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# Underreaction to Dividend Reductions and Omissions?

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**ABSTRACT**

Using a sample of 2,337 cash dividend reduction or omission announcements over the 1927 to 1999 period, this study reports significant negative post-announcement long-term abnormal returns, which last 1 year only. However, this long-term abnormal performance is driven by the post-earnings-announcement drift. After controlling for the earnings performance and the skewness of buy-and-hold abnormal returns, there is no compelling evidence of a post-dividend-reduction or post-dividend-omission price drift.

A number of studies present evidence of long-term return anomalies following major corporate events that call into question the informational efficiency of capital markets. In particular, these studies demonstrate that announcement-period abnormal stock returns for various events are not unbiased revisions in investors' expectations.[1] Fama (1998) reviews this evidence and concludes that these seemingly puzzling findings are the result of chance, or incorrect statistical method, or a misspecified expected return model.[2] In particular, in his review of the paper by Michaely, Thaler, and Womack (1995), who report a stock price underreaction in samples of 561 dividend initiation and 887 dividend omission announcements made over the 1964 to 1988 period, Fama contends that changing the matching criteria might tell a different story, and hence he calls for an out-of-sample test before drawing any inferences about long-term returns following changes in dividend payments.

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[1] Major corporate events for which post-announcement long-term abnormal stock returns are found include: corporate mergers (Agrawal et al. (1992)), proxy contests (Ikenberry and Lakonishok (1993)), spinoffs (Cusatis, Miles, and Woolridge (1993)), initial public offerings (Loughran and Ritter (1995)), seasoned equity offerings (Spiess and Affleck-Graves (1995)), new exchange listings (Dharan and Ikenberry (1995)), earnings (Bernard and Thomas (1990)), stock splits (Desai and Jain (1997)), share repurchases (Ikenberry, Lakonishok, and Vermaelen (1995)), and dividend initiations and omissions (Michaely, Thaler, and Womack (1995)).

[2] He does mention, however, that a couple of anomalies seem to be above suspicion.

Boehme and Sorescu (2002) respond to Fama's critique by examining the long-term stock performance following announcements of dividend initiations or resumptions using a sample of 2,886 cases over the period from 1927 to 1998. They report no evidence of any abnormal price drift for announcements made prior to 1964 and find that post-announcement abnormal returns for announcements in the 1964 to 1988 period are confined to small firms and disappear when portfolios are value-weighted by market capitalization. Moreover, their results using equally weighted portfolios are not robust across subsamples. Their overall conclusion is that the price drifts reported by Michaely et al. (1995) may be simply due to chance.

The conclusions of Boehme and Sorescu need not extend to dividend omissions or reductions, however. Both theoretical studies (e.g., Bhattacharya (1979, 1980), John and Williams (1985), and Miller and Rock (1985)) and empirical studies (e.g., empirical studies by Bajaj and Vijh (1990), Dielman and Oppenheimer (1984), Healy and Palepu (1988), and Ghosh and Woolridge (1988)) find that these corporate events are very important signals about a firm's value. Moreover, given the reluctance of managers to reduce dividends, a dividend reduction or omission announcement is arguably a bigger surprise to investors than a dividend initiation or resumption. Michaely et al. (1995) find that the announcement-period and the post-announcement abnormal returns of omitting firms are greater in absolute terms than those of initiating firms.

We extend Boehme and Sorescu's (2002) reassessment of the findings of Michaely et al. (1995) by examining the post-announcement long-term abnormal stock returns following cash dividend reductions or omissions in a sample of 2,337 announcements made during the period from February 1927 to December 1999 by firms listed on the NYSE, AMEX, and NASDAQ. We address Fama's (1998) methodological remarks by using two different approaches for measuring the long-term abnormal return of a dividend-event firm. First, we measure the long-term abnormal performance by applying the Fama–French (1993) three-factor model, using (i) equal-weighted and value-weighted calendar-month event-portfolio returns and (ii) ordinary least square and weighted least squares methods to estimate the parameters of the model. Second, we compute the abnormal performance as the mean difference in the stock price performance between the event-firms and non-event benchmark firms over buy-and-hold periods that extend from 1 to 3 years. We select the non-event benchmark firms according to seven different matching criteria: (1) firm size; (2) size and industry affiliation; (3) size and prior stock price performance; (4) industry affiliation and prior stock price performance; (5) size and ratio of book-to-market value of equity; (6) percentage change in earnings; and (7) size and percentage change in earnings.[3]

Using the Fama–French three-factor model, we find statistically significant negative long-term abnormal stock returns following announcements of dividend reductions and omissions. These significant long-term abnormal returns

[3] See Barber and Lyon (1997), Fama (1998), and Mitchell and Stafford (2000) for a discussion on the merits of each method for computing the post-announcement abnormal return.

are confined to the first post-announcement year, and are robust to using the equally or value-weighted returns and the ordinary or weighted least squares methods. Using the matching method, however, the evidence is not as robust. We find negative 1-year post-dividend-event abnormal returns, which are statistically significant using the *t*-test and the nonparametric Wilcoxon signed-rank test when earnings' performance is not a matching criterion.[4] When matching by earnings or by size and earnings, the Wilcoxon signed-rank test results are insignificant, but the *t*-test results remain significant.

To determine the persistence of the post-dividend-event price drift in different time periods and to assess the role chance may play in our results, we split the sample announcements into seven consecutive subsample time periods. The post-announcement first-year abnormal returns are predominately negative across subperiods using all estimates of abnormal performance, a finding that, by itself, is not indicative of random chance. However, we find no evidence of a consistently significant negative post-dividend-event abnormal return in different subsample periods. We, therefore find no compelling evidence that the long-term abnormal returns to dividend reductions or omissions persist across all time periods. That said, we cannot state with certitude that the observed abnormal returns are purely the result of random chance given the persistence of negative average values for the abnormal returns.

Next, motivated by the "pseudo market timing" hypothesis posited by Schultz (2003),[5] we investigate whether our results above are related to the condition of the stock market (i.e., bear or bull) when the dividend reduction or omission announcements were made. It may be the case that the probability of observing long-term underperformance following announcements made during bull (bear) markets is more (less) than 50% because of a likely reversal (rebound) in the market. Therefore, it follows that if the post-announcement first-year negative abnormal returns we find stem mainly from the dividend reductions or omissions in our sample that were made during bull markets, then our findings are not necessarily inconsistent with the efficient markets hypothesis. We find that the post-announcement first-year abnormal return generally remains statistically significantly negative following both bear and bull stock markets. Therefore, our results cannot be attributed to the condition of the stock market at the time of the dividend reduction or omission.

In our next analysis we examine the 1-year post-dividend-announcement drift in five subsamples classified according to the market value of the event firm relative to the distribution of the market values of all CRSP firms in the pre-event month. We find that the results are not robust for firms in the largest size quintile. We interpret this result as suggesting that if

[4] Buy-and-hold abnormal returns may have a skewed distribution, which makes the *t*-test biased.

[5] Schultz (2003) explains that the premise of the *pseudo market timing* hypothesis is that the more capital firms can raise by issuing a certain number of shares, the more likely they are to make an issue even if the market is efficient and managers have no ability to time it. As a result, equity offerings cluster at market peaks, and the probability of observing long-term under-performance ex-post in event time may far exceed 50%. Using simulations, he concludes that underperformance of more than 25% in the 5 years following an equity offering is not unusual in an efficient market.

post-dividend-announcement drift exists, it would most likely be found among smaller firms, in which case its economic significance would be small because the largest firms account for the bulk of trading volume (Boehme and Sorescu (2002)).

Throughout our analysis, the evidence obtained from the Fama–French three-factor model is consistently weakened by evidence from benchmark matching based on percentage change in earnings. As dividend reductions and omissions are often associated with deterioration in earnings performance, this suggests that the post-announcement negative price drift we find using the Fama–French three-factor model may be the post-earnings-announcement price drift first identified by Ball and Brown (1968) and confirmed more recently by Bernard and Thomas (1990) and Chan, Jegadeesh, and Lakonishok (1996). Consequently, we examine the robustness of the findings from the Fama–French three-factor model by controlling for the earnings performance of the dividend-reducing or -omitting firms. We create a rolling portfolio using the difference in the monthly returns between event and non-event firms with similar earnings performance. We find no significant abnormal returns from regressions of this rolling portfolio return on the Fama–French three factors. Our result indicates that firms that reduce or omit their dividend have the same post-event price drift as firms that have similar earnings performance but do not reduce or omit their dividend.

Finally, we perform cross-sectional regression analyses of the post-announcement first-year abnormal stock returns (estimated as buy-and-hold abnormal returns and as cumulative abnormal returns). We include in the model eight factors that are hypothesized or found in previous studies to be significant determinants of the dividend-change-induced announcement-period or post-announcement abnormal stock returns. The results show no clear or robust relation between the post-announcement abnormal return and any of the variables included in the regression model. Therefore, it does not appear that there is a simple empirical explanation for the negative post-announcement price drift that we report.

Overall, the results of our various robustness tests indicate that after controlling for the earnings performance of the dividend event firms and the skewness of the distribution of buy-and-hold abnormal returns, we find no compelling or convincing evidence of a post-dividend-reduction or post-dividend-omission price drift. Our findings suggest that investors do not exhibit cognitive biases in interpreting or assessing the information conveyed at announcements of dividend reductions and omissions (whatever it may be),[6] since their initial reaction, as measured by the 2-day announcement-period abnormal return, is

[6] The studies of Healy and Palepu (1988), DeAngelo, DeAngelo, and Skinner (1992), and Benartzi, Michaely, and Thaler (1997) indicate a consensus about a very strong correlation between dividend changes and changes in earnings performance in the year preceding and the year of the dividend change. However, the evidence on the relation between dividend changes and subsequent earnings changes is not conclusive (see Healy and Palepu (1988), Nissim and Ziv (2001), DeAngelo, DeAngelo, and Skinner (1992), DeAngelo, DeAngelo, and Skinner (1996), and Benartzi et al. (1997)).

not followed by a long-term abnormal return that is separate from the post-earnings-announcement abnormal return.

We believe that our paper's contribution to the literature is threefold. First, we examine dividend reductions and omissions, events that have not been examined since the publication of Fama's (1998) paper with its important framework for conducting research on long-term stock price performance following major corporate events. Our paper fills that gap in the literature and addresses Fama's (1998) criticisms of long-term event studies. Second, our sample of dividend reductions and omissions covers the period from 1927 through 1999, which provides evidence pertaining to periods that precede and follow the 1964 to1988 study period of Michaely et al. (1995). Third, we show that the post-dividend-announcement price drift is actually the well-documented post-earnings-announcement price drift (Ball and Brown (1968), Bernard and Thomas (1990), and Chan et al. (1996)).

The remainder of this paper is organized as follows. Section I describes the sample. Section II examines the post-announcement long-term abnormal stock return for the entire sample. Section III examines the persistence of this return in different subsamples. Section IV examines the relation between the post-dividend-announcement drift and the post-earnings-announcement drift. Section V presents the cross-sectional regression analysis of the abnormal returns. Section VI concludes the paper.

## I. Sample Selection and Description

We obtain announcements of cash dividend reductions and omissions by searching the stock master file of the Center for Research in Security Prices (CRSP) and Standard and Poor's COMPUSTAT PDE tapes for firms listed on the NYSE, AMEX, or NASDAQ system that reduced or omitted their regular cash dividend to their common shareholders during the period from January 1927 through December 1999. Firms from this list are included in the final sample if they meet the following screening criteria: (1) the announcing firm has sufficient data on the CRSP tape; (2) the cash dividend reduction or omission is either the first in the company's history or after continuous payments for at least 5 years; and (3) the announcement does not pertain to a regulated industry, to an American depository receipt (ADR), to a Canadian company, or to a firm undergoing liquidation or a merger. In addition, the sample of dividend omissions excludes announcements of stock dividends in lieu of cash dividends and dividend omissions following dividend cuts in the prior quarter. The resulting final sample consists of a total of 2,337 announcements (1,073 omissions and 1,264 reductions) from February 1927 through December 1999.

Table I presents the distribution of the sample announcements by calendar year. The announcements are not exactly evenly distributed over the 1927 to 1999 study period. However, the maximum number of events in any year is 141 (in 1931), which constitutes only 6.0% of the sample, and the distribution is consistent with the general performance of the U.S. economy. Note that our

**Table I**

## Chronological Distribution of the Sample of Cash Dividend Reductions or Omissions

The sample consists of 1,264 cases of cash dividend reduction and 1,073 cases of cash dividend omission, or a total of 2,337 cases. These cash dividend reductions or omissions correspond to the period from February 1927 to December 1999 by NYSE, AMEX, or NASDAQ listed firms with sufficient data on the database of the Center for Research in Security Prices (CRSP). All the cash dividend reduction or omission announcements in the sample are either the first in the company's history or after continuous payments for at least 5 years. None of the sample announcements pertains to an American depository receipt, a Canadian company, a firm undergoing liquidation or a merger, or a regulated industry. The sample excludes dividend omissions following dividend reductions in the earlier quarter and announcements of stock dividends in lieu of cash dividends.

| Year | Number of Events | Percent of Sample | Year | Number of Events | Percent of Sample | Year | Number of Events | Percent of Sample |
|---|---|---|---|---|---|---|---|---|
| 1927 | 14 | 0.6 | 1952 | 21 | 0.9 | 1977 | 30 | 1.3 |
| 1928 | 20 | 0.9 | 1953 | 23 | 1.0 | 1978 | 20 | 0.9 |
| 1929 | 14 | 0.6 | 1954 | 26 | 1.1 | 1979 | 39 | 1.7 |
| 1930 | 91 | 3.9 | 1955 | 11 | 0.5 | 1980 | 71 | 3.0 |
| 1931 | 141 | 6.0 | 1956 | 22 | 0.9 | 1981 | 46 | 2.0 |
| 1932 | 103 | 4.4 | 1957 | 75 | 3.2 | 1982 | 126 | 5.4 |
| 1933 | 18 | 0.8 | 1958 | 102 | 4.4 | 1983 | 43 | 1.8 |
| 1934 | 3 | 0.1 | 1959 | 10 | 0.4 | 1984 | 31 | 1.3 |
| 1935 | 4 | 0.2 | 1960 | 56 | 2.4 | 1985 | 30 | 1.3 |
| 1936 | 2 | 0.1 | 1961 | 41 | 1.8 | 1986 | 34 | 1.5 |
| 1937 | 6 | 0.3 | 1962 | 32 | 1.4 | 1987 | 17 | 0.7 |
| 1938 | 0 | 0.0 | 1963 | 43 | 1.8 | 1988 | 20 | 0.9 |
| 1939 | 5 | 0.2 | 1964 | 28 | 1.2 | 1989 | 21 | 0.9 |
| 1940 | 4 | 0.2 | 1965 | 20 | 0.9 | 1990 | 37 | 1.6 |
| 1941 | 10 | 0.4 | 1966 | 30 | 1.3 | 1991 | 52 | 2.2 |
| 1942 | 17 | 0.7 | 1967 | 30 | 1.3 | 1992 | 36 | 1.5 |
| 1943 | 3 | 0.1 | 1968 | 32 | 1.4 | 1993 | 16 | 0.7 |
| 1944 | 0 | 0.0 | 1969 | 53 | 2.3 | 1994 | 4 | 0.2 |
| 1945 | 1 | 0.0 | 1970 | 139 | 5.9 | 1995 | 11 | 0.5 |
| 1946 | 2 | 0.1 | 1971 | 96 | 4.1 | 1996 | 6 | 0.3 |
| 1947 | 9 | 0.4 | 1972 | 35 | 1.5 | 1997 | 5 | 0.2 |
| 1948 | 15 | 0.6 | 1973 | 26 | 1.1 | 1998 | 4 | 0.2 |
| 1949 | 30 | 1.3 | 1974 | 46 | 2.0 | 1999 | 10 | 0.4 |
| 1950 | 7 | 0.3 | 1975 | 73 | 3.1 | | | |
| 1951 | 21 | 0.9 | 1976 | 18 | 0.8 | | | |
| Total for all years | | | | | | | 2,337 | 100.0% |

73-year study period ensures that no one year or economic cycle dominates or biases our results.

Table II displays the industry representation of the sample. We find that 490 different four-digit Standard Industry Classification (SIC) industries are represented in the sample. As Panel A of Table II shows, the manufacturing sector represents about 73% of the announcements, but the distribution of the number of announcements per four-digit SIC industry, shown in Panel B of Table II, indicates that the maximum number of announcements in any one

**Table II**

## Industry Representation of the Sample of Cash Dividend Reductions or Omissions

This table examines whether the sample dividend events exhibit any industry clustering. The 2,337 cash dividend reduction or omission announcements in the sample represent 490 different nonregulated four-digit Standard Industry Classification (SIC) industries.

Panel A: Industry Representation of the Sample

| Industry | SIC codes | Number of events | Percent of sample |
|---|---|---|---|
| Mining | 1,000–1,499 | 121 | 5.2 |
| Construction | 1,500–1,999 | 34 | 1.5 |
| Manufacturing | 2,000–3,999 | 1,711 | 73.2 |
| Transportation | 4,000–4,999 | 143 | 6.1 |
| Wholesale trade | 5,000–5,199 | 51 | 2.2 |
| Retail trade | 5,200–5,999 | 179 | 7.7 |
| Services | 7,000–8,999 | 98 | 4.2 |
| Total | | 2,337 | 100.0% |

Panel B: Frequency Distribution of Number of Dividend Reductions or Omissions in a Four-Digit SIC Industry

| Number of dividend events in a 4-digit SIC industry | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of 4-digit SIC industries having the above number of dividend events | 171 | 76 | 48 | 44 | 23 | 21 | 22 | 18 | 8 | 11 | 8 | 6 | 1 | 7 | 5 | 1 |
| The above number of 4-digit SIC industries as a percent of the 490 sample industries | 34.9 | 15.5 | 9.8 | 9.0 | 4.7 | 4.3 | 4.5 | 3.7 | 1.6 | 2.2 | 1.6 | 1.2 | 0.2 | 1.4 | 1.0 | 0.2 |
| Number of dividend events in a 4-digit SIC industry | 17 | 19 | 20 | 21 | 22 | 24 | 25 | 27 | 28 | 30 | 31 | 32 | 49 | 51 | 58 | 68 |
| Number of 4-digit SIC industries having the above number of dividend events | 1 | 1 | 1 | 3 | 2 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| The above number of 4-digit SIC industries as a percent of the 490 sample industries | 0.2 | 0.2 | 0.2 | 0.6 | 0.4 | 0.2 | 0.4 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 | 0.2 |

four-digit SIC industry is 68, and that industry accounts for less than 3% of the sample.

## II. Post-announcement Long-Term Abnormal Return for the Entire Sample

### A. The Rolling Portfolio Method

We estimate the post-announcement long-term abnormal returns for the dividend-event firms using the rolling portfolio method, which Fama (1998) recommends and Loughran and Ritter (1995), Brav and Gompers (1997), and Boehme and Sorescu (2002) use. For every calendar month, we compute the equally and value-weighted returns on the portfolio, which contains all firms that reduced or omitted their dividend payment during the preceding 12, 24, or 36 calendar months. We then use the calendar-time event-portfolio returns in the following Fama and French (1993) three-factor model to estimate the abnormal return of the rolling portfolio:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t}, \qquad (1)$$

where $R_{p,t}$ represents the return on the event-portfolio in month $t$; $R_{f,t}$ is the 1-month U.S. Treasury bill rate in month $t$; $R_{m,t}$ is the return on the value-weighted index of NYSE, AMEX, and NASDAQ listed stocks in month $t$; $SMB_t$ is the difference between the returns on portfolios of small and big stocks (below or above the NYSE median value) with about the same weighted average book-to-market value of equity ratio in month $t$; and $HML_t$ is the difference between the returns on portfolios of high and low book-to-market value of equity ratio (above and below the 0.7 and 0.3 fractiles) with about the same weighted average size in month $t$. The intercept $\alpha_p$ is then interpreted as the average monthly abnormal return of the event portfolio across all 12, 24, or 36 months, as corresponds to the rolling portfolio.

Since the number of dividend-reducing or -omitting firms included in the rolling event portfolio changes over time, we use both the ordinary least squares (OLS) and the weighted least squares (WLS) methods to estimate the three-factor model's parameters, including the average monthly abnormal return $\alpha_p$. The weights we use in the WLS model are equal to the number of event firms in the monthly portfolio. Also, we compute the value-weighted returns using the market values of the firms in the rolling portfolio as of the end of the month before the event date as the weighting vector. We have 875 calendar month portfolio return observations, as the sampling period is from February 1927 through December 1999.

### B. Post-announcement Abnormal Stock Returns Using the Rolling Portfolio Method

Table III presents the post-announcement average abnormal monthly stock returns, which we estimate using the rolling portfolio returns and

**Table III**

## Post-announcement Average Abnormal Monthly Returns Estimated Using the Rolling Portfolio Method for Firms that Reduce or Omit Their Cash Dividend

This table reports the post-announcement average abnormal monthly returns ($\alpha_p$), which are estimated using the rolling portfolio method. For every month, the equally and value-weighted returns on the portfolio, which contains all firms that reduced or omitted their cash dividend payment during the preceding 12, 24, or 36 calendar months, are estimated. Then, the calendar-time event-portfolio returns are used in the following Fama and French (1993) three-factor model to estimate the portfolio's abnormal returns:

$$R_{p,t} - R_{f,t} = \alpha_p + \beta_p(R_{m,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t},$$

where $R_{p,t}$ represents the return on the event portfolio in month $t$; $R_{f,t}$ is the 1-month U.S. Treasury bill rate in month $t$; $R_{m,t}$ is the return on the value-weighted index of all NYSE, AMEX, and NASDAQ listed stocks in month $t$; $SMB_t$ is the difference between the returns on portfolios of small and big stocks (below or above the NYSE median value) with about the same weighted average book-to-market value of equity ratio in month $t$; and $HML_t$ is the difference between the returns on portfolios of high and low book-to-market value of equity ratio (above and below the 0.7 and 0.3 fractiles) with about the same weighted average size in month $t$. The intercept $\alpha_p$ is then interpreted as the average abnormal monthly return of the event portfolio across all 12, 24, or 36 months, as corresponds to the rolling portfolio. In the last three columns of this table, the post-announcement average abnormal monthly returns are estimated separately for post-event years 1, 2, and 3 to determine the duration of the announcements' effect. Equally and value-weighted calendar-time portfolio returns are computed each month for all firms that reduced or omitted their dividend in the previous 1 to 12, 13 to 24, and 25 to 36 calendar months. Since the number of firms included in the rolling event portfolio changes over time, both ordinary least squares (OLS) and weighted least squares (WLS) estimates of the intercept $\alpha_p$ are provided below. The weights used in the WLS model are equal to the number of event firms in the monthly portfolio. Also, the value-weighted returns are computed using the market values of the firms in the rolling portfolio as of the end of the month before the announcement date as the weighting vector. The sample consists of 2,337 cash dividend reduction or omission announcements made in the period from February 1927 through December 1999 (i.e., 875 calendar months). The statistical significance of each of the average abnormal monthly returns ($\alpha_p$) is tested using the parametric $t$-test. The null hypothesis tested is that the estimate of $\alpha_p$ is equal to zero. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively, in a two-tailed test.

| Event Portfolio Return | Parameter Estimation Method | Statistic | Post-announcement Period | | | Post-announcement Year | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 year | 2 years | 3 years | 1st year | 2nd year | 3rd year |
| Equally weighted | OLS | $\alpha_p$ (%) | −0.97 | −0.50 | −0.30 | −0.97 | 0.10 | 0.23 |
| | | $t$-statistic | −6.1*** | −3.7*** | −2.4** | −6.1*** | 0.7 | 1.5 |
| | WLS | $\alpha_p$ (%) | −0.72 | −0.31 | −0.17 | −0.72 | 0.11 | 0.14 |
| | | $t$-statistic | −5.8*** | −3.1*** | −1.9* | −5.8*** | 1.0 | 1.3 |
| Value weighted | OLS | $\alpha_p$ (%) | −0.86 | −0.30 | −0.20 | −0.86 | 0.29 | 0.05 |
| | | $t$-statistic | −4.3*** | −1.7* | −1.3 | −4.3*** | 1.7* | 0.3 |
| | WLS | $\alpha_p$ (%) | −0.59 | −0.18 | −0.11 | −0.59 | 0.24 | 0.02 |
| | | $t$-statistic | −3.9*** | −1.4 | −1.0 | −3.9*** | 1.7* | 0.2 |
| Number of observations (months) | | | 875 | 875 | 875 | 875 | 863 | 851 |

the Fama and French (1993) three-factor model. We present these abnormal stock returns for rolling periods that extend from 1 to 3 years and for post-event years 1, 2, and 3, separately, to determine the duration of the announcements' effect. As shown in Table III, we find statistically significant negative post-announcement abnormal stock returns to the dividend-reducing or -omitting firms. These abnormal returns are robust to the choice of equal- or value-weighting and the OLS or WLS estimation procedure. However, it is clear that the statistically significant abnormal returns are confined to the first post-announcement year only. The post-announcement first-year average monthly abnormal stock return is on a magnitude of between −0.59% and −0.97% (all significant at the 1% level). This range for the monthly abnormal return translates to −6.85% to −11.04% (compounded) for the entire first year.

### *C. The Matching Method*

The second method we use to compute the long-term abnormal stock return to a dividend-reducing or -omitting firm is to compare its stock price performance to that of a matched firm over a specified holding period. We use seven different matching criteria since the significance of the long-run abnormal returns may be sensitive to the matching criterion used (Fama (1998)). Our matching criteria are: (1) firm size, which we measure by the market value of the event firm as of 1 month before the announcement date, obtained from the CRSP database; (2) size and industry affiliation, which we determine by the two-digit SIC code of the event firm as indicated in the CRSP database; (3) size and prior common stock price performance, which we measure over the 1 year before the dividend event using the CRSP database; (4) industry affiliation and prior common stock price performance; (5) size and the book-to-market ratio, which we measure as of the end of the fiscal year prior to the announcement date using the COMPUSTAT database; (6) percentage change in earnings, which we measure by the percentage change in the income before extraordinary items during the dividend-event year relative to the previous year using the COMPUSTAT database; and (7) size and percentage change in earnings.

In addition to the obvious reasons for using firm size and industry affiliation, we use the prior stock price performance as one of the matching criteria because De Bondt and Thaler (1985, 1987), Fama and French (1988), Cutler, Poterba, and Summers (1991), Jegadeesh and Titman (1993), Chan et al. (1996), and Barber and Lyon (1997) report evidence that future returns can be predicted using past return and hence failing to control for it may lead to incorrect measurement of the post-announcement long-term abnormal return.[7] We also use

[7] De Bondt and Thaler (1985, 1987) find that portfolios of long-term past losers outperform long-term past winners over the subsequent 3 to 5 years. Fama and French (1988) and Cutler et al. (1991) find a negative autocorrelation over horizons of 3 to 5 years. Jegadeesh and Titman (1993) report that over an intermediate horizon of 3 to 12 months, past winners continue to outperform past losers. Chan et al. (1996) document the persistence, or momentum, of stock returns over

the ratio of book-to-market value of equity as one of the matching criteria because Fama and French (1992) find a significant positive relation between the expected return of a firm and its book-to-market ratio. As dividend changes can be preceded by significant changes in earnings, we use the percentage change in earnings as one of the matching criteria to control for any post-earnings-announcement price drift (Ball and Brown (1968), Bernard and Thomas (1990), and Chan et al. (1996)).

For the size and prior common stock price performance matching criterion, we select the matched firm as the one with the closest prior common stock price performance from the list of non-event firms whose market value of equity as of 1 month before the announcement date is between 60% and 140% of the market value of equity of the event firm. Similarly, for the size and book-to-market ratio-matching criterion, we select the matched firm as the one with the closest book-to-market ratio from the list of non-event firms whose market value of equity as of 1 month before the announcement date is between 60% and 140% of the market value of equity of the event firm. None of the matched firms omitted or reduced their dividend during the period from 3 years before to 3 years after the event date, and for all seven matching criteria, each matched firm is listed on the same stock exchange as the corresponding event firm. When a matched firm is delisted before the end of the holding period, the next-best matched firm is substituted on the delisting date. The sample of cash dividend reduction or omission announcements that is used to compute the long-term abnormal returns using the matching method consists of 1,351 cases and covers the period July 1963 through December 1999, because both the COMPUSTAT database, which is the source of the data for the last three matching criteria, and the CRSP daily return database do not go back earlier than 1962.

Table IV summarizes the outcome of our procedure for matching the dividend-reducing or -omitting firms with non-event benchmark firms based on the seven matching criteria above. The event firms and the matched firms have very comparable mean values for the criteria upon which they are matched, a fact that indicates the general success of our matching procedure. However, the dividend-event firms and the matched firms often have very divergent mean values for the criteria on which they are not matched. For example, the average size of the matched firms is almost twice as large as the average size of the event firms in the case of matching by industry and prior stock price performance. Clearly, Table IV underscores the need to examine the long-term abnormal returns using all seven matching criteria as a robustness test.

the horizon of 6 months to a year. Also, using simulation for the period 1973 to 1994, Barber and Lyon (1997) show that for firms with high pre-event momentum, conventional $t$-tests are positively biased for the 1-year horizon, and negatively biased for the 3- and 5-year horizons. For firms with low pre-event momentum, conventional $t$-tests are negatively biased for the 1-year horizon, but positively biased for 3-year horizon. The implication of the study of Barber and Lyon (1997) is that the post-announcement abnormal return might be caused by pre-announcement abnormal return, explained by either mean-reversion or underreaction.

**Table IV**
**Mean Values of Matching Criteria for the Dividend-Event Firms and the Matched Firms**

This table examines the success of the procedures used in this paper to match the event firms with non-event firms according to the following seven sets of matching criteria: (1) firm size (which is measured by the market value of the event firm as of 1 month before the announcement date and obtained from the CRSP database); (2) size and industry affiliation (which is determined by the two-digit Standard Industry Classification code of the event firm as indicated in the CRSP database); (3) size and prior common stock price performance (which is measured over 1 year before the dividend event using the CRSP database); (4) industry affiliation and prior common stock price performance; (5) size and ratio of book to market value of equity (which is measured as of the end of the fiscal year prior to the announcement date using the COMPUSTAT database); (6) percentage change in earnings (which is measured as the percentage change in the income before extraordinary items during the dividend-event year relative to the prior year using the COMPUSTAT database); and (7) size and percentage change in earnings. The matched firms did not omit or cut their dividend during the period from 3 years before to 3 years after the dividend-event date. For all seven matching criteria, each matched firm is listed on the same stock exchange as the corresponding event firm. For the size and prior common stock price performance-matching criterion, the matched firm is selected by first identifying non-event firms whose market value of equity as of 1 month before the announcement date is between 60% and 140% of the market value of equity of the event firm. Then from this set, the firm with the closest prior common stock price performance is selected as the matched firm. For the size and book-to-market ratio and for the size and percentage change in earnings matching criteria, the same procedure is followed. When a matched firm is delisted before the end of the holding period, the next-best matched firm is substituted on the delisting date. The sample of cash dividend reduction or omission announcements that is used to compute the long-term buy-and-hold abnormal returns consists of 1,351 cases and covers the period from July 1963 through December 1999. The reason for this shorter study period in the case of the matching method is that the COMPUSTAT database (which is the source of the data for the last three matching criteria) and the CRSP daily return database do not go back earlier than 1962.

| | | | Mean values of matching criteria | | | |
|---|---|---|---|---|---|---|
| Matching criteria | Number of observations | Group of firms | Size ($ million) | Prior stock performance (%) | Ratio of book-to-market value | Percent change in earnings |
| Size | 1,351 | Event firms | 258.94 | −24.22 | 1.22 | −2.26 |
| | | Matched firms | 259.53 | 16.56 | 0.88 | 0.20 |
| Size and industry | 1,350 | Event firms | 263.62 | −24.47 | 1.22 | −2.50 |
| | | Matched firms | 230.35 | 10.59 | 0.99 | −0.29 |
| Size and performance | 1,333 | Event firms | 259.60 | −24.48 | 1.22 | −2.10 |
| | | Matched firms | 241.60 | −24.13 | 0.88 | −0.45 |
| Industry and performance | 1,334 | Event firms | 261.09 | −24.89 | 1.21 | −2.24 |
| | | Matched firms | 444.99 | −23.28 | 1.00 | −0.08 |
| Size and book–market ratio | 1,023 | Event firms | 284.79 | −24.80 | 1.24 | −2.37 |
| | | Matched firms | 225.69 | 11.59 | 1.25 | 0.53 |
| Earnings | 1,082 | Event firms | 256.47 | −24.54 | 1.22 | −2.40 |
| | | Matched firms | 395.90 | −1.44 | 1.08 | −2.09 |
| Size and earnings | 1,081 | Event firms | 269.52 | −24.20 | 1.24 | −2.25 |
| | | Matched firms | 231.80 | 3.95 | 0.88 | −1.71 |

After matching the dividend-event firms with non-event benchmark firms, we follow the prescription of Barber and Lyon (1997) and calculate the holding period abnormal return for a firm as: $BHAR_{(i,a,b)} = \prod^{b}_{t=a}(R_{it} + 1) - \prod^{b}_{t=a}(R_{mt} + 1)$, where $BHAR_{(i,a,b)}$ is the buy-and-hold abnormal return for event firm $i$ over the holding period from $a$ to $b$, $R_{it}$ is the return on stock $i$ on day $t$, and $R_{mt}$ is the return on the matched firm on day $t$.[8] We compute the buy-and-hold average abnormal returns (BHAAR) over holding periods that extend from 1 to 3 years. We also calculate BHAAR for each individual year in the 3-year period following the event because Fama (1998) and Mitchell and Stafford (2000) argue correctly that buy-and-hold abnormal returns can give a false impression of the speed of price adjustment to an event since they can grow with the return horizon even when there is no abnormal return after the first period. None of the buy-and-hold periods include the announcement day of the dividend reduction or omission or the following trading day. If an event firm is delisted before the end of a holding period, we include its truncated return series in the analysis, and we assume that it earns the daily return of the benchmark firm during the remaining days in the holding period. We determine the statistical significance of each of the BHAARs using the parametric $t$-test (two-tailed) and the nonparametric Wilcoxon signed-rank test (two-tailed). This latter test is unaffected by the problem of skewness of the distribution of BHARs.

### *D. Post-announcement Abnormal Stock Returns Using the Matching Method*

Table V presents the post-announcement buy-and-hold average abnormal common stock returns using the matching method. Consistent with the results obtained from the rolling portfolio method, we find that the abnormal returns last 1 year only and have a range of −5.89% to −14.52%, which is comparable to the range obtained using the rolling portfolio method (i.e., −6.85% to −11.04%). These abnormal returns are statistically significant at the 5% level or better based on the $t$-test for all seven matching criteria. However, using the nonparametric Wilcoxon signed-rank test, the abnormal returns estimated by benchmark matching with prior earnings performance (only or with firm size) are statistically insignificant at conventional levels. This latter result suggests that after controlling for the post-earnings-announcement drift and accounting for the skewness of the distribution of buy-and-hold abnormal returns, there is no compelling evidence of a significant post-dividend-reduction or post-dividend-omission drift.

## III. Post-announcement Long-Term Abnormal Return in Different Subsamples

### *A. Dividend Reductions versus Omissions*

Michaely et al. (1995) examine dividend omissions but not reductions. Christie (1994) reports that dividend omissions are associated

[8] Barber and Lyon (1997) recommend using buy-and-hold abnormal returns. We also perform the tests using monthly CARs and find similar results to those reported for the BHARs.

**Table V**

## Post-announcement Long-Term Buy-and-Hold Average Abnormal Returns Estimated Using the Matching Method for Firms that Reduce or Omit Their Cash Dividend

This table reports the long-term buy-and-hold average abnormal common stock returns (BHAAR) over holding periods that extend from 1 to 3 years following cash dividend reduction or omission announcements. It also reports the buy-and-hold average abnormal returns for each year during the 3-year period following the announcements. The reason for this latter examination is the argument of Mitchell and Stafford (2000) and Fama (1998) that buy-and-hold abnormal returns can give a false impression of the speed of the price adjustment to an event, because they can grow with the return horizon even when there is no abnormal return after the first period. The buy-and-hold abnormal return (BHAR) for each event firm is calculated in this table as

$$BHAR_{i,a,b} = \prod_{t=a}^{b}(R_{it}+1) - \prod_{t=a}^{b}(R_{mt}+1),$$

where $ER_{(i,a,b)}$ = Excess return for event firm $i$ over the time period from day $a$ to day $b$, $R_{it}$ is the return on the common stock of event firm $i$ on day $t$, and $R_{mt}$ is the return on the stock of the matched firm on day $t$. Matched firms are selected using the following sets of matching criteria: (1) firm size; (2) size and industry affiliation; (3) size and prior stock price performance; (4) industry affiliation and prior stock price performance; (5) size and ratio of book to market value of equity; (6) percentage change in earnings; and (7) size and percentage change in earnings. The post-announcement long-term abnormal returns do not include the abnormal returns over days −1 through 0 relative to the announcement date. If an event firm is delisted before the end of a buy-and-hold period, its truncated return series is still included in the analysis, and it is assumed to earn the daily return of the benchmark for the remainder of the period. The statistical significance of each of the BHAARs is tested using the parametric $t$-test, based on the cross-sectional standard deviations. The null hypothesis tested is that the BHAAR is equal to zero. The nonparametric Wilcoxon signed-rank test is also used in case of any skewness in the distribution of the BHARs. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively, in a two-tailed test.

| Matching criteria | Number of observations | Statistic | Post-Announcement Buy-and-Hold Period | | | Post-Announcement Buy-and-Hold Year | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 year | 2 years | 3 years | 1st year | 2nd year | 3rd year |
| Size | 1,351 | BHAAR (%) | −14.52 | −16.80 | −23.68 | −14.52 | 0.60 | 1.13 |
| | | *t*-statistic | −6.0*** | −4.2*** | −4.2*** | −6.0*** | 0.3 | 0.6 |
| | | *W*-test *p*-value (%) | 0.0 | 0.0 | 0.0 | 0.0 | 94.3 | 90.4 |
| Size and industry | 1,350 | BHAAR (%) | −10.66 | −12.64 | −19.34 | −10.66 | 0.63 | −0.61 |
| | | *t*-statistic | −5.4*** | −3.4*** | −4.0*** | −5.4*** | 0.4 | −0.3 |
| | | *W*-test *p*-value (%) | 0.0 | 0.1 | 0.2 | 0.0 | 97.3 | 42.8 |
| Size and performance | 1,333 | BHAAR (%) | −10.79 | −14.20 | −16.56 | −10.79 | −1.01 | 0.41 |
| | | *t*-statistic | −4.7*** | −3.7*** | −3.4*** | −4.7*** | −0.5 | 0.2 |
| | | *W*-test *p*-value (%) | 0.0 | 0.0 | 2.7 | 0.0 | 76.0 | 32.7 |
| Industry and performance | 1,334 | BHAAR (%) | −9.01 | −10.04 | −17.30 | −9.01 | 0.35 | −1.43 |
| | | *t*-statistic | −4.4*** | −2.8*** | −3.6*** | −4.4*** | 0.2 | −0.7 |
| | | *W*-test *p*-value (%) | 0.1 | 5.9 | 4.3 | 0.1 | 41.9 | 47.0 |
| Size and book–market ratio | 1,023 | BHAAR (%) | −10.34 | −17.10 | −18.95 | −10.34 | −3.30 | 1.61 |
| | | *t*-statistic | −4.2*** | −4.8*** | −4.2*** | −4.2*** | −1.6 | 0.8 |
| | | *W*-test *p*-value (%) | 0.0 | 0.0 | 0.0 | 0.0 | 5.3 | 75.4 |
| Earnings | 1,082 | BHAAR (%) | −9.12 | −10.25 | −13.30 | −9.12 | −2.07 | −0.48 |
| | | *t*-statistic | −3.3*** | −2.3** | −2.6*** | −3.3*** | −0.7 | −0.2 |
| | | *W*-test *p*-value (%) | 18.1 | 27.1 | 13.6 | 18.1 | 57.3 | 86.6 |
| Size and earnings | 1,081 | BHAAR (%) | −5.89 | −5.73 | −10.85 | −5.89 | −0.43 | −0.58 |
| | | *t*-statistic | −2.2** | −1.6 | −2.1** | −2.2** | −0.2 | −0.3 |
| | | *W*-test *p*-value (%) | 50.1 | 61.9 | 63.6 | 50.1 | 77.7 | 96.8 |

with announcement-period abnormal returns that are smaller in magnitude than would be predicted based on patterns estimated across reductions of less than 100%. For these reasons, we examine dividend reductions and omissions separately to determine whether differences manifest in their long-term abnormal returns. Panel A of Table VI reports results using the rolling portfolio method; Panel B reports results using the matching method.

Using the rolling portfolio method, we find statistically significant abnormal stock returns following both reductions and omissions. These abnormal returns are again confined to the first year following the dividend event. The abnormal returns in the subsample of dividend omissions are larger in absolute terms than those for reductions ranging between −9.08% and −12.32% for the year compared to a range of −6.07% to −10.50% for dividend reductions.

Similarly, in Panel B, the BHAARs for the subsample of dividend omissions are larger in absolute terms. The BHAARs for omissions range from −9.13% to −19.42% compared to a range of −2.91% to −9.69% for the subsample of reductions. The abnormal stock returns following omissions appear robust to changing the matching criteria, as all are statistically significant at the 5% level using the parametric *t*-test.[9] However, results for omissions matched by size and earnings are not statistically significant at the 10% level using the nonparametric Wilcoxon signed-rank test. The BHAARs for the subsample of reductions are statistically significant across matching criteria with the exception of matching by earnings (by itself or with size).

### *B. Sampling Period*

We examine whether the negative price drift following announcements of dividend reductions and omissions is confined to certain subperiods in our 73-year study period. The motivation for this examination is fourfold. First, Michaely et al. (1995) report a stock price underreaction to dividend initiation and omission announcements made over the 1964 to 1988 period. However, Boehme and Sorescu (2002) report no evidence of any abnormal price drift following announcements of dividend initiations or resumptions made prior to 1964. Second, Fama (1998) argues that observing an equally frequent occurrence of underreactions and overreactions to a specific corporate event would be indicative of random chance and consistent with the efficient markets hypothesis. Third, it may be possible that this mispricing existed in earlier periods, was recognized by investors, and has since disappeared. Fourth, it may be that increased transparency, wider and faster diffusion of information, decreased transaction costs, and improved regulation and oversight have led to an increase in the efficiency of the capital markets, in which case we would observe the post-announcement abnormal returns diminishing over time.

[9] We can compare these results to those of Michaely et al. (1995). Specifically, with reference to Table VII on page 597 of their paper, they report an average industry-and-size adjusted excess return of −14.7% during the first year following dividend omissions. We find that it is −15.03% in our sample. Therefore, we have very similar estimates.

**Table VI**

## Post-announcement Average Abnormal Returns Estimated Using the Rolling Portfolio and the Matching Methods for Firms that Reduce Their Cash Dividend and for Firms that Omit Their Cash Dividend

This table examines whether the reported post-announcement long-term abnormal returns are confined to the sub-sample of 1,264 cash dividend reductions (681 in the case of the matching method) or the subsample of 1,073 cash dividend omissions (670 in the case of the matching method). The sample reductions are not a monotone continuation of dividend omissions. Specifically, there are only four cases of dividend reductions that exceed 80% (the average reduction is 45%). [N] denotes the number of observations for both a two-tailed $t$-test and Wilcoxon signed-rank test. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Panel A: Post-announcement First- and Second-Year Average Abnormal Monthly Returns ($\alpha_p$)

| Event portfolio return | Parameter estimation method | Statistic | Dividend reductions | | Dividend omissions | |
|---|---|---|---|---|---|---|
| | | | 1st year | 2nd year | 1st year | 2nd year |
| Equally weighted | OLS | Estimate of $\alpha_p$ (%) | −0.92 | 0.13 | −1.03 | 0.15 |
| | | $t$-statistic | −5.0*** | 0.7 | −4.7*** | 0.7 |
| | WLS | Estimate of $\alpha_p$ (%) | −0.59 | 0.06 | −0.84 | 0.15 |
| | | $t$-statistic | −4.7*** | 0.6 | −5.0*** | 0.9 |
| Value weighted | OLS | Estimate of $\alpha_p$ (%) | −0.80 | 0.36 | −1.09 | 0.30 |
| | | $t$-statistic | −3.7*** | 1.9* | −4.2*** | 1.2 |
| | WLS | Estimate of $\alpha_p$ (%) | −0.52 | 0.20 | −0.79 | 0.14 |
| | | $t$-statistic | −3.5*** | 1.4 | −3.7*** | 0.7 |
| Number of observations (months) | | | 875 | 863 | 875 | 863 |

(*continued*)

**Table VI**—*Continued*

Panel B: Post-announcement First- and Second-Year Buy-and-Hold Average Abnormal Returns (BHAAR)

| Matching criteria | Statistic | Dividend reductions | | Dividend omissions | |
|---|---|---|---|---|---|
| | | 1st year | 2nd year | 1st year | 2nd year |
| Firm size | BHAAR (%) | −9.69 | −1.29 | −19.42 | 2.52 |
| | *t*-statistic | −3.6*** | −0.6 | −4.9*** | 0.8 |
| | *W*-test *p*-value (%) [N] | 1.6[681] | [681] | 0.0[670] | [670] |
| Size and industry affiliation | BHAAR (%) | −6.37 | −2.36 | −15.03 | 3.67 |
| | *t*-statistic | −2.8*** | −1.1 | −4.6*** | 1.2 |
| | *W*-test *p*-value (%) [N] | 7.0[681] | [681] | 0.0[669] | [669] |
| Size and prior stock performance | BHAAR (%) | −8.30 | 0.04 | −13.35 | −2.08 |
| | *t*-statistic | −3.1*** | 0.0 | −3.6*** | −0.6 |
| | *W*-test *p*-value (%) [N] | 3.3[676] | [676] | 0.6[657] | [657] |
| Industry and prior stock performance | BHAAR (%) | −8.47 | 2.61 | −9.56 | −1.97 |
| | *t*-statistic | −3.2*** | 1.2 | −3.1*** | −0.6 |
| | *W*-test *p*-value (%) [N] | 4.5[676] | [676] | 0.6[658] | [658] |
| Size and ratio of book-to-market value | BHAAR (%) | −5.98 | −3.79 | −15.26 | −2.75 |
| | *t*-statistic | −2.2** | −1.5 | −3.6*** | −0.8 |
| | *W*-test *p*-value (%) [N] | 3.0[543] | [543] | 0.0[480] | [480] |
| Percentage change in earnings | BHAAR (%) | −3.88 | −5.56 | −14.80 | 1.70 |
| | *t*-statistic | −1.4 | −1.4 | −3.0*** | 0.7 |
| | *W*-test *p*-value (%) [N] | 99.8[563] | [563] | 6.2[519] | [519] |
| Size and percentage change in earnings | BHAAR (%) | −2.91 | −2.61 | −9.13 | 1.94 |
| | *t*-statistic | −1.0 | −1.0 | −2.1** | 0.4 |
| | *W*-test *p*-value (%) [N] | 49.0[563] | [563] | 11.8[518] | [518] |

In Table VII, we split the sample into seven consecutive subsampling periods and we examine the post-announcement first-year average abnormal return in each period for the dividend-reducing or -omitting firms. We focus on the first-year abnormal returns because we show earlier that the price drift is confined to the first post-announcement year. Because the COMPUSTAT database and the CRSP daily return database do not provide data for years prior to 1962, we have no results for periods prior to 1963 using the matching method.

The results for the rolling portfolios are reported in Panel A of Table VII. The signs for the abnormal returns in Panel A are all negative, which is not consistent with random chance. The results also indicate that the pricing anomaly that Michaely et al. (1995) report for omission announcements made over the 1964 to 1988 period manifest in "out-of-sample" periods, that is, before 1963 and after 1990. However, our three-factor model results are not robust during the 1970 to 1979 period, with three out of the four estimates of the model recording statistically insignificant abnormal returns.

The buy-and-hold results reported in Panel B are, with two exceptions, negative across time periods and matching criteria; however, the evidence for a time-persistent pricing anomaly is inconsistent in general, and is unsupported when firms are matched based on earnings. We find that the statistical significance of the abnormal performance is not robust across matching criteria for the 1990 to 1999 period with regard to the parametric $t$-test and/or the nonparametric Wilcoxon signed-rank test. When we match by prior earnings performance (by itself or with size), we find no evidence of significant post-dividend-event drift during the 1960s, and during the 1970s the abnormal return turns positive although statistically insignificant.

Collectively, the results reported in Table VII provide no compelling evidence of a significant pricing anomaly that persists across all of our contiguous time periods. However, the evidence does not allow us to conclude with certitude that the long-term abnormal return is purely the result of random chance.

### *C. Stock Market Condition*

Schultz (2003) argues that observing long-term abnormal stock returns following corporate events that cluster at stock market peaks (or stock market bottoms as a corollary) is not unusual in an efficient market. Our sample of dividend reductions or omissions exhibits some clustering around periods of slow economic activity, which should coincide with bear markets. It is therefore possible that our post-announcement long-term abnormal returns are the result of clustering in time. For this reason, we examine the long-term abnormal returns in two subsamples defined by the condition of the stock market in the month of the dividend announcement, that is, bear or bull. Similar to Kim and Zumwalt (1979), we define a bear (bull) market month as one during which the return on the value-weighted CRSP index is lower (higher) than the 1-month U.S. Treasury bill rate. We hypothesize that the probability of observing long-term underperformance following announcements made during bear markets

**Table VII**

## Post-announcement First-Year Average Abnormal Monthly Returns and Buy-and-Hold Average Abnormal Returns for Firms that Reduce or Omit Their Cash Dividend during Different Decades

This table examines whether the reported post-announcement price drifts are confined to specific subsample periods. This examination is motivated by Boehme and Sorescu's (2002) finding that there is no abnormal price drift for the period prior to 1964 in their sample of dividend initiations and resumptions. The sample in Panel A consists of 2,337 announcements made in the period from February 1927 through December 1999. The sample in Panel B consists of 1,351 announcements made in the period from July 1963 through December 1999. [N] denotes the number of observations for both a two-tailed $t$-test and Wilcoxon signed-rank test. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively.

Panel A: Post-announcement First-Year Average Abnormal Monthly Returns ($\alpha_p$)

| Event portfolio return | Parameter estimation method | Statistic | Period of dividend reduction or omission announcement | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 27–39 | 40–49 | 50—59 | 60–69 | 70–79 | 80–89 | 90–99 |
| Equally weighted | OLS | Estimate of $\alpha_p$ (%) | −1.28 | −1.05 | −1.32 | −1.03 | −0.80 | −0.97 | −1.37 |
| | | $t$-statistic | −2.7*** | −2.9*** | −5.4*** | −3.4*** | −2.7*** | −3.3*** | −2.3** |
| | WLS | Estimate of $\alpha_p$ (%) | −0.82 | −1.11 | −1.60 | −0.87 | −0.28 | −0.90 | −1.09 |
| | | $t$-statistic | −3.0*** | −3.7*** | −8.5*** | −3.8*** | −1.1 | −3.5*** | −2.4** |
| Value weighted | OLS | Estimate of $\alpha_p$ (%) | −1.28 | −0.76 | −1.11 | −1.25 | −0.61 | −0.84 | −1.80 |
| | | $t$-statistic | −2.7*** | −2.0** | −4.1*** | −3.4*** | −1.3 | −1.8* | −1.9* |
| | WLS | Estimate of $\alpha_p$ (%) | −0.73 | −0.68 | −1.14 | −0.98 | −0.12 | −1.12 | −1.43 |
| | | $t$-statistic | −2.3** | −2.0** | −4.8*** | −3.3*** | −0.3 | −2.7*** | −2.1** |
| Number of observations (months) | | | 155 | 120 | 120 | 120 | 120 | 120 | 120 |

(*continued*)

**Table VII**—*Continued*

| Panel B: Post-announcement First-Year Buy-and-Hold Average Abnormal Returns (BHAAR) | | | | | |
|---|---|---|---|---|---|
| Matching criteria | Statistic | Period of dividend reduction or omission announcement | | | |
| | | 63–69 | 70–79 | 80–89 | 90–99 |
| Firm size | BHAAR (%) | −19.80 | −10.56 | −14.74 | −19.30 |
| | *t*-statistic | −2.6*** | −3.3*** | −4.3*** | −2.0** |
| | *W*-test *p*-value (%) [N] | 0.3[209] | 0.8[522] | 0.0[439] | 6.4[181] |
| Size and industry affiliation | BHAAR (%) | −13.94 | −5.63 | −16.80 | −6.51 |
| | *t*-statistic | −2.4** | −2.0** | −4.6*** | −1.2 |
| | *W*-test *p*-value (%) [N] | 2.0[208] | 6.9[522] | 0.0[439] | 40.0[181] |
| Size and prior stock performance | BHAAR (%) | −20.78 | −7.09 | −9.17 | −13.92 |
| | *t*-statistic | −2.6*** | −2.4** | −2.5** | −1.8* |
| | *W*-test *p*-value (%) [N] | 5.4[204] | 10.2[511] | 7.3[438] | 10.1[180] |
| Industry and prior stock performance | BHAAR (%) | −3.77 | −6.18 | −17.34 | −2.72 |
| | *t*-statistic | −0.9 | −2.1** | −4.3*** | −0.4 |
| | *W*-test *p*-value (%) [N] | 29.8[203] | 15.1[513] | 0.0[438] | 96.9[180] |
| Size and ratio of book-to-market value | BHAAR (%) | −20.46 | −6.99 | −11.10 | −12.78 |
| | *t*-statistic | −2.6*** | −2.4** | −2.7*** | −1.3 |
| | *W*-test *p*-value (%) [N] | 0.1[76] | 1.4[427] | 0.7[364] | 18.9[156] |
| Percentage change in earnings | BHAAR (%) | −8.49 | 1.39 | −14.69 | −26.52 |
| | *t*-statistic | −1.5 | 0.4 | −2.9*** | −2.2** |
| | *W*-test *p*-value (%) [N] | 44.7[139] | 13.2[433] | 10.5[358] | 1.7[152] |
| Size and percentage change in earnings | BHAAR (%) | −1.70 | 1.87 | −10.27 | −21.50 |
| | *t*-statistic | −0.3 | 0.7 | −2.2** | −1.8* |
| | *W*-test *p*-value (%) [N] | 61.6[138] | 52.5[433] | 25.3[358] | 16.2[152] |

is less than 50% because of a likely rebound in the stock market; in contrast, the probability of observing long-term underperformance following announcements made during bull markets is more than 50% because of a possible reversal in the market.

Table VIII reports the post-announcement first-year abnormal stock price performance in each subsample. The post-announcement first-year average monthly abnormal returns obtained from the Fama and French (1993) three-factor model are all negative and statistically significant at the 1% level in both subsamples. The buy-and-hold abnormal returns (BHAARs) are also all negative in both subsamples and statistically significant at conventional levels using the *t*-test and the Wilcoxon test, except in the case of matching based on the earnings change. When benchmarked by size and earnings, the average abnormal return is insignificant in bear markets using the *t*-test. Moreover, the abnormal returns are insignificant under the Wilcoxon signed-rank test when benchmarked by percentage change in earnings (by itself or with size). Overall, these results are not consistent with the predictions of the above hypothesis, which means that an argument similar to Schultz (2003) cannot be used to explain the post-announcement abnormal returns we find.

### *D. Firm Size*

Using the CRSP database, we determine that firms in the top CRSP size quintile account for about 78% of the market capitalization of all NYSE, AMEX, and NASDAQ listed firms in 2001.[10] It follows that if the post-dividend-event price drift is confined to the other CRSP size quintiles, then its economic significance must be small. Boehme and Sorescu (2002) report that the long-term price drifts that they find for the post-1964 period in their sample of dividend initiations or resumptions are confined to smaller firms. Moreover, Fama (1998) argues that many long-run anomalies are concentrated on small-sized firms because current asset pricing models work poorly for small stocks.

To explore this issue, we split our sample into five subsamples or size quintiles according to the market value of the dividend-event firm, as of the end of the month before the announcement date, relative to the distribution of the market value of all CRSP listed firms in that month. We then examine the post-announcement first-year average abnormal monthly returns and the buy-and-hold abnormal returns for each subsample. Table IX reports the results for the different market capitalization quintiles.

Panel A of Table IX presents the average abnormal monthly returns from the rolling portfolio method. In all size quintiles, the average abnormal monthly returns are negative and, with one exception, statistically significant at conventional levels. The −0.27% figure for the fifth size quintile using equally weighted portfolio returns is statistically insignificant at conventional levels.

[10] The five size quintiles represent, respectively, 77.95%, 13.8%, 6.14%, 1.78%, and 0.32% of the total market capitalization of all firms on CRSP as of the end of 2001.

**Table VIII**

## Post-announcement First-Year Average Abnormal Monthly Returns and Buy-and-Hold Average Abnormal Returns for Firms that Reduce or Omit Their Cash Dividend during Bear versus Bull Stock Markets

This table examines the post-announcement abnormal returns of the dividend-event firms in two subsamples defined by the stock market condition during the announcement month. This examination is motivated by the argument that the probability of observing long-term underperformance following announcements made during bull (bear) markets may be more (less) than 50% because of a likely reversal (rebound) in the market. A month is considered a bear market month if the stock market return (measured using the value-weighted CRSP index) during that month is lower than the risk-free rate (measured by the rate on the 1-month U.S. Treasury bill). [N] denotes the number of observations for both a two-tailed $t$-test and Wilcoxon signed-rank test. $^{***}$, $^{**}$, and $^{*}$ denote significance at the 1, 5, and 10% levels, respectively.

Panel A: Post-announcement First-Year Average Abnormal Monthly Returns ($\alpha_p$)

| Event Portfolio return | Parameter estimation method | Statistic | Bear stock market | Bull stock market |
|---|---|---|---|---|
| Equally weighted | OLS | Estimate of $\alpha_p$ (%) | −0.82 | −1.05 |
| | | $t$-statistic | $-4.0^{***}$ | $-5.0^{***}$ |
| | WLS | Estimate of $\alpha_p$ (%) | −0.69 | −0.73 |
| | | $t$-statistic | $-4.2^{***}$ | $-5.6^{***}$ |
| Value weighted | OLS | Estimate of $\alpha_p$ (%) | −0.74 | −0.97 |
| | | $t$-statistic | $-2.9^{***}$ | $-3.9^{***}$ |
| | WLS | Estimate of $\alpha_p$ (%) | −0.62 | −0.60 |
| | | $t$-statistic | $-3.2^{***}$ | $-3.6^{***}$ |
| Number of observations (months) | | | 868 | 875 |

(*continued*)

**Table VIII**—*Continued*

| Panel B: Post-announcement First-Year Buy-and-Hold Average Abnormal Returns (BHAAR) | | | |
|---|---|---|---|
| Matching criteria | Statistic | Bear stock market | Bull stock market |
| Firm size | BHAAR (%) | −19.36 | −11.19 |
| | *t*-statistic | −4.2*** | −4.4*** |
| | *W*-test *p*-value (%) [N] | 0.0[551] | 0.0[800] |
| Size and industry affiliation | BHAAR (%) | −11.08 | −10.37 |
| | *t*-statistic | −3.4*** | −4.2*** |
| | *W*-test *p*-value (%) [N] | 0.2[551] | 0.0[799] |
| Size and prior stock performance | BHAAR (%) | −15.48 | −7.56 |
| | *t*-statistic | −3.9*** | −2.8*** |
| | *W*-test *p*-value (%) [N] | 0.2[544] | 6.6[789] |
| Industry and prior stock performance | BHAAR (%) | −8.64 | −9.26 |
| | *t*-statistic | −2.9*** | −3.4*** |
| | *W*-test *p*-value (%) [N] | 1.5[545] | 1.6[789] |
| Size and ratio of book-to-market value | BHAAR (%) | −9.67 | −10.85 |
| | *t*-statistic | −2.9*** | −3.1*** |
| | *W*-test *p*-value (%) [N] | 0.1[443] | 0.2[580] |
| Percentage change in earnings | BHAAR (%) | −9.38 | −8.93 |
| | *t*-statistic | −2.3** | −2.3** |
| | *W*-test *p*-value (%) [N] | 49.6[458] | 23.9[624] |
| Size and percentage change in earnings | BHAAR (%) | −4.44 | −6.95 |
| | *t*-statistic | −1.3 | −1.8* |
| | *W*-test *p*-value (%) [N] | 44.7[458] | 81.7[623] |

**Table IX**

## Post-announcement First-Year Average Abnormal Monthly Returns and Buy-and-Hold Average Abnormal Returns for Firms that Reduce or Omit Their Cash Dividend in Subsamples Defined by Firm Size

This table examines the post-announcement abnormal returns of the dividend-event firms in five size quintiles, defined by the market value of the event firm as of the end of the month before the announcement date relative to the size distribution of all CRSP listed firms in that month. This examination is motivated by Boehme and Sorescu's (2002) finding that long-term price drifts following dividend initiations and resumptions are confined to smaller firms. The sample in Panel A consists of 2,337 announcements. The sample in Panel B consists of 1,351 announcements. [N] denotes the number of observations for both a two-tailed $t$-test and Wilcoxon signed-rank test. ***, **, and ** denote significance at the 1, 5, and 10% levels, respectively.

Panel A: Post-announcement First-Year Average Abnormal Monthly Returns ($\alpha_p$)

| Event portfolio return | Parameter estimation method | Statistic | Sub-samples defined by firm size (from small to large) | | | | |
|---|---|---|---|---|---|---|---|
| | | | 1st quintile | 2nd quintile | 3rd quintile | 4th quintile | 5th quintile |
| Equally weighted | OLS | Estimate of $\alpha_p$ (%) | −1.48 | −1.08 | −0.67 | −1.09 | −0.52 |
| | | $t$-statistic | −3.5*** | −3.6*** | −2.7*** | −4.2*** | −2.0** |
| | WLS | Estimate of $\alpha_p$ (%) | −1.00 | −1.06 | −0.62 | −0.61 | −0.27 |
| | | $t$-statistic | −3.8*** | −5.4*** | −3.3*** | −3.6*** | −1.5 |
| Value weighted | OLS | Estimate of $\alpha_p$ (%) | −1.56 | −1.20 | −0.82 | −1.13 | −0.61 |
| | | $t$-statistic | −3.7*** | −4.0*** | −3.3*** | −4.3*** | −2.2** |
| | WLS | Estimate of $\alpha_p$ (%) | −1.17 | −1.18 | −0.76 | −0.66 | −0.39 |
| | | $t$-statistic | −4.5*** | −5.8*** | −4.1*** | −3.6*** | −1.9* |
| Number of observations (months) | | | 659 | 800 | 800 | 787 | 727 |

(*continued*)

**Table IX**—*Continued*

| Panel B: Post-announcement First-Year Buy-and-Hold Average Abnormal Returns (BHAAR) | | | | | | |
|---|---|---|---|---|---|---|
| | | Sub-samples defined by firm size (from small to large) | | | | |
| Matching criteria | Statistic | 1st quintile | 2nd quintile | 3rd quintile | 4th quintile | 5th quintile |
| Firm size | BHAAR (%) | −18.77 | −20.23 | −10.67 | −18.11 | −5.95 |
| | *t*-statistic | −2.3** | −3.0*** | −2.6*** | −4.0*** | −1.7* |
| | *W*-test *p*-value (%) [N] | 7.4[223] | 1.5[270] | 0.4[335] | 0.0[275] | 11.5[248] |
| Size and industry affiliation | BHAAR (%) | −6.11 | −18.24 | −12.67 | −9.48 | −3.17 |
| | *t*-statistic | −1.0 | −3.7*** | −3.4*** | −2.3** | −0.9 |
| | *W*-test *p*-value (%) [N] | 33.6[223] | 0.5[270] | 0.0[334] | 2.8[275] | 60.7[248] |
| Size and prior stock performance | BHAAR (%) | −26.16 | −8.50 | −15.09 | −4.26 | −1.27 |
| | *t*-statistic | −3.0*** | −2.0** | −3.4*** | −1.1 | −0.3 |
| | *W*-test *p*-value (%) [N] | 2.8[214] | 18.4[267] | 0.4[333] | 27.6[273] | 99.8[246] |
| Industry and prior stock performance | BHAAR (%) | −9.19 | −9.34 | −6.07 | −13.81 | −7.26 |
| | *t*-statistic | −1.7* | −2.1** | −1.5 | −2.9*** | −1.5 |
| | *W*-test *p*-value (%) [N] | 7.7[214] | 8.9[267] | 18.7[332] | 2.6[274] | 53.6[247] |
| Size and ratio of book-to-market value | BHAAR (%) | −14.99 | −16.04 | −10.16 | −7.72 | −3.50 |
| | *t*-statistic | −2.9*** | −2.2** | −1.9* | −1.8* | −0.8 |
| | *W*-test *p*-value (%) [N] | 0.8[156] | 0.6[211] | 5.9[249] | 3.7[213] | 45.5[194] |
| Percentage change in earnings | BHAAR (%) | −4.77 | −11.76 | −6.02 | −8.43 | −15.26 |
| | *t*-statistic | −0.5 | −1.9* | −1.3 | −1.4 | −2.8*** |
| | *W*-test *p*-value (%) [N] | 22.4[184] | 32.3[226] | 38.3[267] | 65.3[213] | 8.6[192] |
| Size and percentage change in earnings | BHAAR (%) | −10.54 | −5.03 | −8.15 | −6.64 | 1.51 |
| | *t*-statistic | −1.2 | −1.0 | −1.6 | −1.3 | 0.3 |
| | *W*-test *p*-value (%) [N] | 49.4[184] | 97.4[225] | 17.8[267] | 56.7[213] | 14.3[192] |

In Panel B, the buy-and-hold average abnormal return for the fifth size-quintile is statistically insignificant for five of the seven matching criteria using both the *t*-test and the Wilcoxon signed-rank test. Therefore, the evidence for a significant post-dividend-announcement abnormal return among the top quintile of firms is inconsistent and not compelling. This finding suggests that to the extent there is a post-dividend-announcement price drift, it is likely to be found among smaller firms, and its economic significance is relatively small.

## IV. Is the Drift We Report the Post-earnings Announcement Price Drift?

As dividend reductions and omissions are often associated with deterioration in earnings performance, the post-announcement negative price drift we observe may simply be a post-earnings announcement price drift such as first identified by Ball and Brown (1968) and confirmed more recently by Bernard and Thomas (1990) and Chan et al. (1996). We use the earnings performance of the dividend-reducing or -omitting firm as a matching criterion to specifically control for the post-earnings announcement stock price drift. Throughout our analysis, the evidence from the rolling portfolio models is weakened by evidence from the buy-and-hold benchmark-adjusted returns and in particular from the results obtained by matching on prior earnings performance. Specifically, after controlling for percentage change in earnings we find: (1) there is no statistically significant post-dividend price drift in the total sample when significance is determined using the Wilcoxon signed-rank test (Table V); (2) there is no significant drift in the subsample of dividend reductions (Table VI); (3) the drift is not significantly different from zero in the 1960s and 1970s (Table VII); (4) the drift is not significantly different from zero in bear markets and marginally significant in bull markets when benchmarking is by size and earnings (Table VIII); (5) there is no evidence of a drift in any of the subsamples defined by firm size when benchmarking is by size and earnings and in a majority of the subsamples when benchmarking is by earnings only (Table IX).

Moreover, our finding that the price drift may be found among smaller firms is interesting in that Chordia et al. (2006) find that the post-earnings-announcement drift occurs mainly in the highly illiquid stocks, which have high trading and market impact costs. These transaction costs account for 66% to 100% of the paper profits from a long-short strategy designed to exploit the earnings momentum. This limit-to-arbitrage evidence can explain why investors do not respond efficiently to earnings announcements and hence the subsequent post-earnings-announcement price drift (Ball and Brown (1968), Bernard and Thomas (1990)).[11]

To further address the issue of a post-earnings announcement drift, we reexamine the rolling portfolio method and account for a post-earnings

[11] We thank the anonymous referee for providing this limit-to-arbitrage explanation and informing us about the paper by Chordia et al. (2006).

**Table X**

## Post-announcement First-Year Average Abnormal Monthly Returns for Dividend-Reducing or -Omitting Firms after Simultaneously Controlling for Earnings Momentum and the Fama and French Three Factors

This table examines whether the dividend reducing or omitting firms exhibit 1-year post-announcement abnormal returns that are significantly different from the 1-year post-announcement abnormal returns of firms that experienced similar earnings change but did not reduce or omit their dividends. The 1-year rolling-portfolio monthly excess returns of event firms (compared to non-dividend-event earnings-matched firms) are regressed on the three factors of the Fama and French (1993) model. The motivation of this examination is that the three-factor model, unlike the matching method using earnings performance, does not control for the earnings performance of the sample firms and there is a well-documented robust post-earnings-announcement price drift anomaly (see Ball and Brown (1968), Bernard and Thomas (1990), Chan et al. (1996)). The sample in this table consists of 1,082 announcements. The statistical significance of each of the average abnormal monthly returns ($\alpha_p$) is tested using the parametric $t$-test. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively, in a two-tailed test.

| Event portfolio return | Parameter estimation method | Statistic | Post-announcement Period | | | Post-announcement Year | | |
|---|---|---|---|---|---|---|---|---|
| | | | 1 year | 2 years | 3 years | 1st year | 2nd year | 3rd year |
| Equally weighted | OLS | $\alpha_p$ (%) | −0.03 | 0.12 | 0.05 | −0.03 | 0.04 | −0.10 |
| | | $t$-statistic | −0.11 | 0.50 | 0.24 | −0.11 | 0.15 | −0.35 |
| | WLS | $\alpha_p$ (%) | 0.00 | −0.08 | −0.09 | 0.00 | −0.15 | −0.08 |
| | | $t$-statistic | 0.00 | −0.48 | −0.61 | 0.00 | −0.77 | −0.39 |
| Value weighted | OLS | $\alpha_p$ (%) | −0.37 | 0.04 | 0.11 | −0.37 | 0.09 | 0.11 |
| | | $t$-statistic | −0.94 | 0.12 | 0.35 | −0.94 | 0.28 | 0.34 |
| | WLS | $\alpha_p$ (%) | −0.20 | −0.22 | −0.14 | −0.20 | −0.32 | 0.03 |
| | | $t$-statistic | −0.72 | −0.96 | −0.69 | −0.72 | −1.30 | 0.11 |
| Number of observations (months) | | | 437 | 437 | 437 | 437 | 425 | 413 |

announcement drift in the methodology. We first match the dividend-event firms with non-event firms with similar earnings performance. We then obtain excess monthly returns by subtracting the matching firm's return from the event firm's return. Next we create a rolling portfolio using the excess monthly returns and use the Fama–French three-factor model to estimate the abnormal return on the rolling portfolio. Table X presents the results.

Clearly, when we control for the earnings performance of the dividend-reducing or -omitting firms when using the Fama–French model, we find no evidence of any significant abnormal return in any of the 3 years following the dividend event. Therefore, consistent with the evidence from the buy-and-hold method when matching by prior earnings' performance, this finding indicates that the post-dividend-announcement drift we find earlier using the three-factor model is actually driven by the post-earnings-announcement drift.

## V. Regression Analysis of the Post-announcement Abnormal Returns

In this section, we make an additional effort to uncover some factor(s) that can explain the results we find. We model the post-announcement first-year buy-and-hold abnormal return $BHAR_j$ (which is measured using seven different matching criteria) as a function of the following eight factors, which prior research hypothesizes or finds to be significant determinants of the announcement-period or post-announcement abnormal returns associated with dividend cuts or omissions:

$$\begin{aligned} BHAR_j = {} & \varphi_0 + \varphi_1 CUT_j + \varphi_2 YIELD_j + \varphi_3 RSIZE_j + \varphi_4 DIVPAY_j \\ & + \varphi_5 MARKET_j + \varphi_6 STAR_j + \varphi_7 EARN\Delta_j \\ & + \varphi_8 RISK\Delta_j + \varepsilon_j, \quad j = 1, \ldots, N, \end{aligned} \tag{2}$$

where $CUT_j$ is the percentage dividend reduction for event firm $j$; $YIELD_j$ is the dividend yield of event firm $j$ (measured as the ratio of the dollar amount of dividend per share for the year before the announcement divided by the share price 1 month before the announcement date); $RSIZE_j$ is the ratio of the market value of event firm $j$ (as of 1 month before the announcement date) to the mean market value of all firms on CRSP during the event year; $DIVPAY_j$ is the percentage of firms paying dividends during the announcement year (data are obtained from Fama and French (2001)); $MARKET_j$ is the market return minus the risk-free return during the announcement month (measured by the value-weighted CRSP index and the rate on the 1-month U.S. Treasury bill, respectively); $STAR_j$ is the 2-day announcement-period abnormal stock return of event firm $j$; $EARN\Delta_j$ is the percentage change in the earnings of event firm $j$ over the year following the announcement; $RISK\Delta_j$ is the change in the systematic risk of event firm $j$ (measured as the difference between the beta estimates from the market model using day $-250$ through day $-30$ and then day $+30$ through day $+250$ as estimation periods; and $\varphi_0$ to $\varphi_8$ are ordinary least squares estimates. All parameter estimates are tested using the White (1980) corrected $t$-statistics. Since buy-and-hold abnormal returns may exhibit skewness, we also regress the 1-year cumulative abnormal returns, $CAR_j$, for the dividend event firms on the same variables. The $CAR_j$ are computed as the difference between the cumulated sum of monthly returns of the dividend-event firm and the cumulated sum of monthly returns of the non-event benchmark-matched firm.

We include in the above regression model the percentage dividend reduction $CUT_j$, dividend yield $YIELD_j$, and relative size $RSIZE_j$ of event firm $j$ because prior studies such as Ghosh and Woolridge (1988) and Christie (1994) either hypothesize or find these factors to be significant determinants of the 2-day announcement-period abnormal return. We include the percentage of firms paying dividends during the announcement year, $DIVPAY_j$, because Baker and Wurgler (2004) propose that investors' demand for dividends changes over time and the propensity to pay dividends highly correlates with this variable.[12] We

[12] In regression analyses not reported above but that are available upon request, we find that

include the market return minus the risk-free return, $MARKET_j$, in the regression model to account for any significant difference between the abnormal returns in the two market conditions. We include the 2-day announcement-period abnormal return, $STAR_j$, as an additional potential determinant of the long-term abnormal return since the magnitude or sign of the post-announcement first-year abnormal return may be related to the sign and magnitude of the announcement-period abnormal return. We include the post-event change in earnings, $EARN\Delta_j$, and the change in systematic risk, $RISK\Delta_j$, because Grullon, Michaely, and Swaminathan (2002) find these factors to be significant determinants of the long-term price drift.[13]

When buy-and-hold abnormal returns are used as the dependent variable, the $F$-statistics shown in Table XI are statistically insignificant at conventional levels for five of the seven regression models, and the coefficient of determination $R^2$ is not higher than 2.04%. When cumulative abnormal returns are used as the dependent variable, the $F$-statistics shown in Table XII are also statistically insignificant at conventional levels for four of the seven regression models, and the coefficient of determination $R^2$ is not higher than 2.77%. In both tables, these goodness-of-fit measures do not indicate that these models can predict or explain an economically significant percentage of the variation in the post-announcement first-year abnormal returns to the dividend-event firms. In addition, an examination of the White (1980) corrected $t$-statistics for the ordinary least squares parameters for both tables does not lead to any robust generalization about a significant relation between the post-announcement long-term abnormal returns and any of the independent variables. Therefore, this regression analysis does not help us uncover a simple explanation for the results we report.

## VI. Conclusions

We examine the post-announcement long-term stock price performance of firms that reduce or omit their cash dividend payment using a sample of 2,337 announcements made during the period from 1927 through 1999. We measure the long-term abnormal performance by applying the three-factor model of Fama and French (1993) and also by using the mean difference in the holding period returns of matched pairs of event firms and non-event benchmark firms as prescribed by Barber and Lyon (1997). To address Fama's (1998) methodological remarks, we use various specifications of the Fama–French regressions and match the firms using several matching criteria.

The Fama–French regressions find statistically significant negative abnormal returns over the first post-announcement year for the dividend-reducing or -omitting firms. The results are robust with respect to regression specifications and are generally robust across tests of various subsamples that we examine.

the announcement-period abnormal stock return is significantly related to the percentage of firms that paid dividends in the announcement year $DIVPAY_j$.

[13] We thank the anonymous referee for pointing this out.

**Table XI**

## Cross-sectional Regression of the Post-announcement First-Year Buy-and-Hold Abnormal Returns for Dividend-Reducing or -Omitting Firms

This table reports the results of the cross-sectional regression analysis of the post-announcement first-year buy-and-hold abnormal common stock returns to the dividend-event firms $BHAR_j$ (which are measured using seven different matching criteria) on several potentially influential factors. The specified model is:

$$BHAR_j = \varphi_0 + \varphi_1 CUT_j + \varphi_2 YIELD_j + \varphi_3 RSIZE_j + \varphi_4 DIVPAY_j + \varphi_5 MARKET_j + \varphi_6 STAR_j + \varphi_7 EARN\Delta_j + \varphi_8 RISK\Delta_j + \varepsilon_j, \quad j = 1, \ldots, N,$$

where $CUT_j$ is the percentage dividend reduction of event firm $j$; $YIELD_j$ is the dividend yield of event firm $j$ (measured as the ratio of the dollar amount of dividend per share for the year before the announcement divided by the share price 1 month before the announcement date); $RSIZE_j$ is the ratio of the market value of event firm $j$ (as of 1 month before the announcement date) to the mean market value of all firms on CRSP during the event year; $DIVPAY_j$ is the percentage of firms paying dividends during the announcement year (data are obtained from Fama and French (2001)); $MARKET_j$ is the market return minus the risk-free return during the announcement month (measured by the value-weighted CRSP index and the rate on the 1-month U.S. Treasury bill, respectively); $STAR_j$ is the 2-day announcement-period abnormal stock return of event firm $j$ (obtained using the market model); $EARN\Delta_j$ is the percentage change in the earnings of event firm $j$ over the 1 year following the announcement; and $RISK\Delta_j$ is the change in the systematic risk of event firm $j$ (measured as the difference between the beta estimates from the market model using day −250 through day −30 and then day +30 through day +250 as estimation periods). The statistical significance of each of the ordinary least squares (OLS) parameter estimates is tested using the White (1980) corrected $t$-statistic, shown below in parentheses. The null hypothesis tested is that the OLS parameter estimate is equal to zero. $N$ is the number of observations. Missing values for some of the independent variables reduce the number of observations. $^{***}$, $^{**}$, and $^{*}$ denote significance at the 1, 5, and 10% levels, respectively, in a two-tailed test.

| | Ordinary-Least-Squares Estimates (and $T$-Statistics) for Coefficient of | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matching criteria for measuring $BHAR_j$ | *Intercept* | $CUT_j$ | $YIELD_j$ | $RSIZE_j$ | $DIVPAY_j$ | $MARKET_j$ | $STAR_j$ | $EARN\Delta_j$ | $RISK\Delta_j$ | $R^2$(%) | $F$ | $N$ |
| Firm size | 6.51 | −0.24 | −1.04 | 1.95 | −0.06 | 0.06 | −0.13 | −0.11 | 4.18 | 0.77 | 1.49 | 755 |
| | (0.5) | (−2.0$^{**}$) | (−1.1) | (2.1$^{**}$) | (−0.3) | (0.1) | (−0.3) | (−0.6) | (1.0) | | | |
| Size and industry affiliation | 18.26 | −0.23 | −0.02 | 2.72 | −0.22 | −0.70 | 0.37 | −0.22 | −0.27 | 1.99 | 4.17$^{***}$ | 755 |
| | (1.6) | (−2.4$^{**}$) | (−0.1) | (4.0$^{***}$) | (−1.3) | (−1.5) | (1.0) | (−1.4) | (−0.1) | | | |
| Size and prior stock performance | −21.03 | 0.08 | 1.46 | 2.41 | −0.05 | −0.10 | 0.18 | −0.25 | 2.18 | 0.84 | 1.43 | 748 |
| | (−1.4) | (0.7) | (2.3$^{**}$) | (2.0$^{**}$) | (−0.2) | (−0.2) | (0.3) | (−1.2) | (0.5) | | | |
| Industry and prior stock performance | 9.75 | −0.13 | 0.19 | 0.80 | −0.17 | −0.87 | 0.49 | −0.31 | 1.87 | 1.30 | 1.26 | 748 |
| | (0.8) | (−1.3) | (0.3) | (0.8) | (−0.9) | (−1.6) | (1.2) | (−1.5) | (0.4) | | | |
| Size and ratio of book-to-market value | −17.46 | −0.04 | 1.91 | 3.22 | 0.04 | 0.01 | 0.65 | −0.33 | −7.08 | 1.94 | 2.31$^{**}$ | 712 |
| | (−1.2) | (−0.4) | (2.3$^{**}$) | (3.2$^{***}$) | (0.1) | (0.0) | (1.1) | (−1.5) | (−1.5) | | | |
| Percentage change in earnings | −5.06 | −0.30 | −0.34 | −2.03 | 0.31 | −0.77 | 0.06 | −0.16 | 8.93 | 2.04 | 1.26 | 737 |
| | (−0.3) | (−2.3$^{**}$) | (−0.5) | (−1.3) | (1.2) | (−1.2) | (0.1) | (−0.5) | (1.45) | | | |
| Size and percentage change in earnings | −31.03 | −0.05 | 0.11 | 3.21 | 0.55 | −0.61 | 0.47 | −0.28 | 3.04 | 1.44 | 1.22 | 736 |
| | (−1.9$^{*}$) | (−0.4) | (0.1) | (2.4$^{**}$) | (2.0$^{**}$) | (−0.9) | (0.8) | (−1.6) | (0.5) | | | |

**Table XII**

## Cross-sectional Regression of the Post-announcement First-Year Cumulative Abnormal Returns for Dividend-Reducing or -Omitting Firms

This table reports the results of the cross-sectional regression analysis of the post-announcement first-year cumulative abnormal common stock returns to the dividend event firms, $CAR_j$, on several potentially influential factors. The $CAR$s are computed as the difference between the sum of monthly returns of the dividend event firm and the sum of monthly returns of the non-event matched firm. The specified model is:

$$CAR_j = \varphi_0 + \varphi_1 CUT_j + \varphi_2 YIELD_j + \varphi_3 RSIZE_j + \varphi_4 DIVPAY_j + \varphi_5 MARKET_j + \varphi_6 STAR_j + \varphi_7 EARN\Delta_j + \varphi_8 RISK\Delta_j + \varepsilon_j, \quad j = 1, \ldots, N,$$

where $CUT_j$ is the percentage dividend reduction of event firm $j$; $YIELD_j$ is the dividend yield of event firm $j$ (measured as the ratio of the dollar amount of dividend per share for the year before the announcement divided by the share price 1 month before the announcement date); $RSIZE_j$ is the ratio of the market value of event firm $j$ (as of 1 month before the announcement date) to the mean market value of all firms on CRSP during the event year; $DIVPAY_j$ is the percentage of firms paying dividends during the announcement year (data are obtained from Fama and French (2001)); $MARKET_j$ is the market return minus the risk-free return during the announcement-month (measured by the value-weighted CRSP index and the rate on the 1-month U.S. Treasury bill, respectively); $STAR_j$ is the 2-day announcement-period abnormal stock return of event firm $j$ (obtained using the market model); $EARN\Delta_j$ is the percentage change in the earnings of event firm $j$ over 1 year following the announcement; and $RISK\Delta_j$ is the change in the systematic risk of event firm $j$ (measured as the difference between the beta estimates from the market model using day −250 through day −30 and then day +30 through day +250 as estimation periods). The statistical significance of each of the ordinary-least-squares (OLS) parameter estimates is tested using the White (1980) corrected $t$-statistic, shown below in parentheses. The null hypothesis tested is that the OLS parameter estimate is equal to zero. $N$ is the number of observations. Missing values for some of the independent variables reduce the number of observations. ***, **, and * denote significance at the 1, 5, and 10% levels, respectively, in a two-tailed test.

| | Ordinary-Least-Squares Estimates (and $T$-Statistics) for Coefficient of | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Matching criteria for measuring $CAR_j$ | *Intercept* | $CUT_j$ | $YIELD_j$ | $RSIZE_j$ | $DIVPAY_j$ | $MARKET_j$ | $STAR_j$ | $EARN\Delta_j$ | $RISK\Delta_j$ | $R^2$(%) | $F$ | $N$ |
| Firm size | 2.10 | −0.12 | −0.47 | 1.30 | −0.08 | −0.11 | −0.30 | −0.17 | 2.59 | 0.70 | 1.14 | 755 |
| | (0.2) | (−1.4) | (−0.8) | (1.8*) | (−05) | (−0.3) | (−0.9) | (−0.7) | (0.8) | | | |
| Size and industry affiliation | 9.56 | −0.16 | 0.24 | 2.48 | −0.15 | −0.76 | 0.09 | −0.18 | −1.68 | 1.83 | 3.87*** | 755 |
| | (1.0) | (−2.1**) | (0.5) | (4.1***) | (−1.1) | (−2.0**) | (0.3) | (−1.1) | (−0.5) | | | |
| Size and prior stock performance | 0.41 | −0.11 | 0.43 | 2.33 | −0.07 | −0.40 | 0.07 | −0.19 | 1.80 | 0.97 | 1.30 | 748 |
| | (0.0) | (−1.2) | (0.6) | (2.2**) | (−0.4) | (−0.9) | (0.2) | (−1.1) | (0.5) | | | |
| Industry and prior stock performance | 3.67 | −0.08 | 0.15 | 0.76 | −0.08 | −0.85 | 0.38 | −0.20 | 3.99 | 1.34 | 1.21 | 748 |
| | (0.3) | (−1.0) | (0.3) | (0.7) | (−0.5) | (−2.0**) | (1.1) | (−1.0) | (1.1) | | | |
| Size and ratio of book-to-market value | −18.71 | 0.09 | 1.47 | 2.76 | 0.01 | −0.38 | 0.59 | −0.31 | −5.41 | 2.77 | 3.08*** | 712 |
| | (−1.8*) | (1.1) | (2.5***) | (3.5***) | (0.1) | (−0.9) | (1.8*) | (−1.7*) | (−1.6) | | | |
| Percentage change in earnings | 2.90 | −0.21 | −1.01 | −2.40 | 0.20 | −0.80 | 0.16 | −0.07 | 3.76 | 2.28 | 2.30** | 737 |
| | (0.3) | (−2.3**) | (−1.7*) | (−1.9*) | (1.2) | (−1.8*) | (0.5) | (−0.4) | (1.0) | | | |
| Size and percentage change in earnings | −16.25 | −0.04 | −0.17 | 2.07 | 0.37 | −0.40 | 0.51 | −0.18 | 1.31 | 1.57 | 1.42 | 736 |
| | (−1.5) | (−0.4) | (−0.3) | (2.2**) | (2.2**) | (−0.9) | (1.2) | (−1.4) | (0.4) | | | |

By itself, the methodology based on Fama–French regressions of the monthly excess returns of the dividend-event firms provides fairly consistent evidence of a post-dividend-announcement price drift.

However, in our analysis of buy-and-hold abnormal returns from matched firms, we find that the negative long-term abnormal performance following the dividend announcements becomes statistically insignificant when we control for the pre-event earnings performance of the dividend-reducing or -omitting firms and take into account the skewness of the distributions of the buy-and-hold abnormal returns. Specifically, the Wilcoxon signed-rank test results when matching by earnings or by earnings and firm size are statistically insignificant for: (1) the whole sample; (2) the dividend reductions subsample; (3) the 1960s, 1970s, and 1980s subperiods; (4) bull versus bear subsamples; and (5) most of the firm-size quintiles.

We subsequently reexamine the Fama–French analysis in light of the sensitivity of the buy-and-hold abnormal returns to matching by earnings performance. We create a rolling portfolio using the difference of the monthly returns between event and non-event firms with similar earnings performance. We find no significant abnormal returns from regressions of this rolling portfolio return on the Fama–French three factors. Therefore, our result indicates that firms that reduce or omit their dividend have the same post-event price drift as firms that have similar earnings performance but do not reduce or omit their dividend.

The collective evidence therefore indicates that the price drift we observe is a post-earnings-announcement price drift. We also find that the price drift is likely confined to smaller-sized firms, which suggests that the price drift observed following our dividend event is not necessarily inconsistent with market efficiency. Chordia et al. (2006) find that the post-earnings-announcement drift occurs mainly in highly illiquid stocks whose trading costs can account for 66% to 100% of the paper profits from a long-short strategy designed to exploit earnings momentum. The post-earnings-announcement price drift can be a consequence of this limit to arbitrage and therefore falls within the parameters of an efficient market.

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