -50.98 | 4.04   | -7.81 | 0.69  | (0.85) | 0.029  | 5.7    |
|         | (6.33)  | (3.42)   | (0.90)  | (0.73)  | (0.98) |       |         |

---

The results for dividend increases in Model (1) of Panel B are qualitatively equivalent to those in Panel A for dividend change and dividend yield. Announcement period excess returns are positively related to these two variables. However, in the dividend increase subsample, Tobin’s Q and announcement period excess returns are significantly positively related. This is opposite the prediction of the overinvestment hypothesis. The results for dividend decreases in Panel C are somewhat weaker. Model (1) of Panel C indicates that announcement period excess returns are significantly positively related to the standardized dividend change for the subsample of dividend decreases. However, there is no significant relation between announcement period excess returns and dividend yield. There is also no significant relation between announcement period excess returns and Tobin’s Q.

The influence of multicollinearity was negligible. For example, there was no case in which the variance inflation factor for a given variable exceeded 2.0.
Thus, after controlling for the size of the dividend change, Tobin’s Q, and dividend yield, our evidence is consistent with the cash flow signaling and dividend clientele hypotheses but provides little support for the overinvestment hypothesis. Announcement effects are positively related to the size of the dividend change and to the firm’s prior dividend yield, but unrelated to Tobin’s Q.9

To gain some additional insight into the economic importance of the cash flow signaling and clientele hypotheses, we estimate the marginal impact of CHNG and YLD using Model (1) of Panel A. We estimate the incremental announcement period excess return for an average firm in the highest quartile of CHNG as compared to an average firm in the lowest quartile of CHNG, while holding all other regressors constant. Increasing CHNG from the average of the lowest quartile (CHNG = 0.0006) to the highest quartile (CHNG = 0.0061) increases the announcement period excess return by 2.39 percent (0.0055 × 434.3). Repeating the analysis using dividend yield, increasing YLD from the average of the lowest quartile (YLD = 0.0042) to the average of the highest quartile (YLD = 0.0158) increases the announcement period excess return by 1.06 percent (0.0116 × 91.1). These results indicate that both the standardized dividend change and dividend yield have an economically meaningful impact on the excess returns associated with dividend change announcements.

One possible explanation for the lack of support for the overinvestment hypothesis is that our proxy for managers’ propensity to overinvest is weak. Jensen’s (1986) free cash flow hypothesis predicts that the degree of overinvestment will be related to the firm’s investment opportunity set and its cash flow. Firms with Q < 1 and high cash flows are most likely to be overinvestors, so an increase in dividends should have the greatest positive impact on share price for these firms. Thus, for Q < 1 firms, the announcement effects of dividend changes should be positively related to cash flow. Conversely, cash flow should be unrelated to the announcement effects of Q > 1 firms since these firms are not likely to be overinvesting. This more refined test of the overinvestment hypothesis is developed in Lang, Stulz, and Walkling (1991).

Model (2) in Table 4 presents the results of this test. We follow Lehn and Poulsen (1989) in defining cash flow as operating income before depreciation minus interest expense, taxes, preferred dividends, and common dividends. As in Lang, Stulz, and Walkling (1991), we scale the cash flow measure by the book value of total assets. We regress announcement period excess returns on the standardized dividend change, dividend yield, cash flow, and the dummy variable indicating Q > 1. We use an interaction term (Q × CFLOW) equal to the product of QDUM and cash flow (CFLOW) to test the hypothesis that announcement returns are positively related to cash flow for Q < 1 firms but unrelated to cash flow for Q > 1 firms.

9We also estimated the regressions using the following alternative specification,

\[ XR = b_0 + b_1 \text{CHNG} + b_2 \text{YLD} + b_3 \text{QDUM} \ast \text{CHNG} + b_4 \text{QDUM} \ast \text{YLD} + b_5 \text{QDUM}. \]

To test the overinvestment hypothesis, we compute the value of the partial derivative of XR with respect to QDUM. Our results are qualitatively equivalent to the results presented in Table 4: excess returns are significantly greater for Q > 1 firms than for Q < 1 firms in the dividend increase subsample but do not differ significantly between Q < 1 and Q > 1 firms in the dividend decrease subsample.
The results presented in the three panels of Table 4 do not support the overinvestment hypothesis. Announcement returns are significantly negatively related to the cash flow measure in Panel A; the overinvestment hypothesis implies a positive relationship. Furthermore, the coefficients on the interaction term \( Q \times CFLOW \) are statistically insignificant, indicating that there is no difference in the coefficients on the cash flow variable for \( Q < 1 \) and \( Q > 1 \) firms. Notably, the coefficients on \( CHNG \), \( YLD \), and \( QDUM \) are virtually unchanged from the estimates obtained using Model (1). Announcement returns continue to be significantly positively related to the standardized dividend change in all three panels and to dividend yield in Panels A and B. \( QDUM \) continues to be insignificant in Panels A and C and significantly positive in Panel B.10

C. Sensitivity Tests

In this section, we perform several sensitivity tests to verify the robustness of our results. One possibility is that our proxy for overinvestment will be weak if there are time-series patterns in the average Tobin’s Q in the market that are unrelated to changes in investment opportunities. For example, more firms are likely to have \( Q < 1 \) in a bear market. If the market decline is not related to changes in future investment opportunities, then we may misclassify a firm as an overinvestor simply because market prices are temporarily low. Similarly, we may misclassify some firms as value maximizers in a bull market since more firms are likely to have \( Q > 1 \).

To examine this possibility, we redefine \( QDUM \) in Model (1) of Table 4 to be equal to 0 if \( Q < 1 \) and \( Q \) is less than the median \( Q \) for all firms listed on the NBER file for that year. Similarly, \( QDUM \) is equal to 1 if \( Q > 1 \) and \( Q \) is greater than the median \( Q \) for all firms in that year. Our results are unaffected. The coefficients on \( CHNG \) and \( YLD \) continue to be significant while the coefficient on \( QDUM \) is insignificantly different from zero.

Similarly, our proxy for overinvestment may be weak if only a subset of firms has serious free cash flow problems. To examine this possibility, we redefine \( QDUM \) to be equal to 1 if \( Q \) is greater than the median \( Q \) for all firms with \( Q > 1 \). In the same way, \( QDUM \) is equal to 0 if \( Q \) is less than the median \( Q \) for all firms with \( Q < 1 \). This should increase the power of the tests by focusing on those firms with the most extreme \( Q \) ratios. Again, however, our results are unaffected. The coefficients on \( CHNG \) and \( YLD \) remain highly significant while the coefficient on \( QDUM \) remains insignificant.

Finally, we control for the influence of outlier observations by estimating all of the regressions after eliminating those observations in the upper 5 percent of Cook’s D statistic. The results are nearly identical to those in Table 4. We also estimate all of the regressions using \( Q \) as a continuous variable rather than a dichotomous variable. None of the results is qualitatively affected.

10We also ran the regressions having redefined \( QDUM \) to equal 1 when \( Q > 1 \) and \( CFLOW \) is less than the sample median and to equal 0 when \( Q < 1 \) and \( CFLOW \) is greater than the sample median. This reduces the sample to 2,539 observations. The coefficients on this dummy variable are insignificant in all three regressions.
IV. Further Evidence from Analysts’ Forecast Revisions and Changes in Capital Expenditures

A. Revisions in Analysts’ Earnings Forecasts

According to the cash flow signaling hypothesis, stock prices react to dividend change announcements because dividend changes convey new information about firms’ future cash flows. This implies that an unexpected change in dividend will cause the market to revise its cash flow expectations in the direction of the dividend change. Lang and Litzenberger (1989) use this prediction to distinguish between the cash flow signaling and overinvestment hypotheses: they argue that the overinvestment hypothesis has no cash flow implications.11

Previous studies provide strong evidence that dividend changes convey information regarding future earnings. Healy and Palepu (1988) find abnormal changes in earnings following dividend initiations and omissions. Ofer and Siegel (1987) find that analysts revise their earnings forecasts following dividend changes. Carroll (1992) finds that quarterly dividend changes are associated with changes in both the level and variance of future earnings. These results are consistent with the cash flow signaling hypothesis. Lang and Litzenberger (1989), however, examine the median of the percentage change in analysts’ forecasts of current-year EPS following an announced dividend change, scaled by the percentage change in dividend. They find no significant change for either dividend increases or decreases in either high Q or low Q firms and conclude that this is inconsistent with the cash flow signaling hypothesis.

In this section, we examine the change in analysts’ forecasts following the dividend change announcements in our sample as a proxy for information regarding future changes in cash flows. We use analysts’ forecasts rather than actual earnings because there is some evidence that analysts’ forecasts outperform time-series models as measures of the market’s earnings expectations. This allows us to perform a cleaner test of the hypothesis that dividend changes cause market participants to revise their estimates of future cash flows.12

We obtain analysts’ forecast data from the Investment Brokers Estimate System (I/B/E/S) data base developed by Lynch, Jones, and Ryan Co. Analysts’ forecasts of annual earnings per share (EPS) are obtained monthly from all major brokerage firms to compile the data base. We eliminate those cases in which annual EPS is announced in the same month as the sample dividend change. The use of this data limits our sample to 2,068 of the original 6,777 dividend change announcements.

11A change in investment could, in fact, lead to revised expectations of near-term cash flows. For example, an increase (decrease) in investment may be associated with a decrease (increase) in cash flows if some of the investment expenditures are expensed. On the other hand, an increase (decrease) in investment may increase (decrease) earnings whether or not the investment has a positive net present value. Thus, the predictions of the overinvestment hypothesis for near-term cash flows are ambiguous. The overinvestment hypothesis is clear, however, in its predictions concerning changes in investment following dividend changes. We address this issue in Section IV.B.

12See Ofer and Siegel (1987) for an elaboration of these points.
We measure the standardized change in the median of analysts’ forecasts surrounding each dividend change announcement as: \[ \frac{(F_{i} - F_{-1}) \times 100}{P_{0}} \], where:

i) \( F_{-1} \) is the median analysts’ forecast of current annual EPS in the month prior to the dividend change announcement month,
ii) \( F_{i} \) is the median analysts’ forecast of current annual EPS in the month following the dividend change announcement month, and
iii) \( P_{0} \) is the market price of the firm’s equity two days prior to the dividend change announcement.

Previous studies assume that the expected analyst forecast revision is equal to zero and, therefore, that the observed analyst forecast revision is an unbiased estimate of the unexpected revision. However, evidence in O’Brien (1988) suggests that, on average, analyst forecasts contain an upward bias. Moreover, Brous (1992) argues that, since only 15–20 percent of analysts update their forecasts in a given month, information released in a given month will affect mean forecast revisions for several subsequent months, thereby inducing serial correlation in monthly forecast revisions. Brous proposes a method for computing expected analyst forecast revisions that explicitly accounts for both the bias in analyst forecasts and the serial correlation in monthly forecast revisions.

We compare standardized forecast revisions around dividend change announcements to estimates of the expected forecast revision computed using Brous’s (1992) method. Specifically, the expected forecast revision for firm \( i \) in month \( t \) is estimated by the following,

\[
E[FR_{i,t}] = k + \left( \frac{1}{n} \right) \sum_{c=1}^{n-1} e_{i,t-c},
\]

where \( k \) is the forecastable component of the forecast revision and is estimated as the average two-month standardized forecast revision for all months available on the I/B/E/S tape except months –6 to +6 relative to the dividend change month; \( e_{i,t-c} \) represents the unforecastable component and is equal to the difference between \( k \) and the actual two-month standardized forecast revision for firm \( i \) in month \( t - c \). Following Brous (1992), we assume \( n = 5 \), which implies that analyst forecast revisions follow a fourth-order moving average process. The unexpected forecast revision is then simply the difference between the actual and expected forecast revision.

Table 5 presents median standardized unexpected forecast revisions for the sample as a whole and for subsamples classified according to the direction of the dividend change and Tobin’s Q. Overall, analysts revise their forecast of the dividend change announcement.
current year’s EPS following the dividend change by a median 0.024 percent of the preannouncement stock price. This represents an approximate 2.9-percent change in forecasted EPS. This change is significant at the 0.01 level. Median unexpected standardized revisions are 0.014 for dividend increases and −0.121 for dividend decreases, both significant at the 0.01 level. These findings are consistent with previous evidence (Ofer and Siegel (1987) and Carroll (1992)) and indicate that analysts significantly revise their estimates of earnings in the direction of the dividend change following the sample announcements.17

### TABLE 5

**Unexpected Revisions in Median Earnings per Share Forecasts Surrounding Dividend Changes over the Period 1962–1988a**

<table>
<thead>
<tr>
<th></th>
<th>All Changes</th>
<th>Dividend Increases</th>
<th>Dividend Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Firms</td>
<td>0.024</td>
<td>0.014</td>
<td>−0.121</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>Q &lt; 1</td>
<td>0.030</td>
<td>0.015</td>
<td>−0.128</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>Q &gt; 1</td>
<td>0.012</td>
<td>0.011</td>
<td>−0.041</td>
</tr>
<tr>
<td></td>
<td>(0.0005)</td>
<td>(0.0002)</td>
<td>(0.5623)</td>
</tr>
<tr>
<td>Difference</td>
<td>0.018</td>
<td>0.004</td>
<td>−0.087</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0195)</td>
</tr>
</tbody>
</table>

*aOur sample includes 1,865 dividend increases and 203 dividend decreases for which sufficient analyst earnings forecast data are available on the IBES summary file. The negative of forecast revisions is taken for dividend decreases in the first column ("All Changes"). P-values are listed in parentheses. The unexpected change in median forecast is the actual revision in the median forecast from one month prior to one month following the dividend change announcement less the expected forecast revision, all expressed as a percentage of the stock price as of two days prior to the dividend change. Expected analyst forecast revisions are estimated as a fourth-order moving average process as in Brous (1992).

When we split the sample into Q < 1 and Q > 1 firms, we find significant forecast revisions in all but the Q > 1 dividend decrease subsample, where the sample size is only 17. Consistent with the stock returns evidence, we find that the magnitude of the revisions is greater in the Q < 1 sample. Standardized forecast revisions are a median 0.015 for dividend increases and −0.128 for dividend decreases in the Q < 1 sample versus 0.011 and −0.041 in the Q > 1 sample. The difference is significant at the 0.01 level for the increases and at the 0.02 level for the decreases.18 These findings are consistent with the fact that the dividend

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17The larger revisions following dividend decreases could reflect the fact that dividend decreases are less common than increases and are therefore less anticipated. This would suggest that dividend decreases convey more information than do dividend increases. This is clearly not the complete explanation, however, because it would imply that the magnitude of the difference in revisions between the increases and decreases should be greater in the Q > 1 sample, where dividend decreases are less likely. Table 5 indicates that the reverse is true.

18We also estimated the regressions reported in Table 4, substituting the unexpected standardized forecast revisions for the standardized dividend changes. If dividend changes convey valuable information, excess returns surrounding dividend change announcements should be positively related to analysts’ forecast revisions. Using Model (1) from Table 4, the relation between announcement period excess returns and analyst forecast revisions is significantly positive for the full sample (t = 4.81),
changes for \( Q < 1 \) firms are larger than those of the \( Q > 1 \) firms. Indeed, when we regress the unexpected standardized forecast revision on the standardized dividend change (CHNG) and a binary variable denoting \( Q > 1 \) firms (QDUM), we find that CHNG is significantly positive in the full sample \((t = 7.0)\) and the sample of dividend increases \((t = 1.9)\), but insignificant in the dividend decrease sample. QDUM is not significant in any of the regressions. Collectively, these results provide strong support for the cash flow signaling hypothesis.\(^{19}\)

**B. Changes in Capital Expenditures**

The overinvestment hypothesis predicts that overinvesting firms will experience positive excess returns following dividend increase announcements because the increase reduces the market’s expectations of the amount of cash that will be wastefully invested. Under this hypothesis, then, capital expenditures of \( Q < 1 \) firms will be less than previously expected following dividend increases and greater than previously expected following dividend decreases. The overinvestment hypothesis makes no clear predictions regarding the future investment level of \( Q > 1 \) firms. The cash flow signaling and dividend clientele hypotheses make no clear predictions about the future investment level of either type of firm.

In Table 6, we compare the post-announcement capital expenditures of the sample firms to three alternative proxies for the level of capital expenditures that would have been expected in the absence of the dividend change. We focus on capital expenditures (COMPUSTAT #30) in the first full fiscal year following the year in which the dividend change is announced, which we label year 1. Year 0 is the fiscal year in which the dividend change announcement is made. Although we have no hypothesis regarding capital expenditures following dividend changes by \( Q > 1 \) firms, we provide data on their capital expenditure changes for completeness.

In Panel A of Table 6, we assume that, in the absence of the dividend change, year 1 capital expenditures would have been expected to equal year \(-1\) capital expenditures. We, therefore, measure the unexpected capital expenditure for each firm as the difference between year 1 capital expenditure and year \(-1\) capital expenditure, standardized by the year \(-1\) book value of total assets. Panel A indicates that \( Q < 1 \) firms, on average, increase their capital spending by 3.6 percent of year \(-1\) total assets following dividend increases. The median increase is 2.3 percent. \( Q < 1 \) firms decrease capital expenditure by an average of 2.0 percent of year \(-1\) total assets following dividend decreases (median = \(-1.6\) percent). All mean and median changes in capital expenditures by the \( Q < 1 \) firms are significant at the 0.01 level. Thus, \( Q < 1 \) firms actually increase capital

\(^{19}\)Lang and Litzenberger (1989) attempt to control for the size of the dividend change by measuring the elasticity of analyst forecast revisions with respect to the dividend change and find no significant elasticities. We replicated this approach on our sample and found significant elasticities for dividend increases and decreases in both the \( Q > 1 \) and \( Q < 1 \) samples. The difference in results may reflect our larger sample size.
TABLE 6
Changes in Capital Expenditures following the Sample of 5,992 Dividend Increases and 785 Dividend Decreases over the Period 1962–1988

<table>
<thead>
<tr>
<th></th>
<th>Dividend Increases</th>
<th>Dividend Decreases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td><strong>Panel A. Unadjusted Changes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q &lt; 1</td>
<td>3.60 (0.0001)</td>
<td>2.29 (0.0001)</td>
</tr>
<tr>
<td>Q &gt; 1</td>
<td>4.24 (0.0001)</td>
<td>2.84 (0.0001)</td>
</tr>
<tr>
<td><strong>Panel B. Industry-adjusted Changes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q &lt; 1</td>
<td>1.68 (0.0001)</td>
<td>0.68 (0.0001)</td>
</tr>
<tr>
<td>Q &gt; 1</td>
<td>2.94 (0.0001)</td>
<td>1.66 (0.0001)</td>
</tr>
<tr>
<td><strong>Panel C. Time-series-adjusted Changes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Q &lt; 1</td>
<td>1.92 (0.0001)</td>
<td>1.64 (0.0001)</td>
</tr>
<tr>
<td>Q &gt; 1</td>
<td>2.04 (0.0001)</td>
<td>1.42 (0.0001)</td>
</tr>
</tbody>
</table>

a P-values are listed in parentheses.
b Unadjusted capital expenditure changes are defined as capital expenditures in the first full year following the dividend change (year 1) minus capital expenditures in the last full year prior to the dividend change (year −1), expressed as a percentage of year −1 total assets.
c Industry-adjusted capital expenditures are defined as unadjusted capital expenditure changes minus the contemporaneous changes in the level of capital expenditures for all firms in the same 2-digit SIC code as the sample firm.
d Time-series-adjusted capital expenditure changes are defined as unadjusted changes minus the change in capital expenditures over the two years preceding the dividend change (year −3 to year −1).

Expenditures following dividend increases and decrease them following dividend decreases. This is contrary to the predictions of the overinvestment hypothesis if year −1 capital expenditures are an appropriate proxy for the expected year 1 capital expenditures of the sample firms in the absence of the dividend change.

In Panel B of Table 6, we compare the year −1 to year 1 change in the sample firms’ capital expenditures to concurrent capital expenditure changes in their two-digit SIC industries. We calculate the industry change as the difference between total industry capital expenditures in year 1 and total industry capital expenditures in year −1, standardized by the total assets of the industry at the end of year −1. For each sample firm, we subtract the appropriate industry change from the standardized change calculated for the Panel A results. The Panel B results indicate that Q < 1 firms increase their capital expenditures relative to other firms in their industries following dividend increases, an average of 1.7 percent (median = 0.7 percent). Dividend decreases are followed by an average 1.9 percent decrease in industry-adjusted capital expenditures (median = −1.6 percent). The Panel B changes for Q < 1 firms all differ significantly from zero at the 0.01 level.
Thus, industry-adjusted changes in capital expenditures also run counter to the predictions of the overinvestment hypothesis.

Finally, Panel C of Table 6 compares each sample firm’s year $-1$ to year $1$ capital expenditure change to its capital expenditure change over the previous two-year period, year $-3$ to year $-1$. On a time-series-adjusted basis, $Q < 1$ firms increase their capital expenditures following dividend increases and decrease them following decreases; the mean (median) changes are 1.9 percent (1.6 percent) and $-2.6$ percent ($-1.6$ percent), respectively, all significantly different than zero at the 0.01 level. Again, these results are contrary to those predicted by the overinvestment hypothesis.

Overall, the Table 6 results are inconsistent with the hypothesis that the excess returns associated with dividend change announcements by $Q < 1$ firms reflect information about the future level of overinvestment. We find that $Q < 1$ firms actually increase their level of investment following dividend increases and decrease investment following dividend decreases. These results hold for all three alternative proxies for the level of investment expected in the absence of the dividend change: the year $-1$ capital expenditure of the sample firm, the concurrent change in capital expenditure by the sample firm’s industry, and the year $-3$ to year $-1$ change in the sample firm’s capital expenditure.

V. Conclusion

In this paper, we reexamine various hypotheses that seek to explain the positive association between dividend change announcements and stock price reactions. Our investigation is motivated by recent evidence linking Tobin’s Q and dividend yield. We argue that the negative relation between Tobin’s Q and dividend yield may lead to a spurious correlation between Q and excess returns around dividend announcements. This can lead to biased inferences regarding the relative importance of the cash flow signaling, overinvestment, and dividend clientele hypotheses. Because the cash flow signaling, overinvestment, and dividend clientele hypotheses are not mutually exclusive, we integrate these three main hypotheses into a single testing framework.

Our results are generally consistent with the implications of the cash flow signaling and dividend clientele hypotheses but provide little support for the overinvestment hypothesis. Specifically, we find that two-day excess returns around dividend change announcements are positively related to the standardized size of the dividend change and to the level of the dividend yield, but unrelated to Tobin’s Q. Furthermore, our evidence indicates that analysts update their forecasts of future earnings on the basis of the observed dividend change. Consistent with the negative relation between the magnitude of the dividend change and Tobin’s Q, these earnings revisions are larger for $Q < 1$ firms than they are for $Q > 1$ firms. Collectively, these findings provide strong support for the cash flow signaling hypothesis. We also find a positive relation between dividend yield and announcement period excess returns, consistent with the clientele hypothesis advanced by Bajaj and Vijh (1990). On the other hand, we find that $Q < 1$ firms increase their capital expenditures following dividend increases and decrease them following dividend decreases, directly contrary to the predictions of the overinvestment hypothesis.
Our tests cannot reject the hypothesis that dividend change announcements convey some information about the investment policy of the firm or the hypothesis that agency cost considerations play some role in determining the level of dividend payments. Indeed, agency cost considerations underlie the hypothesized link between Tobin’s Q and dividend yield in Smith and Watts (1992) and Gaver and Gaver (1993). However, it seems clear that the overinvestment hypothesis is not the predominant explanation for the incremental information content of dividend change announcements. This is consistent with the argument made by Jensen (1986) and others that regular dividend payments are likely to be weak substitutes for debt payments in controlling free cash flow problems.

References


