Dividend & Repurchase Disclosures and their Effect on Cumulative Abnormal Returns

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ABSTRACT,
This study attempts to discover differences and similarities between the effect of dividend disclosures and the effect of repurchase disclosures. We explore the relationship between these disclosures and cumulative abnormal return. This is done through an event study in which the disclosures are the events, and a non-parametric test to check whether findings are robust. Additionally, we attempt to explain the CARs resulting from the disclosures through an OLS regression, using payout change, free cash flow and information asymmetry as predictor variables. The results show a significant relationship between CAR and dividend disclosures, but no significant relationship between CAR and repurchase disclosures. The median dividend disclosure CAR does not differ significantly from the median repurchase disclosure CAR. The CAR was not successfully explained by our predictor variables, possibly due to the chosen proxies. Future research could replicate the study while incorporating more accurate proxies to explain the CAR from payout disclosures better.

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Repurchase disclosure, dividend disclosure, cumulative abnormal return, event study, information asymmetry, free cash flow, signalling theory.

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1. INTRODUCTION

Dividends and share repurchases are forms of payout through which cash of a firm is returned to the owners. Both types of payout have been researched thoroughly by academics, but recently repurchases have started to take place more often relative to dividends, as repurchases might substitute dividends (Brav, Graham, Harvey, & Michaely, 2005; Grullon & Michaely, 2002). However, Guay and Harford (2000) found that that the reaction of share prices to dividend disclosures are still more positive than the reaction of share prices to share repurchase disclosures. Others have pointed out that dividends might be losing their power as a signal, resulting in a less sizeable change in firm valuation (Amihud & Li, 2006). If this trend continues, repurchase disclosures might soon have a larger impact on abnormal returns than dividend disclosures.

This paper asks the question: '*what is the difference between the effect of share repurchase disclosures and the effect of dividend change disclosures on cumulative abnormal returns?*' Here, the disclosures are the announcements of the actual dividend or repurchase to take place. The effect of such disclosures is measured as the cumulative abnormal return (CAR) of stock prices. We also seek to explain these effects with an OLS regression.

Firstly, we look into the difference between the CARs using an event study. To make a further distinction between the levels of CAR in the case of a disclosure, we investigate the role of two predictor variables. The first being the payout change (dividend change or acquired stake in repurchase). The second being free cash flow (FCF), and the third asymmetry of information. Because the availability of high amounts of free cash flow can result in agency problems (Jensen, 1986), it is hypothesized that there is a positive relationship between FCF, and the CAR resulting from dividend or repurchase disclosures. We use net operating cash as a proxy for the level of free cash flow. Information asymmetry is expected to influence CAR through increasing the possibility to signal new information to the market in a disclosure. When information asymmetry is low, it can be expected that a dividend or repurchase disclosure contains little new information and vice versa. The proxy for measuring information asymmetry is related to size. It is assumed that larger firms have more access to press sources, are more frequently monitored and produce larger amounts of information than smaller firms. Three proxy variables used in this study to assess the level of information asymmetry are total assets, total sales and market capitalization.

Our samples consist of 244 repurchase disclosures from the period of 2010 until 2015 and 97 dividend disclosures from the first half of 2017. Both samples are geographically limited to the UK, the Netherlands and Germany. An event study is used to measure the CAR. The normal returns are the returns that would have been realised in absence of the disclosure events. Because we estimate the normal returns with the market-adjusted return model, the samples from two different periods are comparable if the descriptive statistics are similar.

Results of the event study show that in essence the median CAR of the dividend sample is not significantly different from the CAR of the repurchase sample. These findings are in line with the trend found by Amihud and Li (2006) coming from a starting point where dividend disclosures still resulted in higher CARs than repurchase disclosures (Guay & Harford, 2000).

Both cumulative average abnormal returns (CAAR) of both samples are positive. Despite that, the CAAR for our repurchase sample is not significant when outliers are removed. The dividend sample, on the other hand, gains significance after removing outliers. A non-parametric test backs up these results.

Regarding the OLS regression, we were not able to explain the CAR successfully with our predictor variables. For the repurchase disclosure CARs we have not attempted to do so because of the lack of significance in the event study. In the case of dividend disclosure CARs, our models lack significance and generally have a low explained variance. This can, at least in part, be attributed to the choice of proxy variables, since these do possibly not reflect the objected variables as well as assumed.

This study contributes by providing insight in the recent effect of repurchase and dividend disclosures in the UK, the Netherlands and Germany.

This paper is structured in the following way. Section 2 briefly identifies relevant literature, compares findings and contrasts views of different authors to arrive at various hypotheses. Section 3 continues to describe the sampling strategy, define variables and stipulate the applied methodology to test hypotheses. In Section 4 the results are presented in a thorough analysis of descriptive statistics, the event studies, statistical tests and our regression. Section 5 ends with a conclusion in which we briefly describe the most important findings and suggest a direction for future research.

2. LITERATURE & HYPOTHESES

In this section, we attempt to identify, group and contrast views on dividends and repurchases of different authors. Section 2.1 provides an overview of theories, while Section 2.2 discusses empirical findings. Section 2.3 briefly summarises the hypotheses resulting from research gaps or contrasts.

2.1 Theoretical framework

2.1.1 Signalling theory

Miller and Modigliani (1961) argue that investors should be indifferent when it comes to dividend policy in a perfect and rational market. Following the irrelevance proposition, share prices should not respond to changes in dividends in a perfect market. In their reflection on practice they notice that in reality share prices may react to dividend changes because these changes might signal provisions of future earnings to investors.

Lintner (1956), as one of the pioneers of dividend theory, argues firms to be hesitant to degrade dividend levels. Lintner further emphasises the use of payout targeting. With this in mind, firms should only increase dividends when they can sustain or increase the dividend payout level to achieve the targeted level of dividends. Various academics developed theoretical signalling equilibria (Bhattacharya, 1979; John & Williams, 1985; Miller & Rock, 1985). The theoretical functions attempt to show separating equilibria as to whether a dividend signal is credible or not and approximate the value of such signal. The three models account for cost and benefit from both the firm side and the investor side. One cost for the investor side is the presence of insider information, which might be leveraged to achieve private returns by insiders. It is therefore important that investors can distinguish between credible and non-credible signals.[1] In the cost benefit analysis of these theoretical signalling equilibria, the investor might prefer dividends over repurchases or verse visa. It was further argued by La Porta, Lopez-de-Silanes, Shleifer, and

[1] This paper assumes that investors can distinguish between credible and non-credible signals, and as a result a signal through dividend or repurchase disclosures could only decrease information asymmetry.

Vishny (2000) that dividend changes and repurchase programs are no perfect substitutes, because governments tax capital gains differently than gains from dividends. This might result in different abnormal returns in the case of dividend disclosures than in the case of repurchase disclosures. But empirical evidence shows no unambiguous conclusions.

2.1.2 Free cash flow hypothesis

Jensen (1986) started a popular stream of payout policy literature based on an agency problem between shareholders and managers. When firms hold much cash, their managers might invest in negative NPV projects to satisfy personal utility. This is known as overinvestment or shareholder expropriation, which reduces trust of investors and as such increases cost of capital. Jensen argues that firms tend to pay dividend, do repurchases or indebt themselves to reduce this agency problem and thereby reduce the cost of capital. When a firm has low FCF, it might be seen as a risky move to increase dividends or initiate a repurchase. This increased perceived risk might, in turn, affect the abnormal returns. It is hypothesized that the higher the FCF, the higher the excess return resulting from dividend or repurchase disclosures.

2.1.3 Information asymmetry

Information asymmetry between managers and, buyers and sellers of stocks might increase the cost of capital for a firm (He, Lepone, & Leung, 2013). The problem that arises from information asymmetry is adverse selection. Because investors miss out on information regarding the 'quality' of a stock, prices deviate from their fundamental values. When investors can not differentiate between low-quality stocks and high-quality stocks because of information asymmetry their prices will show a tendency towards the mean. This is known as the 'lemon problem' and occurs when a seller has superior information compared to the buyer.

Management can choose to reduce this type of agency problem by bringing information in the market. Repurchases and dividend announcements might be one way to send such signal into the market. The reduction of information asymmetry might be part of the cause of the cumulative abnormal return (CAR) for a repurchase or dividend announcement. When there is high information asymmetry, there is more opportunity to reduce this information asymmetry. This is why the effect of a repurchase or dividend change disclosures is expected to be higher for high information asymmetry stocks.

Our proxy variables for information asymmetry are market capitalisation, total assets and total sales. The reason for the choice of this proxy is that these are measures of size. Larger firms are often better followed by analysts, and often produce larger amounts of information than smaller firms do. The higher level of market capitalisation symbolises the higher level of equity at risk, which should in turn lead to higher incentive to monitor and request information. These proxies should thus be inversely correlated with information asymmetry. Our regression models in the results section should be interpreted with this in mind.

This paper, thus, expects that information asymmetry and free cash flow act as a moderating variables in the relationship between a payout alteration (i.e. dividend change or repurchase announcement) and CAR.

2.2 Empirical evidence

A method frequently used to test the effect of events on share prices is the event study. Through estimating the 'normal returns' of a firm and subtracting these from the actual returns, the abnormal returns are identified. If well executed, the event study shows how the newly disclosed information is valued by the market.

Pettit (1972) used an event study to empirically review how investors value dividend announcements. Pettit used a market model to estimate normal returns. The time frames used were from three months before till three months after the announcement as well as from three days before till three days after the announcement. Cases were put into bins relative to the dividend change and their previous earning performance. Pettit found returns in the month of announcement and the dividend change to be significantly positively related with the exception of initial dividend payments. Pettit's findings further imply that prior earnings, grouped by positive versus negative earnings, are not related to share price's reaction to dividend announcement.

A bit more recent, DeAngelo, DeAngelo, and Skinner (1996) found announcement day abnormal returns to be related to dividend increases, but only with a modest economic impact. Where Pettit (1972) used a market model, DeAngelo et al. (1996) used a market-adjusted return method. Despite the different method for estimation of normal returns, findings imply that the dividend disclosures convey little information to justify higher levels of firm valuation. Furthermore, DeAngelo et al. (1996) emphasize that dividend change disclosures are not a useful signal of future earnings prospects. They are thus sceptical about dividends as a signal of future earnings and show stock market reactions are minor. Besides, DeAngelo, DeAngelo, and Skinner (2004) found dividends to be concentrated in high earning firms. This would not be expected if dividends were used to signal new information, since according to DeAngelo et al. (2004) these high earning firms already have dominant access to important information reporting journals and reporters and consequently dividends should, according to signalling theory, be used by 'second tier firms', which do not have access to such press resources.

A decline of information content in dividend announcements was further emphasised by Amihud and Li (2006). They empirically show that the CAR surrounding dividend change announcements has been declining over the last decades. Amihud and Li attribute this decline to increasing stockholdings by institutional investors, whom are often better informed than individual investors. If a relationship between information asymmetry and the CAR of dividend change disclosures can be found, another explanation to the declining CAR could be that information asymmetry has been reduced by successful improvements in reporting standards. But where Amihud and Li criticize dividends as a signal, Grullon, Michaely, Benartzi, and Thaler (2005) even take it a step further and claim no research has found reliable evidence to say that changes in dividends contain information about future changes in earnings. Grullon et al. further state that authors who find a relationship between dividend announcements and future earnings have not accounted for the nonlinearities when modelling earnings. What is being signalled by dividend announcements is left open for discussion by Grullon et al. (2005). This paper does not focus on the signalling content of payout disclosures, but rather on the resulting change in valuation of a firm disclosing payout information.

The more recent literature clearly hesitates to advocate for dividend signalling theories. One reason for the disappearance of dividends as a signal for future earnings, and thus for the stock market to react severely, could be the rise of share repurchases. However, dividends have remained the dominant version of payout since share repurchases used to be seen as shady and were even illegal in some countries. Only in recent decades a transition has started to take place. Perhaps the transition from dividends to share repurchases contributes to the lower information content of dividends as a signal. Grullon and Michaely (2002) find that firms in the US have been substituting dividends with share repurchases. Firms in their sample that lowered dividends without buying back stock experienced a falling stock price, whereas firms that replaced dividends with buybacks did not. Fama and French (2001) shed light on the disappearance of dividends from another angle. They argue that "[…] *the primary effect of repurchases is to increase the already high earnings payouts of cash dividend payers.*" and that repurchases are mainly being made by the same firms that pay dividends. According to Fama and French repurchases only complement dividends, which might be because owners require higher cash returns.

Through interviews with, and surveying CFOs, Brav et al. (2005) find firms are likely to replace dividends with repurchases but not the other way around. The most important reason for this is repurchases being more flexible, while dividends are seen as rigid. In recent years, share repurchases have not only substituted dividends, but might also have acted as a signalling mechanism. Huang (2015) pleads that share repurchases act as a signal for undervaluation of stock. Meanwhile, Chang and Puthenpurackal (2014) reason that abnormal returns are positively related to the size of share repurchases. Whereas most recent literature, suggesting the shift from dividends to repurchases, would imply that the market will value signalling through repurchasing more than through dividends, Guay and Harford (2000) find that the reaction of share prices to dividend announcements are still larger than the reaction of share prices to share repurchase announcements. To contribute to this part of payout policy literature, it will be tested whether investors are indifferent between dividends and repurchases. We hypothesize a positive relationship between both, dividend and repurchase disclosures and excess returns. Excess returns are measured through the CAR in an event study, further explained in Section 3. Additionally, no difference in perceived signal value is presumed, meaning that dividends and repurchases should results in similar median cumulative abnormal returns.

The existing literature has found little consensus when it comes to signalling theories. Whether or not future earnings are signalled remains questionable and therefore also the valuation of such signal. We add to the current literature by looking at a new variable which could explain CAR of payout disclosures, namely information asymmetry. We control for free cash flow, as existing literature points out the importance of this concept and for the percentage dividend change relative to the prior year. A further addition is made by comparing dividend disclosure CARs to repurchase disclosure CARs. Most research on repurchases was done with a sample from repurchases from the US, since repurchases are most often initiated by US based firms. We try to address the research gap by looking at a European sample consisting of the UK, Germany and The Netherlands. Table 1 represents the summarised literature review of this paper and points out some additional studies.

Table 1: Summarised literature review

Theory	Content	In favour	Not in favour
Irrelevance	The payout decision is irrelevant for firm valuation in a perfect, frictionless market.	(Miller & Modigliani, 1961)	(DeAngelo & DeAngelo, 2006)
Signalling	Payout announcements convey new information to the market	(Bhattacharya, 1979; John & Williams, 1985; Miller & Rock, 1985).	(Benartzi, Michaely, & Thaler, 1997; G. Grullon, Michaely, Benartzi, & Thaler, 2005).
Free cash flow & Agency theory	Paying out retained earnings reduces the manager-shareholder agency problem.	(G. Grullon & Michaely, 2004; Gugler & Yurtoglu, 2003; Jensen, 1986; Nohel & Tarhan, 1998)	(Chang & Puthenpurackal, 2014; Howe, He, & Kao, 1992)

This table points out a literature overview selected by the author.

2.3 *Hypotheses*

In short, the aforementioned hypotheses are:

H1: There is a positive relationship between dividend change disclosures and cumulative average abnormal returns.

H2: There is a positive relationship between repurchase disclosures and cumulative average abnormal returns.

H3: The median cumulative abnormal returns for dividend change disclosures are not different from the median cumulative abnormal returns for repurchase disclosures.

H4.1: There is a positive relationship between free cash flow and the CAR in case of a dividend change disclosures.

H4.2: There is a positive relationship between free cash flow and the CAR in case of a repurchase disclosures.

H5.1: There is a positive relationship between information asymmetry (between managers and investors) and the CAR in case of a dividend change disclosures.

H5.2: There is a positive relationship between information asymmetry (between managers and investors) and the CAR in case of a repurchase disclosures.

3. METHODOLOGY

This section describes the data, variables, sample and methodology. How cases were selected and which data was used is discussed in Section 3.1. Further, we define variables in Section 3.2 and present our methodology in Section 3.3.

3.1 *Sample and data*

The research draws inferences from two samples. We have gathered one sample for repurchase disclosures and one sample for dividend disclosures. Only disclosures of firms registered officially in Germany, The Netherlands or the United Kingdom are sampled. The 'repurchase sample' was drawn from Orbis for the period from 1st of January 2010 until 31st of December 2015. After excluding duplicates, confounding events (e.g. earning announcements) and entries with insufficient stock data available for the further methodology, 244 initial repurchase disclosures remain. Of these 244 repurchases, 44 (18.0%) were executed by

German firms, 20 (8.2%) by Dutch firms and 180 (73.8%) by firms from the UK.

The ‘dividend sample’ was manually gathered for the period from the start of January 2017 until the end of May 2017. Though the further selection procedure was similar to the repurchase sample’s procedure. For the divided sample this resulted in 97 cases. Of these 97 repurchases, 2 (2.1%) were executed by German firms, 1 (1.0%) by Dutch firms and 94 (96.9%) by firms from the UK.

We use Google Finance for gathering daily share prices required in further analyses.

3.2 Defining the variables

The variables used in this research can be observed in Table 2.

It shows the dependent variable on top with the independent variables listed below. The abnormal return (AR) is the excess return that could be attributed to the event of interest when no firm specific confounding events occurred. Even large samples might not cancel out the error caused by confounding events, because these confounding events are likely not random, which is why we exclude confounding events. The cumulative abnormal return (CAR) represents the sum of the abnormal returns over all days of an event window. A more specific calculation of (cumulative) abnormal returns can be found in the methodology in Section 3.3.

The cumulative abnormal returns of all events are averaged to retrieve the cumulative average abnormal return (CAAR), which is relevant to hypothesis one and hypothesis two.

Table 2: List of variables and data items

Variable:	*Data items:*
Cumulative abnormal return	Daily security prices, daily market index levels
Repurchase disclosure	Repurchase acquired % stake (t) of total outstanding
	Announcement date (t)
Dividend disclosure	Dividend size announced (t)
	Dividend size (t-1)
	Announcement date (t)
Free cash flow (proxies)	Operating cash flow divided by market capitalisation (year t-1)
	Operating cash flow divided by total assets (year t-1)
Information Asymmetry (proxies)	Total assets (year t-1)
	Total sales (year t-1)

*Proxy variables have been used when direct observation of a variable was not feasible

We attempt to find an explanation for the CAR in hypotheses four and five. Throughout these hypotheses, the ‘free cash flow’ variable and the information asymmetry variable are used. To represent the level of free cash flow, we have used the proxy variables ‘operating cash flow divided by market capitalisation’ and ‘operating cash flow divided by total assets’. The net operating cash aspect should give weight to the level of cash available, and possibly leftover, for investments, while the total assets or market capitalization aspect should correct for size of the firm.

The proxy for measuring information asymmetry is related to size. It is assumed that larger firms have more access to press sources, are more frequently monitored and produce larger amounts of information than smaller firms. Three proxy variables used in this study to assess the level of information asymmetry are total assets, total sales and market capitalization.

3.3 Methods

In order to test our hypotheses, we make use of several statistical tests. Section 3.3.1 justifies the choice for each test, while Section 3.3.2 further describes the main method in the study.

3.3.1 Choice of methods

In order to test hypothesis one and hypothesis two, we apply an event study. This method makes use of cumulative average abnormal returns to point out whether excess returns created by a set of events are significant. A more thorough explanation of how this method was applied in this study can be found in Section 3.3.2. For a comprehensive description of event studies, we refer to MacKinlay (1997).

When the cumulative abnormal returns from the event study are not normally distributed, we can use a non-parametric test to examine the significance of the results. A Wilcoxon ranked sign test does not require any distribution in the dependent variable.

In Equation 1, W^+ is the sum of positive ranks, uW^+ is the mean expected under the null hypothesis and σW^+ is the standard deviation under the null hypothesis. When $Z > Z(P = 0.05)$, that is larger than 1.94, we can reject our null hypothesis, because we use an alpha level of 5% and our test is right sided.

Equation 1: $Z = [W^+ - uW^+] / \sigma W^+$

Furthermore, a mood’s median test can point out whether the median CAR of our dividend sample differs significantly from the median CAR of our repurchase sample. Thus, with a mood’s median test, we test the third hypothesis. This test is also non-parametric and does not require the CARs to have any distribution. This is a special application of the Pearson’s chi-squared test, where the two samples are split in two based on the combined sample median and then tested for goodness-of-fit.

The final method is a regression analysis. The ordinary least squares regression shows the fit of a model for explaining the CARs in our samples. Hypothesis four and hypothesis five are tested through an OLS regression analysis.

In Equation 2, one possible regression model is shown. In this regression formula, CAR represents the dependent variable (the cumulative abnormal return), PC represents the payout change (dividend change or % stake repurchased), FCF represents the free cash flow variables and IA the information asymmetry variables. Due to the various proxy variables, it is possible to create several regression models with the sole regression formula by just changing the input proxy variables.

Equation 2: $CAR = \gamma_1 * PC + \gamma_2 * FCF + \gamma_3 * IA + \varepsilon$

3.3.2 Event studies

In short an event study goes as follows: the events in the study are categorized, in our case dividend disclosures and initial repurchase disclosures. For these events stock data is gathered for at least a set period around the event and a longer period prior to the event. Hereafter, the abnormal returns are calculated. The abnormal returns are then summed over time and averaged over the events. Lastly, the resulting cumulative average abnormal return of each group is checked for significance and inferences are drawn.

The chosen event window ranges from seven days prior to the event, until seven days after the event. This way information leakage (prior to the event) could be identified, and this gives markets more than sufficient time to adapt to the new information.

To determine the abnormal returns it is usual to subtract the normal (expected) returns for a stock from the actual returns for that same stock over the event period, see Equation 3.

Equation 3: $AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_{\tau})$

This statistical method requires the user to analyse a period prior to the event in order to find out the normal performance of the stocks relative to the market. According to MacKinlay (1997) 120 days is a common estimation window, in which the event window itself is not included. Our estimation window therefore ranges from day -128 until day -8.

Normal returns can be modelled by either the constant mean return model or the market model. The former assumes returns of a stock to be constant through time, while the latter assumes the stock to have returns relative to market returns. For instance, Pettit (1972) uses the S&P500 as market standard, under the market model approach. This study uses the market model with the DAX, AEX and FTSE, for events of firms out of the respective markets, as market indices, rather than the constant mean return model. The reason for which is that the market model adjusts for market variability reducing the variance in the abnormal returns. Besides, the market model allows for the comparison of samples over differing periods because it accounts for market circumstances. This makes our dividend sample median and repurchase sample median comparable. The market model is formally represented in Equation 4.

Equation 4: $R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$ ***With:*** $E(\varepsilon_{it} = 0)$

In this equation 'R_{it}' is the expected return of firm *i* at time *t*, 'α_i' is the intercept in the regression formula of firm *i* retrieved from the estimation window: [-128,-8]. 'β_i' is the beta of firm *i* over the same estimation window, 'R_{mt}' is the actual market return at time *t*, and 'ε_{it}' is a random error factor, which is expected to be zero for larger samples. This model is used to estimate the normal returns in the event studies.

In order to draw inferences, the abnormal returns for each day of all the individual events are averaged, resulting in the average abnormal return (AAR). Then the average abnormal returns are cumulated over the event window, leading to the cumulative average abnormal return (CAAR).

To find evidence in favour of significant abnormal returns, it has to be shown that the CAAR in the period after the event differs significantly from zero. We can observe the CAAR of any specific window within the event window [-7, +7]. The null hypothesis is presented in Equation 5. It assumes the CAR to be normally distributed with a mean of 0.

Equation 5: $CAAR \sim N[0, var(CAAR)^{1/2}]$

A transformation takes place by dividing by the estimated standard deviation. This standardisation is shown in Equation 6 and is done in order to reach a N(0,1) distribution for the null hypothesis.

Equation 6: $H_0 = CAAR / (var(CAAR)^{1/2} \sim N(0,1)$

4. RESULTS

In this section, the reader can expect to find the results of the paper. In Section 4.1, we show the descriptive statistics for the events and firm variables. Thereafter, we analyse the effect of dividend and repurchase disclosures in Section 4.2. We finalize the results with an attempt to explain the CAR by our predictor variables in a regression analysis in Section 4.3.

4.1 Descriptive statistics

Table 3 outlines the descriptive statistics of the samples for repurchase disclosures and dividend disclosures. The table starts with the descriptive statistics of the cumulative abnormal returns (CAR) for the specified event window. We have chosen a specific event window from the event day until three days after the event day ([0, +3]). This window was selected because in an efficient market all new information should be reflected in the valuation of the firms within this period. After the dependent variable, the table continues with the descriptive statistics of the independent variables in our hypotheses. The descriptive statistics show little difference between the dividend sample and the repurchase sample, however, here we emphasis the most important distinctions.

The mean cumulative abnormal return for the specified window is 1.44% for repurchase disclosures while it is only 0.25% for dividend disclosures. We can contribute part of this rather large economic difference by looking at the skewness of the data. Where the CAR for repurchase disclosures is skewed to the right, the CAR for dividend disclosures is skewed to the left. The medians for the two event types are 0.24% (repurchase) and 0.31% (dividend). Next to the skewness in our CARs, we found a high kurtosis of 33.2 for repurchase disclosures versus 18.3 for dividend disclosures.

This leaves us with serious consideration with regards to the normality of our data and the usage of parametric tests. Therefore, we test the normality of our data and execute non-parametric tests in Section 4.2.2.

Table 3: Descriptive statistics for the dividend & repurchase disclosure samples

		Mean	**Median**	**Std. Dev.**	**Min.**	**Max.**	**N**
CAR [0, +3]	*Repurchase*	1.44%	0.24%	8.98%	-34%	79%	244
	Dividend	0.25%	0.31%	9%	-60%	17%	97
% stake acquired in repurchase	*Repurchase*	11.6	10.0	11.1	0.03	100	237
	Dividend						
% dividend change $[(t - t_{-1}) / t_{-1}]$	*Repurchase*						
	Dividend	15.8	10.0	19.0	-46.0	67.0	48

Table 3 (continued): Descriptive statistics for the dividend & repurchase disclosure samples

		Mean	Median	Std. Dev.	Min.	Max.	N
Net oper. cash divided by total assets	*Repurchase*	0.12	0.1	0.09	0.01	0.59	84
	Dividend	0.09	0.08	0.08	-0.12	0.3	72
Net oper. cash divided by market cap.	*Repurchase*	0.14	0.09	0.15	0.003	0.91	104
	Dividend	0.08	0.06	0.08	-0.02	0.24	21
Market cap.	*Repurchase*	7.12B	0.88B	16.0B	0.01B	126.5B	193
	Dividend	2.95B	0.96B	8.74B	0.09B	43.5B	24
Total assets	*Repurchase*	15.22B	0.99B	46.4B	0.01B	273.0B	228
	Dividend	5.34B	0.50B	18.8B	0.02B	118.2B	81
Total sales	*Repurchase*	7.80B	1.96B	17.7B	0.001B	166.1B	146
	Dividend	48.3B	35.1B	30.8B	4.8B	116.6B	23

N denotes the number of values available in the sample for the respective variable. 'B' denotes billion Euro.

4.2 Repurchase & dividend disclosures

4.2.1 Event studies

Table 4 and 5 presents the results of the event studies.

The average abnormal returns (AAR) and the cumulative average abnormal returns (CAAR) are reported for repurchase disclosures (left) and dividend disclosures (right) together with their p-values and the percentage of positive abnormal returns (AR) on each day. An event window starting at 7 days prior to the events and ending 7 days after the events allows for the observation of AAR behaviour in the days surrounding the events. We visualize the [-7, +7] event window in Figure 1.

The CAAR for repurchase disclosures develops according to expectations, rising majorly at the event date (day zero).

The CAAR for the dividend disclosures, on the other hand, behaves differently. It seems to rise pre-event. Possibly investors act in the anticipation of the event. Still, unlike for repurchase disclosures, after the event date (day zero), the CAAR seems to drop gradually. This is resulting mainly from negative post-event AARs on day 3 and day 6 in our sample.

We have defined two specific event windows, one from day zero until day two and one from day zero until day three. If we cumulate the average abnormal returns for these two windows we can review the period in which the market should respond to new information in a reasonably efficient market.

When we look at these two specific event windows [0, +2] and [0, +3], we observe significant cumulative average abnormal returns for repurchase disclosures, but not for dividend disclosures.

Table 4: Abnormal returns event window [-7, +7]

	Repurchase disclosures					**Dividend disclosures**				
Days	***Pos. (%)***	***AAR***	***P-value***	***CAAR***	***P-value***	***Pos. (%)***	***AAR***	***P-value***	***CAAR***	***P-value***
-7	55	-0.08%	0.35	-0.08%	0.35	74	0.19%	0.19	0.19%	0.19
-6	55	-0.06%	0.38	-0.14%	0.31	63	0.21%	0.16	0.41%	0.09
-5	57	0.05%	0.41	-0.10%	0.39	77	0.02%	0.46	0.43%	0.12
-4	60	0.20%	0.17	0.10%	0.4	74	0.15%	0.24	0.58%	0.09
-3	59	0.00%	0.5	0.10%	0.41	57	0.01%	0.48	0.59%	0.11
-2	54	-0.33%	0.06	-0.23%	0.33	77	0.15%	0.24	0.74%	0.08
-1	56	0.19%	0.18	-0.04%	0.47	69	0.17%	0.22	0.91%	0.06
0	61	1.35%	<0.01***	1.31%	<0.01***	46	0.45%	0.02	1.36%	0.01**
1	59	0.06%	0.39	1.36%	0.02**	51	-0.04%	0.43	1.32%	0.02**
2	53	-0.05%	0.4	1.31%	0.02**	63	0.13%	0.27	1.45%	0.02**
3	55	0.09%	0.33	1.40%	0.02**	60	-0.34%	0.06	1.11%	0.06
4	59	0.10%	0.31	1.51%	0.02**	54	-0.06%	0.38	1.05%	0.08
5	57	-0.10%	0.32	1.41%	0.03*	69	0.27%	0.11	1.31%	0.05*

Table 4: (continued) Abnormal returns event window [-7, +7]

6	53	0.05%	0.41	1.46%	0.03*	60	-0.78%	<0.01 ***	0.53%	0.25
7	54	0.14%	0.25	1.60%	0.02**	74	-0.48%	0.01	0.05%	0.48
[0, +2]	58			1.35%	<0.01***	53			0.54%	0.07
[0, +3]	57			1.44%	<0.01***	55			0.20%	0.32

The columns 'Pos. %' denote the percentage of the ARs on the specified day(s) that where positive.

Table 5: Abnormal returns event window [-7, +7] no outliers

	Repurchase disclosures					**Dividend disclosures**				
Days	*Pos. (%)*	*AAR*	*P-value*	*CAAR*	*P-value*	*Pos. (%)*	*AAR*	*P-value*	*CAAR*	*P-value*
-7	55	-0.08%	0.35	-0.08%	0.35	74	0.19%	0.19	0.19%	0.19
-6	55	-0.06%	0.38	-0.14%	0.31	63	0.21%	0.16	0.41%	0.09
-5	57	0.05%	0.41	-0.10%	0.39	77	0.02%	0.46	0.43%	0.12
-4	60	0.20%	0.17	0.10%	0.4	74	0.15%	0.24	0.58%	0.09
-3	59	0.00%	0.5	0.10%	0.41	57	0.01%	0.48	0.59%	0.11
-2	54	-0.33%	0.06	-0.23%	0.33	77	0.15%	0.24	0.74%	0.08
-1	56	0.19%	0.18	-0.04%	0.47	69	0.17%	0.22	0.91%	0.06
0	61	1.35%	<0.01***	1.31%	<0.01***	46	0.45%	0.02	1.36%	0.01**
1	59	0.06%	0.39	1.36%	0.02**	51	-0.04%	0.43	1.32%	0.02**
2	53	-0.05%	0.4	1.31%	0.02**	63	0.13%	0.27	1.45%	0.02**
3	55	0.09%	0.33	1.40%	0.02**	60	-0.34%	0.06	1.11%	0.06
4	59	0.10%	0.31	1.51%	0.02**	54	-0.06%	0.38	1.05%	0.08
5	57	-0.10%	0.32	1.41%	0.03*	69	0.27%	0.11	1.31%	0.05*
6	53	0.05%	0.41	1.46%	0.03*	60	-0.78%	<0.01 ***	0.53%	0.25
7	54	0.14%	0.25	1.60%	0.02**	74	-0.48%	0.01	0.05%	0.48
[0, +2]	58			1.35%	<0.01***	53			0.54%	0.07
[0, +3]	57			1.44%	<0.01***	55			0.20%	0.32

When excluding the outliers the results of the repurchase disclosures are no longer significant. After excluding outliers 213 cases remained for repurchase disclosures and 91 for dividend disclosures. * means significance at 5% level, ** at the 2.5% level and *** at the 1% level.

4.2.2 Non-parametric tests

As described in Section 4.1, the medians of the CARs for repurchase disclosures and dividend disclosures are 0.24% and 0.31% respectively. A Mood's median (non-parametric) test for independent samples points out that the medians do not differ significantly (degrees of freedom = 1, test statistic = .024, p-value = .877, α = .05). This provides evidence in favour of our third hypothesis.

In Section 4.1, it was further indicated that the CARs for the two types of disclosures might not be normally distributed. A Sharpiro-Wilk test further emphasises the lack of normality in the distribution of these CARs, see table 6. These results call for the use of a non-parametric test to back up our event studies. With a Wilcoxon Signed Ranks test, we can test whether the median CAR differs from the expected median CAR. Under the null hypothesis the median CAR is zero. In Table 7 the test results are summarised.

Table 6: Normality test for disclosure CARs

	Statistic	**Degrees of freedom**	**P-value**	**Alpha**
Repurchase	0.621	244	< 0.001	0.05
Dividend	0.719	97	<0.001	0.05

Sharpiro-Wilk tests point out no normality.

Even though the repurchase disclosures had higher cumulative average abnormal returns according to the event study with outliers included, the Signed Ranks test indicates the results of the event study for repurchase disclosures are not significant. For dividend disclosures, however, the results remain significant in the non-parametric test.

Table 7: Signed Ranks test disclosures

	Repurchases (N = 244)	Dividends (N = 97)
Statistic	*Value*	*Value*
W+	14863	4753
u^{W+}	14945	2377
σ^{W+}	1103.638	278
z	-0.0743	8.551***
p-value	0.53	<0.01

W+ is the sum of positive ranks, u^{W+} is the mean expected under the null hypothesis and σ^{W+} is the standard deviation under the null hypothesis

This means we have found evidence for our first, but not for our second hypothesis.

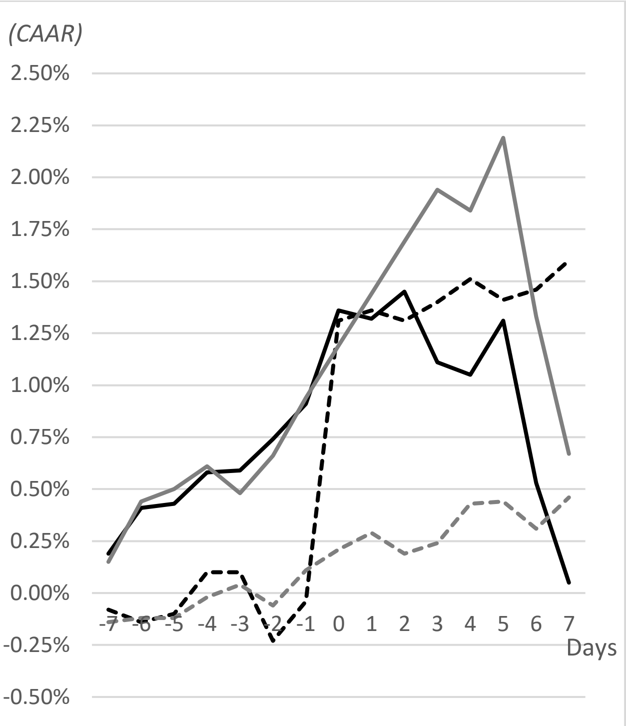
4.3 Regression analysis

The next step in the analysis of the repurchase and dividend disclosures, was to attempt to explain the cumulative abnormal returns. One of our expectations was that net cash from operating activities is positively related to the cumulative abnormal return of a disclosure. Our further expectation was that information asymmetry would be positively related to CARs. In several OLS regression models we try to explain the CARs for repurchase disclosures and dividend disclosures, see Table 10. A bivariate analysis of the variables relevant for the regression formula can be found in Table 9.

The dividend disclosure regression models does not yield significant results. Besides the absence of significance, the '% dividend change' predictor coefficient does not have a robust sign and the 'free cash flow' variable does not have a robust sign either.

Even though model one has a relatively high explained variance and close to significant coefficients, this model shows high VIF scores. This indicates multicollinearity problems in the model. Sadly, we did not find any evidence to support hypothesis 4.1, and 5.1 through the regression analysis.

Figure 1: CAAR for two types of disclosure



▬ ▬ denotes the repurchase disclosures, ▬ ▬ denotes the repurchase disclosures without outliers, and ▬ and ▬ denote the dividend disclosures and dividend disclosures without outliers respectively.

Table 8: Regression explaining the CAR for dividend disclosures

	Dividend disclosures regression models			
	1	*2*	*3*	*4*
Intercept	0.202 (0.037)	0.0168 (0.77)	0.071 (0.08)	-0.009 (0.52)
% dividend change	-0.154 (0.095) 1.950	-0.023 (0.75) 1.06	-0.067 (0.38) 1.257	0.037 (0.38) 1.004
Net oper. cash divided by market cap	-0.887 (0.069) 4.36		-0.253 (0.35) 1.257	
Net oper. cash dividend by total assets		0.325 (0.33) 1.04		0.151 (0.14) 1.004
Market cap. in Billion EUR	-0.646 (0.11) 3.47			
Total sales in Billion EUR		-0.012 (0.99) 1.07		
R-squared	0.415	0.164	0.139	0.076
Adjusted R-squared	0.164	-0.194	-0.077	0.024
N	11	11	11	38

Values reported are the unstandardized coefficients, the p-values between brackets and the VIF score. That is: [Coefficient (p-value) VIF-score]. For distributions of the variables, see Table 3. For a bivariate analysis, see Table 8.

Table 9: Bivariate analysis for the variables in the dividend disclosure regression models

	1	2	3	4	5	6
Car [0, +3] (1)	1 (na) 91					
% dividend change (2)	0.127 (0.41) 44	1 (na) 48				
Market cap. in billion EUR (3)	-0.052 (0.81) 24	-0.019 (0.96) 11	1 (na) 24			
Total sales in billion EUR (4)	0.024 (0.91) 22	0.212 (0.53) 11	-0.138 (0.55) 21	1 (na) 23		
Net oper. cash dividend by total assets (5)	0.237 (0.05) 57	-0.060 (0.72) 38	-0.292 (0.20) 21	0.033 (0.88) 23	1 (na) 72	
Net oper. cash divided by market cap. (6)	-0.112 (0.63) 21	-0.453 (0.16) 11	-.570** (0.007) 21	0.353 (0.12) 21	0.283 (0.21) 21	1 (na) 21

**Correlation is significant at the 0.01 level (2-tailed). Format: [Pearson's correlation (p-value) N]

5. CONCLUSIONS

This paper analysed the impact of dividend change and repurchase disclosures on CAAR. We have attempted to explain the CAR from these disclosures by looking at two possible predictor variables.

Through an event study, we have found a significant relationship between dividend disclosures and CAAR, but found no significant relationship between repurchase announcements and CAAR. This means the first hypothesis can be accepted, but the second hypothesis has to be rejected. Non-parametric tests showed similar results. Therefore, CARs for repurchase announcements have not further been analysed and focus was placed on explaining the CAR of dividend repurchases. An OLS regression on our data provides no evidence for free cash flow to explain the CAR. Nor did the OLS indicate a relationship between information asymmetry and CAR. Thus, we have found no empirical evidence for our fourth and fifth hypothesis. Our samples further point out that dividend disclosures have a slightly higher median CAR than repurchase disclosures. This difference, however, was found to be not significant, leading to the acceptance of our third hypothesis. This finding is in line with the Amihud and Li (2006).

This study has contributed to finance literature by providing insight in the effect of payout disclosures in the UK, The Netherlands and Germany.

These contributions aside, there are also limitations to mention. Hence, the limitations are discussed and linked to suggestions for future research to omit these limitations. Firstly, the fact that we have not found evidence for our fourth and fifth hypothesis might partly result from the absence of normality in the distribution of dividend disclosure CARs. Secondly, a limitation to our research is the choice of proxy variables. Information asymmetry might not be as closely related to company size as was assumed in this study. Thirdly, net operating cash does possibly not accurately mimic the level of free cash flow, as it might lack to account for the portion of cash earmarked for NPV positive projects, which cannot be observed directly. Repeating the study with a better proxy for asymmetry of information and free cash flow is suggested for future research. Other limitations can come from our sample, which is geographically restricted to the UK, The Netherlands and Germany. It would be interesting to enlarge the sample scope to, for instance, the Euro Zone, yet we leave this to future research.

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7. Appendix

Appendix A: Correlation table repurchase disclosure sample

		1	2	3	4	5	6	7
CAR [0, +3] (1)	Pearson Correlation	1						
	P-value							
	N	244						
% stake acquired of total outstanding (2)	Pearson Correlation	0.259**	1					
	P-value	<0.01						
	N	237	237					
Total assets in billion EUR (3)	Pearson Correlation	-0.032	-.199***	1				
	P-value	0.635	.003					
	N	228	222	228				
Total sales in billion EUR (4)	Pearson Correlation	-0.063	-0.157	0.581***	1			
	P-value	0.449	0.063	<0.01				
	N	146	142	146	146			
Net oper. cash divided by market cap. (5)	Pearson Correlation	0.181	0.027	0.164	0.096	1		
	P-value	0.066	0.788	0.097	0.343			
	N	104	102	104	100	104		
Net oper. cash divided by total assets (6)	Pearson Correlation	-0.090	-0.190	-0.100	-0.072	-0.083	1	
	P-value	0.413	0.084	0.379	0.560	0.571		
	N	84	84	79	67	49	84	
Market capitalisation in billion EUR (7)	Pearson Correlation	-0.001	-0.281***	0.530***	0.806***	0.008	-0.034	1
	P-value	0.991	<0.01	<0.01	<0.01	0.937	0.789	
	N	193	189	193	124	101	65	193

*** means that the correlation is significant at the 0.01 level (2-tailed).

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