THE MARKET RESPONSE TO UNEXPECTED DIVIDEND ANNOUNCEMENTS

Alan A. Stephens, Utah State University
Dennis Proffitt, Grand Canyon College

Abstract

Research concerning the informational content of dividends continues to provide inconsistent results. This paper argues that this lack of consistency is the result of the definition of dividend expectations used in past studies. This study examines a broad cross-section of dividend policies and incorporates into the definition of dividend policy the full range of past sequence and timing of dividend changes.

Introduction

The controversy concerning the informational content of dividends continues to swirl. Early studies, using monthly returns [Watts, 1973; Gonedes, 1978] concluded that unexpected dividend announcements communicate no information beyond that reflected in contemporaneous variables (e.g. earnings announcements). Other authors challenged these findings [Laub, 1976; Pettit, 1976], but these challenges were rebuked by Watts [1976a, 1976b]. All of these studies can be criticized because they were based on observations of monthly stock returns.

Aharony and Swary [1980] used daily stock returns and found a small but significant dividend announcement effect which is separate from the earnings announcement effect. Asquith and Mullins [1983] found positive returns surrounding the initiation of dividend payments by the firm. However, Woolridge [1982] concluded that,

Whereas Aharony and Swary concluded that dividend changes in general contain information, this study demonstrates that if a dividend change is expected by the market, the actual announcement does not provide additional information to the market. (p. 247)

In addition to the lack of consistent findings noted above, some prior studies report a lack of statistical significance, and variations in the empirical methodology used in past studies result in an absence of clear, replicable conclusions.

We feel that part of these problems are due to the definition of dividend expectations used in past studies. Early studies defined the expected dividend as a linear function of past dividends and current and past earnings. This approach was first proposed by Lintner [1956] and later refined by Fama and Babiak [1968], as below:

$$D(i,t) - D(i,t-1) = c(1)D(i,t-1) + c(2)E(i,t) + c(3)E(i,t-1) + e(i,t) \quad (1)$$

where:

- D(i,t) = dividends per share for firm i at time t,
- E(i,t) = earnings per share for firm i at time t, and
- e(i,t) = the regression residual with the usual properties.

Implicit in this linear function is the assumption that all firms are reluctant to change their dividend payments, and therefore follow a constant dividend policy. Literature developing the "speed of adjustment" and other partial adjustment models [Charest, 1978; Kalay, 1980; and others] was also based on this assumption. Later stu-

dies [Aharony and Swary, 1980; Kane, Lee, and Marcus, 1984; and others] used a naive expectations model of the following form:

$$E[D(i,t)] = D(i,t-1) \quad (2)$$

Implicit in this definition of dividend expectations is the assumption that all dividend changes are unexpected. Asquith and Mullins [1983] recognized this assumption as a flaw in existing work. They referred to the fact that most prior studies identified unexpected dividend increases through either the naive expectations model (2) or a single dividend expectations model such as (1) applied to all firms. However, they realized that once a dividend policy is established and put in place by the firm, the full sequence and timing of past dividend announcements will be used by investors in forming a better model in forecasting future dividend payments. Therefore, the expected dividend change may not always be zero as assumed in the naive model.

In their study Asquith and Mullins examined only the market response to the initial dividend payment of firms. Woolridge [1982] attempted to incorporate a broader definition of dividend expectations by using the *Value Line* quarterly forecasts to represent market expectations. Unfortunately, Woolridge also restricted his sample, in this case to companies who paid stable dividends for a period of at least two years.

This study provides a comprehensive look at the market response to unexpected dividend announcements. The methodology differs from that used in past studies in at least two important areas. First, the sample of firms contains a broad cross-section, not simply companies that are initiating dividend payments or who follow a stable dividend policy. Second, the definition of dividend expectations incorporates the full range of the past sequence and timing of dividend changes. In order to fully incorporate these past changes, we develop a dividend policy classification algorithm. Our findings indicate that only through the proper recognition of existing dividend policies in the calculation of expected dividends can the full impact of unanticipated dividend announcements be measured.

The Grouping of Firms by Dividend Policy

In this paper, we demonstrate that the market response to unanticipated dividend announcements is a function of the dividend policy followed by the firm. The proper identification, then, of dividend policies is critical to our work. From the definitions in current financial literature [Weston and Copeland, 1986; Brealey and Meyers, 1984; and many others] it is possible to specify three general dividend policies: (1) the payment of a stable dollar amount per share, (2) the payment of a constant percentage of income per share, and (3) the payment of residual dollar amounts per share. Although these three policies do not exhaust all possible patterns, they cover the possibilities generally expected to be observed in the market. While these dividend policies are familiar in a general sense to readers of almost any corporate finance textbook, it is probably beneficial to provide a brief description of the policies as defined in this study.(1)

The stable dividend policy is implied by the words "stable dollar dividend per share." Firms that adhere to this policy seek to maintain a target dividend per share. Dividends may increase or decrease with a lag after earnings changes, but only after the change in earnings appears permanent. An alternative to the stable policy is the constant payout dividend policy. This policy implies that the firm pays a constant percentage of its earnings in the form of dividends. Obviously, there should be a high, positive correlation between quarterly earnings and quarterly dividend payments for these firms. The residual dividend policy is based upon the premise that the investor would prefer to have the firm retain and reinvest its earnings rather than distribute them to shareholders. Implicit in this premise, of course, is the presence of higher reinvestment yields for the firm than those that exist for shareholders. In this case, the firm's dividend payments would be a residual determined by the profitability of its investment set.

The dividend expected to be paid by the firm varies with the dividend policy employed. For the case of firms following a stable dividend policy, dividend expectations can be modeled by the naive expectations approach used in many past studies. (Equation 2.) Firms employing a constant dividend policy are expected to pay a relatively constant proportion of their quarterly earnings in the form of dividends, and thus the expected dividend for these firms can be represented as:

$$E[D(i,t)] = k[e(i,t)] \quad (3a)$$

where:

k = the target dividend payout ratio (which can be approximated by taking the mean payout ratio over time), and
e(i,t) = the company's earnings for a specific quarter.

A few firms classified in the constant group announced their quarterly dividends prior to their earnings announcements. For these firms, expected dividends were assumed to be a constant proportion of the prior quarter's earnings, as:

$$E[D(i,t) = k[e(i,t-1)] \quad (3b)$$

Under the residual dividend policy, firms would pay dividends only if they expect to generate a level of funds in excess of their reinvestment needs. In our sample, the firms following this policy paid dividends only on an infrequent, irregular basis. The dividend expected by the shareholders of these firms for any particular quarter, then, is:

$$E[D(i,t)] = 0 \quad (4)$$

In addition to differing levels of expected dividends by policy group, we hypothesize that the investor response to unanticipated dividend announcements will vary by group. For the stable group, we hypothesize the traditional positive correlation between the sign of the unanticipated dividend announcement and the market response. For the constant group, we hypothesize no significant market response (either positive or negative) to unanticipated dividend announcements so long as the dividend announcement follows the announcement of earnings. Recall that this group pays a rather consistent proportion of their earnings in the form of dividends. If earnings announcements, then, precede dividend announcements, it is the earnings announcement that investors will react to, since this announcement contains the major variable of interest. On the other hand, if the dividend announcement is made public prior to the earnings announcement (which was the case for a small number of firms in our sample), then the dividend announcement provides the first performance indication, and investors are expected to react to it in a significant manner.

For the residual dividend policy group, we hypothesize a negative market response to an unanticipated dividend increase. We maintain that these firms are generally high growth firms that retain their earning in order to support their growth levels. For these firms, the dividend decision signals a decline in future growth opportunities, and the market responds in a negative fashion due to unequal tax treatment of capital gains and ordinary income. The presence of the clientele effect would indicate that investors in residual policy firms are principally interested in capital gains, rather than dividend income. If the firm signals reduced growth opportunities, the market should respond negatively.

Methodology

Using four variables, (past dividends paid, net income, earnings payout ratio, and external financing used) Stephens [1980] has developed a statistical algorithm based on multiple discriminant analysis that will consistently identify the three dividend payment patterns outlined above. This algorithm consistently identifies a substantial number of firms that behave in a homogeneous manner with respect to variables related to the dividend policy decision.

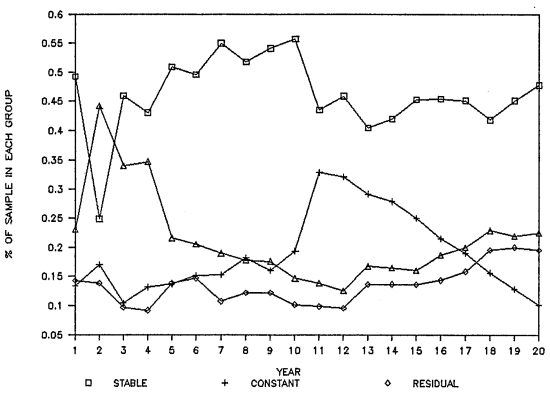
This classification algorithm was applied to all firms listed in the COMPUSTAT Research File for which full data (dividends, net income, earnings, and external financing) was available. Each firm was classified into one of the three dividend policies previously identified (or an "unidentified group," if they did not fit the conditions for one of the defined groups) for the last 20 years contained in the file, according to the criteria in the Appendix. Thus initially there were 20 years of classification data for each of the firms.

A chart depicting the number of firms classified into each group, and the trends in group membership over time, is given in Exhibit 1. By examining this chart, one can assess the magnitude of the errors that would have been made by incorporating the naive model of dividend expectations represented by equation 2. The naive model represents only the payment pattern of the stable dividend group. While the stable group was the largest group in each of our sample years,(2) it contained an average of only 46% of our total group membership. Clearly, in

order to incorporate the full variation in past dividend payment patterns into investor's expectations, an approach incorporating more than simply the expectations of the stable group's investors is required. The constant and residual

Exhibit 1

Group Membership Size Over Time



groups, while smaller in size than the stable group, are large enough that their omission would be serious.

In determining the announcement effect, we considered only firms that did not change their dividend policy over our 20-year classification period (1959-1978). This resulted in a final sample of 149 firms, of which 61% were classified as stable, 25% classified as constant, and 13% classified as residual. The remaining firms were either unidentified or changed classification groups, and thus they were not considered for further analysis.

In order to calculate the market impact of unanticipated dividend announcements, the expected daily return for a given stock must be subtracted from the stock's actual returns surrounding the announcement date. We computed expected returns using a variation of the market model, as below:

$$E[r(i,t)] = a(i) + b(i)r(m,t) + e(i,t) \quad (5)$$

where:

E[r(i,t)] = the expected geometric mean daily return of stock i, taken over a three-day period consisting of days t-1, t, and t+1;

r(m,t) = the geometric mean daily return of the S&P 500 market index, taken over the same three-day period as above; and a(i), b(i), e(i,t) = regression parameters with the usual properties.

Taking moving averages is a technique suggested by Aharony and Swary [1980] to correct for the nonsynchronous trading problems often present in daily security returns. (See Scholes and Williams [1977]). OLS regression was used for each stock using each day in our observation period except those dates +/- 10 days from either a dividend or earnings announcement. The reason these dates were excluded, of course, is that if there is an announcement effect, then the expected value of e(i,t) is not zero, violating an important OLS assumption.

The excess return [e(i,t)] for a period of +/- 10 days of the dividend announcement date was obtained in the following manner:

$$e(i,t) = r(i,t) - E[r(i,t)] \quad (6)$$

Daily average residuals [DAR(j,t)] were obtained for each group (j) during each day (t) surrounding the announcement date by taking the mean value of e(i,t) across group members. Using the null hypothesis that the expected value of DAR(j,t) = 0.0, the values of DAR(j,t) were tested for statistical significance using a t-statistic of the following form:

$$t[DAR(j,t)] = [DAR(j,t) \text{ X } sqr(n) / sd(j) \quad (7)$$

where:

n = the number of firms in the dividend policy group, and

sd(j) = the standard deviation of daily returns for that group.

Cumulative average residuals [CAR(j)] were obtained for each group by:

$$CAR(j) = \sum_{1}^{10} [DAR(j,t)] \quad (8)$$

These show the cumulative impact of the unanticipated dividend announcement.

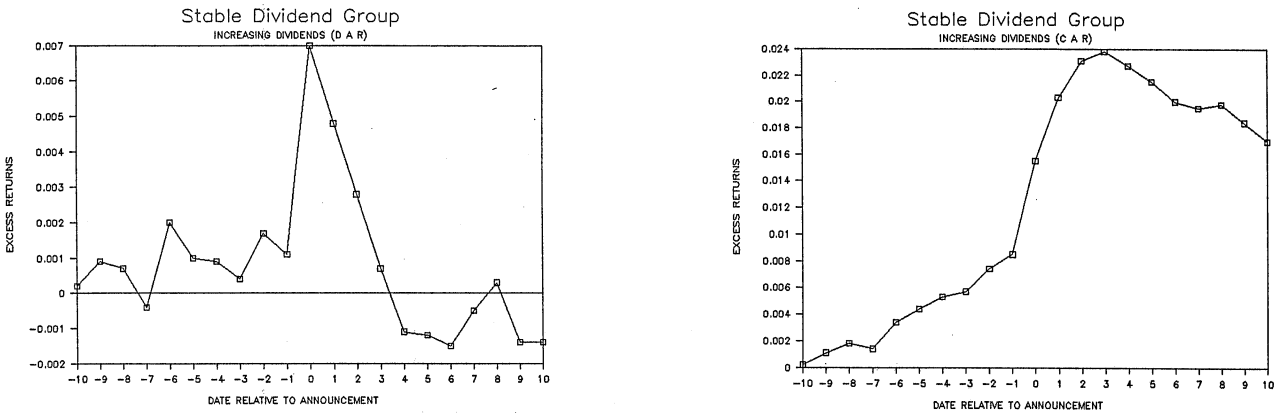
Results

There appear to be variations in the results

from one dividend policy group to another. Results are discussed below by group.

For the stable group, we find there is a strong, positive association between the direction of the unanticipated dividend change and the market response. The values of DAR(i,t) and CAR(j) are graphed in Exhibits 2 and 3 for unanticipated dividend increases and decreases respectively. In Exhibit 2,depicting unanticipated dividend increases, the value of DAR(i,t) at t=0 (the announcement

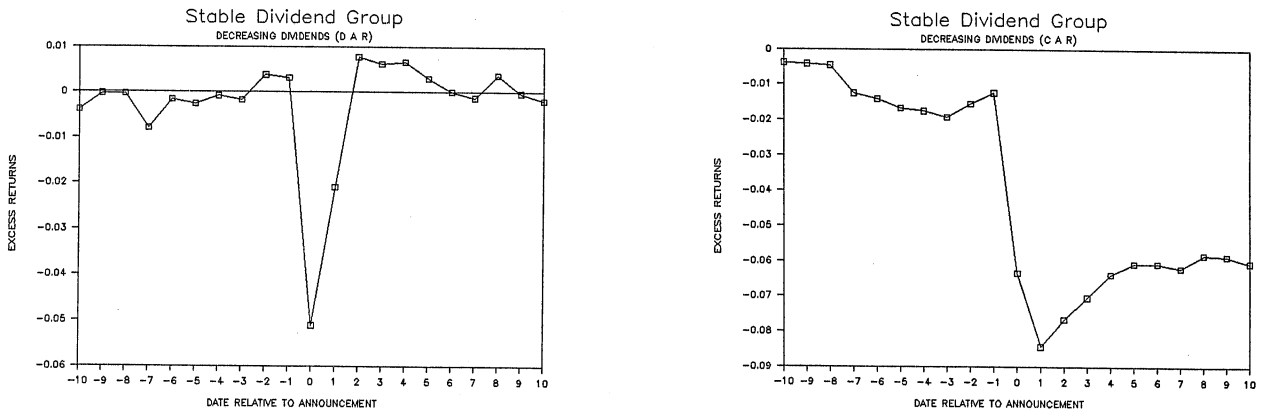
Exhibit 2



date) is 20.32, which is significant at virtually any significance level. In Exhibit 3, depicting unanticipated dividend decreases, the value of the t-statistic at t=0 is -51.64, which has an even higher significance level. The strength of the t-statistics reported here are much stronger than in any prior study, and we feel this is due to the identification algorithm used to isolate the stable dividend group.

Recall that we hypothesized no significant announcement effect for the constant group when the

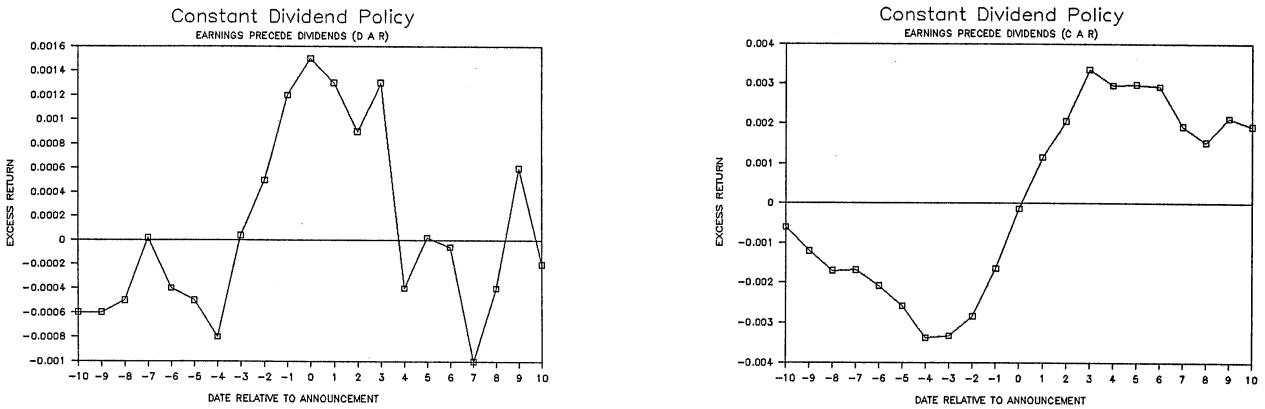
Exhibit 3



earnings announcement preceded the dividend announcement. Exhibit 4 graphs the DAR(i,t) and CAR(j) values for all constant payout firms. The abnormal returns from t=-1 to t+3 are statistically significant at the 0.05 significance level, so the null hypothesis did not hold. This finding indicates that the dividend announcement possesses information value over and above the earnings announcement, even for firms that follow a constant payout policy. While the constant payout group has never been identified and isolated in prior work, many other authors have found similar results across firms. [Aharony and Swary, 1980; Divecha and Morse, 1983; Fama, Fischer, Jensen and Roll, 1969; Kane, Lee, and Marcus, 1984].

A theoretical foundation for this finding (which was not tested for directly) can be found in Miller and Rock [1984]. They indicate that dividend announcements provide information, but about current, not future earnings. (Remember that earnings can be manipulated by accounting techniques.) Current earnings then provide a signal about future earnings, which determine the value of the firm. Consistent with Modligiani and Miller, it is the future earnings, not dividends, that provide value

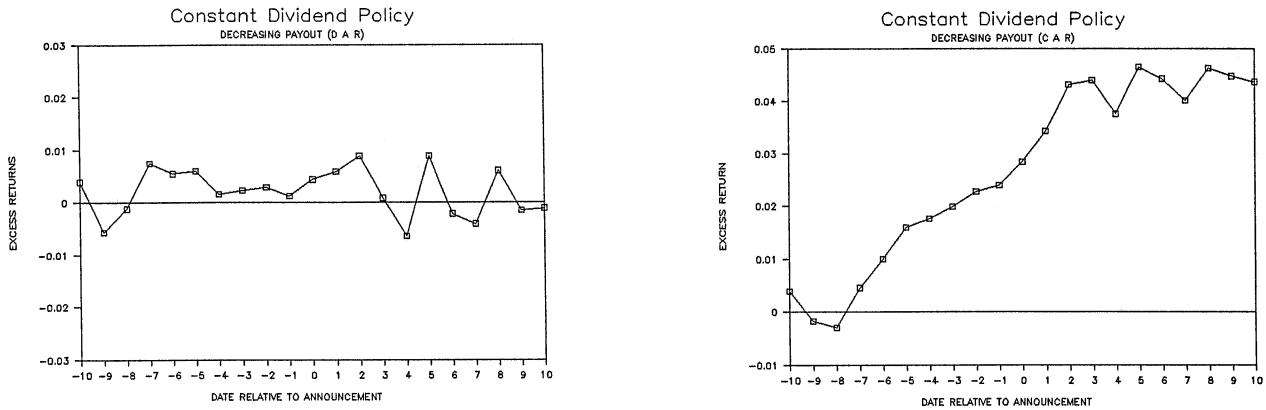
Exhibit 4



under the Miller and Rock hypothesis. This is also consistent with Watts [1973] and Gonedes [1978], who found that dividends provide little marginal predictive power in forecasting future earnings.

Exhibit 5 show the results of for the firms that exhibited unanticipated dividend decreases as per equations 3a and 3b. None of the excess returns were significant for this group. This finding was

Exhibit 5

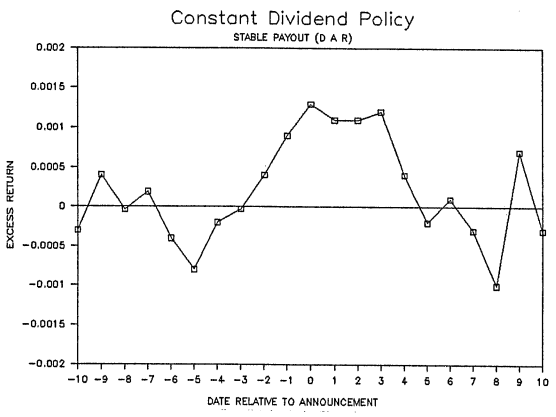


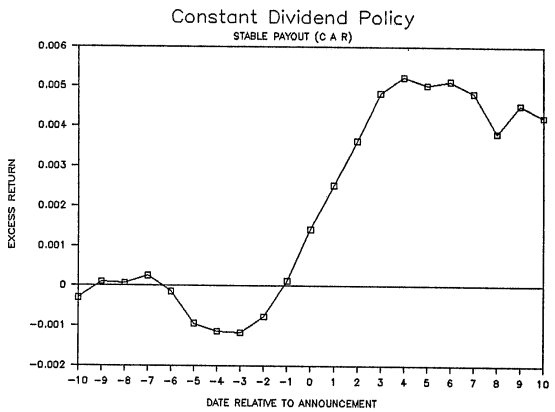
true whether the dividend announcement preceded the earning announcement or vice versa. It should be noted that for every instance in this case, the actual dollar level of the dividend was the same as the previous dividend paid. Thus an earning increase has not been immediately matched by a dividend increase. This evidence suggests that while firms may stabilize their payout over time, investors are more concerned with the absolute dollar value of the dividend. Thus no increase in the dollar value of the dividend means no response from the investors.

Exhibit 6 show firms in the constant dividend policy group which that maintained their payout ratios. In Exhibit 6, the announcement effect from t=0 to t=3 are significant at the 5.0 percent level. Again we have noted that in the maintenance of the long term payout ratio the absolute value of the dividend has increased. Thus it again it appears that investors are responding more to the increase in

the dividend level than to the maintenance of the payout ratio.

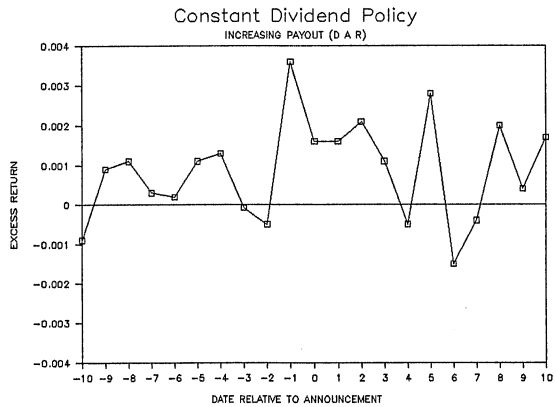
Exhibit 6

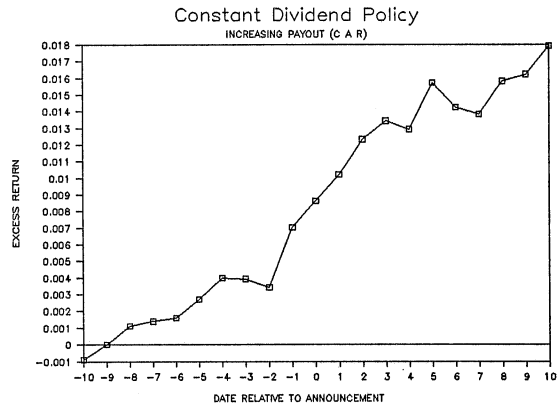




In the case of unanticipated dividend increases (Exhibit 7), the abnormal excess return occurs at t=-1 which is statistically significant at the 5.0% level.

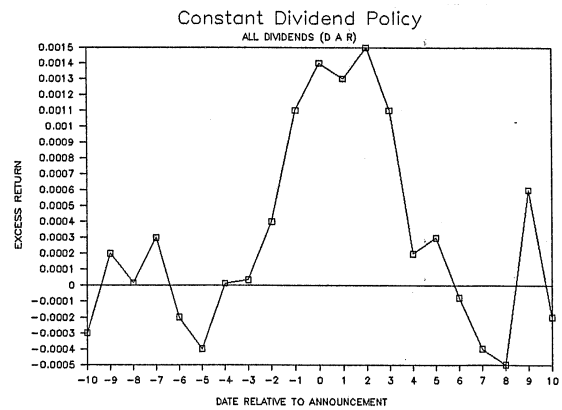
Exhibit 7

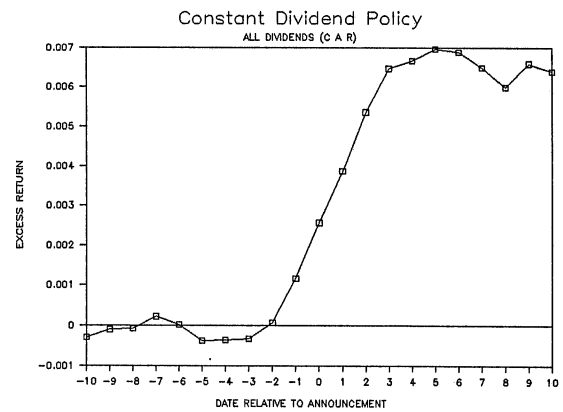




The results for the constant dividend payout policy suggest that investors are more concerned with the absolute level of the dividend rather than the maintenance of a payout level. Exhibit 8 shows the excess return results for all firms in the Constant Policy (stable, increasing and decreasing payout).

Exhibit 8

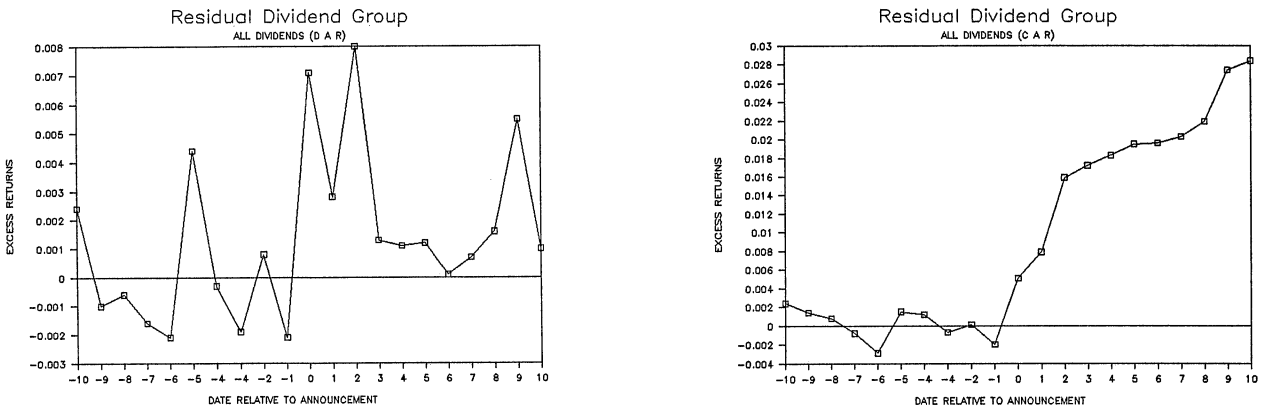




In all cases except one the absolute value of the dividend remained the same, or represented an increase from the previous announced dividend. From t=-1 to t=3 the excess returns are significant at any level.

The residual policy group is graphed in Exhibit 9. All dividends for this group are unexpected since, by definition these firms pay dividends to shareholders only on an infrequent, irregular basis. The abnormal returns observed at days t=0 and t=2 are statistically significant at almost any significance level. While our findings for this group are not consistent with our hypothesis, they are similar to those of Asquith and Mullins [1983] who studied market response to the initial dividend payment of firms. The sample employed by Asquith and Mullins consisted of companies who had never previously paid a dividend, and thus it is similar to our residual group, which pays irregular dividends on an infrequent basis only.

Exhibit 9



There are interesting implications for the clientele effect in our residual group findings. Given the presence of the clientele effect, one would expect investors in these firms to be responding to the opportunity for additional capital gains. When these firms signal decreased growth opportunities ahead through the payment of a dividend, we would expect the market to respond in a negative fashion. The absence of this market response for residual group firms is contrary to the existence of a significant clientele effect.

Summary and Conclusions

Our findings, while not entirely consistent with our original hypotheses, do indicate that the market response to dividend announcements is a function of the dividend policies as identified in this paper. The stable group clearly provided the most unambiguous announcement effect. The significance levels we observed in our study through isolating this group were much higher than those observed in previous studies.

There was much more noise in the constant and residual groups. While there were significant announcement effects at t=0 for most cases, there were also unexplained "spikes" observed in the values of D(i,t) for other days. We can be far less certain about the consistent value of dividends as a signal for these firms.

We also show that, although most firms do follow a stable dividend policy, there are sufficient number of firms using other dividend policies to confound the findings of empirical work in this area if these firms are ignored. We feel that future research should control for different dividend policies by varying the calculation of expected dividends across policy groups.

Finally, we feel that firms paying non-stable dividends should be the focus of future work on the

information content of dividend announcements. There are a substantial number of these firms, too many to ignore (as done by Charest [1978] and Woolridge [1982]). Also, uncertainties surrounding the market response to the dividend announcements of these firms makes them a much more interesting group to analyze.

FOOTNOTES

1. A listing of more specific quantitative criteria used to define the dividend policy groups in provided in the Appendix.
2. It appears that the belief that all firms follow a stable dividend policy stems from the early work of Lintner [1956] and Fama and Babiak [1968]. Lintner's study is based on a subjectively-selected sample of only 28 firms. Fama and Babiak found that a linear model incorporating past dividends and earnings best predicted future dividends. Perhaps this model fit their data the best simply because the stable dividend group is the largest. (We have no quarrel with this assumption.) However, evidence here implies that the naive model of dividend expectations ignores too many firms that do not follow a stable dividend policy.

REFERENCES

1. Aharony, Joseph and Itzhak Swary. "Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis." *Journal of Finance* (35) March, 1980. pp. 1-12.
2. Asquith, Paul and David W. Mullins. "The Impact of Initiating Dividend Payments on Shareholder's Wealth." *Journal of Business* (56) January, 1983. pp. 77-96.
3. Bar-Yosef, Sasson, and Lucy Huffman. "The Information Content of Dividends: A Signalling Approach." *Journal of Financial and Quantitative Analysis* (21) March, 1986. pp. 47-58.
4. Bhattacharya, Sudipto. "Imperfect Information, Dividend Policy, and the 'Bird in the Hand' Fallacy. "Bell Journal of Economics (10) Spring, 1979. pp. 259-270.
5. Black, Fischer and Myron Scholes. "The Effects of Dividend Yield and Dividend Policy on Common Stock Prices and Returns." *Journal of Financial Economics* 1 May, 1974. pp. 1-22.
6. Brealey, Richard and Stewart Meyers. *Principles of Corporate Finance* (New York: McGraw-Hill Book Co.) 2nd ed., 1984.
7. Charest, Guy. "Dividend Information, Stock Returns, and Market Efficiency - II." *Journal of Financial Economics* (6) June-September, 1978. pp. 297-330.
8. Divecha, Arjun, and Dale Morse. "Market Responses to Dividend Increases and Changes in Payout Ratios." *Journal of Financial and Quantitative Analysis* (18) June, 1983. pp. 163-173.
9. _____, Patrick J. Hess, and E. Han Kim. "On Interpreting Security Returns During the Ex-Dividend Period." *Journal of Financial Economics* (13) 1984. pp. 3-34.
10. Fama, Eugene, and Harvey Babiak. "Dividend Policy: An Empirical Analysis." *Journal of the American Statistical Association* (63) December, 1968.
11. _____, Lawrence Fischer, Michael C. Jensen, and Richard Roll. "The Adjustment of Stock Prices to New Information." *International Economic Review* February, 1969. pp. 1-21.
12. Gonedes, Nicholas J. "Corporate Signalling, External Accounting, and Capital Market Equilibrium: Evidence on Dividends, Income, and Extraordinary Items." *Journal of Accounting Research* (16) Spring, 1978. pp. 26-79.
13. Kalay, Avner. "Signalling, Information Content, and the Reluctance to Cut Dividends." *Journal of Financial and Quantitative Analysis* (35) November, 1980. pp. 855-869.
14. Kane, Alex, Young Ki Lee, and Alan Marcus. "Earnings and Dividend Announcements: Is there a Corroboration Effect?" *Journal of Finance* (34) September, 1984. pp. 1091-1099.
15. Laub, P. Michael. "On the Information Content of Dividends." *Journal of Business* (49) January, 1976. pp. 73-80.
16. Lintner, John. "Distribution of Incomes of Corporations Among Dividends, Retained Earnings, and Taxes." *American Economic Review* May, 1956. pp. 97-113.
17. Makhija, Anil and Howard E. Thompson. "Some Aspects of Equilibrium for a Cross-Section of Firms Signalling Profitability With Dividends: A Note." *Journal of Finance* (41) March, 1986. pp. 249-254.
18. Miller, Merton H. and Kevin Rock. "Dividend Policy Under Asymmetric Information." *Journal of Finance* (40) September, 1985. pp. 1031-1051.
19. Pettit, R. Richardson. "Dividend Announcements, Security Performance, and Capital Market Efficiency." *Journal of Finance* (27) December, 1972. pp. 993-1007.
20. _____. "The Impact of Dividends and Earnings Announcements: A Reconciliation." *Journal of Business* (49) January, 1976. pp. 86-96.
21. Scholes, Myron, and J. Williams. "Estimating Betas from Nonsynchronous Data." *Journal of Financial Economics* (5) December, 1977.
22. Stephens, Alan. "The Identification of Dividend Policies and an Evaluation of Their Impact on Firm Value." (unpublished Ph.D. dissertation, University of Utah, 1980.)
23. Watts, Ross. "The Information Content of Dividends." *Journal of Business* (46) April, 1973. pp. 191-211.
24. _____. "Comments on 'On the Information Content of Dividends.'" *Journal of Business* (49) January, 1976. pp. 81-85.
25. _____. "Comments on 'The Impact of Dividend and Earnings Announcements: A Reconciliation.'" *Journal of Business* (49) January, 1976. pp. 97-106.
26. Woolridge, Randy. "The Information Content of Dividend Changes." *Journal of Financial Research* (5) Fall, 1982. pp. 237-247.
27. _____. "Stock Dividends as Signals." *Journal of Financial Research* (6) Spring, 1983. pp. 1-12.
28. Weston, J. Fred and Thomas E. Copeland. *Managerial Finance* (Hinsdale, Ill: The Dryden Press) 8th ed. 1986.