The impact of dividend changes on stock return in the US stock market.

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ABSTRACT,
This research investigates the relationship of changes in dividends with stock return. After decades of inconclusive research on the relevance of dividends to shareholders' wealth, the initially found positive relationship between changes in dividends and stock return is tested using a recent data sample. The research follows the event study methodology and finds that excess stock returns are present on the days following a dividend announcement. The relationship however, does not seem to be as strong in comparison to previous literature following a similar methodology a few decades ago. Suggesting that investors have noticed the inconclusive stance of academic scholars about the relevance of dividends, and have adjusted their reaction to dividends accordingly.

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1. INTRODUCTION

Whether to allocate cash flow back to shareholders or not, and if so, how much of the retained earnings should be allocated back to shareholders in the form of a dividend, is a central financial issue that managers of publicly traded companies face. An important aspect of this decision is how the market reacts to changes in dividends. This research aims to add to the knowledge of the influence of changes in dividends on the stock return of publicly traded firms in the United States.

The academic finance literature surrounding this question is both wide and diverse. Starting with the articles of Lintner in 1956 and Miller & Modigliani in 1961 (as cited in Benartzi, Michaely, & Thaler, 1997), dividends have been a central theme amongst financial scholars (Benartzi et al., 1997). Lintner's paper argued that the dividend decision, which determines the size of a dividend to shareholders and is made by top management, is relevant due to the impact of dividends on shareholder's wealth. He hypothesized that top management signals improved future prospects of a firm through an increase in or initiation of dividends. On the other hand, and perhaps in reaction to Lintner, Miller & Modigliani argued for an irrelevance of dividends under certain market conditions. They explained that under certain conditions the value of a firm to its shareholders remains constant regardless of dividend amounts, making the dividend decision irrelevant. From this point onwards, different scholars have added to the debate from a lot of different angles, and proposed different hypotheses in an attempt to permanently settle the debate on dividend relevance or irrelevance (Baker & Weigand, 2015). Theories such as the bird in the hand hypothesis, the signaling explanation, the agency costs and free cash flows hypothesis, and more, have all been investigated empirically and will be discussed further in the theoretical framework, in section 2. For now, it suffices to say that the empirical evidence of each of these theories does not provide conclusive evidence about the relevance of the dividend decision (Baker, Powell, & Veit, 2002; Baker & Weigand, 2015), and academic finance scholars have not reached a consensus on how dividends affect shareholder's wealth. Since the evidence on how dividends influence shareholder's wealth has remained inconclusive despite intensive research, one might expect the investment public to respond a lot less positive, if at all, to the announcement of dividend increases than before. This research seeks to investigate whether the investment public still reacts positively towards announcements of increases in dividend amounts despite the lack of an empirically supported explanation of added shareholder's wealth from increases in dividends. The following research question was formulated:

What is the impact of changes in dividend amount on the stock return of companies in recent years?

2. THEORETICAL FRAMEWORK

The body of academic research on the relevance of dividends and their impact on shareholder's wealth is both extremely vast and diverse in its conclusions (Al-Malkawi, Rafferty, & Pillai, 2015). A large amount of different theories have been developed and empirically investigated by a wide array of financial scholars. Although some theories appear quite logical and sound very convincing, empirical evidence which convincingly unites the academic scholars has, as of yet, not been found (Al-Malkawi et al., 2015; Baker & Weigand, 2015). In the following section an overview of the most prominently supported theories will be given. Each theory will be reviewed on their argumentation and the empirical research that has been conducted to investigate the theory.

2.1 Dividend Irrelevance Theory

The famous paper of Miller & Modigliani in 1961 (as cited in (Al-Malkawi et al., 2015; Baker et al., 2002; Baker & Weigand, 2015; Benartzi et al., 1997), forms the basis for the theory of dividend irrelevance. Under certain conditions M&M argue that the chosen dividend amount has no influence on the wealth accrued to investors over time. They argue that the investment policy that generates the cash flow drives firm value rather than the way those cash flows are distributed towards its shareholders (Baker & Weigand, 2015). On the basis of this argumentation they conclude that rational investors should be indifferent towards the dividend policy upheld by the firm that they invest in. The conditions used in this line of reasoning as put forward in the review paper of Al-Malkawi et al. (Al-Malkawi et al., 2015) were those of the so called perfect capital market and comes down to the following assumptions. 1) The taxes that investors have to pay are the same as the taxes that a firm has to pay on their retained earnings. 2) When an investor buys or sells the security there are no costs associated with regards to the transaction or temporary flotation. 3) Every relevant piece of information about the firm is available to all investors in a costless manner. 4) The interests of the managers align perfectly to those of the shareholders. 5) Every investor aims to maximize his/her profits and acts to achieve that goal. Since these assumptions are purposely unrealistic in nature, empirical testing of this theory has not been possible (Al-Malkawi et al., 2015). The theory has, however, been a starting point to develop theories or conduct empirical research on the basis of rejecting one or more of these assumptions.

2.2 The Information Content of Dividends Hypothesis

As explained in the review of Al-Malkawi et al. (Al-Malkawi et al., 2015), the information content of dividend hypothesis, also frequently called the signaling explanation theory (Baker et al., 2002), argues for a relevance of dividends from an investors point of view, because managers have more knowledge on a firm's future prospects than the investors and use dividends to signal these improved future prospects. It is in a manager's interest to signal this increased firm prospects to the market if he feels that the stock is currently underpriced. The manager then uses a change in dividend to correct the market value. According to the hypothesis, an increase in dividends can thus be considered a signal for increased future firm performance and investors should respond positively. The empirical research that has investigated this hypothesis has mainly focused on two central questions. Do share prices respond in a positive manner to announcements of changes in dividends? And are dividend increases (decreases) a signal for increases (decreases) in future earnings. For the first question, most research found a positive link between changes in dividend and corresponding share prices (Aharony & Swary, 1980; Asquith & Mullins, 1983; Dhillon & Johnson, 1994; Pettit, 1972). The second question, however, led to more debate and contradicting results. Watts (Watts, 1973) for example came to the conclusion that even if there was a signaling effect present, the effect was only trivial since he did not find a significant relationship between changes in dividends and future earnings, after regression analysis. Gonedes (Gonedes, 1978) had similar results and came to a similar conclusion. Both Laub (as cited in Al-Malkawi et al., 2015) and Pettit (Pettit, 1976) challenged the findings and conclusions of Watts and concluded that changes in dividends do provide information about future earnings other than the information provided by past earnings. In addition Nissim and Ziv (Nissim & Ziv, 2001) provide empirical findings in which they find a positive correlation between changes in dividends and changes in earnings, which seems to provide support for the information content hypothesis(Al-

Malkawi et al., 2015). In the research conducted by Benartzi et al. (Benartzi et al., 1997) where 1025 firms were investigated over a 22 year time period, the researchers conclude that there is no conclusive evidence to support that changes in dividends signal future changes in earnings.

2.3 The Bird in the Hand Hypothesis

This theory relies on the assumption that investors as a group prefer relatively certain short term cash flows over, perhaps larger but uncertain, future cash flows. It argues that investors hold a dividend payment in higher regard than the same value as retained earnings, which in turn leads to the conclusion that an increase in dividends would cause market value to increase (Al-Malkawi et al., 2015). In support of this theory Gordon (as cited in Al-Malkawi et al., 2015) found evidence that dividends had a higher influence on stock return than retained earnings. Similar results were found by Fisher (as cited in Al-Malkawi et al., 2015) who concluded that the impact of an increase in dividends was greater than the impact of added retained earnings. These results, however, were greatly questioned as to the validity of their methods used to derive at their conclusions (Al-Malkawi et al., 2015). Incorporating these criticisms, Diamond (as cited in Al-Malkawi et al., 2015) used an adjusted methodology, to investigate the impact of both dividends and retained earnings on stock return and found only weak support for the bird in the hand hypothesis. He for instance, controlled for differences in risk among firms due to industry characteristics, and incorporated growth from external sources of finance rather than merely using growth from investments financed with retained earnings. In a research by Baker, Powell and Veit (Baker et al., 2002), which surveyed managers on their reasoning behind paying dividends, no support for the bird in the hand hypothesis was found.

2.4 Agency Costs and Free Cash Flow Hypothesis of Dividend Policy

Another theory arguing for the relevance of the dividend decision by managers and the way in which investors should value dividends, is the agency costs and free cash flow hypothesis (Al-Malkawi et al., 2015). Derived from the assumptions used in M&M's paper of dividend irrelevance, in which agents are assumed to act in the best interest of the owners (as cited in Al-Malkawi et al., 2015), this theory argues that in reality agents do not always have the same personal interests as owners. This means that owners will either have to intensively monitor or install some kind of benefit plan to align the personal interests of agents to the interests of the firm, in both cases costs are incurred by shareholders (Al-Malkawi et al., 2015). Put forward by Easterbrook in 1984 (as cited in Al-Malkawi et al., 2015), dividends are a way to partly reduce these incurred cost because the amount of cash not designated for investment or operational purposes in the firm is reduced. The lack of reserves give managers less room to misuse their position of control for their own interests. On the other hand, this lack of reserves can also lead to undesired behavior such as unnecessarily increasing the firm's debt level. Therefore the right balance should be aimed for. The empirical evidence to support this theory has been provided by Rozeff's paper (as cited in Al-Malkawi et al., 2015) and a decade later by Dempsey and Laber (as cited in Al-Malkawi et al., 2015), who found a negative relationship between the percentage of stock held by insiders and the payout ratio. Additionally they found a positive relationship between number of shareholders and the dividend yield. On the contrary though, Lie (as cited in Al-Malkawi et al., 2015) and other researchers found little to no evidence in support of the theory and Denis, Denis and Sarin (as cited in Al-Malkawi et al., 2015) found contradicting evidence and a negative relationship between dividend yield and the level of overinvesting.

2.5 Clientele Effects of Dividends Hypothesis

The basic premise of the clientele effect of dividends theory is that investors do not share a similar investment situation (Al-Malkawi et al., 2015). Investors come in all sort of different classes. They differ in the way they are taxed, they differ in their investment philosophy, they differ in their investment horizon, etc. This in turn creates different preferences towards how a business handles its dividend decision, and creates different groups based on those preferences, called clienteles. This dividend clientele effect, causes the dividend decision to be relevant in choosing what kind of investors a company wants to attract. In the case of an individual firm where it is very relevant to attract a certain kind of investor, the dividend decision can be a valuable tool. The empirical research investigating the clientele effect is diverse in its focus (Al-Malkawi et al., 2015). Pettit for example (as cited in Al-Malkawi et al., 2015) has investigated the relationship of investors' portfolios' dividend yield and their age which he found to be positive. He also found that when investors have a higher income they are less inclined to go for a high dividend yield in their portfolio. Another pathway of empirical research investigated whether changes in dividends are associated with changes in clienteles. Richardson et al. (as cited in Al-Malkawi et al., 2015), after researching the clientele effect from this angle, concluded that the influence of the Clientele effect, is very low.

2.6 Tax-Effect Hypothesis

The assumption made by M&M which is perhaps the most obviously unrealistic, is the assumption of no taxes (Al-Malkawi et al., 2015). Investors have to pay additional taxes when receiving a dividend, which often exceeds, depending on the tax system in which the investor operates, the taxes that have to be paid for retained earnings. Due to this higher tax rate, the basic argument is that investors prefer a lower dividend. The theory thus states that lower dividend yield firms, keeping all other factors that influence a firm's value the same, sell at a higher price than firm's maintaining a high dividend yield (Al-Malkawi et al., 2015). This theory is in direct opposition to the bird in the hand hypothesis and has thus received quite some attention in empirical research. One of the central paper's to contribute to this theory, is a paper by Brennan (as cited in Al-Malkawi et al., 2015) in which he develops a model to test whether tax risk-adjusted returns are associated with dividend yield. In testing this model, and the relationship using different methods, many different scholars find different results through slight differences in operationalization of the variables.

In reviewing all these different theories a single conclusion persists. Despite intensive empirical investigation the dividend puzzle, as mentioned in Baker et al. (Baker et al., 2002), remains unsolved. The way in which the dividend decision has an effect on shareholders' wealth, if there is such an effect remains undetermined.

3. HYPOTHESIS

From the overview of theoretical development and empirical research, it becomes clear that in most previous empirical studies changes in dividends have demonstrated a positive relationship with changes in stock return in the days of, and right after, the announcement day. In this research we are interested to see whether this effect is still present. The research aims to investigate the relationship between changes in dividends and the stock return of investors. Therefore the following null hypothesis will be used:

H0: changes in dividend amounts do not have a relationship with changes in share prices.

4. METHODOLOGY

This section will outline the used methodology. First the general research design will be explained. After which the data sampling and operationalization of variables will be discussed in detail. Finally the statistical analysis used to answer the research question will be described.

4.1 Research Design

The research mainly follows the event study methodology developed by Fama et al. (Fama, Fisher, Jensen, & Roll, 1969), and explained in a review by Binder and in a review by Peterson (John J. Binder, 1998; Peterson, 1989). The research differs from Fama et al. in determining the variables under observation and in the determination of the time under observation, both will be explained in a later section. The central characteristic of the event study methodology is to determine a measure of excess return which can be attributed to the event under study. It requires a determination of other factors that form the expected return, an exclusion of specific factors that also influence the firm in event time, and the specification of event time in which the excess returns are expected to relate to the specific event. The observed excess returns are then used in statistical analysis to investigate hypotheses.

In this research the events were the dividend announcements. For each announcement in the data sample, which will be described in the following section, excess returns were calculated for a period of 21 trading days starting 10 trading days before the announcement day, which will be explained in section 4.3. The announcement day together with the subsequent trading day are considered the event time and the effect of the change in dividend is expected to take place during this event window, which will be explained further in section 4.3. As a control sample, the same data is collected for a sample of announcements with no changes in dividends. The excess returns over the 21 trading day period are ultimately used to analyze whether the announcement of a change in dividend has an effect on the stock return of investors, which will be explained further in section 4.4.

4.2 Data

This research uses a sample of 50 randomly selected firms from the S&P 500, a list of the 500 largest firms in the United States. The sample was chosen in line with sample sizes of previous literature (Brickley, 1983), yet not unduly large due to work intensive data collection methods. From these 50 firms data was collected from the 1st of January 2014 up until the 31st of December 2018, again due to work intensive data collection the total sample was kept large enough but manageable. The time period under investigation is similar to that of previous literature (Pettit, 1972). In this period all cash dividend amounts per share and corresponding ex-dividend dates were collected from https://www.dividendchannel.com/history, from these amounts the change in relation to the previous amount was calculated. For all changes in dividend amounts and for a randomly selected sample of 200 no change dividend amounts, the corresponding announcement dates were collected from https://www.streetinsider.com/dividend_history.php?q=YUM.

The random sample was taken because the initial sample size was deemed unmanageably large. After this, the announcement dates were checked to see if there were no earnings announcements within a time period of 10 days before the announcement date up until 10 days after the announcements. This was done to keep the influence of earnings announcements out of the analysis. If earnings announcements in close proximity to the dividend announcements are left in the sample, then the excess return are potentially biased since there is no way to distinguish what part of the excess returns is due to the influence of the earnings announcements. The relation between Earnings announcements and Dividend announcements was investigated in the research by Aharony & Swary (Aharony & Swary, 1980), who also excluded earnings announcements within a 10 day time period of the dividend announcement. Earnings announcements were collected from https://www.streetinsider.com/ec_earnings.php?q=. Data was excluded from the sample if earnings were present within that timeframe. For each announcement in the final sample the adjusted closing price for each trading day in the 22 trading days surrounding the announcement date was collected, starting 11 trading days before the announcement date. Adjusted closing prices for both the firm and the S&P 500 index were collected, and was collected from https://finance.yahoo.com/quote/ABT/history?period1=1388444400&period2=1546210800&interval=1d&filter=history&frequency=1d.

4.3 Variables

In order to investigate the relationship of these events and the reaction of the stock market to them we must first determine measurable variables that are relevant to answer the research question.

4.3.1 Independent Variable

To reflect dividend announcements to which the market has not yet responded, and which are not incorporated in the market price, we use the naïve dividend announcement model (Aharony & Swary, 1980) to define unexpected dividends. The naïve model forecasts no change in dividends. Aharony & Swary argue that managers are reluctant to change the dividend amount per share, and only do so if they see a valid reason for it. For this reason, the expected dividend is assumed to be equal to the previous dividend and thus, each change in dividend is considered to be unexpected.

The adoption of this model leads to the following calculation of unexpected dividend change:

$$\Delta D_{it} = \frac{D_{new} - D_{old}}{D_{old}} * 100\%$$

Where,

D_{new} is the cash dividend amount per share under investigation.

And D_{old} is the cash dividend amount per share of the previous cash dividend announcement.

In defining unexpected dividend changes this way, we assume an efficient market, in which current share prices reflect all previously known and relevant information. A future dividend can be expected, or partly expected, by the market and such expectations will be reflected in the share price before the actual announcement.

4.3.2 Dependent Variable

To reflect the price reaction of shareholders to firm-specific factors, three different methods of estimating excess return have become common in the use of the event study methodology (Brown & Warner, 1985). The first and most common is the OLS market model. This model uses linear regression during an estimation period to estimate Beta and Jensen's alpha which are used with a market index to calculate the expected return. The second model is the mean-adjusted model which uses an estimation period to determine a mean return for an individual stock. This mean return is then used as the expected return. The final model is the market-adjusted model. This model uses the return on an index, which reflects the market return, as the expected return for an individual stock.

In this research, the market-adjusted model was used rather than the OLS market model and the mean-adjusted model, due to

concerns for both alternative models. While the OLS market model is used in most previous literature, it does have its issues and statistical concerns when estimating the model parameters (Peterson, 1989). In addition in the research by Brown & Warner (Brown & Warner, 1985) each of these methodologies was tested for 250 samples of 50 firms. In this research, the researchers added simulated excess return to actual stock data to simulate an event induced excess return. Each methodology was then tested for two types of error. Identifying excess return where none was present and the failure of identifying excess return when it was indeed present. In this research the OLS market model did not outperform the mean-adjusted model or the market-adjusted model.

The mean-adjusted model was not used because it does not account for market wide factors and only uses historical stock data to calculate the expected value.

The market-adjusted model thus seems the most suitable for the research. In this research, the S&P 500 index was used to reflect the market in the market-adjusted model.

The excess return is calculated for each relative trading day under observation and for each announcement in the data sample. The following calculation is used to determine excess return:

$$XR_{it} = R_{it} - R_{mt}$$

Where,

XR_{it}= the excess return estimated for firm i on trading day t relative to the announcement day

R_{it} = the observed raw return for firm i on trading day t relative to the announcement day

And R_{mt} = the observed return on a market index on trading day t relative to the announcement day. In this case the return of the S&P 500.

The returns are calculated from the observed adjusted closing price of the day under observation and the previous trading day. Returns for both the firm and the market index are calculated this way for each trading day under observation. This leads to a percentage change which is used as the measure of return:

$$R_t = \frac{adj.close_{new} - adj.close_{old}}{adj.close_{old}} * 100\%$$

Where,

$adj.close_{new}$ is the adjusted close price on the trading day under observation

And $adj.close_{old}$ is the adjusted close price on the trading day before the trading day under observation.

Under the assumption of an efficient market, in which investors respond to new information very quickly, we have chosen a short period to reflect the market reaction to the announcement of a new dividend. Considering there is no way of knowing at what time the announcement of the new dividend was made public, we take the announcement day plus the subsequent trading day to reflect the period in which the market reacts to the new dividend. This leaves a 2-trading day excess return as the dependent variable.

4.3.3 Comparison Variable

As will be described in section 4.4, the research compares the mean excess return in event time to the average non-overlapping 2-trading day mean excess return. To comprise this comparison variable, for each announcement in the data sample, the excess return of the non-overlapping 2-trading days are summed across the time series for each non-overlapping 2-trading day pair starting on trading day -10 relative to the announcement day as was done by Asquith & Mullins (Asquith & Mullins, 1983). This control variable does not incorporate the 10th trading day after the announcement day, since there is an uneven number of days in the comparison period. The average is then taken from the 9 pairs of 2-trading day excess return to use as comparison variable.

4.4 Statistical analysis

To analyze whether changes in dividend have an impact on stock return, we investigate and test the return of the 2-day excess return as described in section 4.3. This measure of 2-day excess return in event time is used in three different Students' T tests to see if there was in fact an effect of the changes in dividend amount present for this sample which is not due to chance at an alpha level of 0.05.

The first test compares the mean 2-day excess return in event time of the change sample to a hypothesized value of 0, as was done in previous literature (Asquith & Mullins, 1983; Healy & Palepu, 1988), since if there is in fact no relationship present a mean excess return of 0 would be expected. This was tested using a one-sample T test.

The second test compares the mean two-day excess return in event time to the mean average non-overlapping two-day excess return in comparison time, in which trading day 10 relative to the announcement day is omitted due to uneven numbers in the comparison period. If there was no relationship between changes in dividends and stock return we would expect these two-day excess returns to be similar in event and comparison time, which was also tested in previous literature (Brickley, 1983). This comparison is tested with a paired-sample T test.

The third test compares the mean of the 2-day excess return in event time of the change sample to the 2-day excess return in event time of the no change sample. If there is no relationship between changes in dividends and stock return we would expect the mean excess return to be similar for both the sample of changes in dividend amount and the sample of no change in dividend amount. The use of a control sample to compare means in event time was also used in previous literature (Aharony & Swary, 1980; Brickley, 1983). To compare the means we use an independent samples T test.

5. EMPIRICAL FINDINGS & DISCUSSION

5.1 Empirical Findings

The data sample was collected as described in section 4.2. For the 50 firms in the 4 year time period, 993 cash dividends were collected. From the changes in dividend amount, determined as described in section 4.3.1, of the original sample 192 changes with available announcements dates were found. The no change random sample provided 200 announcements with corresponding announcement dates. These 392 announcements were checked for the presence of earnings announcements within 10 days as described in section 4.2. This left a total data sample of 185, of which 92 increases in dividend amount, 3 decreases in dividend amount and 90 no change in dividend amount were found. Considering the number of decreases were so low that no valid inferences can be concluded from this data, the sample of decreases was omitted from the analysis. This left two separate data samples; the increase sample which is the sample under investigation, and the no change sample which will be used as a control sample. The Figure on the next page (see Figure1), presents an overview of the data sampling.

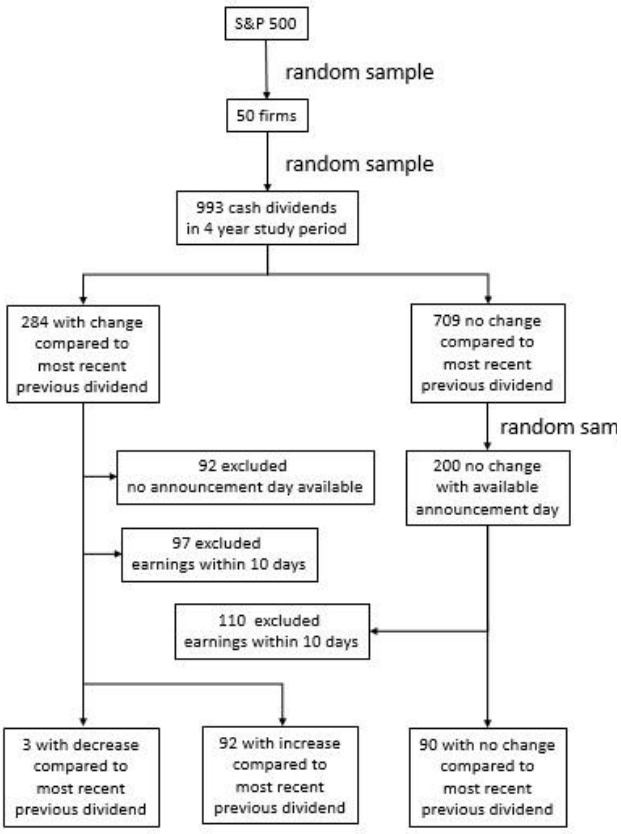

Figure 1: Illustration of data sampling

Table 1: Descriptive statistics of variables for both samples

	Increase in dividend sample	No change in dividend sample
N	92	90
Dividend change (%)		
Median	11.01	0
Minimum–maximum	1.32-480	0-0
Mean	26.27	0
St. dev.	76.49	0
2-day Excess return in event time (%)		
Median	0.55	-0.12
Minimum - maximum	-4.16-5.34	-4.28-2.90
Mean	0.44	-0.08
St. dev.	1.84	1.26
Average 2-day Excess return in comparison time (%)		
Median	0.02	0.21
Minimum-maximum	-2.39-1.49	-1.23-2.21
Mean	0.0002	0.18
St. dev.	0.54	0.53

In the table on the left (see Table 1), the descriptive statistics found for the variables described in section 4.3 are displayed.

In the table below (see Table 2), the trading days are grouped into non-overlapping 2-trading day periods, and the mean excess returns of these time periods are displayed for each sample. The highest observed 2-day mean excess return for the increase sample is clearly the event period with the second highest being +0.17 %. For the no change sample the highest observed mean excess return of 0.53 was measured in the 2-trading day period furthest away from the event period (-10,-9).

Table 2: Non-overlapping 2-day excess return with st.dev.

Non-overlapping 2-Day period relative to announcement day	Mean excess return (increase sample) (%)	St. dev. (increase sample)	Mean excess return (no change sample) (%)	St. dev. (no change sample)
(-10, -9)	0.16	1.65	0.53	1.91
(-8,-7)	-0.04	1.72	0.37	2.08
(-6,-5)	0.01	1.32	0.20	1.58
(-4,-3)	0.17	1.39	0.15	1.49
(-2,-1)	0.06	2.02	0.32	1.52
(0,1)	0.44	1.84	-0.08	1.26
(2,3)	-0.05	1.62	0.05	1.17
(4,5)	0.06	1.28	-0.10	1.25
(6,7)	-0.19	1.32	0.00	1.27
(8,9)	-0.18	1.31	0.09	1.26

Finally the tests were performed using SPSS data analytics of which the full results are reported in the appendix, and a summary is displayed in the table below. Each test rejects the null hypothesis at the 0.05 alpha level and has a T value of a little over 2. T-test 1 is the comparison of mean excess return in event time with hypothesized value 0. T-test 2 is the comparison of mean excess return in event time to the mean of average non-overlapping two-day excess return of the comparison time. T-test 3 is the comparison of mean excess return in event time of the increase sample with the mean excess return in event time of the no change sample. Levene's test for equality of variances had a p value of 0.018.

Table 3: Test statistics

	T-test 1	T-test 2	T-test 3
T value	2.315	2.088	2.257
Sig.	0.023	0.040	0.025
CI (95%) lower case	0.063	0.022	0.066
CI (95%) upper case	0.825	0.866	0.988

5.2 Discussion

The aim of this research was to investigate what impact changes in dividend have on stock return. Our main finding is that increases in dividends are associated with positive excess returns. This remains the case after comparing the mean excess return in

event time of the increase sample to both the comparison period and a control sample of dividend announcements where the dividend amount did not change.

The excess return found in this research was +0.44%, which seems to be small when compared to the excess return found in previous research using daily excess returns and using a similar methodology. Asquith & Mullins (Asquith & Mullins, 1983) reported an excess return in event time, they also used a 2 trading day period, of +3.7%. In both the articles of Aharony & Swary (Aharony & Swary, 1980), and Dhillon & Johnson (Dhillon & Johnson, 1994), larger excess returns in the event period were found. In comparison to previous literature the effect of changes in dividends on stock return seems to have declined somewhat over the last decades. This seemingly decreased effect could perhaps be due to a change in investor's convictions about the relevance of dividends. After taking notice of the lack of consensus amongst financial scholars, as described in section 2, investors might have dampened their positive outlook on receiving additional dividends.

In addition, we found 92 increases in dividends which ranged from +1.32% to +480% with a median of 11.01. From this we can see that, although there are large difference in size of increase in dividend amounts, about half of these increases in the 1-11 percent change category.

Another finding of the research is that the majority of dividend announcements had the same dividend amount as the previous dividend announcement. Of the 993 cash dividends found in the initial data sample, 284 dividend amounts changed compared to 709 dividend amounts that remained unchanged. This finding provides support for the naïve dividend model (Aharony & Swary, 1980), which assumes each change in dividends to be unexpected by the market.

The way in which we have defined and calculated the variables in this research may of course have impacted the results. The reasons for defining the dependent variable as we did, have been explained in section 4.3. In defining the independent variable we have assumed the naïve model to be an accurate depiction of investors' expectations. Since investors might have certain expectations about changes in dividends, the naïve dividend model could be an unrealistic depiction of the unexpected change in dividend. Alternative methods such as the analyst model (Capstaff, Klæboe, & Marshall, 2015), might lead to different findings and different conclusions. In the analyst model, expected dividends are estimated using the average of forecasts made by financial analysts. The previous literature regarding the effect of dividend announcements on stock return, however, have mostly followed the naïve model as well.

To say with certainty that the relationship between changes in dividends and stock return has decreased over the past decade solely on the basis of this research, is not realistic. First of all, assuming this change to be 100% valid and reliable, we have no way of knowing whether this change occurred gradually or radical. Second of all, the research has its weaknesses. The sample of decreases was too low to incorporate in the analysis and with only a single sample of 50 firms, conclusions cannot be drawn with certainty. In the simulation of Brown & Warner (Brown & Warner, 1985) for instance, the null hypothesis of 0 mean excess return at, +0.5% simulated excess return was rejected by 26% of the 250 samples, while using market adjusted returns. This suggests a multitude of samples, that find a significant excess return, is needed to claim a relationship with relative certainty.

In addition the research could benefit from additional improvements. One such improvement would be the extension of incorporated control variables. Although the research does rely on certain control variables and uses a comparison sample to decrease the risk of drawing invalid conclusions, there might be other variables that bias the excess returns that were found. Other firm-specific events, for example merger & acquisitions announcements, managerial changes or actual sales events were not accounted for in this research. Clustering effects, some firms being overly represented in the final sample than other firms, and the size of firms were also unaccounted for. Incorporating these in the analysis might influence the final conclusions and improve the research design.

Another improvement would be to use data sources which allow for easier scalability, in order to increase the data sample and the time under observation. In this way upward or downward economic cycles are less of a factor and conclusions can be drawn with more certainty. A larger data sample would also allow for easier categorization. The research does not analyze the influence of the size of the dividend change. Considering the median was found at + 11.01% in this sample, we would suggest categorizing the first +10% increases as small. Perhaps, the size of the dividend change can be used in a regression analysis as an independent variable. The research does, however, follow a similar methodology to methodology used in previous research. Making the results comparable to results found in the literature mentioned in section 2. The use of controls adds to the validity of the rejection of the null hypothesis.

In future research, an interesting pathway could be to follow the behavioral finance perspective, and conduct more qualitative research on why this effect persists. In the review of Baker and Weigand (Baker & Weigand, 2015), behavioral explanations are mentioned as part of the theory's on dividend policy. The research mentioned in this area, however, is less abundant and of more recent years than other theoretical perspectives. Mapping the perspectives of investors when it comes to dividends might prove relevant in solving the dividend relevance puzzle. Another option would be to test the impact of changes in dividend amount on stock return for two time periods using exactly the same firms and exactly the same methodology. That way, the hypothesis that investors now respond less positive to changes in dividend than before can be investigated.

6. CONCLUSION

After having investigated the relationship of changes in dividends and stock return, we conclude that stock returns do increase when dividend amounts increase. Although the relationship seems positive, decreases were not part of the analysis, it does appear to be less strong than in previous literature. The persistence of this positive response to dividends of the market, despite an inconclusive stance of financial scholars when it comes to the relevance of dividends and their effect on shareholders' wealth, seems to best support the bird in the hand hypothesis. An increase in dividend amount means additional cash flow for investors, which they seem to eagerly welcome. The other side, that an increase in dividend amount, means a decrease in retained earnings seems to be less important. A practical implication of this insight could be that, in the days following increases in dividend shares tend to be overpriced relative to their long term inherent value. If this effect proves to be reliable and persistent over time, it might be exploited in portfolio management.

7. REFERENCES

Aharony, J., & Swary, I. (1980). Quarterly Dividend and Earnings Announcements and Stockholders' Returns: An Empirical Analysis. *The Journal of Finance*, *35*(1), 1–12. Retrieved from https://www.jstor.org/stable/2327176

Al-Malkawi, H. N., Rafferty, M., & Pillai, R. (2015). Dividend Policy : A Review of Theories and Empirical Evidence Dividend Policy : A Review of Theories and Empirical Evidence. *International Bulletin of Business Administration*, *9*(1), 171–200.

Asquith, P., & Mullins, D. W. (1983). The Impact of Initiating Dividend Payments on Shareholders' Wealth. *Journal of Business*, *56*(1), 77–96. Retrieved from https://www-jstor-org.ezproxy2.utwente.nl/stable/2352747

Baker, H. K., Powell, G. E., & Veit, E. T. (2002). Revisiting the dividend puzzle. *Review of Financial Economics*, *11*(4), 241–261. https://doi.org/10.1016/s1058-3300(02)00044-7

Baker, H. K., & Weigand, R. (2015). Corporate dividend policy revisited. *Managerial Finance*, *41*(2), 126–144. https://doi.org/10.1108/MF-03-2014-0077

Benartzi, S., Michaely, R., & Thaler, R. (1997). Do Changes in Dividends Signal the Future or the Past. *The Journal of Finance*, *LII*(3), 1007–1034. Retrieved from https://doi-org.ezproxy2.utwente.nl/10.1111/j.1540-6261.1997.tb02723.x

Brickley, J. A. (1983). Shareholder Wealth, Information Signaling and the Specially Designed Dividend. *Journal of Financial Economics*, *12*, 187–209.

Brown, S. J., & Warner, J. B. (1985). Using Daily Stock Returns The Case of Event Studies. *Journal of Financial Economics*, *14*(1), 3–31. Retrieved from https://doi.org/10.1016/0304-405X(85)90042-X

Capstaff, J., Klæboe, A., & Marshall, A. P. (2015). Share Price Reaction to Dividend Announcements: Empirical Evidence on the Signaling Model from the Oslo Stock Exchange. *Multinational Finance Journal*, *8*(1/2), 115–139. https://doi.org/10.17578/8-1/2-4

Dhillon, U. S., & Johnson, H. (1994). The Effect of Dividend Changes on Stock and Bond Prices. *The Journal of Finance*, *49*(1), 281–289. Retrieved from https://www.jstor.org/stable/2329145

Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). Adjustment of Stock Prices to New Information. *International Economic Review*, *10*(1), 1–21. Retrieved from http://www.jstor.org/stable/2525569

Gonedes, N. J. (1978). Corporate Signaling, External Accounting, and Capital Market Equilibrium: Evidence on Dividends, Income, and Extraordinary Items. *Journal of Accounting Research*, *16*(1), 26–79. https://doi.org/10.2307/2490411

Healy, P. M., & Palepu, K. G. (1988). Earnings Information Conveyed by Dividend Initiations and Omissions. *Journal of Financial Economics*, *21*(2), 149–175. Retrieved from https://doi.org/10.1016/0304-405X(88)90059-1

John J. Binder. (1998). The Event Study Methodology Since 1969. *Review of Quantitative Finance and Accounting*, *11*(2), 111–137. Retrieved from https://link-springer-com.ezproxy2.utwente.nl/article/10.1023%2FA%3A1008295500105

Nissim, D., & Ziv, A. (2001). Dividend changes and future profitability. *Journal of Finance*, *56*(6), 2111–2133. https://doi.org/10.1111/0022-1082.00400

Peterson, P. P. (1989). Event Studies: A Review of Issues and Methodology. *Quarterly Journal of Business and Economics*, *28*(3), 36–66. Retrieved from https://www.jstor.org/stable/40472954

Pettit, R. R. (1972). Dividend Announcements, Security Performance, and Capital Market Efficiency. *The Journal of Finance*, *27*(5), 993–1007. Retrieved from https://www.jstor.org/stable/2978844

Pettit, R. R. (1976). The Impact of Dividend and Earnings Announcements : A Reconciliation. *The Journal of Business*, *49*(1), 86–96. Retrieved from https://www.jstor.org/stable/2329145

Watts, R. (1973). The Information Content of Dividends. *The Journal of Business*, *46*(2), 191–211. Retrieved from https://www.jstor.org/stable/2351363

8. APPENDIX

8.1 Test 1, One Sample T test

Comparing event period of increase sample to 0 mean excess return

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
2-day XR (0,1)	92	.4438	1.8389	.1917

One-Sample Test

	Test Value = 0					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
2-day XR (0,1)	2.315	91	.023	.4438	.0629	.8246

8.2 Test 2, Paired Sample T test

Comparing event period to comparison period of increase sample

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	2-day XR (0,1)	.4438	92	1.8389	.1917
	average 2-day comparison XR	.0002	92	.5376	.0560

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	2-day XR (0,1) & average 2-day comparison XR	92	-.244	.019

Paired Samples Test

		Paired Differences				
					95% Confidence Interval of the Difference	
		Mean	Std. Deviation	Std. Error Mean	Lower	
Pair 1	2-day XR (0,1) - average 2-day comparison XR	.4435	2.0377	.2124	.0215	

Paired Samples Test (continued)

		Paired Differences			
		95% Confidence Interval of the Difference			
		Upper	t	df	Sig. (2-tailed)
Pair 1	2-day XR (0,1) - average 2-day comparison XR	.8655	2.088	91	.040

8.3 Test 3, Independent Sample T test

Comparing event period of increase sample with event period of no change sample

Group Statistics

	Sample number (increases=1, decreases=2, no change=3)	N	Mean	Std. Deviation	Std. Error Mean
2-day XR (0,1)	1	92	.4438	1.8389	.1917
	3	90	-.0829	1.2626	.1331

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means	
		F	Sig.	t	df
2-day XR (0,1)	Equal variances assumed	5.693	.018	2.248	180
	Equal variances not assumed			2.257	161.495

Independent Samples Test

		t-test for Equality of Means		
		Sig. (2-tailed)	Mean Difference	Std. Error Difference
2-day XR (0,1)	Equal variances assumed	.026	.5267	.2343
	Equal variances not assumed	.025	.5267	.2334

Independent Samples Test

		t-test for Equality of Means	
		95% Confidence Interval of the Difference	
		Lower	Upper
2-day XR (0,1)	Equal variances assumed	.0643	.9890
	Equal variances not assumed	.0658	.9875