Are Dividends a Signal of Future Firm Performance?

An Empirical Test of the Dividend Signaling Hypothesis among Norwegian Listed Firms

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Preface

This paper is written as a partial fulfillment of the requirements of the course Master of Science in Business and Economics, major in Finance and Accounting. The writing of this paper has been challenging and demanding work. It has also been, in many ways, an invaluable learning experience. Besides getting insight into various themes of financial theory I have, over the course of this paper, acquired experience in quantitative data analysis, statistics and project work.

My motivation for the choice of topic and research question was mainly my profound fascination with finance, capital markets, as well as quantitative analysis. Over the course of the aforementioned study programme, I developed a keen interest and aptitude for these subjects and as such, writing a master thesis in the form of an empirical test of a financial theory seemed an obvious choice.

In closing, I would like to take this opportunity to thank my supervisor, Tor Tangenes, for valuable guidance and advice. I would also like to thank my family and friends for their support and encouragement during my work on this project.

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Abstract

The goal of this paper is to examine the dividend behavior, as well as to test the dividend signaling hypothesis among Norwegian firms listed on the OSE. The signaling hypothesis predicts that changes in dividend payouts act as signals of the future performance of the firm. To test this, I examine the relation between dividend changes and future changes in earnings among 76 public firms over a period of six years. The results of my analysis provide no consistent support for the predictions of the dividend signaling hypothesis. Additionally, my results show that there are clear differences in dividend behavior between Norwegian firms and their US counterparts. The examined Norwegian firms are more flexible with their dividend policies, showing less reluctance to cut and omit dividends than is common among firms in the US. Dividend smoothing also appears to be less prevalent among Norwegian firms.

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Introduction

In modern financial markets, information is often considered one of the most valuable commodities an investor can possess. With an ever-increasing number of potential investment objects, as well as actors competing for opportunities, it is clear that acquisition and interpretation of relevant information is becoming more and more important.

Acquiring this information, however, is often not a straightforward task. The separation of ownership and control inherent to large, modern-day companies creates gaps between the knowledge of executives and shareholders. International expansion and globalization makes it more difficult to keep track of the inner workings of firms operating across borders, which are often subject to different regulations in different parts of the world. Further compounding the problem is the tendency of some firms to use various forms of creative accounting to give a sometimes-erroneous picture of their situations.

Because of these problems, investors, analysts and academics have spent the last century searching for new sources of information that can be used to predict future firm performance. In addition to financial accounts and other information published by the corporations, attention has been given to actions through which a corporation may, intentionally or not, reveal vital information about its current and future situation. These include financing decisions, reactions to investment opportunities, vertical and horizontal integration, et cetera.

One of these sources of information and potential predictor of firm performance that has received some attention is dividend policy. The act of paying dividends to shareholders is one of the ways a company can funnel part of its profits to its owners. When investors purchase shares in company, they usually do so expecting to make a positive return on their investment. There are two sources of returns; capital gains (the increase in the company's stock price), and direct cash transfer from the company to the shareholders (Copeland, et al, 2005).

A company whose business is going well will likely be making a profit from its operations. This capital can then either be held back in order to finance new investment opportunities, or it can be paid out to the shareholders. Should the company choose the latter, it can do this in one of two ways; by repurchasing shares – whereupon the firm offers to buy back some of its own stock from its owners, or by paying a cash dividend (Brealy & Myers, 2003).

An inherent difference between these is that a share repurchase entails the investors selling some of their stock, thereby losing the voting rights as well as the rights to future profits that come with it. Dividends, on the other hand, are usually direct cash payments to shareholders, and as such do not reduce the amount of stock in circulation. Additionally, share repurchases and dividend payments are often treated differently by the tax system, although this varies from country to country.

How much of a firm's profits will be paid out to shareholders is decided by the board of directors. They may also choose to not pay any dividends at all; a corporation is not obliged by law to pay dividends to stockholders. In the case of preferred stock, as opposed to common stock, the situation is somewhat different. While preference shares typically do not grant the holder any of the voting rights associated with common shares, they do grant a preferential right to dividends (Brealy & Myers, 2003). As such, they usually come with fixed dividend payments and/or cumulative dividends depending on the exact type of preferred stock.

After a board has decided on the amount to be paid in the form of dividends, a record date is set. The firm then announces the amount that will be paid to shareholders that are registered on the record date. Payment usually takes place about two weeks later. Shares are typically traded *with dividend* until a few days before the record date, after which they are traded *ex dividend.*

The effect of a firm's dividend policy on its value has been the object of much research and is, to this day widely debated. According to Brealy & Myers (2003), academics are split between three points of view. There are those belonging to the "conservative right", who believe that increases in dividend payments increase firm value. On the other side there is the radical left, who are of the opinion that increases in dividends have a negative effect, decreasing the firm's value. In middle there are the one's who claim that dividend policy has no effect on the value of a firm. This middle-of-the-road party base their view on the paper published by Modigliani and Miller where they show that dividend policy is irrelevant in a market without taxes, transaction costs or other imperfections (Modigliani & Miller, 1961).

Today, Modigliani and Miller's theory is generally considered correct. There is however, substantial evidence of the effects of changes in dividends on a firm's market value (Pettit, 1972, Aharony & Swary, 1980, Eades et al. 1985, Michaely et al. 1995). The general tendency seems to be that announced increases in dividend payouts are followed by increases in share price, while decreases have the opposite effect. The reasons for this are assumed to be the imperfections inherent to real-world markets. Such factors as taxes, transaction costs, differences in borrowing capacity and investment opportunities between firms and investors as well as information asymmetry are believed to be tied to the effects that changes in dividends have on firm value.

In addition, academics have argued that changes in dividend payments could contain firm specific information. Lintner (1956) suggested that dividends depend not only on current and past but also future earnings. Modigliani and Miller were among the first to introduce the idea of information content in dividends, as well as the notion of dividend signaling, claiming that because dividends depended on the firm's earnings, changes in dividend payments could provide information about the firms own earning expectations (Modigliani and Miller, 1959).

The research on the ability of dividend changes to predict future firm performance has however, yielded somewhat conflicting results. While some researchers like Nissim & Ziv (2001) have reported results supporting the signaling theory, others, like Benartzi (1997) and Grullon et al. (2005) have found no evidence of any relation between changes in dividend and future earnings.

The main goal of this paper is therefore to examine whether changes in dividends among Norwegian listed firms are in any way related to the firms future earnings.

Review of theory and literature

In this chapter I review the relevant theory and research that will form the foundation for my paper. I will start by introducing the most notable contributions to dividend theory before moving on to empirical analyses and tests conducted by various research papers.

Dividend policy

Over the course of the past century, several prominent researchers have conducted studies of the dividend policies among various firms. In particular, effort has been made to determine the factors influencing managements' dividend decisions. Some of the most prominent contributions to this branch of financial research were made by Lintner (1956), and Modigliani & Miller (1961), in the form of Lintners model of dividend policy as well as the dividend irrelevance theorem. In the following part, I will discuss these and other works, as well as their implications and empirical support.

Lintners model.

In 1956, John Lintner published one of the first studies of dividend policy among American firms. For this study, Lintner selected 28 listed, well-established companies for an in-depth investigation. He proceeded to make a financial analysis based on published sources for each company over the course of the post-war years. An attempt was made to identify all occasions when changes in dividends might have been under active consideration, even if no change was made. Interviews with the managements were then conducted, the focus of which was to determine which factors were viewed as most relevant when changes in dividends were being considered.

Among his results, Lintner found that the examined companies all seemed to have a structured and strategic approach to the question of whether dividends should be changed. One of the central features was that the consideration of what dividends should be paid out turned, first and foremost, on the question of whether the current rate of dividend payment should be changed. Lintner states that *"...we found no instance in which the question of how much should be paid in a given quarter or year was considered without regard to the existing rate as an optimum problem in terms of the interests of the company and/or its stockholders at the given time, after the manner suggested by the usual theoretical formulations of such problems in static terms, even when expectations are considered."* (Lintner, 1956).

This implies that the current rate of dividend payment is of significant importance for the management when considering dividend changes, and is used a form of benchmark. In other words, whether a considered dividend payment is small or large in itself might be of secondary importance. What matters is the size of the payment relative to the current rate (i.e. the previous payments).

Lintner writes *"On the basis of our field observations, the dependent variable in the decision-making process is the change in the existing rate, not the amount of the newly established rate as such."* (Lintner, 1956).

Many managements seemed to exhibit a form of conservatism as well as a belief that most investors prefer a stable rate of dividends payments and that the financial markets place a premium on stability and gradual dividend growth. Because of this, most companies sought to avoid making changes to dividend rates that would have to be reversed within a short time. This led to the development of relatively consistent patterns of behavior in dividend decisions. In order to achieve this consistent pattern of steady payout rates, managements would only change dividends in any given year by a part of the amount that earnings figures suggested, with further adjustments held of until the following years, thus smoothing the dividends over time.

Lintner argued that any reason which would lead the management to decide to change the dividend rate, as well as any reason that would be of significant consideration in determining the amount of change, had to seem prudent and convincing to the management itself. Such reasons would also have to involve considerations that stockholders and financial communities would understand, and find reasonably persuasive. He posits that current net earnings would meet these conditions better than any other factors. The study further finds that managements have compelling motivation to base their decisions regarding change in dividend payouts on changes in earnings. Indeed, it holds that no other consideration was as consistent, year by year, and company by company. As such, major changes in earnings, or levels of earnings inconsistent with current payout rates were the most important determinants of dividend decisions, both in regards to the question of whether to change the rate as well as the size of the change.

Most of the companies studied were also found to have rather specific policies outlining the ideal or target payout ratio. Given changes in earnings, the companies would move their dividend payouts to gradually adjust to the new level in earnings. The speed at which a company would move toward its ideal payout ratio, however, varied somewhat. Some of the firms in the study moved faster towards their ideal ratio, while others were more careful in making large changes to the payout rate.

In addition, Lintner noted that factors like capital budgeting and investment opportunities seemed to have little bearing on changes in the dividend payout rate. If a company was faced with abundant investment opportunities that could not be financed through existing funds, it would raise new capital or abandon the projects altogether, implying that managements would rather forego potentially profitable investments than reduce dividend payouts.

All this seems to suggest that managements are, in general, very conscious regarding changes in dividend payout rates. They show great care and conservatism, avoiding significant increases in dividends relative to the previous years, as well as increases that cannot be sustained in the future. Lintner argued that the reason for this is the "vigorous and effective" reactions by stockholders to cuts in dividends. He proceeds to outline a theoretical model based on the findings regarding firm dividend decision-making:

$$\Delta D_{it} = a_i + c_i(D_{it}^* - D_{i,(t-1)}) + U_{it}$$

where

D_{it}^* =	$r_i P_{it}$
r =	target dividend payout ratio.
P_t =	current years profit after taxes.
ΔD_{it} =	change in dividend payments.
$\Delta D_{i,(t-1)}$ =	last period dividend payment.
c_i =	speed of adjustment towards target payout ratio.
a_i / U_{it} =	a constant / normally distributed random error term.

According to this model, changes in dividends are, for the most part, products of profits, last periods dividend payout, the firms target payout ratio, and the firms adjustment speed. After applying the above model to the financial data for the 28 companies in question, Lintner found that it explained 85% of the changes in dividends over a period of 23 years.

Empirical study on dividend policy

Further study of corporate dividend policy was conducted by John A. Britain in 1966. Using Lintners original model as a starting point, he examined the effect of alternative measures of profits and cash flow, as well as the impact of various other variables on dividend policy. Britain (as cited by Evans, 1967) showed that cash flow (profits after taxes plus depreciation) explained changes in dividends better than balance-sheet profits after taxes. He posited that this might have to do with the limits imposed on depreciation in the latter measure.

Among his other results, he reported that tax rates seemed to have a significant impact on dividend payouts. Specifically, increases in income tax resulted in lower dividend payout ratios. Additionally, Britain tested the effects of other factors. Examining interest rate, growth rate, investment demand, corporate tax rate, liquidity, inflation and changes in stock price, he found that only interest rate had any correlation with dividend behavior.

Fama and Babiak (1968) conducted an empirical test of several models of dividend policy, including the standard model developed by Lintner. Applying the models to data for individual firms (whereas Lintner and Brittain focused mainly on aggregate data), they examined the ability of the various models to describe corporate dividend behavior. Fama and Fabiac argued that their preliminary result showed little support for Brittains hypothesis of cash flow being a better predictor than earnings, noting that Lintners original model with net earnings as an independent variable, performed better, albeit not by much.

The authors showed that of all the tested models, the ones with the best explanatory power were Lintners original model as well as a slightly modified version of it. Specifically, Fama and Babiac altered the model by suppressing the constant term as well as adding a new term for the lagged level of earnings. Their tests showed that this second modified version was slightly superior to the original. In conclusion, they noted that net earnings seemed to be a better measure for profits than either cash flow or net earnings and depreciation as a separate variable.

More recently, Brav et al (2005), conducted a survey of 384 financial executives to examine the determinants of dividend payouts as well as share repurchases. Using earlier academic work as a base, they explored the role of taxes, agency considerations and signaling as possible factors influencing dividend behavior. Their results went a long way in supporting one of Lintners key results – that managements exhibit a high degree of conservatism when it comes to dividend decisions. In particular, they found very strong evidence suggesting that executives are extremely averse to cutting dividends. Their survey showed that over 90% of dividend-payers would avoid reducing payouts if at all possible, and close to 90% felt that there are negative consequences to dividend cuts. A similarly high percentage responded that maintaining consistency with historic dividend policy is an important consideration in determining dividend payouts, and that they considered the payout rate of recent periods when choosing the new rate.

The authors reported that some executives implied a willingness to go to extremes to avoid dividend cuts – selling assets, laying off employees, increasing debt financing as well as foregoing positive NPV projects was seen as preferable to reducing dividend payouts. Interestingly, some three-fourths of the executives perceived an asymmetry between reducing and increasing dividends; there was not much advantage to be gained from increasing payouts, however the penalty for reducing them was seen as substantial. Accordingly, executives reported that beyond maintaining the current payout rate, dividend policy was a second-order concern. As such, increases in dividends were only considered when requirements for investments and liquidity were met.

Further in line with classic dividend theory, they found that a large percentage (90%) of the surveyed managers choose to smooth dividends from year to year, as well as 78% of dividend-payers stating that are reluctant to make increases in dividend payouts that might need to be reversed. Similarly, more than two-thirds of dividend-payers reported that the stability of future earnings is a key factor when determining dividend policy, and that sustainable changes in earnings are of vital importance.

A study by Baker, Mukherjee and Paskelian (2006) is also of particular interest to this paper, as it investigated the views on dividend policy among managers of Norwegian firms. In this study, Baker et al. sought to examine the key factors that influence dividend policy decisions among companies in Norway, as well as compare them to those of US firms. They theorized that the determinants of dividend policy in Norway might differ from other countries because of the difference in regulatory environments and tax systems. They therefore predicted that significant differences would exist in the importance managers of Norwegian and US firms attribute to factors influencing dividend decisions.

Their sample consisted of financial officers in 121 firms listed on the Oslo stock exchange in 2004, of which 33 completed the survey. Their results showed that three of the highest ranked factors influencing dividend policy involve earnings. More specifically, 91% of managers answered that the level of current earnings was either moderately of highly important. 78% answered that the stability of earnings was of moderate to high importance, and 72% attributed the same level of significance to the level of expected future earnings.

Another factor that was considered highly significant by Norwegian managers was financial leverage, being ranked as the second most important determinant on average. This suggests that managers are mindful of level of debt financing and the risk of large amounts of debt. The fifth highest ranked factor influencing dividend policy was liquidity constraints, suggesting that the amount of free cash the firm had available played a crucial role in the dividend decision. The authors reason that this could also imply unwillingness to borrow to pay dividends. Somewhat surprisingly, the factors "concern about affecting the stock price", and "desire to maintain a given payout ratio", were reported to be of relatively low importance, being ranked as nr 14 and 15, respectively.

Baker, et al (2006), then compared responses of Norwegian managers to their US counterparts. They noted that while the factors pertaining to current earnings, future earnings, and stability of earnings ranked equally high in the two countries, there were also several large differences. Among these were the importance attributed to the pattern of past dividends and stock price concerns, which were much higher in the US, as well as the importance of legal constraints, which was shown to be more significant among Norwegian firms.

The authors speculated if some of these differences could be attributed to the Norwegian legal and regulatory system, arguing that *"a centralized government in Norway sets regulatory standards and heavily regulates business in order to ensure stockholders' rights. In the U.S., the regulatory environment fosters widespread shareholder participation, not government domination as is evident in certain Norwegian firms and industries."* – Baker, et al (2006).

It should be noted that this study does suffer from some weaknesses that could potentially influence its results, like a somewhat small sample size as well as non-response bias. However, I have chosen to include it in my paper, as it is one of the few published studies into dividends and dividend policy among Norwegian firms that I have been able to find.

Modigliani and Millers dividend irrelevance theory

In 1958, Modigliani and Miller published a theoretical paper that has since been regarded by many as the starting point of financial research. In this paper, M&M showed how, given certain assumptions, like absence of taxes, transaction costs, and asymmetric information, a firms capital structure would be irrelevant to its value (Modigliani & Miller, 1958). While these results were the object of much attention and debate in academic circles at the time, today they are generally considered to be correct. Three years later M&M published a follow-up paper expanding their theory to include corporate dividend policy. Modigliani and Miller began by examining the effects that dividend policy might be expected to have in a world with perfect capital markets, as well as absence of other imperfections. Their exact assumptions can be briefly summarized as follows (Modigliani & Miller, 1961):

- Capital markets are efficient (all investors have access to all relevant information)
- No buyer or seller of securities is large enough for his transactions to have an impact on market price
- Absence of transaction costs
- Absence of taxes
- Absence of agency costs
- Investors behave rationally, meaning that they prefer more wealth to less.
- Perfect certainty on part of the investors as to the future profits of every corporation.

Given these assumptions, M&M argued that dividend policy would have no impact on the value of a firm, and as such, no effect on the shareholder's wealth. In other words, as long as the assumptions hold true, dividend policy is irrelevant.

This can be explained with the following example: assume that a firm has decided on a given investment program, as well as it's capital budgeting. In other words, investments and financing are fixed variables. The firm then decides to increase its dividend. This extra money must come from somewhere, and given that the investment and borrowing policy is fixed, it must inevitably come from the issuance of new shares. However, the new shares can only be sold if their price reflects the firm's real value.

If the firm's total value remains unchanged, the issuance of the new stock will have to dilute the stock price. Brealy and Myers (2003) refer to this as a transfer of wealth from the old shareholders to the new ones. The new shareholders receive newly printed shares at a reduced price, while the old suffer a capital loss on theirs. This capital loss is then perfectly offset by the dividend payout (figure 1).

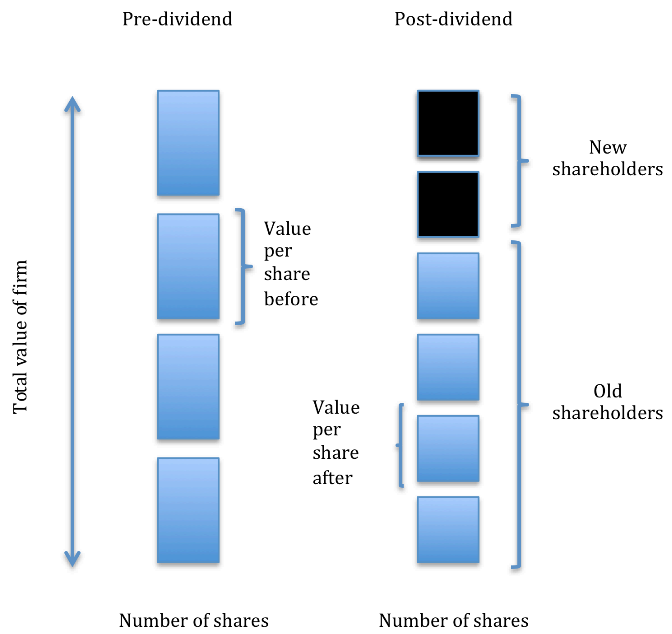


Figure 1 – A third of the firm's value is paid out in the form of dividends with funds raised by issuing new shares. The total value of the firm remains unchanged. (Brealy and Myers, 2003).

At first glance, one might assume that the value for the old shareholders is in the influx of spendable cash. But given the assumption of perfect capital markets, in other words, the absence of brokerage costs, information asymmetries, etc, the investors could just as easily have raised the same cash by selling their shares on the market. This is illustrated by figure 2.

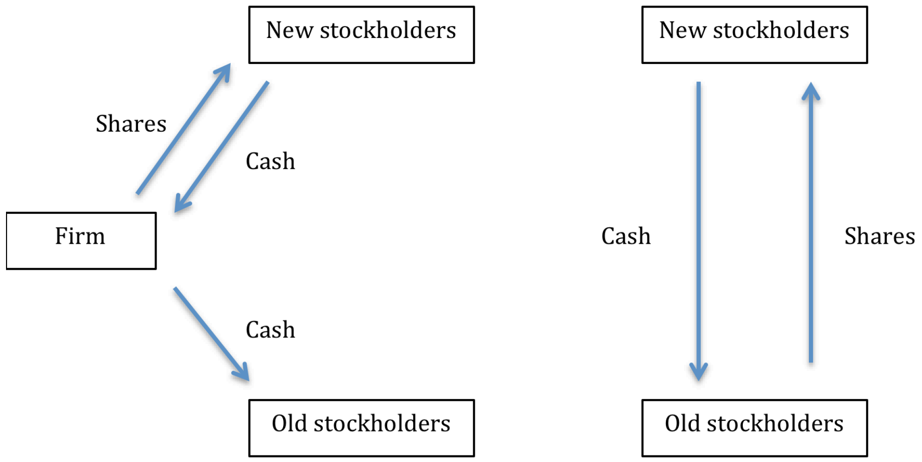


Figure 2 (Brealy and Myers, 2003)

This means that as long as the firms' investment policy remains unchanged, any changes in dividend payouts will have no bearing on the shareholders' wealth; an increase (decrease) in dividends will be offset by a decrease (increase) in share value – in the end, the cash flow from the firm to the shareholders remains the same. M&M therefore state that *"values are determined solely by "real" considerations – in this case the earning power of the firm's assets and its investment policy- and not by how the fruits of the earning power are "packaged" for distribution"* (Modigliani & Miller, 1961).

However, if dividend policy is indeed irrelevant to the value of a firm and thus irrelevant to investors, one is faced with the question of why managements spend a great deal of time and effort developing dividend policies, and why changes in dividend rates often lead to significant changes in market price. To answer these questions, it might be prudent to start by examining assumptions made in M&M's irrelevance theorem. By studying the specific assumptions that are vital for dividend policy irrelevance, one might get a better idea of which factors actually make it relevant in the less-than-perfect capital markets of the real world.

Dividend policy in a world with taxes

As noted earlier, one of the inherent assumptions of Modigliani and Miller's irrelevance theory is that neither firms nor investors need to pay a portion of their profits to the government in the form of tax. While such an assumption certainly helps create the simple and uncomplicated theoretical framework needed to bring M&M's original point across, it does not reflect the reality of actual world economies, where corporate as well as personal taxes are an inescapable part of any equation.

The argument that a firm's choice of how to "package" and distribute profits among its shareholders is a matter of irrelevance, hinges on the assumption that the value of cash flows will be the same in all scenarios. In other words, the value for the shareholders is the same regardless of whether the firm chooses to pay out its profits in the form of dividends or let the shareholders realize the value through capital gains. In the real world however, these profits are subject to taxes that diminish their value.

Farrar and Selwyn (1967) examined the effect of taxes in their research paper. They posited that personal taxes could affect the value of capital gains and dividends unequally if capital gains and dividend payouts were taxed at different rates. To illustrate this, assume a firm pays out all its excess cash in the form of dividends. The income of a shareholder can then be expressed by the following equation:

$$\tilde{Y} = [(\tilde{X} -_r D_c)(1 - T_c) -_r D_p](1 - T_p)$$

where

$\tilde{Y}$ =	the uncertain income of the shareholder.
$\tilde{X}_t$ =	the uncertain income from the firm's operations.
r =	the interest rate on corporate as well as personal debt.
D_c =	the corporate debt.

D_p = personal debt.

T_p = personal tax (on dividends).

In this scenario, all profits are paid out as dividends and taxed at the dividend tax rate, T_p. Alternatively, the firm can choose to let its shareholders take out the profits in the form of capital gains:

$$\tilde{Y} = [(\tilde{X} -_r D_c)(1 - T_c)] * (1 - T_g) - rD_p(1 - T_p)$$

where

T_g = tax rate on capital gains.

In this case, the firm lets its shareholders take out the profits as capital gains (for instance through share repurchase), which are then taxed at the capital gains rate. As wee see from the two equations, the income to the shareholder, $\tilde{Y}$, is influenced by the tax rates on either dividends, T_p, or on capital gains, T_g. In this way, differences between the rates can alter the value of the two methods of distribution of income. Given that an investor behaves rationally, he will prefer the form of payment that is subject to the lowest rate of taxation, thereby maximizing the value of the cash flow.

Copeland et al. (2005), note that even in a case of the tax rate on capital gains being equal the rate on dividend payouts, the effective tax on capital gains will still be the lesser of the two, because capital gains can be deferred indefinitely. In other words, the shareholder can delay the realization of the capital gains by retaining the shares, as the profits are only realized (and taxed), when the shares are sold. Dividends, on the other hand, are taxed in the same period they are paid out by the firm.

What then, are the implications of this for our paper? First, it is shown that taxes can potentially influence the value of dividend payouts, which means that they could influence firm dividend policy and behavior. This implies that because tax systems vary from country to country both in their nature as well as in their complexity, one country's tax system could influence dividend policy differently than that of another. This, in turn, could mean that dividend behavior varies from country to country. In other words, the results of research into dividends in the US or other nations need not be entirely transferrable to other economies, like the Norwegian one, making further research into Norwegian markets a thing of interest.

Agency theory

In addition to the assumed absence of taxes and other market imperfections, the M&M theorem explicitly assumes the absence of agency costs. The basic principles of agency theory can be summed up as follows: due to the size and complexity of modern firms, as well as fragmented ownership structures, the separation of ownership and control has become common in publically owned corporations. Under this system, shareholders, as the principals, hire a management to run the day-to day operations of the firm for them, acting as agents on their behalf. However, the limited ability of the shareholders to control and monitor the management, as well as the fact that the interests of the principals and their agents do not always coincide, can result in the management acting in a way that is not in their employers' best interests (Copeland et al, 2005).

The costs that arise from such conflicts of interest are referred to as agency costs, and encompass costs of monitoring as well as losses suffered by the principals as a result of the agents' actions. Because of this, shareholders often employ costly measures like incentive schemes and monitoring systems to control the agents, and thus reduce the likelihood of disloyal actions.

Some academics have suggested that agency theory may, at least partially, explain the why firms pay dividends despite the associated costs, as well as why investors seem to value dividend payouts. In his paper, Rozeff

(1982) argued that dividend payouts function as a tool that reduces the agency costs of equity. When insiders, i.e. the management shareholders sell off some of their stock to outsiders – investors who are not part of the management, agency costs arise as a result (Jensen & Meckling, 1976). To reduce these agency costs, the firm pays dividends, thereby giving investors a signal of its intentions.

There are, of course, costs associated with these payouts. One of these costs is in the form taxes, provided dividends are taxed at a higher rate than capital gains. In addition, according to Rozeff (1982), high dividend payouts are often accompanied by raising capital through external issue to finance the firm's investment projects. However, the fact that high payouts force the firm to resort to external capital markets can in itself be considered a form of control on agency problems.

Because outside investors and financial institutions often impose stringent terms on the firms they infuse capital into, such as financial requirements and restrictions on the uses of funds, this limits the potential for imprudent actions on the part of the management. It also puts the firm and its management under greater scrutiny. In other words, when a dividend-paying firm is forced to turn to external capital markets, the markets effectively perform monitoring and control which the shareholders benefit from.

Thus, it can be surmised that regular dividend payments are beneficial for shareholders in two ways: First, it forces the firm to disgorge cash, distributing its profits among the investors and reducing the amount of free cash available to the management, thereby making them less likely to invest in non-value maximizing ventures (La Porta et al. 2000). Second, when the firm subsequently turns to external capital markets to raise new cash, the shareholders further benefit from the scrutiny imposed on the firm by the market.

To test the theory, Rozeff (1982) examined the payout ratios of 1000 firms across 64 different industries in the period 1974-1980. Based on the idea that agency costs are higher when outsiders hold more stock, he predicted that the proportion of the stock held by insiders would be negatively related to dividend payouts. Furthermore, he theorized that the higher the concentration of ownership among the outsiders (i.e. a few large owners), the more easily they are able to influence insider behavior, reducing agency costs, and thus in turn reducing the need for dividends. He therefore suggested that higher concentrations of ownership among the outsiders might lead to lower dividend payouts. Both of these predictions were confirmed in his analysis.

DeWenter & Warther (1998), compared a number of japanese and US firms, in order to test the agency theory of dividends. They argued that because the ties between management and shareholders are stronger in Japan than in the US, this leads to less information asymmetry and fewer agency conflicts, thus affecting their dividend policies. Among their results, they found that stock price reactions to dividend payout changes were much less pronounced in the Japanese markets compared to US markets. In addition, Japanese managers were less reluctant to change dividends than their US counterparts, implying that information asymmetry and agency problems do play a role in dividend policy.

La Porta et al. (2000) suggested that dividend payouts could be an outcome of an effective system of legal protection of shareholders. Given a high level of protection, minority shareholders would be able to pressure firms to pay out their excess cash, leaving less funds for insiders to use on activities that would not benefit the minority owners. They also noted that an implication of this was that under effective shareholder protection, high growth companies should have significantly lower payout rates than low growth companies. The reasoning behind this is that given effective legal protection, minority shareholders should be willing to accept lower payouts provided that there are substantial value-increasing projects available to the firm, as they would be confident that they could extract high dividends later. Examining dividend payout policies among firms in 33 different countries, they found strong support for this hypothesis.

What this implies is that differences in such things as shareholders' legal protections as well as ownership concentration could influence firms' dividend policy, as well as market reaction to dividend changes. This could be relevant to my paper, as the Norwegian legal and regulatory system provides shareholders with strong legal protection, as noted by Baker et al. (2006).

Also, firms on the Oslo stock exchange are generally characterized by a high level of ownership concentration compared to their counterparts on foreign exchanges (Døskeland & Mjøs, 2008). Ødegaard (2009) found that on average, the five largest shareholders in OSE listed firms own approximately 52% of the equity. In comparison, Demetz and Lehn (1985) reported the mean equity share held by the 5 largest owners to be 24.81% among US firms. Because of these differences, it is not unreasonable to expect that dividend policies of Norwegian firms also will differ from those of their US counterparts.

Dividend information content and the signaling hypothesis

In their irrelevance theorem, Modigliani and Miller assume that capital markets are efficient and that investors have perfect knowledge regarding the future performance of every corporation. In the real world however, a firm's cash flow is usually the subject of variation and uncertainty, giving rise to the risk inherent to capital markets.

Further complicating the issue, is the matter of information asymmetry, that is, the uneven access to relevant information by managements and investors. As a result of the separation of ownership and control that is prevalent in today's markets, there is an information gap between the firm's executives and its shareholders. Since the management is much closer to the firm and its operations, they possess more information than the investors about the firm's current situation, as well as its future prospects.

Because of this gap in information, several tools are used to convey relevant data from the management to the investors. One of the purposes of financial accounts and reporting is to distribute this information. Financial reports are therefore widely used by individual and institutional investors when valuing a company and its stock. However, the rules and regulations governing financial accounts and reports are often complex, and sometimes allow a certain degree of freedom on the part of managements to make their own adaptations.

This is something that can potentially give rise to certain acts of "creative accounting" – instances where a firm's management, either intentionally or not, manipulates the figures in its financial accounts for one purpose or another in such a way that they do not fully reflect the firm's situation (Brealy & Myers, 2003). Agency theory tells us that management's interests do not always coincide completely with the interests of the shareholders, or those of other potential investors, making such occurrences a realistic possibility. Indeed, the questions surrounding the information quality of financial accounts and reports, as well as issues like earnings management, smoothing, big baths and other forms of accounting manipulation have given rise to an entire school of research.

Because of these issues, investors are always looking for other sources of information to separate the profitable firms from the rest. The theory of dividend information content is based on the idea that dividends contain information about a firm's current situation, and possibly also its future. Ross (1977) developed an incentive-signaling model that showed how changes in a firm's financial structure could be seen as unambiguous signals to the market of changes in the firm's outlook. Ross argued that "*Implicit in the irrelevancy proposition is the assumption that the market knows the (random) return stream of the firm and values this stream to set the value of the firm. What is valued in the marketplace, however, is the perceived stream of returns for the firm".*

This means that while any changes in such things as capital structure or dividend payouts do not change the actual value of a firm, they can change the markets *perception* of its value. This hinges on the fact that the value attributed to a firm by investors depends not only on a firm's current earnings, but also on the sum of all future cash flows. According to Copeland, et al (2005), Ross's financial structure signaling model can be applied to dividend policy as well, suggesting that dividends have the added benefit of carrying valuable signals.

The idea of dividend changes being signs of changes in a firm's financial situation is closely tied to the factors affecting the dividend behavior of managements (Pettit, 1972). As we discussed in the chapter on dividend policy, research seems to indicate that financial executives are most likely to increase dividends when the firm experiences a sustainable increase in earnings, or when earnings are expected to grow. At the same time, they usually display a high degree of conservatism when considering increases in payout rate, and are reluctant to announce increases that will need to be reversed in the near future.

Thus, to an observing investor who is considering purchasing shares in the firm, an announcement of a dividend increase could be taken as a signal that management is optimistic about the firm's future cash flows. At the same time, studies show that managements are generally very averse to decreasing dividend payout rates, considering it only as a last resort. It follows then, that when a firm announces a decrease in dividend payouts, this can be taken as a sign that the firm is experiencing problems that are likely to persist for the foreseeable future.

The fact that the market reacts to changes in dividends is well documented (Pettit, 1972, Aedes, et al, 1985). When a firm announces a change in its dividend payouts, its stock tends to appreciate, an effect that seems to contradict Modigliani and Miller's irrelevance theory. Were dividends irrelevant to the value of the company, one would not expect such a change. The only effect that should be expected given irrelevance would be an adjustment downwards in stock price on the ex-dividend day equal to the dividend payment, reflecting the reduced value of the firm. This reaction to announcements in dividend changes is thus often cited as suggesting that dividends contain information about companies, and as such are valuable signals.

In 1979, Bhattacharya published a paper where he developed a signaling model similar to that of Ross (1977), describing why firms choose to pay dividends despite the tax-related disadvantages. He posited that if investors believe that firms that pay higher dividends have higher value then unexpected increases in dividends should be taken as favorable signals by the market. In this case the firm would benefit from increasing its payout rate as this would lead to an appreciation in its perceived market value. Such benefit would serve as a trade-off to the taxation cost that dividends are subject to.

This implies that dividends contain information that cannot effectively be conveyed through other means, such as annual accounts and earnings reports. Indeed, in his model, Bhattacharya chooses to ignore other sources of information like accounts, arguing that they are inherently unreliable screening mechanisms, being subject to moral hazard (Bhattacharya, 1979). In other words, management has incentive to misrepresent the profitability of their firm as being better than it actually is. Because dividend payouts are a costly signaling method, they could be considered more reliable then other, less expensive signaling instruments. Furthermore, the signal is difficult to emulate by less profitable firms, as they would likely have problems raising the required funds to pay the dividends.

Miller and Rock (1985) proposed a dividend signaling model based on the concept of net dividends. In their paper, they acknowledged the effects that dividend changes seem to have on stock prices, attributing this to the information asymmetry of capital markets. Using their model they showed that earnings, dividends and financing decisions were closely related. More importantly, they argued that the main cause for the effect of dividend announcements is that they conveyed information on the earnings of the firm. The authors then proceeded to show that the announcement effect on shareholder wealth depends on the earnings surprise and that earnings surprise and net dividend surprise therefore convey the same information (Copeland, et al, 2005).

At the same time they noted that the possibility that dividends contain information beyond that of the firm's earnings still existed, stating "*Just how much marginal information, if any, is conveyed by dividends over and above that of earnings is still a matter of some dispute. Part of the problem is that announcements are made continually so that some dividend announcements are always being made before some earnings announcements and after others*". – Miller and Rock (1985).

John & Williams (1985), as well as Ambarish et al. (1987), developed theoretical frameworks where they show how insiders can utilize dividends, investment, and new stock issues as efficient signals to convey information to the market. They also proposed a signaling equilibrium with taxable dividends. Central in their assumptions is the idea that corporate insiders possess information unavailable to outsiders. Firms with higher expected future earnings will distribute more cash by paying higher dividends and thus receive higher prices for their stock. They argued that dividends are used as signals because the positive announcement effects on share prices outweigh their dissipation costs (taxes on dividends).

Furthermore, they posited that in the signaling equilibrium, there would be an optimal dividend for a firm to pay. This optimum dividend would increase in the present value of the firm's cash flows as well as the cash needs of its shareholders. At the same time, it would decrease in the tax rate on dividends and the supply of corporate cash (John & Williams, 1985).

Empirical research on the announcement effect of dividend changes

If changes in the payout rate do indeed convey valuable information to the market, this could go a long way toward explaining the significant shifts in stock prices that often accompany an announcement of change in dividends. Several research paper have been written on this theme, with the goal of determining the extent to which the market reacts to changes in firm's dividend payout rates.

In 1972, Pettit conducted a study into the effects of dividend change announcements in order to estimate the speed and accuracy with which the market reacted to announcements in dividend changes (Pettit, 1972). Examining the data of 625 firms on the New York stock exchange over a time period of 4 years, he stated that his results seemed to support the proposition that investors make considerable use of the information implicit in the announcement of changes in dividend payout rates.

Pettit reported that the marked reacted very dramatically when dividends were reduced or substantially increased. At the same time, he noted that the effects of more moderate increases were relatively smaller. This is in line with theory of dividend policy, where managements generally tend to view the benefit of moderate increases in dividends as disproportional to the disadvantages of decreases (Brav et al, 2005).

Interestingly, the results of the study showed an absence of any significant effect of earnings announcements on prices. A closer examination confirmed that there was a strong dividend effect in the month of the announcement, while the earnings effect was not significant in any period. Pettit noted that "*the results imply that a dividend announcement, when forthcoming, may convey significantly more information than the information implicit in an earnings announcement.*" - (Pettit, 1972). This could perhaps be taken as support for Bhattacharya's (1979) assumption that investors put little stock in the earnings announcements of financial reports because of their unreliability and instead look to dividend announcements for information.

In summary, Pettit concluded that the market clearly seemed to make use of the dividend announcements in assessing the value of securities. As such, the reluctance on the part of managements to omit or cut dividends was well founded, leading in turn to reluctance to increase dividends without being reasonably confident they could be maintained. In addition, his results implied that dividend changes were substantially more important than earnings announcements in terms of their effect on the price of securities.

Aharony & Swary (1980) wrote a paper with the goal of examining whether quarterly changes in dividend payouts provided more information than what was already disseminated through earnings numbers. They used a sample of 149 industrial firms listed on the New York stock exchange that paid quarterly dividends and provided quarterly earnings announcements over a period of 13 years. In order to isolate the effects of dividends from those of earnings announcements, the authors limited their sample of dividend and earnings announcements to the ones that were conveyed to the market on different dates within a given quarter. This they argued, allowed them to distinguish between earnings announcements that preceded, followed or accompanied dividend announcements (Aharony & Swary, 1980).

The reported results indicated that shareholders of firms that did not increase their dividends, on average, did not experience any abnormal returns in the immediate period following the announcement. At the same time, shareholders of firms that increased dividend payouts, experienced abnormal returns over the following 20 days. The results in both cases were similar regardless of whether the dividend announcement followed or preceded the earnings announcement. Additionally, shareholders in firms that decreased dividends were found to experience negative abnormal returns in the immediate period following the change. In this case as well, the effects of the dividend announcement were similar regardless of whether it was followed or preceded by earnings announcements.

The fact that the timing of the announcements of dividends relative to that of earnings was not found to have any impact on their effect on stock returns, could suggest that dividends do contain either more information or more reliable information than that of earnings announcements, as theorized by Bhattacharya (1979).

Aharony & Swary then examined the effects of earnings on the shareholders' returns. First, they noted that in almost 90% of the cases in their sample, increases in dividends were either preceded or followed by increases in earnings. This lends support to the idea that managements tend to increase dividends only when the firm is experiencing an (sustainable) increase in earnings (Lintner, 1956, Brav, et al, 2005).

Furthermore, unlike Pettit (1972), they found that earnings announcements had significant effect on returns, noting that shareholders of firms that announced increases in earnings and payouts, experienced abnormal returns on both the earnings and dividend announcement dates, regardless of which came first. The authors therefore argued that the significant abnormal returns observed at the time of dividend change announcement do not reflect diffusion or leakage of information conveyed by earnings. Instead, they posit that additional information is generated by dividend announcements.

Further research on the effects of dividends changes was conducted by Eades et al (1985). In their paper, they sought to examine the timeliness and unbiasedness of capital markets in reacting to dividend announcements. Using a sample of all the firms on NYSE that made regular dividend announcements from 1962 to 1980, they tested for the effects of changes in dividends on security returns. Similar to other studies on the subject, their results showed a significant positive correlation between dividend changes and stock returns.

More specifically, they reported that the post-announcement day returns for firms that increased their payouts are significantly positive for six days following the announcement date. Conversely, firms that reduced their dividend payouts, experienced negative returns. However, in the case of dividend decrease, the market showed a more timely reaction, as almost all of the adjustment in share prices occurred on the first and second day after the announcement.

Eades, et al (1985), argued that the apparent sluggishness observed in the market following a positive dividend announcement was attributable to what they called the ex-dividend effect. They noted that when ex-dividend days are in close proximity to announcement days, the returns between the two dates would be abnormally high. When controlling for this effect, they found that the market did indeed react timely to dividend increases.

Additionally, they test for the unbiasedness of the markets reaction to changes in dividends by examining the average excess returns across firms that announce a dividend omission, as well as those that continue paying dividends. The authors posit that given the absence of market bias, the net average effect should be neutral. However, their results showed that the aggregate average announcement effect was positive and statistically significant. Aedes et al. state that this seems to suggest that the market is either overly pessimistic in forecasting dividends or overly optimistic in assessing their information content. While the authors discuss various possible explanations for this result, they do not arrive at any certain conclusion.

Somewhat more recently, Michaely et al. (1995) further examined market reactions to dividend announcements. Unlike the other studies reviewed above, they focused on investigating the effects of dividend initiations and omissions. In addition, they examined whether there was any evidence of excess returns after the market had an initial chance to react to the change in dividend policy.
Their sample consisted of all companies on the New York stock exchange and the American stock exchange that initiated dividends in the period 1964 to 1988, providing a total of 561 cash dividend initiation events, and 887 omissions.

They noted that the average performance of the stocks that initiate dividend payouts was significantly better than the benchmarks for the year before the initiation. Conversely, the firms that omitted dividends had performed poorly in the year leading up to the omission. This is in line with existing theory stating that decisions to change dividends are closely tied to firm performance (Lintner, 1956, Brav, et al, 2005).

When examining the market reactions to the changes in payout policy, they found that the firms that announced initiations experienced, on average, an excess return of 3.4% during the three-day announcement period. The firms that omitted dividends, on the other hand, experience a price movement in the opposite direction; the stocks of omitting firms showed an excess return of -7.0 percent in the period immediately following the announcement. The authors noted that this significant drop in price was, most likely, a response to the change in dividend policy.

They then proceeded to examine the long-run effects of these changes, studying returns on the stocks over a three-year period. The results seemed to suggest a rather pronounced long-term drift following the announcement events. They found that for the initiating firms, average excess returns for the first year were 7.5% while the three-year excess return was 24.8%. For the omitting firms, there was a similar drift in the other direction. During the first year, they experienced excess returns of -11.0%, and -15.3% after 3 years. These results were noted to be statistically significant.

In summary, Michaely et al. concluded that the results show that the market reacts significantly to changes in dividends. Also, the reaction to omissions was a great deal more significant than in the case of initiations; the change in yield after omissions, was, according to the authors, about seven times larger. Finally, they pointed out the surprising evidence of a long-term drift effect following the announcements.

Do managers intentionally use dividends as a signaling tool?

As I show in the review of research on dividend announcement effects, there is significant evidence pointing to a reaction on part of the market to changes in dividend payouts. Share prices tend to move in the same direction as the dividend change in the immediate period following the dividend announcement, implying that the market interprets the dividend change as a signal regarding the firm's situation. It can be assumed that managers are aware of this effect, given the large amount of empirical evidence. An interesting question is therefore whether managements intentionally use dividends to convey some information to investors, thereby creating this effect, or if they are simply aware the effect and plan around it.

Abrutyn and Turner (1990), surveyed the chief executive officers of 550 of the 1000 biggest US firms in 1988. They found that many managers were aware of the effects of dividends on stock prices, and used them to this end. Specifically, they reported that 63 percent of the respondents in their survey ranked the theory that dividends are paid out because they serve as signals to investors as the first or second most important explanation for their dividend decisions. In addition, 85 percent responded that they did not plan changes to their dividend payouts as a result of the US tax reform of 1986. Furthermore, their results showed that firms, whose management felt that signaling was important, had higher payout ratios than firms whose managements were of the opinion that their shareholders preferred retained earnings.

In their study, Brav, et al (2005) asked managers a series of question regarding their payout policies to determine their view on the role of dividends as signals. Among their results, they reported that only one-fourth of the managers strongly agreed to the proposition that they used dividends to separate their firm from competitors. Sixty percent disagree that they use dividends to show that they are strong enough to bear the cost of acquiring new capital if needed, and only 9 percent agree that they pay dividends to show that their firm is strong enough to pass up profitable investments.

Based on their findings, Brav, et al (2005) argued that the overall pattern seems to be that while dividend policy does convey information, managers rarely view it as a tool to separate a company from its competitors. They concluded that their evidence does not support any notion of dividends being intentionally used as a signaling tool by managers.

Dividend changes and future firm performance

As shown in the previous chapter, there is a substantial amount of evidence that markets tend to react to changes in dividend payout policy. The movements in security prices on the announcement dates as well as the immediate period after indicate that investors seem to value increases in payout ratios, taking them as a good sign. Conversely, dividend cuts or omissions are taken as bad signs by the market, with a subsequent fall in stock price.

While there is a general consensus that the markets consider dividend changes a source of information, there is still much debate surrounding the question of the exact nature of this information. As I noted in my review of the research on corporate dividend policy, many research papers have found earnings to be a vital factor in explaining its dividend policy. Managements have also reported such factors as increases in earnings, sustainability of earnings as well as future earning prospects as crucial determinants in their dividend decisions (Brav et al. 2005, Baker et al. 2006).

It would seem reasonable then, to assume that dividends are, at least partially, a sign of future cash flows. The immediate question that follows is that if dividends are determined by current and future cash flows, can they serve as a form of predictors of the future profitability of the firm? If they can, this would certainly go a long way toward explaining the nature of the information contained in dividends, as well as the effect that dividend changes have on market value. The question of the predictive power of dividends has, however, been somewhat less explored than other themes like dividend policy and their impact on stock prices. Benartzi et al. (1997) wrote that, "*When dividends are increased or initiated, prices tend to go up, and when dividends are (less often) cut or omitted, prices fall. Much less is known, however, about the actual realization of future earnings.*"

Empirical research

Various studies conducted in the recent past have tried to examine the relationship between dividend changes, and such things as profitability, excess earnings and risk. The literature does, however, seem to be somewhat conflicted in this matter. Some academics have reported results supporting the notion that dividends predict future earnings, while others have found no such evidence, indicating that there is still not enough data to draw any definite conclusions. In the following section, I will present a few of these studies in detail, as my own research draws heavily upon some of them.

In an effort to examine the predictive power of dividends on future earnings, DeAngelo et al. (1996), examined a sample of 145 firms listed on NYSE. This sample consisted of companies that experienced a decline in earnings following ten or more periods of earnings increase. They treated the period in which the firms reported earnings failure as year zero, and proceeded to examine their dividend decisions at this point in time.

They found that 68% of the firms in question increased their dividend payout rates despite the reduction in earnings, while about 30% left them unchanged. Only two of the examined firms (1.4% of the sample) chose to reduce their payouts. The authors attributed this to the general consensus that managers are reluctant to cut dividends. Further, they noted that most of these increases in payouts were equal or larger to the ones in preceding periods, indicating an enduring confidence on part of the management as to the future profitability.

DeAngelo et al. then tested these 99 dividend-increasing firms for any positive earnings surprises over the next 3 years. In this part of the analysis they used two measures of abnormal earnings; a random-walk model where normal earnings equaled earnings in year 0, and one model that compounded earnings in year zero by the growth rate in the preceding years. Using these tests, they found no sign of systematically positive earnings surprises among the firms that increased dividends. The results showed that under the assumption of random walk, there was no significant deviation from earnings in year 0, while the growth-adjusted model showed reliably negative earnings surprises following the change in dividends, indicating that the profitability of these firms was reduced compared to previous years. After running further tests on companies that increased dividends again in year 1, they still did not find any sign of positive correlation with future earnings.

The authors discuss several possible explanations for these results. They argue that the failure of dividend decisions to predict future earnings may be attributed to managers being overly optimistic (deliberately or not) regarding company growth, and thus send overly optimistic signals about future earnings. This notion is interesting in its implications: It would suggest that while dividends do indeed function as a form of signal regarding future firm earning prospects, they only reflect managements own appraisal of these prospects, which could obviously be biased and inaccurate.

Another possible explanation put forth in the paper is that because dividend increases generally tend to be relatively small in size, and thus only represent negligible costs for the firm, they are not systematically reliable. In other words, because the cost of signaling is relatively low, the likelihood of false signals increases.

A study by Benartzi et al. (1997) sought to expand upon this theme by testing a large number of firms and events as well as testing for whether or not the size of the dividend change has any bearing on its predictive power. They argued that because signaling theory tells us that costly signals should, in general, be more reliable than less costly ones, it follows that the larger the increase in dividend payout ratio, the larger the increase in future earnings that can be expected. In addition, they used several different measures of unexpected earnings in order examine how this could effect the results.

With 1025 firms and 7186 firm years, their sample was substantially larger than that of DeAngelo et al. (1996). Earnings were defined as income before extraordinary items deflated by the market value of equity at the beginning of the announcement year. In addition, they defined a change in dividends as the difference between the last quarterly payments in year 0 minus the last quarterly payments in year -1. (Firms in the US pay dividends four times a year). They then examined the changes in unexpected earnings in year 0, 1 and 2, in other words, the year of the dividend change as well as the following two years.

Among their findings, they noted that the firms that did not change dividends reported flat earnings in year 0. Firms that increased their dividend payouts experienced increased earnings, relative to the size of the dividend change, while firms that cut dividends experienced significant drops in earnings in the year in question. In other words, the relation between changes in current earnings and dividend behavior is quite strong, as suggested by the theory on determinants of dividend policy (Lintner, 1956).

Although the changes in earnings of firms in year 0 were closely related to their dividend decisions, the same did not hold for earnings in years 1 and 2. In fact, when using a model which measured unexpected earnings as the increase in earnings from the previous year plus the average increase of firms that did not change dividends, they found that the firms that cut dividends experienced strong positive unexpected earnings in the first year following the dividend change, contrary to what the signaling theory predicts.

They then fitted the data to a regression model to examine the explanatory power of the dividend changes with respect to future earnings. This confirmed the earlier results that dividend reductions are helpful in explaining future earnings, although the relation was, once again, negative - contrary to what one might expect. They did however, find that firms that increase payout ratios are less likely to experience reductions in earnings than firms that do not.

This finding suggests that dividend increases may be a signal that the firm's current earnings increase is expected to be permanent (Benartzi, et. al. 1997).

Nissim and Ziv (2001) argued that the reason Benartzi et al. (1997) were unable to find any positive correlation between dividend changes and changes in abnormal earnings over the years following the dividend announcement was, at least partially, due to a specification error in their model. Specifically, the problem had to do with how the dependent variable, changes in unexpected earnings was calculated. As previously mentioned, Benartzi et al. defined this as earnings in year 0 minus earnings in year -1 deflated by market value of equity in the beginning of year 0. In other words:

$$\frac{E_t - E_{t-1}}{P_{-1}}$$

According to Nissim & Ziv, the original model employed by Benartzi et al. assumed that the change in earnings in year *t* is unrelated to the level of earnings in year *t-1.* However, because market price reflects expectations about future earnings, the ratio of earnings to price is likely negatively related to expected change in future earnings. Unexpected earnings are therefore measured with error that is negatively correlated with the ratio of current earnings to price. Because companies that increase payout rates tend to have high earnings to price ratios, this biases against finding information content in dividends (Nissim & Ziv, 2001). To correct this issue, they proposed using book value instead of market value to deflate the earnings change variable.

Further, Nissim & Ziv suggested that in order to accurately calculate expected change in earnings, one needs more than just earnings information. They noted that return on equity (ROE) has previously been shown to be an important predictor of changes in earnings. Since ROE is mean reverting, high ROE is a predictor of decrease in earnings, while low ROE predicts an increase. In other words, firms with high (low) ROE are more likely to experience reductions (increases) in earnings than the opposite. Because changes in dividend payout ratios are positively related to ROE (Nissim & Ziv, 2001), expected changes in earnings will likely be negative correlated with changes in dividends. An absence of correlation between changes in dividends and future earnings would thus suggest that changes in dividends do, in fact, convey information on future earnings. They therefore included ROE in the year before the dividend change as a control variable in the model.

Using this revised model, Nissim & Ziv analyzed a number of firms listed on the NYSE. Their results showed that changes in dividends in year 0 had a significant positive correlation with changes in earnings in both year 1 and year 2. In addition, they tested for the effect of various measures of changes in dividends and changes in earnings as well as several modifications to the model. Among the modifications they applied was a model where dividend increases and decreases were treated separately, reasoning that the relation between changes in earnings and dividends is not necessarily symmetric for dividend increases and decreases. They also controlled for several other variables such as earnings in year 0.

Their conclusion was that, in all cases, the results showed strong support for the signaling theory, indicating a significant relation between changes in dividend payouts and changes in future earnings.

In their research paper, Grullon et al. (2005) challenged the findings of Nissim and Ziv (2001), arguing that their results could be influenced by flaws in the applied model that cause bias. One of these flaws lies in the assumption that the rate of mean reversion is linear. In other words, one assumes that high levels of profitability tend to revert to mean at the same speed as low or negative levels. According to Grullon et al. (2005), this is not always the case. They argued that significant differences have been shown to exist in the mean reversion of earnings, such as that large changes tend to revert faster than small changes, and negative changes revert faster than positive changes. Not taking these effects into account could therefore produce results that are biased.

The authors proceeded to test the model employed by Nissim & Ziv (2001) in an attempt to replicate their findings. Their reported findings in this part of the analysis showed some support for those of Nissim & Ziv (2001). In the next part, they controlled for the suggested non-linear mean reversion and auto-correlation of earnings. In addition, they tested the relation between dividend changes and ROA as a measure of firm profitability (as opposed to the classic measure of net earnings).

The results from the applied non-linear model did not provide support for the dividend-signaling hypothesis, indicating that dividends contained no information about future earnings. When examining the relation between changes in dividends and ROA, they found that there appeared to be a negative correlation between the two, counter to what the signaling hypothesis would suggest.

Finally, they tested the predictive power of dividend changes on the level of profitability – in other words, they use the *actual* return on equity in the period following the dividend change instead of the *change* in ROE. This relationship is tested with both the linear as well as the non-linear model. Again, for the linear model, the reported results were similar to those of Nissim and Ziv (2001). With the model that controlled for non-linearity, however, no significant relationship between changes in dividends and future profitability levels was found.

Research Design

This chapter will consist of a detailed presentation and discussion of my research design. I will begin by introducing and defining all the variables that I use in the research process, as well as their theoretical foundation. I will also talk about my selected sample, the process of obtaining data for this sample, and the final result.

Variables

In this part I will introduce the variables used in my research design. I will examine and review the definitions of the variables used by other academics in their papers, as well as their argumentation for these. Based on this, I will then proceed with a formal definition of the variables in my design.

Changes in earnings

The main dependent variable in my research is the change in a firm's earnings in one year relative to the year before. However, while the concept of a firm's net earnings as a proxy for its profitability seems simple enough, measuring it as well as its changes is not necessarily a straightforward task. In the research papers on dividend change effects, academics have used a wide variety of definitions and measures for this variable.

DeAngelo et al. (1996) reasoned that there are two ways to assess the level of abnormal future earnings – using a random walk model or, alternatively, a growth-adjusted model. The first model assumes that earnings follow a random walk, that is, the predicted earnings of a firm in year *t* are equal to its earnings in year *t-1.* The growth-adjusted model, on the other hand, assumes that future earnings of a firm should grow at a rate relative to the growth rate observed in the past. As such, the growth model predicts earnings as equal to earnings in year 0 compounded forward at the growth rate observed in the years -1 through -5. Abnormal earnings for a firm in a given year would then equal the realized earnings minus the earnings predicted by either of the models, deflated by the book value of equity in year *t-1*. Also, when calculating the change in earnings over years 1 through 3 following the dividend change, they used the average change in earnings over these three years.

Benartzi et al. (1997), measured changes in earnings in several ways. First, they used a random walk based model similar to the one employed by DeAngelo et al. (1996). Changes in earnings were calculated as the difference between earnings in year *t* and year *t-1*, deflated by the market value of equity at the beginning of year *t*. In addition, they used measures designed to account for the expected growth in a firm's earnings. These included industry-adjusted earnings which calculated the mean and average earnings change for the specific industry in the given year as a benchmark for the dividend increasing firm, as well as drift-adjusted earnings that accounted for earnings growth in the past 5 years.

Nissim and Ziv (2001) did, however, argue against using market value of equity as a deflator for earnings. As noted earlier, they posited that the market value of the firm already incorporated expectations of future earnings, and as such, could produce biased results if used as a deflator. They therefore chose to use the random walk model with book equity as a divisor. In addition, they employed a measure of "abnormal earnings", defined as the difference between total earnings and abnormal earnings, where normal earnings were the required return to owners based on cost and level of invested equity capital.

In my research design, I will employ several ways of measuring the changes in firm earnings. Both of these will draw on the random-walk models suggested by DeAngelo (1996) and Nissim & Ziv (2001). While it can be argued that the growth-adjusted models proposed by DeAngelo (1996) and Benartzi (1997) are more versatile measures, given the somewhat limited number of firms in the sample, as well as a total of 6 years of observations, implementing these adjusted models would be impractical. I will therefore measure changes in earnings as:

1) The earnings (*E*) in year *t* minus the earnings in year *t-1*, deflated by the book value of equity at the end of year *t-1*:

$$\Delta E_t = \frac{E_t - E_{t-1}}{B_{t-1}}$$

2) The earnings in year *t* minus the earnings in year *t-1*, deflated by the earnings in year *t-1*:

$$\Delta E_t = \frac{E_t - E_{t-1}}{E_{t-1}}$$

Earnings (*E*) are defined as the total earnings for the given year, after all costs, interests, taxes, depreciations and amortizations.

Changes in dividends

The main predicting variable in my research design is the change in the cash paid out by the firm to the shareholders in the form of dividends. I will mainly be looking at the change in this variable from one year to the next.
The authors of earlier research into dividends and changes in dividend payouts have used several definitions and measures of this variable. Arguably, one of the complicating issues of measuring dividend changes in the US is that most firms pay quarterly dividends. This often necessitated some method of extrapolating an annual dividend from four quarterly ones. Benartzi et al. (1997) used the last dividend paid in a given year multiplied by four. Change in annual dividend was defined as the annual dividend in year *t* minus the annual dividend in year *t-1*. To standardize the values for a cross-firm comparison, they used two different deflators: the dividend in year *t-1* as well as market value of equity at the beginning of year *t*.

Nissim & Ziv (2001) calculated the geometric sum of the quarterly dividends for a given firm in year *t* to obtain the annual dividend. They argued that using annual dividend was the most logical course of action as dividends are set in response to annual rather than quarterly earnings. However, when calculating the amount paid out by the firms as well as the changes in payouts, they used dividends per share, as opposed to the total amount paid out by the firm in dollars. Grullon et al. (2005) employed a similar measure of dividend change in their research design.

Aharony & Swary (1980) used a simpler approach to measuring the changes in dividend payout from year to year. They used a naive model of expected dividends that predicted that the payout in year *t* would be equal to year *t-1*. In other words, dividends followed a random walk. The variable of dividend changes could assume one of three values. It would be positive if the firm increased their payouts and negative if the payouts were reduced. A no-change scenario was considered neutral. They justified this simple model by arguing that managers have previously shown reluctance to change dividend payments unless they expect a significant change in the future prospects of the firm. An increase in dividends would thus be considered a positive signal, while a decrease would be a negative one.

One of the differences in dividend policy between US and Norwegian firms is that while US firms pay dividends four times a year, the vast majority of Norwegian listed companies pay annual dividends. This simplifies the measuring process, as it saves me from having to calculate annual dividends. I therefore measure dividend payout (*Div*) in a given year as the total amount in NOK paid out by the company as dividends to the shareholders. It should be noted that this is the total sum, as opposed to dividends per share. The reason I choose to use this measure is because I believe it will provide the most unbiased reflection of a firm's payouts, in contrast to dividends per share, which could be influenced by such things as change in the number of shares outstanding (either through splits, emissions, or repurchases).

Additionally, "dividend in year *t*" implies the actual amount announced and paid in year *t.* It should not be confused with the dividend *for* year *t* (which would be the amount paid in year *t+1*), as it is described in the financial reports of most Norwegian firms.

The change itself will be measured in two ways: one will be a measure inspired by Aharony & Swary (1980), where changes in dividends are represented by two dummy variables, one for increases in dividends and one decreases. The increase (decrease) variable will be 1 if dividends were increased (decreased) in year *t* relative to *t-1*, and 0 otherwise. Under this model, initiations and omissions will be treated as increases and decreases, respectively.

The second measure will take into account the fact that the relation between changes in dividends and future earnings is not necessarily linear in nature. For example, larger changes in dividends have been reported to have more effect on share prices than smaller changes. Thus, the change in annual dividends will be measured by the total amount paid out in year *t* minus the amount paid in *t-1*, deflated by the amount in *t-1.* This measure of dividend change will differentiate between increases/decreases and initiations/omissions – only actual changes in payments will be measured. I.e., the firm will need to have paid dividends both in year *t* as well as year *t-1*. The calculation is given by:

$$\Delta Div = \frac{Div_t - Div_{t-1}}{Div_{t-1}}$$

Initiations and omissions

When it comes to the definition of dividend initiations and omissions, the issue is slightly more complex. One intuitively apparent definition of dividend initiation would be the very first payout in a firm's history. This definition was employed by Michaely et al (1995) in their research paper. Healy and Palepu (1988), defined initiations as the very first payment made by a firm, or a resumption of dividend payouts after a hiatus of at least 10 years. Pettit (1972), on the other hand, used a broader definition. In his paper, initiations included firms that paid dividends after having omitted payouts in the previous quarter.

As for dividend omissions, Michaely et al (1995) defined these as an omission of payouts either after six consecutive quarterly payouts, three consecutive semi-annual payouts, or two consecutive annual payouts. In contrast, Pettit (1972), defined omissions as a failure of firm to pay dividends after having a positive payout in the previous quarter.

The question of how to define initiations and omissions is thus mainly a question of how broad a definition to use. It is reasonable to assume that the very first initiation is a more extreme event than the resumption of payments after a hiatus of, say, one or two years. On the other hand, the somewhat limited time period of my sample makes such narrow definitions as those employed by Michaely et al. (1995), and Haely & Palepu (1988) impractical. I will therefore use a definition similar to that of Pettit (1972). Dividend initiations will be defined as the first payment made after at least one year of missed payments, while dividend omissions are defined as the failure to pay dividends after at least one year of confirmed payouts.

Profitability

While changes in earnings give a good picture of the changes in a firm's performance over a given period, they may not always provide sufficient information regarding the firm's overall profitability. I will therefore use several measures of firm profitability, in order to be able to compare them between firms. Nissim & Ziv used return on equity (ROE) as a measure of firm profitability, calculated as the net earnings in year *t* divided by the book value of equity in the same year.

Grullon, et al (2005) recommended using several performance metrics to gauge a firm's profitability as well as changes in profitability in order to get a more refined picture of the relation between dividend changes and future profitability. For this purpose, they used return on equity (ROE), as well as return on assets (ROA). Their definition and measure of ROA was somewhat different from the classical one found in most financial textbooks; they used operating income before interests, taxes, depreciations, and amortizations

(EBITDA) in year *t* divided by the book value of total assets. They also argue that ROA is a superior to ROE when it comes to measuring changes in profitability.

For my own research design I will use two measures of profitability – Return on assets and return on equity. Return on assets will be calculated by the classic formula of net earnings divided by the total book value of assets at the end of year *t*:

$$ROA_t = \frac{E_t}{Ba_t}$$

Return on equity is calculated as net earnings divided by total book value of equity:

$$ROE = \frac{E_t}{Be_t}$$

Furthermore, the changes in ROA and ROE are given by the following equations respectively:

$$\Delta ROA = \frac{ROA_t - ROA_{t-1}}{ROA_{t-1}}$$

$$\Delta ROE = \frac{ROE_t - ROE_{t-1}}{ROE_{t-1}}$$

Firm size

The size of a company could be construed to have some form of link to its dividend policy as well as its profitability. Furthermore, it would be interesting to compare the size of firms that pay dividends frequently to those that do so only rarely. A large firm with a substantial amount of assets in place and a high degree of earning power, could for example, be expected to pay more dividends than a smaller firm.

Additionally, a large firm should be more likely to have a less volatile stream of income than a firm of smaller size, a factor that could also contribute to increased dividend payouts. In their paper on dividends and capital structure, Fama and French (2002) noted that firms with volatile cash flows are predicted to have lower dividend payouts. They used the natural logarithm of the book value of assets as a proxy for firm size.

Borrowing from Fama and French, I will measure the size of a firm in a given year *t* as the logarithm of its book assets (*Ba*) in the same year:

$$Size\_Ba_t = \log(Ba_t)$$

The other variable I will use to measure the size of a firm is the revenue from operations (*OR*). As it can be inferred that a larger firm should be able to generate more revenue, I would argue that this would be a suitable second measure. The computation is given by:

$$Size\_\mathrm{Re}v_t = \log(OR_t)$$

Financial leverage

The final variable in my research design will be the company's financial leverage. Financial leverage is understood as the degree to which the firm relies on outside financing. This variable could be relevant to my analysis in several ways. For one, the level of debt financing is often closely tied to the firms free liquidity reserves; a firm that has large amounts of debt will also have similarly high interest expenses that must be paid before any payments can be made to the shareholders. It is also reasonable to expect that a company with a large amount of debt will be more reluctant to increase dividends, as large amounts of debt are associated with increased risk (Copeland et al, 2005).

Baker et al (2006) also reported that managers of Norwegian firms considered the amount of debt in the firm's capital structure an important determinant in their dividend decisions, ranking it as the second most important factor on average. In addition, financial leverage could also be linked to the firm's profitability. For instance, Fama & French (2002) found a negative correlation between the amount of debt financing and a firm's profitability. In other words, firm's that had less debt in their capital structures tended to be more profitable.

I will measure the financial leverage of a firm in year *t* the ratio of debt (*D*) to total book assets (*Ba*) at the end of year *t.* In other words, the more of the assets that are financed through debt, the higher the ratio and the financial leverage. The formula is given by:

$$Leverage_t : \frac{D_t}{Ba_t}$$

Data collection and sample

The goal of this paper is to test the dividend-signaling hypothesis among Norwegian public firms listed on the Oslo stock exchange (OSE) by examining whether there is any relation between changes in dividends and future profitability. The selected sample period is 2007-2012. Using the databases of Proff Forvalt, I extracted a number of key accounting figures for the sample companies in the given period. These figures included net earnings, revenue from operations, total operating result, book value of equity and book value of assets.

In addition, I had planned to extract figures regarding the individual firms dividend payouts for the given periods from the same database. However, I quickly discovered that the Proff Forvalt database records over dividend payouts were, in many cases, either inaccurate, incomplete, or both. Several firms that had paid dividends over the given period were not registered with any dividend outlays in the database. Thus, while the primary financial accounting figures that I required were found to be reasonably complete, the database lacked sufficient information on dividend payouts.

I therefore manually examined the financial statements of each of the companies in my sample in order to extract accurate information on the amount paid out in the form of dividends for each year in period of interest. Firms listed on the Oslo stock exchange are required to publicize their annual financial statements, structured in accordance with the International Financial Reporting Standards (IFRS), in a timely manner as well as making these available to investors and other parties. Because of this, all the Norwegian listed companies had financial statements available for download on their webpages, although the number of previous annual reports varied somewhat for some firms.

This made the process of finding and examining the relevant financial reports easier. However, it also caused a problem regarding the sample of firms. While it was my intention to include the firms that were listed for three or more years in the period 2007-2012 but were taken off the exchange prior to the writing of my paper, this proved problematic, as most of the firms tended to promptly remove their annual statements from public access following their delisting. Because the financial statements were no longer available, I had no way of accurately determining their dividend payments in the period of interest. An overview of listings and delisting provided by the Oslo stock exchange showed that there were some 96 firms that had been delisted in the period 2008-2014. Some of these had been acquired by other companies, some had chosen to withdraw from the exchange, while others had been taken down.

In effect, this limited my sample to firms that were listed in the measurement period and are still listed today. It should be noted that this could potentially introduce a form of survivorship bias to the sample. On the other hand, since the main objects of the analysis are firms that pay dividends, it can be argued that the strong, solid firms are also the most likely to pay dividends to their shareholders.

The lists over registered companies provided by OSE, indicated that there are 163 firms listed on the exchange today. Of these, I removed the ones with less than 3 years on the exchange in the sampling period, in other words, the ones that were listed after 2011 and later. Additionally, there were a number of foreign companies registered overseas on which the database of Proff Forvalt had no information. This brought my final sample to 111 listed firms and a number of 648 firm years. Of these firms, 76 had paid dividends in the period 2007-2012. The total number of dividend payments for the period was 306.

	No. of firms	No. of firm years	No. of payments
Original sample	111	648	
Dividend paying	76	451	306
Final sample	76	451	306

Special dividends

Finally, I will detail the treatment of special dividends among the firms in the sample. The most common form of dividend payouts are referred to as ordinary dividends. Most of the time, when the board of directors proposes a dividend for a given financial year, it is usually an ordinary dividend that is proposed. However, on occasion, the boards of the companies I examined have proposed special dividends.

Over the course of my examination of the financial statements, I found that this usually occurs following a year of particularly strong financial results. What these special dividends had in common was that they were all of a significant size relative to ordinary dividends, and that they were exceedingly rare (I was able to identify less than ten special dividends in total for all the examined years). I have chosen to exclude the special dividends that I have been able to identify from my analysis for two reasons:

1) Special dividends are understood to be extraordinary occurrences. I.e., they are one-off events. As such, they should not be taken as a signal of payments or earnings to come.

2) Their substantial magnitude coupled with their rarity could create outliers that, in turn, could potentially eschew the results of the analysis.

Descriptive statistics and preliminary results

Table 1 shows the distributions of increases/decreases as well as initiations/omissions and no-change events among the 76 firms that paid dividend during the measured period. We see that increases make up 30.7% of the total events over the given period, while decreases make up a sum of 18.4%. In addition, almost 11% of the events are omissions, that is, firms paying dividends in year *t-1* that then elect to omit payments entirely in year *t*. The number of initiation events, where a firm that omits dividends in year *t-1* initiate payouts in year *t*, make up 12%.

This is a significant departure from the results reported by studies of US firms, where decreases are far less common than increases. As a comparison, Nissim & Ziv (2001) reported a number of 811 decreases and 13 221 increases in their sample. The ratio of increases to decreases was thus approximately 16:1. In other words, for every decrease event, there were more than 16 increases. Benartzi et al. (1997), presented similar distributions, with an average of 16.6 increases for every decrease. In contrast, among my sample of Norwegian listed firms, I have identified a total of 115 increase events and 69 decreases between 2008 and 2012. This makes for a ratio of 1.66:1. In other words, while dividend decreases are less frequent than increases, they not nearly as infrequent as they are among US firms.

Table 1 - Distribution of dividend changes

This table shows the distribution of changes in dividend payments over the measurement period

	2007		2008		2009		2010		2011		2012		Total	
	No	%	No	%	No	%	No	%	No	%	No	%	no	%
Payments	49	67,1%	54	74,0%	40	53,3%	54	72,0%	56	73,7%	53	69,7%	306	
Increases			28	38,4%	9	12,0%	24	32,0%	36	47,4%	18	23,7%	115	30,7%
Decreases			10	13,7%	23	30,7%	8	10,7%	9	11,8%	19	25,0%	69	18,4%
No change			24	32,9%	15	20,0%	25	33,3%	21	27,6%	20	26,3%	105	28,0%
Initiations			8	11,0%	7	9,3%	16	21,3%	6	7,9%	8	10,5%	45	12,0%
Omissions			3	4,1%	21	28,0%	2	2,7%	4	5,3%	11	14,5%	41	10,9%
			73	100,0%	75	100,0%	75	100,0%	76	100,0%	76	100,0%	375	100,0%

Table 2 - Mean size of changes in dividends

This table shows the mean size of increases/decreases in dividend payouts in NOK(thousands) and in percent.

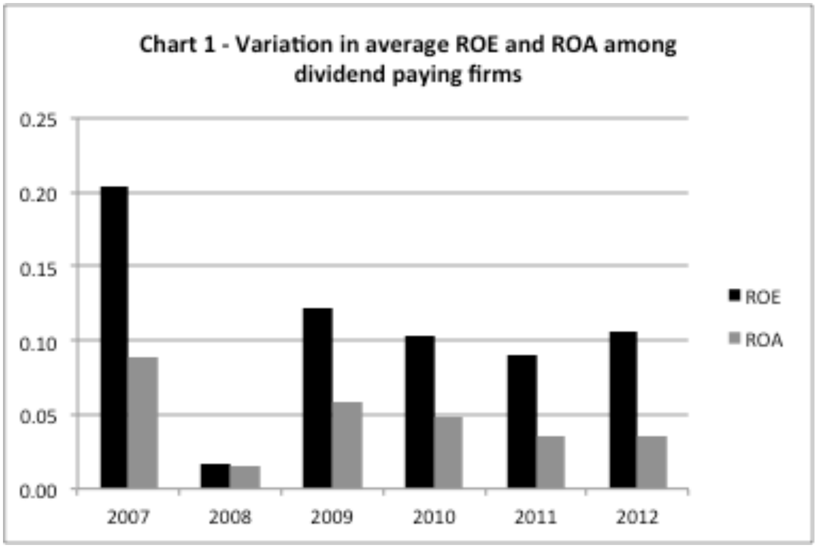
	2008		2009		2010		2011		2012		Total	
	NOK	%	NOK	%	NOK	%	NOK	%	NOK	%	NOK	%
Increases	535491	82.4%	30084	17,0%	107010	122.8%	362814	70.6%	236409	38.6%	254362	66.3%
Decreases	-267184	-31.7%	-364526	-50.6%	-638574	-30.7%	-16840	-35.8%	-296281	-32.0%	-316681	-36.1%

Moreover, table 2 reports the mean size of the increases and decreases in dividend payouts, both in NOK and as percentages. Here as well, the statistics seem to differ from those of US firms. Research into the dividend payouts of US companies has shown that decreases in payouts, while far less frequent than increases, are on average larger in magnitude. In their study, Nissim & Ziv (2001), found that the average rate of decrease in payouts was -42.67%, while the rate of increases was 16.42%. Similar figures were also reported by Grullon et al. (2005). In contrast, my results show that the mean size of decreases for the sample period was -36.1%. At the same time, the mean size of increases was substantially higher, at 66.3%.

This, in addition to the large frequency of dividend decreases, indicates that the examined Norwegian companies are more flexible with their dividend payouts than their US counterparts, and seem to be much less averse to reducing their dividends. Study of dividend behavior among US firms has also shown a penchant towards trying to maintain stable payouts. To achieve this, their managements tend to smooth their dividends over time, a practice that could account for the average increases being relatively small in size. The fact that the increases in my sample are, on average, significantly larger than those observed in the US, could be taken as a sign that dividend smoothing is less common in Norway.

Also of interest is the distribution of dividend events in the year 2009. As we can see from table 1, the number of dividend decreases spikes in 2009 – up to 30.3% from 13.2% in 2008, while the number of increases is substantially reduced – to 11.8% from 36.8% the year before. The figures for omissions and initiations show the same tendencies; 27.6% of the dividend events are omissions – the largest number in any of the years.

The most readily apparent explanation for this pattern is the global financial crisis of 2008, which hit stock exchanges hard all over the world. Chart 1 shows the variation in the average return of equity (ROE) and return on assets (ROA) among the dividend paying firms for the period 2007 – 2008. We see that average firm profitability is significantly reduced in 2008, explaining the sharp decline in dividend payouts in the following year. This effect does eschew the ratio of increases/decreases in dividends somewhat, and should be taken into account when interpreting the results. That being said, it does not fully account for the relatively large amount of dividend decrease events, as the same pattern can be observed in all the examined periods.



The cause for the effects observed in 2012 is somewhat less clear. The profitability chart does show that average firm profitability had declined slightly in 2010 and again in 2011, although these changes do not appear significant.

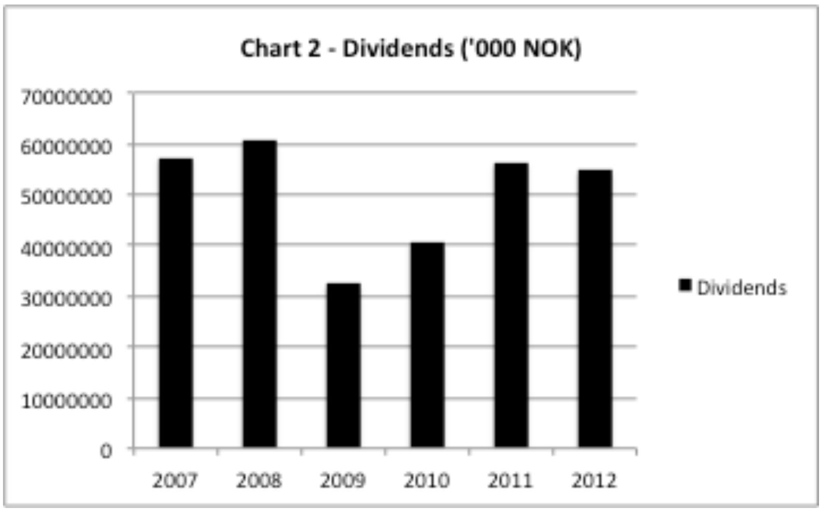


Chart 2 reports the total amount paid out in the form of dividends by the examined companies in the period 2007-2012. We see that dividends increase slightly in 2008 from 2007. In 2009, there is a significant reduction in dividend payments, down to almost half of the total amount paid out in 2008. As noted earlier, this is most likely attributable to the global financial crisis in 2008. The firms on the Oslo stock exchange experienced, on average, a marked reduction in profitability in 2008, as can be inferred from the chart describing the variation in ROE and ROA. This decrease in profitability seems to be linked to the reduction in dividend payments in the following year of 2009.

From 2010 and on, dividend payments follow a pattern of steady increase until 2012, where we see a slight reduction from the year before. This decrease does appear to be very small however, and should not cause problems for the analysis.

Table 3 shows the characteristics of the firms that change their dividends in the measured period. The characteristics reported are for the financial year prior to the dividend payment in question. In other words, the table shows the figures at the end of year *t-1*, for firms that changed their dividends in year *t*. We see that the firms that increased their dividends, on average, experienced slightly higher profitability in the year before the change, compared to the firms that decreased payouts. Dividend increasing firms had a mean ROE and ROA of 20.37% and 8.78%, respectively. In contrast, firms that cut dividends have slightly lower profitability figures, at 16.65% and 7.35%. The same pattern can be observed for firms that initiate/omit payouts. This is in line with dividend theory, which predicts that managements tend to increase dividends following periods of earnings growth (Lintner, 1956, Brav et al, 2005).

Table 3 - Firm characteristics

This table shows the characteristics of the firms in the year prior to the dividend payment.

Dividend Increases	2008		2009		2010		2011		2012		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROE	24,75%	14,53%	21,44%	14,45%	19,54%	14,72%	17,06%	12,56%	19,06%	12,61%	20,37%	13,77%
ROA	11,04%	8,86%	8,11%	5,62%	8,79%	8,01%	7,94%	6,74%	8,00%	4,81%	8,78%	6,81%
Size (Assets)	6,986	0,982	6,645	0,865	6,649	0,903	7,109	0,842	7,051	0,904	6,888	0,899
Size (Revenue)	6,619	1,133	6,566	0,784	6,428	0,856	6,752	0,962	6,909	0,864	6,655	0,920
Leverage	57,81%	22,02%	59,19%	15,77%	55,45%	16,50%	53,46%	17,81%	56,23%	14,81%	56,43%	17,38%

Dividend Decreases	2008		2009		2010		2011		2012		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROE	30,50%	23,15%	0,74%	36,83%	17,00%	15,19%	21,11%	33,92%	13,89%	29,28%	16,65%	27,68%
ROA	14,90%	11,52%	0,70%	14,39%	8,00%	6,14%	9,11%	14,68%	4,05%	4,59%	7,35%	10,26%
Size (Assets)	6,915	0,614	6,855	0,830	6,933	0,954	5,897	0,723	6,909	0,929	6,702	0,810
Size (Revenue)	6,583	0,816	6,249	1,238	6,316	1,667	5,739	0,780	6,229	1,306	6,223	1,161
Leverage	50,19%	16,79%	58,47%	22,54%	44,18%	18,51%	56,50%	15,08%	56,59%	24,73%	53,19%	19,53%

Dividend Initiations	2008		2009		2010		2011		2012		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROE	18,75%	6,67%	19,57%	22,97%	9,56%	6,87%	6,33%	5,85%	6,75%	21,79%	12,19%	12,83%
ROA	7,63%	3,62%	10,14%	9,49%	4,19%	4,00%	1,67%	3,27%	3,50%	10,98%	5,43%	6,27%
Size (Assets)	6,311	0,784	6,008	0,500	6,840	1,044	6,984	1,151	6,622	0,712	6,553	0,838
Size (Revenue)	6,079	0,489	6,018	0,583	6,576	0,876	6,318	1,056	6,346	0,759	6,268	0,753
Leverage	59,86%	10,54%	50,07%	18,99%	54,45%	19,77%	59,82%	25,00%	54,39%	11,09%	55,72%	17,08%

Dividend Omissions	2008		2009		2010		2011		2012		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
ROE	8,33%	14,98%	-4,71%	27,25%	17,00%	21,21%	5,25%	33,37%	1,36%	16,43%	5,45%	22,65%
ROA	0,67%	1,53%	-1,52%	8,52%	5,50%	6,36%	-1,00%	10,95%	0,82%	9,28%	0,89%	7,33%
Size (Assets)	7,217	0,423	6,855	1,021	6,367	0,530	5,798	0,524	6,335	1,031	6,514	0,706
Size (Revenue)	6,825	0,527	6,429	1,128	6,097	0,200	5,702	0,668	6,011	0,976	6,213	0,700
Leverage	75,90%	14,60%	66,99%	17,02%	61,60%	10,61%	50,35%	22,82%	62,56%	17,14%	63,48%	16,44%

Furthermore, dividend-increasing firms seem to differ in size from the ones that decrease payouts. The table shows that figures for size in terms of both assets and revenues are higher for the firms that increased their dividends (with the revenues measure showing the most significant difference), implying that larger companies are more likely to pay more dividends. This is logical, as larger companies can be expected to have a stronger financial base to support dividend payments, even in periods of reduced earnings growth.

There is, on the other hand, less difference in mean leverage between increasing and decreasing firms. The companies that increased dividends had, on average, 56.43% debt financing. In contrast, dividend-decreasing firms had a leverage of 53.19%. This is counter to expectations, as one would expect that firms with less debt in their capital structure would have more free cash, and thus be more likely to pay higher dividends. There is however, a more significant difference in debt levels between firms that initiate and the ones that omit payouts. The former group has a mean leverage of 55.78%, while the latters is 63.48%.

Table 4 provides an overview over the mean change in earnings as well as profitability in the dividend change year (*t*) as well as the following year (*t+1*) for the firms that changed their payouts.

We see that while dividend increases are in some years accompanied by increases in earnings and profitability, there does not seem to be any consistent pattern to this. Firms that increased their dividends in 2008 and 2010 experienced significant reductions in earnings as well as returns of assets and equity. The figures for 2009, 2010 and 2012 indicate the opposite; increasing firms show, on average, increased earnings and profitability.

Table 4 - Changes in profitability

This table reports the mean changes in profitability for the dividend payment year (t) as well as the following year (t+1). Variables have been winsorized at the 5- and 95 percentiles.

Dividend Increases											
	2008		2009		2010		2011		2012	Total	
	t	t+1	t	t+1	t	t+1	t	t+1	t	t	t+1
$(E_t-E_{t-1})/BE_{t-1}$	-13,86%	7,89%	5,56%	2,44%	1,04%	-3,29%	-2,78%	0,69%	-1,50%	-2,31%	1,93%
$(E_t-E_{t-1})/E_{t-1}$	-99,61%	-44,36%	124,00%	23,44%	-15,75%	19,87%	25,92%	-12,53%	-2,00%	6,51%	-3,40%
ROA	-110,57%	-49,54%	118,89%	10,11%	-25,25%	18,33%	19,42%	-20,00%	-9,11%	-1,32%	-10,28%
ROE	-115,43%	-61,32%	85,33%	4,00%	-27,13%	23,83%	17,94%	-19,56%	-5,00%	-8,86%	-13,26%

Dividend Decreases											
	2008		2009		2010		2011		2012	Total	
	t	t+1	t	t+1	t	t+1	t	t+1	t	t	t+1
$(E_t-E_{t-1})/BE_{t-1}$	-27,10%	7,00%	16,91%	-7,52%	-1,50%	5,38%	-5,78%	6,11%	3,84%	-2,73%	2,74%
$(E_t-E_{t-1})/E_{t-1}$	-91,90%	91,70%	4,22%	-45,83%	12,75%	67,63%	-44,89%	-11,33%	16,63%	-20,64%	25,54%
ROA	-95,10%	87,50%	-0,48%	-48,52%	2,50%	56,88%	-37,67%	-5,11%	10,11%	-24,13%	22,69%
ROE	-90,50%	77,50%	-9,65%	-51,87%	-2,38%	49,12%	-21,56%	-5,44%	11,53%	-22,51%	17,33%

Dividend Initiations											
	2008		2009		2010		2011		2012	Total	
	t	t+1	t	t+1	t	t+1	t	t+1	t	t	t+1
$(E_t-E_{t-1})/BE_{t-1}$	-11,88%	19,00%	2,71%	6,14%	7,75%	-7,75%	-2,33%	-3,67%	7,25%	0,70%	3,43%
$(E_t-E_{t-1})/E_{t-1}$	-79,38%	-99,88%	-105,71%	17,57%	149,25%	-33,63%	64,50%	-57,00%	52,25%	16,18%	-43,24%
ROA	-103,00%	-140,50%	-80,14%	10,00%	131,25%	-38,31%	49,83%	-54,17%	66,63%	12,91%	-55,75%
ROE	-92,88%	-153,25%	-77,14%	13,14%	97,56%	-34,31%	92,17%	-55,50%	60,88%	16,12%	-57,48%

Dividend Omissions											
	2008		2009		2010		2011		2012	Total	
	t	t+1	t	t+1	t	t+1	t	t+1	t	t	t+1
$(E_t-E_{t-1})/BE_{t-1}$	-19,33%	32,33%	12,10%	7,71%	-19,50%	2,00%	-3,25%	7,00%	2,82%	-5,43%	12,26%
$(E_t-E_{t-1})/E_{t-1}$	33,67%	265,67%	-148,67%	116,29%	-194,50%	140,00%	-82,00%	15,50%	-35,09%	-85,32%	134,37%
ROA	-156,67%	265,33%	-163,24%	89,24%	-156,00%	131,50%	-85,50%	22,00%	-33,45%	-118,97%	127,02%
ROE	-96,33%	219,67%	-162,52%	69,95%	-181,00%	168,50%	-78,75%	22,50%	-35,36%	-110,79%	120,16%

Among firms that decrease their payouts, we see a similar lack of any consistent pattern in the relation between dividend changes and performance. Dividend decreasing firms suffer a drop in earnings and profitability in the years 2008, 2010 and 2011. On the other hand, the decreasing firms show more positive changes in 2012, and to a lesser extent, in 2009. The aggregate total figures for the two categories over the examined period show that both groups on average suffer reductions in earnings and profitability in the payout year, although the reductions seem to be more significant among dividend decreasing firms.

As for initiations and omissions, the total average figures for the entire period indicate that firms that initiate payouts tend to experience increases in earnings and profitability, while omitting firms show reductions in their performance. However, as with increases and decreases, this is not entirely consistent in all the examined years.

Analysis

To test the signaling hypothesis, I will run a series of multiple regressions in order to examine the relation between changes in dividend and changes in future earnings. Before presenting my results, I will also review eight regression assumptions and test my data to find out whether these assumptions are satisfied.

Methodology

My main method of analysis is a pooled cross-section time-series regression, also known as panel data analysis. This method differs from classical regression models in several ways. While ordinary cross-sectional analysis models study several physical units at a single point in time, and time-series or longitudinal models examine the changes in a single unit over multiple time periods, panel data analysis combines these two methods in a single model. In other words, the analysis consists of a number of physical units across several time periods.

There are a number of advantages to using panel data as a means of analysis. One of these is that it allows one to study the variations in certain variables not only across several physical units of analysis (in this case, firms), but also across a second dimension, time. In addition to this, it effectively increases the number of observations in the regression. Where an ordinary cross-sectional analysis limits the number of observations to the number of physical units, a panel data analysis effectively multiplies the number of physical units with the number of temporal periods, potentially strengthening the statistical results of the regression analysis. However, while there are advantages to this research design, there are also possible pitfalls, like autocorrelation in the data, to consider.

According to Gujarati & Porter (2009), there are three ways of analyzing panel data: a simple, unmodified OLS regression model, a fixed effects regression model (FEM), or a random effects regression model (REM). The first option basically entails pooling the cross-sectional, time-series data together and running a single, unmodified regression on this pooled data. While this is arguably the simplest approach, it does ignore the cross-sectional and time-series nature of the data. There may be effects in play, affecting the interaction between the independent and explanatory variables, which are not picked up due to the models inherent limitations.

These are referred to as "fixed effects" and can generally be grouped into *time-invariant* and *time-variant* effects. The first category refers to factors that are unique for specific units (firms), and do not vary over time. Examples of these could be such things as the competence of a firm's management, the firm's culture, its ownership structure as well as other traits that could set it apart from other firms, and that remain more or less constant over time. *Time-variant* effects, on the other hand, are factors that impact all the units in a sample, but change over time, such as changes in legal and regulatory environment, changes in tax systems, etc.

The fixed effects models (FEM) are designed take these factors into account. Gujarati & Porter (2009) describe two models that account for the fixed effects in panel data: the least squares dummy variable (LSDV) model, and the fixed effect within group (WG) estimator model. The LSDV model controls for fixed effect by adding dummy variables for the individual units and/or the time periods in the data, while the WG estimator model eliminates such effects by using mean-corrected values for the given variables.

In contrast, the random effects model (REM) treats the individual-specific as well as the time-specific effects as random effects, absorbing these in the error term. In other words, instead of treating the variables discussed earlier as fixed, it regards them as random variables. One of the key assumptions of this model is that the studied sample is a small, randomly drawn portion of a much larger population.

Thus, the question of which approach is most appropriate depends on the nature of the data. While my data is not a complete sample of all the firms on the OSE in the examined period, it is still not a small sample of a very large population, nor is it randomly drawn. As such, the use of an REM type model does not seem to be advisable in this case. At the same time, there are clear signs of time-variant effects within the data material, as shown in the descriptive statistic: The financial crisis in 2008 impacts all the firms, yet is not universal over all the time-periods. In other words, one can assume that there are statistically significant differences between the examined periods.

This precludes the use of an unmodified regression model on the pooled data, as the time-periods in the sample are not fully comparable. Instead, I will employ a fixed effects model for the analysis. Specifically, I will utilize the least squares dummy variable (LSDV) approach to control for the differences between the time-periods in the data.

The LSDV model accounts for the potential differences between units and/or periods of observation by allowing the intercept to vary across units or time (Gujarati & Porter, 2009). A panel data analysis model with a time-variant intercept would thus be written as:

$$Y_{it} = \beta_{0t} + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + u_{it}$$

The subscript "*i*" represents individual units, while "*t*" represents time periods.

In order to control for outside effects, one adds dummy variables representing individual units, and/or time-periods in the model. The number of dummy variables added is *n-1*, where *n* is the number of units or time-periods. In other words, one must add one less dummy variable than there are separate units/time-periods, in order to avoid the problem of perfect collinearity. An LSDV model with 4 years of data, designed to control for temporal variation, can then be written as:

$$Y_{it} = \alpha_0 + \alpha_1 D_{2t} + \alpha_2 D_{3t} + \alpha_3 D_{4t} + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + u_{it}$$

The dummy variable representing a specific year will be "1" for observations in that year and "0" otherwise. The first period will serve as a reference point, represented by the intercept α_0, while the other α coefficients will represent the difference in the intercept of the other periods from the baseline. To control for temporal effects, such as those of the financial crisis, I will add dummy variables to all my regression models, based on the method described above.

In addition to temporal variation, there is also the possibility of time-invariant effects in my sample. According to Gujarati & Porter (2009), heterogeneity among the examined firms that remains constant over time can potentially cause such effects. Heterogeneity implies that some firms might exhibit certain traits that set them apart from others. If these effects do not vary from period to period, they may cause autocorrelation in the data. This is especially likely if the unique traits have an impact on the relation between variables in the model. One possible solution to this is to include firm-specific dummy variables, in addition to time period- specific dummies. However, the Durbin-Watson tests suggest absence of autocorrelation in my time-adjusted models (see regression assumption 7). I therefore argue that such steps are unnecessary in this case.

Models and hypothesis

When testing for the relation between dividend changes and changes in earnings, I will use several regression models with different ways of measuring the predictor of interest, changes in dividend payouts. This should lead to more robust results, as I examine how they hold up to different measures of the independent variable. I will test the relation between dividend changes in year *t* and earnings changes in the same year (*t*), as well as the following year (*t+1*). The analysis period for the year *t* models is 2008-2012, and 2009-2012 for *t+1*.

The basic model is inspired by the one employed by Nissim & Ziv (2001), and will use the first measure of ΔDiv, as described in the chapter on research design. Here, changes in dividends will be measured by two dummy variables, Div_Inc and Div_Dec, representing increases and decreases in payouts respectively. Additionally, this model will treat dividend initiations as increases, and omissions as decreases. As suggested by Nissim & Ziv, I include return on assets (ROE) in year *t-1*, as a predictor. Furthermore, I add the variables for firm size and leverage in year *t-1* as control variables, in addition to 4 time period-specific dummy variables (D09-D12). The model is given by:

Year *t*:

$$\frac{E_{i,t}-E_{i,t-1}}{BV_{i,t-1}} = \alpha_0 + \alpha_1 D09 + \alpha_2 D10 + \alpha_3 D11 + \alpha_4 D12 + \beta_1 Div\_Inc_{i,t} + \beta_2 Div\_Dec_{i,t}$$
$$+\beta_3 ROE_{i,t-1} + \beta_4 Size\_\mathrm{Re}v_{i,t-1} + \beta_5 Leverage_{i,t-1} + \varepsilon_{i,t}$$

Year *t+1*:

$$\frac{E_{i,t+1}-E_{i,t}}{BV_{i,t}} = \alpha_0 + \alpha_1 D10 + \alpha_2 D11 + \alpha_3 D12 + \beta_1 Div\_Inc_{i,t} + \beta_2 Div\_Dec_{i,t}$$
$$+\beta_3 ROE_{i,t} + \beta_4 Size\_\mathrm{Re}v_{i,t} + \beta_5 Leverage_{i,t} + \varepsilon_{i,t}$$

One key feature of the basic model is that it treats all dividend changes equally, regardless of their magnitude. There might, however, be reason to expect the size of the change to have some bearing on the relation between the dividend change and future earnings. For instance, it has been suggested that smaller changes are less reliable signals, due to being less costly for the firm (DeAngelo et al. 1996). In order to examine whether the size of the change in dividend payouts has any significance, I modify the model to take into account the magnitude of the change. This second model is given by the following equations:

Year *t*:

$$\frac{E_{i,t}-E_{i,t-1}}{BV_{i,t-1}} = \alpha_0 + \alpha_1 D09 + \alpha_2 D10 + \alpha_3 D11 + \alpha_4 D12 + \beta_1 \frac{Div_{i,t}-Div_{i,t-1}}{Div_{i,t-1}} + \beta_2 ROE_{i,t-1}$$
$$+\beta_3 Size\_\mathrm{Re}v_{i,t-1} + \beta_4 Leverage_{i,t-1} + \varepsilon_{i,t}$$

Year *t+1*:

$$\frac{E_{i,t+1}-E_{i,t}}{BV_{i,t}} = \alpha_0 + \alpha_1 D10 + \alpha_2 D11 + \alpha_3 D12 + \beta_1 \frac{Div_{i,t}-Div_{i,t-1}}{Div_{i,t-1}} + \beta_2 ROE_{i,t}$$
$$+\beta_3 Size\_\mathrm{Re}v_{i,t} + \beta_4 Leverage_{i,t} + \varepsilon_{i,t}$$

In addition to the potential effects of the relative size of the dividend change, several researchers have suggested that the effects of the changes are not necessarily linear in nature. E.g. it has been argued that a decrease in payouts is a more impactful event than a similar sized increase (Pettit, 1972, Brav et al, 2005). In order to test the differences of dividend increases and decreases in relation to future earnings, I will modify the model to distinguish between positive changes and negative changes, as suggested by Nissim & Ziv (2001). I do this by adding two variables to the model;

DPC* $\frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}}$ and DNC* $\frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}}$

DPC is a dummy variable that is 1 if the change is positive and 0 if negative, whereas DNC is 1 if the change is negative and 0 otherwise.

I will also examine whether there is any significant relation between dividend initiations/omissions and future earnings changes. I therefore add two dummy variables representing payout initiations and omissions – Div_Init and Div_Omit. This third model can thus be expressed as follows:

Year *t*:

$$\frac{E_{i,t} - E_{i,t-1}}{BV_{i,t-1}} = \alpha_0 + \alpha_1 D09 + \alpha_2 D10 + \alpha_3 D11 + \alpha_4 D12 + \beta_1 DPC * \frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}}$$
$$+\beta_2 DNC * \frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}} + \beta_3 Div\_Init_{i,t} + \beta_4 Div\_Omit_{i,t} + \beta_5 ROE_{i,t-1}$$
$$+\beta_6 Size\_\mathrm{Re}v_{i,t-1} + \beta_7 Leverage_{i,t-1} + \varepsilon_{i,t}$$

Year *t+1*:

$$\frac{E_{i,t+1} - E_{i,t}}{BV_{i,t}} = \alpha_0 + \alpha_1 D10 + \alpha_2 D11 + \alpha_3 D12 + \beta_1 DPC * \frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}}$$
$$+\beta_2 DNC * \frac{Div_{i,t} - Div_{i,t-1}}{Div_{i,t-1}} + \beta_3 Div\_Init_{i,t} + \beta_4 Div\_Omit_{i,t} + \beta_5 ROE_{i,t}$$
$$+\beta_6 Size\_\mathrm{Re}v_{i,t} + \beta_7 Leverage_{i,t} + \varepsilon_{i,t}$$

Furthermore, in the chapter on regression assumptions, I find that the variable measuring return on equity (ROE) shows signs of a non-linear relation to the dependent variable (see regression assumption 4). For this reason, I will run additional regression on each model with an added quadratic term for return on equity (ROE_{t-1}^2).

Finally, in order to examine the possibility that changes in dividends might be the results of changes in past earnings rather than signals of future performance, I will run a simple regression model to test the relation between the earnings change in year *t* and change in dividends in year *t+1*:

$$\frac{Div_{i,t+1} - Div_{i,t}}{Div_{i,t}} = \alpha_0 + \alpha_1 D10 + \alpha_2 D11 + \alpha_3 D12 + \beta_1 \frac{E_{i,t} - E_{i,t-1}}{BV_{i,t-1}} + \beta_2 Size\_Rev_{i,t} + \beta_3 Leverage_{i,t}$$

Based on my earlier review of past research, as well as the dividend information content and signaling theories, I propose the following hypotheses:

H1: Dividend changes are positively related to changes in future earnings.

H2: Dividend increases are positively related to increases in future earnings.

H3: Dividend decreases are positively related to decreases in future earnings.

H4: Dividend initiations are positively related to changes in future earnings.

H5: Dividend omissions are negatively related to changes in future earnings.

Regression assumptions

For a regression analysis to provide correct and unbiased results, the data material must satisfy a number of requirements. The Gauss-Markov theorem lists 7 basic assumptions that need to be met. According to Berry (1993), the assumptions of the Gauss-Markov assumptions, when satisfied, ensure that the ordinary least squares (OLS) estimators for a regression models coefficients are unbiased and efficient. Berry states that the OLS coefficients are "BLUE" – that is, best linear unbiased estimators, when the 7 assumptions are met. Additionally, he introduces an 8th assumption, which deals with the distribution of the error term within the variables.

In this chapter, I will list the 8 assumptions as described by Berry (1993). I will test my data material to ensure that it meets the requirements, and make changes where necessary.

Assumption 1.

Assumption one states that all independent variables must be either quantitative or dichotomous and that the dependent variable must be quantitative, continuous and unbounded (Berry, 1993). Additionally, it requires that all variables be measured without error.

A variable is understood to be quantitative when it is numerical, and the distance between every value it can assume is identical. An example of this would be a scale of 1-7. Further, a variable is continuous when the number of values it can assume is large. While there is no set rule regarding the number of value that is required, the general guideline is that the more values a variable can assume, the safer the assumption of approximate continuousness. Furthermore, “unbounded” means that the variable is free to assume the max/min values that are natural in the given context. The dependent variable in my model satisfies these requirements, as the change in earnings deflated by book equity is measured on a numeric, continuous and unbounded scale.

A dichotomous variable can assume one of two possible values, such as yes/no, true/false. The dummy variables such as the ones for increases and decreases in dividends, as well as for initiations and omissions, fall under this category. All my non-dummy independent variables are quantitative and continuous.

In terms of measurement without error, this assumption essentially requires that the variables measure what they are supposed to measure. There are two types of measurement errors: random and non-random errors. The latter refers to human error on the part of the researcher, such as mistakes made during data extraction, registration, and processing.

Non-random errors on the other hand are, as the name suggests, systematic errors in the data material. These can occur when specific variables fail to properly measure the concepts that they are meant to measure. This is especially a problem for qualitative measures, such as those used in surveys. In these cases, the variables are usually tested through factor analysis to establish various forms of validity. In my case however, the variables are all based on accounting figures extracted from databases and financial reports. While it is difficult to safeguard completely against random errors, I would argue that the employed variables have minimal risk of systematic errors on the basis that they all have reasonably strong theoretical foundations, as discussed in the chapter on research design. I therefore conclude that assumption one is satisfied.

Assumption 2

Regression assumption 2 requires that all independent variables have a variance greater than 0. In other words, there must be variation in the values of the predictor variables. This is because OLS requires variation in the models predictor variables to estimate the relation between the dependent variable and the predictors. A violation of assumption two could potentially lead to biased results, and is usually caused by either misspecification of the variables or similar errors.

To test the level of variance in the independent variables, I run descriptive statistics with figures for standard deviation and variance. An examination of the results shows that there is positive variance in all independent variables (attachments). Assumtion 2 is therefore satisfied.

Assumption 3

According to regression assumption 3, there must not be perfect multicollinearity between the observations for the independent variables in the model (Berry, 1993). Because regression analysis works by isolating the effects of one predictor on the dependent variable at a time, a high degree of correlation between the predictors could make it impossible to isolate individual predictor effects, potentially leading to biased results.

Berry (1993) argues that a situation of perfect multicollinearity rarely occurs in a research setting. When it does, it is most commonly due to mistakes on the part of the researcher, such as misspecifications of the model. One example would be the inclusion of two independent variables that have a built-it linear relationship, such as age and date of birth. Another instance where perfect multicollinearity can occur is if one has included too many independent dummy-variables in the regression model. Generally, the number of dummy-variables must be *n-1*, where *n* is the number of values the given discrete variable can assume. Finally, perfect multicollinearity can occur if the number of observations in the sample is too small, and one has more independent variables than observations.

To test the data for multicollenearity, I run a bivariate correlation analysis, where I examine the correlations between each pair of independent variables in each of my regression models. The results are presented in the attachments. To avoid the problem of multicollinearity, the correlation factor between each pair of variables must be <0.8, and preferably <0.6 (Sandvik, 2012). As the results of the correlation analysis show, this requirement is satisfied for all the given independent variables.

According to Gujarati & Porter (2009), the level of multicollinearity can also be inferred from the variance-inflating factor (VIF). The VIF statistics for the specific variables are included in the regression outputs in the attachments. The values that the VIF can assume ranges from 1 and up – the higher it is, the more significant the multicollinearity. As a rule of thumb, VIF should be <10 for each independent variable (Sandvik, 2012). All of my independent variables have values that are <2. Based on this, I conclude that assumption 3 is satisfied.

Assumption 4

Assumption 4 states that the error term in the regression model has a zero mean (Berry, 1993). In other words, given the model

$$Y_j = \alpha + \beta_1 X_{1j} + \beta_2 X_{2j} + \ldots + \beta_k X_{kj} + \varepsilon_j ,$$

$$E(\varepsilon_j \mid X_{1j}, X_{2j}, \ldots, X_{kj}) = 0$$

What this means, is that the spread of observations needs to be approximately equally distributed above and below the regression line. If this is not the case, one might be dealing with a non-linear relation. If the relation between the dependent variable and the predictors is non-linear in nature, this could lead to biased results, as linear regression by default assumes a linear relation between the variables. One solution to this problem is to include a quadratic (x^2), or cubic (x^3) term of the variable in the model, to account for this non-linearity (Sandvik, 2012).

In order to test for non-linear relations between the dependent variable and the predictors, I extract a plot over the residuals (P-plot). I addition, I run curve estimation to get a picture of the exact level of non-linearity in the relations. The curve estimation analysis reports the explanatory power of the model (R^2) with a linear term, as well as with an added quadratic and cubic term. A general rule is that the addition of a higher power term should be considered if the increase in R^2 is >0.2.

As the results of the curve estimation (attachments) show, the only predictor to exhibit a significant non-linear relation with the dependent variable is return on equity. This is not entirely unprecedented, as Grullon et al (2005) suggested that this might be the case. The curve estimation predicts an increase in R^2 from 0.323 to 0.360 given the addition of a quadratic term. Because of this, I will run additional regressions with the term quadratic term "ROE^2" included to account for this effect and report the results separately in the analysis.

All the others predictor variables can be seen to have reasonably linear relation with the dependent variable. While there are some signs of non-linearity among some of them, these appear to be marginal. For these variables I deem regression assumption 4 to be satisfied.

Assumption 5

Assumption 5 requires that the error term be uncorrelated with any of the independent variables. Berry defines the error term as "the combined effect of all variables that influence the dependent variable but are excluded from the regression" (Berry, 1993). In other words, this refers to "outside effects" from variables that are not included in the model. A potential consequence of a violation of this assumption is that one might find spurious relations between the dependent variable and the predictors in the model.

According to Berry, this is often the result of specification errors in the model. The researcher might be using the wrong independent variables – either by excluding relevant variables or by including irrelevant ones. He notes that there are two common frames of reference to judge the "correctness" of the model – the *true model*, or the theoretical framework that the model is based upon. The *true model* is the concept of a hypothetical model that would explain all variance in the dependent variable. One way to interpret this might be to use the R^2 statistics that describe the explanatory power of the model. Because the true model would have to have an R^2 of 1, the closer to this the applied model is, the more correct it would be.

The second frame of reference is the theoretical framework. An applied model is less likely to include (exclude) irrelevant (relevant) variables if it has a strong theoretical foundation. In my case, the models employed in the analysis draw upon those used in other research papers. In addition, I also include several control variables that, according to financial theory might be expected to have an influence on the dependent variable.

Assumption 6

Assumption six states that the error terms in the regression model need to be homoscedastic. In other words, they must all have the same variance (Berry, 1993). Mathematically, this means that in an equation

$VAR(\varepsilon_j | X_{1j}, X_{2j}, \ldots, X_{kj}) = \sigma^2$, and σ^2 is constant.

If, on the other hand, the error term is not constant, one has a situation of heteroscedasticity, causing assumption 6 to be violated. According to Berry (1993), in the presence of heteroscedasticity, the OLS coefficient estimators will be unbiased but not BLUE. One possible solution to this problem is to use alternative methods of analysis. More specifically, the generalized least squares (GLS) approach, is able to account for heteroscedasticity, producing estimators that are BLUE.

In order to test for presence of heteroscedasticity in my data, I use the Breusch-Pagan test. Woolridge (2012) describes the testing procedure as follows:

1. Estimate the regression $Y = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + u$, and obtain the OLS residual $\hat{u}$.
2. Run the regression $\hat{u}^2 = \alpha_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_k + u$. Note the R^2 statistic for this auxiliary regression.
3. Form the LM statistic ($LM = n * R^2_{\hat{u}^2}$) and calculate the p-value using the χ^2_k distribution.

The results are presented in the attachments. As we can see, all the models have p-values <0.05, which suggests the presence of heteroschedasticity. However, there is not much I am able to do about this. One possible solution proposed by Berry (1993), is to use the generalized least squared method instead of the classical OLS. However, my main tool of statistical analysis, SPSS, does not have the necessary facilities to estimate GLS. I therefore proceed with an OLS regression, noting this possible weakness, which should be kept in mind when interpreting the results.

Assumption 7

Assumption 7 states that there should not be autocorrelation present in the data, i.e. the error terms for any two observations should not be correlated. According to Berry (1993), the problem of autocorrelation most commonly occurs in time-series regression models. As such, it is of particular significance to this paper, as my analysis employs pooled cross-sectional time series models.

Berry argues that autocorrelation can become a problem whenever the positions of the observations in the data are "structured" relative to one another in some way. This is also why autocorrelation frequently occurs in time-series models, as the observations are structured in time sequences. Generally, when both the dependent variable as well as most of the predictors gradually increase over time, there is reason to suspect autocorrelation. Furthermore, it can also occur in situations where certain exogenous events create shocks that affect the variables in the model, carrying forward into future periods. Thus, if such effects are not accounted for in the model, autocorrelation between the observed variables may occur.

In the case of this paper, one such event is the financial crisis of 2008, which has a clear impact on the firms in my analysis. In order to control for the effects of this, I make modifications to my models, which will take time-variant factors into account. This is described in further detail in the previous chapter.

In addition to temporal correlation, panel data has also been known to be susceptible to spatial correlation. Gujarati & Porter (2009), posit that this can be caused by time-invariant heterogeneity among the observed firms. In other words, if there are factors that are unique for some companies, that are constant over time and that exhibit effects on the variables in the model, this can lead to correlations between the error term and the regressors.

One way to test for the presence of autocorrelation in the data is by using Durbin-Watsons d-test (Gujarati & Porter, 2009). A calculation of Durbin-Watsons d-value is done in SPSS while running the OLS regression. This statistic can assume a value of $0 \leq d \geq 4$, where a centered value of 2 would imply absence of autocorrelation. The further the value is eschewed towards 0 or 4 the more significant the autocorrelation problem. When compared against the significance points found in the Durbin-Watson statistical table (Gujarati & Porter, 2009), I find that the d-value of all my regression models (which control for time-variant effects) are within the "safe zone", indicating absence of autocorrelation. For the sake of reference, I report these d-values in my results. In conclusion, I deem regression assumption 7 to be satisfied.

Assumption 8

In addition to the 7 classical regression assumptions, Berry (1993) adds an eighth assumption, which states that the error term of the independent variables in the model should be normally distributed. This is because tests of statistic significance rely on a normal distribution. Thus, if the data are not normally distributed, this could lead to erroneous inferences of statistical significance. According to Berry (1993), the larger the sample population, the more likely it is that the sampling distributions of regression coefficients are normally distributed, even if the error term is not. He does however, not elaborate on what might be considered a "large sample".

One common reason why a variable might have a non-normal distribution is the inclusion of extreme cases, known in statistical research as outliers. These are observations that deviate from the mean observed value in a significant way. There are two possible reasons for these deviations: they can be a product of a mistake on the part of the researcher, such as erroneously recorded data, or they can represent an actual extreme case – an observation that genuinely deviates from the average.

In order to test the normality of the variables in my model, I examine the variables for skewness and kurtosis. The results of these tests are presented in the attachments. According to Sandvik (2012), the values of both statistics should preferably be close to zero. Values of 3 and 5 represent degrees of non-normality, with values >5 indicating potentially high levels of non-normality. In addition, I test for outliers by examining the maximum standard deviations of the independent variables in relation to the dependent. I do this by running individual linear regressions of each predictor against the dependent variable. Here, standard deviations >3 are considered to be signs of outliers (Sandvik, 2012).

The results show that some of the independent variables exhibit high levels of skewness and kurtosis. Specifically, the variables for dividend change (ΔDiv), and positive dividend change (DPC* ΔDiv) show kurtosis values of ≈75 and ≈88. The reason for this lies mainly with the nature of these variables and the concept they measure. Because of the way change in dividends is measured, decreases can only assume values of $-1<x<0$. Increases, on the other hand are potentially unbounded, allowing for higher absolute values. This is the reason why the negative change variable (DNC* ΔDiv) is less prone to high levels of skewness and kurtosis. Also, several observations have a standard deviation in excess of 3.

In order to alleviate the problem, I winsorize the variables with kurtosis values >5 at the 1% and 99% levels. This significantly reduced the skewness and kurtosis, although the kurtosis values remained relatively high for the variables mentioned above. To examine how this might affect my results I performed a robustness test by running additional regressions on my models after further winsorising the problematic variables at the 5% and 95% levels, as well as trimming away the observations with a standard deviation in excess of 3.

The outputs of these regressions are presented in the attachments under regression assumption 8. As can be inferred from the outputs, these results were not a significant departure from the results of the main analysis. Furthermore, I consider these measures very extreme, as they require the removal or alteration of a large number of valid observations. For these reasons, I do not include these results in the main body of the paper, and will not factor them into the conclusion. The dependent variables in the main analysis are therefore only winsorised at 1 and 99 percent levels.

Results

The results from the regressions for year *t* show some slightly mixed results. While the basic model shows statistically significant positive relation between dividend increases and future earnings changes, no such relation is found for the decreases. When I take into account the size of the changes in the second model, no significant relation is found.

Similarly, the results from the third model show no statistically significant relation between either increases or decreases in dividends and future earnings changes. This implies that even though there might be some relation when using a simple measure, the results do not hold when more sophisticated measures of dividend change are used. The same is also true for dividend initiations. The third model does however show a negative and significant relation between dividend omissions and changes in future earnings, suggesting that omitting firms experience a reduction in earnings in the year that payments are omitted.

The results for year *t+1* are clearer in their implications: There are no statistically significant relations between increases/decreases or initiations/omissions and earnings changes in the year following the dividend change in any of the models.

In terms of the other variables, ROE has, as predicted, a significant and negative relation to earnings changes in the following year. Size and financial leverage are shown to have less impact in the models although leverage seems to be significant in some cases. The models have a high explanatory power, as indicated by the high R^2 value, though much of this can likely be attributed to the ROE variable. The addition of a non-linear ROE term (ROE^2), does increase predictive power as anticipated. However, it does not alter the aforementioned results in any noteworthy way.

Also of interest is the fact that model 4 finds a significant and positive relationship between earnings changes and changes in payouts in the following year. While this certainly does not prove any causal relation, it could be taken to suggest that the examined firms change their dividend in response to past earnings changes, rather than in anticipation of increased future performance.

To summarize, I do not find support for hypothesis 1, 2, 3, and 4 for year *t*. There is, however some support for hypothesis 5 for year *t.* For year *t+1* no support is found for any of the hypotheses. Based on these results, H1, H2, H3, and H4 are rejected for year *t*, and H1, H2, H3, H4, and H5, are rejected for year *t+1.*

Table 5: Results of regression models, year *t.*

	Model 1 Basic dummy model		Model 2 Dividend change model		Model 3 Div increase/decrease initiation/omission model	
R^2	0.396		0.386		0.406	
Adjusted R^2	0.381		0.372		0.388	
Durbin-Watson d-value	1.985		1.960		1.949	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Dividend increase (dummy)	0.136*	2.580				
Dividend decrease (dummy)	0.030	0.582				
Dividend change			0.052	1.213		
Dividend increase					0.078	1.807
Dividend decrease					-0.45	-1.029
Dividend initiation					0.026	0.622
Dividend omission					-0.118**	-2.612
ROE	-0.555**	-12.428	-0.530**	-12.162	-0.551**	-12.653
Size	-0.047	-0.964	-0.022	-0.464	-0.035	-0.721
Leverage	0.121*	2.508	0.106*	2.204	0.124*	2.588
D2009	0.247**	4.415	0.247**	4.532	0.265**	4.692
D2010	0.119*	2.276	0.121*	2.289	0.111*	2.114
D2011	0.083	1.574	0.090	1.706	0.087	1.666
D2012	0.111*	2.075	0.111*	2.083	0.120*	2.267

** = Significant at the 1% level

• = Significant at the 5% level

Table 6: Results of regressions with an added quadratic ROE term (ROE^2), year *t.*

	Model 1 Basic dummy model		Model 2 Dividend change model		Model 3 Div increase/decrease initiation/omission model	
R^2	0.415		0.404		0.424	
Adjusted R^2	0.399		0.390		0.404	
Durbin-Watson d-value	1.973		1.954		1.953	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Dividend increase (dummy)	0.133*	2.557				
Dividend decrease (dummy)	0.025	0.490				
Dividend change			0.043	1.010		
Dividend increase					0.071	1.649
Dividend decrease					-0.047	-1.091
Dividend initiation					0.035	0.844
Dividend omission					-0.112*	-2.510
ROE	-0.555**	-12.832	-0.541**	-12.546	-0.561**	-13.028
ROE^2	0.141**	3.428	0.139**	3.352	0.136**	3.308
Size	-0.033	-0.675	-0.007	-0.152	-0.019	-0.408
Leverage	0.097*	2.033	0.083	1.725	0.101*	2.105
D2009	0.237**	4.283	0.234**	4.341	0.251**	4.491
D2010	0.127*	2.460	0.130*	2.487	0.119*	2.286
D2011	0.087	1.678	0.095	1.820	0.092	1.783
D2012	0.126*	2.373	0.124*	2.350	0.132*	2.522

** = Significant at the 1% level

* = Significant at the 5% level

Table 7: Results of regression models, year *t+1*

	Model 1 Basic dummy model		Model 2 Dividend change model		Model 3 Div increase/decrease initiation/omission model	
R^2	0.405		0.404		0.404	
Adjusted R^2	0.388		0.389		0.384	
Durbin-Watson d-value	1.973		1.982		1.994	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Dividend increase (dummy)	0.049	0.854				
Dividend decrease (dummy)	0.011	0.198				
Dividend change			-0.022	-0.466		
Dividend increase					-0.026	-0.534
Dividend decrease					0.003	0.064
Dividend initiation					-0.022	-0.454
Dividend omission					-0.025	-0.479
ROE	-0.587**	-12.170	-0.575**	-12.221	-0.576**	-11.808
Size	-0.010	-0.192	0.003	0.048	0.001	0.014
Leverage	0.100	1.862	0.095	1.774	0.099	1.824
D2010	-0.115	-1.900	-0.130*	-2.253	-0.120	-1.904
D2011	-0.95**	-2.842	-0.160**	-2.287	-0.157**	-2.736
D2012	-0.151**	-2.677	-0.149**	-2.646	-0.149**	-2.623

** = Significant at the 1% level

* = Significant at the 5% level

Table 8: Results of regressions with an added quadratic ROE term (ROE^2), year *t+1.*

	Model 1 Basic dummy model		Model 2 Dividend change model		Model 3 Div increase/decrease initiation/omission model	
R^2	0.437		0.436		0.437	
Adjusted R^2	0.419		0.420		0.415	
Durbin-Watson d-value	0.1947		1.957		1.972	
	Coeff	t-value	Coeff	t-value	Coeff	t-value
Dividend increase (dummy)	0.047	0.840				
Dividend decrease (dummy)	0.014	0.250				
Dividend change			-0.022	-0.469		
Dividend increase					-0.027	-0.581
Dividend decrease					0.007	0.152
Dividend initiation					-0.023	-0.493
Dividend omission					-0.015	-0.292
ROE	-0.579**	-12.320	-0.568**	-12.382	-0.566**	-11.898
ROE^2	0.185**	4.060	0.186**	4.074	0.185**	4.044
Size	0.012	0.232	0.025	0.472	0.023	0.437
Leverage	0.066	1.236	0.061	1.150	0.064	1.199
D2010	-0.095	-1.602	-0.108	-1.919	-0.101	-1.643
D2011	-0.143*	-2.596	-0.143*	-2.582	-0.139*	-2.493
D2012	-0.119*	-2.142	-0.117*	-2.109	-0.117*	-2.099

** = Significant at the 1% level

* = Significant at the 5% level

Table 9: Results of regression model examining relation between earnings changes and future dividends

	Model 4	
	Change dividends$_{t+1}$ = Change earnings$_1$	
R^2	0.124	
Adjusted R^2	0.106	
Durbin-Watson d-value	2.172	
	Coeff	t-value
Change earnings	0.141*	2.419
Size	0.151*	2.378
Leverage	-0.056	-0.0881
D2010	0.244**	3.384
D2011	0.247**	3.587
D2012	0.063	0.913

** = Significant at the 1% level

* = Significant at the 5% level

Conclusion and discussion

In this paper I have examined the dividend behavior among Norwegian listed firms, as well as the relation between changes in dividend payouts and future earnings changes. I find that there are several differences between the Norwegian firms examined in this paper, and the US firms studied in popular research. The results of this paper can summarized as follows:

First, the examined Norwegian firms are shown to be far more flexible with their dividend policies than their US counterparts, demonstrated by the fact that dividend decreases, as well as omissions and initiations occur relatively frequently. As such, managements seem less reluctant to decrease and omit dividend payouts than what might be expected based on financial theory.

Second, dividend changes among the examined firms are, on average, of a significantly higher magnitude than what has been reported among US firms. This further reinforces the notion of a high degree of flexibility in dividend policy among Norwegian firms. Also, the fact that dividend increases were found to be of a relatively large magnitude compared to what is common among US firms could imply that dividend smoothing is less prevalent among Norwegian companies.

Third, the analysis showed that there were no strong relations between changes in dividend payouts and future changes in earnings performance. While I did find that dividend omissions were related to decreases in earnings in the payment year, this result this not hold for the year following the omission. Moreover, neither increases nor decreases in payouts were found to have any significant relation to earnings changes in the payment year or the following year. As such, I conclude that my results do not provide any consistent support for the dividend signaling hypothesis.

Fourth, the analysis showed a strong link between past earnings changes and changes in dividend payouts. While it needs to be noted that no causal inferences can be made based on this analysis alone, it does seem to suggest that past changes in earnings factor heavily in the dividend decisions of the examined firms. Taken together with the other results, it could imply that the examined firms base their dividend decisions more on past changes in earnings than on any expectation of future performance.

One possible reason for the differences between Norwegian and US firms could be that the market in Norway is smaller and more transparent. Agency theory suggests that factors like the legal protection of shareholders, as well as levels of ownership concentration could influence the dividend culture prevalent in a market. More specifically, it has been argued that higher concentrations of ownership in a market reduce information asymmetry as well as agency conflicts, thus reducing the importance of consistent dividend payout policies. Because the Norwegian market is, as noted earlier, characterized by both strong legal protection and high ownership concentrations, I believe this could go a long way toward explaining my results.

Limitations and further research

One potential limitation of this paper is the somewhat short time period of the analysis. In addition, due to issues previously mentioned in the chapter on research design, the sample used in the analysis does not contain every company listed on the Oslo Stock Exchange in the given period. For these reasons, the results need not be entirely representative of all firms on the OSE.

Additionally, while the results of this study show some differences in the dividend behavior of Norwegian firms compared to what has previously been reported in the US, it does not specify the exact reason for these apparent differences. A potential course for further research would therefore be to examine the mechanisms that might give rise to the observed differences. As I mentioned in the discussion, agency theory provides one possible explanation for my results. As such, it might be a good starting point for further research.

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Attachments

Regression Assumption 2 – Variance test

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Dummy_Inc_DIV_t	375	.00	1.00	.4267	.49525	.245
Dummy_Dec_DIV_t	375	.00	1.00	.2933	.45590	.208
Dummy_Init_t	375	.00	1.00	.1200	.32540	.106
Dummy_Omit_t	375	.00	1.00	.1093	.31247	.098
Change_DIV_t	375	-.78	4.40	.1389	.66007	.436
Inc_Dummy	375	.00	1.00	.3067	.46173	.213
Dec_Dummy	375	.00	1.00	.1840	.38800	.151
DPCxChange_DIV	375	.00	4.40	.2086	.61122	.374
DNCxChange_DIV	375	-.78	.00	-.0697	.18155	.033
ROE_Tminus1	375	-.81	.63	.1053	.20838	.043
SizeRev_Tminus1	375	2.72	8.83	6.3346	1.00623	1.013
Leverage_Tminus1	375	.01	.96	.5687	.19123	.037
Dummy_09	375	.00	1.00	.2000	.40053	.160
Dummy_10	375	.00	1.00	.2000	.40053	.160
Dummy_11	375	.00	1.00	.2027	.40252	.162
Dummy_12	375	.00	1.00	.2027	.40252	.162
Valid N (listwise)	375					

Regression Assumption 3 – Correlation results

Model 1 (t)

Correlations

		Dummy_Inc_DIV_t	Dummy_Dec_DIV_t	ROE_Tminus1	SizeRev_Tminus1	Leverage_Tminus1	Dummy_09	Dummy_10	Dummy_11	Dummy_12
Dummy_Inc_DIV_t	Pearson Correlation	1	-.556**	.300**	.200**	-.053	-.216**	.108*	.128*	-.086
	Sig. (2-tailed)		.000	.000	.000	.310	.000	.037	.013	.096
	N	375	375	375	375	375	375	375	375	375
Dummy_Dec_DIV_t	Pearson Correlation	-.556**	1	-.095	-.059	.054	.322**	-.176**	-.135**	.112*
	Sig. (2-tailed)	.000		.066	.256	.299	.000	.001	.009	.030
	N	375	375	375	375	375	375	375	375	375
ROE_Tminus1	Pearson Correlation	.300**	-.095	1	.106*	-.083	-.190**	.041	-.011	-.060
	Sig. (2-tailed)	.000	.066		.041	.111	.000	.427	.834	.247
	N	375	375	375	375	375	375	375	375	375
SizeRev_Tminus1	Pearson Correlation	.200**	-.059	.106*	1	.500**	-.005	-.011	.002	.018
	Sig. (2-tailed)	.000	.256	.041		.000	.916	.833	.974	.727
	N	375	375	375	375	375	375	375	375	375
Leverage_Tminus1	Pearson Correlation	-.053	.054	-.083	.500**	1	.085	-.039	-.023	-.002
	Sig. (2-tailed)	.310	.299	.111	.000		.098	.449	.663	.962
	N	375	375	375	375	375	375	375	375	375
Dummy_09	Pearson Correlation	-.216**	.322**	-.190**	-.005	.085	1	-.250**	-.252**	-.252**
	Sig. (2-tailed)	.000	.000	.000	.916	.098		.000	.000	.000
	N	375	375	375	375	375	375	375	375	375
Dummy_10	Pearson Correlation	.108*	-.176**	.041	-.011	-.039	-.250**	1	-.252**	-.252**
	Sig. (2-tailed)	.037	.001	.427	.833	.449	.000		.000	.000
	N	375	375	375	375	375	375	375	375	375
Dummy_11	Pearson Correlation	.128*	-.135**	-.011	.002	-.023	-.252**	-.252**	1	-.254**
	Sig. (2-tailed)	.013	.009	.834	.974	.663	.000	.000		.000
	N	375	375	375	375	375	375	375	375	375
Dummy_12	Pearson Correlation	-.086	.112*	-.060	.018	-.002	-.252**	-.252**	-.254**	1
	Sig. (2-tailed)	.096	.030	.247	.727	.962	.000	.000	.000	
	N	375	375	375	375	375	375	375	375	375

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model 2 (t)

Correlations

		Change_DIV_t	ROE_Tminus1	SizeRev_Tminus1	Leverage_Tminus1	Dummy_09	Dummy_10	Dummy_11	Dummy_12
Change_DIV_t	Pearson Correlation	1	.180**	.101	-.017	-.205**	.152**	.117*	-.095
	Sig. (2-tailed)		.000	.050	.737	.000	.003	.023	.065
	N	375	375	375	375	375	375	375	375
ROE_Tminus1	Pearson Correlation	.180**	1	.106*	-.083	-.190**	.041	-.011	-.060
	Sig. (2-tailed)	.000		.041	.111	.000	.427	.834	.247
	N	375	375	375	375	375	375	375	375
SizeRev_Tminus1	Pearson Correlation	.101	.106*	1	.500**	-.005	-.011	.002	.018
	Sig. (2-tailed)	.050	.041		.000	.916	.833	.974	.727
	N	375	375	375	375	375	375	375	375
Leverage_Tminus1	Pearson Correlation	-.017	-.083	.500**	1	.085	-.039	-.023	-.002
	Sig. (2-tailed)	.737	.111	.000		.098	.449	.663	.962
	N	375	375	375	375	375	375	375	375
Dummy_09	Pearson Correlation	-.205**	-.190**	-.005	.085	1	-.250**	-.252**	-.252**
	Sig. (2-tailed)	.000	.000	.916	.098		.000	.000	.000
	N	375	375	375	375	375	375	375	375
Dummy_10	Pearson Correlation	.152**	.041	-.011	-.039	-.250**	1	-.252**	-.252**
	Sig. (2-tailed)	.003	.427	.833	.449	.000		.000	.000
	N	375	375	375	375	375	375	375	375
Dummy_11	Pearson Correlation	.117*	-.011	.002	-.023	-.252**	-.252**	1	-.254**
	Sig. (2-tailed)	.023	.834	.974	.663	.000	.000		.000
	N	375	375	375	375	375	375	375	375
Dummy_12	Pearson Correlation	-.095	-.060	.018	-.002	-.252**	-.252**	-.254**	1
	Sig. (2-tailed)	.065	.247	.727	.962	.000	.000	.000	
	N	375	375	375	375	375	375	375	375

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model 3 (t)

Correlations

		DPCxChange_DIV	DNCxChange_DIV	Dummy_Init_t	Dummy_Omit_t	ROE_Tminus1	SizeRev_Tminus1	Leverage_Tminus1	Dummy_09	Dummy_10	Dummy_11	Dummy_12
DPCxChange_DIV	Pearson Correlation	1	.131*	-.126*	-.120*	.195**	.104*	-.010	-.154**	.134**	.104*	-.097
	Sig. (2-tailed)		.011	.014	.020	.000	.045	.842	.003	.010	.044	.062
	N	375	375	375	375	375	375	375	375	375	375	375
DNCxChange_DIV	Pearson Correlation	.131*	1	.142**	.135**	-.002	.019	-.029	-.228**	.102*	.076	-.021
	Sig. (2-tailed)	.011		.006	.009	.964	.710	.581	.000	.047	.144	.685
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_Init_t	Pearson Correlation	-.126*	.142**	1	-.129*	.023	-.003	-.028	-.041	.144**	-.064	-.023
	Sig. (2-tailed)	.014	.006		.012	.658	.950	.592	.428	.005	.219	.659
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_Omit_t	Pearson Correlation	-.120*	.135**	-.129*	1	-.179**	-.026	.141**	.273**	-.132*	-.092	.057
	Sig. (2-tailed)	.020	.009	.012		.000	.610	.006	.000	.010	.076	.269
	N	375	375	375	375	375	375	375	375	375	375	375
ROE_Tminus1	Pearson Correlation	.195**	-.002	.023	-.179**	1	.106*	-.083	-.190**	.041	-.011	-.060
	Sig. (2-tailed)	.000	.964	.658	.000		.041	.111	.000	.427	.834	.247
	N	375	375	375	375	375	375	375	375	375	375	375
SizeRev_Tminus1	Pearson Correlation	.104*	.019	-.003	-.026	.106*	1	.500**	-.005	-.011	.002	.018
	Sig. (2-tailed)	.045	.710	.950	.610	.041		.000	.916	.833	.974	.727
	N	375	375	375	375	375	375	375	375	375	375	375
Leverage_Tminus1	Pearson Correlation	-.010	-.029	-.028	.141**	-.083	.500**	1	.085	-.039	-.023	-.002
	Sig. (2-tailed)	.842	.581	.592	.006	.111	.000		.098	.449	.663	.962
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_09	Pearson Correlation	-.154**	-.228**	-.041	.273**	-.190**	-.005	.085	1	-.250**	-.252**	-.252**
	Sig. (2-tailed)	.003	.000	.428	.000	.000	.916	.098		.000	.000	.000
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_10	Pearson Correlation	.134**	.102*	.144**	-.132*	.041	-.011	-.039	-.250**	1	-.252**	-.252**
	Sig. (2-tailed)	.010	.047	.005	.010	.427	.833	.449	.000		.000	.000
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_11	Pearson Correlation	.104*	.076	-.064	-.092	-.011	.002	-.023	-.252**	-.252**	1	-.254**
	Sig. (2-tailed)	.044	.144	.219	.076	.834	.974	.663	.000	.000		.000
	N	375	375	375	375	375	375	375	375	375	375	375
Dummy_12	Pearson Correlation	-.097	-.021	-.023	.057	-.060	.018	-.002	-.252**	-.252**	-.254**	1
	Sig. (2-tailed)	.062	.685	.659	.269	.247	.727	.962	.000	.000	.000	
	N	375	375	375	375	375	375	375	375	375	375	375

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Model 1 (t+1)

Correlations

		Dummy_Inc_DIV_t	Dummy_Dec_DIV_t	ROE_T	SizeRev_T	Leverage_T	Dummy_10	Dummy_11	Dummy_12
Dummy_Inc_DIV_t	Pearson Correlation	1	-.556**	.208**	.199**	.002	-.216**	.108*	.128*
	Sig. (2-tailed)		.000	.000	.001	.968	.000	.037	.013
	N	375	375	299	299	299	375	375	375
Dummy_Dec_DIV_t	Pearson Correlation	-.556**	1	.007	-.042	.017	.322**	-.176**	-.135**
	Sig. (2-tailed)	.000		.909	.468	.776	.000	.001	.009
	N	375	375	299	299	299	375	375	375
ROE_T	Pearson Correlation	.208**	.007	1	.096	-.106	.111	.052	-.002
	Sig. (2-tailed)	.000	.909		.097	.067	.056	.373	.967
	N	299	299	299	299	299	299	299	299
SizeRev_T	Pearson Correlation	.199**	-.042	.096	1	.502**	-.011	-.003	.022
	Sig. (2-tailed)	.001	.468	.097		.000	.854	.953	.700
	N	299	299	299	299	299	299	299	299
Leverage_T	Pearson Correlation	.002	.017	-.106	.502**	1	-.051	-.038	-.008
	Sig. (2-tailed)	.968	.776	.067	.000		.380	.513	.894
	N	299	299	299	299	299	299	299	299
Dummy_10	Pearson Correlation	-.216**	.322**	.111	-.011	-.051	1	-.250**	-.252**
	Sig. (2-tailed)	.000	.000	.056	.854	.380		.000	.000
	N	375	375	299	299	299	375	375	375
Dummy_11	Pearson Correlation	.108*	-.176**	.052	-.003	-.038	-.250**	1	-.252**
	Sig. (2-tailed)	.037	.001	.373	.953	.513	.000		.000
	N	375	375	299	299	299	375	375	375
Dummy_12	Pearson Correlation	.128*	-.135**	-.002	.022	-.008	-.252**	-.252**	1
	Sig. (2-tailed)	.013	.009	.967	.700	.894	.000	.000	
	N	375	375	299	299	299	375	375	375

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model 2 (t+1)

Correlations

		Change_DIV_t	ROE_T	SizeRev_T	Leverage_T	Dummy_10	Dummy_11	Dummy_12
Change_DIV_t	Pearson Correlation	1	.088	.112	.021	-.205**	.152**	.117*
	Sig. (2-tailed)		.130	.053	.716	.000	.003	.023
	N	375	299	299	299	375	375	375
ROE_T	Pearson Correlation	.088	1	.096	-.106	.111	.052	-.002
	Sig. (2-tailed)	.130		.097	.067	.056	.373	.967
	N	299	299	299	299	299	299	299
SizeRev_T	Pearson Correlation	.112	.096	1	.502**	-.011	-.003	.022
	Sig. (2-tailed)	.053	.097		.000	.854	.953	.700
	N	299	299	299	299	299	299	299
Leverage_T	Pearson Correlation	.021	-.106	.502**	1	-.051	-.038	-.008
	Sig. (2-tailed)	.716	.067	.000		.380	.513	.894
	N	299	299	299	299	299	299	299
Dummy_10	Pearson Correlation	-.205**	.111	-.011	-.051	1	-.250**	-.252**
	Sig. (2-tailed)	.000	.056	.854	.380		.000	.000
	N	375	299	299	299	375	375	375
Dummy_11	Pearson Correlation	.152**	.052	-.003	-.038	-.250**	1	-.252**
	Sig. (2-tailed)	.003	.373	.953	.513	.000		.000
	N	375	299	299	299	375	375	375
Dummy_12	Pearson Correlation	.117*	-.002	.022	-.008	-.252**	-.252**	1
	Sig. (2-tailed)	.023	.967	.700	.894	.000	.000	
	N	375	299	299	299	375	375	375

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model 3 (t+1)

Correlations

		DPCxChange_DIV	DNCxChange_DIV	Dummy_Init_t	Dummy_Omit_t	ROE_T	SizeRev_T	Leverage_T	Dummy_10	Dummy_11	Dummy_12
DPCxChange_DIV	Pearson Correlation	1	.131*	-.126*	-.120*	.133*	.108	.027	-.154**	.134**	.104*
	Sig. (2-tailed)		.011	.014	.020	.022	.063	.639	.003	.010	.044
	N	375	375	375	375	299	299	299	375	375	375
DNCxChange_DIV	Pearson Correlation	.131*	1	.142**	.135**	-.140*	.045	-.017	-.228**	.102*	.076
	Sig. (2-tailed)	.011		.006	.009	.016	.439	.772	.000	.047	.144
	N	375	375	375	375	299	299	299	375	375	375
Dummy_Init_t	Pearson Correlation	-.126*	.142**	1	-.129*	.067	.006	.017	-.041	.144**	-.064
	Sig. (2-tailed)	.014	.006		.012	.246	.913	.771	.428	.005	.219
	N	375	375	375	375	299	299	299	375	375	375
Dummy_Omit_t	Pearson Correlation	-.120*	.135**	-.129*	1	-.151**	-.002	.095	.273**	-.132*	-.092
	Sig. (2-tailed)	.020	.009	.012		.009	.975	.101	.000	.010	.076
	N	375	375	375	375	299	299	299	375	375	375
ROE_T	Pearson Correlation	.133*	-.140*	.067	-.151**	1	.096	-.106	.111	.052	-.002
	Sig. (2-tailed)	.022	.016	.246	.009		.097	.067	.056	.373	.967
	N	299	299	299	299	299	299	299	299	299	299
SizeRev_T	Pearson Correlation	.108	.045	.006	-.002	.096	1	.502**	-.011	-.003	.022
	Sig. (2-tailed)	.063	.439	.913	.975	.097		.000	.854	.953	.700
	N	299	299	299	299	299	299	299	299	299	299
Leverage_T	Pearson Correlation	.027	-.017	.017	.095	-.106	.502**	1	-.051	-.038	-.008
	Sig. (2-tailed)	.639	.772	.771	.101	.067	.000		.380	.513	.894
	N	299	299	299	299	299	299	299	299	299	299
Dummy_10	Pearson Correlation	-.154**	-.228**	-.041	.273**	.111	-.011	-.051	1	-.250**	-.252**
	Sig. (2-tailed)	.003	.000	.428	.000	.056	.854	.380		.000	.000
	N	375	375	375	375	299	299	299	375	375	375
Dummy_11	Pearson Correlation	.134**	.102*	.144**	-.132*	.052	-.003	-.038	-.250**	1	-.252**
	Sig. (2-tailed)	.010	.047	.005	.010	.373	.953	.513	.000		.000
	N	375	375	375	375	299	299	299	375	375	375
Dummy_12	Pearson Correlation	.104*	.076	-.064	-.092	-.002	.022	-.008	-.252**	-.252**	1
	Sig. (2-tailed)	.044	.144	.219	.076	.967	.700	.894	.000	.000	
	N	375	375	375	375	299	299	299	375	375	375

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Model 4

Correlations

		Change_Div_t	Size_Tminus1	Leverage_Tminus1	Dummy_10	Dummy_11	Dummy_12
Change_Div_t	Pearson Correlation	1	.124*	-.007	.183**	.145*	-.102
	Sig. (2-tailed)		.032	.910	.002	.012	.079
	N	299	299	299	299	299	299
Size_Tminus1	Pearson Correlation	.124*	1	.502**	-.011	-.003	.022
	Sig. (2-tailed)	.032		.000	.854	.953	.700
	N	299	299	299	299	299	299
Leverage_Tminus1	Pearson Correlation	-.007	.502**	1	-.051	-.038	-.008
	Sig. (2-tailed)	.910	.000		.380	.513	.894
	N	299	299	299	299	299	299
Dummy_10	Pearson Correlation	.183**	-.011	-.051	1	-.335**	-.338**
	Sig. (2-tailed)	.002	.854	.380		.000	.000
	N	299	299	299	299	299	299
Dummy_11	Pearson Correlation	.145*	-.003	-.038	-.335**	1	-.338**
	Sig. (2-tailed)	.012	.953	.513	.000		.000
	N	299	299	299	299	299	299
Dummy_12	Pearson Correlation	-.102	.022	-.008	-.338**	-.338**	1
	Sig. (2-tailed)	.079	.700	.894	.000	.000	
	N	299	299	299	299	299	299

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Regression Assumption 4 – Curve fit estimation

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.323	178.102	1	373	.000	.076	-.653		
Quadratic	.360	104.732	2	372	.000	.058	-.662	.300	
Cubic	.366	71.461	3	371	.000	.066	-.754	.305	.152

The independent variable is ROE_Tminus1.

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.000	.160	1	373	.689	.042	-.006		
Quadratic	.000	.081	2	372	.922	.056	-.011	.000	
Cubic	.001	.078	3	371	.972	.267	-.132	.022	-.001

The independent variable is SizeRev_Tminus1.

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.023	8.785	1	373	.003	-.114	.212		
Quadratic	.027	5.163	2	372	.006	-.035	-.141	.338	
Cubic	.031	3.891	3	371	.009	.069	-1.016	2.254	-1.217

The independent variable is Leverage_Tminus1.

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.007	2.710	1	373	.101	.011	-.026		
Quadratic	.008	1.421	2	372	.243	.011	-.035	.001	
Cubic	.014	1.756	3	371	.155	.009	-.078	.027	-.002

The independent variable is Change_DIV_t.

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.005	1.708	1	373	.192	.012	-.022		
Quadratic	.005	.860	2	372	.424	.011	-.018	-.001	
Cubic	.008	.936	3	371	.423	.015	-.073	.024	-.002

The independent variable is Change_DIV_txINC.

Model Summary and Parameter Estimates

Dependent Variable: Change_Earnings_t

Equation	Model Summary					Parameter Estimates			
	R Square	F	df1	df2	Sig.	Constant	b1	b2	b3
Linear	.009	3.408	1	373	.066	-.003	-.136		
Quadratic	.009	1.732	2	372	.178	-.003	-.197	-.094	
Cubic	.009	1.177	3	371	.318	-.004	-.346	-.606	-.404

The independent variable is Change_DIV_txDEC.

Regression assumption 6

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_Tminus1 SizeRev_Tminus1
Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE ZRESID.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.619[a]	.383	.368	.21291	1.944

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.259	9	1.140	25.145	.000[b]
	Residual	16.546	365	.045		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.041	.074		-.558	.577	-.188	.105		
	Dummy_Inc_DIV_t	.063	.029	.117	2.216	.027	.007	.120	.602	1.660
	Dummy_Dec_DIV_t	.020	.031	.034	.654	.513	-.040	.081	.614	1.628
	ROE_Tminus1	-.611	.051	-.532	-11.978	.000	-.712	-.511	.857	1.167
	SizeRev_Tminus1	-.018	.013	-.067	-1.356	.176	-.044	.008	.692	1.445
	Leverage_Tminus1	.196	.068	.140	2.881	.004	.062	.329	.718	1.392
	Dummy_09	.170	.038	.255	4.499	.000	.096	.245	.528	1.893
	Dummy_10	.086	.035	.128	2.432	.016	.016	.155	.607	1.648
	Dummy_11	.065	.035	.098	1.848	.065	-.004	.135	.598	1.671
	Dummy_12	.087	.036	.131	2.435	.015	.017	.158	.583	1.716

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.6591	.9217	.0069	.16562	375
Residual	-.71727	1.41511	.00000	.21034	375
Std. Predicted Value	-4.022	5.524	.000	1.000	375
Std. Residual	-3.369	6.646	.000	.988	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Change_DIV_t ROE_Tminus1 SizeRev_Tminus1 Leverage_Tminus1 Dummy_09
Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE ZRESID.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.612[a]	.375	.361	.21401	1.928

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.042	8	1.255	27.409	.000[b]
	Residual	16.763	366	.046		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	-.044	.074		-.596	.552	-.190	.102		
	Change_DIV_t	.009	.013	.030	.695	.487	-.017	.035	.932	1.073
	ROE_Tminus1	-.587	.050	-.511	-11.771	.000	-.685	-.489	.907	1.102
	SizeRev_Tminus1	-.011	.013	-.043	-.885	.376	-.037	.014	.729	1.372
	Leverage_Tminus1	.177	.068	.126	2.613	.009	.044	.310	.731	1.368
	Dummy_09	.170	.037	.254	4.629	.000	.098	.242	.568	1.761
	Dummy_10	.089	.035	.133	2.498	.013	.019	.158	.607	1.647
	Dummy_11	.071	.035	.107	2.008	.045	.001	.141	.602	1.661
	Dummy_12	.087	.036	.131	2.442	.015	.017	.157	.595	1.681

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.6328	.8990	.0069	.16386	375
Residual	-.70430	1.43797	.00000	.21171	375
Std. Predicted Value	-3.904	5.444	.000	1.000	375
Std. Residual	-3.291	6.719	.000	.989	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_Tminus1
SizeRev_Tminus1 Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID)
  /SAVE ZRESID.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.626[a]	.392	.373	.21196	1.922

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.497	11	.954	21.241	.000[b]
	Residual	16.308	363	.045		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	-.039	.074		-.525	.600	-.184	.106		
	DPCxChange_DIV	.016	.014	.048	1.126	.261	-.012	.043	.917	1.090
	DNCxChange_DIV	-.066	.063	-.046	-1.033	.302	-.190	.059	.854	1.171
	Dummy_Init_t	.016	.035	.020	.459	.646	-.053	.085	.920	1.087
	Dummy_Omit_t	-.097	.039	-.113	-2.482	.014	-.173	-.020	.811	1.233
	ROE_Tminus1	-.605	.050	-.527	-12.161	.000	-.703	-.507	.892	1.121
	SizeRev_Tminus1	-.014	.013	-.054	-1.125	.261	-.040	.011	.722	1.386
	Leverage_Tminus1	.203	.068	.145	2.986	.003	.069	.336	.713	1.402
	Dummy_09	.182	.038	.272	4.773	.000	.107	.257	.515	1.943
	Dummy_10	.084	.035	.126	2.391	.017	.015	.154	.600	1.666
	Dummy_11	.071	.035	.107	2.019	.044	.002	.140	.602	1.662
	Dummy_12	.094	.036	.141	2.633	.009	.024	.164	.586	1.708

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.6262	.9539	.0069	.16753	375
Residual	-.70235	1.36609	.00000	.20882	375
Std. Predicted Value	-3.779	5.653	.000	1.000	375
Std. Residual	-3.314	6.445	.000	.985	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT ZRE_1_sqa
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_Tminus1 SizeRev_Tminus1
Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID).
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09[b]	.	Enter

a. Dependent Variable: ZRE_1_sqa

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.219[a]	.048	.025	3.31565	1.959

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09

b. Dependent Variable: ZRE_1_sqa

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	202.453	9	22.495	2.046	.034[b]
	Residual	4012.632	365	10.994		
	Total	4215.084	374			

a. Dependent Variable: ZRE_1_sqa

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Dummy_Dec_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_Inc_DIV_t, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	2.434	1.157		2.103	.036	.158	4.709		
	Dummy_Inc_DIV_t	-.520	.446	-.077	-1.166	.244	-1.397	.357	.602	1.660
	Dummy_Dec_DIV_t	-.247	.480	-.033	-.514	.608	-1.190	.697	.614	1.628
	ROE_Tminus1	.549	.795	.038	.691	.490	-1.014	2.112	.857	1.167
	SizeRev_Tminus1	-.456	.205	-.137	-2.226	.027	-.859	-.053	.692	1.445
	Leverage_Tminus1	3.649	1.058	.208	3.450	.001	1.569	5.729	.718	1.392
	Dummy_09	-.244	.589	-.029	-.414	.679	-1.402	.914	.528	1.893
	Dummy_10	-.459	.549	-.055	-.835	.404	-1.539	.622	.607	1.648
	Dummy_11	-.655	.551	-.079	-1.189	.235	-1.738	.428	.598	1.671
	Dummy_12	-.686	.558	-.082	-1.229	.220	-1.783	.411	.583	1.716

a. Dependent Variable: ZRE_1_sqa

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-1.0209	2.9399	.9733	.73574	375
Residual	-2.51354	42.37407	.00000	3.27551	375
Std. Predicted Value	-2.711	2.673	.000	1.000	375
Std. Residual	-.758	12.780	.000	.988	375

a. Dependent Variable: ZRE_1_sqa

$N*R^2 = (375*0,048) = 18$

LM = 18

P = 0.0352

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT ZRE_2_sqa
  /METHOD=ENTER Change_DIV_t ROE_Tminus1 SizeRev_Tminus1 Leverage_Tminus1 Dummy_09
Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID).
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: ZRE_2_sqa

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.214[a]	.046	.025	3.27341	1.974

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: ZRE_2_sqa

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	187.707	8	23.463	2.190	.028[b]
	Residual	3921.775	366	10.715		
	Total	4109.482	374			

a. Dependent Variable: ZRE_2_sqa

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, ROE_Tminus1, Change_DIV_t, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	2.437	1.134		2.148	.032	.206	4.667		
	Change_DIV_t	-.099	.203	-.026	-.489	.625	-.497	.299	.932	1.073
	ROE_Tminus1	.157	.763	.011	.206	.837	-1.343	1.656	.907	1.102
	SizeRev_Tminus1	-.498	.197	-.151	-2.527	.012	-.885	-.110	.729	1.372
	Leverage_Tminus1	3.732	1.035	.215	3.604	.000	1.696	5.768	.731	1.368
	Dummy_09	-.263	.561	-.032	-.469	.639	-1.366	.840	.568	1.761
	Dummy_10	-.442	.542	-.053	-.816	.415	-1.509	.624	.607	1.647
	Dummy_11	-.708	.542	-.086	-1.307	.192	-1.774	.357	.602	1.661
	Dummy_12	-.717	.545	-.087	-1.314	.190	-1.789	.356	.595	1.681

a. Dependent Variable: ZRE_2_sqa

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-1.0167	2.6635	.9760	.70844	375
Residual	-2.54916	42.96058	.00000	3.23821	375
Std. Predicted Value	-2.813	2.382	.000	1.000	375
Std. Residual	-.779	13.124	.000	.989	375

a. Dependent Variable: ZRE_2_sqa

$N*R^2 = (375*0,046) = 17.25$

LM = 17.25

P = 0.0276

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS CI(95) R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT ZRE_3_sqa
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_Tminus1
SizeRev_Tminus1 Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN NORMPROB(ZRESID).
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: ZRE_3_sqa

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.230[a]	.053	.024	3.16428	1.964

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: ZRE_3_sqa

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	202.432	11	18.403	1.838	.046[b]
	Residual	3634.597	363	10.013		
	Total	3837.030	374			

a. Dependent Variable: ZRE_3_sqa

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Init_t, ROE_Tminus1, DNCxChange_DIV, DPCxChange_DIV, Dummy_11, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	95.0% Confidence Interval for B Upper Bound	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	2.652	1.103		2.405	.017	.483	4.821		
	DPCxChange_DIV	-.072	.207	-.018	-.346	.730	-.478	.335	.917	1.090
	DNCxChange_DIV	-.216	.948	-.013	-.227	.820	-2.079	1.648	.854	1.171
	Dummy_Init_t	-.213	.524	-.022	-.406	.685	-1.244	.818	.920	1.087
	Dummy_Omit_t	-.895	.582	-.087	-1.539	.125	-2.038	.249	.811	1.233
	ROE_Tminus1	.162	.743	.012	.218	.827	-1.299	1.624	.892	1.121
	SizeRev_Tminus1	-.534	.191	-.168	-2.789	.006	-.910	-.157	.722	1.386
	Leverage_Tminus1	3.852	1.013	.230	3.802	.000	1.860	5.845	.713	1.402
	Dummy_09	-.161	.569	-.020	-.282	.778	-1.280	.959	.515	1.943
	Dummy_10	-.451	.527	-.056	-.854	.393	-1.487	.586	.600	1.666
	Dummy_11	-.705	.524	-.089	-1.345	.180	-1.735	.326	.602	1.662
	Dummy_12	-.598	.531	-.075	-1.125	.261	-1.642	.447	.586	1.708

a. Dependent Variable: ZRE_3_sqa

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.9965	2.7698	.9680	.73571	375
Residual	-2.62701	39.09665	.00000	3.11740	375
Std. Predicted Value	-2.670	2.449	.000	1.000	375
Std. Residual	-.830	12.356	.000	.985	375

a. Dependent Variable: ZRE_3_sqa

$N*R^2 = (375*0{,}053) = 19.875$

LM = 19.875

P = 0.0471

Regression Assumption 8

Before winsorization:

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Dummy_Inc_DIV_t	375	.00	1.00	.4267	.49525	.298	.126	-1.922	.251
Dummy_Dec_DIV_t	375	.00	1.00	.2933	.45590	.911	.126	-1.175	.251
Dummy_Init_t	375	.00	1.00	.1200	.32540	2.348	.126	3.533	.251
Dummy_Omit_t	375	.00	1.00	.1093	.31247	2.514	.126	4.343	.251
Change_DIV_t	375	-.99	11.03	.1597	.86571	7.231	.126	74.944	.251
DPCxChange_DIV	375	.00	11.03	.2306	.82569	8.164	.126	88.226	.251
DNCxChange_DIV	375	-.99	.00	-.0709	.18684	-2.734	.126	6.672	.251
ROE_Tminus1	375	-1.28	1.31	.1065	.23305	-.796	.126	8.794	.251
SizeRev_Tminus1	375	2.72	8.83	6.3346	1.00623	-.787	.126	1.908	.251
Leverage_Tminus1	375	.01	.96	.5687	.19123	-.493	.126	.133	.251
Dummy_09	375	.00	1.00	.2000	.40053	1.506	.126	.270	.251
Dummy_10	375	.00	1.00	.2000	.40053	1.506	.126	.270	.251
Dummy_11	375	.00	1.00	.2027	.40252	1.485	.126	.207	.251
Dummy_12	375	.00	1.00	.2027	.40252	1.485	.126	.207	.251
Valid N (listwise)	375								

After winsorization (1% and 99% levels):

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Dummy_Inc_DIV_t	375	.00	1.00	.4267	.49525	.298	.126	-1.922	.251
Dummy_Dec_DIV_t	375	.00	1.00	.2933	.45590	.911	.126	-1.175	.251
Dummy_Init_t	375	.00	1.00	.1200	.32540	2.348	.126	3.533	.251
Dummy_Omit_t	375	.00	1.00	.1093	.31247	2.514	.126	4.343	.251
Change_DIV_t	375	-.78	4.40	.1389	.66007	3.995	.126	21.195	.251
DPCxChange_DIV	375	.00	4.40	.2086	.61122	4.873	.126	27.357	.251
DNCxChange_DIV	375	-.78	.00	-.0697	.18155	-2.611	.126	5.609	.251
ROE_Tminus1	375	-.81	.63	.1053	.20838	-.902	.126	4.122	.251
SizeRev_Tminus1	375	2.72	8.83	6.3346	1.00623	-.787	.126	1.908	.251
Leverage_Tminus1	375	.01	.96	.5687	.19123	-.493	.126	.133	.251
Dummy_09	375	.00	1.00	.2000	.40053	1.506	.126	.270	.251
Dummy_10	375	.00	1.00	.2000	.40053	1.506	.126	.270	.251
Dummy_11	375	.00	1.00	.2027	.40252	1.485	.126	.207	.251
Dummy_12	375	.00	1.00	.2027	.40252	1.485	.126	.207	.251
Valid N (listwise)	375								

Robustness test:

Model 1, year *t*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.550[a]	.302	.281	.12529

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, ROE_Tminus1_sqa, Dummy_10, Dummy_09, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_11, ROE_Tminus1

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.217	10	.222	14.125	.000[b]
	Residual	5.117	326	.016		
	Total	7.335	336			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, ROE_Tminus1_sqa, Dummy_10, Dummy_09, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_11, ROE_Tminus1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.108	.046		-2.357	.019
	Dummy_Inc_DIV_t	.046	.019	.157	2.506	.013
	Dummy_Dec_DIV_t	.001	.019	.004	.063	.950
	ROE_Tminus1	-.452	.069	-.488	-6.544	.000
	ROE_Tminus1_sqa	.247	.180	.095	1.372	.171
	SizeRev_Tminus1	.002	.008	.012	.218	.827
	Leverage_Tminus1	.050	.043	.066	1.176	.240
	Dummy_09	.153	.024	.401	6.443	.000
	Dummy_10	.080	.022	.216	3.592	.000
	Dummy_11	.067	.022	.186	3.033	.003
	Dummy_12	.085	.022	.236	3.776	.000

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2464	.2204	-.0141	.08123	337
Residual	-.37120	.35033	.00000	.12341	337
Std. Predicted Value	-2.861	2.886	.000	1.000	337
Std. Residual	-2.963	2.796	.000	.985	337

a. Dependent Variable: Change_Earnings_t

Model 2, year *t*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.553[a]	.306	.287	.12315

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1_sqa, Dummy_10, Dummy_09, SizeRev_Tminus1, Dummy_11, ROE_Tminus1

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.171	9	.241	15.908	.000[b]
	Residual	4.929	325	.015		
	Total	7.100	334			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1_sqa, Dummy_10, Dummy_09, SizeRev_Tminus1, Dummy_11, ROE_Tminus1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.109	.045		-2.427	.016
	Change_DIV_t	.023	.019	.059	1.161	.246
	ROE_Tminus1	-.389	.065	-.426	-6.024	.000
	ROE_Tminus1_sqa	.150	.175	.058	.858	.392
	SizeRev_Tminus1	.005	.008	.034	.610	.542
	Leverage_Tminus1	.042	.042	.056	1.008	.314
	Dummy_09	.163	.023	.430	7.121	.000
	Dummy_10	.084	.022	.231	3.861	.000
	Dummy_11	.072	.022	.204	3.320	.001
	Dummy_12	.085	.022	.239	3.866	.000

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2330	.2236	-.0121	.08063	335
Residual	-.35094	.34535	.00000	.12148	335
Std. Predicted Value	-2.741	2.922	.000	1.000	335
Std. Residual	-2.850	2.804	.000	.986	335

a. Dependent Variable: Change_Earnings_t

Model 3, year *t*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.570[a]	.325	.300	.12199

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1_sqa, Dummy_Init_t, Dummy_Omit_t, Dummy_10, DPCxChange_DIV, Dummy_11, SizeRev_Tminus1, Dummy_09, ROE_Tminus1

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.308	12	.192	12.925	.000[b]
	Residual	4.792	322	.015		
	Total	7.100	334			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1_sqa, Dummy_Init_t, Dummy_Omit_t, Dummy_10, DPCxChange_DIV, Dummy_11, SizeRev_Tminus1, Dummy_09, ROE_Tminus1

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.112	.045		-2.500	.013
	DPCxChange_DIV	.052	.025	.110	2.076	.039
	DNCxChange_DIV	-.034	.044	-.039	-.781	.436
	Dummy_Init_t	.037	.022	.081	1.638	.102
	Dummy_Omit_t	-.042	.025	-.085	-1.669	.096
	ROE_Tminus1	-.433	.066	-.474	-6.589	.000
	ROE_Tminus1_sqa	.205	.175	.080	1.175	.241
	SizeRev_Tminus1	.004	.008	.027	.482	.630
	Leverage_Tminus1	.052	.042	.069	1.239	.216
	Dummy_09	.167	.023	.440	7.146	.000
	Dummy_10	.076	.022	.209	3.482	.001
	Dummy_11	.068	.022	.191	3.124	.002
	Dummy_12	.086	.022	.242	3.941	.000

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2410	.2149	-.0121	.08313	335
Residual	-.33254	.35804	.00000	.11978	335
Std. Predicted Value	-2.754	2.730	.000	1.000	335
Std. Residual	-2.726	2.935	.000	.982	335

a. Dependent Variable: Change_Earnings_t

Model 1, year *t+1*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.519[a]	.269	.244	.11532	1.887

a. Predictors: (Constant), Dummy_12, Leverage_T, ROE_T_sqa, Dummy_Dec_DIV_t, Dummy_11, SizeRev_T, Dummy_Inc_DIV_t, Dummy_10, ROE_T

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.259	9	.140	10.521	.000[b]
	Residual	3.418	257	.013		
	Total	4.677	266			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_T, ROE_T_sqa, Dummy_Dec_DIV_t, Dummy_11, SizeRev_T, Dummy_Inc_DIV_t, Dummy_10, ROE_T

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.020	.047		.428	.669
	Dummy_Inc_DIV_t	.015	.018	.056	.809	.419
	Dummy_Dec_DIV_t	.022	.021	.075	1.079	.281
	ROE_T	-.397	.064	-.481	-6.206	.000
	ROE_T_sqa	.079	.181	.032	.435	.664
	SizeRev_T	.008	.008	.059	.903	.367
	Leverage_T	.042	.045	.060	.931	.353
	Dummy_10	-.066	.022	-.214	-2.946	.004
	Dummy_11	-.076	.020	-.255	-3.731	.000
	Dummy_12	-.071	.020	-.239	-3.477	.001

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.1932	.2215	.0138	.06880	267
Residual	-.28959	.33821	.00000	.11335	267
Std. Predicted Value	-3.008	3.019	.000	1.000	267
Std. Residual	-2.511	2.933	.000	.983	267

a. Dependent Variable: Change_Earnings_t

Model 2, year *t+1*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.519[a]	.269	.244	.11532	1.887

a. Predictors: (Constant), Dummy_12, Leverage_T, ROE_T_sqa, Dummy_Dec_DIV_t, Dummy_11, SizeRev_T, Dummy_Inc_DIV_t, Dummy_10, ROE_T

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.259	9	.140	10.521	.000[b]
	Residual	3.418	257	.013		
	Total	4.677	266			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_T, ROE_T_sqa, Dummy_Dec_DIV_t, Dummy_11, SizeRev_T, Dummy_Inc_DIV_t, Dummy_10, ROE_T

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.020	.047		.428	.669
	Dummy_Inc_DIV_t	.015	.018	.056	.809	.419
	Dummy_Dec_DIV_t	.022	.021	.075	1.079	.281
	ROE_T	-.397	.064	-.481	-6.206	.000
	ROE_T_sqa	.079	.181	.032	.435	.664
	SizeRev_T	.008	.008	.059	.903	.367
	Leverage_T	.042	.045	.060	.931	.353
	Dummy_10	-.066	.022	-.214	-2.946	.004
	Dummy_11	-.076	.020	-.255	-3.731	.000
	Dummy_12	-.071	.020	-.239	-3.477	.001

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.1932	.2215	.0138	.06880	267
Residual	-.28959	.33821	.00000	.11335	267
Std. Predicted Value	-3.008	3.019	.000	1.000	267
Std. Residual	-2.511	2.933	.000	.983	267

a. Dependent Variable: Change_Earnings_t

Model 3, year *t+1*:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.523[a]	.273	.242	.11543	1.926

a. Predictors: (Constant), Dummy_12, Leverage_T, Dummy_Init_t, ROE_T_sqa, DNCxChange_DIV, Dummy_Omit_t, DPCxChange_DIV, Dummy_11, SizeRev_T, Dummy_10, ROE_T

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.279	11	.116	8.727	.000[b]
	Residual	3.398	255	.013		
	Total	4.677	266			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_T, Dummy_Init_t, ROE_T_sqa, DNCxChange_DIV, Dummy_Omit_t, DPCxChange_DIV, Dummy_11, SizeRev_T, Dummy_10, ROE_T

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.027	.047		.579	.563
	DPCxChange_DIV	.005	.026	.012	.200	.841
	DNCxChange_DIV	-.007	.046	-.009	-.149	.882
	Dummy_Init_t	-.035	.024	-.085	-1.476	.141
	Dummy_Omit_t	-.004	.027	-.009	-.144	.885
	ROE_T	-.393	.065	-.476	-6.025	.000
	ROE_T_sqa	.081	.181	.033	.446	.656
	SizeRev_T	.009	.008	.067	1.028	.305
	Leverage_T	.043	.046	.061	.943	.346
	Dummy_10	-.060	.023	-.194	-2.593	.010
	Dummy_11	-.073	.021	-.244	-3.533	.000
	Dummy_12	-.071	.021	-.239	-3.462	.001

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.1896	.2211	.0138	.06935	267
Residual	-.27157	.33558	.00000	.11302	267
Std. Predicted Value	-2.933	2.990	.000	1.000	267
Std. Residual	-2.353	2.907	.000	.979	267

a. Dependent Variable: Change_Earnings_t

Model 4:

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.377[a]	.142	.123	.26254

a. Predictors: (Constant), Dummy_12, Change_Earnings_Tminus1, Size_Tminus1, Dummy_11, Leverage_Tminus1, Dummy_10

b. Dependent Variable: Change_Div_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	3.088	6	.515	7.467	.000[b]
	Residual	18.679	271	.069		
	Total	21.767	277			

a. Dependent Variable: Change_Div_t

b. Predictors: (Constant), Dummy_12, Change_Earnings_Tminus1, Size_Tminus1, Dummy_11, Leverage_Tminus1, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.301	.101		-2.972	.003
	Change_Earnings_Tminus1	.144	.058	.149	2.491	.013
	Size_Tminus1	.045	.018	.166	2.513	.013
	Leverage_Tminus1	-.163	.098	-.110	-1.653	.100
	Dummy_10	.124	.048	.188	2.607	.010
	Dummy_11	.217	.045	.331	4.794	.000
	Dummy_12	.074	.044	.117	1.675	.095

a. Dependent Variable: Change_Div_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2758	.2894	-.0111	.10558	278
Residual	-.77197	.73234	.00000	.25968	278
Std. Predicted Value	-2.507	2.846	.000	1.000	278
Std. Residual	-2.940	2.789	.000	.989	278

a. Dependent Variable: Change_Div_t

Regressions

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_Tminus1 SizeRev_Tminus1
Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.629[a]	.396	.381	.21065	1.985

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.609	9	1.179	26.566	.000[b]
	Residual	16.196	365	.044		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.046	.074		-.628	.531		
	Dummy_Inc_DIV_t	.074	.028	.136	2.580	.010	.596	1.679
	Dummy_Dec_DIV_t	.018	.030	.030	.582	.561	.616	1.623
	ROE_Tminus1	-.713	.057	-.555	-12.428	.000	.830	1.205
	SizeRev_Tminus1	-.013	.013	-.047	-.964	.335	.689	1.452
	Leverage_Tminus1	.169	.067	.121	2.508	.013	.715	1.399
	Dummy_09	.165	.037	.247	4.415	.000	.527	1.896
	Dummy_10	.080	.035	.119	2.276	.023	.605	1.652
	Dummy_11	.055	.035	.083	1.574	.116	.595	1.682
	Dummy_12	.074	.036	.111	2.075	.039	.577	1.732

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.4681	.7753	.0069	.16842	375
Residual	-.70281	1.34207	.00000	.20810	375
Std. Predicted Value	-2.820	4.562	.000	1.000	375
Std. Residual	-3.336	6.371	.000	.988	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Change_DIV_t ROE_Tminus1 SizeRev_Tminus1 Leverage_Tminus1 Dummy_09
Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.621[a]	.386	.372	.21207	1.960

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.344	8	1.293	28.750	.000[b]
	Residual	16.461	366	.045		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.047	.074		-.642	.521		
	Change_DIV_t	.021	.018	.052	1.213	.226	.900	1.111
	ROE_Tminus1	-.682	.056	-.530	-12.162	.000	.882	1.134
	SizeRev_Tminus1	-.006	.013	-.022	-.464	.643	.720	1.389
	Leverage_Tminus1	.148	.067	.106	2.204	.028	.726	1.377
	Dummy_09	.165	.036	.247	4.532	.000	.565	1.769
	Dummy_10	.081	.035	.121	2.289	.023	.602	1.662
	Dummy_11	.060	.035	.090	1.706	.089	.596	1.678
	Dummy_12	.074	.035	.111	2.083	.038	.591	1.693

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.4367	.7647	.0069	.16631	375
Residual	-.68906	1.37253	.00000	.20979	375
Std. Predicted Value	-2.667	4.557	.000	1.000	375
Std. Residual	-3.249	6.472	.000	.989	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_Tminus1
SizeRev_Tminus1 Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.637[a]	.406	.388	.20949	1.949

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.875	11	.989	22.527	.000[b]
	Residual	15.930	363	.044		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.041	.073		-.561	.575		
	DPCxChange_DIV	.034	.019	.078	1.807	.072	.872	1.146
	DNCxChange_DIV	-.067	.065	-.045	-1.029	.304	.848	1.180
	Dummy_Init_t	.022	.035	.026	.622	.535	.908	1.101
	Dummy_Omit_t	-.101	.039	-.118	-2.612	.009	.806	1.241
	ROE_Tminus1	-.708	.056	-.551	-12.653	.000	.863	1.158
	SizeRev_Tminus1	-.009	.013	-.035	-.721	.471	.714	1.401
	Leverage_Tminus1	.174	.067	.124	2.588	.010	.709	1.410
	Dummy_09	.177	.038	.265	4.692	.000	.514	1.944
	Dummy_10	.074	.035	.111	2.114	.035	.593	1.686
	Dummy_11	.058	.035	.087	1.666	.097	.595	1.681
	Dummy_12	.080	.035	.120	2.267	.024	.582	1.718

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.4504	.8076	.0069	.17052	375
Residual	-.69177	1.28912	.00000	.20638	375
Std. Predicted Value	-2.682	4.696	.000	1.000	375
Std. Residual	-3.302	6.154	.000	.985	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_Tminus1 ROE_Tminus1_sqa
SizeRev_Tminus1 Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, ROE_Tminus1_sqa, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.644[a]	.415	.399	.20761	1.973

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, ROE_Tminus1_sqa, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.116	10	1.112	25.788	.000[b]
	Residual	15.689	364	.043		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Dummy_Inc_DIV_t, ROE_Tminus1_sqa, Dummy_10, ROE_Tminus1, Dummy_11, SizeRev_Tminus1, Dummy_Dec_DIV_t, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.072	.073		-.986	.325		
	Dummy_Inc_DIV_t	.072	.028	.133	2.557	.011	.595	1.680
	Dummy_Dec_DIV_t	.015	.030	.025	.490	.624	.616	1.624
	ROE_Tminus1	-.728	.057	-.566	-12.832	.000	.825	1.212
	ROE_Tminus1_sqa	.380	.111	.141	3.428	.001	.950	1.052
	SizeRev_Tminus1	-.009	.013	-.033	-.675	.500	.683	1.463
	Leverage_Tminus1	.136	.067	.097	2.033	.043	.700	1.428
	Dummy_09	.158	.037	.237	4.283	.000	.526	1.902
	Dummy_10	.085	.034	.127	2.460	.014	.604	1.656
	Dummy_11	.058	.035	.087	1.678	.094	.594	1.683
	Dummy_12	.084	.035	.126	2.373	.018	.574	1.743

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3480	.9979	.0069	.17240	375
Residual	-.77276	1.16262	.00000	.20482	375
Std. Predicted Value	-2.059	5.748	.000	1.000	375
Std. Residual	-3.722	5.600	.000	.987	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Change_DIV_t ROE_Tminus1 ROE_Tminus1_sqa SizeRev_Tminus1
Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1_sqa, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.636[a]	.404	.390	.20917	1.954

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1_sqa, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10.836	9	1.204	27.519	.000[b]
	Residual	15.969	365	.044		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_DIV_t, ROE_Tminus1_sqa, ROE_Tminus1, Dummy_11, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.074	.073		-1.019	.309		
	Change_DIV_t	.017	.017	.043	1.010	.313	.896	1.115
	ROE_Tminus1	-.695	.055	-.541	-12.546	.000	.877	1.140
	ROE_Tminus1_sqa	.375	.112	.139	3.352	.001	.947	1.056
	SizeRev_Tminus1	-.002	.013	-.007	-.152	.879	.713	1.402
	Leverage_Tminus1	.116	.067	.083	1.725	.085	.711	1.407
	Dummy_09	.156	.036	.234	4.341	.000	.562	1.778
	Dummy_10	.087	.035	.130	2.487	.013	.600	1.666
	Dummy_11	.063	.035	.095	1.820	.070	.596	1.679
	Dummy_12	.082	.035	.124	2.350	.019	.587	1.702

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3154	.9811	.0069	.17021	375
Residual	-.75699	1.19381	.00000	.20664	375
Std. Predicted Value	-1.894	5.724	.000	1.000	375
Std. Residual	-3.619	5.707	.000	.988	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_Tminus1
ROE_Tminus1_sqa SizeRev_Tminus1 Leverage_Tminus1 Dummy_09 Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, ROE_Tminus1_sqa, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.650[a]	.423	.404	.20668	1.953

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, ROE_Tminus1_sqa, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	11.342	12	.945	22.128	.000[b]
	Residual	15.463	362	.043		
	Total	26.805	374			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, DNCxChange_DIV, ROE_Tminus1, Dummy_Init_t, ROE_Tminus1_sqa, Dummy_11, DPCxChange_DIV, Dummy_Omit_t, Dummy_10, SizeRev_Tminus1, Dummy_09

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.069	.073		-.948	.344		
	DPCxChange_DIV	.031	.019	.071	1.649	.100	.870	1.150
	DNCxChange_DIV	-.070	.064	-.047	-1.091	.276	.848	1.180
	Dummy_Init_t	.029	.035	.035	.844	.399	.904	1.106
	Dummy_Omit_t	-.096	.038	-.112	-2.510	.013	.804	1.243
	ROE_Tminus1	-.721	.055	-.561	-13.028	.000	.859	1.164
	ROE_Tminus1_sqa	.366	.111	.136	3.308	.001	.942	1.062
	SizeRev_Tminus1	-.005	.013	-.019	-.408	.683	.707	1.414
	Leverage_Tminus1	.141	.067	.101	2.105	.036	.694	1.441
	Dummy_09	.168	.037	.251	4.491	.000	.511	1.956
	Dummy_10	.079	.035	.119	2.286	.023	.592	1.689
	Dummy_11	.061	.034	.092	1.783	.075	.595	1.682
	Dummy_12	.088	.035	.132	2.522	.012	.579	1.727

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3326	1.0165	.0069	.17415	375
Residual	-.73523	1.11733	.00000	.20333	375
Std. Predicted Value	-1.949	5.797	.000	1.000	375
Std. Residual	-3.557	5.406	.000	.984	375

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Div_t
  /METHOD=ENTER Change_Earnings_Tminus1 Size_Tminus1 Leverage_Tminus1 Dummy_10
Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, Leverage_Tminus1, Change_Earnings_Tminus1, Dummy_11, Size_Tminus1, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Div_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.352[a]	.124	.106	.62771	2.172

a. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_Earnings_Tminus1, Dummy_11, Size_Tminus1, Dummy_10

b. Dependent Variable: Change_Div_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.224	6	2.704	6.862	.000[b]
	Residual	115.053	292	.394		
	Total	131.277	298			

a. Dependent Variable: Change_Div_t

b. Predictors: (Constant), Dummy_12, Leverage_Tminus1, Change_Earnings_Tminus1, Dummy_11, Size_Tminus1, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-.592	.238		-2.490	.013		
	Change_Earnings_Tminus1	.324	.134	.141	2.419	.016	.881	1.136
	Size_Tminus1	.098	.041	.151	2.378	.018	.744	1.345
	Leverage_Tminus1	-.199	.226	-.056	-.881	.379	.737	1.357
	Dummy_10	.374	.110	.244	3.384	.001	.575	1.739
	Dummy_11	.378	.105	.247	3.587	.000	.633	1.580
	Dummy_12	.096	.105	.063	.913	.362	.634	1.577

a. Dependent Variable: Change_Div_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.4905	.9211	.1298	.23333	299
Residual	-.97228	4.02194	.00000	.62136	299
Std. Predicted Value	-2.659	3.391	.000	1.000	299
Std. Residual	-1.549	6.407	.000	.990	299

a. Dependent Variable: Change_Div_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_T SizeRev_T Leverage_T Dummy_10
Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.636[a]	.405	.388	.20089	1.973

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.962	8	.995	24.662	.000[b]
	Residual	11.704	290	.040		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.088	.076		1.148	.252		
	Dummy_Inc_DIV_t	.025	.030	.049	.854	.394	.623	1.604
	Dummy_Dec_DIV_t	.007	.033	.011	.198	.843	.616	1.625
	ROE_T	-.703	.058	-.587	-12.170	.000	.882	1.133
	SizeRev_T	-.003	.014	-.010	-.192	.848	.690	1.448
	Leverage_T	.137	.074	.100	1.862	.064	.710	1.408
	Dummy_10	-.068	.036	-.115	-1.900	.058	.557	1.794
	Dummy_11	-.095	.033	-.161	-2.842	.005	.642	1.558
	Dummy_12	-.089	.033	-.151	-2.677	.008	.647	1.546

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3837	.7687	.0414	.16346	299
Residual	-.62727	1.36531	.00000	.19818	299
Std. Predicted Value	-2.601	4.449	.000	1.000	299
Std. Residual	-3.122	6.796	.000	.986	299

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Change_DIV_t ROE_T SizeRev_T Leverage_T Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.635[a]	.404	.389	.20075	1.982

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.939	7	1.134	28.142	.000[b]
	Residual	11.727	291	.040		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.086	.076		1.133	.258		
	Change_DIV_t	-.008	.017	-.022	-.466	.642	.912	1.096
	ROE_T	-.689	.056	-.575	-12.221	.000	.926	1.080
	SizeRev_T	.001	.013	.003	.048	.962	.715	1.398
	Leverage_T	.130	.073	.095	1.774	.077	.717	1.395
	Dummy_10	-.077	.034	-.130	-2.253	.025	.616	1.622
	Dummy_11	-.095	.033	-.160	-2.827	.005	.640	1.562
	Dummy_12	-.088	.033	-.149	-2.646	.009	.646	1.548

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3727	.7621	.0414	.16322	299
Residual	-.63199	1.36379	.00000	.19837	299
Std. Predicted Value	-2.537	4.415	.000	1.000	299
Std. Residual	-3.148	6.794	.000	.988	299

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_T
SizeRev_T Leverage_T Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.636[a]	.404	.384	.20166	1.994

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.954	10	.795	19.560	.000[b]
	Residual	11.712	288	.041		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.089	.077		1.160	.247		
	DPCxChange_DIV	-.010	.019	-.026	-.534	.594	.882	1.134
	DNCxChange_DIV	.004	.070	.003	.064	.949	.818	1.222
	Dummy_Init_t	-.017	.037	-.022	-.454	.650	.896	1.116
	Dummy_Omit_t	-.021	.044	-.025	-.479	.633	.768	1.303
	ROE_T	-.690	.058	-.576	-11.808	.000	.869	1.150
	SizeRev_T	.000	.014	.001	.014	.988	.711	1.407
	Leverage_T	.136	.074	.099	1.824	.069	.698	1.434
	Dummy_10	-.071	.037	-.120	-1.904	.058	.525	1.906
	Dummy_11	-.093	.034	-.157	-2.736	.007	.631	1.584
	Dummy_11	-.088	.033	-.149	-2.623	.009	.644	1.553

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.3696	.7617	.0414	.16338	299
Residual	-.64155	1.35766	.00000	.19825	299
Std. Predicted Value	-2.516	4.409	.000	1.000	299
Std. Residual	-3.181	6.732	.000	.983	299

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Dummy_Inc_DIV_t Dummy_Dec_DIV_t ROE_T ROE_T_sqa SizeRev_T Leverage_T
Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, ROE_T_sqa, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.661[a]	.437	.419	.19573	1.947

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, ROE_T_sqa, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.594	9	.955	24.923	.000[b]
	Residual	11.072	289	.038		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Dec_DIV_t, ROE_T_sqa, Dummy_11, Leverage_T, Dummy_Inc_DIV_t, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.043	.075		.573	.567		
	Dummy_Inc_DIV_t	.024	.029	.047	.840	.401	.623	1.604
	Dummy_Dec_DIV_t	.008	.033	.014	.250	.803	.615	1.625
	ROE_T	-.694	.056	-.579	-12.320	.000	.881	1.135
	ROE_T_sqa	.461	.113	.185	4.060	.000	.943	1.061
	SizeRev_T	.003	.013	.012	.232	.817	.683	1.465
	Leverage_T	.090	.073	.066	1.236	.217	.692	1.445
	Dummy_10	-.056	.035	-.095	-1.602	.110	.553	1.807
	Dummy_11	-.085	.033	-.143	-2.596	.010	.638	1.567
	Dummy_12	-.070	.033	-.119	-2.142	.033	.634	1.578

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2284	1.0133	.0414	.16982	299
Residual	-.60392	1.16866	.00000	.19276	299
Std. Predicted Value	-1.589	5.723	.000	1.000	299
Std. Residual	-3.085	5.971	.000	.985	299

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER Change_DIV_t ROE_T ROE_T_sqa SizeRev_T Leverage_T Dummy_10 Dummy_11
Dummy_12
  /RESIDUALS DURBIN.
```

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, ROE_T_sqa, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.660[a]	.436	.420	.19557	1.957

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, ROE_T_sqa, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.574	8	1.072	28.019	.000[b]
	Residual	11.092	290	.038		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, ROE_T_sqa, Change_DIV_t, Dummy_11, Leverage_T, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.042	.075		.560	.576		
	Change_DIV_t	-.008	.017	-.022	-.469	.640	.912	1.096
	ROE_T	-.681	.055	-.568	-12.382	.000	.925	1.081
	ROE_T_sqa	.462	.113	.185	4.074	.000	.943	1.060
	SizeRev_T	.006	.013	.025	.472	.637	.708	1.413
	Leverage_T	.083	.072	.061	1.150	.251	.699	1.432
	Dummy_10	-.064	.033	-.108	-1.910	.057	.611	1.638
	Dummy_11	-.084	.033	-.143	-2.582	.010	.637	1.571
	Dummy_12	-.069	.033	-.117	-2.109	.036	.633	1.580

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2135	1.0062	.0414	.16962	299
Residual	-.60943	1.16627	.00000	.19293	299
Std. Predicted Value	-1.503	5.688	.000	1.000	299
Std. Residual	-3.116	5.963	.000	.986	299

a. Dependent Variable: Change_Earnings_t

```
REGRESSION
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT Change_Earnings_t
  /METHOD=ENTER DPCxChange_DIV DNCxChange_DIV Dummy_Init_t Dummy_Omit_t ROE_T
ROE_T_sqa SizeRev_T Leverage_T Dummy_10 Dummy_11 Dummy_12
  /RESIDUALS DURBIN.
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Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, ROE_T_sqa, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10[b]	.	Enter

a. Dependent Variable: Change_Earnings_t

b. All requested variables entered.

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.661[a]	.437	.415	.19649	1.972

a. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, ROE_T_sqa, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10

b. Dependent Variable: Change_Earnings_t

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.585	11	.780	20.216	.000[b]
	Residual	11.080	287	.039		
	Total	19.666	298			

a. Dependent Variable: Change_Earnings_t

b. Predictors: (Constant), Dummy_12, ROE_T, SizeRev_T, Dummy_Init_t, ROE_T_sqa, Dummy_Omit_t, DPCxChange_DIV, DNCxChange_DIV, Dummy_11, Leverage_T, Dummy_10

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.045	.075		.600	.549		
	DPCxChange_DIV	-.011	.018	-.027	-.581	.562	.882	1.134
	DNCxChange_DIV	.010	.068	.007	.152	.880	.818	1.223
	Dummy_Init_t	-.018	.036	-.023	-.493	.622	.896	1.116
	Dummy_Omit_t	-.013	.043	-.015	-.292	.771	.766	1.306
	ROE_T	-.679	.057	-.566	-11.898	.000	.867	1.153
	ROE_T_sqa	.461	.114	.185	4.044	.000	.940	1.064
	SizeRev_T	.006	.013	.023	.437	.662	.703	1.423
	Leverage_T	.088	.074	.064	1.199	.232	.680	1.471
	Dummy_10	-.060	.036	-.101	-1.643	.101	.522	1.917
	Dummy_11	-.082	.033	-.139	-2.493	.013	.628	1.593
	Dummy_12	-.069	.033	-.117	-2.099	.037	.631	1.584

a. Dependent Variable: Change_Earnings_t

Residuals Statistics[a]

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	-.2091	1.0070	.0414	.16974	299
Residual	-.61716	1.16285	.00000	.19283	299
Std. Predicted Value	-1.476	5.689	.000	1.000	299
Std. Residual	-3.141	5.918	.000	.981	299

a. Dependent Variable: Change_Earnings_t