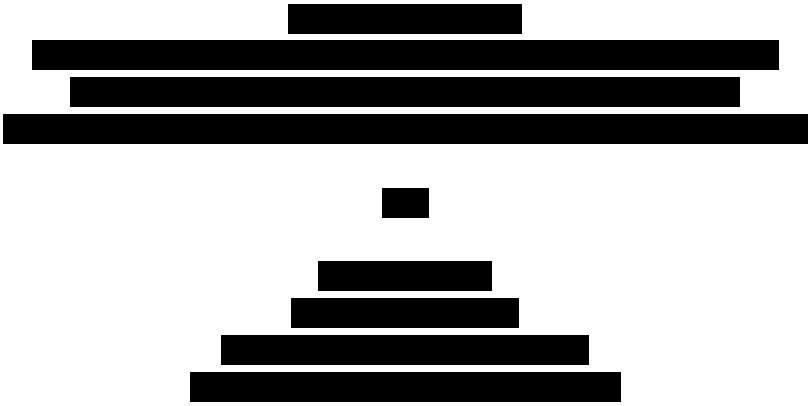
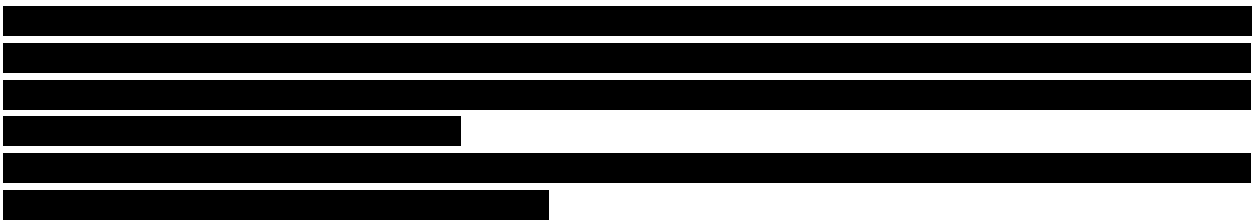
When Do Dividend Changes Signal Changes in Future Profitability?



Abstract

We study financial performance after firms announce their dividend decisions right after releasing quarterly earnings reports. We first separate firms with positive or negative earnings for the quarter and further group them into five mutually exclusive portfolios: initiating, increasing, keeping, decreasing, or eliminating dividends, based on their prior quarter dividend practices. We confirm a reversal pattern: Firms reporting negative earnings tend to outperform thereafter. In particular, firms with a negative-earnings quarter and consequently initiating or increasing dividends exhibit *significantly positive* future performance while firms with a positive-earnings quarter and deciding to decrease or eliminate dividends exhibit *significantly negative* future performance. Firms in other earnings-dividend portfolios don't show significant changes in future profitability. Our findings shed light on research into firms' dividend policy changes and their future performance.

JEL Classifications: G14, G35
Key words: Earnings announcement and consequent dividend decisions; earnings reversal; future financial performance and dividend policy change; information content and signaling hypothesis.



When do Dividend Changes Signal Changes in Future Profitability?

1. Introduction

A major issue in corporate finance is whether any information content exists in a dividend policy change. In their seminal work, Modigliani and Miller (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. After relaxing some of the assumptions, several theoretical models suggest that increases in dividends should reflect positive past earnings and signal future earnings growth potential. At the same time, many empirical studies attempt to prove/disprove those models or theories by focusing on firms' past and future earnings performance after firms make (change) their dividend decisions. In doing so, most studies focus on firms' future performance in the sample after they make dividend announcements without further separating firms' earnings performance relative to their dividend decisions.[1]

There are several theories and empirical evidence that suggest that firms with different earnings power and making consequent dividend decisions may reveal inside information to the market differently. Under the dividend signaling hypothesis, firms increase (or initiate) dividends as a costly signal to convey their true worth or to purposefully separate themselves from other major competitors. One of the most important predictions of the hypothesis is that the change in dividend should be positively correlated with future changes in earnings power and profitability (Bhattacharya (1979) and Miller and Rock (1985)). This also implies that there should be a positive relationship between dividend changes and the stock price reaction due to the dividend change. Early empirical evidence supports this prediction; firms that raise (or initiate) dividends usually

[1] For example, see the earlier work of Bhattacharya (1979), Aharony and Swary (1980), Asquith and Mullins (1983), Miller and Rock (1985), DeAngelo, DeAngelo, and Skinner (1996), Benartzi, Michaely, and Thaler (1997), Grullon, Michaely, and Swaminathan (2002), Grullon, Michaely, Benartzi, and Thaler (2005), and the recent work by Baker, Mendel, and Wurgler, 2015, Liu and Chen (2015), Wu, 2018, Ham, Kaplan, and Leary (2020), and many others.

experience stock price increase while firms that cut (or eliminate) dividends experience an opposite effect in their stock prices (Aharony and Swary (1980) and Asquith and Mullins (1983)).

However, this initial success is met with skepticism once people find that stock price appreciation doesn't always lead to an increase in future earnings power and profitability. Contrary to the prediction, studies by DeAngelo et al. (1996), Benartzi et al. (1997), and Grullon et al. (2002) find little or no significant evidence that any increase in dividends predicts an abnormal increase in future earnings. Grullon et al. (2005) even show evidence that dividend changes are negatively correlated to future profitability changes, such as return on assets (ROA hereafter). Furthermore, models that include dividend changes do not seem to outperform those that do not include dividend changes in out-of-sample earnings forecast. All those results add more complexity to the dividend puzzle.

Recently, Ham et al. (2020) revisit dividend information content and their results show that dividend changes contain information about highly persistent changes in firms' future economic income after they make the adjustments in initial data cleaning, measurement selection, and model specification. Specifically, they use an "event window approach" to delineate earnings after firms make dividend changes, adopt alternative earnings measures to control for endogenous investment and asset write-downs surrounding dividend changes, and control for possible nonlinear relation between dividend changes and market reactions. Their results suggest that dividend announcement returns reflect information content about the level of permanent earnings.

Another question related to signaling claims that dividend policies have potential to resolve (or reduce) agency problem between corporate managers and shareholders (Jensen and Meckling (1976), Hart and Moore (1994), and Porta, Lopez-de-Silanes, Shleifer, and Vishny (2000)), and therefore have the potential to increase firms' value. Under the agency theory, a firm may have

excess cash but lack sound investment projects. Unless the cash is paid out to the shareholders, it might be diverted by the managers for their personal use or could be misused on unprofitable projects that provide private benefits to the managers. Thus, shareholders prefer cash dividends over retained earnings. In a good-type firm where the management should act on behalf of the shareholders and voluntarily keep paying, increase or initiate dividends with extra cash. Otherwise, the shareholders will exert pressure on the board members to achieve their desired outcome.

There are several theories that could potentially explain the above phenomenon. Under the dividend signaling model, a "good-type" firm could be signaling a temporary negative-earnings shock with its long-term confidence in its earnings growth potential and profitability. Consistent with Lintner's (1956) theory of dividend smoothing, those firms would increase/initiate dividends because they believed that they could sustain higher dividends in the future. Under Jensen's (1986) free cash flow hypothesis, a firm that was not efficiently using its cash on good projects could wish to pay out the excess cash as dividends to its shareholders. A declining ROA, cash holdings, and current ratio in future periods after the dividend increase (to a sustainable level) were consistent with that hypothesis. A third explanation asserted that a firm that was truly in financial distress could be facing increasing pressure to give back some of its value via dividends to its shareholders, who might benefit from a temporary price appreciation. By returning more cash to shareholders, a wealth transfer would occur from creditors to stockholders. In this case, we would expect lower profitability measures in the follow-up periods after dividend decisions.

While there have been many empirical tests of dividend policies, most studies have limited their focus to the entire sample without further decomposing the firms according to their earnings status. In particular, limited research has focused on the information content from the change in dividend policies by firms with different earnings status (positive or negative) and consequently

make their dividend changes. Common sense would suggest that firms with negative earnings would decrease (or eliminate) dividends and use the extra cash to invest in the value-added projects to achieve better financial results in the future, if the costs associated with that were not too high. At the same time, we would expect that firms with positive earnings should continue (or increase) their dividends with no need to either decrease or eliminate dividends. However, the fact that firms do increase/initiate (decrease/eliminate) dividends after they report negative (positive) earnings. Those scenarios indicate some other alternative thoughts and warrant further investigation.

This paper takes a different approach to examine an old topic, the information content in a dividend decision. Each quarter, we separate all the firms in the entire sample into two distinctive categories based on their quarterly earnings announcements: Either positive earnings (including zero) or negative earnings. Within each category, we further group the firms into five mutually exclusive sub-samples according to their consequent dividend decisions: Firms that decide to initiate, increase, keep the same amount, decrease, or eliminate dividends, based on the dividend distributed during the prior quarter. We then further analyze the financial performance of the firms within each sub-sample, using various financial/accounting measures, and test whether the change in dividend decisions affects firms' future financial performance. We believe that firms in different sub-samples with different future earnings' perspectives will signal to the market differently.

Using quarterly panel data, we examine the information content after dividend changes by the firms that have either a quarter positive or negative net income and consequently decide to change dividend policies. Different from previous findings failing to find a significant relationship between a firm's future earnings change and the change in the current dividends for the entire sample, we find evidence to support the information content (or signaling hypothesis) about firms' future financial performance in four out of ten sub-samples. In particular, we find that firms with

a negative-earnings quarter but deciding to increase or initiate dividends exhibit a significantly better future financial performance while firms with a positive- earnings quarter but deciding to either cut or eliminate dividends experience an opposite effect. Firms in the other six sub-groups exhibit insignificant effects on their future performance after dividend decisions. Our results are consistent with dividend signaling and smoothing hypotheses for several of our sub-samples.

The rest of the paper is organized as follows. Section 2 describes the data set used in this paper. Section 3 covers the methodology while section 4 provides the empirical results. Section 5 offers further discussions and concludes the paper.

2. Dataset

The initial data set consists of all the firms listed on both the Center for Research in Security Prices (CRSP hereafter) database and CRSP/Compustat merged database. From both databases, quarterly data from 1962 to 2007 is used.[2] In particular, the CRSP/Compustat merged database is used to obtain all firms' quarterly financial data, including net income, profit margin, earnings before interest and taxes (EBIT hereafter), ROA, return on equity (ROE hereafter), cash holdings, debt, enterprise value (EV hereafter), and current ratio for each firm. The CRSP database is used to match the history of cash dividends, 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 don't have at least four consecutive quarters of the data are also removed. Each observation from a firm that has a negative quarterly net income is flagged.

[2] The financial turmoil started in 2008 which caused many corporations, especially banking and financial firms to cut or eliminate their dividends for survivals. As a result, we only use the data up to the end of 2007 to avoid any possible survival bias in the analysis.

The amount of dividend used in this paper only includes cash dividends to the ordinary common shareholders. The 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.[3] Following Grullon et al. (2002), dividend outliers of greater than 500% from the prior quarter are also excluded from the sample.[4] 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 so that the rescaled price matches the cumulative total return that includes dividends. The price reaction is measured by the change in rescaled price in the observation quarter and in the follow-up quarter since the market value may reflect stock splits, stock dividends, cash dividends, share repurchases, option exercises, and/or new share issues.

The appropriate measure of financial performance to characterize stocks is always up for debate. Following Grullon et al. (2002), we mainly consider one out of the following two measures: either net income (NI hereafter) or EBIT hereafter. NI (or income before extraordinary items and discontinued operations) is defined in Compustat as "income before extraordinary items" plus "extraordinary items and discontinued items" while EBIT is defined in Compustat as "operating income before depreciation" minus "depreciation expenses." After an initial robustness check, we find that the main results are similar, using either measure. We decide to use NI.[5]

[3] The use of 10% as the cutoff point is arbitrary. The purpose of using a cutoff point is to exclude any expected increase in dividends that has been factored in the market price already, which usually is less than 10%. That way, we can study the unexpected change in dividends on firms' future performance.

[4] Special dividends usually fall into the outlier category and thus are excluded from the sample. However, all the observations with dividend initiations are included in the sample.

[5] Ham et al. (2020) also argues that earnings measures that are less affected by investment and write-downs (Novy-Marx, 2013; Peters and Taylor, 2017), namely, gross profit or operating cash flow, are other possible measures for the persistence of economic income.

Existing analysis sorts out the relationship between dividend changes and current and future earnings changes on firm size. For example, Benartzi et al. (1997) further break up their findings based on quintile of equity market capitalization. We argue that market capitalization may not be the most appropriate measure to sort out. Instead, we use EV, which is an economic measure that reflects the market value of the whole firm.[6] It is the sum of the claims from all the security holders, including debt, preferred, minority, and common-equity holders within a firm. Specifically, we use the following definition:

> EV = market value of common equity + debt + minority interest + value of preferred stock – cash and cash equivalents.

Because EV is a capital structure-neutral metric, it is often used when we compare companies with diverse capital structures. In fact, many stock market investors have been using a ratio of earnings before interest, taxes, depreciation, and amortization (EBITDA) over EV to compare equivalent companies on a risk-adjusted basis.

3. Methodology

3.1. Sub-sample formation

We perform a panel data analysis over the entire sample by first categorizing a firm's net income each quarter (observation or current quarter, t = 0) as positive (including zero) or negative. We then compare dividend per share (DPS hereafter) in the quarter for a firm to DPS of the same firm in the prior quarter (t = -1) and place the firm into one of the following five mutually exclusive sub-samples.[7] We repeat the process every quarter for each firm over the entire sample.

[6] We only sort stocks by EV since it is a capital structure-natural measure. Other possible criteria to sort stocks include using different risk factors, thus as market risk, size, and other financial and market ratios.

[7] Benartzi et al. (1997) rescaled their annual dividend measure to reduce possible bias. We only rescale the dividend to reflect the change in the number of shares outstanding and share price.

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

2) There is no dividend in the prior quarter, but the firm initiates a dividend in the current quarter (initiating dividends).

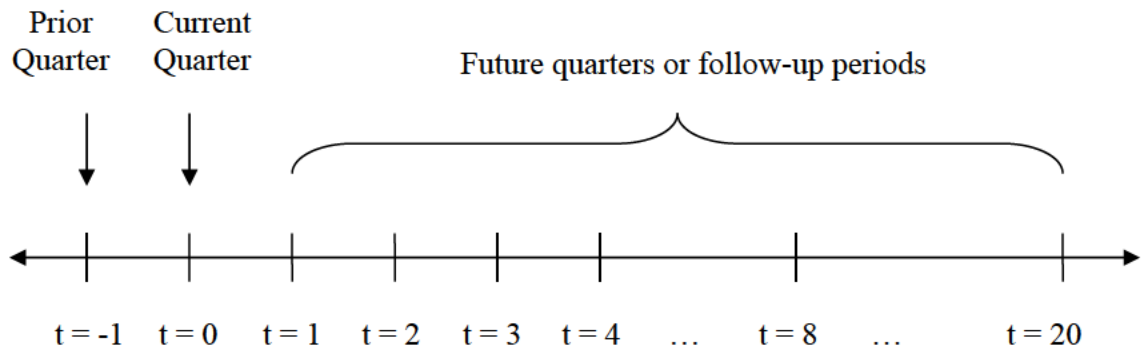
3) There is a dividend in the prior quarter and the firm increases the dividend in the current quarter by more than 10% but less than 500% (increasing dividends).

4) There is a dividend in the prior quarter, but the firm decreases the dividend in the current quarter (decreasing dividends).

5) There is a dividend in the prior quarter and the firm eliminates the dividend in the current quarter (eliminating dividends).

3.2. Research Design

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 then 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 the selected financial and accounting measures for the firms in different earnings-dividend combination sub-samples due to the changes in dividend decisions during the observation quarter and test whether those changes are significant. We further develop regression models to test whether the change in dividend decisions reveals any necessary (or additional) information to predict the change in future NI or financial performance. We believe that firms in different earnings-dividend combinations should signal the market differently. The following diagram provides a detailed timeline and summarizes the basic test structure used in our analysis.



To examine the impact of dividend change on a firm's future earnings, we first 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). We assume that earnings follow a random walk with a mean of $E_{i,0}$ then 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 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. We report the summary statistics in Table 1 and the results for the firms with all positive earnings in Table 2 and the results for the firms with all negative earnings in Table 3. To examine the size effect on information content we repeat the analysis after further sorting firms by their EVs and report the results in Table 4 (for all positive-earnings firms) and Table 5 (for at least one negative-earnings firms).

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 (EPS hereafter) 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 increases in dividends will have 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 to examine the effect on EPS over the follow-up quarters from the change in DPS in the observation quarter. If any increase (or initiation) in dividend in the observation quarter indeed signals future earnings increase, we should observe a positive and significant β_1 from regression (3). On the other hand, if any decrease in dividend signals future earnings decrease, we should observe a positive and significant β_2 from the regression.

Finally, we follow up each firm up to 20 quarters (t = 20) and chart the mean changes in NI, rescaled stock price, ROA, and other related statistics for all the firms in positive and negative earnings groups with different dividend decisions, based on the values in the observation quarter.[8] We present the results in Figures 1-6.[9]

[8] We use the change in the level to show the trend. Another possible measure is to use the percentage change. The results are similar.

[9] We only show the descriptive results/patterns without using tables. The detailed test results are available from the authors upon request.

4. Empirical Results

4.1. Summary Statistics for all Observations

Summary statistics for the entire sample at the firm level are provided in Table 1. Panel A provides the statistics for all firms; Panel B breaks down the statistics for firms that never have a negative NI quarter; Panel C shows the statistics for firms that experience at least one quarter of negative NI. In total, the data set contains 13,417 firms (the number of firms varies over time) 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 quarter-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.

Table 1 also reports the average and standard deviation of a firm's financial performance, including market value, DPS, cash and debt levels, EV, NI, EBIT, net profit margin, 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 lifetime are typically smaller in firm size, pay out 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, EV of $766 million, NI of $3 million, EBIT of $17 million, and current ratio of 4.1, all indicating an otherwise healthy firm. However, the average net profit margin, ROE, and ROA are negative. Employing a two-tail t-test and assuming unequal variances, from Panel D we find that the means are significantly different in all the selected financial and accounting measures between the two groups, firms that never suffer a negative income quarter and 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.

4.2. Summary Statistics for Positive NI Observations

The results are then separated by positive or negative observations in NI. Table 2 shows the results for positive NI observations in each of the 5 distinctive dividend policy categories in the observation quarter and one quarter into the follow-up period, measured by quarter-by-quarter change in means for the selected financial and accounting measures. The total number of positive NI observations is 168,985. Panels A and B refer to 96,588 observations where there are no dividends in the prior quarter and firms decide to either initiate or keep no change in dividends. Panels C, D and E refer to 72,397 observations where there is a dividend in the prior quarter and firms decide to either decrease, increase, or keep same dividends. In each of F and G panels, we use a two-tail t-test assuming unequal variance to test whether the differences in means in the selected financial and accounting measures are significant between the firms that initiate (or increase) dividends from those that do not initiate (or decrease) dividends, respectively.

From Table 2, we first confirm a general reversal pattern: firms that perform better in the observation quarter tend to underperform the next quarter, evidenced by lower NI and other selected profitability ratios. We then 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 net profit margin 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 and thus other lower profitability measures. This result is consistent with previous findings that a dividend-increase or initiation

doesn't signal future earnings increase and profitability. Meanwhile, firms that decrease dividends experience a positive price reaction too but 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 don't initiate) dividends.

4.3. Summary Statistics for Negative NI Observations

Table 3 reports the statistics for the firms with negative earnings. Similar to the patterns found in Table 2, we first confirm a general 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 finding is consistent with the findings of Benartzi et al. (1997). We further 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 prices, debt, EV, and better profitability measures, such as net profit margin, ROE, and ROA, compared with the firms in other three dividend policy categories.

From Panels D and A in Table 3, 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 $43.00 million (or $22.41 million) and other improved profitability measures. Unlike the findings for the positive NI observations, this result strongly suggests that increasing (or initiating) dividends for those firms could be a reliable indicator of future earnings increase, supporting the signaling hypothesis for the firms that report NI and decide to increase (or initiate) dividends. Meanwhile, firms that announce to 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. From Panel E in Table 3, we also find evidence that is

consistent with the signaling and dividend smoothing hypotheses. Firms having negative NI in the observation quarter and deciding to keep same dividends experience a significant increase in stock price and a big jump in NI by about $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 both 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.

4.4. Summary Statistics for Positive NI Observations by EV Quintiles

Next, we break down the analysis by firm size. Conventional wisdom suggests that signals may be different across different firm sizes. Hereby we use EV as a proxy for size to sort firms as opposed to their market values. Table 4 provides the results for firms with positive earnings sorted in quintiles with 1 being the largest in size and 5 being the smallest. Overall, the results are consistent with those in Table 2. Almost all the firms with a positive-income 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. It seems that the reversal pattern also exists across all firm sizes no matter what dividend policy a firm uses: Firms with positive NI in the observation quarter tend to have a 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.

4.5. Summary Statistics for Negative NI Observations by EV Quintiles

Table 5 provides the results for firms with negative earnings. We first confirm the previous findings that there exists a reversal pattern in NI and other profitability ratios for those firms: 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 then 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 same dividends tend to have a higher stock price. The most important finding is that 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 selected profitability measures. This result reinforces the previous findings that larger firms with negative income prefer to send a costly but overall reliable signal to the market about their future earnings prospect 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 never statistically significant.

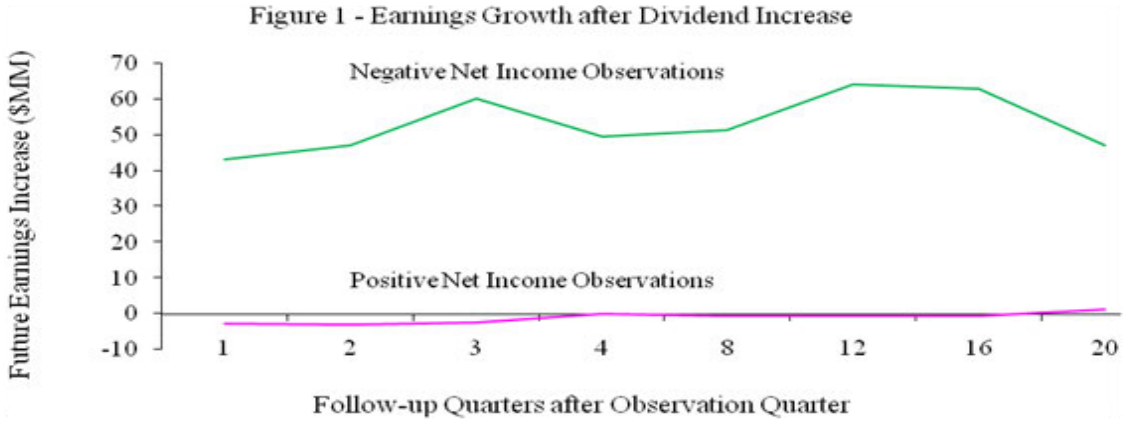
Another finding that is also consistent with the signaling hypothesis is that firms with NI but decide to keep the same dividends experience a similar effect to those that decide to increase (or initiate) dividends. For those firms, the NI and other profitability ratios have significantly improved one quarter into the follow-up period across all firm sizes. For firms that decide to decrease dividends, we find that they tend to experience improved performance one quarter into the follow-up period, even though the improvement is generally not significant.

4.6. Regression Results of Dividend Signaling

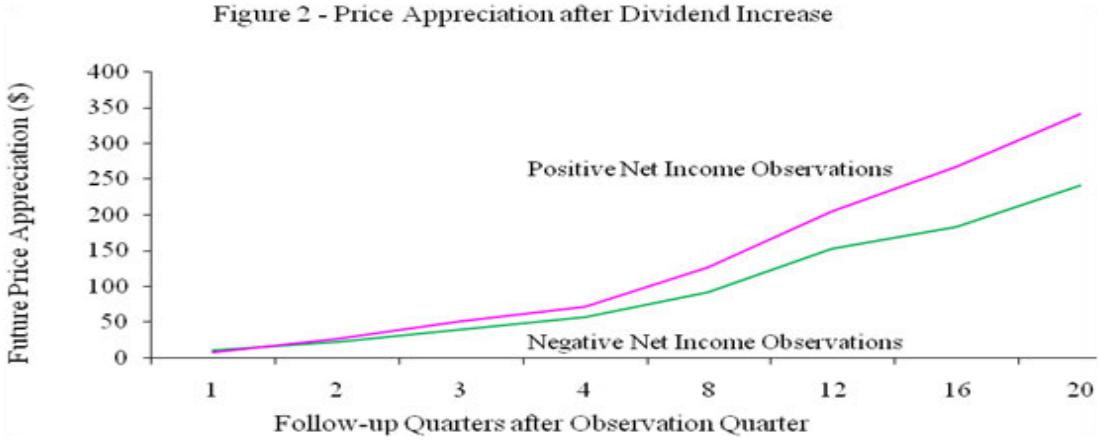
Table 6 provides the regression results. After removing possible autocorrelation and seasonality (reversal pattern) in EPS by adding the lagged changes in EPS in the regression, we find a significantly positive relationship between the increase in DPS in the observation quarter and the increase in EPS 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 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 all significant at the five percent level. The increase in adjusted R^2s ranges from 0.04 to 0.06.

4.7. Short- and Long-term Effects

Next, we extend our analysis into the follow-up periods to examine the short- and long-run performance. We compare the trend of earnings changes (the changes in earnings in the follow-up quarters relative to the current period) after dividend increase between positive and negative net income observations.



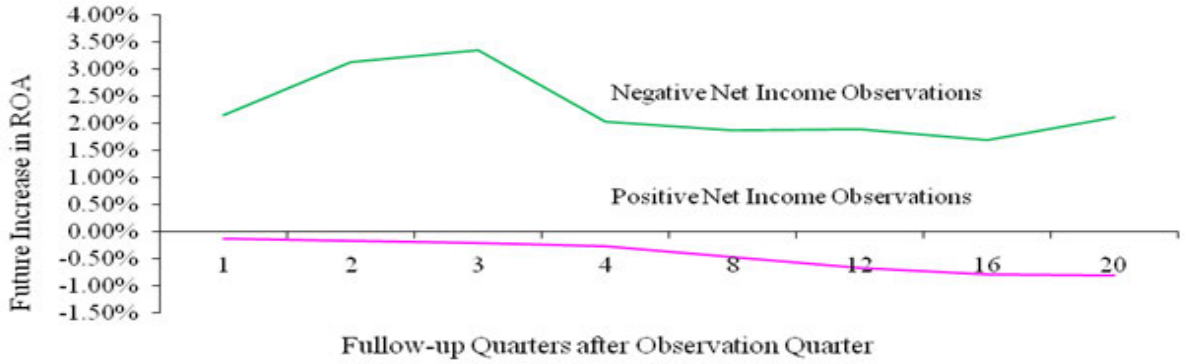
From Figure 1, we find that an increase in dividends does not lead to an increase in future earnings for the firms with positive net income in the observation quarter.[10] On the contrary, we find that an increase in dividends does lead to a significant increase in future earnings for the firms with negative net income in the observation quarter. This increase in future earnings seems stable and persistent over the course of the next 5 years. This finding supports the signaling and dividend smoothing hypotheses as firms should not increase dividends unless they anticipate having higher future earnings to sustain the increase.



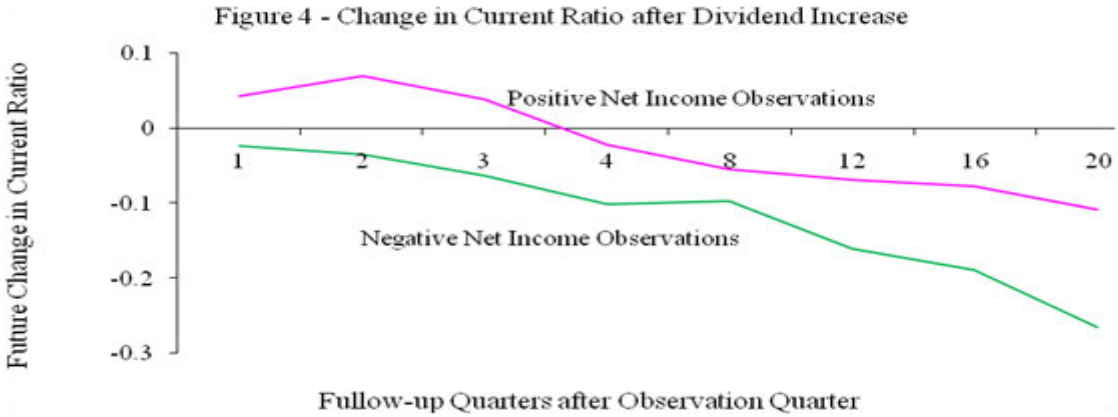
[10] Actually, there is a slightly decrease in earnings during the first year for the firms with all positive earnings in the observation quarter that decide to increase dividends as shown in Figure 1. This result is consistent with the findings in Benartzi et al. (1997) that use annual data.

If dividend increase is indeed a costly signal by firms, we should see a price appreciation if investors interpret the signal accordingly. To that end, we examine and compare the trend of price behavior after dividend increase between positive and negative net income observations, using the rescaled price in Figure 2. As others have shown, increasing dividends does lead to a future price appreciation for the positive income firms, even if it lacks a corresponding earnings increase. Similarly, we find a pattern of price appreciation for the firms with negative income observations that increase dividends, but to a less extend. Excluding the rescaled factor and size effect, this could partially be due to the investor's wariness towards the firms' decision to increase dividends when they are facing earnings shortage.

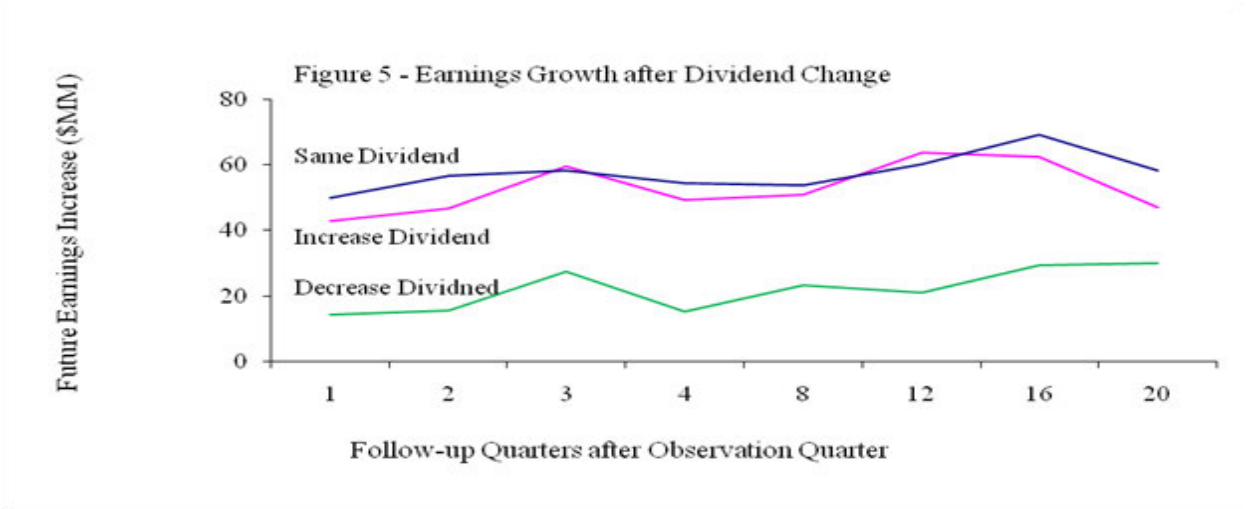
Figure 3 - Increase in ROA after Dividend Increase



If the free cash flow hypothesis is true, we should observe declining ROA and current ratios over time, based on those in the observation quarter. As shown in Figure 3, the positive net income firms that increase dividends continue to see a small but sustained decline in ROA in the long run whereas the negative income firms continue to see an overall increase in ROA in the long run. In the latter case, this is linked to an overall increase in net income as seen in Figure 1 along with other improved profitability measures.



From Figure 4, we observe a steady decline in current ratios overall for both the positive and negative net income firms that increase dividends. But the decline is small and not significant. Overall, we only find limited evidence to support the free cash flow hypothesis.

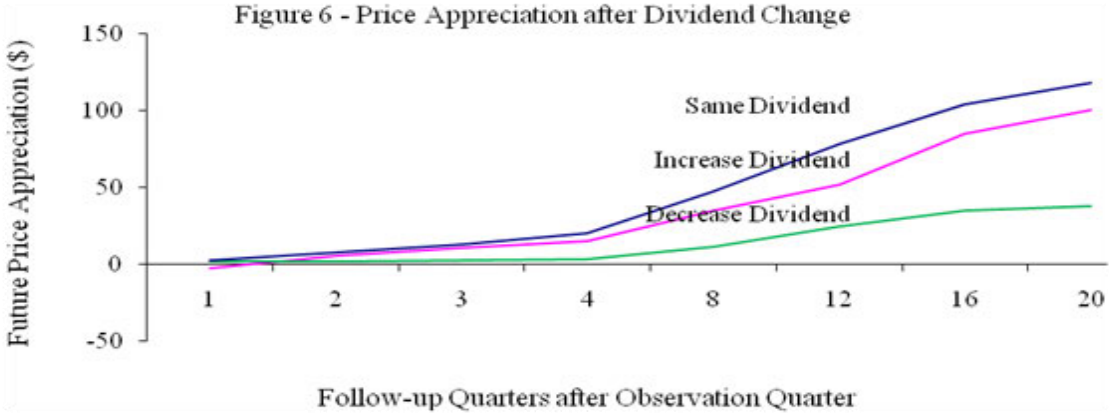


Finally, we explore the long-term effect of the dividend policy on the firms with negative net income. From Figure 5, we find that firms that increase or maintain the same amount of dividend have a greater and significant increase in earnings in the follow-up periods. Once again, the results support the signaling theory that firms increasing or maintaining their dividends are attempting to portray themselves as a good-type firm (in this case, a good type of firm is one with

a stable dividend). Firms that decrease their dividends still experience an increase in earnings but to a smaller degree (not statistically significant), consistent with the existing evidence that firms are not willing to cut dividends unless it is necessary for the survival of the company.

Why do firms like to mimic a good-type firm with stable dividends? The dividend smoothing theory says that stable dividends are highly valued by investors. As we can see in Figure 6, this theory holds empirically even for the firms with negative earnings. Firms with stable dividends consistently have the highest price appreciation in the follow-up periods. The fact that firms with stable dividends consistently outperform firms that increase their dividends reinforces the importance of predictability and transparency of dividend policies to investors. Combining the results in Figures 5 and 6, it seems to reinforce the previous findings that firms with negative earnings decide to increase (or initiate) dividends to signal the market about their future earnings increase and profitability. In the short run, investors are wary of the increase as indicated by a slight initial drop in stock price, but overall investors do respond with a higher stock price as the increased earnings come to fruition. Firms that decrease their dividends have the lowest long run price appreciation, indicating that those firms may really be facing prolonged financial difficulties.

Figure 6 - Price Appreciation after Dividend Change



Overall, we confirm a general reversal pattern: Firms tend to outperform after reporting negative earnings while firms tend to underperform after reporting positive earnings. We also find that firms with a negative-earnings quarter and consequently deciding to either initiate or increase dividends exhibit a *significantly positive* future performance while firms with a positive-earnings quarter but consequently deciding to either decrease or eliminate dividends exhibit a *significantly negative* future performance. Firms in other earnings-dividend bub-samples don't show significant changes in future profitability. Our results indicate that some firms use dividend policy changes to signal the market.

5. Further Discussions and Conclusions

One of the most important issues in corporate finance is whether dividend changes contain information about future earnings growth and profitability. Although dividend signaling theories imply that dividend increases should signal better prospects, empirical studies have provided mixed results. Our analysis is based on firms experiencing negative earnings but deciding to change dividends paints a different picture. Our findings indicate that, excluding firms in the smallest size quintile, the rest of firms with negative NI and deciding to increase (or initiate) dividends exhibit an increased NI and profitability in the short- and long-term, and provide empirical support for the dividend signaling, smoothing, and to a lesser degree, free cash flow hypotheses.

Given these interesting findings, we must address some robustness concerns. We focus our analysis on firms with at least one quarter of negative NI. As a robustness check, using negative EBIT, or alternative accounting measures don't significantly change the main results. However, using only one quarter of negative NI to group observations is quite limited. The next step would

be to check if the results hold for firms with multiple quarters of negative NI. Nevertheless, we argue that since there is limited research that has focused on financial performance in the follow-up quarters based on the decision by management to increase (or initiate) or decrease (or not initiate) dividends after suffering negative earnings in the current quarter, this study still provides valuable insights to address this important issue as over 84% of firms in the sample face such a decision.

Where necessary, we use the book value of the debt as a substitute for the market value of the debt due to lack of readily available data on the latter. While the market interest rates may have changed and the market's perception of the risk of the debt may have changed since the debt was issued, we don't think that the difference will significantly affect the cost of the different capital structure or EV.

Our findings are unique to the literature and certainly open up more questions for further discussions. For example, why is it that in times of positive earnings, firms decreasing dividends but still experience a price appreciation? Why is it that firms that increase dividends but don't have future earnings growth have a price appreciation too? Why is it that in times of negative earnings, firms can increase dividends that are backed up by future increases in earnings but still suffer a decline in stock price in the short run? Investors seem overly optimistic and forgiving of firms that have positive NI and overly cautious of firms with negative NI. Over time, investors see the increase in earnings and reward the stock in the market, but it is not clear whether they understand the information content in the change in dividends.

While our results are consistent with the signaling, smoothing, and free cash flow (to a lesser degree) models, there are still some concerns. In the case of the excess cash hypothesis, why don't firms simply repurchase their shares? If this is a one-time phenomenon, then firms have to

consider future financing needs. If they initiate dividends, it may need to raise capital through a bond or stock issue just to pay dividends in the future. Is there a more efficient way for firms to signal their future earnings growth other than dividends if investors don't understand the signal? Firm size seems to play a limited role to tell when good firms are signaling or when bad firms are liquidating wealth, but is there any better metric? Should we consider other ways to group stocks, (such as using the FF multiple risk factors), use other economic income measures, or use different econometric model specifications? We leave these issues for future research.

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Table 1 - Summary Statistics at Firm Level

This table provides summary statistics of quarterly financial performance for all firms, firms without any negative income quarter, and firms with at least one negative income quarter, along with the t-tests of equal means for different groups, assuming unequal variance over the period 1962-2007. The data includes 13,417 firms with 239,136 valid quarterly observations. MV stands for market value, EV for enterprise value, NI for net income, NPM for net profit margin, and Stdev for standard deviation. Negative net income is flagged based on the firms' quarterly reports.

	MV ($MM)	DPS ($)	Cash ($MM)	Debt ($MM)	EV ($MM)	NI ($MM)	EBIT ($MM)	NPM (%)	ROE (%)	ROA (%)	Current Ratio	Negative NI Flag
Panel A: All firms (N = 13,417)												
Mean	641.92	0.17	80.55	282.52	869.64	8.44	24.80	-4.52	-17.79	-2.45	4.05	0.29
Stdev.	3,727	1.26	432	1,571	4,373	143	174	55.3	309.8	8.5	13.3	N/A
Panel B: Firms without a negative income quarter (N = 2,130)												
Mean	1,164.11	0.37	144.87	368.67	1,420.92	38.96	68.27	0.14	12.28	2.65	3.76	0.00
Stdev.	6,534	2.45	669	1,532	6,778	191	313	0.2	254.9	2.8	15.9	N/A
Panel C: Firms with at least a negative income quarter (N = 11,287)												
Mean	543.40	0.14	68.42	266.27	765.61	2.68	16.60	-5.40	-23.47	-3.41	4.11	0.35
Stdev.	2,897	0.86	369	1,577	3,741	132	131	60.3	318.8	8.9	12.8	N/A
Panel D: t-test in means between firms without and with one quarter of negative income												
t-value	4.30	4.32	5.13	2.82	4.34	8.42	7.50	9.65	5.69	58.64	-0.95	N/A

Table 2 - Summary Statistics for Positive NI Observations

This table provides summary statistics of quarterly financial performance for the firms that have all positive income quarters and decide to change their dividend policy along with the t-tests for equal means in different groups assuming unequal variance over the period 1962-2007. The data contains 168,985 valid quarterly observations. EV stands for enterprise value, NI is net income, and NPM is net profit margin. Qtr/Qtr change in mean represents the change in means between the value one quarter into the follow-up period and the value in the observation quarter while * indicates the change in mean is significant at the 5% level.

	Price ($)	Cash ($MM)	Debt ($MM)	EV ($MM)	NI ($MM)	NPM (%)	ROE (%)	ROA (%)	Current ratio
Panel A: No previous dividends, choose to initiate dividends (N = 5,241)									
Mean	99.80	72.34	286.56	1,202.09	15.76	0.21	4.30	2.12	3.00
Qtr/Qtr change in mean	2.84*	3.21*	6.36*	35.48*	-2.04*	-0.12	-0.79*	-0.28*	0.38*
Panel B: No previous dividends, choose not to initiate dividends (N = 91,347)									
Mean	44.09	65.81	172.71	771.31	10.21	0.24	6.03	2.28	3.45
Qtr/Qtr change in mean	1.35*	2.40*	4.16*	22.50*	-2.59*	-0.25*	-1.98*	-1.02*	-0.06
Panel C: Previous dividends, choose to decrease dividends (N = 6,366)									
Mean	131.38	70.93	374.11	1,271.95	16.31	0.11	4.31	2.05	3.34
Qtr/Qtr change in mean	4.02*	1.91	4.17	35.59*	-2.16*	-0.05*	-1.31*	-0.44*	-0.25
Panel D: Previous dividends, choose to increase dividend (N = 7,082)									
Mean	354.41	160.87	640.74	3,432.11	51.02	0.09	4.80	2.29	2.27
Qtr/Qtr change in mean	11.22*	2.75	14.62*	97.86*	-2.72	0.01	-0.44*	-0.14*	0.04
Panel E: Previous dividends, choose to leave dividends unchanged (N = 58,949)									
Mean	299.65	122.84	839.94	3,089.42	41.43	0.08	4.01	1.72	2.07
Qtr/Qtr change in mean	9.16*	2.32*	15.71*	71.19*	-4.63*	-0.02*	-0.74*	-0.23*	-0.01
Penal F: t-test of difference in qtr/qtr change in mean between initiating and not initiating dividends (Panels A and B)									
t-value	2.15	0.69	1.19	1.23	0.57	0.97	0.43	18.20	2.99
Penal G: t-test of difference in qtr/qtr change in mean between increasing and decreasing dividends (Panels D and C)									
t-value	2.71	0.36	2.90	3.02	-0.27	3.27	4.82	6.81	2.22

Table 3 - Summary Statistics for Negative NI Observations

This table provides summary statistics of financial performance for the firms that have negative income quarters and decide to change their dividend policy along with the t-tests for equal means in different groups assuming unequal variance over the period 1962-2007. The data contains 70,151 valid quarterly observations. Similar variables are defined in Table 2 and * indicates the change in mean is significant at the 5% level.

	Price ($)	Cash ($MM)	Debt ($MM)	EV ($MM)	NI ($MM)	NPM (%)	ROE (%)	ROA (%)	Current ratio
Panel A: No previous dividends, choose to initiate dividends (N = 629)									
Mean	77.35	75.60	469.82	1,222.28	-23.05	-0.28	-6.30	-2.17	2.36
Qtr/Qtr change in mean	-1.45	-5.55	-9.25	-21.56	22.41*	0.48	4.70*	1.64*	0.03
Panel B: No previous dividends, choose not to initiate dividends (N = 61,131)									
Mean	13.32	38.14	112.80	321.49	-8.90	-9.45	-23.46	-7.20	5.05
Qtr/Qtr/ change in mean	-0.40*	0.41	1.97*	2.78	3.38*	1.18	-10.23*	0.08*	-0.37*
Panel C: Previous dividends, choose to decrease dividends (N = 1,795)									
Mean	56.05	56.06	397.25	819.77	-23.48	-1.09	-10.71	-3.58	3.65
Qtr/Qtr change in mean	0.87	1.87	-4.51	10.75	4.12	0.21	-1.37	0.89*	0.05
Panel D: Previous dividends, choose to increase dividend (N = 259)									
Mean	176.60	67.08	661.96	2,023.31	-29.66	-0.12	-5.95	-2.14	1.91
Qtr/Qtr change in mean	-2.79	7.39	6.01	20.71	43.00*	0.10*	1.46	2.13*	-0.02
Panel E: Previous dividends, choose to leave dividends unchanged (N = 6,337)									
Mean	180.89	97.36	922.30	2,344.16	-47.23	-0.11	-5.84	-1.74	1.85
Qtr/Qtr change in mean	2.29*	4.60	3.42	1.83	50.13*	0.09*	4.78*	1.71*	-0.03
Penal F: t-test of difference in qtr/qtr change in mean between initiating and not initiating dividends (Panels A and B)									
t-value	-0.37	-1.59	-1.11	-0.89	3.40	-0.58	6.04	3.55	4.31
Penal G: t-test of difference in qtr/qtr change in mean between increasing and decreasing dividends (Panels D and C)									
t-value	-0.74	1.06	0.98	0.30	2.89	-0.69	0.54	3.19	-0.34

Table 4 - Summary Statistics for Positive NI Observations in Quintiles by EV

This table provides summary statistics of quarterly financial performance sorted by EV for the firms that have all positive NI quarters and decide to change their dividend policy over the period 1962-2007. The data contains 168,985 valid quarterly observations. Quintile 1 refers to the largest while 5 the smallest. Similar variables are defined in Table 2 and * indicates the change in mean is significant at the 5% level.

	EV Quintile	Price ($)	Cash ($MM)	Debt ($MM)	EV ($MM)	NI ($MM)	NPM (%)	ROE (%)	ROA (%)	Current ratio
Panel A: No previous dividends, choose to initiate dividends (N = 5,241)										
Mean	1	312.97	299.07	1,260.42	5,411.13	67.69	0.97	4.90	2.01	1.80
Qtr/Qtr change in mean	1	7.67*	14.87*	23.06*	146.92*	-9.09*	-0.01	-0.72*	-0.17*	0.03
Mean	2	69.62	29.10	120.64	425.39	6.96	0.96	4.30	2.10	2.35
Qtr/Qtr change in mean	2	2.51*	1.20*	6.57*	21.18*	-0.58*	-0.01	-0.67*	-0.22*	0.80
Mean	3	53.43	14.58	35.25	123.07	2.41	0.16	4.17	2.10	2.85
Qtr/Qtr change in mean	3	1.09	0.16	1.68*	5.48*	-0.20*	-0.05*	-0.46*	-0.14*	0.66
Mean	4	29.63	6.87	13.25	43.67	1.09	0.10	4.22	2.12	3.47
Qtr/Qtr change in mean	4	1.62*	-0.04	0.34*	2.50*	-0.20*	-0.04*	-0.81*	-0.34*	0.03
Mean	5	16.81	12.13	3.47	8.20	0.63	0.58	3.91	2.27	4.53
Qtr/Qtr change in mean	5	0.94*	-0.14	0.18*	1.37*	-0.15	-0.47	-1.29*	-0.57*	0.39
Panel B: No previous dividends, choose not to initiate dividends (N = 91,347)										
Mean	1	188.00	353.11	1,001.40	4,678.79	58.66	0.12	5.36	2.15	2.36
Qtr/Qtr/ change in mean	1	3.68*	14.53*	20.66*	107.41*	-13.06*	-0.04*	-2.19*	-0.41*	0.01
Mean	2	40.74	47.74	113.39	429.25	6.33	0.21	11.79	2.14	2.87
Qtr/Qtr change in mean	2	1.95*	1.98*	4.62*	24.20*	-1.97*	-0.05	-2.49	-0.61*	0.01
Mean	3	20.02	16.45	34.39	121.85	2.12	0.11	5.16	2.51	3.05
Qtr/Qtr change in mean	3	0.86*	0.14	1.30*	8.23*	-1.01*	-0.16*	-2.85	-0.87*	-0.02
Mean	4	11.31	5.99	12.27	42.92	0.86	0.45	5.51	2.22	3.74
Qtr/Qtr change in mean	4	0.61*	0.18*	0.42*	3.14*	-0.42*	-0.53*	-4.95*	-1.09*	-0.05
Mean	5	5.98	10.98	5.96	9.45	0.98	0.24	4.67	2.34	4.65
Qtr/Qtr change in mean	5	0.40*	-0.34*	0.03	1.63*	-0.37*	-0.42*	-6.37*	-1.80*	-0.19
Panel C: Previous dividends, choose to decrease dividends (N = 6,366)										
Mean	1	419.06	277.79	1,607.11	5,469.23	67.20	0.10	5.05	1.90	1.73
Qtr/Qtr change in mean	1	11.99*	6.90	13.61	144.18*	-8.19*	-0.02*	-1.08*	-0.24*	-0.03
Mean	2	82.35	31.73	126.96	427.18	7.04	0.10	4.32	2.02	3.22
Qtr/Qtr change in mean	2	2.86*	1.72*	4.65*	18.36*	-1.36*	-0.01	-0.84*	-0.29*	-0.81
Mean	3	61.79	15.14	35.82	123.08	2.42	0.21	4.40	2.18	3.24
Qtr/Qtr change in mean	3	1.60*	0.26	1.57*	5.29*	-0.61*	-0.13*	-1.30*	-0.54*	-0.40*
Mean	4	31.20	6.08	12.91	43.37	0.97	0.08	4.07	2.01	3.36
Qtr/Qtr change in mean	4	1.77*	0.29*	0.35*	2.16*	-0.18*	-0.03*	-1.32*	-0.40*	0.22
Mean	5	16.75	9.63	3.19	8.94	0.50	0.08	3.70	2.14	5.13
Qtr/Qtr change in mean	5	0.64*	0.10	0.15*	0.76*	-0.07*	-0.07	-1.98*	-0.71*	-0.26

Panel D: Previous dividends, choose to increase dividend (N = 7,082)										
Mean	1	761.63	387.28	1,584.01	8,625.02	125.30	0.09	5.27	2.18	1.75
Qtr/Qtr change in mean	1	21.71*	7.64	33.61*	233.86*	-6.88	-0.01*	-0.38*	-0.11*	0.01
Mean	2	135.16	34.01	109.35	438.38	9.32	0.08	4.67	2.35	2.29
Qtr/Qtr change in mean	2	5.93*	0.63	5.14*	23.73*	-0.10	-0.01*	-0.30*	-0.12*	0.01
Mean	3	72.08	14.50	32.86	126.19	3.15	0.10	4.44	2.37	2.69
Qtr/Qtr change in mean	3	4.41*	-0.03	1.86*	8.99*	-0.23*	0.01	-0.74*	-0.21*	0.04
Mean	4	35.81	7.07	14.51	46.25	1.43	0.07	4.45	2.29	2.73
Qtr/Qtr change in mean	4	1.94*	0.21	0.64*	3.04*	-0.12*	0.01	-0.44*	-0.14	0.28
Mean	5	28.23	14.65	6.02	10.92	0.87	0.07	4.03	2.41	3.53
Qtr/Qtr change in mean	5	1.43*	-6.87	0.54*	7.98	-0.22	-0.01	-0.53*	-0.22	0.01
Panel E: Previous dividends, choose to leave dividends unchanged (N = 58,949)										
Mean	1	550.46	259.95	1,846.45	6,847.53	89.6	0.09	4.30	1.62	1.53
Qtr/Qtr change in mean	1	15.19*	4.92*	33.82*	153.13*	-9.87*	-0.01*	-0.79*	-0.20*	-0.01
Mean	2	145.05	28.93	142.59	450.29	7.69	0.07	3.98	1.76	2.09
Qtr/Qtr change in mean	2	6.09*	0.75*	3.51*	15.72*	-1.12*	-0.01*	-0.64*	-0.23*	-0.01
Mean	3	71.62	13.35	39.94	126.77	2.63	0.07	3.72	1.83	2.51
Qtr/Qtr change in mean	3	3.21*	0.34*	1.03*	4.99*	-0.40*	-0.01	-0.71*	-0.27*	-0.02
Mean	4	38.70	7.64	14.86	45.51	1.12	0.10	3.57	1.77	2.73
Qtr/Qtr change in mean	4	2.22*	-0.01	0.61*	2.75*	-0.17*	-0.05*	-0.81*	-0.25*	-0.01
Mean	5	23.17	10.74	5.35	11.67	0.66	0.07	3.39	1.94	3.99
Qtr/Qtr change in mean	5	1.58*	-0.96	0.35	2.33*	-0.18*	-0.02*	-0.83*	-0.35*	-0.06

Table 5 - Summary Statistics for Negative NI Observations in Quintiles by EV

This table provides summary statistics of financial performance sorted by EV for the firms that report negative NI in a quarter and decide to change their dividend policy consequently over the period 1962-2007. The data contains 70,151 valid quarterly observations. Quantile 1 refers to the largest while 5 the smallest. Similar variables are defined in Table 2 and * indicates that the change in mean is significant at the 5% level.

	EV Quintile	Price ($)	Cash ($MM)	Debt ($MM)	EV ($MM)	NI ($MM)	NPM (%)	ROE (%)	ROA (%)	Current ratio
Panel A: No previous dividends, choose to initiate dividends (N = 629)										
Mean	1	234.33	326.95	2,152.24	5,659.43	-105.41	-0.17	-5.18	-1.62	1.51
Qtr/Qtr change in mean	1	-6.61	-22.79	-49.44	-117.88	105.55*	0.11*	4.35*	1.62*	0.01
Mean	2	42.45	31.34	151.94	340.43	-7.16	-0.16	-7.98	-2.07	2.42
Qtr/Qtr change in mean	2	-0.28	-2.87	1.27	7.00	4.49*	0.08	6.38*	1.33*	-0.07
Mean	3	54.57	10.31	39.05	88.08	-1.87	-0.09	-6.14	-1.74	2.34
Qtr/Qtr change in mean	3	0.02	-1.58*	1.08*	1.70	1.58*	0.02	4.29*	1.67*	0.03
Mean	4	31.65	4.44	11.24	28.72	-0.73	-0.37	-5.16	-2.25	2.49
Qtr/Qtr change in mean	4	-0.34	-0.17	0.37*	-0.29	0.62*	0.17	3.45*	1.71*	0.20
Mean	5	16.88	6.23	3.30	7.71	-0.52	-0.60	-7.04	-3.17	3.40
Qtr/Qtr change in mean	5	0.21	-0.44*	0.24	1.16*	0.25	0.44	4.02*	1.90*	-0.02
Panel B: No previous dividends, choose not to initiate dividends (N = 61,131)										
Mean	1	82.51	330.32	1,256.73	3,506.01	-76.79	-10.54	-22.51	-3.38	3.26
Qtr/Qtr/ change in mean	1	-3.55*	7.99*	19.63*	13.99	34.57*	-3.28	1.28	1.07*	-0.09*
Mean	2	19.07	51.10	112.81	327.02	-11.48	-15.03	-15.96	-5.29	4.76
Qtr/Qtr change in mean	2	-0.51*	0.58*	2.52*	4.19*	3.47*	5.66	-11.85*	0.84*	-0.20*
Mean	3	9.21	16.26	24.47	85.40	-4.03	-14.75	-22.20	-7.29	5.09
Qtr/Qtr change in mean	3	-0.11	-0.13	0.62*	2.01	0.86*	2.10	-7.32*	0.76*	-0.26*
Mean	4	5.08	5.83	7.94	28.47	-1.77	-6.14	-24.01	-7.90	4.26
Qtr/Qtr change in mean	4	-0.07*	-0.25*	0.25*	1.27*	0.47*	-0.67	-13.63*	0.76*	-0.36*
Mean	5	2.26	6.59	2.82	5.46	-1.31	-4.67	-28.90	-8.62	6.42
Qtr/Qtr change in mean	5	-0.02	-0.51*	0.01	1.18*	0.46*	0.47	-10.91*	0.90*	-0.62*
Panel C: Previous dividends, choose to decrease dividends (N = 1,795)										
Mean	1	184.89	250.33	2,162.33	4,539.22	-129.25	-0.24	-18.49	-2.56	1.56
Qtr/Qtr change in mean	1	10.89*	12.73	-34.16	53.57	21.63	0.11	5.07	1.54*	0.05
Mean	2	56.52	27.43	182.63	351.10	-9.71	-0.35	-7.91	-2.37	2.36
Qtr/Qtr change in mean	2	0.75	-1.20	-0.26	2.12	1.21	0.20	1.13	0.76*	-0.12
Mean	3	31.15	8.70	39.26	85.56	-2.62	-1.74	-8.18	-3.08	3.31
Qtr/Qtr change in mean	3	-0.36	-0.75	0.22	0.02	0.37	-0.24	-2.69	0.31	-0.10
Mean	4	20.51	4.07	10.85	28.38	-0.96	-1.06	-10.47	-4.23	3.56
Qtr/Qtr change in mean	4	-0.50	-0.11	0.34*	0.38	0.38	0.29	-4.51	0.93*	-0.17
Mean	5	6.63	37.78	19.75	-1.69	-0.63	-2.05	-10.36	-5.46	7.11
Qtr/Qtr change in mean	5	0.04	1.44	4.11	8.34	1.06	0.65	-7.55	1.01*	0.58

Panel D: Previous dividends, choose to increase dividend (N = 259)										
Mean	1	367.20	150.52	1,773.03	5,529.92	-78.65	-0.16	-4.96	-1.83	1.48
Qtr/Qtr change in mean	1	-4.07	22.13	7.51	56.86	115.81*	0.10*	5.71*	2.13*	-0.06
Mean	2	98.30	41.57	142.99	333.22	-6.89	-0.12	-7.24	-2.63	1.88
Qtr/Qtr change in mean	2	-3.21	-0.85	9.51	1.28	8.72*	0.13*	7.40*	2.98*	-0.07
Mean	3	58.97	9.82	38.78	91.56	-2.10	-0.08	-6.39	-1.94	2.11
Qtr/Qtr change in mean	3	-0.78	0.20	1.98*	3.08	1.91*	0.10*	4.95*	1.82*	0.01
Mean	4	44.09	6.07	13.70	30.57	-1.06	-0.11	-6.34	-2.51	2.40
Qtr/Qtr change in mean	4	-1.33	0.07	1.30*	1.69	1.45*	0.10*	-2.72	1.69	0.19
Mean	5	10.12	2.32	2.76	8.19	-0.14	-0.03	-1.47	-0.90	3.19
Qtr/Qtr change in mean	5	-0.16	-0.04	0.06	0.10	0.12	-0.04	-1.17	-1.32	-0.14
Panel E: Previous dividends, choose to leave dividends unchanged (N = 6,337)										
Mean	1	344.29	235.90	2,312.65	5,927.45	-118.22	-0.12	-6.92	-1.80	1.39
Qtr/Qtr change in mean	1	3.85	12.89	2.72	-6.44	126.95*	0.12*	6.59*	1.90*	0.02
Mean	2	109.38	20.17	162.16	364.41	-8.25	-0.11	-5.31	-1.74	1.81
Qtr/Qtr change in mean	2	2.39*	-0.58	6.12*	8.59*	7.30*	0.08*	3.35*	1.69*	-0.04*
Mean	3	45.82	9.50	39.40	90.95	-2.50	-0.10	-6.22	-1.68	2.20
Qtr/Qtr change in mean	3	0.52	-0.49*	1.97*	2.61*	2.28*	0.08*	6.01*	1.67*	-0.05*
Mean	4	30.21	3.61	12.31	30.28	-0.72	-0.09	-3.75	-1.59	2.56
Qtr/Qtr change in mean	4	-0.56*	-0.05	0.51*	0.28	0.76*	0.09*	1.30	1.53*	-0.14*
Mean	5	12.06	29.74	10.66	-0.53	-0.90	-0.06	-3.34	-1.68	3.66
Qtr/Qtr change in mean	5	-0.53	2.59	0.07	-2.30	0.83*	0.05*	3.03*	1.49*	-0.18*

Table 6 - Regression Results

This table provides the results from regression (3) for firms with negative income and deciding to change their dividends:

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

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 the dividend in quarter *t* and zero otherwise, and the lagged changes in earnings per share for firm *i* are added in the regression to remove any possible autocorrelation and seasonality in the earnings series. Increase in R^2 is the difference between the adjusted R^2s with and without the dividend variables in the regression, while N is the number of observations in the regression.

Quarter (N)	β_1 (t-value)	β_2 (t-value)	Adjusted R^2	Increase in Adjusted R^2
t = 0 (2,683)	0.068 (2.07)	-0.028 (-1.44)	0.11	0.05
t = 1 (2,680)	0.081 (3.15)	-0.023 (-0.67)	0.13	0.05
t = 2 (2,678)	0.098 (4.56)	-0.035 (-1.74)	0.14	0.06
t = 3 (2,672)	0.070 (2.15)	-0.013 (-1.09)	0.10	0.04