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Master Thesis in Finance

The Effect of Dividend Increase on Future Earnings: Evidence from Nordic Countries between 2000 and 2015

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Abstract

This master thesis contributes to the literature concerning the theoretical and empirical understanding of dividend's change on company's future earnings. The paper analyses if dividends have explanatory power over future earnings. Also, the analysis expects to provide more evidence of the relationship in Nordic region. This thesis is based on a quantitative study where we use a sample of 586 companies listed on OMX Nordic all-share index over the period between 2000 and 2015. The sample resulted in total of 7021 instances of dividend changes. In addition to using change in earnings as dependent variable, change in dividends as independent variable, this study uses eight control variables that affect the relationship between dividends and future earnings. This study finds that changes in dividends can explain next year's downward dividend changes and two year's after upward dividend changes. However, the coefficients of dividend changes are inconsistent with different specifications of regressions. Therefore, we conclude that dividends are a poor instrument to explain future earnings changes and should not be relied on when predicting company's future earnings.

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1. Introduction

This study examines one of the very common and unresolved topics in finance despite the large number of studies conducted. We are interested in investigating whether dividend changes can be used as a reliable signal to forecast future earnings prospects. Various prior studies and results have supported the hypothesis that there exists a positive relationship between dividends changes and future profits. According to Miller and Modigliani (1961) investors interpret a change in dividends as a change in management's expectations of the future prospects of the firm in a world with information asymmetry. Asquith and Mullins (1986) suggest that dividends pay-out and repurchases are seen by investors as a measure to deliver information to shareholders that reflect management's view on the firm's performance and future prospects. Many other theorists like Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985) have studied this topic and found evidence to back up this hypothesis. However, other studies have expressed their uncertainty regarding this issue. They could only observe a very limited and insignificant relationship between dividends changes and future earnings such as Benartzi et al. (1997), thereby rejecting the future signalling function of dividends. According to Watts (1973), dividends can at best have trivial expectations of future prospects. Grullon, Michaely and Benartzi (2003) studied if dividend changes can be used as a factor to forecast future profitability. They found that it is better for investors not to use the changes in dividends in their forecasts, as models considering dividend changes do not outperform models that do not consider it as a factor.

The indistinct impact of dividend policy and earnings of the firm leads to the main motivation of this study: To investigate if firms' dividends are capable of predicting future earnings or if dividend payments lack explanatory power in predicting future income. In addition, this study intends to provide investors interested in Nordic stock markets, with a broader and up to date evidence towards dividends changes and their impact on future earnings.

In this study, no consistent relationship between dividends changes and future profitability was identified. The result is consistent with studies conducted by Benartzi et al. (1997), DeAngelo, DeAngelo and Skinner (1996), and Grullon, Michaely and Benartzi (2003). Our evidence failed to support the hypothesis tested. The results show that the dividend signalling hypothesis is misleading. We also demonstrate that the changes in dividends should not be considered when

forecasting future profitability. Furthermore, the outcomes of the tests suggest that the Scandinavian companies do not intentionally reduce dividends to spend it on new investment opportunities, instead they use excess cash and short-term borrowings thereby rejecting the residual policy.

This investigation will contribute to the already existing studies in several ways. First, most of the published studies covering this topic are outdated, consequently, we will employ more recent data ranging from 2000 to 2015 reflecting the effect of the economic crisis of 2008 and the inception of the Eurozone. The up-to-date sample will provide us with a recent overview about the relationship between dividend payments and future income. Second, most of the studies used evidence from the US market and very few approached this topic in the Scandinavian market. In general, a large number of companies of the Scandinavian market and especially the higher market-cap companies constituting our sample tend to pay dividends, this fact ensures that the study will be based on an adequate number of observations leading to a higher validity of the tests. Hence, we use a data set of companies based in the Nordic countries. Finally, we will use eight selected control variables to provide a more extensive study. Our methodology will provide an insight on these factors that explain the link between variations in dividends and future performance trends. In addition, our results will provide direct evidence that can help explain some of the important implications resulting from previous studies covering this issue.

The paper is organised as follows. Section 2 presents the discussion of the relationship between dividends and profitability. It also presents an overview of empirical findings and the hypothesis set out in this study. Section 3 introduces data and methodology and displays the summary statistics. Results are presented in Section 4. Section 5 provides a discussion of the results. The final section concludes and summarizes the findings of the analysis.

2. Theory

2.1 The relationship between dividend policy and company's earnings

In this section, the article defines the relationship between dividend policy and company's earnings. It explains dividend signalling and residual dividend hypotheses, followed by an assertion that former has more reliable argumentation than latter. Also, in this section we provide an overview and summary of empirical evidence regarding paper's topic. The section will now proceed to detail the purpose of dividend payments.

Considering dividends pay-out as an important concept in corporate finance we revisit the major aspects of this subject. Dividends pay-out generally aims to compensate return requiring investors, for exposing themselves to the risk of holding the firms' stocks in their portfolios, in addition to sending signals to investors related to the periodic performance of the firm. Martin Feldstein Green (1979) say: "The nearly universal policy of paying substantial dividends is the primary puzzle in the economics of corporate finance". Asquith and Mullins (1986) propose that Management has to anticipate a periodic signal for investors, if it fails to do so it will disappoint the investors' expectations and therefore the price of the stock will fall. Ghosh and Woolridge (1988) suggest that dividend policy has an essential role in the execution and implementation of the investment program or strategy of the firm if managers can support capital projects using adequate internal funds. The study will now commence describing dividend signalling hypothesis.

Dividend signalling

The starting point of dividend signalling hypothesis was Lintner's (1956) dividend smoothing model. Lintner (1956) argues that managers tend to keep dividends stable, and increase them only if they can ensure that they are capable of preserving higher dividend level in the future. The empirical evidence show that dividend smoothing effect is present in the markets: firms tend to keep dividends stable even if their earnings are volatile over the period (Ogden et al., 2003). Also, markets are more sensitive to negative changes in the dividend payments compared to positive changes, which confirms Lintner's management's preference for stabilizing dividends hypothesis (Ogden et al., 2003).

Following the logic that dividends are in most cases paid from company's retained earnings and because managers strive to maintain dividends stable and increase them only if they are confident in keeping them high, it can be concluded that an increase in dividends will convey a signal to the market about an increase in future earnings. Watts (1973) suggest that following Lintner's model, dividends convey information about company's both future and past earnings. Since earnings consist of permanent and transitory components and dividend payments depend on earnings consequently dividends would serve as a substitute for expected future earnings (Modigliani and Miller, 1959). Since dividend and revenue have a surrogate relationship, following dividend stabilisation policy investors will have a good reason to interpret a change in dividends pay-out as a rate of change in company's future profitability (Modigliani and Miller, 1959).

The relationship between dividend policy and company's returns suggests possible dividend signalling from manager's perspective. By increasing dividend payments, managers convey a signal to the market about a permanent shift in firm's earnings (Benartzi et al., 1997). Paying out higher dividends gives a positive perception about the company, suggesting that it certainly has profitable activities that actually generate cash and not only accounting numbers (Asquith and Mullins, 1986). Increasing dividend payments allows the firm to differentiate itself from other companies in the market and urges the management to preserve the good performance in order to sustain the level of residual payments and avoid the costly consequences of dividend cutting (Asquith and Mullins, 1986).

However, to send a reliable dividend signal to the market the firm must devise a credible and affordable signal. The signal has to be higher than the signal of low value firms, to obtain a separating equilibrium (Ogden et al., 2003). To prevent imitation of dividend signal from other inferior rival companies, a firm must bear costs of sending a trustworthy signal. The outlined costs are an increased probability of issuing shares in the future, forgone investment in profitable projects and higher tax burden on dividends compared to capital gains (Ogden et al., 2003). If the company possesses sufficiently large earnings to increase dividend payments without bearing extensive costs of doing so, only then the firm signals to the market its positive changes in future earnings. Therefore, according to dividend signalling theory, an increase in dividend will lead to the increase in company's future returns.

Residual dividend policy

On the other hand, residual dividend theory suggests the opposite intuition about the relationship between dividends and earnings. The theory claims that if a company pays high dividends it shows that it has already exhausted all of its profitable future projects which indicates low expected future earnings. The argument underlying, is that reinvesting firm's profits into its valuable future projects would benefit shareholders more, than reinvesting profits into alternative markets (Keown et al., 2000). Placing company's profits into productive and successful investments help to reduce the transactional costs of reinvesting dividends in other companies. If a firm starts paying high dividends it consequently signals that it has exhausted all its lucrative profits and its future earnings will not grow. According to residual dividend policy, shareholders should receive dividend payments after the firm invests in all the positive NPV projects available from its internal funds (Keown et al., 2000). Following this theory, we would expect that low dividend paying firms would have higher earnings compared to high dividend paying firms.

Reconciliation of dividend and income relationship theory

However, this study reasons that dividend signalling model provides a more reliable argumentation for the relationship between dividend policy and firm's earnings. First, managers of the firms with plentiful reserves of free cash flows have incentives to overinvest (Zhou and Ruland, 2006). By paying high dividends firms can avoid overinvestment and concentrate on high growth projects instead of investing its cash in unprofitable "pet" projects. Jensen (1986) argues that dividend payments can prevent wasting free cash flow on poor investments.

Second, by increasing dividend payments the firm has less retained cash and reduces manager's intention for "empire building". This reduces the conflict of interest with shareholders and reduces the probability of inefficient "empire building" which will most likely bring poor earnings growth in the future (Jensen 1986). Easterbrook (1984) adds that the dividend policy can decrease agency costs because regular payments require the managers to raise capital. Finally, companies that attempt to mimic the signal of the firms with good future prospects will experience high costs in the future. If a firm decides to manipulate its dividends, it is likely to be exposed in the future by investors and could face liquidity and leverage problems by being unable to keep up relatively high

dividend payments. Accordingly, we would expect that firms increasing their dividend payments, will most likely experience an increase in revenue in the future. The section will now follow with an overview of the empirical evidence.

2.2 Empirical evidence

The pioneers of the investigation regarding the relationship between changes in dividends and changes in earnings were Watts (1973) and Genodes (1978). Watts (1973) regressed next year's earnings on current year's dividends to test whether dividends have any potential in conveying information about revenues. Given the assumption that market participants know that other variables contribute to earnings, the objective was to test if dividends are able to explain significance in future earnings. The results conclude that there exists a positive relationship between the variables, however, the effect was weak and even negative when dividing firms in percentiles (Watts, 1973). Genodes (1978) follows a similar approach by separating dividend increases in quintiles and concludes that dividend payments do not reflect any specific managerial information about the prediction of future income. However, these studies were later criticised by their successors for relying on a small number of observations and failing to control for factors that can cause spurious relationships between changes in dividends and earnings (Benartzi et al., 1997).

The studies that followed the initial analyses could be divided into two groups: Researches that found a positive relationship between dividend payments and future income, and studies that prove a non-existent relationship between the variables.

The positive relationship between dividends and earnings are documented by Nissim and Ziv (2001). Differently from other studies they show that change in earnings as a dependent variable should be deflated by the book value of common equity instead of market value of equity. Also, the authors account for heteroscedasticity and autocorrelation in the regression residual by adding earnings as a control variable. They found a positive relationship at least for the first two years of post-dividends pay-out, but only in the case where dividend changes were increasing. They could not obtain the same results for both directions of dividend changes as their results suggested a negative relationship between dividend decrease and future earnings (Nissim and Ziv, 2001).

Manakyan and Carroll (1990) showed similar results as Nissim and Ziv (2001). They attempted to test dividends and earnings relationship using the Granger test of causality and non-parametric tests. The Granger test consists of estimating two equations relating market earnings and market dividends using the same variables, which include lagged values of the dependent variable, in both equations. They find that unexpected changes in dividends cause short term earnings to vary consistently with the signal's direction for at least two quarters following the signalling.

The support for earnings predictability given current dividends is also documented by Arnott and Asness (2003) and Zhou and Ruland (2006). Both articles use earnings growth as dependent variable instead of a change in earnings, in addition to this Arnott and Asness (2003) use dividend pay-out ratio instead of a change in dividends as independent variable. Furthermore, Zhou and Ruland (2006) concentrate on company-level analysis, while Arnott and Asness (2003) study uses aggregate level analyses based on index listed companies. Both articles find a positive and significant correlation between future earnings and current dividends for both univariate and multivariate analysis, but negative and significant relationship between past earnings growth and dividends (Zhou and Ruland, 2006; Arnott and Asness, 2003). These studies confirm the theory of dividend signalling and contradict the theory of overinvestment.

Contrary to reviewed studies in the literature, there is evidence of a non-existent relationship between dividends and firm's income. Benartzi et al. (1997) use similar approach as Nissim and Ziv (2001) by using a large sample and controlling for spurious relationships, however, differently from its counterpart they deflate change in earnings by the market value of equity. They matched the earnings of firms which change dividends in a given year to those that do not and which operate in the same industry therefore controlling for possible industry trends. They also adjust for a possible earnings drift by subtracting from firms' earnings the five-year earnings drift before comparing the firms. Their results show that firms that increase dividends in current year, encounter an increase in earnings in previous and current year. Therefore, they conclude that the size of dividend increase does not predict future earnings. Moreover, firms that omit dividends in current period faced a reduction in earnings in previous year and current period; however, they experience significant increases in earnings in next period.

DeAngelo, DeAngelo and Skinner (1996) found no evidence for positive relationship between favourable dividends decisions and increase in future earnings specifically for companies that face a decline in their earnings after nine or more consecutive years of growth. Their evidence helped to verify three hypotheses that support their findings: First managers sometimes do mistakes when they signal high dividends because they have wrong information in hand. Second managers sometimes get over optimistic about the growth of the firm which leads to a false high dividend signalling. This second hypothesis was also identified by Jensen (1993) who suggested that "managerial mind-set and corporate culture" causes a delay in informing managers that a period of high growth is over. The third hypothesis suggests that the reliability of the signal vanishes most of the time because managers make only modest cash commitments (DeAngelo, DeAngelo and Skinner, 1996). In addition, Brav, Graham, Harvey, and Michaely (2005) could identify that managers reject the signalling function of dividends based on surveys and interviews they have conducted with hundreds of financial executives.

Moreover, Grullon, Michaely and Benartzi (2003) criticized Nissim and Ziv (2001) results claiming that the results of the study were biased because their results show completely the opposite after controlling for the non-linear patterns in the behaviour of earnings. They add that the positive relationship spotted may be spurious as Brooks and Buckmaster (1976), Elgers and Lo (1994) and Fama and French (2000) suggest that: "Assuming linearity when the true functional form is nonlinear has the same consequences as leaving out relevant independent variables". The reason for using non-linearity of the relationship is because it is assumed that earnings follow a mean reverting process (Grullon, Michaely and Benartzi, 2003). In their study, they concluded that changes in dividends are negatively correlated with income and are consequently a very poor factor to explain future profitability and earnings (Grullon, Michaely and Benartzi, 2003). The following table summarises the view in the literature about the relationship between dividend changes and future earnings changes.

Table 2.1: Panel A. Summary of studies that confirmed a relationship between dividends and earnings.

Author(s)	Name of the article	Results
Watts (1973)	The Information Content of Dividends	Regressions indicate a positive, but weak relationship between the variables.
Asquith and Mullins (1986)	Signaling with dividends, stock repurchases, and equity issues	Suggest that dividends pay-out deliver information to shareholders that reflect management's view on the firm's performance and future prospects.
Healy and Palepu (1988)	Earnings information conveyed by dividend initiations and omissions	Find a positive relation between abnormal returns around dividend initiations or omissions and subsequent changes in earnings.
Manakyan and Carroll (1990)	An Empirical Examination of the Existence of a Signaling Value Function For Dividends	Dividend signals are followed by changes in earnings in the subsequent two quarters.
Nissim and Ziv (1997)	Dividend Changes and Future Profitability	Finds that dividend changes are positively related to earnings changes in each of the two years after dividends change.
Arnott and Asness (2003)	Surprise! Higher Dividends = Higher Earnings Growth	Proves correlation between dividend pay-out ratio and earnings growth.
Zhou and Ruland (2006)	Dividend Pay-out and Future Earnings Growth	Displays that high dividend paying firms tend to experience strong future earnings. Regression shows for significant and positive future earnings growth.

Table 2.1: Panel B. Summary of studies that denied the relationship between dividends and earnings.

Author(s)	Name of the article	Results
DeAngelo,DeAngelo and Skinner (1996)	Reversal of fortune dividend signalling and the disappearance of sustained earnings growth	Find no evidence for a positive relationship between favourable dividends decisions and increase in future earnings specifically for companies that face a decline in their earnings after 9 or more consecutive years of growth.
Benartzi, Michaely and Thaler (1997)	Do changes in dividends signal the future or the past?	Find support that the size of dividend increase does not predict future earnings. Firms that had an increase in dividends show an increase in earnings during the period preceding and not following the dividend pay-out.
Grullon, Michaely and Benartzi (2003)	Dividend Changes Do Not Signal Changes in Future Profitability	Find that changes in dividends is a very poor factor to explain future profitability and earning.

Following the discussion of the previous literature and empirical evidence the article outlines three main hypotheses:

Hypothesis 1: Companies that increase dividend payments will have a positive income change in the future compared to firms that did not change dividend.

Hypothesis 2: Companies with a larger change in dividends will have larger change in earnings.

Hypothesis 3: Companies that experience a decrease or an omission of in dividends will face a relatively higher change in future earnings than companies experiencing an increase in dividends.

3. Data and Methodology

3.1 Sample and Data

The financial analysis and accounting data of Scandinavian countries were collected from Thomsons Reuters - Datastream 5.1 database. This analysis uses companies listed on OMX Nordic all-share index. The index is composed of a total number of 586 companies, 302 of them are listed on Stockholm exchange, 140 are listed on Copenhagen exchange market, 128 are listed on Helsinki and 16 are listed on Iceland. Where necessary the financial data of firms were reorganised to Euro currency to dispose of currency effects.

In order to be included in the sample a firm must be publicly traded, regularly pay dividends for at least two years and provide sufficient information about its earnings for at least a year prior and after the dividend payments. Furthermore, to avoid any potential influence of outlier observations, in total 1% from both highest and lowest observations in dividend changes and earnings changes were winsorised to the value in 0.5th and 99.5th percentile. After filtering out the data the total sample consists of 7,021 dividend observations and 7,806 earnings observations between 2000 and 2015.

3.2 Description of Variables

The dependent variable in this article is the yearly change between firm's net income before extraordinary items and the preferred dividend, deflated by book value of equity at the beginning of earnings change year: $\Delta E_{i,t} = \left(E_{i,t} - E_{i,t-1}\right)/B_{i,t-1}$, where $E_{i,t}$ denotes earnings in year t, $B_{i,t-1}$ is the book value of common equity for the previous year. This article prefers Nissim and Ziv (2001) recommendation to deflate earnings by the book value of equity, rather than Benartzi et al. (1997) suggestion to deflate by the market value of equity. The reasoning behind this is that deflating our sample by the market value of equity resulted in more volatile observations of earnings changes compared to book value deflator. Moreover, it is shown that deflating earnings by market value of equity results in measurement error that becomes biased against finding information content in dividends (Nissim and Ziv, 2001).

In this study, we use percentage change in annual dividend payments to capture the effect of dividends change. We define it as: $\Delta DIV_{i,t-x} = \frac{D_{i,t-x} - D_{i,t-x-1}}{D_{i,t-x-1}}$, *x=1,2* where $\Delta DIV_{i,t-x}$ is annual change in dividends at period x before current time t, $D_{i,t-x}$ is annual dividend in year *t-x* and $D_{i,t-x-1}$ is annual dividend in year *t-x-1*. By using percentage change in dividends the study reduces the effect of potential share repurchase and isolates the effect of change in dividend payments. We did not apply dividend pay-out ratio to measure the effect of dividends as recommended by Arnott and Asness (2003). We believe that the ratio is sensitive to industry and economic cycles, and it is therefore, a poor measure of dividend signals. Hence, we believe that our definition is more suitable for this type of study.

Table 3.1 shows the frequency of dividend changes between 2000 and 2015. During the investigated period we could identify 2,819 instances of dividend increases, 1,196 cases of dividend decreases and 3,006 observations of no change in dividend payments. The table displays a sharp decrease in dividend payments in 2003, 2009, 2010 and 2014. Moreover, a gradual increase in dividend paying firms can be seen throughout the years. However, this does not necessarily mean that Nordic countries begun initiating dividend payments, it is solely an effect of this chosen sample in which some firms initiated their dividend payments only at a later point of the sample. Also, our chosen data is sensitive to survivorship bias. We exclude bankrupted companies from our data which lead our results to be biased towards better performing companies.

Table 3.1 Frequency of Dividend Changes by Year (n=7,021). This table shows a number of increases, decreases and no change in dividend payments in our total sample as well as over each year from 2000 to 2015.

Year	Number of Increases	Number of No Change	Number of Decreases	Total
2000	161	102	50	313
2001	153	138	60	351
2002	94	228	54	376
2003	115	187	86	388
2004	161	199	32	392
2005	170	170	58	398
2006	210	170	28	408
2007	235	148	40	423
2008	206	204	42	452
2009	61	178	236	475
2010	170	196	119	485
2011	250	198	44	492
2012	212	225	64	501
2013	220	207	85	512
2014	157	233	128	518
2015	244	223	70	537
Total	2,819	3,006	1,196	7,021

This study applied eight control variables to support the explanation of the relationship between changes in dividend payments and changes in earnings. The choice was based on the availability of the data, the theoretical reasoning behind the variables, recommendations from previous studies and empirical results. The analysis believes that the chosen control variables are the most capable in motivating the effect on earnings. Below we present each control variable and motivation regarding its usage.

- Return on equity (ROE): Nissim and Ziv (2001) argues that ROE is probably the most important control variable in this type of study. They show that ROE has a good fit in the relationship between dividends and earnings. Freeman, Ohlson and Penman (1982) agrees as well that an important predictor of earnings changes is ROE. This ratio is mean reverting and high ROE implies expected decrease in earnings. Since dividend changes are positively correlated with current ROE, the expected change in earnings is likely to be negatively correlated with dividend change.

- Return on assets (ROA): Zhou and Ruland (2006) in a similar study which is related to dividend changes and earnings growth argues that ROA is negatively related to earnings. In their study they controlled for ROA, arguing that if profitability is high, companies should find it hard to demonstrate strong earnings growth, therefore ROA should be negatively correlated to earnings.
- Gross Margin (GMA): It represents the percentage of total sales that the company retains after incurring direct cost of production. We expect this variable to be positively correlated with dividends and earnings. Ou and Penman (1989) shows that gross margin is positively and significantly related to earnings.
- Percentage change in sales (CHS): It is another control variable that we believe is capable of explaining the change in earnings. Keeping income statement items constant we would expect changes in sales to be positively related to net income. Benartzi et al. (1997) and Ou and Penman (1989) suggest a similar idea. Ou and Penman show that change in sales is positive and significant predictor of earnings.
- Percentage change in depreciation (CHD): In this study we also added a control variable of percentage change in depreciation. Intuitively higher depreciation costs lead to lower net income. Ou and Penman (1989) find a support that change in depreciation leads to a negative and significant relationship for earnings.
- Operating income to total assets ratio (OTA): Following financial constraints and residual hypotheses we would expect to find small size firms with high growth and no dividend payments and large firms with low growth and high dividend payments. Therefore, we would expect operating income to total assets ratio to have a negative impact on earnings. Ou and Penman (1989) finds mixed results for a direction of the causality for this variable.
- Cash dividend as a percentage change of cash flow (CDIV): It is another control variable that is used in this study. Ou and Penman (1989) argues that this ratio is positive and significant to net income.
- Leverage D/E (DET): Intuitively more leveraged firms tend to have higher preference payments to debtholders, they have fewer dividends and earnings to pay to shareholders, therefore, we suggest a negative relationship between leverage and net income. Ou and Penman (1989) finds that D/E ratio is negative and significant to earnings in their sample.

3.3 Summary Statistics

Summary statistics for the dependent and independent variable are presented in table 3.2. Dividends increasing firms have a slightly higher median of percentage change in earnings than dividend decreasing firms, however, the mean shows opposite results. We compare the summary statistics with Benartzi et al. (1997) sample. We notice that the spread of change in earnings in their sample is larger than in ours. Furthermore, it is interesting to notice that the increase in dividends has a similar distribution of the sample to Benartzi et al. (1997), however, the sample in this study has less negative values in dividend decreases. This is because our sample limits dividend decreases to -1 (100%), due to the nature of the applied dividend percentage change formula. Also, to avoid losing observations due to denominator being 0 when firm increases its dividends in t_0, we denote all the initiations of dividends as 1 (100%).

We also notice differences when compared with Nissim and Ziv article (2001). Our sample captures more disperse dividend increases and decreases. Also, our sample reports higher mean in dividend increases, decreases and all dividend events. This mismatch potentially could be due to the different definition of change in dividend payments in Nissim and Ziv (2001) article.

Table 3.2 Descriptive Statistics for Dividend Event Observations. The top horizontal line in the table displays change in dividend payments, the bottom line shows change in earnings. The table shows mean, standard deviation (SD), 10%, 25%, 75%, 90% of distributions and median.

	Mean	SD	10%	25%	Median	75%	90%
				Dividend Decreases (N=1,196)			
ΔDividends	-0.4905	0.3568	-1.0000	-0.9372	-0.4258	-0.1547	-0.0667
ΔEarnings	0.0221	0.2810	-0.1855	-0.0672	0.0079	0.0804	0.2095
				Dividend Increases (N=2,819)			
ΔDividends	0.5963	1.0456	0.0667	0.1250	0.3000	0.8333	1.0000
ΔEarnings	0.0184	0.2094	-0.1282	-0.0356	0.0141	0.0624	0.1424
				No Change in Dividends (N=3,006)			
ΔDividends	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ΔEarnings	0.0971	0.5486	-0.2366	-0.0706	0.0185	0.1223	0.4214
				All dividend events (N=7,021)			
ΔDividends	0.1559	0.7874	-0.3333	0.0000	0.0000	0.2000	0.8333
ΔEarnings	0.0545	0.4221	-0.1848	-0.0548	0.0146	0.0842	0.2461

Table 3.3 Cross-Correlation Matrix of All Control Variables. The table shows correlation between change in earnings as dependent variable (ΔE), change in dividends as independent variable (ΔDIV) and eight control variables. Definition of control variables is presented in section 3.2.

	ROA	ROE	OTA	GMA	ΔE	ΔDIV	DET	CHS	CHD	CDIV
ROA	1.0000									
ROE	0.5537	1.0000								
OTA	0.6864	0.4107	1.0000							
GMA	0.2154	0.1160	0.2505	1.0000						
ΔE	0.1054	0.0845	0.1122	0.0547	1.0000					
ΔDIV	0.0613	0.0251	0.0510	-0.0272	-0.0826	1.0000				
DET	-0.1066	0.3920	-0.1186	0.1200	0.0032	-0.0266	1.0000			
CHS	0.0897	0.0511	0.1073	0.0525	0.0711	0.0041	-0.0055	1.0000		
CHD	-0.0049	-0.0039	0.0094	0.0353	0.0566	-0.0034	0.0145	0.5297	1.0000	
CDIV	0.0982	0.0470	0.0338	0.0168	-0.0157	0.0442	-0.0035	-0.0184	0.0053	1.0000

The cross-correlation matrix represented by table 3.3 suggests that there is a moderate positive relationship between ROE and ROA and between CHD and CHS and a stronger one between ROA and OTA. The correlation matrix does not show any multicollinearity between the control variables: Following the rule of thumb (>0.8) by Brooks (2014). Therefore we decided to include all displayed variables in our regressions.

4. Results

In this section we will present our results that we produced from Welch's t-test, pooled data regressions and cross-sectional regressions. The relationships between changes in dividends and changes in earnings will be presented in the tables 4.1-4.7 and robustness test are presented in tables 4.8-4.11.

4.1 Welch's t-test

We divide our empirical testing into two parts. In the first part we replicate the Welch's t-test conducted by Benartzi et al. (1997). We test the relationship between the current year dividend changes against the change in earnings for 6 different periods: the current year, the two years preceding the dividend declaration and the three years following the dividend change. For each of the test periods we divide our sample into 8 categories. Firms experiencing dividend increases are separated into five equal quintiles with quintile 5 being the category with the highest dividend increase and quintile 1 with the lowest dividend increase. The other three categories represent the firms that have experienced a cut to zero in dividend payments, a dividends decrease or no change in dividends. The Welch's t-test table (Table 4.1) represents the test results, it shows the mean of the earnings changes for all firms during the testing period.

Table 4.1: T-test Results. This table presents changes in earnings in the two years before dividend changes, current year and three years after dividend changes. Each firm-year in the sample is categorized into either one of the dividend increasing quintiles, no change in dividends, dividend reduction or dividend cut to zero. Results can be interpreted as a percentage change, i.e. dividend cut to zero leads to -3.97% change in earnings at year -2. All the presented results are statistically significant at 1% confidence level.

Dividend Change	Year -2	Year -1	Year 0	Year +1	Year +2	Year +3
Dividend cut to zero	(0.0397)	(0.0701)	0.0529	0.1569	0.0661	0.0339
Decrease	0.0217	(0.0340)	0.0119	0.0368	0.0308	0.0164
No change	0.0696	0.0753	0.0971	0.0899	0.0908	0.0872
Increase : Q1	0.0280	0.0057	0.0077	0.0230	0.0150	0.0224
Increase : Q2	0.0413	0.0359	0.0117	0.0045	0.0107	0.0424
Increase : Q3	0.0482	0.0489	0.0250	(0.0005)	0.0283	0.0175
Increase : Q4	0.0483	0.0878	0.0130	0.0176	0.0093	0.0329
Increase : Q5	0.0810	0.1269	0.0345	(0.0232)	0.0464	0.0453

The t-statistics of the tests are all significant at the 1% confidence level suggesting the presence of a non-systematic relationship between dividend changes and earnings changes for all periods. Concerning the mean results interpretation we find that our results are consistent with the Benartzi et al. (1997) results, as no incremental increase or decrease in earnings could be explained by the dividend changes in neither present earnings nor future earnings for the subsequent 3 years. The mean of earnings for the four periods ($t_0, t_{+1}, t_{+2}, t_{+3}$) is positive in the case of a dividend cut to zero and a dividend decrease. Moreover, it does not follow an increasing trend with the magnitude of the dividend increase, for instance for the periods (t_{+1}, t_{+2}) the mean for quintile 2 is lower than quintile 1 and for t_{+1} the mean is negative for quintiles 3 and also 5 which represents the quintile with the highest increase in dividends.

Our study also tests the relation between dividend changes and the previous two years earnings which was not tested by Benartzi et al. (1997). The results show that the means of past earnings for t_{-1} and t_{-2} is actually negative when they are followed by a dividend cut to zero in year 0. In addition the means of past earnings are incrementally increasing for the t_{-1} and t_{-2} over the five quintiles when they are followed by a dividend increase in t_0. These results confirm the hypothesis suggested by Grullon, Michaely and Benartzi (2003), DeAngelo and Skinner (1996) and Benartzi et al. (1997) that dividends do not possess explanatory power for future earnings, but more likely rely on past dividends.

In table 4.1 we also notice that keeping dividends stable for year zero results in higher earnings change for the year itself and for the three following periods (t_{+1}, t_{+2}, t_{+3}) when compared with dividend increase, decrease and omission. This suggests that stable dividend payments leads to largest future profitability for companies in our sample

The results of the Welch's t-test advocate that we reject our 1st hypothesis. We notice that dividend non-changing firms have higher future earnings than dividend changing firms. We also reject 2nd hypothesis for future periods, since we notice that larger dividend changes do not lead to larger earnings changes. However, we accept this hypothesis for both past periods.

4.2 Regression of Future Earnings Change on the Dividend Change

In order to get a better sense of the results for the Welch's t-test we move on to the second part of our testing. In this part we reproduce OLS tests conducted by Nissim and Ziv (2001). In their study Nissim and Ziv (2001) tested the relationship between the changes in earnings between years t and t_{-1} deflated by market value of equity at the beginning of the dividend change year and the change in dividend per share for $t - x$ as shown in equation 1:

$$\frac{(E_{i,t}-E_{i,t-1})}{MV_{i,t-1}} = \alpha_0 + \alpha_1 \Delta DIV_{i,t-x} + \varepsilon_{i,t},\ x=1,2 \qquad \text{(eq. 1)}$$

Differently from Nissim and Ziv (1997) this study normalizes the change in earnings by book value instead of market value of equity to reduce the volatility of the earnings and avoid biases against finding information content in dividends as motivated in section 3.2. In this analysis we start our testing with equation 2:

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_1 \Delta DIV_{i,t-x} + \varepsilon_{i,t},\ x=1,2 \qquad \text{(eq. 2)}$$

Table 4.2 Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Change. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=0		t=1		t=2	
	Coefficient	t-Statistic	Coefficient	t-Statistic	Coefficient	t-Statistic
Intercept	0.0511	10.3983	0.0563	11.2335	0.0554	10.6460
ΔDiv	0.0053	0.8717	-0.0332	-5.2609	-0.0071	-1.0785
R^2	0.0001		0.0044		0.0002	
N	6,832		6,328		5,834	

Inconsistently with Nissim and Ziv (2001) our results from pooled regression in table 4.2 show that the coefficient ΔDiv for dividend change is negative for t_1 and t_2 when deflating the change in earnings by the book value instead of the market value of equity; therefore rejecting the measurement error in the dependant variable hypothesis of Nissim and Ziv (2001). The t-statistics is insignificant for t_0 and t_2, however, the results propose a significance for t-statistics at t_1.

Furthermore, the R-squared for all periods are negligent suggesting that the dependent variable in this case has a very weak explanatory power for earnings. Similar conclusion was reached in previous studies, consequently, these results once more confirm Benartzi et al. (1997) results, that dividend changes are not reliable indicators of future earnings at least for the two years following dividend change. The results show that higher dividends lead to negative future earnings which denies the dividend signalling hypothesis.

In order to make sure that the coefficient of our causal variable does not suffer from bias of omitted variables, we introduce control variables that are related to earnings to the previous regression. The reason behind the use of each control variables is motivated in section 3.2. Nissim and Ziv (2001) considered using ROE as their only control variable based on the evidence of Freeman, Ohlson and Penman (1982) study which finds ROE to be an important predictor of earnings changes. In order to compare the results with Nissim and Ziv (2001) we firstly run equation 3 with ROE for the period t_{-1} as a control variable.

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_1 \Delta DIV_{i,t-x} + \alpha_2 ROE_{i,t-1} + \varepsilon_{i,t},\ x=1,2 \qquad \text{(eq. 3)}$$

Table 4.3 Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Change and ROE as Control Variables. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0735	16.6771	0.2321	6,233	0.0736	16.1329	0.2313	5,749
ΔDiv	-0.0057	-1.0337			0.0095	1.6523		
ROE	-0.0046	-42.9714			-0.0046	-41.5637		

The results in table 4.3 show that the coefficient ΔDiv for dividend change is negative and not significant at t_1 contrary to Nissim and Ziv (2001) but positive and significant at the 10% confidence level for t_2. As for the ROEt_{-1} coefficient the results are very similar to Nissim and Ziv (2001) showing a negative and significant relationship for both periods (t_1 and t_2) confirming the ROE prediction of earnings changes hypothesis. Our results also show a higher R-squared than Nissim and Ziv (2001) suggesting a better fit of the model. Once more the results contradict Nissim

and Ziv (2001) and reject any relationship between changes in earnings and changes in dividends for the year following the dividend change and feature a minor informative effect for the second year following the dividend change.

In order to strengthen the certainty of our results to the previous regression in addition to ROE we add all the control variables which have an impact on earnings as presented in the section 3.

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_1 \Delta DIV_{i,t-x} + \alpha_2 ROE_{i,t-1} + \alpha_3 ROA_{i,t-1} + \alpha_4 GMA_{i,t-1} + \alpha_5 CHS_{i,t-1} + \alpha_6 OTA_{i,t-1} + \alpha_7 CDIV_{i,t-1} + \alpha_8 DET_{i,t-1} + \alpha_9 CHD_{i,t-1} + \varepsilon_{i,t}, \; x=1,2 \qquad \text{(eq. 4)}$$

Table 4.4 Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Change and All Control Variables at t=1 and t=2. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0237	3.3993	0.1657	2,848	0.0198	2.7564	0.1677	2,659
ΔDiv	-0.0046	-1.1244			0.0099	2.4981		
ROE	-0.0023	-6.0796			-0.0026	-6.7580		
ROA	-0.0078	-8.8639			-0.0075	-8.1609		
GMA	0.0003	1.4870			0.0002	1.4269		
CHS	-0.0080	-1.8237			-0.0072	-1.5946		
OTA	0.6788	11.9083			0.6955	11.4966		
CDIV	-5.23E- 05	-4.1524			-5.50E- 05	-4.4053		
DET	0.0262	6.1445			0.0306	6.9755		
CHD	0.0031	1.6840			0.0027	1.4236		

The results in table 4.4 are consistent with our previous findings, the coefficient ΔDiv for dividend change is still negative and not significant at t_1 and still positive and significant for t_2 The new findings of this regression is that all the control variables introduced behaved well in the model since their coefficients are significant and hold the proper sign relative to the variable's relationships with the change in earnings as described in section 3.2.

4.3 Adjusted Regression of Future Earnings Change on the Dividend Change

This study performed autocorrelation, heteroscedasticity and normality tests on equations 3 and 4 and concluded that the implemented regressions suffers from heteroscedasticity and autocorrelation. Nissim and Ziv (2001) spotted the same problem and suggest that the positive relationship between dividend changes and change in earnings for the second year following the dividend change may be caused by the autocorrelation in the change in earnings series. To test if dividend change has an incremental effect on future earnings in the dividend change year this article follows similar approach as Nissim and Ziv (2001). We add the change in earnings deflated by the book value of equity from the previous year as an additional control variable to control for autocorrelation. More specifically we define: $EAR_{i,t-x} = \frac{E_{i,t-x}-E_{i,t-x-1}}{B_{i,t-x-1}}$, *x=1,2*, here $E_{i,t-x}$ denotes firm's net income before extraordinary items and the preferred dividend in year t lagged by x periods and $B_{i,t-x-1}$ is the book value of common equity for the previous year lagged by period x. In addition, since the effect between dividend changes and earnings changes is not symmetric for dividend decrease and dividend increase, in this study we assign two different coefficients for the dividend increase and decrease variables. DPC and (DNC) are dummy variables which take the value of 1 if dividend increase or (decreases) or 0 otherwise. Equation 5 is then tested and the results are reported in table 4.5:

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_{1p}DPC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_{1n}DNC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_2 ROE_{i,t-1} + \alpha_3 EAR_{i,t-x} + \varepsilon_{i,t},\ x=1,2 \qquad \text{(eq. 5)}$$

Table 4.5 Adjusted Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and ROE Control Variable. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0743	15.2797	0.2452	6,214	0.0637	11.2294	0.0316	5,652
DPC*ΔDiv	0.0034	0.5657			-0.0164	-2.3265		
DNC*ΔDiv	-0.0456	-2.5703			0.0148	0.7177		
ROE	-0.0052	-42.9532			0.0007	10.4007		
EAR	-0.0403	-3.5464			-0.1146	-8.4670		

The results in table 4.5 show that the coefficient DPC*ΔDiv for dividend increase is positive and insignificant for the period t_1 and negative and significant for the period t_2. The coefficient DNC*ΔDiv for dividend decrease is negative and significant for the period t_1 which means that dividends increase leads to a decrease in earnings. DNC*ΔDiv for dividend decrease is positive and insignificant for the period t_2. Moreover, one can notice that R-squared for t_1 is higher than in Nissim and Ziv (2001) study, which suggest that our model fits better, however, it is opposite for t_2. These results build up on our previous findings assuring that dividend changes have inconsistent explanatory power for future earnings questioning if dividends have any explanatory power at all for the two years following the dividend change.

To strengthen our results we once more add all the control variables to the regression which is adjusted for heteroscedasticity, autocorrelation and involves dummy dividend variables as presented in equation 6. The results are presented in table 4.6:

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_{1p}DPC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_{1n}DNC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_2 ROE_{i,t-1} + \alpha_3 EAR_{i,t-x} + \alpha_4 ROA_{i,t-1} + \alpha_5 GMA_{i,t-1} + \alpha_6 CHS_{i,t-1} + \alpha_7 OTA_{i,t-1} + \alpha_8 CDIV_{i,t-1} + \alpha_9 DET_{i,t-1} + \alpha_{10} CHD_{i,t-1} + \varepsilon_{i,t},\ x=1,2 \quad \text{(eq. 6)}$$

Table 4.6 Adjusted Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and All Control Variables. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0143	1.8999	0.1752	2,848	-0.0439	-8.3437	0.4839	2,620
DPC*ΔDiv	-0.0051	-1.1635			-0.0048	-1.6609		
DNC*ΔDiv	-0.0213	-1.2057			-0.0324	-2.9332		
ROE	-0.0019	-5.0200			0.0033	12.3816		
EAR	-0.1300	-5.7105			-0.2997	-23.3458		
ROA	-0.0062	-6.7112			0.0108	16.9026		
GMA	0.0003	1.5870			0.0001	1.0889		
CHS	-0.0061	-1.3834			0.0151	4.8552		
OTA	0.6003	10.2694			-0.6173	-14.6258		
CDIV	-0.0001	-4.2654			-7.24E- 06	-0.8055		
DET	0.0249	5.8584			-0.0122	-3.8921		
CHD	0.0022	1.2342			-0.0064	-4.9840		

The results in table 4.6 display that both coefficients DPC*ΔDiv and DNC*ΔDiv are insignificant at t_1 while DNC*ΔDiv is significant at 1% level and DPC*ΔDiv is significant at 10% confidence level during the period t_2. On the other hand, we can notice that the coefficients of the variables CHS, OTA, CDIV, DET and CHD during the period t_1 and the coefficient of the variable CDIV during the period t_2 hold the inconsistent sign relative to the variables' relationships with the change in earnings and therefore do not fit the model.

Given that the results of the regression including all the control variables resulted in puzzling results in this section we ran the same regression once more with two main differences. First, we dropped all the control variables that had inconsistent results with the predicted signs and which we believe does not fit the model. Second we winsorised the control variables observations by replacing the 0.5% of outliers from both highest and lowest observations. The regression and its results are reported as follows:

$$\frac{(E_{i,t}-E_{i,t-1})}{B_{i,t-1}} = \alpha_0 + \alpha_{1p}DPC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_{1n}DNC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_2 ROE_{i,t-1} +$$
$$\alpha_3 EAR_{i,t-x} + \alpha_4 ROA_{i,t-1} + \alpha_5 GMA_{i,t-1} + \alpha_6 CHS_{i,t-1} + \alpha_7 OTA_{i,t-1} + \alpha_8 DET_{i,t-1} +$$
$$\alpha_9 CHD_{i,t-1} + \varepsilon_{i,t},\ x=1,2 \qquad \text{(eq. 7)}$$

Table 4.7 Adjusted Regression of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and Relevant Control Variables. In t=1 regression we used only 4 control variables that had consistent signs of coefficients with our equations: ROE, ROA and GMA. In t=2 we excluded CDIV control variable because in the previous regression it did not resulted in consistent coefficient with our expectations. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0749	13.7167	0.2362	5,383	0.0028	0.4118	0.1802	3,336
DPC*ΔDiv	0.0064	0.9751			-0.0134	-2.2185		
DNC*ΔDiv	-0.0443	-2.2686			-0.0320	-1.6303		
ROE	-0.0039	-17.2775			0.0011	3.3839		
EAR	-0.0402	-3.2779			-0.1594	-10.5069		
ROA	-0.0033	-5.9396			0.0126	13.7470		
GMA	0.0003	4.8269			-4.59E- 05	-0.4068		
CHS					0.0256	5.2396		
OTA					-0.8058	-12.2144		
DET					0.0235	6.5478		
CHD					-0.0075	-1.0048		

The results of the winsorised variables in table 4.7 show that all the control variables fit the model adequately for both periods. In addition we can notice that the coefficient DPC*ΔDiv is positive and insignificant while DNC*ΔDiv is negative and significant for the period t_1, and for the period t_2 the results show that DPC*ΔDiv is negative and significant while DNC*ΔDiv is negative and insignificant. These results are close to the adjusted regression with only ROE control variable in place. The results suggest that there might exist a negative relationship between dividend decreases and earnings changes in t_1 and negative relationship between dividend increases and earnings changes in t_2. However, the results are inconsistent with theoretical evidence which rejects once more our 1st hypothesis - the relation between dividend changes and future earnings. Although,

the results confirm 3rd hypothesis, since we notice that dummy variable of negative dividend change has larger coefficients than positive dividend change.

4.4 Robustness Checks

To check robustness the paper runs additional cross-sectional regression (equation 8) including dependent variable as currency adjusted firm's raw net income before extraordinary items and the preferred dividend earnings, deflated by book value of equity. As independent variables the study includes dividend dummy variables in periods t_0 and t_{-1}, market value of equity (MV), book value of equity (BV) and previous years' raw earnings deflated by book value of equity (EARR). Here raw earnings are defined as: $EARR_{i,t-x} = \frac{E_{i,t-x}}{B_{i,t-x}}$,*x=1,2*. The regression and its results are reported as follows:

$$\frac{(E_{i,t})}{B_{i,t}} = \alpha_0 + \alpha_{1p} DPC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_{1n} DNC_{i,t-x} * \Delta DIV_{i,t-x} + \alpha_2 EARR_{i,t-x-1} + \alpha_3 BV_{i,t-1} + \alpha_4 MV_{i,t-1} + \alpha_5 DIV_{i,t-1} + \alpha_{6p} DPC_{i,t-x-1} * \Delta DIV_{i,t-x-1} + \alpha_{6n} DNC_{i,t-x-1} * \Delta DIV_{i,t-x-1} + \alpha_7 EARR_{i,t-x} + \varepsilon_{i,t} \text{ , } x=1,2 \quad \text{(eq. 8)}$$

Table 4.8 Regression of Future Earnings, Deflated by Book Value of Equity, on the Dividend Dummies, Market Value of Equity, Book Value of Equity and Earnings. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. DPC*ΔDiv-1 is positive change in dividends in the previous period, DNC*ΔDiv-1 is negative change in dividends in the previous period. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R2	N	Coefficient	t-Statistic	R2	N
Intercept	0.0654	11.1400	0.0251	5,729	0.0661	10.6051	0.0234	5,232
DPC*ΔDiv	-0.0232	-3.4134			-0.0143	-1.9474		
DNC*ΔDiv	-0.0640	-3.1315			-0.0071	-0.3304		
EARR t-x-1	-0.0501	-3.1649			-0.1566	-11.0058		
BV -1	0.0068	1.9217			0.0000	-0.0090		
MV -1	0.0000	-1.8412			0.0000	-1.4506		
DIV -1	-0.3447	-0.1853			-0.2656	-0.1407		
DPC*ΔDiv-1	0.3187	0.1713			0.2596	0.1375		
DNC*ΔDiv-1	0.3422	0.1839			0.2621	0.1388		
EARR t-x	-0.1378	-10.2456			-0.0036	-0.2073		

Results in table 4.8 show that changing the specification of the previous regressions by substituting the dependant and independent variables may constitute a robustness test for our results. By getting consistent results with previous regressions we can assure that our results are insensitive to changes in definition of regression. It is evident that in t_1 , the dummies of t_0 dividend increase and decrease are significant and negative. In period t_2 only increase in dividend dummy is significant and negative. These results are consistent with the results obtained in previous regressions confirming that our results are robust for this data.

We also check robustness individually for Sweden, Denmark and Finland. We re-run equation 6 by removing currency affects, but we continue to adjust for autocorrelation. Also, we employ all the control variables discussed in section 3.3. The results are presented in tables 4.9-4.11.

Table 4.9 Relationship of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and All Control Variables for companies listed in Sweden. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0459	4.7318	0.3229	1,356	0.0688	5.9586	0.1950	1,231
DPC*ΔDiv	0.0046	0.1760			-0.0276	2.7745		
DNC*ΔDiv	-0.0209	-2.4830			0.0170	0.5338		
ROE	-0.0002	-0.6500			0.0003	0.5315		
EAR	-0.0317	-1.0146			-0.5012	-14.719		
ROA	-0.0172	-14.213			-0.0069	-4.5088		
GMA	0.0009	4.5062			0.0005	2.1134		
CHS	0.0298	2.6812			-0.0312	-2.4269		
OTA	0.8736	10.934			-0.1292	-1.2874		
CDIV	-0.0001	-2.5578			-0.0001	-3.1120		
DET	0.0179	3.3843			0.0156	2.3984		
CHD	-0.0106	-1.8086			0.0143	2.0590		

Table 4.10 Relationship of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and All Control Variables for companies listed in Denmark. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	-0.0169	-0.9876	0.1636	584	0.0478	2.2537	0.1638	542
DPC*ΔDiv	-0.0088	-1.4021			-0.0142	1.8590		
DNC*ΔDiv	-0.0142	-0.3608			0.0058	0.1215		
ROE	-0.0036	-3.7505			-0.0045	-3.8181		
EAR	-0.2302	-5.6982			-0.4443	-8.9613		
ROA	0.0029	1.5583			0.0022	1.0239		
GMA	-0.0003	-0.9409			-9.26E-05	-0.1655		
CHS	0.0195	1.2258			-0.0431	-0.9747		
OTA	0.5514	4.4262			0.2612	1.5204		
CDIV	4.24E-05	0.4745			-0.0001	-1.3839		
DET	0.0251	2.9876			0.0255	2.4758		
CHD	-0.0589	-1.6215			-0.0467	-1.0296		

Table 4.11 Relationship of Future Earnings Change, Deflated by Book Value of Equity, on the Dividend Dummies and All Control Variables for companies listed in Finland. Here DPC*ΔDiv is positive change in dividends, DNC*ΔDiv is negative change in dividends. The critical values for t-statistics regressions are 1.645 for 10% level 1.960 for 5% level and 2.576 for 1% level.

	t=1				t=2			
	Coefficient	t-Statistic	R^2	N	Coefficient	t-Statistic	R^2	N
Intercept	0.0376	2.2890	0.1573	890	0.0702	3.1449	0.2008	822
DPC*ΔDiv	0.0044	0.4253			-0.0044	-0.3104		
DNC*ΔDiv	-0.0546	-1.8437			-0.0103	-0.2506		
ROE	-0.0052	-5.2456			-0.0069	-5.1275		
EAR	-0.1128	-1.9658			-0.7318	-12.349		
ROA	3.49E-05	0.0147			0.0072	2.1721		
GMA	7.63E-05	0.2080			-0.0001	-0.2241		
CHS	0.0520	1.4459			-0.1136	-2.4535		
OTA	0.4689	3.9676			-0.0956	-0.5884		
CDIV	-5.28E-05	-0.7184			4.85E-05	0.4377		
DET	-0.0056	-0.4897			0.0150	0.9630		
CHD	-0.0853	-3.8665			0.0851	2.8705		

The results for companies registered in Sweden shows that the coefficient DPC*ΔDiv is positive and insignificant while DNC*ΔDiv is negative and significant for the period t_1, and for the period

t_2 the results show that DPC*ΔDiv is negative and significant while DNC*ΔDiv is positive and insignificant. This suggests that firms which decreased dividend payments, had around 2.09% lower profits in next period. While the companies that increased their dividend payments, had around 2.76% lower profits in two years after initial dividend change.

The analysis of Danish companies suggest that all changes in dividend payments resulted in negative future earnings, however, these results are insignificant in our tests. On the other hand, in period t_2 the results show that DPC*ΔDiv is negative and significant while DNC*ΔDiv is positive and insignificant. This advocates that Danish companies that increased dividend payments, had around 1.42% lower earnings in two years after initial dividend change.

Finally, the results from companies in Finland show similar results to those of companies based in Denmark. In t_2 the results show that both positive and negative changes in dividends resulted in negative coefficients, however, the results are statistically insignificant. Although, companies that decreased their dividend payments had around 5.46% lower profits next year.

5. Discussion

This section will analyse obtained results from the regression analysis and discuss the hypothesis stated in the introduction. Our study found limited support for this topic. The results show that changes in dividends can explain next year's downward dividend changes and the following two year's upward dividend changes. Although contrary to the expectations in this article, the coefficients of results show a positive relationship between dividend changes and earnings changes during the following year, however, a negative relationship between dividend changes and earnings changes during the following two years. This hardly supports dividend signalling theory or residual dividend policy and prompt to question the reasoning behind the inconsistencies in results.

One of the explanations of the difference in results is that empirically firms generally do not follow dividend residual policy. Based on managers' responses to surveys Smith (2009) argues that theoretical approach of dividend signalling and residual policy is largely coincidental and not intended company's policy. It is argued that instead of reducing dividends due to new investment opportunities, as suggested by the theory, firms are more likely to build up cash balances or use short-term borrowing to fund future investments (Smith, 2009). Furthermore, relying on data from European banking industry, Basse et al. (2014) argue that dividend signalling is not anymore a relevant economic phenomenon. They show that, for example, a reduction of dividends only theoretically signals future problems, but this does not empirically hold. Consequently, it could be argued that residual dividend policy has lost its empirical power in explaining the relationship between dividends and earnings and this is reflected in our results.

Another possible explanation for the inconsistency in results is that this study captured changes in variables during the 2008-2009 financial crisis. It might be the case that external factors rather than internal management decisions in the company heavily contributed to the change in dividend payments and changes in earnings. Bliss et al. (2015) argue that exogenous shock to the supply of credit during the credit crisis led firm's management to revise pay-out policies for their firms. During the crisis, a vast majority of companies were more inclined to reduce dividend payments and use the proceeds to maintain cash levels or fund investments (Bliss et al., 2015). Consequently, the effect of the financial crisis might have impacted our data sample.

Furthermore, another major factor that possibly altered the results is the country of origin of the data and the market cap of the firms considered. As previously discussed most of the published literature have considered samples from the US, where it is very common to declare dividends every quarter instead of every year as in Scandinavia. This fact suggests that dividends in the US are subject to higher volatility because the dividend decision can vary several times a year depending on several factors most importantly the overall economic situation of the country and the market cap considered.

Another important point is the difference in taxation and currency between the US and the Scandinavian countries. Taxes on capital gains and dividends are not homogenous in the US and the Scandinavian countries, which suggests that taxes can play a role in dividends fluctuations and therefore could affect the tests results. The four Nordic countries considered in this study use different currencies. While the US Dollar is known to be the most used currency in international transactions and the world's primary reserve currency, Finland uses the Euro and Denmark's Krona is pegged to the Euro. On the other hand, the Swedish Krona is independent of Euro and the Icelandic Krona is a low-volume world currency that is also independent of Euro. This diversity in currencies and their different relationship with the Euro for the countries considered in our sample creates a higher volatility in dividends variations especially during volatile market climates in comparison with the US Dollar which is considered to be more stable. The currency effect unquestionably is a factor that influences dividend decisions and therefore can be an additional reason for getting inconsistent results compared with previous literature. We conclude that the type of data has an impact on results, more precisely the origin of the country where companies are listed may impact the effect of dividends on future earnings.

This thesis identifies several weaknesses of this investigation and provides recommendations for future studies. First, as previously noted the countries constituting our sample have different macroeconomic dependency factors that drive their economy, for instance, the Norwegian market is mainly dependent on oil while the other countries like Sweden's and Denmark's economy is mostly driven by manufacturing and trading. Later studies should consider the macroeconomic factors that drive the economy when conducting similar studies due to the effect of such factors on

the volatility of the stock market return and profitability. In addition to that, the data collected for this sample is focused mainly on large companies in the Scandinavian region. This has resulted in a biased analysis towards large listed companies. The future studies of the Scandinavian region should include a more diverse sample of firms, regardless of their size. Furthermore, compared to other studies, our sample consists of proportionally more instances in dividend increases than in similar studies. In other words, our sample is more prone to capture instances of dividend increases when compared with previously conducted studies. It might be a case that the selection of data or the data span contributed to this outcome, therefore it is recommended for future studies to expand data both in terms of time span and a sample of companies. Finally, in this study, we focused on a single definition for change in earnings and change in dividends due to the scope of this study. In our opinion, future studies should employ more extensive definitions of variables. For example, the impact of income growth or revenue growth should be chosen as a dependent variable.

6. Conclusion

This study approaches the relationship between dividends and profits by exploring how pay-out policy can influence the change in future profitability by analysing the evidence from the Scandinavian region. The outcome of this study displays that the pay-out policy does not possess the ability to explain future earnings. We failed to find significant and consistent relationship between dividends and future earnings consistently with previous studies conducted by Benartzi et al. (1997), DeAngelo, DeAngelo and Skinner (1996), and Grullon, Michaely and Benartzi (2003) regarding this subject.

The regression tests showed that changes in future profitability should be due to other macroeconomic factors rather than changes in dividends. Results suggested that dividend pay-out in the Nordic market is not an indicator of how successful the company is, they rather suggest that it can be due to other factors mainly behavioural ones differently from other countries such as the US. In addition, our findings helped to prove that the signalling hypothesis is misleading as changes in dividends were more likely to reflect volatility in past profitability rather than explaining future earnings. Also, our study failed to capture evidence of residual dividend policy as we were not able to find negative consistent relationship between an increase in pay-out policy and firm's profit. Therefore, as suggested by Smith (2009) we conclude that empirically dividend signalling and residual policy is largely coincidental.

On the other hand, our sample t-test statistic suggested evidence of dividend smoothing hypothesis. We observed that the companies which have kept dividends constant experienced a larger change in earnings than those which increased their dividends. This signals that in general market conditions in the Nordic countries have influenced managers to keep dividends constant and invest profitability surplus in the growth of the companies instead of increasing dividends' payments.

Future research may replicate this study and use the same variables for different markets or indices. It would be very interesting to apply this analysis to various countries in order to check if these theories can be applied to some other areas or different behavioural factors can be identified.

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