When do Dividend Changes Signal Changes in Future Profitability?

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ABSTRACT

This paper examines financial performance after firms release their quarterly reports and consequently announce dividend decisions. We separate firms according to their reported earnings (either positive or negative) and put them into five mutually exclusive categories according to the dividend announcements (initiating, increasing, keeping, decreasing, or eliminating dividends). We confirm a reversal pattern: Firms tend to outperform after reporting negative earnings. In particular, firms with negative-earnings quarters but deciding to either initiate or increase dividends exhibit a *significantly positive* future performance while firms with positive-earnings quarters but deciding to either decrease or eliminate dividends exhibit a *significantly negative* future performance. Firms in the other earnings-dividend categories don't show any significant changes (to slightly negative) in their future profitability.

INTRODUCTION

A major issue in corporate finance is whether any information content exists in dividend policy changes. In their seminal work, Modigliani and Miller (MM 1961) assert that in a frictionless world where the investment policy of a firm remains constant, dividend policy does not affect the overall wealth of shareholders. There are lots of studies attempting to prove or disprove the theory by focusing on firms' past and future earnings performance after firms make their dividend decisions. In doing so, most of the studies focus on firms' future financial performance after their dividend announcements without further separating firms' earnings performance relative to their dividend decisions.

This paper takes a different approach to examine an old topic, the information content after a dividend decision. Each quarter, we separate firms based on their quarterly earnings: Either positive (including zero) or negative. Within each category, we further group the firms into five mutually exclusive sub-groups according to their dividend decisions: Firms deciding to initiate dividends, firms deciding to increase dividends, firms deciding to keep the same amount of dividends, firms deciding to decrease dividends, or firms deciding to eliminate dividends, based on the dividends during the previous quarter. We analyze the financial performance of the firms in each sub-group, using various financial/accounting measures, and test whether the changes in dividend decisions affect firms' future financial performance.

We confirm a reversal pattern: Firms tend to outperform after reporting negative earnings. In particular, firms with negative-earnings quarters but deciding to either initiate or increase dividends exhibit a

significantly positive future performance while firms with positive-earnings quarters but deciding to either decrease or eliminate dividends exhibit a significantly negative future performance. Firms in the other earnings-dividend categories don't show any significant changes (or to slightly negative) in their future profitability.

DATA SET AND SUMMARY STATISTICS

The initial data set consists of all the firms listed on both the CRSP/Compustat merged database and the CRSP database. From both databases, quarterly data from 1962 to 2007 is used to avoid the possible survivorship that many firms faced in 2008 crisis. In particular, the CRSP/Compustat merged database is used to find quarterly financial data, including net income (NI), profit margin (PM), earnings before interest and taxes (EBIT), return on assets (ROA), return on equity (ROE), cash holdings, debt level, enterprise value (EV), and current ratio for each firm. The CRSP database is used to find the history of cash/stock dividend, stock price, market value of equity, and share split data. Firms that don't have quarterly values for the selected variables are excluded from the sample. Due to the format of panel data analysis, firms that do not have at least four consecutive quarters of the data are also removed.

Summary statistics for the entire sample at the firm level provide the statistics for all firms, for firms that never have a negative NI quarter, and for firms that experience at least one quarter of negative NI. In total, the data set contains 13,417 firms with 239,136 valid quarterly observations. At the firm level, 11,287 firms (about 84% of the entire sample) have at least one quarter of negative NI while 2,130 firms (about 16% of the entire sample) never have a negative NI quarter. At the observation level, 70,151 (about 29% of the total observations) are flagged with quarterly negative NI. For the firms that suffer at least one quarter negative NI, about 35% of the observations are flagged with negative NI.

Summary statistics also report the average and standard deviation of a firm's financial performance, including market value, dividend per share (DPS), cash and debt levels, EV, NI, EBIT, PM, ROE, ROA, and current ratio for all the firms and the firms with or without a negative earnings quarter. Relative to the firms that never have a negative NI quarter, firms that report at least negative NI once in their life time are typically smaller in firm size, pay less dividends, and have lower (sometimes negative) values in the selected financial and accounting measures. Those firms have an average market value of $543 million, quarterly dividend of $0.14 per share, cash level of $68 million, debt of $266 million, enterprise value of $766 million, net income of $3 million, EBIT of $17 million, and current ratio of 4.1, all indicating an otherwise healthy firm. However, the average PM, ROE, and ROA are negative. Using a two-tail t-test and assuming unequal variances, we find that the means are significantly different in all the selected financial and accounting measures between the firms that never suffer a negative income quarter and the firms that have at least one negative income quarter, with only one exception that is the current ratio, which is not significantly different from each other between the two groups.

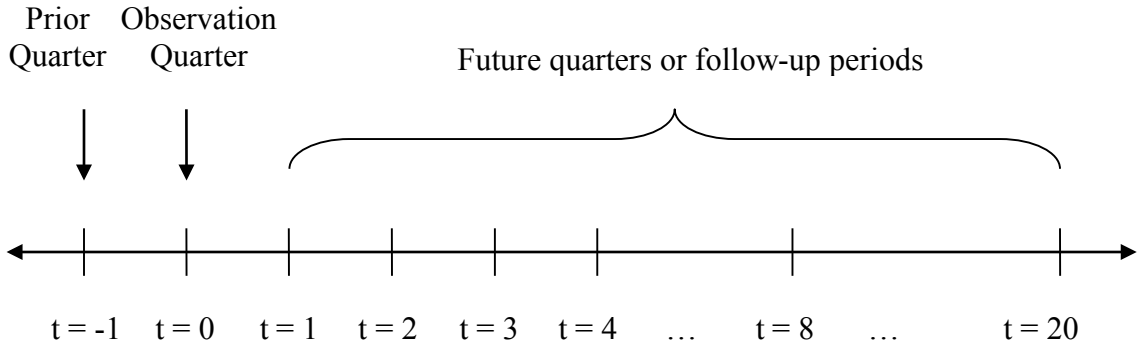
TEST MODELS

We perform a panel data analysis over the entire sample by categorizing a firm's NI in each observation quarter ($t = 0$) as either positive (including zero) or negative. We then compare dividend per share (DPS) in the observation quarter to DPS of the same firm in the prior quarter ($t = -1$) and place it into one of the following five mutually exclusive sub-groups.

1) There is a dividend in the prior quarter and the firm keeps the same amount of dividend in the observation quarter (keeping dividend). The observation that if there was no dividend in the prior quarter and there is no dividend in the observation quarter falls into this group;

2) There is no dividend in the prior quarter but the firm initiates a dividend in the observation quarter (initiating dividend);
3) There is a dividend in the prior quarter and the firm increases the dividend in the observation quarter (increasing dividend);
4) There is a dividend in the prior quarter but the firm decreases the dividend in the observation quarter (decreasing dividend);
5) There is a dividend in the prior quarter and the firm eliminates the dividend in the observation quarter (eliminating dividend).

Key statistics for each firm are further evaluated in future quarters (follow-up periods). Specifically, we follow up each firm during the first year (t = 4) to see the short term effect, and every year thereafter until the fifth year (t = 20) to see the long term effect. We focus on the change in the future quarters in selected financial and accounting measures for the firms in different sub-groups due to the changes in dividend decisions in the observation quarter and test whether the changes are significant. We further develop regression models to test whether the changes in dividends reveal any information to predict the future changes in earnings/financial performance for various groups with different earnings-dividend policy combinations. The following diagram shows the time line and basic test structure of our analysis.



Dividends used in this paper only include cash dividends to the ordinary common shareholders. Cash dividend per share is adjusted for any stock split and the change in the number of shares outstanding. We categorize an increase in dividend in the observation quarter as a 10% increase, at least, in the cash dividend from the prior quarter (to avoid any expected dividend increase by dividend-paying firms). Dividend outliers of greater than 500% from the prior quarter (special dividends) are excluded from the sample. Accordingly, the stock price is adjusted for the ex-dividend day price drop and rescaled upward for any dividend paid, stock split, stock dividend, and any other adjustments that may affect the number of shares outstanding such that the rescaled price matches the cumulative return that includes dividends.

To examine the impact of dividend change on firm future earnings we calculate the unexpected change in earnings (called quarter-by-quarter change hereafter) for the follow-up period (t = 1) based on the earnings in the observation quarter (t = 0). Assuming that earnings follow a random walk with a mean of $E_{i,0}$, the unexpected change in earnings for firm i in time t that decides to change its dividend is given by

$$UE_{i,t} = E_{i,t} - E_{i,0}. \qquad (1)$$

We then calculate the mean in unexpected changes in earnings for the firms with positive and negative earnings respectively, in each of the five distinctive dividend groups:

$$\overline{UE_t} = \frac{\sum_{i=1}^{N} UE_{i,t}}{N}, \qquad (2)$$

and further test whether the change is significantly different from zero. Applying the same approach, we calculate the changes in other financial and accounting measures and test whether the means in those changes are significantly different from zero. To examine the size effect on information content we repeat the analysis after sorting firms by their enterprise values and report the results for all positive earnings and for at least one negative earnings, respectively.

To formally test whether dividend changes contain any information about future earning changes for the firms that report negative income and decide to increase (or initiate) dividend, we consider the following regression:

$$\Delta EPS_{i,t+1} = \alpha + \beta_1 \Delta DPS_{i,t} + D_{i,t} * \beta_2 \Delta DPS_{i,t} + \sum_{j=0}^{3} \gamma_{t-j} \Delta EPS_{i,t-j} + \varepsilon_{i,t}, \qquad (3)$$

where $\Delta EPS_{i,t+1}$ is the change in earnings per share for firm *i* from quarter t to t+1, $\Delta DPS_{i,t}$ is the change in dividend per share for firm *i* from quarter t-1 to t, $D_{i,t}$ is a slope dummy that is one if firm *i* decreases DPS in quarter *t* and zero otherwise to test whether the increase in dividends will have any explanatory power that is different from dividend decreases, and the lagged changes in EPS for firm *i* are added in the regression to remove any possible autocorrelation and seasonality in EPS series. The earnings drift should be captured by the intercept in the regression. We repeat the regression several times in order to examine the impact on EPS over the follow-up quarters from the change in DPS in the observation quarter. If any increase (or initiation) in dividends in the observation quarter indeed signals future earnings increase, we should observe a positive and significant β_1 from the regression. On the other hand, if any decrease in dividends signals future earnings decrease, we should observe a positive and significant β_2 from the regression.

EMPIRICAL RESULTS

The initial results are separated by either positive or negative observations in NI. The total number of positive income quarter observations is 168,985. There are 96,588 observations where there are no dividends in the prior quarter and firms decide to either initiate or keep no change in dividends. There are another 72,397 observations where there is a dividend in the prior quarter and firms decide to either decease, increase, or keep the same amount of dividends. We use a two tail t-test, assuming unequal variance to test whether the difference in means in the selected financial and accounting measures is significant between firms that initiate (or increase) and those that don't initiate (or decrease) dividends. We find that for most of those measures, the quarter-by-quarter changes in means are significantly different over the two groups.

In addition, we find a general reversal pattern: Firms that perform better in the observation quarter tend to underperform during the next quarter, evidenced by lower NI and other profitability ratios. We also find that firms that pay dividends in the previous quarter and decide to either increase or keep the same amount of dividends in the observation quarter tend to have higher level of cash, debt, stock price, EV, NI, and comparable ROE, ROA, but slightly lower PM and current ratio, compared with firms in other three dividend policy groups. One quarter into the follow-up period, firms that increase (or initiate) dividends experience a significant increase in stock price and EV but a decrease in NI (possibly used to pay for dividends) and thus other lower profitability measures. This result is consistent with previous findings that a dividend increase or initiation doesn't necessarily signal future increase in earnings and profitability. At the same time, firms that decrease dividends also experience a positive price reaction (to a lesser extend) but a reduced NI and other profitability measures. The t-tests indicate that the means in

quarter-by-quarter changes in stock price, ROA, and current ratio are significantly different between the firms that increase (or initiate) and those that decrease (or do not initiate) dividends.

For the firms with negative earnings, we find a similar reversal pattern: Firms that suffer negative NI in the observation quarter tend to improve in the following quarter, evidenced by an increase in NI and other better financial and accounting measures. This is also consistent with the previous findings. We also find that firms that pay dividends in the previous quarter and decide to increase or keep the same amount of dividends tend to have higher stock price, debt, EV, and better profitability measures, such as PM, ROE, and ROA, compared with the firms in other three dividend policy categories.

Still for the firms with negative earnings, we find that one quarter into the follow-up period, firms that increase (or initiate) dividends tend to experience a decrease in stock price but a significant increase in NI by an average of $43.00 million (or $22.41 million) and other improved profitability measures. Unlike the findings for the positive income observations, this result strongly suggests that increasing (or initiating) dividends for those firms could be an indicator of future earnings increase, supporting the signaling hypothesis for the firms that report negative NI and decide to increase (or initiate) dividends; while firms that decrease dividends usually experience a smaller price appreciation, improved NI, and other profitability ratios in the next quarter. But all the changes are not statistically significant. There is other evidence that is consistent with the signaling and dividend smoothing hypotheses: Firms having negative NI in the observation quarter and deciding to keep the same dividends experience a significant increase in stock price and a big jump in NI by $50.13 million on average in the follow-up quarter, along with much improved profitability measures. The t-tests show that the means in quarter-by-quarter changes in NI and ROA are significantly different between the firms with negative income in the current quarter and decide to either increase (or initiate) or decrease (or don't initiate) dividends in the following period. These results are in line with the dividend signaling hypothesis: Firms need to change their dividend decisions to reveal the necessary information to the market about their future earnings changes.

Next, we break down the analysis by firm size. Conventional wisdom suggests that the signals may be different across different firm size. We use EV as a proxy for "size" to sort firms as opposed to their market values. Overall, the results are consistent with the findings using all observations. Almost all the firms with positive income each quarter experience a significant increase in stock price one quarter into the follow-up period no matter what size and dividend policy a firm adopts. The reversal pattern exists across all firm sizes no matter what dividend policy a firm adopts: Firms with positive NI in the observation quarter tend to have lower NI in the follow-up period across all firm sizes, along with other lower profitability ratios. However, the change in current ratios over the five distinctive dividend policy groups is seldom significant over different firm sizes.

For the firms with negative earnings, we confirm the previous findings that there exists a reversal pattern in NI and other profitability ratios: Firms that report negative NI in the observation quarter tend to improve their performance in the next quarter across all firm sizes, no matter what dividend policy a firm adopts. We also find that firms that increase (or initiate) dividends tend to have a lower stock price one quarter into the follow-up period while firms that keep the same amount of dividends tend to have a higher stock price. The most interesting and important finding is that, on average, firms deciding to increase (or initiate) dividends experience a significant increase in NI in the follow-up period by $115.81 million (or $105.55 million) for the firms in quintile 1, $8.72 million (or $4.49 million) for those in quintile 2, $1.91 million (or $1.58 million) for those in quintile 3, and $1.45 million (or $0.62 million) for those in quintile 4, along with much improved other profitability measures. Those results seem to suggest that larger firms with negative income prefer to send a costly but overall reliable signal

to the market about their future earnings increase and profitability. For the firms in the smallest quintile, however, we find that even though their NI and other profitability ratios tend to improve one quarter into the follow-up period but the changes are not statistically significant. Another finding is that firms with negative income but decide to keep the same amount of dividends experience a similar effect to those that decide to increase (or initiate) dividends. For those firms, the NI and other profitability ratios have improved significantly one quarter into the follow-up period across all firm sizes. Firms that decide to decrease dividends still tend to experience improved performance one quarter into the follow-up period, even though the improvement is generally not significant.

After removing possible autocorrelation and seasonality (reversal pattern) in EPS by adding the lagged changes in EPS in regression (3), we find a significantly positive relationship between the increase in DPS in the observation quarter and the increase in EPS one quarter into the follow-up period, supporting the previous findings that the change in DPS helps predict the change in future EPS for the firms with negative income that intend to signal the market by changing their dividends. The estimated coefficient associated with the lagged change in DPS is 0.068 with a t-value of 2.07. We also find that the decrease in DPS and the change in future EPS are negatively correlated. The regression coefficient is -0.028 with a t-value of -1.44. Overall, adding a lagged dividend variable in the regression improves the model fitness, evidenced by an increase in adjusted R^2 by about 5%. Finally, we find that the change in DPS in the observation quarter predicts the change in EPS several quarters into the follow-up periods. The regression coefficients associated with the lagged changes in DPS range from 0.098 (t=2) to 0.070 (t=3) and the t-values are significant. The increase in adjusted R^2s ranges from 0.04 to 0.06.

Finally, we extend our analysis into the follow-up periods to examine both short and long term effects. We find that an increase in dividends does not lead to a consistent increase in future earnings for the firms with positive NI in the observation quarter. On the contrary, we find that an increase in dividends does lead to a significant increase in future earnings for the firms with negative NI in the observation quarter. This increase in future earnings seems stable and persistent over the course of the next 5 years.

If dividend increase is indeed a costly signal by firms, we should observe price appreciation if investors interpret the signal accordingly. Using the rescaled price, we find that increasing dividends does lead to a future price appreciation for the positive income firms, even if it lacks of a corresponding earnings increase. In a similar way, we find a pattern of price appreciation for the firms with negative income observations that increase dividends, but to a lesser extent. For the long run effect of dividend policy on the firms with negative NI, we find that firms that increase or maintain the same amount of dividend have a greater and significant increase in earnings in the follow-up periods. Firms that decrease their dividends still manage an increase in earnings but to a smaller magnitude (not statistically significant), which is consistent with the existing evidence that firms are not willing to cut dividends unless it is necessary for the survival of the company.

CONCLUSIONS

We revisit an old topic, the information content in dividend decision with a new approach, by separating firms according to their NI and dividend policies. We confirm a general reversal pattern: Firms tend to outperform after reporting negative earnings. Moreover, we find firms with negative-earnings quarters but deciding to either initiate or increase dividends exhibit a significantly positive future performance (especially for larger firms) while firms with positive-earnings quarters but deciding to either decrease or eliminate dividends exhibit a significantly negative future performance. Firms in the other earnings-dividend categories don't show any significant changes in their future earnings and profitability.