The Relationship between Dividend Changes and Future Earnings Changes

Master Thesis Finance

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Abstract

This study examines the relationship between dividend changes and future earnings changes for industrial firms listed in NYSE, AMEX, and NASDAQ from 1993 to 2011. This study is based on the model developed by Nissim and Ziv (2001) who find a positive relation between dividend changes and earnings changes in two years following the dividend change. Contrary, I find no evidence supporting that dividend changes are informative about future earnings changes based on the whole sample data. Both dividend increases and dividend decreases are unrelated to earnings changes in the two subsequent years. Beyond Nissim and Ziv (2001), I additionally differentiate dividend changes between confirmatory dividend changes (observations that the dividend change and recent past earnings change are of the same sign) and contradictory dividend changes (observations that the dividend change and recent past earnings change have opposite signs) in the same way as Koch and Sun (2004) who examine the market reactions to dividend change announcements by distinguishing dividend changes between confirmatory dividend changes and contradictory dividend changes. I find that confirmatory dividend changes (i.e. the dividend change and past earnings change are of the same sign)) are positively related to earnings changes in each of the two subsequent years, and contradictory dividend decreases (i.e. dividends decrease when past earnings went up.) are negatively related to earnings changes in the second year following the dividend change. However, these empirical results are not robust to my alternative measurement of the deflator. Additionally, the mean and median cumulative abnormal stock returns for the 2-day period surrounding the announcement of the dividend change are positive for dividend increases, and negative for dividend decrease. Overall, this study finds that dividend changes provide substantially limited information about changes in the firm's future earnings.

1. Introduction

Dividend policy refers to the payout policy that a firm follows in determining the size and pattern of cash distributions to shareholders over time. A company's board of directors, with the input of senior management, sets a corporation's dividend policy.[1] Miller and Modigliani (1961) propose the financial irrelevance theory in their pioneering work, stating that dividend policy has no impact on overall firm value. They document that investors do not care about receiving capital gains or dividends because the total returns will be the same. But the model is developed in an idealized world with perfect capital market, rational investor behavior, and perfect certainty. In the real world, the model is not realistic. If we relax one or more assumptions of the dividend irrelevance hypothesis, it is found that dividend policy does seem to matter for firm value. Most previous studies (e.g. Pettit (1972, Brickley (1983) and Lie (2000)) present similar results showing that the stock market reacts positively to dividend increases and initiations but negatively to dividend decreases and omissions. In other words, dividend policy does affect firm value.

In practice, determining an appropriate dividend policy is often difficult because the firm has to balance many potentially conflicting factors. Managers need to consider their long-term financing goals as well as shareholder value maximization. Therefore, they cannot decide dividend policy isolated from other interrelated decisions as dividend policy affects the amount of the firm's retained earnings that are important to exploit future growth as well as shareholder wealth.

1.1 The Context of the Research

Lintner (1956) develops a theoretical dividend model which gives us implications about the corporate dividend decision making. His model suggests that firms tend to set a long-term target payout ratio and adjust it slowly over time. Firms tend to increase dividends only when managers believe that cash flows in the future would be sufficient to support the higher dividend rate. And firms tend to avoid dividend cuts if at all possible. So dividend has a smoother pattern than earnings because managers try to stabilize dividend payments.

Based on Lintner's (1956) finding, the dividend signaling model has emerged to explain why firms pay dividends and occasionally adjust dividend payments. The

[1] Baker, H.K. (2009), *Dividends and Dividend Policy*. JohnWiley & Sons, Inc., Hoboken, New Jersey, pp. 3

dividend signaling model suggests that dividend changes provide information content about future profitability. Due to the information asymmetry between managers and outside investors, managers use the dividend change as a signaling device to convey their expectations about the firm's future profits.

Empirical studies have long investigated the relationship between dividend change and future profitability. Healy and Palepu (1988) find that dividend initiations are associated with positive earnings in the year before, and two years after the dividend initiation. Conversely, dividend omission is associated with earnings declines in the two years before and one year after the dividend omission. More recently, Nissim and Ziv (2001) find supporting evidence of the information content of dividends. They find that dividend changes are positively related to earnings changes in each of the two years subsequent to the dividend change.

My study is an extension of the study done by Nissim and Ziv (2001). First following Nissim and Ziv (2001), I will study how dividend changes are related to earnings changes in each of the two years following the dividend change based on industrial firms listed in NYSE, AMEX, and NASDAQ from 1993 to 2011. Also, motivated by Koch and Sun (2004) who examine the market reactions to dividend change announcements by distinguishing dividend changes between confirmatory dividend changes (observations for which the dividend change and recent past earnings change are of the same sign) and contradictory dividend changes (observations for which the dividend change and recent past earnings change have opposite signs), I will additionally divide my firm-year observations that have made non-zero dividend changes into two subgroups in the same way as Koch and Sun (2004). I hypothesize that confirmatory dividend changes are likely to be positively related to earnings changes in the two subsequent years. One of the possible explanations is that dividends are paid out with current or prior earnings. In the most case, change in dividends follows change in past earnings in the same direction. So these confirmatory dividend changes are likely to signal that the direction of past earnings change is expected to be sustainable in the future. Conversely, I hypothesize that contradictory dividend changes are likely to be negatively related to earnings changes in the two subsequent years.[2] One of the possible explanations for the negative relation is that for firms with contradictory dividend decreases, managers may have seen the potential investment

[2] Of course, I am aware that contradictory dividend changes may be positively related to earnings changes in the two subsequent years. For instance, the manager may want to keep more funds available for his own sake when the past earnings increase is followed by the dividend cut. Also, the manager may be confident about his company and believe that the firm's future performance will get better to continuously support the increased dividends.

opportunities and intend to keep more funds for future investments which are likely to increase subsequent earnings, and that for firms with contradictory dividend increases, managers may want to satisfy equity investors through increasing dividends but less funds will be available for future development since they are paying more dividends in the context of earnings decreases, then their future earnings may get worse. Although there may be other reasons for these firms doing so, and different reasons may lead to different outcomes. In my study, I only hypothesize that contradictory dividend changes are likely to be negatively related to earnings changes in the two subsequent years and test whether my hypothesis can be supported by the empirical results.

Moreover, many researches (e.g. Pettit (1972), Kaly and Loewenstein (1985)) have documented the information content of dividends by examining the relationship between dividend changes and abnormal stock returns around the dividend change announcement. Most of these studies find that dividend increases are associated with positive abnormal stock returns in the days surrounding the dividend change announcement, and dividend decreases are associated with negative abnormal stock returns in the days surrounding the dividend change announcement. In the descriptive statistics section, I will display the mean and median cumulative abnormal stock returns for the 2-day period surrounding the announcement of the dividend increase and decrease, respectively.

My study contributes to current literature in several ways: firstly, beyond Nissim and Ziv (2001), I will examine whether dividend changes play a different role in confirmatory dividend changes group and contradictory dividend changes group. As far as I know, it has not been investigated before. Secondly, my sample consists of U.S. publicly traded firms during the recent twenty years from 1993 to 2011. Most previous studies employ the data in the period before the early 1990s, their findings may be less indicative for current and future investors. Hopefully, my research may fill the gap in the existing literature and provide some new information to the investors and firm managers who make the dividend policy in corporate finance.

1.2 Structure of the Research

The structure of the research is organized as follows. Section 2 presents the literature review covering various dividend models and relevant empirical studies during the past few decades. Section 3 provides hypothesis development, sample selection criteria, variable construction, empirical methods, empirical results and analysis. Section 4 provides robustness checks of my empirical results. Finally, Section 5 contains the

summary and conclusions.

2. Literature Review

This section provides trends in dividend payments over time and various dividend theories that offer some implications about why firms choose to pay dividends and the role dividends play in corporate finance.

2.1 Trends in Dividends: Payers and Payout

This section presents the disappearing pattern of the fraction of publicly traded firms paying dividends and provides some possible explanations for the disappearing incidence.

2.1.1 Disappearing Dividends and the Evidence

Researchers have long debated on what makes most public firms to pay out cash in the form of dividend. Miller and Modigliani (1961) propose the dividend irrelevance proposition, stating that firm value is not affected by its dividend policy, investors are indifferent between receiving capital gains and receiving cash dividend as the total returns from price appreciation and dividend will be same. Easterbook (1984) and Jensen (1986) propose the proposition to explain the payout to shareholders based on the agency cost. They argue that distributing cash to shareholders will reduce the amount of funds under the manager's control, thus payout can alleviate the overinvestment problem by self-served managers who might use the excess cash to invest in value-reducing projects.

In the United States, tax on dividend is higher than that on capital gains. Theoretically, companies should prefer share repurchase rather than dividends from the tax perspective. However, in the real world, the majority of listed firms still prefer to payout cash to shareholders. Black (1976) proposes the *dividend puzzle* stating that firms generally pay dividends to shareholders despite the tax disadvantage of dividends.

Recently, Fama and French (2001) find a decline incidence in the percentage of dividend paying firms. They document that the propensity of firms paying cash dividends has decreased dramatically after 1978. After reaching a peak of 66.5 percent in 1978, the proportion of firms paying cash dividends declines continuously to 20.8 percent in 1999. On average, about 5 percent of sample firms stop paying dividends. Despite the surge in the number of public firms, the number of payer has decreased

sharply. Baker and Wurgler (2004a) find the similar dividend-paying pattern in line with Fama and French (2001). They assert that the declining trend in propensity of firms paying dividends is not a new phenomenon.

2.1.2 Possible Explanations for the Disappearing Dividends

Fama and French (2001) identify three important factors that determine the decision to pay dividends: profitability, investment opportunities and firm size. They attribute the declining incidence of firms paying dividends to the firm characteristics of the newly listed firms after 1978. These newly listed firms after 1978 tilt towards characteristics of small size but fast-growing, both of which are strongly associated with low probability to pay dividends. They further point out firms are less likely to pay dividends, even among large and profitable firms. DeAngelo, DeAngelo and Skinner (2000) provide supplemental evidence showing that special dividends have also disappeared recently. Firms used to pay special dividends almost as predictably as profitable companies pay regular cash dividends.

Grullon and Michaely (2002) argue that share repurchases have emerged as an economically significant alternative to regular cash dividends in the early 1980s. The aggregate expenditure on the repurchase of common and preferred shares have more than tripled from $9.2 billion to $28.6 billion between1983 and 1984. Grullon and Michaely (2002) also argue that firms finance their share repurchase with funds that they otherwise would have paid out as cash dividends. The growing share repurchases during the 1980s and 1990s matches almost perfectly with the declining cash dividend payouts. Using Lintner's (1956) dividend model, they find evidence supporting their proposition that firms seem to have substituted share repurchase for regular cash dividends, even after controlling for the cross-sectional variation in firm characteristics. They point out that before 1982, managers were uncertain about the legitimacy of share repurchases since there were no legal guidelines for repurchases at that time. Hence, few managers would take the risk of being charged with market manipulation. The Securities and Exchange Commission (SEC) established guidelines for repurchases on the open market in 1982, which provide managers with a safe harbor to carry on repurchasing shares.

On the other hand, share repurchases do not constitute a long-term commitment as the regular cash dividends, Lintner's (1956) dividend model suggest that dividends are an ongoing commitment to distribute cash to shareholders. Jagannathan, Stephens and Weisbach (2000) document that share purchases are mainly used to distribute temporary cash flows. As a consequence, share repurchases are very volatile because

these firms typically have more uncertain cash flows. Graham, Harvey, and Michaely (2005) provide further evidence showing that managers tend to use share repurchases to pay out transitory cash flows. They document that many managers now favor share repurchases because share repurchases are supposed to be more flexible than regular cash dividends. More interestingly, they find that when choosing between share repurchases and regular dividends, most managers do not think that tax consideration is a dominant factor.

Amihud and Li (2006) provide another explanation for the disappearing dividends based on the dividend signaling. They suggest that dividends are disappearing because of the decline in the information content of dividends. Paying dividends is costly because the firm might have to raise new funds once it pays out these funds. With the information conveyed in dividends decreasing, managers are becoming unwilling to use dividend as a signaling device. They attribute the declining information content of dividends to the shareholder structure changes. They find that the average portion of a firm's equity held by institutional investors has increased from 29 percent to 53 percent between 1980 and 1990. Generally, institutional investors have the resources and power to gather and process information which retail investors are unable to do. They are better informed in this way rather than through dividends. They also argue that stock price has already incorporated part of the information that is supposed to be conveyed by the dividend announcement.

To conclude, there is no single explanation for the disappearing incidence of dividends after 1978.

2.2 Agency Costs and the Free Cash Flow Hypothesis

The free cash flow hypothesis traces its root to the agency problem between firm insiders and outside investors as has been documented by Jensen and Meckling (1976). An obvious characteristic of public firms is the divergence of interest between managers and shareholders. Jensen (1986) argues that managers have incentives to expand the firm bigger than its optimal size since more resources will be under their control as the company becomes larger. This selfish motivation will induce managers to invest in value-reducing projects or even negative net present value (NPV) projects, which might benefit themselves but undermine shareholders' interest. Since managers are less likely to use external funds to finance the value-reducing or negative NPV investments, they rely on internally generated funds. Hence, firms with substantial amounts of free cash flows are likely to overinvest in unnecessary projects.

Easterbrook (1984) and Jensen (1986) suggest that to alleviate the agency problem arising from the separation of ownership and management, one possible solution is to return excess funds to shareholders by paying cash dividends. Many studies have documented that managers are reluctant to cut dividend payments (e.g. Lintner (1956)), so a dividend initiation or increase means reducing excess cash at the disposal of managers, thereby reducing their ability to misuse these funds. [3] The implication from the free cash flow hypothesis is that dividend increase announcements should be followed by positive stock market reactions because investors are aware of the agency problem ex-ante and believe that the potential overinvestment problem is mitigated by dividend increases. On contrary, dividend decrease should be accompanied by negative market reactions because they are not a preferable signal to investors.

Lang and Litzenberger (1989) are the first to perform empirical test on the free cash flow hypothesis. They hypothesize that market return to dividend changes is larger for potentially overinvesting firms than for value-maximizing firms. They use Tobin's Q to identify either overinvesting firms or value-maximizing firms. Specifically, they define a firm as an overinvestor when Tobin's Q <1, and value maximizer when Tobin's Q >1. Lang and Litzenberger (1989) find that the average return for Q < 1 firms are significantly higher than Q > 1 firms. Their empirical result is in favor of the free cash flow hypothesis that dividend increases by overinvesting firms signal the firm's intention to mitigate the agency problem.

Yoon and Stark (1995) argue that dividend changes provide information about changes in the managers' misuse of excess cash under the free cash flow hypothesis. Therefore, the main task is to test the relationship between dividend changes and a firm's investment opportunities. They identify 3,748 dividend increases and 431 dividend decreases between 1969 and 1988. Besides Tobin's Q, they use the direction of insider trading as an additional proxy for investment opportunity. They find that there is no significant difference in the magnitude of stock price reactions in response to the dividend announcements between low Q and high Q firms, after controlling for the size of dividend change, the expected dividend yield, and the market value of the firm. Their finding is in contrast to that of Lang and Litzenberger (1989) who present that the absolute announcement returns are larger for Tobin's Q < 1 firms than for Tobin's Q > 1 firms. Nevertheless, they admit that their finding alone may not be sufficient enough to contradict the free cash flow hypothesis, because the control variables (e.g., the size of dividend change, the expected dividend yield, and the market value of the firm) used

[3] Jensen, Michael. C. (1986), *Agency costs of free cash flow, corporate finance, and takeovers*. The American economic review, pp. 323-329

in their study are correlated with the firm's investment opportunities.

Lie (2000) asserts that contradictory evidence provided by Lang and Litzenberger (1989) versus Yoon and Stark (1995) could possibly result from the confounding effects of dividend change expectations and investment opportunities. Therefore, studies of special dividends and share repurchases may offer more appropriate tests of the free cash flow hypothesis. He investigates 7,417 regular dividend increase, 570 special dividends, and 207 repurchases from 1978 to 1993. The study mainly offers two following implications. Firstly, the payout announcements for repurchases and large special dividends are positively related to the stock market reactions for low Q firms, but this is not the case for high Tobin's firms. This result demonstrates that incremental cash payouts are beneficial for mitigating potential overinvestment problems. Secondly, there is no evidence suggesting that small special dividends and regular dividend increase help mitigate the overinvestment problem. The finding suggests that large special dividends and share repurchases could be perceived as a remedy to the potential free cash flow problem. However, there is little evidence supporting that regular cash dividend increases signal the firm's intention to mitigate the agency problem.

2.3 Information Asymmetry and Dividend Signaling Theory

Dividend signaling theory traces its root in the Lintner's (1956) dividend model. Lintner (1956) documents that firms generally set long-term target dividend payout ratio, and slowly adjust it in respond to earnings changes. Firms tend to increase dividend payments only when managers believe that future cash flows would be sufficient to support the higher dividend payments, and firms tend to avoid dividend cuts if at all possible.

Miller and Modigliani (1961) document "the information content of dividends" in a theoretical framework. They suggest that outside investors interpret a change in the dividend rate as a change in management's views of future profit prospects for the firm where a firm has adopted a long-established target payout ratio, and changes of investors' expectation about future earnings will reflect on changes of stock price[4].

2.3.1 Dividend Signaling Models

Ross (1977) develops a one-period incentive-signaling model by grouping firms as either Type A or Type B firms. Specially, returns of Type A firms equal *a*, and returns of Type B firms equal *b*. These two types of firms cannot be differentiated at time zero

[4] Miller, M.H. and Modigliani, F. (1961), *Dividend Policy, Growth, and The valuation of Shares.* The Journal of Business, Vol. 34, No.4, pp.411-433

even though $a > b$. Type A firms are capable of supporting an increased dividend payout without increasing the likelihood of bankruptcy, whereas Type B firms are not. Ross (1977) assumes that managers' compensation is positively related to their firms' market value, and they will be penalized if their firms go bankrupt. He also assumes that managers have more inside information of their firms' future cash flows. Managers of Type B firms are aware of their situations that any increase in dividend payout would send a false signal, and possibly cause their companies to go bankrupt eventually. So they have no incentives to increase dividends. As a consequence, investors view a dividend increase as coming from a Type A firm which is worthy of high valuation since any dividend increase in Type A firms will not increase the likelihood of its bankruptcy.

Bhattacharya (1979) develops a model that attempts to explain why many firms choose to pay dividends even if there is a tax disadvantage. He assumes that outside investors have imperfect information about a firm's profitability, and information, such as accounting data, is not fully reliable in assessing a firm's profitability. Although the tax rate on dividends is higher than on capital gains, Bhattacharya (1978) shows that investors are willing to pay a higher tax rate if they receive the favorable signal that the firm will have greater value in the future. Therefore, dividend is a useful signaling device for outside investor to evaluate a firm's future profitability.

Miller and Rock (1985) develop a model assuming that managers know more information about their firms' current earnings than outside investors. They propose that managers could try to eliminate the existing information asymmetry, which would reduce the need to send the costly signals to outside investors. But this method also involves dead-weight costs. Miller and Rock propose that dividends and financing are opposite sides of the same thing, i.e., financing is actually the negative dividends. They conclude that an unexpected earnings change has the same influence on firm returns as an unexpected dividend change. In addition, they state that current dividend payment trend rather than dividend itself is the basis on which the market predicts a firm's future earnings.

2.3.2 Empirical Evidence on Dividend Signaling

Empirical studies on dividend signaling primarily focus on two lines: one line of the research focuses on the dividend announcement effect by examining the abnormal returns around dividend announcement dates. The other line of the research focuses on examining the relationship between dividend changes and future earnings.

The empirical analysis of the dividend announcement effect is first highlighted by Pettit (1972). Pettit finds a positive pattern between dividend changes and abnormal stock returns surrounding the announcement date of the dividend change. Using a monthly and daily basis, Pettit finds that on average, the market makes unbiased value estimates from the information conveyed in these dividend change announcements and that stock price fully reflects the dividend change immediately on the announcement date or the following day.

However, Watts (1973) presents some evidence showing that the information content of dividends is trivial. Although he finds an association between unexpected dividend changes and future earnings changes, the average absolute size of future information conveyed by the dividend change is very small. He documents that traders cannot earn sufficient abnormal returns on such information content when transaction costs are considered.

Handjinicolaou and Kalay (1984) find that dividend increases do not have an impact on returns but that dividend decreases have a negative impact on returns. They investigate the bond price movements surrounding dividend announcements. They find that shareholder obtain gains when the information is positive. Bondholders, however, share losses when the information is negative. There exists a transfer of wealth from bondholders to shareholders when the dividend payment is altered. They document that their finding is consistent with the information content of dividends. On the other hand, Dhillon and Johnson (1994) cast doubt on the dividend signaling theory based on the fact that negative bondholder returns are associated with dividend increases. They conclude that dividend signaling might play a less important role in conveying information than it used to be.

Aharony and Swary (1980) examine quarterly cash dividends and earnings announcements made on different dates in a quarter. They find that changes in quarterly dividends provide information in addition to the quarterly earnings announcements. They find that stock prices react quickly to the dividend announcement, which supports the semi-strong form of efficient market hypothesis. Kane, Lee, and Marcus (1984) develop an expectation model of dividends and earnings based on a formula that determines what constitutes an unexpected change in dividend or earnings. They conclude that dividend announcement and earnings announcement have a significant impact on stock price individually.

In another line of the research that focuses on examining the relationship between dividend changes and future earnings, Ofer and Siegel (1997) document that analysts

revise their earnings expectations based on the unanticipated changes in dividend policy. They find a significant association between the size of earnings revision and the size of the unexpected dividend increase. Dyl and Weigand (1988) provide supplemental evidence that unexpected dividend changes can also affect the riskiness of earnings in addition to earnings expectations. They find that the riskiness of earnings, stock price variations, cash flows, and systematic risk of a firm drop significantly as the firm initiates dividends.

Healy and Palepu (1988) examine the relationship between dividend initiations and the level of earnings. They find that firms that initiate dividends typically have positive earnings changes in the year before and two years after the dividend initiation. This finding is consistent with Lintner's (1956) dividend model, indicating that dividend initiations are informative about future earnings growth. Conversely, they find that dividend omissions are associated with two years of earnings declines, and earnings continue to decline in the first subsequent year.

DeAngelo and DeAngelo (1990) examine the dividend policy adjustments of 80 NYSE firms that were experiencing financial distress between 1980 and 1985. They find a high incidence of dividend cuts by firms with persistent (three or more) losses, but no such pattern for firms with transitory losses. In other findings, DeAngelo, DeAngelo and Skinner (1996) study the signaling content of dividends for firms whose annual earnings experience a decline after having increased for at least nine consecutive years. They find that there is virtually no supporting evidence for the argument that dividend decisions help identify firms with superior future earnings. They document three factors that can help explain the phenomenon: managerial overoptimism, modest resource commitments, and managerial mistakes.

Benartzi, Michaely, and Thaler (1997) present that it is unable to document a reliable association between dividend changes and future earnings change. They document that firms increasing dividends have experienced significant earnings increases in the prior year, but show no subsequent unexpected earnings growth. Firms reducing dividends have experienced reductions in earnings in the prior year, but these firms show significant subsequent earnings increases. But they also document that dividend-increasing firms are less likely than non-changing firms to experience a drop in future earnings, which is consistent with Lintner's (1956) dividend model that firms increase dividends only if managers believe that earnings are increased permanently.

Nissim and Ziv (2001) try to figure out the relationship between dividend changes and future profitability. Assuming linear mean reversion in earnings changes, they find

a positive relationship between dividend changes and future earnings changes. One of their main findings is that the positive effect of dividend changes on future profitability are asymmetric between dividend increases and dividend decreases. Specifically, dividend increases are related with future profitability for at least four subsequent years, while dividend decreases are not significantly related to future profitability after controlling for current and expected profitability. However, Grullon, Michaely, Benartzi, and Thaler (2005) argue that the finding of Nissim and Ziv (2001) does not stand after controlling for the nonlinear patterns in the behavior of earnings.

In summary, the empirical evidence on the information content of dividend is mixed, with some studies support the signaling theory while the others contradict it. Dividend policy continues to be one of the controversial issues in corporate finance.

2.4 Firm Life Cycle Theory of Dividends

The life cycle theory of dividends is based on the notion that dividend policy is changing as the firm moves to a different stage of its life cycle. According to the life cycle of dividends, young firms typically do not choose to pay dividends because they face a relatively large investment opportunity set but are not sufficiently profitable to self-finance through internally generated capital as their capital spending is far beyond their profits. In addition, these firms face substantial hurdles in raising external funds from capital market. As a result, they will retain earnings as much as possible for future reinvestment. After a period of growth, these firms gradually reach the maturity stage when most of them have accumulated abundant profits. At this point, investment opportunity set is limited, growth rate and profitability have flattened, and systematic risk has declined. Finally, these mature firms begin distributing cash to shareholders. The firm life cycle theory of dividend demonstrates that trade-off between retention and distribution is different among different stages of a firm's life cycle.

So far, few studies have directly examined the life cycle theory of dividends but empirical evidence generally supports it. Fama and French (2001) investigate the time-series shift in the dividend payment behavior of publicly traded U.S. firms between 1926 and 1999. They find a substantial decline in the proportion of firms that pay dividends. They show that 66.5% of industrial firms paid dividends in the year 1978, while only 20.8% did so in 1999. They document that the declining incidence is due in part to the changing firm characteristics of new listed firms after 1978. These new lists are dominated by firms that have small size, low (or negative) profits and high growth rates, which are characteristics of never paying dividends. Their results indicate

that firm life cycle factors play an important role in the dividend decision. In particular, dividend-paying firms are typically large, more profitable. Their retained earnings are sufficient to cover capital spending. On the other hand, non-payers are small, less profitable and fast-growing. These firms have not generated ample profits to fully meet their financing needs and require external capital. In summary, this study shows that the decision to pay cash dividends is mainly dominated by firm characteristics that determine the firm's life cycle stage.

DeAngelo, DeAngelo and Stulz (2006) try to explicitly test the life cycle theory of dividends based upon Fama and French's (2001) study. They link the probability of a firm that pays dividends to the earned/contributed capital mix that is measured by the ratio of retained earnings to total common equity (RE/TE) or total assets (RE/TA). They assert that RE/TE (RE/TA) is a good proxy for a firm's life cycle stage. Low RE/TE (RE/TA) firms are in capital infusion stage, whereas high RE/TE (RE/TA) firms are in mature stage with substantial cumulative profits. Hence, they predict that the probability of a firm that pays dividends will increase with the RE/TE (RE/TA). Using a sample of publicly traded U.S. firms between 1972 and 2002, they find supporting evidence for the life cycle theory of dividends. They report a significantly positive relation between the proportion of publicly traded industrial firms that pay dividends and RE/TE (RE/TA), after controlling for firm current and lagged profitability, growth opportunities, size, total equity, cash balances and dividend history. Their finding also holds for dividend initiation and omission.

Skinner (2008) studies the firm payout policy including dividends and share repurchases. He finds that for firms that distribute cash through dividends and share repurchases, the magnitude of share repurchases is dominated by earnings over a two- or three-year window, which supports the life cycle theory. In addition, he finds that firms are increasingly using share repurchases instead of dividends to payout earnings.

Denis and Osobov (2008) extend the research to six developed countries. They study the cross-sectional determinants of dividend policy in U.S., Canada, U.K., Germany, France, and Japan over the period between 1989 and 2002. They document that the propensity to pay dividends is high among firms that are large, highly profitable, and retained earnings are a large portion of total equity. On the other hand, von Eije and Megginson (2008) investigate dividends and share repurchases of firms listed in 15 European Union nations from 1989 to 2005. However, they find no association between the likelihood of cash payouts and the ratio of retained earnings to total equity. But they do find that firm financial reporting frequency, size, age, and past profitability

are positively associated with cash payouts.

Recently, Brockman and Unlu (2011) document that retained earnings decile is positively related to the propensity to pay dividends in a global setting. They find that firms that initiate dividend payments increase their retained earnings decile rank prior to their dividend initiations, and firms that omit dividend payments decrease their retained earnings rank prior to their dividend omissions. These results are in line with the life cycle theory of dividends.

3. Data & Methodology

This section first provides the hypotheses development which I will examine in section 3.4. Then I discuss the variable construction, data selection criteria and model specifications in my study. The last part contains the empirical tests of the models where I will discuss the empirical results and whether my hypotheses are supported by the empirical tests.

3.1 Hypothesis Development

Based on the literature review above, I make the three following hypotheses for my study.

3.1.1 Hypothesis 1: Dividend Changes are Informative about Future Earnings.

According to the dividend signaling theory, if dividend policy changes, it is likely to affect future earnings. In other words, dividend changes are significantly related to earnings changes in each of the two years subsequent to the dividend change.

3.1.2 Hypothesis 2: Dividend Changes are Informative about Future Earning, Controlling for Past Earnings Changes and the Lagged ROE.

Benartzi et al. (1997) report that dividend changes are highly correlated with past earnings changes. Hence, the relation between dividend changes and future earnings changes may capture the autocorrelation in the earnings change series. Ohlson and Penman (1982) document that earnings to the book value of equity (ROE) is an important predictor of future earnings changes. High (low) ROE is expected to decrease (increase) future earnings due to the mean-reverting behavior of earnings changes. Dividend changes may be correlated with ROA as well. As a result, I include past earnings changes and the lagged ROE in the regression models as additional control variables. I therefore hypothesize that dividend changes are informative about future earnings, controlling for past earnings changes and the lagged ROE.

3.1.3 Hypothesis 3: Dividend Changes are Positively (Negatively) Related to Future Earnings Changes for the Corresponding (Contradictory) Sign Group.

Motivated by Koch and Sun (2004) who examine the market reactions to dividend change announcements by distinguishing dividend changes between confirmatory dividend changes (observations that the dividend change and recent past earnings change are of the same sign) and contradictory dividend changes (observations that the dividend change and recent past earnings change have opposite signs), I will additionally divide my firm-year observations that make non-zero dividend changes into two subgroups in the same way as Koch and Sun (2004). I hypothesize that confirmatory dividend changes are likely to be positively related to earnings changes in the two subsequent years. One of the possible explanations is that dividends are paid out with current or prior earnings. In the most case, change in dividends follows change in past earnings in the same direction. So these confirmatory dividend changes are likely to signal that the direction of past earnings change is expected to be sustainable in the future. Conversely, I hypothesize that contradictory dividend changes are likely to be negatively related to earnings changes in the two subsequent years. One of the possible explanations for the negative relation is that for firms with contradictory dividend decreases, managers may have seen the potential investment opportunities and intend to keep more funds for future investments which are likely to increase subsequent earnings, and that for firms with contradictory dividend increases, managers may want to satisfy equity investors through increasing dividends but less funds will be available for future development since they are paying more dividends in the context of earnings decreases, then their future earnings may get worse. Although there may be other reasons for these firms doing so, and different reasons may lead to different outcomes. In my study, I only hypothesize that contradictory dividend changes are likely to be negatively related to earnings changes in the two subsequent years and test whether my hypothesis can be supported by the empirical results.

3.2 Variable Construction

The key variables used in the study are earnings changes, dividend changes and return on equity. Firstly, earnings used in this study are earnings before extraordinary items because it is the usual case in many previous studies (Nissim and Ziv (2001) and Grullon et al., 2005)). The annual past earnings change is defined as follows:

$$\Delta\text{PastEarnings}_{it} = (Earnings_{it} - Earnings_{i(t-1)})/BookEquity_{i(t-1)}$$

I define past earnings change for firm *i* at time t as the difference in the annual earnings before extraordinary items between year t and $t-1$, deflated by the book value of equity at the beginning of the dividend change year. Nissim and Ziv (2001) suggest that it is better to deflate the earnings change by the book value of equity rather than the market value of equity. Since price reflects expectations about future earnings, the ratio of earnings to price is likely to be negatively related to the expected change in earnings (Penman (1996)[5]

Future earnings change for firm *i* at time *t* is defined as follows:

$$\Delta\text{FutureEarnings}_{i(t+1)} = (Earnings_{i(t+1)} - Earnings_{it})/BookEquity_{i(t-1)}$$

$$\Delta\text{FutureEarnings}_{i(t+2)} = (Earnings_{i(t+2)} - Earnings_{i(t+1)})/BookEquity_{i(t-1)}$$

The two equations represent the earnings change in the first and the second year following the dividend change respectively. The future earnings changes are also deflated by the book value of equity at the beginning of the dividend change year.

Dividend change for firm *i* at time *t* is measured by the rate of dividend change. The dividend change is defined as follows:

$$\Delta Div_{it} = (Div_{it} - Div_{i(t-1)})/Div_{i(t-1)}$$

Where Div_{it} is the dividend per share for firm i at time t, Div_{t-1} is the dividend per share for firm i at time $t-1$. Clearly, two consecutive years of dividend payments are necessary for the calculation of the dividend change.

The lagged return on equity is defined as earnings before extraordinary items scaled by the book value of equity. I use the return on equity in year t and $t+1$ in my analysis, they are defined as follows:

$$ROE_{it} = Earnings_{it}/BookEquity_{it}$$
$$ROE_{i(t+1)} = Earnings_{i(t+1)}/BookEquity_{i(t+1)}$$

3.3 Dataset

The sample consists of firms recorded in Compustat annual file over the sample period 1993-2011. To be included in the sample, a firm must meet the following criteria: (1) A

[5] Nissim, D. and Ziv, A. (2001), *Dividend Changes and Future Profitability.* The Journal of Finance, vol. 56, No.6, pp.2111-2133

firm must distribute cash dividend (US dollars) for at least two consecutive years because two consecutive years of dividend payments are necessary for the calculation of the change in dividends. This means that dividend initiation and omission events are excluded from the study. (2) The sample is restricted to industrial firms listed in NYSE, AMEX and NASDAQ. Consistent with most of the previous literatures (e.g. Benartzi et al. (1997) and Nissim and Ziv (2001)), financial industry (SIC codes between 6000 and 6999) and utilities (SIC codes between 4900 and 4949) are excluded from the sample. (3) There are no missing records of stock returns and market returns to estimate the cumulative abnormal return. The event window for my event study is [-2, 2], and the estimation window is [-230,-30]. Stock returns are available in the CRSP file. (4) I do not investigate stock dividends, stock repurchase or special dividends since these dividend behaviors do not possess the same level of information content as regular cash dividends changes.

My sample consists of 7,192 dividend increases, 2,247 dividend decreases and 2,752 no-change observations. They are made by 1,146 industrial firms listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Table 1 presents the descriptive statistics of the sample. Panel A shows the total number and percentage of firm-year observations in different dividend groups. Dividend increases account for the largest proportion in my sample, with 59 percent of the firm-year observations increasing dividends. It is in line with previous studies (e.g. DeAngelo and DeAngelo (1990) and Nissim and Ziv (2001)) that dividend increases are the most frequent cases. 18 percent of the firm-year observations experience dividend cuts, which are far less frequent than dividend increases.

Panel B reports values of mean, standard deviation, 10th, 25th, 50th, 75th, and 90th percentiles of dividend changes (ΔDiv_{it}) for dividend increases, dividend decreases, and all dividend changes. The unconditional mean (median) of dividend changes is 52.1 percent (12.5 percent) for dividend increases, -36.8 percent (-35.3 percent) for dividend decreases and 30.9 percent (8.3 percent) for all dividend changes. The mean dividend increases is larger in magnitude than the mean dividend decreases, whereas the median dividend increases is smaller in magnitude than the median dividend decreases. It means that the mean dividend increases may be affected by extremely large dividend increases.

Panel C shows the mean and median values of cumulative abnormal returns around dividend change announcements. The event window for calculating cumulative abnormal returns is [-2, 2], and the estimation windows for estimating normal returns

is [-230, -30]. I use value-weighted returns for NYSE, AMEX and NASDAQ as proxy for market return, and estimate the following market model over the estimation window for each dividend change announcement:

$$R_{it} = \alpha + \beta R_{mt} + \varepsilon_{it}$$

Where R_{it} is the stock return of firm i at time t, and $\mathrm{R_{mt}}$ is the value-weighted return for NYSE, AMEX and NASDAQ at time t. The abnormal returns and cumulative abnormal returns in the event window are calculated as follows:

$$AR_{it} = R_{it} - NR_{it} = R_{it} - (\hat{\alpha} + \hat{\beta} R_{mt})$$
$$CAR_i = \sum_{t=t_1}^{t=t_2} AR_{it}$$

Where AR_{it} is the abnormal return of firm i at time t, NR_{it} is the normal return that is calculated by the estimated market model, CAR_i is the cumulative abnormal returns of firm i. $[t_1, t_2]$ is the event window.

In order to test whether the cumulative abnormal returns are significantly different from zero. I use t-tests to test the mean cumulative abnormal returns, and Wilcoxon signed-rank tests to test the median cumulative abnormal returns. The mean (median) cumulative abnormal returns (the cumulative average abnormal return) during the two days surrounding the announcement date of dividend change is 0.95 percent (0.57 percent) for dividend increases, and -0.32 percent (-0.13 percent) for dividend decreases. They are all significantly different from zero except the median cumulative abnormal return for dividend decreases. Consistent with various previous studies (e.g., Kalay and Loewenstein (1985)), the results in Panel C show a positive relation between dividend changes and abnormal stock returns. On average, Investors can exploit significantly positive stock returns when a firm announces a dividend increase.

Table 1

Sample Descriptive Statistics

The sample consisits of 12,191 firm-year observations by 1,146 industrial firms that are listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Financial industry (SIC codes between 6000 and 6999) and utilities industry (SIC codes between 4900 and 4949) are excluded from the sample. Firms in sample must have paid cash dividends for at least two consecutive years. Panel A shows the total number and percentage of firm-year observations in different dividend groups. Panel B shows descriptive statistics for dividend changes. The variable ΔDiv_{it} is the change in cash dividend per share in the dividend change year, divided by the previous year's level. Panel B shows values of mean, standard deviation, 10th, 25th, 50th, 75th, and 90th percentiles for the variable ΔDiv_{it} in the different dividend change groups. Panel C shows the mean and median cumulative abnormal returns around dividend change announcements for dividend increases and decreases. The event window to calculate the abnormal returns is [-2, 2]. For the mean column, I use t-test to test whether the means are significantly different from zero. For the median column, I use Wilcoxon signed-rank test to test whether the medians are significantly different from zero. The critical values of the mean and median tests are reported in parentheses.

Panel A: Sample

	Divided Increases	No Change	Dividend Decreases	Total
Firm-year Observations	7,192	2,752	2,24	12,191
Percentage	59%	23%	18%	100%

Panel B: Sample Descriptive Statistics for Dividend Changes

	Mean	SD	P10	P25	P50	P75	P90
	Dividend Increases (N=7,192)						
ΔDiv_{it}	0.521	3.082	0.029	0.063	0.125	0.272	0.714
	Dividend Decreases (N=2,247)						
ΔDiv_{it}	-0.368	0.230	-0.722	-0.500	-0.353	-0.188	-0.081
	All Dividend Changes (N=9,439)						
ΔDiv_{it}	0.309	2.719	-0.413	0.000	0.083	0.200	0.529

Panel C: Cumulative Abnormal Return around Announcements of Dividend Change

	CAR_i	
	Mean	Median
Dividend Increases	0.95%***	0.57%***
	(16.95)	(15.93)
Dividend Decreases	-0.32%**	-0.13%
	(-2.05)	(-1.42)

*** Statistical significance at the 1 percent level ** Statistical significance at the 5 percent level

3.4 Methodology & Empirical Results

3.4.1 Model Specifications

Based on the theoretical and empirical studies on the information content of dividend hypothesis, it is important to test whether a firm that increases (decreases) dividend payments in a year will have an unexpected increase (decrease) in future earnings.

Following Nissim and Ziv (2001), I use model (1) and (2) to test hypothesis 1.

$$\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+1)} \qquad (1)$$

$$\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+2)} \qquad (2)$$

Where $\Delta\text{FutureEarnings}_{i(t+1)}$ is the change in earnings in the first year after the dividend change, $\Delta\text{FutureEarnings}_{i(t+2)}$ is the change in earnings in the second t year after the dividend change. ΔDiv_{it} is the rate of the dividend change in the dividend change year.

To control for the autocorrelation in earnings change series and correlation between dividend changes and the lagged return on equity, I include past earnings changes and the ratio of earnings to the book value of equity in model (3) and (4). In addition, I distinguish between dividend increase and dividend decrease since some previous studies (e.g. DeAngelo and DeAngelo (1990) and Benartzi et al. (1997)) document that the effect of dividend changes on future earnings changes is asymmetric for dividend increases and decreases. Therefore, dividend increases and decreases are distinguished by introducing the dummy variables.

I estimate the following model (3) and (4) to test hypothesis 2:

$$\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + \alpha_1 PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it} + \alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{it} + \varepsilon_{i(t+1)} \qquad (3)$$

$$\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + \alpha_1 PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it} + \alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{i(t+1)} + \varepsilon_{i(t+2)} \qquad (4)$$

Where $PosDum_{it}$ is a dummy variable that equals 1 if dividend changes are positive in year t and 0 otherwise. $NegDum_{it}$ is also a dummy variable that equals 1 if dividend changes are negative in year t and 0 otherwise. $\Delta\text{PastEarnings}_{it}$ is the change in earnings in the dividend change year. ROE_{it} is the return on equity in the dividend change, and $\text{ROE}_{i(t+1)}$ is the return on equity in the first year after the

dividend change. All the other variables are defined in the same way as in model (1) and (2).

3.4.2 Empirical Tests of the Models

Table 2 reports the empirical results of model (1) and (2) to test hypothesis 1 that dividend changes are informative about future earnings. The results show that the coefficients on dividend changes (α_1) in model (1) and (2) are both statistically insignificant, indicating that dividend changes do not contain information about earnings changes in each of the two years subsequent to the dividend change. Noticeably, the R-squares are zero in Table 2. This means that the variable of dividend changes alone provides virtually no information about future earnings changes based on the whole sample data. These results are consistent with the previous study carried out by Benartzi et al. (1997) who also find no significant relation between dividend changes and future earnings. These results are consistent with the previous study carried out by Benartzi et al. (1997) who also find no significant relation between dividend changes and future earnings changes, but inconsistent with the results of Nissim and Ziv (2001) who find that dividend changes are positively related to earnings changes in each of the two years following the dividend change. Nissim and Ziv (2001) attribute the insignificant results of Benartzi et al. (1997) to the measurement error in the dependent variable because Benartzi et al. (1997) deflate earnings changes by the market value of equity. Nissim and Ziv (2001) document that stock price also incorporates expectations about future earnings, it is likely that the earnings-to-price ratio is negatively associated with the price-deflated earnings change in the first year subsequent to the dividend change (Penman (1996)). To avoid any possible distortions from the deflator, they suggest it is better to deflate the earnings changes by the book value of equity rather than by the market value of equity. I deflate the earnings changes by the book value of equity as suggested by Nissim and Ziv (2001), but I still find no significant relation between dividend changes and future earnings changes. Therefore, hypothesis 1 is not confirmed.

Table 3 shows the empirical results of model (3) and (4) to test hypothesis 2 that dividend changes are informative about future earnings changes, after controlling for past earnings changes and the lagged return on equity which are expected to be correlated with dividend changes.[6] The results in Table 3 indicate that the coefficients on dividend increases and decreases are all insignificant, showing that both dividend increases and dividend decreases are still unrelated to earnings changes

[6] Surprisingly, the correlation between dividend changes and past earnings changes is 0.001, and the correlation between dividend changes and the current return on equity is also approximately 0.001 in my sample.

in each of the two years subsequent to the dividend change based on the whole sample data, even controlling for past earnings changes and the lagged ROE. The coefficient on past earnings changes (α_3) in model (3) is negative and statistically significant at the 5 percent level. This indicates that past earning changes are negatively related to earnings changes in the first year subsequent to the dividend change based on the whole sample data. However, no significant relation is found between past earnings changes and earnings changes in the second year after the dividend change since the coefficient on the earnings changes (α_3) in model (4) is insignificant. For the lagged return on equity, the coefficient on the lagged return on equity (α_4) is positive and significant at 5 percent level in Model (4) but insignificant in Model (3). This indicates that the lagged return on equity is positively related to earnings changes in the second year rather than the first year following the dividend change. Hence, Ohlson and Penman's (1982) finding which suggests that high (low) ROE implies an expected decrease (increase) in future earnings is unconfirmed.

Therefore, hypothesis 2 is unconfirmed as well because neither dividend increases nor dividend decreases are found to be significantly related to earnings changes in each of the two subsequent years.

To test hypothesis 3, I use the 9,438 firm-year observations by 1,142 industrial firms that have made non-zero dividend changes from 1993 to 2011. Following Koch and Sun (2004), I divide my sample into two subgroups based on whether the dividend change and past earnings change are of the same sign. The number of firms with confirmatory dividend changes is 5,530, and the number of firms with contradictory dividend changes is 3,908.

The regression results of model (1) and (2) in which the variable of dividend changes is the only explanatory variable are not reported here. The coefficients on dividend changes (α_1) remain insignificant for both confirmatory and contradictory groups. It indicates that when future earnings changes are explained by dividend changes alone, dividend changes are unrelated to earnings changes in each of the two subsequent years.

Table 4 shows the regression results of model (3) and (4) in which dividend increases and dividend decreases are distinguished by including dummy variables, and past earnings changes and the lagged return on equity are added as additional control variables. Panel A shows the results for firms with confirmatory dividend changes. The coefficient on dividend increases (α_1) in model (3) is positive and significant at the 10 percent level, showing that confirmatory dividend increases are positively related to

earnings changes in the first subsequent year. However, no significant relation is found between confirmatory dividend increases and earnings changes in the second subsequent year because the coefficient on dividend increases (α_1) in model (4) is insignificant. On the other hand, the coefficients on dividend decreases (α_2) in model (3) and (4) for firms with confirmatory dividend changes are both positive and highly significant at the 1 percent level. It means that when dividend decreases are preceded by past earnings decreases, dividend decreases are positively related to earnings changes in each of the two years after the dividend change. Moreover, the coefficients on dividend decreases are substantially larger in magnitude compared to those on dividend increases, indicating that dividend decreases provides more information content about future earnings changes. As for the economic significance of dividend decreases, one standard deviation (0.254) decrease in negative dividend changes leads to a decrease in earnings changes in the first year following the dividend change by 9.3 percent, and a decrease in earnings changes in the second year following the dividend change by 29.0 percent.

In Panel B of Table 4 where firms make contradictory dividend changes, the coefficients on dividend increases (α_1) are both insignificant, showing that dividend increases provide little information about future earnings changes. The coefficient on dividend decreases (α_2) in model (4) is negative and significant at the 10 percent level. It means that when dividend decreases are preceded by past earnings increases, dividend decreases are negatively related to earnings changes in the second year after the dividend changes. This evidence is consistent with the second part of hypothesis 3 where I hypothesize that dividend changes are negatively related to future earnings changes for firms with contradictory dividend changes. There may be several reasons that can explain the negative relation between contradictory dividend decreases (i.e. dividend cuts are preceded by past earnings increases) and earnings changes in the second year after the dividend decrease. The first possible explanation is that some managers may have seen the potential investment opportunities and intend to retain more funds for future investments which are likely to increase earnings in the subsequent years. The second possible explanation is that dividend policy is a tool for changing financing mix as Damodaran A. (2010, pp 10.44) states.[7] Increasing dividends increases a firm's financial leverage, and decreasing dividends reduces a firm's financial leverage. So a firm that decreases dividends may want to satisfy current bondholders and attract potential bondholders because less wealth is transferred from lenders to shareholders. Also, firms with lower financial leverage are

[7] Damodaran A. (2010), *Applied Corporate Finance*. John Wiley & Sons, Chapter 10, pp.44

capable of raising debt capital at a lower cost. Therefore, if it is the case, firms are likely to increase earnings in the subsequent years. The third possible explanation is that some managers may have realized the changing competition environment and want to hoard more cash to strengthen their competitive outcomes. Fresard (2010) documents that large cash holdings lead to significant future market share gains at the expense of industry rivals. In addition to these possible explanations, firms may have other reasons to decrease dividends after the past earnings increase.

In sum, the empirical results in Table 5 indicate that confirmatory dividend increases and decreases are both positively related to earnings changes in each of the two years after the dividend change, and that only contradictory dividend decreases are negatively related to earnings changes in the second subsequent year. However, contradictory dividend increases are unrelated to earnings changes in each of the two subsequent years, and contradictory dividend decreases are unrelated to earnings changes in the first subsequent year. Overall, the significant results in Table 4 are in line with hypothesis 3, while the insignificant results remain unconfirmed.

Table 2

Results from Regressions of Future Earnings Change on the Dividend Change

This table reports the regression results of model (1) and (2).

Model (1) $\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+1)}$

Model (2) $\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+2)}$

The sample consists of 12,191 firm-year observations by 1,146 industrial firms that are listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Financial industry (SIC codes between 6000 and 6999) and utilities industry (SIC codes between 4900 and 4949) are excluded from the sample. Firms in sample must have paid cash dividends for at least two consecutive years. The variable $\Delta\text{FutureEarnings}_{i(t+1)}$ and $\Delta\text{FutureEarnings}_{i(t+2)}$ represent the change in the earnings before extraordinary items for the first year and the second year respectively subsequent to the dividend change, scaled by the book value of equity at the beginning of the dividend change year. The variable ΔDiv_{it} is the rate of dividend change, defined as the change in dividend per share scaled by the dividend per share in a prior year. The *t*-statistics are reported in parentheses.

	α_0	α_1	R^2	N
Model (1)	0.033	-0.001	0.000	12,155
	(2.58)	(-1.12)		
Model (2)	0.015	-0.003	0.000	12,091
	(0.74)	(-1.46)		

Table 3

Results from Regressions of Future Earnings Change on the Dividend Change and other Control Variables

This table reports the regression results of model (3) and (4).

$$\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + \alpha_1 PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it} + \alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{it} + \varepsilon_{i(t+1)} \quad (3)$$

$$\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + \alpha_1 PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it} + \alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{i(t+1)} + \varepsilon_{i(t+2)} \quad (4)$$

The sample consists of 12,191 dividend events made by 1,146 industrial firms that are listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Financial industry (SIC codes between 6000 and 6999) and utilities industry (SIC codes between 4900 and 4949) are excluded from the sample. Firms in sample must have paid cash dividends for at least two consecutive years. The variable $\Delta\text{FutureEarnings}_{i(t+1)}$ and $\Delta\text{FutureEarnings}_{i(t+2)}$ represent the change in the earnings before extraordinary items for the first year and the second year respectively subsequent to the dividend change, scaled by the book value of equity at the beginning of the dividend change year. The variable ΔDiv_{it} is the rate of dividend change, defined as the change in dividend per share scaled by the dividend per share in a prior year. The variable $\Delta\text{PastEarnings}_{it}$ is the change in earnings before extraordinary items in the dividend change year, scaled by the book value of equity at the beginning of the dividend change year. The variable $PosDum_{it}$ ($NegDum_{it}$) is a dummy variable that equals 1 if the dividend change is positive (negative) and 0 otherwise. The variable ROE_{it} ($\text{ROE}_{i(t+1)}$) represent the return on equity in the dividend change year (one year) after the dividend change, defined as earnings before extraordinary items in year t ($t+1$) scaled by the book value of equity in year t ($t+1$). The *t*-statistics are reported in parentheses.

	α_0	α_1	α_2	α_3	α_4	R^2	N
Model(3)	0.029	-0.001	-0.036	-0.037**	0.001	0.019	12,145
	(2.26)	(-0.98)	(-0.60)	(-1.97)	(1.54)		
Model(4)	-0.001	-0.001	-0.229	0.004	0.002**	0.034	12,071
	(-0.10)	(-1.15)	(-1.60)	(0.13)	(2.26)		

**statistically significance at the 5 percent level

Table 4

Results from Regressions of Future Earnings Change on the Dividend Change and other Control Variables for Two Subgroups

This table reports the regression results of model (3) and (4).

Model (3) $\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it}$

$+\alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{it} + \varepsilon_{i(t+1)}$

Model (4) $\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it}$

$+\alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{i(t+1)} + \varepsilon_{i(t+2)}$

The variable $\Delta\text{FutureEarnings}_{i(t+1)}$ and $\Delta\text{FutureEarnings}_{i(t+2)}$ represent the change in the earnings before extraordinary items for the first year and the second year respectively subsequent to the dividend change, scaled by the book value of equity at the beginning of the dividend change year. The variable ΔDiv_{it} is the rate of dividend change, defined as the change in dividend per share scaled by the dividend per share in a prior year. The variable $\Delta\text{PastEarnings}_{it}$ is the change in earnings before extraordinary items in the dividend change year, scaled by the book value of equity at the beginning of the dividend change year. The variable $PosDum_{it}$ ($NegDum_{it}$) is a dummy variable that equals 1 if the dividend change is positive (negative) and 0 otherwise. The variable ROE_{it} ($\text{ROE}_{i(t+1)}$) represent the return on equity in the dividend change year (one year) after the dividend change, defined as earnings before extraordinary items in year t ($t+1$) scaled by the book value of equity in year t ($t+1$). The *t*-statistics are reported in parentheses.

Panel A: Results for the observations with confirmatory dividend changes							
	α_0	α_1	α_2	α_3	α_4	R^2	N
Model (3)	0.092	0.003*	0.368***	-1.405***	-0.001	0.772	5,518
	(5.52)	(1.66)	(2.81)	(-5.49)	(-0.05)		
Model (4)	0.222	0.007	1.141***	-3.612***	0.008	0.740	5,487
	(3.65)	(1.39)	(3.01)	(-3.88)	(1.48)		
Panel B: Results for the observations with contradictory dividend changes							
	α_0	α_1	α_2	α_3	α_4	R^2	N
Model (3)	0.065	-0.001	0.128	-0.027***	0.002	0.014	3,889
	(1.42)	(-0.87)	(1.34)	(-2.92)	(0.43)		
Model (4)	-0.032	0.000	-0.18	0.030	-0.021	0.020	3,864
	(-0.79)	(0.25)	(-1.65)	(3.72)	(-1.09)		

***statistical significance at the 1 percent level * statistical significance at the10 percent level

4. Robustness Checks

This section presents the robustness checks of my empirical results showed in Section 3.4.2. Instead of deflating changes in earnings by the book value of equity at the beginning of the dividend change year, I deflate them by the book value of total assets at the beginning of the dividend change year.

Table 5 presents the regression results for model (1) and (2) when changes in earnings are deflated by the book value of total assets at the beginning of the dividend change year. Similar to Table 2, none of the coefficients on dividend changes (α_1) are significant. Based on the whole sample data, dividend changes are unrelated to earnings changes in the two subsequent years when earnings changes are deflated by the book value of total assets. The R-squares are also close to zero, showing that dividend changes provides little information about future earnings changes when the variable of dividend changes is the only explanatory variable in the models.

Table 6 presents the regression results for model (3) and (4) when changes in earnings are deflated by the book value of total assets at the beginning of the dividend change year. Similar to Table 3, none of the coefficients on either dividend increases or dividend decreases (α_1 and α_2) are significant. Based on the whole sample, dividend changes are unrelated to earnings changes in the two subsequent years when earnings changes are deflated by the book value of total assets. Past earnings changes show a negative relation with earnings changes in each of the two years following the dividend change as the coefficients on past earnings changes (α_3) remain negative and statistically significant at the 1 percent level in both model (3) and model (4).

I also perform the robustness checks for firms with confirmatory dividend changes and firms with contradictory dividend change though the results are not reported here. When changes in earnings are deflated by the book value of total assets at the beginning of the dividend change year, confirmatory dividend decreases are positively related to earnings changes in the first subsequent year, and contradictory dividend decreases are negatively related to earnings changes in the first subsequent year. The other coefficients on either dividend increases or dividend decreases are insignificant.

The robustness check results show that dividend changes are consistently unrelated to earnings changes in each of the two subsequent year based on the whole sample data. Also, the positive relation between confirmatory dividend changes and earnings changes in the two subsequent years is no more significant in the robustness

checks. Only confirmatory dividend decreases are positively related to earnings changes in the second subsequent year. To conclude, when earnings changes are deflated by the book value of total assets rather than the book value of equity in the dividend change year, dividend changes offer little information about future earnings changes.10

Table 5

Results from Regressions of Future Earnings Change on the Dividend Change by Alternative Deflator

This table reports the regression results of model (1) and (2).

Model (1) $\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+1)}$

Model (2) $\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + \alpha_1 \Delta Div_{it} + \varepsilon_{i(t+2)}$

The sample consists of 12,191 firm-year observations by 1,146 industrial firms that are listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Financial industry (SIC codes between 6000 and 6999) and utilities industry (SIC codes between 4900 and 4949) are excluded from the sample. Firms in sample must have paid cash dividends for at least two consecutive years. The variable $\Delta\text{FutureEarnings}_{i(t+1)}$ and $\Delta\text{FutureEarnings}_{i(t+2)}$ represent the change in the earnings before extraordinary items for the first year and the second year respectively subsequent to the dividend change, scaled by the book value of equity at the beginning of the dividend change year. The variable ΔDiv_{it} is the rate of dividend change, defined as the change in dividend per share scaled by the dividend per share in a prior year. The *t*-statistics are reported in parentheses.

	α_0	α_1	R^2	N
Model (1)	0.07	-0.001	0.000	12,172
	(8.80)	(-1.19)		
Model (2)	0.006	-0.001	0.001	12,108
	(6.81)	(-1.64)		

[10] In addition, the empirical results remain similar when I include year fixed effects, similar to Braggion & Moore (2011).

Table 6

Results from Regressions of Future Earnings Change on the Dividend Change and other Control Variables by Alternative Deflator

This table reports the regression results of Model (3) and (4).

Model (3) $\Delta\text{FutureEarnings}_{i(t+1)} = \alpha_0 + PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it}$

$$+\alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{it} + \varepsilon_{i(t+1)}$$

Model (4) $\Delta\text{FutureEarnings}_{i(t+2)} = \alpha_0 + PosDum_{it} \cdot \Delta Div_{it} + \alpha_2 NegDum_{it} \cdot \Delta Div_{it}$

$$+\alpha_3 \Delta\text{PastEarnings}_{it} + \alpha_4 \text{ROE}_{i(t+1)} + \varepsilon_{i(t+2)}$$

The sample consists of 12,191 firm-year observations by 1,146 industrial firms that are listed in NYSE, AMEX and NASDAQ between 1993 and 2011. Financial industry (SIC codes between 6000 and 6999) and utilities industry (SIC codes between 4900 and 4949) are excluded from the sample. Firms in sample must have paid cash dividends for at least two consecutive years. The variable $\Delta\text{FutureEarnings}_{i(t+1)}$ and $\Delta\text{FutureEarnings}_{i(t+2)}$ represent the change in the earnings before extraordinary items for the first year and the second year respectively subsequent to the dividend change, scaled by the book value of total assets at the beginning of the dividend change year. The variable ΔDiv_{it} is the rate of dividend change, defined as the change in dividend per share scaled by the dividend per share in a prior year. The variable $\Delta\text{PastEarnings}_{it}$ is the change in earnings before extraordinary items in the dividend change year, scaled by the book value of total assets at the beginning of the dividend change year. The variable $PosDum_{it}$ ($NegDum_{it}$) is a dummy variable that equals 1 if the dividend change is positive (negative) and 0 otherwise. The variable ROE_{it} ($\text{ROE}_{i(t+1)}$) represent the return on equity in the dividend change year (one year) after the dividend change, defined as earnings before extraordinary items in year t ($t+1$) scaled by the book value of equity in year t ($t+1$). The *t*-statistics are reported in parentheses.

	α_0	α_1	α_2	α_3	α_4	R^2	N
Model(3)	0.007	-0.001	-0.009	-0.241***	0.001	0.039	12,151
	(10.42)	(-0.20)	(-1.05)	(-6.54)	(1.10)		
Model(4)	0.006	-0.001	-0.011	-0.150***	0.001	0.011	12,081
	(6.94)	(-1.27)	(-1.36)	(-3.76)	(0.66)		

***statistical significance at the 1percent level

5. Summary and Recommendations

This section provides summary and recommendations for my study. Section 5.1 presents the results and conclusions for my three main hypotheses. Section 5.2 provides the implications and recommendations based on the results of my study.

5.1 Summary of the Research

This study investigates the information content of dividends by analyzing the impact of dividend changes on future earnings changes. Following Nissim and Ziv (2001), I examine the relationship between dividend changes and earnings changes in each of the two years following the dividend change. Also, motivated by Koch and Sun (2004) who examine the market reactions to dividend change announcements by distinguishing dividend changes between confirmatory dividend changes and contradictory dividend changes, I divide the firm-year observations that have made non-zero dividend changes into two subgroups based on whether the dividend change and past earnings change are of the same sign. I hypothesize that dividend changes are likely to be positively related to earnings changes in the two subsequent years for firms with confirmatory dividend changes, and negatively related to earnings changes in the two subsequent years for firms with contradictory dividend changes.

Many researches (e.g. Pettit (1972), Kaly and Loewenstein (1985)) document the information content of dividends by examining the relationship between dividend changes and abnormal stock returns around the dividend change announcement. I show that the mean (median) cumulative abnormal returns during the two days surrounding the announcement date of dividend change is 0.95 percent (0.57 percent) for dividend increases, and -0.32 percent (-0.13 percent) for dividend decreases, all statistically different from 0 (except the median cumulative abnormal returns for dividend decreases). These results are consistent with the previous studies which document that the abnormal stock returns are positive for dividend increases, and negative for dividend decreases.

Empirical results indicate that dividend changes provide virtually no information about earnings changes in the two subsequent years. All the coefficients on dividend changes in model (1) and (2) remain statistically insignificant, showing that dividend changes are unrelated to earnings changes in each of the two years following the dividend change in the simplest models in which the variable of dividend changes is the

only explanatory variable. Thus, hypothesis 1-Dividend changes are informative about future earnings changes- is unconfirmed.

After incorporating past earnings change and the lagged return on equity into the models and making a distinction between dividend increases and dividend decreases, I find that neither dividend increases nor dividend decreases are significantly related to earnings changes in the two subsequent years. Thus, hypothesis 2-Dividend changes are informative about future earnings changes, controlling for past earnings changes and the lagged return on equity- is unconfirmed as well.

When dividend changes are classified into confirmatory dividend changes and contradictory dividend changes, confirmatory dividend increases and decreases are both positively related to earnings changes in each of the two subsequent years. Contradictory dividend decreases are negatively related to earnings changes in the second subsequent year. However, these results are no more significant in the robustness checks. When changes in earnings are deflated by the book value of assets in the dividend change year, only the relation between contradictory dividend decreases and earnings changes in the first subsequent year is found to be significant.

When changes in earnings are deflated by the book value of equity, confirmatory dividend increases and decreases are positively related to earnings changes in each of the two subsequent years, and confirmatory dividend decreases are negatively related to earnings changes in the second subsequent year. When changes in earnings are deflated by the book value of total assets, contradictory dividend decreases are negatively related to earnings changes in the first subsequent year. Nevertheless, dividend decreases appear to offer more information about future earnings changes than dividend increases in terms of the size of the coefficients and the associated *t*-statistics, though not all the coefficients on dividend decreases remain significant.

One of the possible explanations for the positive relation between confirmatory dividend changes and earnings changes in the two subsequent years is that dividends are paid out with current or prior earnings. In the most case, change in dividends follows change in past earnings in the same direction. So these confirmatory dividend changes are likely to signal that the direction of change in past earnings is expected to be sustainable in the future. There may be several reasons that can explain the negative relation between contradictory dividend decreases (i.e. dividend cuts are preceded by past earnings increases) and earnings changes in the second year after the dividend decrease. Some managers may have seen better investment opportunities, or some managers may want to adjust their capital structure to attract more bondholders, or

some managers may want to strengthen their future market shares in response to the changing competition environment. Also, there may be other plausible reasons than can help explain the results. Thus, hypothesis 3- Dividend changes are positively related to future earnings changes for firms with confirmatory dividend changes, and negatively related to future earnings changes for firms with contradictory dividend changes- is also only partially confirmed as the results are not robust to an alternative measurement of the deflator.

5. 2 Recommendations

In summary, this study finds limited evidence supporting the information content of dividends. The empirical results indicate that variations in future earnings can be largely predicted by past earnings changes because past earnings changes are negatively related to earnings changes in each of the two subsequent years in most cases. In contrast to Nissim and Ziv (2001) who find that dividend changes are positively related to earnings changes in each of the two subsequent years, I find that dividend changes provide substantially limited information about a firm's future earnings

This study is based on industrial firms listed on the NYSE, AMEX, and NASDAQ from 1993 to 2011. It provides investors and equity market some understanding of whether dividend changes are informative about future earnings changes for U.S. publicly traded firms during the recent twenty years from 1993 to 2011. The results show that dividend changes provide little information about future earnings change.

Noticeably, the coefficients on dividend decreases appear to be more significant and larger in magnitude than those on dividend increases though not all of them are significant. Future research could possibly investigate what causes the difference between dividend increases and decreases, and whether dividend decreases are more valuable in assessing the firm's future earnings. Such further detailed research could provide additional insights about the information content of dividends.

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