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Bachelor's Programme in Business

Dividend Changes Information Content

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Bachelor’s thesis
2025

Aalto-yliopisto
Aalto-universitetet
Aalto University

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Title of thesis Dividend Changes Information Content

Programme Bachelor's Programme in Business

Major Finance

Thesis supervisor Professor Matti Keloharju

Date 10.04.2025 **Number of pages** 23 **Language** English

Abstract

Non-professional investors like to invest in companies which increase dividends. But do dividends and specifically dividend changes include new information content about future earnings? Yes, they do. I will show proof in this paper by using regression models to analyse different aspects which may affect the result. Important adjustment to many prior studies that I have used window event approach in this study, while fiscal year approach is often used in other studies. Also, there are some nonlinear relations between dividend changes and market reactions. I created controls to be able to get results from regression models. So, my overall result in this study is that dividend changes have information about future earnings in dividend increases and decreases.

Keywords Dividends, Payout policy, Earnings expectations

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Tekijä Jesse Viertola	
Työn nimi Dividend Changes Information Content	
Koulutusohjelma Kauppatieteiden kandidaatti	
Pääaine Rahoitus	
Työn ohjaaja Professori Matti Keloharju	
Päivämäärä 10.04.2025 **Sivumäärä** 23	**Kieli** Englanti

Tiivistelmä

Ei-ammattimaiset sijoittajat pitävät usein osakkeista, jotka kasvattavat osinkojaan. Mutta sisältävätkö osingot ja erityisesti osinkojen muutokset uutta tietoa tulevista tuotoista? Kyllä, sisältävät. Tässä työssä osoitan tämän todeksi käyttämällä regressiomalleja analysoidakseni eri tekijöitä, jotka mahdollisesti voivat vaikuttaa tuloksiin. Merkittävä ero aiempiin tutkimuksiin on, että olen käyttänyt erilaista lähestymistapaa tässä tutkimuksessa verrattuna moniin aikaisempiin tutkimuksiin, jotka ovat käyttäneet tilikausiin nojaavaa lähestymistä. Lisäksi osinkomuutosten ja markkinareaktioiden välillä on joitain epälineaarisia yhteyksiä. Käytin erilaisia kontrolleja saadakseni tuloksia regressiomalleista. Tämän tutkimuksen johtopäätös on, että osinkomuutokset sisältävät tietoa tulevista voitoista niin osingonkorotusten kuin -laskujen yhteydessä.

Avainsanat Osingot, voitonjakopolitiikka, tuotto odotukset

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1 Introduction

The announcement of dividend changes often creates a strong market reaction. In corporate finance it is one of the strongest empirical findings. However, the reasons behind that phenomenon are not completely understood. There are arguments (Miller & Modigliani, 1961) that dividends changes may reveal managers' (private) information to investors about the company's future earnings prospects. Overall, the prior literature does not provide mutual evidence about nature and extent of the earnings information contained in dividend announcements.

For example, in a survey (Lintner, 1956), it is said that dividends are persistent commitment to pay out cash. That is the reason why dividend changes happen only when forecast a permanent change in earnings. A few studies have common intuition with that survey. They find that dividend changes relate to greater persistence of past earnings changes (Benartzi et al., 1997; Koch & Sun, 2004). Another find is that larger dividend payments are associated with higher and more persistent earnings (Fama & French, 1998). These surveys and studies suggest that I can use dividend changes to predict future unexpected earnings. But overall, this question is completely mixed.

Some studies (Aharony & Dotan, 1994; Brickley, 1983) show higher (lower) earnings realization over the first year after a dividend increase (decrease). However, several studies have come to conclude that dividend changes contain no incremental information about future unexpected earnings levels or changes (Grullon et al., 2005; Penman, 1983; Watts, 1973). Also (Deangelo et al., 1996) finds that dividend decisions do not help find companies with high unexpected earnings. However, in other studies, analysts revise their earnings forecasts in response to dividend changes which improves their accuracy (Ofer & Siegel, 1987). After more detailed research those studies which find the connection between dividends and earnings are going to lose that effect after three or four quarters. This finding has led some research to conclude that the explanation for the market reaction to dividends is probably somewhere else. Potential explanation would be for example, behavioural explanations, changes in discount rate or agency costs in free cash flow.

I am going to make in this study a few highly important corrections to analyse the information content of dividends. Later, in this paper, I argument and show evidence that dividend changes convey information about future economic income that persists for at least two years. By that evidence, I suggest that dividend increasing (decreasing) firms move to a new and higher (lower) level of permanent earnings. Furthermore, the extent of information revealed about unexpected earnings is substantial enough to account for the market's reaction to dividend changes. However, my findings also indicate that a significant portion of the earnings information conveyed through dividends would have been reflected in the market through earnings within the first year after the dividend declaration. This potentially implies that managers may be hesitant to incur significant costs solely to expedite this information into stock prices.

I start by looking into prior literature to show much disagreement there is about the relation between dividend changes and future earnings changes. I find that one big reason behind that is the differences in the timing of future earnings. The fiscal year approach is a commonly used technique in prior studies. That approach classifies and compares earnings in the fiscal year containing the dividend change to earnings in the following fiscal year. However, there are some big potential drawbacks. Firstly, dividend change may not happen at the end of the fiscal year when earnings change after dividend change but before fiscal year end is considered as current or past year earnings. Secondly, earnings change shortly after dividends change the baseline against which future earnings are compared. To show benefits of the event window approach when using quarterly data, I can compare earnings announced after dividend change to comparable period before the dividend change (Aharony & Dotan, 1994). In the event window approach specify of past and future earnings relative to dividend change is much cleaner. That is especially important because investors update their opinions straight after the dividend change and now, it is possible to me to capture effect of dividend changes more effectively.

By using the fiscal year approach, I could not find significant evidence in my sample. However, the event window approach shows highly significant evidence between dividend change and future unexpected earnings. These results when using the event window approach are also persistent. In my regression analysis, dividend changes contain information about unexpected future earnings at least two years after the dividend change.

The estimate of persistence is highly affected by a few big dividend changes. These few big dividend changes differ a lot from the vast majority of dividend changes. Prior studies show that the market reaction to dividend announcements is a nonlinear function of the dividend change (Baker et al., 2016). I am going to show that companies with relatively big dividend changes have often more volatile dividend histories and overall, these changes are not so persistent themselves. To account for the nonlinear relationship between dividend news and the magnitude of the change, I employ two optional measures: the percentile rank of the dividend changes and a predicted announcement return, derived from a nonlinear function of both the size and direction of the dividend adjustment.

When using this cleaner measurement for dividend news, I found more persistent information content for my two-year period. To be more specific, by using earnings data, I can find substantial growth in information content for both dividend increases and decreases. Meaning that the dividend changes forecast not only the level of unexpected earnings, but also future earnings growth.

I have made conclusion to add prior studies that argument dividend changes have information about persistence of past earnings changes, rather than about future earnings changes (Koch & Sun, 2004). Also, some review studies have argument that it is the primary channel through which dividends are related to future earnings (Allen & Michaely, 2003). I find that there is one big problem which is that the majority of prior studies have used the fiscal year approach. I use the event window approach in my analysis and tests which provide evidence that dividends changes do convey some information about the persistence of past earnings change. Overall, my results imply that dividend changes provide information that the firm is moving to a new permanent level of earnings.

To provide more information, my results suggest that the earnings information conveyed by dividend changes can explain by high probability much of the market reaction to the dividend changes. I use regression analysis to regress unexpected earnings on returns at both the dividend announcement and in the window straight after dividend announcement to show significantly more cash flow effects flowing into returns at the dividend announcement than at other times. To give contrast, if other factors like behavioral preferences or discount rate news are driven factors for announcement returns, I may expect dividend announcement results to correlate much less with information about future earnings than returns on other quarters.

My results will show that dividend changes contain long-term information about earnings. However, they also suggest that a big part of that information shifts to the new earnings level within the first year after the dividend change. My finding is that when first year earnings changes are known, the dividend change contains substantially less incremental information about future earnings. That is why my results do not necessarily provide support for signalizing models where managers willingly bear a deadweight cost to transmit the signal (John & Williams, 1985). However, my research evidence is highly consistent with models where managers bear sufficiently large reputation costs from failing to maintain the dividend that less profitable firms will not mimic the dividends of more profitable firms (Wu, 2018).

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Secondly, in prior literature both survey and empirical results show that firms increase their dividend when they commit to maintain the new dividend level. I will show that this assumption is not so descriptive at all with extremely large dividend increases. Moreover, large changes in the market discounts (Baker et al., 2016), suggesting that it looks like investors understand that the degree of commitment to the new dividend varies. In my research I am going to demonstrate that by measure of dividend news consistent with market reactions, rather than linear function of percentage changes, the measured persistence of dividend information content increases.

2 Relation to prior literature

Dividends and especially their possible connection to companies' future earnings have been much discussed back in the days (Ang & Bekaert, 2007; Campbell & Shiller, 1988). As information content hypothesis posits that change of dividend payout includes information about earnings forecasts and investors react to it to maximize profits (Miller & Modigliani, 1961). If that hypothesis is accurate there should be a few testable implications (Ham et al., 2020). Firstly, if managers process private knowledge about earnings (both present and future), then dividend increases and decreases should be followed by higher and lower unexpected earnings outcomes, respectively. Secondly, if investors notice the earnings information conveyed through dividend announcements. The result of that is the dividend movement should be met with price movements in the same direction. Similarly, investors should update their forecasts regarding future earnings after dividend changes are announced.

When analyzing the prior studies which have been published recently the overall view of the topic is that dividend changes contain no information or just a little about future earnings (Grullon et al., 2002; Penman, 1983). However, there are published studies which show that there is positive evidence between dividend changes and future earnings (Ofer & Siegel, 1987; Yoon & Starks, 1995). To conclude this, there are published studies for connection and non-connection. But consensus is as Allen & Michaely (2003) support: "The overall accumulated evidence does not support the assertion that dividend changes convey information about future earnings."

When I investigated prior studies about phenomena it was clear that study design makes a huge difference between studies. The way earnings have been computed plays a very big role in results. Two of the most used approaches to computing earnings in prior studies are the fiscal year approach and the event window approach. Basically, in the event window approach earnings after dividend announcement are compared to earnings before dividend declaration (Henderson, 1990). However, the fiscal year differs a little here. In that approach compare earnings for the next fiscal year to fiscal year when the company changes dividend payout (Oyer, 1998). The majority of studies which use the fiscal year approach fail to confirm information content hypothesis.

There are a few reasons why the fiscal year approach lacks in this kind of study. Firstly, dividend changes may come in the middle of the fiscal year.

That may create bias because of the possible effect of new information which dividend increase (decrease) gives effect also to current fiscal year earnings (one to three quarters). I aim to solve that possible bias which the fiscal year approach creates by categorizing earnings not by the fiscal year but by earnings before and after dividend declaration. That is also a relevant adjustment because investors update their valuations about share prices after there has been new information about the company. These adjustments for valuation do not follow the company's fiscal year and create a demand for different approaches.

To solve the problem which the fiscal year approach creates, I will use an event window approach in my study. By using also this approach, I can compare earnings after the dividend announcement to earnings prior changes more effectively. The event study approach in practice means that I compare for example the sum of the next four quarters' earnings to sum of the four quarters earnings which happen before dividend changes. This kind of approach has already been used, for example Aharony & Dotan, 1994. That study shows a very short-term connection between dividend changes and future earnings. However, their findings indicate that the impact significantly weakens and partially reverses within three to four quarters after a dividend change. Other studies which were provided later have dismissed these results as inconsistent with a sustaining shift in earnings.

I build this study methodology from previous literature with two key factors. Firstly, I align with recent literature to more exactly control for expected earnings, based on the information available to investors before the dividend change. Secondly, I extend the event window approach to cover the second year following the dividend change. That allows me to examine the longer-term persistence of earnings information and explore the factors leading to the perceived weakening of its impact.

By modeling earnings expectations across different time horizons using pre-dividend information, I illustrate how the scope of earnings expectations evolves in response to an average dividend change.

Former literature shows also evidence that dividend changes convey information about future earnings. For example, Fama & French, 1998 shows dividends show more information about market values than about information in current and past earnings. Also, dividend changes provide more information than firm characteristics. They argue that it means dividend capture information about expected level of earnings. It is also important to notice that a few studies argue that dividend changes have information about persistence of past earnings changes (Chalmers et al., 2000; Koch & Sun, 2004). In this study I will offer a more comprehensive argument that dividend changes contain information about future unexpected earnings, not information about past already realized earnings.

3 Sample selection and descriptive statistics

I have collected data about dividend declarations from Refinitiv Workspace database. Firstly, I select all companies which have paid dividends over my sample period 2006-2019. I use the FTSE all index from the London Stock Exchange as a target index for my study. After denying a few companies which do not have required data available, I gathered a total of 289 companies to analyze in this study as sample.

I have downloaded those companies' stock price data, dividend data, market value and earnings per share (EPS) which give me the possibility to compute relevant percentage changes. The frequency in that data is quarterly because I focus on this study quarterly dividends (Benartzi et al., 1997). To be able to compute relevant results I require a minimum of eight quarters of stock price data prior dividend declaration date (Fama & French, 2000). Secondly, I require that there are not missing data points in the data series because if there are missing observations it is impossible to calculate statistics. To reduce the effectiveness of outliers I cut out the bottom and top 5% of observations.

Table 1

Descriptive statistics

This table reports mean and median values for dividend changes and the earnings and return realization around dividend announcements. Columns 1-2 report observations when there is no dividend change, Columns 3-4 report observations with a decrease in dividend, Columns 5-6 report observations with an increase in the dividend. Ret(j,k) refers to quarterly compounded stock return for quarter j to quarter k relative to the dividend declaration. The sample period is 2006-2019.

	ΔDIV=0 (N=6830)		ΔDIV<0 (N=722)		ΔDIV>0 (N=4642)	
Variable	Mean	Median	Mean	Median	Mean	Median
ΔDIV	0.000	0.000	-0.279	-0.148	0.151	0.052
E(y-2)	0.179	0.082	0.160	0.060	0.165	0.068
E(y-1)	0.178	0.082	0.163	0.054	0.158	0.068
E(y+1)	0.170	0.076	0.115	0.044	0.150	0.061
E(y+2)	0.166	0.075	0.117	0.046	0.156	0.064
E(y+3)	0.154	0.071	0.127	0.042	0.155	0.064
Ret(-1,1)	0.044	0.035	0.056	0.009	0.060	0.037
Ret(-1,-2)	0.008	0.009	-0.014	-0.006	0.044	0.035
Ret(-2,-4)	0.037	0.033	-0.063	-0.035	0.059	0.043
Ret(-4,-8)	0.095	0.072	-0.055	-0.033	0.125	0.094

Table 1 presents descriptive statistics for my sample. Roughly over half of observations (56%) about dividend declaration maintain previous level, there are 38% (6%) observations for dividend increase (decrease). It is important to notice that there are many more observations with dividend increase than decrease. There are not significant differences between returns in announcement window (difference 0.4%). However, there are clear trends that companies tend to respond with dividend decreases when their stock price does not develop nicely.

Future earnings are larger after dividend increases than decreases. Those observations suggest investors update their valuations about companies after dividend changes. As earlier mentioned, there are clear trends in earnings prior dividend changes forecast future dividend declarations. That finding highly suggests that markets have at least some information affecting before companies give dividend declaration.

4 Do dividend changes predict future cash flows?

Now my goal in this section is to test the hypothesis that dividend changes contain information about future earnings. I am going to do it by using regression analysis. In this analysis I will regress future earnings changes on the dividend change. Future earnings change is my variable of interest in this test. There are some earlier studies about this topic, but I am going to use a little different methodology than most of those studies. The main change compared to prior literature is that I compute earnings before and after dividend changes which provide me with an opportunity to use event window approach. This gives me an opportunity to show two main findings about connection between dividend changes and future earnings. Firstly, I can show that dividend changes contain information at least two years into the future. Secondly, I can show how the fiscal year approach does not do well in this kind of research. That happens because it fails to classify some of the after-dividend earnings for future earnings.

The overall consensus in the current literature is that dividend changes do not predict future earnings changes. That has been used as a reason to reject the argument that future cash flows have been affected by dividend changes. By the argument in this study that dividend changes have information about future earnings, I have here an opinion on why the market reacts to dividend changes. In this study I am in line with prior literature, at least some expectations of future earnings. Like early dividend studies show (Miller & Modigliani, 1961).

4.1 Event window approach tests for information content of dividends

In this analysis I regress earnings changes on percentage dividend change (ΔDIV) and a series of control variables.

$$\Delta E_{it+n} = \beta_0 + \beta_1 \Delta DIV_{it} + \Sigma\beta_j Controls + \varepsilon_{it+n}. \quad (1)$$

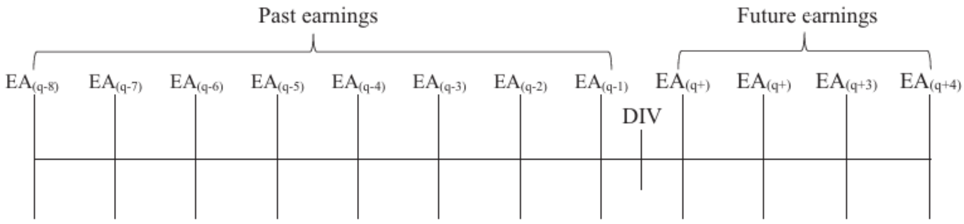
ΔE is a change in earnings. I have calculated all the earnings as sum of four consecutive quarters after dividend change minus sum of the four quarters before the dividend change. I compute earnings changes over one and two years to create evidence that future earnings associated with dividend change longer time frame. The first (second) year's earnings change begins with first (fifth) after the dividend change. I have used each company's market value to scale the earnings change as my goal was to create more comprehensive statistics. Refer, to Figure 1, Panel A for visual and more detailed version of the earnings change calculations. Overall that figure shows how timings of dividend and earnings announcements have classified in event study approach. I cluster all standard errors by the year of dividend declaration.

Figure 1

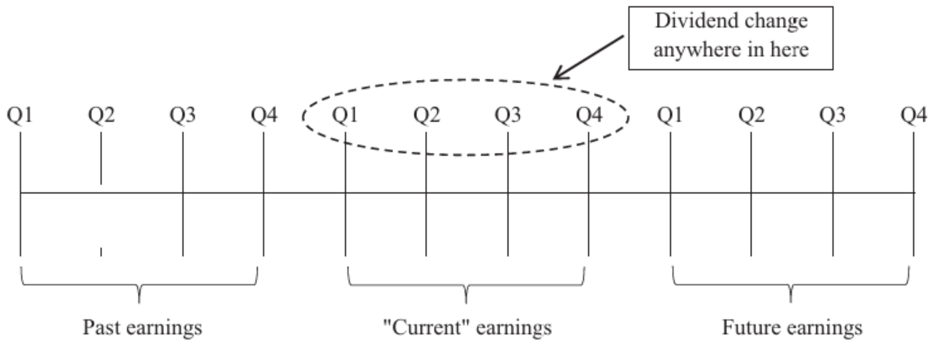
Timeline (Ham et al., 2020).

This figure reports a timeline to introduce the sample and variable construction. In event study approach (Panel A) all dividend declarations in my sample occur between two consecutive earnings announcements. I refer to the lower (upper) bound earnings announcements quarter as quarter q-1 (q+1). If the dividend declaration falls on an earnings announcement date, I consider that earnings announcement as quarter q-1. All quarterly earnings definitions follow accordingly. For example, E(q-1) refers to earnings announced at EA(q-1). All annual earnings calculations come up with four consecutive quarterly earnings figures. For example, E(y+1) is the sum of the four quarterly earnings announced at EA(q+1) through EA(q+4). Accordingly, E(y-1) is the sum of the four quarterly earnings figures announced at EA(q-4) through EA(q-1). All annual earnings change calculations sum four consecutive quarterly earnings figures announced at EA(q+1) through EA(q+4) less than the sum of the four quarterly earnings figures announced at EA(q-4) through EA(q-1). ΔE(y+2) is the sum of the four quarterly earnings figures announced EA(q+5) through EA(q+8) less than the sum of the four quarterly earnings figures announced at EA(q-4) through EA(q-1). In fiscal year approach (Panel B), the change in earnings is the difference in the sum of earnings over the four quarters of the future fiscal year minus the sum of earnings over the four quarters of the current fiscal year (when the dividend is declared).

Panel A: Event study approach



Panel B: Fiscal year approach



I include a few controls for earnings in all specifications that would have been expected in the absence of the dividend change. To specify, I include three independent variables which are the four past quarterly earnings changes, four past earnings changes, nonlinear functions of past annual earnings changes and levels (Grullon et al., 2005) , as well as five variables capturing over four quarters prior the dividend announcement because returns impound information about future earnings (Ball & Brown, 1968)

By estimating Equation (1) using event window approach I present results in Table 2, Panel A. The dependent variable in Column 1 (ΔE(y+1)) is the earnings change in the first four quarters after dividend change. I find significant positive coefficient on the dividend change (β=0.021; t=4.6). The coefficient magnitude suggests the average dividend change of 20% is associated with an increase in expected earnings equal to 4.2% of the market value in the one-year period after a dividend change. So, as a result my regression model estimates that dividend changes have economically meaningful information about future earnings.

Column 2 uses Equation 1 to estimate regression on dependent variable (ΔE(y+2) which is earnings change in second year after dividend change. I provide this regression because to offer evidence of the persistence of the future earnings forecasted by the dividend change. This time I also find it highly coefficient on the dividend change (β=0.013; t=3.0). There is also other study (Nissim & Ziv, 2001) which finds that there is significant information content out of two years. However, this paper has been challenged by subsequent literature on methodological grounds (Grullon et al., 2005), and discounted by subsequent review study (Allen & Michaely, 2003)

In those studies where the fiscal year approach is used, the choice of control variables and deflator affects whether dividend changes predict future earnings (Grullon et al., 2005). However, the way of choosing the deflator is not relevant for the event window approach. In unreported analyses, I normalize dividends by the book value of common equity and total assets, using deflators calculated for both the quarter before and the year before the dividend change. Regardless of the time horizon or the chosen scaling method, my conclusions remain unchanged-dividend changes continue to exhibit a relationship with future earnings changes that last for up to two years.

4.2 Fiscal year approach tests for information content of dividends

To investigate whether the differences between our findings and those of prior research argument from the method of calculating earnings changes over the fiscal year, I adopt the approach used in previous studies in Panel B of Table 2. To be more specific, I define earnings changes as the difference between earnings in the fiscal year following the dividend declaration, capturing earnings reported both before and after the dividend announcement (Figure 1 shows visual representation). I include control variables like those on Panel A to ensure that any differences in coefficients arise solely from the change in the earnings calculation method. In Column 1, the dependent variable measures the change in earnings from the fiscal year of the dividend declaration to the subsequent fiscal year. The estimated coefficient on the dividend change is both statistically insignificant and economically small, representing only 1.0% of the magnitude observed in Panel A. In Column 2, I extend the earnings change measurement to the second fiscal year after the dividend change, respectively. In this test I did not observe significant relationship between dividend change and future earnings.

Using the fiscal year approach to measure information content, rather than event window approach, has two important effects. Firstly, earnings announced shortly after the dividend declaration are excluded from calculation of future earnings. Secondly, the earnings announced soon after the dividend declaration serve as the new baseline for measuring subsequent earnings changes. As a result, unexpected earnings fluctuations that begin in the quarters immediately following the dividend change may be obscured by aggregating into fiscal years. Before a dividend announcement, investors form earnings expectations based solely on pre-declaration information. Therefore, I argue that methods excluding post-dividend earnings realizations provide a clearer and more comprehensive understanding of whether market reactions reflect new information about future earnings conveyed by the dividend change.

Table 2

Dividend changes and future earnings

This table represents least squares regression results over my sample period (2006-2019). My dependent variable in regression is the arnings change for the the time period denoted in he variable name. I use some nonlinear control variables. They are functions of past annual earnings levels and changes. In Panel A, the past earnings level (change) is the sum of the four quarterly earnings levels (changes) before the dividend change. In Panel B, the past earnings (change is the fiscal year earnings level (change) in the year of the dividend change. Total of six variables is included. Three each for the earnings level and change: (i) an interaction between the variable and a indicator equal to one if the variable is negative, (ii) an interaction between a positive indicator and the variable squared, and (iii) an interaction between a negative indicator and the variable squared. I have clustered standard errors by the year of the dividend declaration. I report T-statistics in parentheses ***, **, and * denote statistical signicance at the 1%, 5%, and 10% levels for two-tailed tests, respectively. Apendix A represents variable definitions and Figure 1 depicts the timeline for quarter and year designations.

Panel A: Event window approach		
	(1)	(2)
	ΔE(y+1)	ΔE(y+2)
ΔDIV	0.021***	0.013***
	(4.614)	(3.002)
Ret(-1,-2)	0.064***	0.068***
	(11.194)	(10.663)
Ret(-2,-4)	0.049***	0.051***
	(8.972)	(8.501)
Ret(-4,-8)	0.018***	0.026***
	(9.231)	(9.007)
E(q-1)	0.351***	0.346***
	(10.551)	(3.879)
E(q-2)	0.050**	0.057*
	(2.412)	(1.746)
E(q-3)	0.019	0.018
	(0.398)	(0.321)
E(q-4)	0.002	0.004
	(0.177)	(0.136)
ΔE(q-1)	0.359***	0.201***
	(8.002)	(5.274)
ΔE(q-2)	0.157***	0.089*
	(2.999)	(1.683)
ΔE(q-3)	0.066*	0.008
	(1.797)	(0.476)
ΔE(q-4)	0.011	-0.024
	(0.452)	(-0.337)
Nonlinear controls	Included	Included
Observations	10528	8773
R-squared	0.131	0.099

Panel B: Fiscal year approach		
	(1)	(2)
	ΔE(fy+1)	ΔE(fy+2)
ΔDIV	0.002	0.001
	(0.674)	(0.217)
Ret(-1,-2)	0.029***	0.027***
	(6.552)	(6.391)
Ret(-2,-4)	0.030***	0.037***
	(4.131)	(2.738)
Ret(-4,-8)	0.012***	0.016***
	(5.106)	(2.940)
E(fq4)	0.235***	0.202*
	(7.782)	(1.957)
E(fq3)	0.189***	0.196**
	(3.006)	(2.100)
E(fq2)	0.022	0.074
	(0.947)	(0.882)
E(fq1)	0.006	0.008
	(0.074)	(0.056)
ΔE(fq4)	0.296***	0.213***
	(5.666)	(3.950)
ΔE(fq3)	0.228***	0.230***
	(4.102)	(2.771)
ΔE(fq2)	0.067*	0.064
	(1.772)	(1.261)
ΔE(fq1)	-0.036	-0.105*
	(-0.992)	(-1.659)
Nonlinear controls	Included	Included
Observations	11046	9252
R-squared	0.117	0.109

5 Persistence of the future earnings forecasted by dividend changes

Dividends are often viewed as a long-term commitment to pay out cash flows (Brav et al., 2005). I expect that dividend changes to be associated with persistent changes in the earnings used to fund the payout. My regression results show that dividend changes include long-horizon information (at least two years) about future earnings. However, at least some of the short-horizon earnings do not persist. I will examine in this section in more detail the source of attenuation in my previous results. To be more specific, I show that the apparent partial reversion across horizons is a result of a small number of very large dividend changes. In my sample there are also some nonlinear relations between the size of a dividend change and the market reaction. After adjusting this factor, I find that dividend changes are associated with highly persistent differences in future unexpected earnings.

5.1 Measuring earnings

When using accounting information, there are some big potential issues. That issue is changes in the amount of economic income that firm generates each period. It happens because accounting standards accelerate expenses into earnings (Enache & Srivastava, 2018). Those expenses are often investments like advertising, and research and developing (R&D). However, these investments may have positive correlation with dividend change. Relative to this, some special items may accelerate the implications of a negative cash flow shock into net income. I am going to show in Table 3 evidence that the absolute change in dividend does have significant effects on earnings. Other factors (advertising and R&D) are not tested in this study in more detail.

As a baseline of comparison in Columns 1-2 of Panel A, I estimate model like Equation (1). However, I have made one important change here which is separate positive and negative dividend changes. That is necessary because accounting systems do not treat good and bad news symmetrically. To be more specific, bad news is recognized in economic income much faster (Basu et al., 1997). So, if expenses increase and they create attenuation in economic income, I expect as a result that earnings changes following dividend decreases to be less persistent than those following dividend increases:

$$\Delta E_{it+n} = \beta_0 + \beta_1 \mid \Delta DIV_{it} \cdot I\left(\Delta DIV_{it} > 0\right) + B_2 \mid \Delta DIV_{it} \mid \\ \cdot I\left(\Delta DIV_{it} < 0\right) + \Sigma \beta_j Controls + \varepsilon_{it+n} \tag{2}$$

My results show that there is some information in dividend changes (in both increases and decreases) which convey to future unexpected earnings for the next two years. However, I can point out that there is some attenuation in results. This is shown as β1 coefficient declines from 0.025 in the first year to 0.019 over the next year. So, I can argue that about 76% (0.019/0.025) of positive news persist for at least two years in my sample. When analysing earnings changes following dividend changes (coefficient β2), I find that their persistence is much lower, only 42% (-0.016/-0.038).

Table 3

Information content of dividends using earnings

In this table I report on ordinary least squares regression results over my 2006-2019 sample period. My dependent variable here is the change in earnings. Control variables remain from Table 2. I have clustered the standard errors by year of dividend declaration. T-statistics are reported in parentheses ***, **, and * denote statistical significance at the 1%, 5%, 10% levels for two-tailed tests, respectively. Appendix A reports variable definitions and Figure 1 depicts the timeline for quarter and year designations.

Panel A: Earnings		
	(1)	(2)
	ΔE(y+1)	ΔE(y+2)
abs(ΔDIV>0)	0.025***	0.019***
	(4.265)	(1.994)
abs(ΔDIV<0)	-0.038***	-0.016***
	(-4.662)	(-2.101)
Controls	Included	Included
Observation	10528	8773
R-squared	0.149	0.096

Accounting income includes also some period of expenses which could not be matched with revenues. How to recognize these expenses may play an important role when analysing effects. Other studies (for example (Ham et al., 2020)) show more detailed how these expenses affect different absolute dividend changes. In larger picture, this finding is in line with prior literature where is find that companies adjust their cost structures in response to adverse news that also causes dividend cuts (Bulan & Hull, 2013).

Overall, the main findings in this section are that firms' investment-related expenses do respond to profitability shocks surrounding dividend changes. That is potentially confounds in the measurement of the relation between dividend changes and future earnings. In my opinion the information content of dividends is optimal to measure by using the company's earnings data. However, prior to that I am going to introduce an additional element which is measurement of dividend news.

5.2 Measuring dividend news

My tests already introduced in this paper impose a linear relation between size of a dividend change and the associated future earnings news. Prior literature shows that market reaction for both dividends increases, and decreases is firstly increasing in the magnitude of the change. However, larger changes affect flattens out (Baker et al., 2016). On the other hand, when looking at announcement returns, they are larger for dividend decreases than for increases. That finding suggests highly that announcement returns reflect new information about future earnings. Investors take new information from sign and magnitude of dividend change. That is the reason behind opinion that when measure dividend content of dividend news should allow use of these nonlinearities. To understand deeper why market reactions are nonlinear in the dividend change, especially in case of dividend increase. I want to research this topic a little further. Many managers express a commitment to maintaining dividend. That is the reason I possibly expect market reactions to increase with the size of the change in anticipated payout.

Figure 2 shows how distribution of dividend changes is skewed. Overall, in that figure is created empirical diagram about nonzero dividend changes in my sample. There are some insights which I must point out. Firstly, the number of dividend increases is much higher than the number of dividends decreases. Secondly, while majority of dividend changes are under 50%, there are a few big outlier changes.

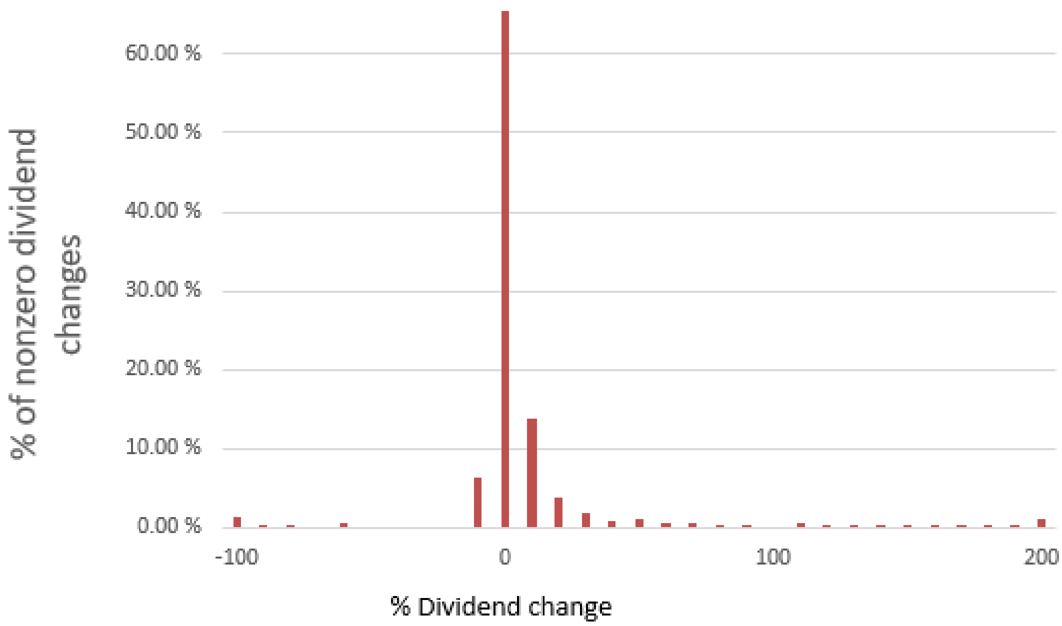
I am going to investigate more how investors treat differently dividend announcements. Firstly, I notice that firms with high dividend increases tend to be those companies with a volatile dividend policy. In Table 4 first two Columns I regress the average absolute dividend change (Column 1), and the percentage of dividend decreases (Column 2) over the past five years on indicators for the size of the year t dividend change. My findings show that those firms with extremely large dividend change tend to lower their dividends soon. Overall, those firms' dividend streams are much more variable.

In Table 4 Columns 3 through 5 show that large dividend changes are less persistent. This observation is in line with earlier arguments in this paper. Results show that the average future dividend change is significantly lower (Column 3), and the probability of future dividend cuts is higher (Column 5). Overall, those regression results show that after big dividend changes firms are much more likely to decrease their dividends than companies which do not change their dividends. So, often companies tend to commit to bigger dividend payout level, with large increases it is not often the case. I am going to explore in the next section by using measure of dividend news more in line with market reactions. This large discount increase affects my estimate of the persistence of earnings changes forecasted by dividend news.

Figure 2

Distribution of dividend changes

This figure shows my empirical analysis about distribution of nonzero dividend changes in my sample. There are a total of 5084 dividend changes in my sample which includes the period 2006-2019. Dividend changes have been computed as difference between quarterly dividend numbers provided from Refinitiv Workspace. I have group results in figure to classes. For example, in class 10 is dividend changes between 10% and 19.9%. Over 200% dividend changes are set to 200%.



5.3 Measuring persistence of future earnings

Now in this section, I am going to research the persistence of earnings forecasted by dividend changes. However, I make some adjustments because of measurement issues described in the previous two sections (measuring earnings and measuring dividend news). I do not use a linear function of the percentage change in the dividend. Instead, I utilize alternative function that consider the nonlinearities in the persistence of, and market reaction to, dividend changes. This regression specification is like that in Table 3, Columns 1-2 in all other respects.

$$\Delta E_{it+n} = \beta_0 + \beta_1 f\left(\Delta DIV_{it} \mid \Delta DIV_{it} > 0\right)$$
$$+\beta_2 f\left(\Delta DIV_{it} \mid \Delta DIV_{it} < 0\right) + \Sigma\beta_j Controls + \varepsilon_{it+n} \tag{3}$$

I create percentile rank dividend increases (rank(ΔDIV>0)) and dividend decreases (rank(ΔDIV<0)). As earlier said, dividend distribution is highly skewed. That is the reason why using percentile rank as my measure of dividend news increases the variation in dividend news accounted for by small changes and reduces the impact of outliers.

Table 4

Dividend policy

Here in this table, I report ordinary least square regression results over my 2006-2019 sample period. I have dependent variables in Panel A include past and future dividend policy characteristics. Standard errors are clustered by the year of dividend declaration. T-statistics are reported here in parentheses ***, **, and * denote statistical significance at the 1%, 5%, 10% levels for two-tailed tests, respectively. Appendix A reports variable definitions.

Panel A: Dividend policy					
	(1)	(2)	(3)	(4)	(5)
	Past abs (ΔDiv)	Past I(ΔDiv<0)	Future ΔDiv	Future abs(Δdiv)	Future I(Δdiv<0
I(ΔDIV<0)	0.019***	0.020***	0.006***	0.029***	0.022***
	(3.008)	(5.761)	(2.486)	(5.833)	(4.559)
I(ΔDIV[1,50])	0.003***	-0.002*	0.004***	0.002**	0.000
	(6.355)	(-1.699)	(8.036)	(2.228)	(1.224)
I(ΔDIV[51,100])	0.018***	0.015***	0.011***	0.023***	0.011***
	(7.013)	(6.650)	(7.221)	(9.264)	(3.520)
I(ΔDIV>100)	0.042***	0.036***	0.002	0.074***	0.077***
	(5.362)	(4.771)	(0.479)	(8.032)	(7.662)
Observation	9510	9510	9510	9510	9510
R-squared	0.008	0.004	0.005	0.013	0.009

In Table 5, I use companies' net income to measure earnings. I have changed the independent variable of interest. I replace the percentage changes in dividends with two different measures of dividend news. So, in Table 5 Columns 1-2 presents estimates using the percentile rank variables. When switching to alternative measures which control the skewness in the distribution of dividend changes. In that case, I find more persistence earnings changes after dividend increases. However, in Columns 3-4 where I present my estimates of Equation 3 using imputed returns in place of the dividend change. In that regression I do not find evidence which supports the attenuation in the earnings information after the dividend change. In case of negative dividend changes, my results are little affected by these specification changes. This is not surprise at all because the distribution of dividend decreases is not so skewing than distribution of dividend increases because there are not so significant outliers in my sample.

Table 5

Effect of the dividend change sign and magnitude information content.

This table reports ordinary least squared regression results over my 2006-2019 sample period. I have used earnings as dependent variable here. Control variables remain from Table 2. I have clustered standard errors by year of the dividend declaration. T-statistics are reported in parentheses ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels for two-tailed tests, respectively. Appendix A reports variable definitions and Figure 1 shows the timeline for quarter and year designations.

Panel A: Earnings				
	(1)	(2)	(3)	(4)
	ΔE(y+1)	ΔE(y+2)	ΔE(y+1)	ΔE(y+2)
rank(ΔDIV>0)	0.015***	0.012***		
	(8.713)	(3.600)		
rank(ΔDIV<0)	-0.051***	-0.011**		
	(-6.033)	(-2.374)		
pret(ΔDIV>0)			0.772***	0.794***
			(11.527)	(6.922)
pret(ΔDIV<0)			-0.412***	-0.093*
			(-4.836)	(-1.693)
Controls	Included	Included	Included	Included
Observation	10528	8773	10528	8773
R-squared	0.166	0.093	0.173	0.096

The main finding in this comparison of results in these regressions is extremely large dividend changes are not so persistent as the small or moderate changes. So, the skewness of dividend increases distribution contributes to the apparent attenuation of information content in earlier results.

5.4 Do dividends convey information about the persistence of past earnings?

Some of the previous studies have argued that dividends are associated with greater persistence of past earnings changes (Koch & Sun, 2004). Also, some review studies show that this is the primary channel through which dividends are related to future earnings (Allen & Michaely, 2003). As my descriptive statistics (Table 1) show that firms which change dividends have pre-dividend declaration earnings changes which go in the same direction as dividend change. That observation remains the possibility that information content of dividend changes arises because dividend changes reflect the persistence of past earnings changes rather than new information about future earnings changes.

I modify Equation 3 to create differentiation between these two alternatives. To create that differentiation, I include the interaction between measures of dividend news and the change in last year's earnings (last four quarters). In the case of dividends having information content only because of their relation to persistence of past earnings changes, I would expect two things to find. Firstly, there to be a significant positive coefficient in the interaction with past earnings. Secondly, to find substantial attenuation in the coefficient on the main effect of the dividend change.

I show results in Table 5 where analysis is done by using net income. Some of my findings are consistent with prior literature arguments about earnings persistence. To be more specific, I find that for the first year after the dividend announcement there are significant relations between both dividends, the change between the increase and the past earnings change relation to future unexpected earnings. This relation stays positive through the two-year time horizon, but it is not significant anymore. However, when looking at dividend decreases my findings are much weaker. I could find significant coefficient only in one-year period. It is important to note that in all cases dividend changes keep to significantly predict future unexpected earnings. Overall, my results highly suggest that dividends convey new information about future earnings over and above the persistence of past earnings changes.

My results are consistent with prior literature about dividend changers compared to non-changer (Ham et al., 2020). Companies' earnings between dividend changers and non-changers clearly diverge over the first few quarters after the dividend change. After one year (four quarters) the gap between dividend changers and non-changers does not widen anymore. However, the changes in the first year after dividend change persist at least the second year. Combined, my results provided here that dividend changes have information about future earnings, and they will shift in the same direction as dividend changes. Also, those new earnings levels are persistent.

6. Conclusion

Investors on the market look up every new news that comes up. They update the valuation of the company, making it more accurate. Dividend changes are a crucial part of that process because they are new information about company actions. In this study I show evidence that dividend changes create persistent effects on future earnings levels. These results in my study differ from the prior literature where hypothesis that dividends have information content are often denied. I use an event window approach in tests which gives clearly the answer that dividend changes have significant information about the company's unexpected future earnings. Investors use every new piece of information available. So, in my opinion every study which tries to understand dividend changes' effect on market reaction should use the event window approach to capture effect more effectively.

I have made one big methodological change compared to prior literature. That is how I treat outliers. I distribute dividend changes in my test to create a more informative view of dividend changes in information content. After cutting out the largest dividend changes, I find that dividend increases (decreases) are followed by persistently higher (lower) unexpected earnings.

Overall, my results are consistent with the market reaction to dividend changes reflecting an expected permanent change in earnings. Some results shown in this study show that much of the shift in earnings happens in the first four quarters after the dividend change. To note, the dividend decision does not need to be motivated by an attempt to create costly signal for dividends to convey information about the earnings information. Increasing dividends continuously is expensive for companies without a sustainable earnings increase (Miller & Rock, 1985). Prior literature shows a strong negative effect between positive dividend changes and likelihood of forced managerial turnover (Wu, 2018). Overall, that creates an incentive for managers to increase dividends only when they anticipate a persistent earnings increase.

My findings represent earlier in this paper are also consistent with contracting models in which payout resolves information asymmetry and managers bear substantial costs for cutting dividends (Demarzo & Sannikov, 2017). These models are done for managers to map earnings information to dividends to maximize the profitability of retaining control. In the case of directors and external investors follow a "manage by exception" approach where their level of involvement decreases as payouts rise but intensifies when payout declines. However, they tend to do so cautiously to reduce the risk of future dividend cuts in the event of an unexpected earnings decline. The potential cost of misleading the market through payout decision (Miller & Rock, 1985; Wu, 2018) serves as deterrent for less profitable firms attempting to imitate more successful ones, allowing dividend changes to signal managerial private information.

Appendix A. Variable definitions

Dividend variables	
Name	Definition
ΔDIV	Current quarterly dividend less the prior quarterly dividend divided by the prior quarterly dividend.
abs(ΔDIV)	Absolute value of ΔDIV
rank(ΔDIV)	Percentile rank of ΔDIV
I(ΔDIV>0) / I(ΔDIV<0)	Indicator variable equal to one if ΔDIV is positive/negative. Zero otherwise.
Past/Future ΔDIV / abs(ΔDIV) / I(ΔDIV<0)	Average of ΔDIV, abs(ΔDIV), or I(ΔDIV<0) over the past/future five years.
I(ΔDIV[1,50]) / I(ΔDIV[51,100]) / I(ΔDIV>100)	Indicator variable equal to one if ΔDIV is greater than zero and less than equal to 50%, greater than 50% and less than or equal to 100% or greater than 100%, zero otherwise.
abs(ΔDIV>0) / abs(ΔDIV<0)	Absolute value of ΔDIV if ΔDIV is greater/less than zero.
rank(ΔDIV>0) / rank(ΔDIV<0)	Percentile rank of ΔDIV if ΔDIV is greater/less than zero.
pret(ΔDIV>0) / pret(ΔDIV<0)	Predicted return if ΔDIV is greater/less than 0. The predicted return is estimated as predicted value from return centered on the declaration on the dividend change and indicators for potitive and negative dividend change
Earnings variables	
Name	Definition
ΔE(y+n)	Difference between the sum of the four quarterly earnings announced before the dividend declaration and earnings for four consecutive quarters after the dividend declaration. The first (second) year's earnings changes begin with (fifth) quarter after dividend declaration. All changes are scaled by market value of equity.
E(q-n)	Earnings announced n quarters before the dividend declaration, scaled by the market value of equity.
ΔE(q-n)	Earnings n quarters before the dividend declaration less earnings for the same quarter in the prior year, scaled by the market value of equity one year before the dividend declaration.
ΔE(fy+n)	Difference between the fiscal year earnings during which the dividend is announced and fiscal year earnings for the one, two, and three years after the dividend declaration.
E(fqn)	Earnings for fiscal quarter n during the fiscal year of the dividend declaration.
ΔE(fqn)	Earnings for fiscal quarter n during the fiscal year of the dividend declaration less the same quarter's earnings in the prior year
Other	
Ret(-j,+k)	Quarterly compounted return from j quarters before the dividend declaration to k quarters after the dividend declaration

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OpenAI's ChatGPT was used in thesis to assist with language refinement and for R programming assistance

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