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Investor Attention to Earnings Announcements on Fridays

An Empirical Analysis of the Market Reactions to Earnings Announcements on the Oslo Stock Exchange

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Abstract

We use quarterly earnings announcements, analyst estimates, and daily equity data from the Oslo Stock Exchange to analyze if investors are less attentive on Fridays. We test this market anomaly with the following hypotheses: (1) Fridays have lower immediate and higher delayed abnormal returns after earnings announcements than other weekdays; and (2) Fridays have lower immediate abnormal turnover after earnings announcements than other weekdays. We do not find that there is a significantly different reaction to Friday announcements, neither for abnormal return nor turnover. Thus, we cannot conclude that investors are less attentive on Fridays. However, this relationship is not constant over time. We find that there was a significantly delayed response to Friday earnings announcements in the period 2005 to 2008.

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1 Introduction

Whether the market effectively incorporates new information is still being debated. However, there are reasons to believe that cognitive limits and restricted attention impact investment decisions and market pricing (Hirshleifer and Teoh, 2003). For example, in the US, Damodaran (1989) and DellaVigna and Pollet (2009) find significantly lower immediate and higher delayed market response to earnings announcements on Fridays compared to other weekdays. They argue that the weekend distracts investors and that this reduced immediate reaction is evidence of lower attention. Furthermore, DellaVigna and Pollet (2009) find that a zero investment portfolio based on the delayed Friday reaction yields a monthly abnormal return of 3.84%.

This paper investigates if the Friday-effect is present in the Norwegian stock market. Thus, we aim to extend the financial literature on investor inattention in the stock market. First, we hypothesize that investors are less attentive to earnings announcements on Fridays when the weekend is close, and therefore react slower. We test this by using the event study methodology. We do not find a significant immediate reaction to Friday announcements during 2005-2020. However, there is significantly negative abnormal returns in the window after announcements, at the 10% level. Contrary, Non-Friday announcements have significantly negative abnormal returns at the event, at the 1% level. They do, however, have an insignificant delayed response to the announcements. Thus, Friday announcements show signs of post-earnings-announcement drift (PEAD), while Non-Fridays do not.

Then we categorize the earnings announcements into surprise quantiles to investigate the weekend effect further. We define surprises as the relative difference between actual earnings and market expectations, where analyst consensus estimates are our proxy for the market beliefs. Additionally, we control for the size of the firm, year of announcement, if it is an early or late announcement, and two-way fixed effects. We find that the weekday of the announcement does not significantly affect the abnormal return, neither immediate nor delayed. However, we find that the grade of surprise significantly affects the variation in abnormal returns. Hence, we believe that the negative reaction to Friday announcements is due to other characteristics than the weekday of publication.

Next, we replicate the analysis with four sub-periods to investigate the market reaction to Friday announcements over time. The first period, 2005-2008, is the only one with a significant PEAD for Friday announcements, negatively at the 10% level. Non-Friday does not have significant abnormal returns after the announcements in any period. Furthermore, we find that Friday significantly negatively affects abnormal returns in the delayed window for the most extreme surprises in the first period. However, it has a significant positive effect in the same period for more normal surprises. Further, Friday has a significantly negative effect on abnormal returns in the second period, 2009-2012, for the more normal surprises. After that, Friday does not significantly affect abnormal returns in any period. Consequently, we find that the market reacted significantly differently to Friday announcements in the first two periods, but not in the last two periods.

To further validate the results, we analyze if there are sectorial differences in the reaction to Friday announcements. We split the firms into sectors based on the Global Industry Classification Standard (MSCI Inc., 2020), including data only from the most extreme surprises. We find that some sectors tend to react differently to Friday announcements. However, all these sectors have relatively few observations, making it hard to draw inferences about the populations. Among the sectors with the most observations, we find no significant differences between Friday and Non-Friday announcements reactions to earnings surprises. Therefore, we cannot conclude that specific sectors react differently to Friday announcements.

Secondly, we hypothesize that investors trade less on Friday earnings announcements. We compare the share turnover around the event for Friday and Non-Friday announcements to investigate this hypothesis. We find that Friday has a significantly lower immediate abnormal turnover than Non-Friday announcements, for the most extreme surprises, at the 5% level. To further verify this difference, we split the data into the same four periods as we do with the abnormal returns. We find that Fridays have a significantly negative effect on abnormal turnover in the first period, on the 1% level. Moreover, we see that this is the only period where Friday significantly affects abnormal turnover. Hence, we find a lower reaction to Friday announcements in the first period. However, we do not find that investors trade less on Friday announcements in the latest periods.

To summarize, we do not find a significantly different response to Friday announcements

in the most recent periods. However, our findings from the first period are consistent with the literature that suggests that investors react slower to earnings announcements on Fridays. We argue that the disappearance of this anomaly is in line with the arbitrage pricing theory (Ross, 1976).

1.1 Theory and Hypothesis Development

The semi-efficient market hypothesis claims that all publicly available information is instantly incorporated into the stock price (Fama, 1970). Thus, no market participant can expect excess abnormal returns in the long term. However, deviations from this expectation might occur because of cognitive and time constraints to process new information (Hirshleifer and Teoh, 2003).

Ball and Brown (1968) find that earnings announcements containing good news tend to yield positive cumulative abnormal returns in the period after announcements, and vice versa (see also Bernard and Thomas (1989) and Abarbanell and Bernard (1992)). This delayed response to earnings announcements is the main result of the post-earnings-announcement drift (PEAD) anomaly, which Fama (1998) refers to as "the granddaddy of all under-reaction events." This anomaly notes that stocks tend to yield cumulative abnormal returns in the direction of the earnings surprise after an announcement. Evidence of PEAD exists from multiple markets worldwide, both in developed and emerging markets (Griffin et al., 2010).

Interestingly, Damodaran (1989) find that earnings announcements made on Fridays are more likely to contain news of decline, and yield negative abnormal returns after the announcements (see also Patell and Wolfson (1982), DellaVigna and Pollet (2005) and DeHaan et al. (2015)). Similarly, DellaVigna and Pollet (2009) find a significant difference between weekdays of announcements, with Fridays yielding more negative abnormal returns relative to other weekdays. They argue that closer to the weekends, investors are less attentive and thus miss some of the information in the earnings reports leading to PEAD. However, they find that the total response to earnings announcements is the same for all days, implying that the reduced immediate effect is followed by an increased delayed effect. Thus, long-term management is indifferent between Friday and Non-Friday announcements. On the other hand, Bagnoli et al. (2005) argue that short-term managers

take advantage of the inattention close to the weekend, thus release negative accounting data on Fridays, often after market close (see also Damodaran (1989), DeHaan et al. (2015) and Michaely et al. (2016)).

As the literature suggests, different characteristics of earnings announcement affects the stock market reaction to the news. Investors seem to underreact to the information from earnings announcement, especially on Fridays. If there is an underreaction, we expect it to be prominent in the Norwegian stock market, as Norwegians work fewer hours on Fridays than other days (Statitisk Sentralbyrå, 2012). Based on the literature above, and the fact that Norwegians have less time to react on Fridays, our first hypothesis is:

(1) Fridays have lower immediate and higher delayed abnormal returns after earnings announcements than other weekdays.

Barber and Odean (2008) find that attention-grabbing news leads to abnormal trading volumes, concluding that investors are net buyers of attention. However, Hirshleifer et al. (2009) find that if there are a lot of earnings announcement publishments at once, the immediate trading volume is lower (see also Peress (2008)). Related to this effect, Cao and Narayanamoorthy (2012) identify that PEAD correlates negatively with trading volume. Correspondingly, Hou et al. (2009) find more considerable drift during low turnover and down markets. This relationship can help explain why there is evidence of larger PEAD during religious holidays and sports events, where attention to the stock market may be lower (Pantzalis and Ucar (2014) and Pantzalis and Ucar (2019)).

Interestingly, there is evidence of differences in trading volume between weekdays. For example, Kiymaz and Berument (2003) find that Mondays and Fridays have significantly lower turnover than other days of the week (see also Chordia et al. (2001)). This finding is also in line with DellaVigna and Pollet (2009), who find that earnings announcements on Fridays have lower immediate trading volume than other days. They argue that investors are distracted by the upcoming weekend and thus underreact to the new information. Based on the literature above, there is reason to believe that inattention leads to lower trading volume. Therefore, our second hypothesis is:

(2) Fridays have lower immediate abnormal turnover after earnings announcements than other weekdays.

2 Literature Review

Our findings contribute to the financial literature on the PEAD anomaly and the role of inattention. First, we relate to the literature by investigating stock price movements after earnings announcements. Multiple studies find that investors react slower and more negatively to earnings announcements made on Fridays relative to Non-Fridays (see for example Damodaran (1989), Patell and Wolfson (1982), DellaVigna and Pollet (2009) and DeHaan et al. (2015)). Secondly, we relate to the literature by examining the immediate trading activity differences between Friday and Non-Friday announcements. Similarly to price reactions, multiple studies find lower trading volume around Friday earnings announcements, arguing that investor inattention is the reason for the post-announcement price reaction (see for example Hirshleifer et al. (2009) and DellaVigna and Pollet (2009)). To our best knowledge, there is no literature on the weekday inattention hypothesis on the Norwegian stock market.

Our paper uses the main framework of DellaVigna and Pollet (2009). They analyze what they call the weekday inattention hypothesis on the US stock markets. Including 228,651 earnings announcements from I/B/E/S and COMPUSTAT from 1984 to 2006, they investigate the different reactions to Friday and Non-Friday earnings announcements. Similarly to us, they define earnings surprises as the difference between actual earnings and the analyst consensus estimates, using data from I/B/E/S as a proxy for investors' expectations. By splitting the earnings surprises into eleven quantiles, from worst to best, they analyze the immediate and delayed response to earnings surprises on Fridays versus Non-Fridays. They find that Friday announcements have a 15% lower immediate response and a 70% higher delayed response. This Friday-effect is still significant after controlling for other characteristics and two-ways fixed effects. Further, they find that the immediate trading volume is 8% lower on Friday announcements, arguing that the weekend distracts the investors. These results are consistent with our findings from the first period. However, we do not find a significantly different reaction to Friday announcements in the last three periods.

DeHaan et al. (2015) analyze if managers "hide" bad news by announcing during low attention periods. They collect 192,485 quarterly earnings announcements from all US public companies from 2000 to 2011 and corresponding analyst consensus from COMPUSTAT and I/B/E/S, respectively. They find that earnings surprises tend to be worse during periods with less attention, arguing that managers take advantage of inattention and hide unfavorable earnings information. Even though they find that Friday announcements tend to be negative, they do not find less attention on Fridays. They argue that managers may incorrectly perceive that attention is lower on Fridays, thus failing to hide bad news. Similarly, we find that Friday announcements are often below market expectations and yield negative abnormal returns. Further, we find lower turnover on Fridays. However, we cannot conclude that this is evidence of lower attention.

3 Data

To investigate if the market reacts differently on Fridays, we collect daily stock data and quarterly earnings announcement data for Norwegian companies from 2000 to 2020. Further, we use analyst consensus estimates as a proxy for market expectations to the earnings announcements. Table A.1 in the appendix lists all variables we have constructed and collected from each of the data sources.

We include all companies which have been a part of the Oslo Stock Exchange Benchmark Index (OSEBX) sometime during the defined period. To determine which companies fit these criteria, we collect yearly lists of constituents of the OSEBX from NewsWeb (Euronext N.V., 2021). Further, we condense these lists to one list containing all unique companies. In total, there are 220 companies.

All data related to earnings, quarterly announcements, and analyst estimates are from Bloomberg L.P. (2021). We use the ERN-function on the Bloomberg terminal to retrieve earnings summary data for each company. This data consists of announcement dates, reported earnings, comparable earnings, analyst consensus estimates, and earnings surprises. Bloomberg calculates their earnings surprises as comparable earnings divided by analyst consensus earnings. To our best knowledge, comparable earnings adjust for differences in accounting principles or currencies. However, these comparable earnings might not always be the best measure. For example, Bloomberg reported an earnings surprise for Mowi ASA in Q1 2015 as 671%, where the comparable earnings equaled 5.6 billion and the analyst estimate was 710.4 million. In contrast, the reported earnings were 736.5 million, which would result in an earnings surprise of 3.67%. To correct this miscalculation, we estimate earnings surprise using the measure that yields the surprise closest to zero for each announcement. Anyhow, this problem is minor, as the two rarely deviate from each other. Nevertheless, we believe that this way of measuring surprises yields a more accurate estimate of deviations from market expectations.

Further, we remove all announcements without any estimates, as we need a proxy for market expectations to conduct our analysis. This limitation leaves us with 146 unique companies and 3445 announcements in total. Additionally, we cannot include announcements with missing return observations in our event window. Thus, our final sample of earnings

announcements is 2763. Table A.2 in the appendix shows the complete and final list of companies. None of the remaining announcements go further back than 2005, restricting our final period for the analysis to 2005-2020. Because the timing of the announcements is essential, we cross-check the dates from Bloomberg with those on Newsweb. We find some duplicate and missing dates from the Bloomberg data, which we correct by using the announcements dates from Newsweb.

Next, we use stock returns and returns for the OSEBX to analyze the market reaction to earnings announcements. All index data and equity-related data are from Børsprosjektet NHH (2020). We collect daily observations of returns for adjusted closing prices, International Securities Identification Number (ISIN), shares issued, Global Industry Classification Standard (GICS), and official share turnover for each company.

Figure 1 shows the yearly distribution of earnings announcements in the sample period. There is a shift in the number of announcements in 2010/2011. The reason for this shift is that Bloomberg restricts the data to the 40 most recent observations per company, which is the ten last years in our defined period if a company has announcements for every quarter. This limitation implies that a company with observations in the last years is unlikely to have observations in the first years of the period, and vice versa. Furthermore, there is a drop in included announcements in 2020 because the equity data from Børsprosjektet does not have newer observations than November 2020. This constraint results in most announcements from the second half of 2020 being excluded from the analysis, as they do not have enough corresponding returns for the event window.

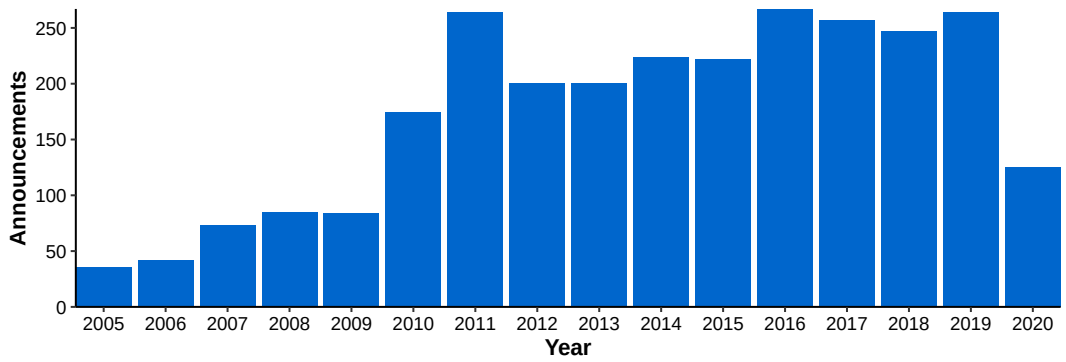

Figure 1: All included earnings announcements distributed by the year they occur.

Table 1 presents summary statistics of the data, split into Friday and Non-Friday announcements and the difference between them. Announcements on Friday and other days are not significantly different from each other in terms of what year they occurred, the magnitude of the surprise, or the announcing companies' market capitalization at the announcement. However, Friday announcements are published significantly faster than Non-Friday announcements. Generally, about 2/3 of announcements come two months after the end of a quarter.

Table 1: Summary statistics for Friday and Non-Friday earnings announcements. Each column contains the mean and standard deviation in parentheses, for each variable. Year specifies the year of the quarter of the corresponding announcement. Earnings Surprise is defined as the relative difference between the actual earnings and analyst consensus estimate earnings. Market Capitalization is calculated as shares issued multiplied by adjusted closing price at the time of announcement. The last three variables are dummies indicating which month after a quarter the earnings announcement is published. For example, an announcement published in June is in the third month after the first quarter, ie. Month 3 of Quarter would be 1 in this instance. The Difference column shows the difference in means between the other two columns, and whether the difference in means is statistically significant.

	Friday	Non-Friday	Difference
Year	2014.54 (0.16)	2014.57 (0.08)	-0.03 (0.18)
Earnings Surprise (%)	2.64 (1.76)	3.32 (0.78)	-0.68 (1.92)
Market Cap. (NOK bn)	16.68 (1.86)	17.87 (0.96)	-1.19 (2.10)
Month 1 of Quarter (%)	34.97 (1.93)	27.57 (0.84)	7.40 (2.10)***
Month 2 of Quarter (%)	63.73 (1.95)	70.63 (0.86)	-6.91 (2.13)***
Month 3 of Quarter (%)	1.31 (0.46)	1.80 (0.25)	-0.49 (0.52)
Note:			*p<0.1; **p<0.05; ***p<0.01

Further, we group the announcements into grades of surprise. If there is inattention on Fridays, we expect the delayed reaction to be more prominent in the most extreme surprises. Therefore, we split the announcements into eleven surprise quantiles. Quantile one contains the most negative surprises, quantile eleven contains the most positive surprises, and quantile six contains the neutral surprises. We define neutral surprises as announcements where the relative difference between actual earnings and analyst consensus estimates are over -0.5% and less than 0.5%. All surprises above the upper boundary for neutral surprises are equally divided into quantiles seven through eleven. Surprises below the lower boundary are equally divided into quantiles five through one. We calculate the boundaries for the surprise quantiles using the complete data set containing all days, not Fridays and Non-Fridays separately. Table 2 shows the distribution of all

Table 2: The earnings announcement surprises are split into eleven quantiles. Neutral surprises are in quantile six, and they are defined as surprises within the interval (-0.5%, 0.5%). Positive surprises are those which are above the neutral ones, and they are split into quantiles seven through eleven. Negative surprises are those which are below the neutral ones, and they are split into quantiles five through one. Quantiles on each side of the neutral quantile six are split evenly with boundaries for the complete data set containing every weekday. The table is split into two sections, one for Friday observations and the other for Non-Friday observations. Each section shows the number of observations and mean surprise in percent for each quantile.

	Q	1	2	3	4	5	6	7	8	9	10	11
Friday	N	49	47	43	43	56	24	45	46	35	51	44
	$\overline{S}$ (%)	-35.6	-9.6	-5.2	-2.8	-1.2	0.0	1.3	3.0	5.9	10.5	53.9
Non-Friday	N	194	194	201	199	187	170	228	224	236	220	227
	$\overline{S}$ (%)	-33.3	-9.9	-5.5	-3.0	-1.2	0.0	1.2	2.9	5.8	10.9	63.5

announcements and the mean surprises for all quantiles for Fridays and Non-Fridays. The mean surprises are mostly even between the days. However, Non-Fridays are skewed positively with 16% more positive surprises than negative ones, while Fridays have 8% more negative surprises than positive ones. Further, there are a lower fraction of neutral surprises on Fridays than Non-Fridays.

Figure 2 displays how the type of surprise is sorted by weekdays and months, while Table 3 shows the frequency of announcements with the same allocation. Friday is the second least common announcement day, while being the weekday with the most negative surprises relative to positive and neutral ones. Tuesday through Thursday are the most common days and have the highest share of neutral surprises. Monday is the least common weekday,

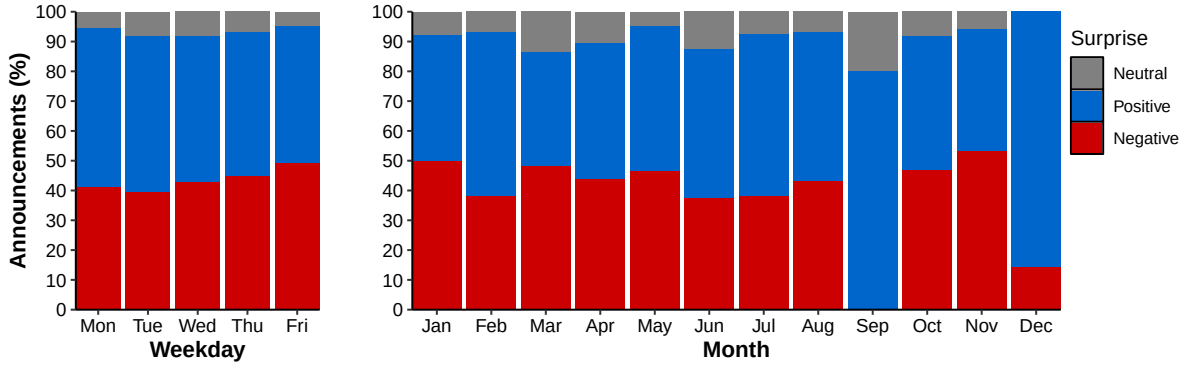

Figure 2: Every earnings announcement is sorted by the day or month they occur and distributed into stacked bars by type of surprise. Neutral surprises are in quantile six. Positive surprises are in quantiles seven through eleven, while negative surprises are in quantiles five through one.

Table 3: Announcements are presented in two separate categories to show how they are distributed across weekdays and months. The first row shows the number of announcements for each weekday or month. The second row shows the percentage of announcements for each weekday or month.

	Weekday					Month											
	Mon	Tue	Wed	Thu	Fri	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
N	112	505	700	963	483	38	640	29	217	450	8	233	453	5	306	377	7
%	4.1	18.3	25.3	34.9	17.5	1.4	23.2	1.0	7.9	16.3	0.3	8.4	16.4	0.2	11.1	13.6	0.3

with 4.1% of all announcements. Meanwhile, we see no clear indication of differences in the type of surprise between the months, besides September and December, which are among the months with the fewest announcements. Also, we see that the months with the fewest announcements are the last in each quarter.

4 Methodology

To investigate the effect of earnings announcements on stock prices, we use the event study framework of Campbell et al. (2012). This method is useful to provide estimations of abnormal performance during events, and to measure the impact of surprises on the wealth of stakeholders (Kothari and Warner, 2007). Additionally, it is also an important test of market efficiency, because systematically non-zero abnormal returns after corporate events breach the market efficiency theory (Fama, 1970).

4.1 Abnormal Return

To measure the abnormal returns after each earnings announcement, we first need to calculate each company's normal return at the event date. Normal returns can be interpreted as the expected stock return of the firm as if the event did not happen (Campbell et al., 2012). We use the Market Model to estimate the expected returns. The advantage of using this model is is that it calculates the correlation between each stock and the market. Thus, it can distinguish the return effect of the company from the market return. Alternatively, one can use the capital asset pricing model. However, prior research shows skepticism to this model, arguing that the market model is more effective in predicting returns (MacKinlay, 1997). Further, we choose not to include a multifactor model to reduce the variance, as the literature shows that it has limited gains (Fama and French, 1996). Hence, the normal return and corresponding variance of company i at time t, is given by:

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \epsilon_{i,t} \tag{1}$$

$$E[\epsilon_{i,t}] = 0 \qquad Var[\epsilon_{i,t}] = \sigma^2_{\epsilon_{i,t}}$$

where $R_{i,t}$ and $R_{m,t}$ are the period t return for company i and the market portfolio m, respectively, $\epsilon_{i,t}$ is the zero mean distribution term, while α_i, $\beta_i R_{m,t}$ and $\sigma^2_{\epsilon_{i,t}}$ are parameters of the market model. We estimate normal returns over 250 trading days, which equals approximately one calendar year. This window secures that four of the past quarterly earnings announcements are present in the estimation. To reduce the chance that stock movements related to the earnings announcement influence normal return estimation,

we use a three trading days hold-out window before the earnings announcement. Thus, the estimation of normal returns takes place in the interval [-253,-4]. Further, we limit the event window to 60 trading days, which is just under three calendar months, to prevent the reaction of the following announcement from interfering with our results. Further, we define four event windows. First, we obtain the pre-announcement reaction from the interval [-3,-1]. To evaluate the immediate effect, we use the interval [0,1]. This interval ensures that reactions to earnings announcements made after market close are included in the results. While there is an inaccuracy cost by using this interval, we argue that it is still a good estimate for the immediate reaction. Then, the post-announcement response is calculated in the interval [2,60], while the last interval [0,60] includes all reactions from the event start to 60 trading days after. Hence, the abnormal return of company i at time t is given by:

$$\widehat{AR_{i,t}} = R^*_{i,t} - \widehat{\alpha}_{i,t} - \widehat{\beta_{i,t}} R^*_{m,t} \tag{2}$$

where $\widehat{AR_i}$ is the abnormal return for company i at time t, $R^*_{i,t}$ is the return for company i at time t, while $\widehat{\alpha}_{i,t}$, $\widehat{\beta_{i,t}}$ and $R^*_{m,t}$ are parameters from the market model. The abnormal returns will be jointly normally distributed with a conditional mean of zero (Campbell et al., 2012). Further, we calculate the cumulative abnormal return to see the total abnormal stock price reaction in the specified intervals. The cumulative abnormal return for each earnings announcement is given by:

$$\widehat{CAR}_n(t_1, t_2) = \sum_{t=t_1}^{t_2} \widehat{AR_i} \tag{3}$$

The cumulative average abnormal return $\widehat{CAAR}_n(t_1, t_2)$ for earning announcements is the average of all $\widehat{CAR}_n(t_1, t_2)$. Further, the variance of $\widehat{CAAR}_n(t_1, t_2)$ is given by:

$$Var(\widehat{CAAR}) = \frac{1}{N^2} \sum_{t=1}^{N} \sigma^2_{AR_{i,t}} \tag{4}$$

where N is the number of events and $\sigma^2_{AR_{i,t}}$ is the residual standard error of the market model for each event. To test the significance of the estimated CAARs in the different intervals, we use the J-test. Because the length of each interval is different, we need to

scale the variance correspondingly. The null hypothesis states that $\widehat{CAAR_{t_1,t_2}}$ equals zero.

$$J = \frac{\widehat{CAAR_{t_1,t_2}}}{[Var(\widehat{CAAR_{t_1,t_2}}) \cdot L]^{\frac{1}{2}}} \sim N(0,1) \tag{5}$$

Return Regressions

Further, we use cross-sectional analysis to investigate if other variables than weekdays can explain differences in CAAR (Campbell et al., 2012). Our regression model specification is as follows:

$$\begin{aligned} CAAR_{i,t}^{h,H} = \beta_0 + \beta^F d_{i,t}^F + \beta^{top} d_{i,t}^{top} + \beta^{bot} d_{i,t}^{bot} + \beta^{top,F} d_{i,t}^{top} \times d_{i,t}^F + \beta^{bot,F} d_{i,t}^{bot} \times d_{i,t}^F \\ + \Gamma X_{i,t} + \epsilon_{i,t} \end{aligned} \tag{6}$$

where $CAAR_{i,t}^{h,H}$ is the cumulative average abnormal return in the time interval [h,H] for company i in quarter t. $d_{i,t}^F$ is equal to one for announcements made on Friday and zero for other weekdays. $d_{i,t}^{top}$ is equal to one if the announcement has an earnings surprise from the top two surprise quantiles and zero for all other surprise quantiles. Similarly, $d_{i,t}^{bot}$ contain only announcements from the bottom two surprise quantiles. $X_{i,t}$ are control variables that we include in some of the regressions. First, we include a year dummy to control for differences between years. Further, because the literature shows negative earnings announcements often are published later after the quarter ends, we include a dummy to differentiate early and late publishments of earnings announcements (Chambers and Penman, 1984). Lastly, we control for the size of the company by including dummies for market capitalization. Each year, we split the sizes of the companies into ten deciles, from smallest to biggest. This split reduces the skewness in market capitalization. Additionally, we add time and individual fixed effects to deal with omitted variable bias. Our specification is similar to the one of DellaVigna and Pollet (2009). However, we add $d_{i,t}^{bot}$ to be able to differentiate the top and bottom surprises.

We use heteroscedasticity robust standard error to correct for unobserved heterogeneity between firms. Additionally, we use firm clustered standard errors to correct for breaches of independently and identically distributed returns within firms. Further, we also cluster the standard errors by time to account for correlations between firms on the same day.

Thus, we obtain unbiased standard errors (Stock et al., 2012). Under the assumptions that the general conditions of ordinary least squares hold, we provide consistent estimators.

4.2 Abnormal Trading Volume

One of the main predictions from the limited attention hypothesis is a lower immediate reaction. Therefore, we also analyze the trading volume around the announcements, as the behavior of trading volume is related to the behavior of stock prices (Karpoff, 1987). We follow the framework of DellaVigna and Pollet (2009) to analyze the abnormal trading activity around Friday and Non-Friday earnings announcements. We define the measure of abnormal trading volume as:

$$\Delta v_{i,t}^{(h,H)} = \frac{\sum_{(u=h)}^{H} log(V_{i,t}^{(u,u)})}{H-h+1} - \frac{\sum_{u=-20}^{-11} log(V_{i,t}^{(u,u)})}{10} \tag{7}$$

where $V_{i,t}^{(u,u)}$ is the fraction of shares traded on the u^{th} day after the announcement for company i in quarter t. $\Delta v_{i,t}^{(h,H)}$ can be interpreted as the average abnormal trading volume in the interval from h to H, relative to the normal volume. We estimate the normal trading volume as the average share turnover between 11 and 20 days before each announcement. We use a reduced estimation window compared to abnormal returns as our focus period is shorter. Further, we believe that this estimation window is a fair proxy for normal turnover at the time of the event. Specifically, $\Delta v_{i,t}^{(0,0)}$ is the abnormal share turnover on the day of the announcement. We limit this analysis to the interval [-3,5], as the primary purpose is to obtain the volume reaction close to the announcement. The window [-3,-1] is the pre-announcement reactions, [0,1] is the immediate reaction, and [2,5] can be interpreted as the delayed immediate reaction.

Turnover Regressions

We use cross-sectional analysis to investigate the effect of other characteristics than the weekday of the announcement. Since we expect surprises to cause abnormal volumes, we use the exact model specifications as we did when analyzing abnormal returns. Further, our results are easily comparable with abnormal returns as we use the same model. Thus,

our regression model is as follows:

$$\begin{aligned}\Delta v_{i,t}^{(0,1)} = \beta_0 + \beta^F d_{i,t}^F + \beta^{top} d_{i,t}^{top} + \beta^{bot} d_{i,t}^{bot} + \beta^{top,F} d_{i,t}^{top} \times d_{i,t}^F + \beta^{bot,F} d_{i,t}^{bot} \times d_{i,t}^F \\ + \Gamma X_{i,t} + \epsilon_{i,t}\end{aligned} \tag{8}$$

where $\Delta v_{i,t}^{(0,1)}$ is the cumulative average abnormal turnover in the interval [0,1] from company i in quarter t. All else is equal to the estimation we do in abnormal returns. The reason for using the same control variables as in the abnormal returns is that we believe the year of announcement, late or early publishing, and the size of the companies are all variables that affect the trading volume. We use heteroscedasticity robust and clustered standard errors for the same reasons as stated in the abnormal return section.

5 Results

This section studies the stock market reaction to earnings announcements differing from the expectations. First, we compare the abnormal returns around Friday announcements to other weekdays. We provide graphical evidence, along with regression to explain the different reactions. Further, we replicate the analysis with four sub-periods to investigate the market reaction to Friday announcements over time. Then we analyze if there are any different reactions among the sectors. Lastly, we investigate if there are different reactions regarding trading volume.

5.1 Stock Price Response

Figure 3 shows graphical evidence of the cumulative average abnormal return after earnings announcements made on Fridays, Non-Fridays, and All weekdays, while Table 4 shows the statistical significance of these reactions. We focus on Friday and Non-Friday announcements, as All weekdays are the weighted average of these announcements. We find that Friday announcements have a significantly negative post-announcement response, while Non-Friday has a significant reaction pre-event and at the event.

Announcements on Fridays have an insignificant positive reaction during the three days before the event. This insignificant positive response continues at the event. Then the reaction shifts to a significant negative abnormal return of -1.7% during days 2 to 60 after an announcement, at the 10% level. Including both the event and the window

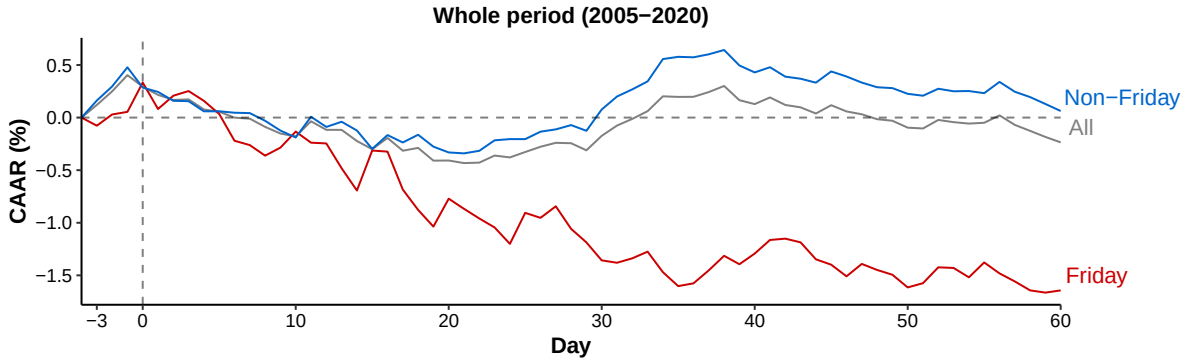

Figure 3: Cumulative average abnormal return around earnings announcements during 2005-2020.

Table 4: Test statistics from J-test for earnings announcements in each category during 2005-2020. From and To shows the starting and ending days for each event window.

Interval			J - Test		
From	To	Length	Friday	Non-Friday	All
-3	-1	3	0.26	4.66***	4.37***
0	1	2	0.16	-2.79***	-2.50**
2	60	59	-1.84*	-0.40	-1.10
0	60	61	-1.78*	-0.90	-1.54
N			483	2280	2763
Note:					*p<0.1; **p<0.05; ***p<0.01

after, there is a significantly negative abnormal return of 1.7%, at the 10% level. On the contrary, Non-Friday announcements have a significantly positive pre-announcement reaction, following a significantly negative response during the event at the 1% level. This negative reaction continues in the window after the event. However, it is insignificant. Overall, we see that Friday announcements have a negative trend, while Non-Friday tends to fluctuate around zero.

Next, we run multiple regressions to investigate the weekend effect on abnormal returns further. The main finding is that Friday is not a significant explanatory variable for the variation in abnormal return. However, the grade of surprise can significantly explain some of the market reactions to announcements.

Table 5, Panel A shows how abnormal returns are affected by weekdays and surprises immediately after an announcement. We see that Friday does not significantly affect abnormal returns in any of the model specifications, neither on all data nor limited to only Top and Bottom Surprise. Further, we see that earnings surprises in Top Surprise are significantly positive at the 1% level in all model specifications. Meanwhile, Bottom Surprise has a significantly negative effect on abnormal returns in all model specifications, at the 5% level without control variables and the 10% level with control variables and fixed effects. Friday announcements do not significantly differ from other days in combination with Top or Bottom Surprise.

Panel B shows the effect of weekdays and surprises on abnormal returns during the delayed response window. Friday does not significantly affect abnormal returns in any model

specifications. Top Surprise has a significantly more positive effect than other surprises, at the 10% level. However, Top Surprise only affects abnormal returns significantly more positively than Bottom Surprise with control variables and fixed effects, at the 5% level. In contrast, neither Bottom Surprise nor the interaction terms have a significant effect.

Panel C includes the immediate and delayed reaction windows and shows the combined effects. Friday only significantly affects abnormal return when including control variables and fixed effects, negatively at the 5% level. Furthermore, Top Surprise has a significantly more positive effect on abnormal returns than other surprises, at the 1% and 5% level. Oppositely, Bottom Surprise is not significant in any model specification. Likewise, Friday in interaction with Top or Bottom Surprise does not significantly affect abnormal returns.

Table 5: Regressions on stock price response in the whole period. Panel A shows the immediate window [0,1]. Panel B shows the delayed window [2,60]. Panel C shows the combined window [0,60]. Columns (1), (2), and (3) include all earnings announcements, while columns (4), (5), and (6) are limited to earnings announcements from surprise quantiles 1, 2, 10, and 11. Control variables included in columns (2), (3), (5), and (6) are dummies for the year of announcement, dummies for how many months after the end of the quarter the announcement is published, and dummies for market capitalization deciles. Columns (3) and (6) consist of time and individual fixed effects.

Panel A

	Dependent variable: Abnormal returns [0,1]					
	All			Top/Bottom Surprise		
	(1)	(2)	(3)	(4)	(5)	(6)
Friday	0.003	−0.004	−0.005	0.004	0.003	0.001
	t = 0.580	t = −0.847	t = −1.038	t = 0.430	t = 0.304	t = 0.077
Top Surprise	0.012***	0.014***	0.014***	0.024***	0.022***	0.021***
	t = 2.827	t = 3.162	t = 3.250	t = 4.112	t = 3.630	t = 3.329
Bottom Surprise	−0.012**	−0.008*	−0.008*			
	t = −2.470	t = −1.844	t = −1.767			
Friday:(Top Surprise)	0.001	0.004	0.004	−0.001	−0.004	−0.004
	t = 0.073	t = 0.365	t = 0.433	t = −0.030	t = −0.302	t = −0.287
Friday:(Bottom Surprise)	0.001	0.005	0.005			
	t = 0.119	t = 0.463	t = 0.465			
Constant	−0.003			−0.014***		
	t = −1.437			t = −3.330		
Fixed Effects	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	2,763	2,763	2,763	1,026	1,026	1,026
R^2	0.006	0.007	0.020	0.020	0.014	0.044
Note:						*p<0.1; **p<0.05; ***p<0.01

Panel B

	Dependent variable: Abnormal returns [2,60]					
	All			Top/Bottom Surprise		
	(1)	(2)	(3)	(4)	(5)	(6)
Friday	−0.009	−0.014	−0.020	−0.002	−0.016	−0.024
	t = −0.771	t = −1.109	t = −1.584	t = −0.062	t = −0.464	t = −0.693
Top Surprise	0.029*	0.030*	0.025*	0.033	0.031	0.042**
	t = 1.901	t = 1.955	t = 1.795	t = 1.611	t = 1.412	t = 2.123
Bottom Surprise	−0.003	0.004	−0.014			
	t = −0.219	t = 0.255	t = −1.081			
Friday:(Top Surprise)	−0.040	−0.033	−0.025	−0.048	−0.022	−0.018
	t = −1.242	t = −0.852	t = −0.675	t = −1.175	t = −0.444	t = −0.389
Friday:(Bottom Surprise)	0.007	0.007	0.008			
	t = 0.246	t = 0.221	t = 0.257			
Constant	−0.007			−0.010		
	t = −1.264			t = −0.724		
Fixed Effects	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	2,763	2,763	2,763	1,026	1,026	1,026
R^2	0.003	0.003	0.104	0.004	0.003	0.098
Note:						*p<0.1; **p<0.05; ***p<0.01

Panel C

	Dependent variable: Abnormal returns [0,60]					
	All			Top/Bottom Surprise		
	(1)	(2)	(3)	(4)	(5)	(6)
Friday	−0.006	−0.018	−0.025**	0.002	−0.013	−0.023
	t = −0.522	t = −1.423	t = −2.075	t = 0.072	t = −0.323	t = −0.603
Top Surprise	0.041**	0.044***	0.039***	0.056***	0.053**	0.063***
	t = 2.566	t = 2.872	t = 2.887	t = 2.692	t = 2.282	t = 3.019
Bottom Surprise	−0.015	−0.004	−0.022			
	t = −0.951	t = −0.300	t = −1.572			
Friday:(Top Surprise)	−0.040	−0.029	−0.020	−0.048	−0.026	−0.022
	t = −1.211	t = −0.782	t = −0.566	t = −1.154	t = −0.491	t = −0.433
Friday:(Bottom Surprise)	0.008	0.012	0.013			
	t = 0.270	t = 0.348	t = 0.399			
Constant	−0.010*			−0.025*		
	t = −1.648			t = −1.692		
Fixed Effects	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	2,763	2,763	2,763	1,026	1,026	1,026
R^2	0.005	0.005	0.088	0.008	0.007	0.093
Note:						*p<0.1; **p<0.05; ***p<0.01

Time Periods

Visually from Figure 4, we see that the negative Friday trend in the whole period is mainly driven by the two first sub-periods, 2005-2008 and 2009-2012. In these periods, Friday announcements are about four percentage points more negative than Non-Friday, mainly due to post announcement reactions. However, this difference seems to decrease over time. Finally, in the two last periods, 2013-2016 and 2017-2020, Friday reacts more similarly to Non-Friday. However, Friday is more negative.

As shown in Table 6, announcements on Fridays have an insignificant pre-announcement response in the first, second and last periods. However, it shows a significantly negative reaction on the 10% level in the third period. The first period is the only period with a significant post-announcements reaction, negative at the 10% level. Contrary to Friday, Non-Friday announcements have a significant pre-announcement reaction in all periods, each positive with different significance levels. However, only the third period has significant abnormal returns at the event, at the 1% level. None of the periods shows a

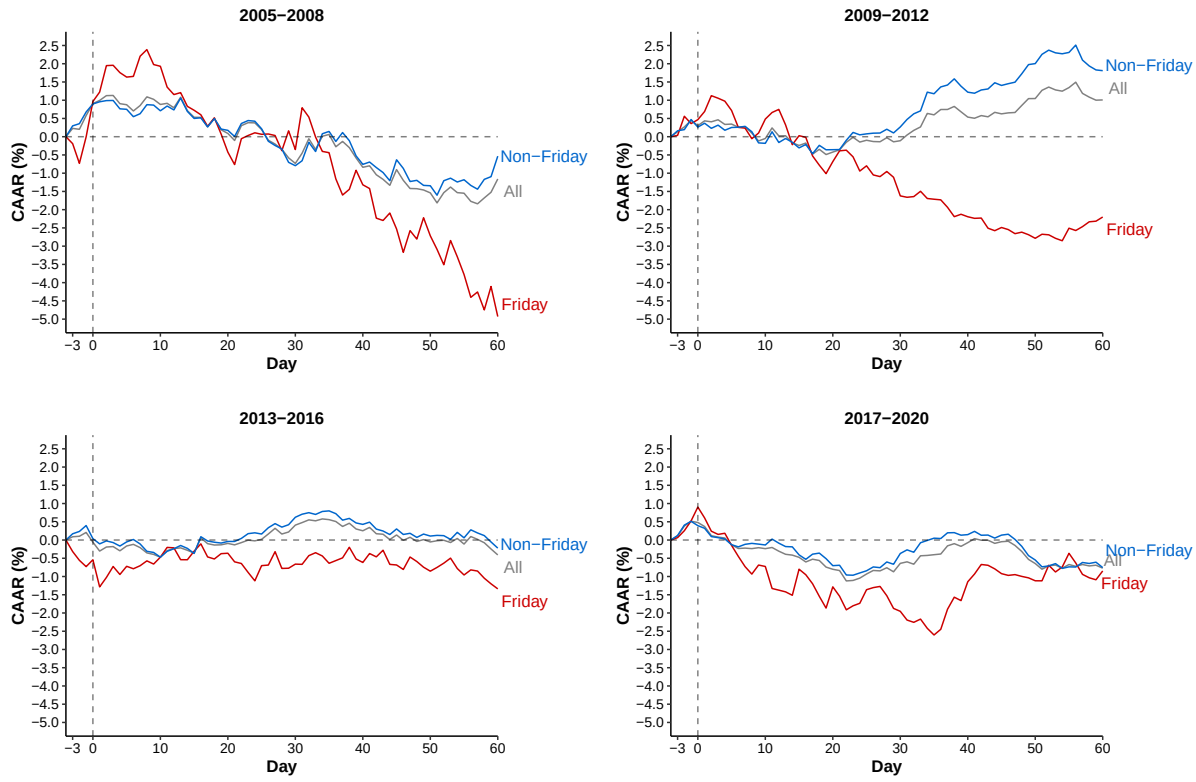

Figure 4: Cumulative average abnormal returns around earnings announcements in the sub-periods.

Table 6: Test statistics from J-test for earnings announcements in each category for the sub-periods. From and To shows the starting and ending days for each event window. L is the length of each interval.

Interval			2005-2008		2009-2012		2013-2016		2017-2020	
From	To	L	F	NF	F	NF	F	NF	F	NF
-3	-1	3	-0.01	2.20**	0.82	1.95*	-1.89*	2.28**	1.61	3.17***
0	1	2	2.11**	1.11	0.92	-0.51	-1.76*	-3.54***	0.31	-1.45
2	60	59	-1.95*	-1.09	-1.48	1.34	-0.03	-0.15	-1.00	-1.50
0	60	61	-1.53	-0.87	-1.29	1.23	-0.35	-0.79	-0.93	-1.74*
N			30	181	139	556	150	746	164	797

Note: *p<0.1; **p<0.05; ***p<0.01

significant post-announcement reaction. Only the last period has a significant response at the event and the interval after, negative on the 10% level.

To further study the underlying causes of these reactions, we replicate the regression analysis from the whole period with these sub-periods. Table 7 in the appendix shows these regressions. At the event, as shown in Panel A, Friday announcements have a significantly different reaction from Non-Friday only in the first period, with a positive effect on abnormal return at the 5% level. Meanwhile, Top Surprise is significantly positive in both the second and last period. However, the fourth period is also significant at the 1% level when limiting the data. Additionally, Bottom Surprise is not significant in any period. In combination with the Top Surprise, Friday is only significant in the third period. Bottom Surprise is, however, insignificant in combination with Friday for all periods.

In the post-event window, shown in Panel B, Friday is only significant in the first two periods when including all the data, both at the 5% level. Like in the immediate window, Bottom Surprise is not significant in any period. However, the interaction term between Friday and Top Surprise is significant in the first period. Additionally, in combination with Bottom Surprise, Friday is also significant in the first period, on the 10% level.

As we see in Panel C, the results are similar to the post-event window when including the whole window. However, Top Surprise is significant in the last period when limiting the data, at the 10% level. Additionally, Friday is not significant in interaction with Top Surprise when limiting the data.

Table 7: Regressions on stock price response in the sub-periods. Panel A shows the immediate window [0,1]. Panel B shows the delayed window [2,60]. Panel C shows the combined window [0,60]. The four first columns include all earnings announcements, while the last four are limited to earnings announcements from surprise quantiles 1, 2, 10, and 11. All regressions include the following control variables: dummies for the year of announcement, dummies for how many months after the end of the quarter the announcement is published, and dummies for market capitalization deciles. All the regressions include time and individual fixed effects.

Panel A

	Dependent variable: Abnormal returns [0,1]							
	All				Top/Bottom Surprise			
	05-08	09-12	13-16	17-20	05-08	09-12	13-16	17-20
Friday	0.03**	−0.001	−0.01	−0.01	0.01	0.02	−0.01	0.01
	t=2.50	t=−0.10	t=−1.40	t=−0.68	t=0.37	t=0.93	t=−0.60	t=0.16
Top Surprise	−0.003	0.03***	−0.01	0.02***	0.002	0.02	0.001	0.04***
	t=−0.23	t=2.58	t=−0.83	t=3.15	t=0.09	t=0.85	t=0.10	t=3.37
Bottom Surprise	−0.004	0.0001	−0.01	−0.01				
	t=−0.50	t=0.01	t=−1.27	t=−0.98				
Friday:(Top Surprise)	0.01	0.004	0.04*	0.004	0.05	−0.01	0.04**	−0.02
	t=0.28	t=0.20	t=1.86	t=0.19	t=1.51	t=−0.55	t=2.36	t=−0.47
Friday:(Bottom Surprise)	−0.01	0.03	−0.004	0.01				
	t=−0.73	t=1.17	t=−0.32	t=0.32				
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	211	671	845	893	90	251	314	318
R^2	0.13	0.04	0.05	0.04	0.19	0.05	0.08	0.10
Note:								*p<0.1; **p<0.05; ***p<0.01

Panel B

	Dependent variable: Abnormal returns [2,60]							
	All				Top/Bottom Surprise			
	05-08	09-12	13-16	17-20	05-08	09-12	13-16	17-20
Friday	0.10**	−0.06**	0.01	−0.02	0.05	0.01	−0.04	−0.11
	t=2.16	t=−2.28	t=0.61	t=−0.74	t=0.70	t=0.10	t=−0.47	t=−1.50
Top Surprise	0.11*	0.004	0.02	0.07**	0.08*	0.04	0.05	0.04
	t=1.81	t=0.15	t=0.69	t=2.34	t=1.72	t=0.70	t=1.64	t=1.19
Bottom Surprise	0.03	−0.04	0.001	0.02				
	t=0.50	t=−1.07	t=0.06	t=0.83				
Friday:(Top Surprise)	−0.27***	−0.03	−0.09	−0.04	−0.21**	−0.05	−0.06	0.09
	t=−3.16	t=−0.37	t=−1.46	t=−0.60	t=−2.07	t=−0.63	t=−0.56	t=1.11
Friday:(Bottom Surprise)	−0.16*	0.05	−0.01	−0.04				
	t=−1.80	t=0.70	t=−0.14	t=−0.59				
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	211	671	845	893	90	251	314	318
R^2	0.27	0.25	0.19	0.13	0.43	0.29	0.24	0.13
Note:								*p<0.1; **p<0.05; ***p<0.01

Panel C

	Dependent variable: Abnormal returns [0,60]							
	All				Top/Bottom Surprise			
	05-08	09-12	13-16	17-20	05-08	09-12	13-16	17-20
Friday	0.12**	−0.06**	0.01	−0.02	0.06	0.03	−0.04	−0.11
	t=2.44	t=−2.30	t=0.21	t=−1.17	t=0.69	t=0.34	t=−0.58	t=−1.13
Top Surprise	0.10*	0.03	0.01	0.10***	0.08*	0.06	0.05	0.08*
	t=1.71	t=1.02	t=0.42	t=3.01	t=1.66	t=1.16	t=1.41	t=1.94
Bottom Surprise	0.03	−0.04	−0.01	0.01				
	t=0.42	t=−1.02	t=−0.39	t=0.46				
Friday:(Top Surprise)	−0.26**	−0.02	−0.06	−0.03	−0.16	−0.06	−0.02	0.07
	t=−2.43	t=−0.31	t=−0.98	t=−0.50	t=−1.32	t=−0.71	t=−0.18	t=0.70
Friday:(Bottom Surprise)	−0.16*	0.07	−0.01	−0.03				
	t=−1.80	t=0.93	t=−0.20	t=−0.43				
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	211	671	845	893	90	251	314	318
R^2	0.27	0.24	0.15	0.11	0.41	0.30	0.19	0.13

Note: *p<0.1; **p<0.05; ***p<0.01

Sectors

In Table 8, we examine whether specific sectors show significant abnormal returns or differences between Friday and Non-Friday. We limit the data to top and bottom surprises, which should yield more prominent reactions. Some sectors have few observations because they are unequally represented on the OSEBX.

Consumer Staples, Energy, Information Technology, Utilities, Industrials, and Materials have a significant immediate reaction to either the Top or Bottom Surprise, all in the direction of the surprise. In contrast, none of the other sectors react significantly to the surprises. Furthermore, none of the sectors have significant abnormal returns for the Top and Bottom Surprise. Also, Health Care is the only sector with a significant response during the delayed window.

There are only three sectors where the reaction to Friday significantly differs from Non-Friday. However, Health Care is the only sector of the three that is not among those with the fewest observations. In this sector, the immediate Friday reaction is significantly less negative than Non-Friday, to the bottom surprises.

Table 8: Stock price response in sectors. The data is limited to earnings surprise quantiles 1, 2, 10, and 11. The Friday columns show the coefficient from the Friday dummy in regressions including control variables and fixed effects. N is the number of announcements for each sector and type of surprise. Friday coefficients and CAAR are in percent.

		Immediate [0,1]		Delayed [2,60]		Combined [0,60]		
Sector	Surprise	CAAR	Friday	CAAR	Friday	CAAR	Friday	N
Communication Services	Top	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*	0
	Bottom	0.9	−8.5	7.3	9.7	8.3	1.2	4
Consumer Discretionary	Top	−0.8	−8.4	16.8	−38.2	16.0	−46.6	6
	Bottom	−3.6	−9.6**	−15.8	24.7	−19.3	15.1	5
Consumer Staples	Top	0.8	−0.8	1.8	−10.6	2.7	−11.5	99
	Bottom	−2.7***	1.5	−2.8	−10.7	−5.5	−9.2	46
Energy	Top	0.8	−0.6	1.6	−8.8	2.4	−9.4	186
	Bottom	−2.0***	−1.2	1.1	−4.3	−0.9	−5.5	169
Financials	Top	1.0	4.6	21.0	12.2	22.0	16.8	5
	Bottom	0.7	−0.9	0.4	16.7*	1.1	15.8*	9
Health Care	Top	2.2	0.2	5.9	−15.1	8.1	−14.9	40
	Bottom	−0.3	6.7*	−9.2*	2.9	−9.6*	9.6	38
Industrials	Top	1.8***	0.6	−3.0	2.3	−1.2	3.0	120
	Bottom	0.2	−0.6	−1.3	2.2	−1.2	1.6	112
Information Technology	Top	−0.9	4.1	2.4	−2.3	1.5	1.8	71
	Bottom	−1.9*	1.9	0.1	2.4	−1.8	4.3	81
Materials	Top	3.3**	−0.3	2.6	−7.9	5.9	−8.2	11
	Bottom	−0.8	2.5	−3.2	7.9	−4.0	10.4	13
Utilities	Top	6.9	−11.3	−1.5	18.1	5.4	6.8	4
	Bottom	−3.5*	−2.3	0.6	7.6	−2.9	5.3	7

Note: *p<0.1; **p<0.05; ***p<0.01

5.2 Trading Volume Response

Figure 5 visualizes the actual and abnormal turnover for Friday and Non-Friday announcements. Both of them have a normal level of share turnover at approximately 0.3%, although Friday is about 0.4 basis points lower in comparison. The reactions pre-event are similar, yet Friday has a slightly higher abnormal turnover. The main differences occur on the announcement day, whereas Friday has 33 percentage points lower abnormal turnover than Non-Friday. Friday has a negative abnormal turnover of -18% the day after the announcement. In contrast, Non-Friday has 15% higher turnover than expected on the same day. Two days after the event, the relationship swaps, with Friday

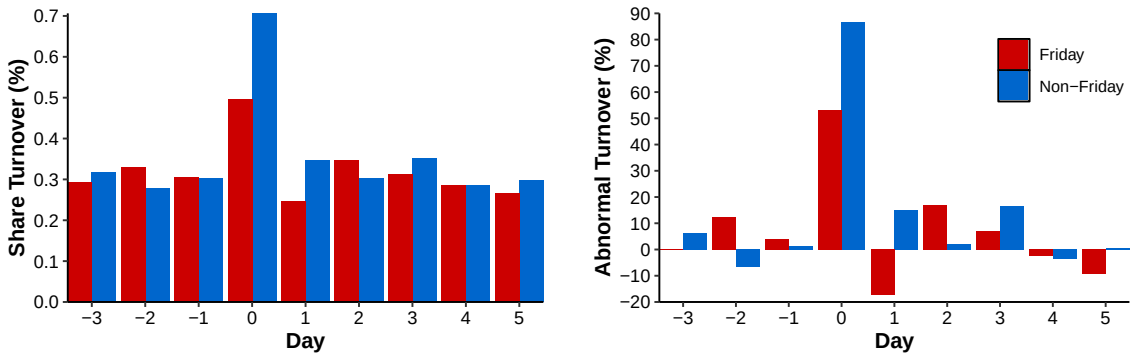

Figure 5: Share turnover is defined as the official traded volume in shares divided by the total amount of shares outstanding. Abnormal turnover is the relative difference of the actual turnover compared to the normal level for turnover. Both share turnover and abnormal turnover are displayed in percent. The plots show the window from three days before the earnings announcement events to five days after.

having 15 percentage points more abnormal turnover than Non-Friday. In the following days, abnormal turnover on Friday decreases. Meanwhile, Non-Friday has 17% abnormal turnover on the third day, before normalizing.

Further, we investigate if the lower abnormal turnover during the immediate response on Fridays remains after including control variables and fixed effects. In Table 9, we see that Friday has a significantly lower response than other weekdays without control variables and fixed effects. Meanwhile, the interaction terms between Friday and Top and Bottom Surprise are insignificant. However, Friday does not have a significantly lower reaction when including controls or fixed effects. Top Surprise on Friday is still insignificant, but the interaction with Bottom Surprise is now significant at the 10% level. The most extreme surprises do not have a significantly different abnormal turnover than the more normal surprises. Friday has a significantly negative effect on abnormal turnover at the 5% level, when limiting the data to only the top and bottom surprises. Further, Friday in interaction with Top Surprise is not significant in any models. We also see that Top and Bottom Surprise do not have significantly different turnover.

Table 9: Regressions on trading volume response in the whole period. Columns (1), (2), and (3) include all earnings announcements, while columns (4), (5), and (6) are limited to earnings announcements from surprise quantiles 1, 2, 10, and 11. Control variables included in columns (2), (3), (5), and (6) are dummies for the year of announcement, dummies for how many months after the end of the quarter the announcement is published, and dummies for market capitalization deciles. Columns (3) and (6) consist of time and individual fixed effects.

	Dependent variable: Abnormal turnover [0,1]					
	All			Top/Bottom Surprise		
	(1)	(2)	(3)	(4)	(5)	(6)
Friday	−0.404*	−0.174	−0.238	−0.996**	−0.852**	−0.894**
	t = −1.783	t = −0.719	t = −0.986	t = −2.574	t = −2.031	t = −2.324
Top Surprise	−0.028	−0.079	−0.014	−0.145	−0.237	−0.166
	t = −0.149	t = −0.450	t = −0.079	t = −0.616	t = −1.050	t = −0.747
Bottom Surprise	0.117	0.103	0.097			
	t = 0.596	t = 0.637	t = 0.605			
Friday:(Top Surprise)	−0.324	−0.057	0.014	0.268	0.585	0.703
	t = −0.667	t = −0.145	t = 0.036	t = 0.464	t = 1.124	t = 1.484
Friday:(Bottom Surprise)	−0.592	−0.710*	−0.637*			
	t = −1.320	t = −1.787	t = −1.655			
Constant	1.695***			1.812***		
	t = 17.670			t = 10.565		
Fixed Effects	No	Yes	Yes	No	Yes	Yes
Controls	No	No	Yes	No	No	Yes
Observations	2,763	2,763	2,763	1,026	1,026	1,026
R^2	0.005	0.003	0.033	0.010	0.006	0.073
Note:						*p<0.1; **p<0.05; ***p<0.01

Time Periods

Next, we replicate the analysis with four sub-periods to explore differences that might have occurred over time. We only include the model specifications with controls and fixed effects, as we believe these models are best at isolating the Friday-effect. Table 10 shows that Friday announcements only significantly differ from Non-Friday in the first period, with a lower response significant at the 1% level. None of the periods have significant reactions for Fridays in interaction with Top Surprise. However, the first period is also the only period with a significant reaction for Friday combined with Bottom Surprise, positively on the 10% level. Further, we see that Top Surprise does not significantly differ from other surprises in any period. Meanwhile, Bottom Surprise has a significantly lower response in the first period and higher in the second, on the 5% and 1% level respectively.

When we limit the data to the most extreme surprises, Friday is insignificant in all

Table 10: Regressions on trading volume response in the sub-periods. The four first columns include all earnings announcements, while the last four are limited to earnings announcements from surprise quantiles 1, 2, 10, and 11. All regressions include the following control variables: dummies for year of announcement, dummies for how many months after the end of the quarter the announcement is published, and dummies for market capitalization deciles. All the regressions include individual and time fixed effects.

	Dependent variable: Abnormal turnover [0,1]							
	All				Top/Bottom Surprise			
	05-08	09-12	13-16	17-20	05-08	09-12	13-16	17-20
Friday	−2.74***	−0.15	−0.33	0.05	−1.25	−1.04	−0.25	0.16
	t=−3.53	t=−0.36	t=−1.00	t=0.16	t=−0.93	t=−1.50	t=−0.41	t=0.22
Top Surprise	−0.96	0.24	0.25	0.12	0.83	−0.95*	−0.30	0.52
	t=−1.46	t=0.66	t=0.87	t=0.50	t=0.73	t=−1.66	t=−0.89	t=1.51
Bottom Surprise	−1.91**	1.25***	0.24	−0.22				
	t=−2.45	t=3.16	t=0.80	t=−0.86				
Friday:(Top Surprise)	2.00	0.33	0.57	0.02	1.13	2.09**	0.62	−0.50
	t=1.04	t=0.34	t=0.94	t=0.03	t=0.52	t=2.53	t=0.68	t=−0.67
Friday:(Bottom Surprise)	2.03*	−1.08	0.18	0.28				
	t=1.79	t=−1.31	t=0.29	t=0.50				
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	211	695	896	961	90	261	329	346
R^2	0.16	0.05	0.03	0.03	0.24	0.21	0.09	0.06
Note:								*p<0.1; **p<0.05; ***p<0.01

periods. However, the second period is significantly positive with Friday in interaction with Top Surprise, on the 5% level. Similarly, the second period is the only period with a significantly different turnover between the surprises, where Top Surprise has a lower turnover than Bottom Surprise, on the 10% level.

5.3 Robustness

In this section, we test if our results are affected by multiple restrictions to the data sample. Further, we analyze the characteristics of companies that often publish earnings announcements on Fridays.

Restricted Samples

To address the issue that some companies do not publish earnings announcements on Fridays, we replicate some of the analysis on the abnormal returns for a homogeneous sample. Table A.3 in the appendix shows the effect of Friday and surprise on the abnormal return, using restricted samples. Panel A is limited to companies with at least 5% of

their announcements on Fridays and other days. There are 2010 announcements, which implies that 753 of the announcement from the full sample comes from companies with either only Friday or Non-Friday announcements. The immediate response is similar to the whole sample. However, Top Surprise now has a less significant effect on abnormal returns, at the 5% level. Additionally, Bottom Surprise is no longer significant at all. There are also minor differences in the post-event window. Top Surprise is now more significant than previously, at the 5% level for all data. Otherwise, there are no further deviations. Including both the event and the window after, the only dissimilarity is that Friday is less significant, now at the 10% level.

Further, as shown in Panel B, we replicate the analysis only including announcements from companies with at least ten announcements. The reasoning behind this restriction is that we believe that companies with few included announcements receive less attention, and thus do not have analyst estimates. Furthermore, we believe that the included announcements from these companies are less reliable, as they probably consist of only a few analysts' estimates. This limitation only reduces the sample by 208 announcements. During the immediate window, the only difference is that Bottom Surprise has a more significant effect on abnormal return, at the 5% level. In the delayed window, Friday now has a significantly negative effect, at the 10% level. Further, Top Surprise is now insignificant. When combining both the immediate and delayed reactions, the only difference is that Bottom Surprise now has a significantly negative effect, at the 5% level.

Lastly, Panel C shows the analysis with both restrictions to the sample. This restriction aims to have a group with frequent announcers that publish on Friday and other weekdays. This restricted sample is similar to the full sample. The only difference in immediate response is that Top Surprise has a less significant effect on abnormal returns, now at the 5% level. In the window after the announcement, Top Surprise is now more significant, at the 5% level. When joining these two windows, Friday has a less significant effect, now at the 10% level. Meanwhile, Bottom Surprise is now significant, at the 10% level.

In summary, there are few deviations in the restricted samples compared to the full sample. Generally, most of the changes are related to the grade of surprise.

Friday Announcers

To further test the robustness of our results, we check if certain companies might skew our results for Fridays by chance. Table 11 displays a selection of companies from our sample filtered by three criteria. These companies have more than 20% of their announcements on Fridays, they have at least ten announcements in total, and they have a higher fraction of negative surprises on Fridays than Non-Fridays.

Further, we calculate the fraction of each company's most popular date compared to the total number of announcements to control for the possibility that some of them might always report their earnings on the same day during a month. For example, XXL Sport & Villmark AS has 10% of their announcements on their most popular date, which means two of twenty announcements are on the same day of a month. We also include the market capitalization decile for each company on the date of their most recent announcement and the average daily turnover in percent for each company.

Figure 6 shows all announcements distributed by the day during a month they occur. The five first days and day 31 have the fewest announcements, while day 15 is when most

Table 11: Displayed is a selection of the companies included in the analysis filtered by several criteria. It highlights the most extreme companies to explore other possible explanations for our results. Companies included in the table have more than 20% of their announcements on Fridays, at least ten total announcements, and a higher fraction of negative surprises on Fridays than Non-Fridays. Besides the variables used for filtering the companies, there are several other variables included of common characteristics. For each company, a percentage is calculated showing the share of announcements that occur on the same day of a month, to indicate if they favor a particular date for publishing their announcements. We also report the market capitalization decile of each company for their most recent announcement, and their average daily turnover in percent.

	Announcements			Negative surprises			Characteristics		
Company	F (%)	NF (%)	Obs (N)	F (%)	NF (%)	All (%)	MCap (Decile)	Turnover (%)	Same Date (%)
Scatec ASA	90.0	10.0	20	56	50	55	6	0.25	15.0
Pronova Biopharma ASA	62.5	37.4	16	40	33	38	7	0.09	18.8
Cermaq Group AS	50.0	50.0	32	56	6	31	8	0.28	12.5
Schibsted ASA	50.0	50.0	40	50	35	42	9	0.25	15.0
AKVA Group ASA	46.2	53.8	26	42	36	38	3	0.04	15.4
IMSK SE	43.5	56.5	23	70	62	65	3	0.10	30.4
Yara International ASA	37.5	62.5	40	53	48	50	10	0.55	15.0
Tomra Systems ASA	33.3	66.6	39	46	19	28	8	0.45	23.1
Aker BP ASA	30.8	69.3	39	58	41	46	8	0.24	10.3
Aker Solutions ASA	30.0	70.0	20	50	29	35	6	0.50	15.0
XXL Sport & Villmark AS	30.0	70.0	20	100	64	75	6	0.31	10.0
Algeta ASA	29.4	70.5	17	60	17	29	7	0.33	11.8
Kvaerneland ASA	27.3	72.7	22	67	50	55	4	0.14	9.1
Ocean Rig ASA	27.3	72.8	11	67	62	64	8	0.57	54.5
BW LPG Ltd	21.7	78.2	23	40	33	35	5	0.53	17.4

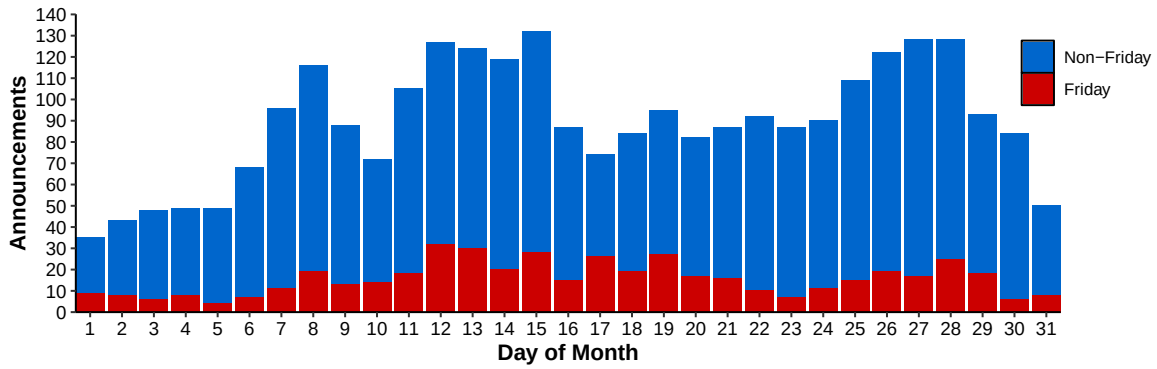

Figure 6: Distribution of all announcements by the day of a month. Each bar in the plot is divided into Friday and Non-Friday.

announcements occur. After the middle of the month, there is a drop in announcements before increasing towards the end. Additionally, Friday and Non-Friday seem to follow the same pattern. However, Friday does have a slight overweight of announcements during the middle of a month compared to Non-Friday.

Most companies do not have a big difference in their fraction of negative surprises on Fridays compared to Non-Fridays. However, there are some companies with notable differences. Cermaq Group AS stands out with the most considerable relative difference. They have 32 announcements, whereas 50% of those are on Fridays. Furthermore, 56% of their Friday announcements are negative surprises, while 6% of their announcements on Non-Fridays are negative surprises. Additionally, only 12.5% of their announcements occur on the same day of a month.

Ocean Rig ASA is the company with most announcements made on the same date among these companies. They publish 55% of their announcements on the same date, with six announcements on the 31st. The five remaining announcements are evenly distributed around the middle and end of the month. With such a high fraction of announcements on the same date and relatively few total announcements, it could be random that most of their announcements occur on Fridays. Thus, it seems more plausible that they favor announcing on the 31st than it suggests that they favor Fridays.

Most of the other companies do not have a high share of announcements published on the same date. This observation indicates that specific dates are not being favored. In general, there seems to be no clear pattern among these companies. Neither the market capitalization deciles nor the average daily turnover shows a strong trend. The market

capitalization seems to be in the upper deciles for most of these companies. However, this might be caused by the filter on the total amount of announcements, as companies with a higher market capitalization generally have more available announcement data due to more analyst coverage.

6 Discussion

We find that Friday announcements have significantly negative PEAD over the period 2005-2020. Meanwhile, they do not have a significant immediate effect. Contrary, we find that Non-Friday announcements do not show signs of PEAD in the same period, but they do have a significant immediate price reaction. These findings are consistent with DellaVigna and Pollet (2009), Damodaran (1989), and Patell and Wolfson (1982), supporting the hypothesis that investors react differently to Friday announcements.

Although we find signs of PEAD on Fridays, we do not find that Fridays significantly differs from other weekdays when including the grade of surprises as explanatory variables. Further, Friday is still insignificant after adding control variables and fixed effects. However, we find that the grade of surprise can significantly explain the abnormal returns on earnings announcements. Thus, we believe that the effect on Fridays is driven by other characteristics than the weekdays of publishing. This result is not in line with the findings of DellaVigna and Pollet (2009), who find that both weekday and surprise significantly explain the stock price reaction.

The fact that we see more negative abnormal returns for Fridays could be because they have the highest fractions of negative surprises. We do not see this reaction in Non-Friday announcements, which could result from the offsetting response between positive and negative surprises. Further, they also have more neutral surprises, which should yield a more neutral reaction. Additionally, on average, the most negative surprises are more negative on Friday than on other days. On the contrary, the most positive surprises on Fridays are less positive than on Non-Fridays.

Further, splitting the data into four sub-periods shows that Friday announcements only suffer from PEAD in the first period, 2005-2008. Non-Friday announcements do not show signs of drift in any period. Additionally, the difference in cumulative abnormal returns for Friday and Non-Friday announcements decreases over time, as Friday announcements become less negative over the same periods. Also, the two first periods are the only periods where Friday significantly affects the abnormal returns. Whereas in the two last periods, other characteristics of the companies and the announcements seem to explain the variation in abnormal returns. Therefore, we believe that the significantly negative

Friday drift we find in the whole period is mainly a result of the market reaction to Friday announcements in the first sub-period.

Chordia et al. (2014) find that after the publication of research on market anomalies, the effect often weakens or disappears entirely over time (see also McLean and Pontiff (2016)). DellaVigna and Pollet (2005) were the first ones who most convincingly demonstrated a clear Friday-effect in the US. They published their first paper on this topic around the start of our first sub-period. This period is the only one where we find signs of a Friday-effect on PEAD. In the following periods, Fridays' effect on abnormal returns seems to lessen. Hence, we believe that the reduced difference between Friday and Non-Friday announcements could result from investors learning about the Friday-effect on PEAD and thus trading on it. Furthermore, we argue that this arbitrage activity could be the reason why we have a different result from DellaVigna and Pollet (2009). Their analysis is based data from 1995-2006, while we analyze the effect during 2005-2020. Thus, it might be that there was an equivalent Friday-effect on the Oslo Stock Exchange previously, as our results in the first sub-period, 2005-2008, are similar to DellaVigna and Pollet (2009).

Next, we do not find apparent differences between Friday and Non-Friday announcements in any sector. Although some sectors show significant differences between the weekdays, they have few observations. Further, only one sector shows significant abnormal returns in the window after announcements. Similarly, this sector has few observations, making the results less reliable. Finally, none of the sectors with the most announcements shows a significant difference between Friday and Non-Friday, nor any signs of PEAD. Thus, we cannot conclude that there are sectorial differences regarding the Friday-effect and PEAD.

Lastly, we find that Friday affects immediate abnormal turnover significantly negative to the most extreme surprises. These results support the findings of DellaVigna and Pollet (2009) and Patell and Wolfson (1982). They argue that this is a sign of inattention to the stock market on Fridays. However, we do not find a significant Friday-effect on announcements closer to the expectations. Furthermore, when examining each sub-period, we find that 2005-2008 is the only period where Friday has a significantly lower immediate reaction than Non-Friday. Thus, it seems like investors did have a lower immediate reaction to Friday announcements. However, we do not find a current difference between the weekdays. We argue that the disappearance of the Friday-effect could result from more

sophisticated information processing due to algorithmic trading. This trading method processes and acts on new information quicker than human traders, and has now grown to account for the majority of all trading volume (Hendershott and Riordan, 2013). We also believe that this could explain why our results differ from DellaVigna and Pollet (2009), as they use older data than us.

Alternative Explanations and Limitations

In this section, we discuss alternative explanations to our findings. Further, we comment on limitations of our analysis that could influence our results.

Analyst Consensus Limitations

Our results depend on average analyst estimates from Bloomberg. Even though Kothari and Warner (2007) find that these consensus estimates are the best proxy for market expectations, there may be limitations to this method. We cannot obtain the number of analyst estimates for each earnings announcement. Thus, our proxy for market expectations could be based on just a single estimate in some instances. We argue that this mainly would be a problem for smaller firms, which receive less attention from analysts. If this is the case, our classification of surprises could be inaccurate. However, as all our included companies are from the main index in the Norwegian stock market, we expect most earnings announcements to have a reasonable degree of analyst coverage.

Further, we do not know when these estimates were calculated. Estimates closer to the earnings report are probably more accurate than estimates many months before the publishing. Again, we think this mainly could be a problem for smaller firms with less analyst coverage. Thus, we do not think this causes notable differences in the results.

Lastly, we were only able to obtain a maximum of 40 earnings announcements for each firm. As this is a rolling limitation by Bloomberg, only the estimates from the newest reports are present. Thus, for long-living companies like Equinor (Statoil), our data sample does not go further back than 2010. This limitation affects our result for the two oldest periods. Therefore, our analysis suffers from a form of survival bias. This bias interferes with the only time period we find PEAD, making the results less reliable. Additionally, firms with a shorter lifespan on the index are likely to be smaller size firms, which correspondingly could have more insecure earnings estimates, as argued previously.

Overlapping Event Windows

Our event study breaches the normality assumption, as multiple event windows overlap. Moreover, many of these companies are in the same sector, implying that their stock prices are probably correlated. Therefore the estimations of abnormal returns are not independent across securities (MacKinlay, 1997). This implies that correlated companies, for example companies within the same sector, with overlapping event windows might influence each others abnormal returns. To avoid breaching this assumption we would have to only include one earnings announcement for each quarter of each year. This restriction would greatly reduce our total number of announcements, as each year would consist of only four announcements.

Short-Term Management

There are more negative surprises on Fridays relative to Non-Fridays in our data. However, we do not find that there is less attention to the announcements on Fridays. These findings are consistent with those of DeHaan et al. (2015), who argue that managers incorrectly perceive that there is less attention on Fridays and thus fail to hide bad news.

We explore the possibility of managers actively dumping negative news on Fridays by looking at a sample from our data of companies that over-announce on Fridays. There is no clear indication that these companies announce more often on the same day of a month than other companies. Therefore, it does not seem like Friday announcements occur because of a date being favored. Rather it could be a weekday they actively choose. However, the companies in this sample are the companies that announce the most on Fridays. Only a few of these companies have considerably more negative surprises on Friday than other days. Furthermore, there are relatively few announcements per company, making it difficult to draw inferences about systematic timing. To conclude, it does not seem to be a common practice to actively announce earnings reports below expectations on Fridays. However, it is plausible that some managers try to use this short-term strategy.

Evening Announcements

Michaely et al. (2013) argue that the Friday-effect observed in the US is mainly a result of evening announcements when investors cannot react, as the market is closed. However, as we do not have timestamps for our announcements, we cannot control for this timing effect. Thus, it could be that the difference between our finding and the finding of DellaVigna

and Pollet (2009) is a result of more evening announcements in the US.

7 Conclusion

Using the event study methodology on announcements for companies from the Oslo Stock Exchange, we investigate the attention to earnings announcements on Fridays. First, we examine if there are lower immediate and higher delayed abnormal returns. We find significant abnormal returns on Friday announcements in the delayed window, whereas we do not find this for Non-Friday. Oppositely, we do not find significant abnormal returns on Friday announcements in the immediate window, whereas we do find this for Non-Friday. However, we find that the abnormal returns are not related to whether it is Friday, but rather to other characteristics of the companies and the announcements. Nevertheless, this relationship is not constant over time. We find that Friday significantly affects abnormal returns in both the immediate and delayed window during 2005-2008. Further, Friday reacts significantly differently from Non-Friday during 2009-2012 in the delayed window. Thereafter, Friday does not significantly affect abnormal returns in the last two periods. Secondly, we test if there is a lower abnormal turnover for Friday announcements. Looking at the whole period, we find that Friday has a significantly lower immediate abnormal turnover than Non-Friday. However, when examining each sub-period, we find that the first period is the only period with a lower immediate reaction.

Overall, our results suggest that investors do not react differently to Friday announcements. Although we find a significantly different reaction in the first two periods, it is not in line with a lower immediate and higher delayed reaction. Thus, we cannot conclude that there is less attention to Friday earnings announcements. In addition, our analysis of the sectors shows no clear indication of sectorial differences. Furthermore, the results are robust using homogeneous samples and controlling for companies with few announcements. However, there are limitations to our results, as the analyst consensus estimates may not always be a correct estimate for the market expectations. Additionally, we may have a normality issue, as some of our event windows overlap. For further research, we suggest a larger sample, with multiple current estimates for each announcement. In addition, controlling for the time of announcement would yield more correct results, as investors cannot react to evening announcements on the day of publication.

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Appendix

A1 All Variables

Table A.1: List of all variables. Shows the actual variable names, whether a variable was collected from a data source or constructed, and description of the information in the variable or how it was constructed.

Variable	Source	Description
Date	Bloomberg	Announcement date
	Børsprosjektet	Equity observation date
	NewsWeb	Announcement dates for cross-checking Bloomberg dates
Reported	Bloomberg	Quarterly reported earnings
Comp	Bloomberg	Adjusted quarterly reported earnings
Estimate	Bloomberg	Mean analyst estimated earnings
Surp	Bloomberg	Relative difference between comparable and estimated earnings
Per	Bloomberg	Column containing both quarter and year for each announcement
ISIN	Børsprosjektet	International Security Identification Number
Symbol	Børsprosjektet	Company ticker symbol
SecurityName	Børsprosjektet	Company name
AdjLast	Børsprosjektet	Adjusted closing price
ReturnAdjLast	Børsprosjektet	Return based on adjusted closing price
SharesIssued	Børsprosjektet	Amount of shares issued
Gics	Børsprosjektet	Global Industry Classification Standard
OffShareTurnover	Børsprosjektet	Daily official share turnover
Year	[Constructed]	Extracted year of quarter from *Per*
Weekday	[Constructed]	Weekday of announcement, based on announcement date
Friday	[Constructed]	Dummy indicating if *Weekday* = Friday
MofQ	[Constructed]	Announcement month after quarter (1, 2, or 3)
SameDate	[Constructed]	Fraction of announcements on a company's most popular date
MCap	[Constructed]	Market capitalization, product of *SharesIssued* and *AdjLast*
MCap_decile	[Constructed]	Market capitalization decile (from 1 to 10)
Surprise	[Constructed]	The surprise closest to zero of *Reported* or *Comp* divided by *Estimate*
Surp_quantile	[Constructed]	Surprise quantile (from 1 to 11)
TopSurp	[Constructed]	Dummy indicating if *Surp_ quantile* is either 10 or 11
BottomSurp	[Constructed]	Dummy indicating if *Surp_ quantile* is either 1 or 2
TurnoverPCT	[Constructed]	Turnover in percent, *OffShareTurnover* divided by *SharesIssued*
abr3_1	[Constructed]	CAAR before announcement, [-3,-1]
abr0_1	[Constructed]	CAAR immediate response, [0,1]
abr2_60	[Constructed]	CAAR delayed response, [2,60]
abr0_60	[Constructed]	CAAR combined reaction, [0,60]
abturn0_1	[Constructed]	Cumulative average abnormal turnover, [0,1]
Sector	[Constructed]	Sector is the first tier of GICS, based on two first numbers of *Gics*

A2 List of Companies

Table A.2: List of all 146 included companies in the analysis. The sector of each company is defined as the last sector a company has been in. The From and To columns shows which period the announcements are from.

Legal Name	Sector	Announcements	From	To
Adevinta ASA	Communication Services	2	2020	2020
AF Gruppen ASA	Industrials	40	2010	2020
Akastor ASA	Energy	39	2010	2020
Aker ASA	Energy	17	2010	2016
Aker BP ASA	Energy	39	2010	2020
Aker Solutions ASA	Energy	20	2015	2020
AKVA Group ASA	Industrials	26	2014	2020
Algeta ASA	Health Care	17	2009	2013
Altinex ASA	Energy	2	2005	2006
American Shipping Company ASA	Industrials	19	2015	2020
ArcticZymes Technologies ASA	Health Care	16	2011	2019
Asetek AS	Information Technology	22	2014	2019
Atea ASA	Information Technology	40	2010	2020
Austevoll Seafood ASA	Consumer Staples	40	2010	2020
Avance Gas Holdings Ltd	Energy	22	2015	2020
Awilco Offshore ASA	Energy	9	2006	2008
Belships ASA	Industrials	9	2010	2020
Bjorge Gruppen ASA	Energy	2	2008	2009
Bonheur ASA	Energy	9	2011	2020
Borgestad ASA	Financials	25	2010	2020
Borr Drilling Limited	Energy	8	2018	2020
Bouvet ASA	Information Technology	13	2013	2020
BW LPG Ltd	Energy	23	2014	2020
BW Offshore Ltd	Energy	40	2010	2020
BWG Homes ASA	Consumer Discretionary	28	2007	2013
Catch Communications AS	Information Technology	1	2005	2005
Cermaq Group AS	Consumer Staples	32	2006	2014
Codfarmers ASA	Consumer Staples	5	2007	2011
Comrod Communications ASA	Industrials	3	2007	2011
Copeinca ASA	Consumer Staples	21	2007	2013
Crayon Group Holding ASA	Information Technology	8	2018	2020
Deep Sea Supply PLC	Energy	34	2008	2016
DNO ASA	Energy	39	2010	2020
Dolphin Drilling ASA	Energy	5	2011	2013
Dolphin Group ASA	Information Technology	4	2011	2013
Eidesvik Offshore ASA	Energy	23	2010	2017
Electromagnetic Geoservices ASA	Energy	38	2010	2020
Elkem ASA	Materials	4	2019	2020
Eltek ASA	Information Technology	8	2005	2013
Ensurge Micropower ASA	Information Technology	10	2016	2018
Equinor ASA	Energy	40	2010	2020
Europris ASA	Consumer Discretionary	17	2016	2020
Evry ASA	Information Technology	5	2018	2019
Fairstar Heavy Transport N.V.	Energy	5	2007	2011
Fjord Seafood ASA	Consumer Staples	2	2005	2005
Fjord1 ASA	Industrials	9	2018	2020
Fjordkraft Holding ASA	Utilities	5	2019	2020
Fred Olsen Production AS	Energy	6	2008	2011
Frontline Ltd	Energy	40	2010	2020
Gaming Innovation Group Inc	Information Technology	22	2013	2020
Golar LNG Ltd	Energy	7	2010	2012
Golden Ocean Group Ltd	Industrials	31	2010	2020
Goodtech ASA	Industrials	7	2010	2013
Grieg Seafood AS	Consumer Staples	40	2010	2020

Table A.2 – *Continued*

Legal.name	Sector	Announcements	From	To
Hafslund ASA	Utilities	5	2010	2015
Havfisk ASA	Consumer Staples	31	2007	2016
Havila Shipping ASA	Energy	14	2010	2016
Hexagon Composites ASA	Industrials	34	2010	2020
IDEX Biometrics ASA	Information Technology	11	2016	2019
Ignis ASA	Communication Services	4	2010	2010
IMSK SE	Energy	23	2007	2015
Interoil Exploration AS	Energy	13	2011	2016
Itera ASA	Information Technology	13	2010	2020
Jinhui Shipping and Transportation Ltd	Industrials	23	2010	2019
Kitron ASA (New)	Information Technology	21	2010	2020
Kongsberg Automotive ASA	Consumer Discretionary	9	2016	2019
Kongsberg Gruppen ASA	Industrials	40	2010	2020
Kvaerneland ASA	Industrials	22	2005	2011
Leroy Seafood Group ASA	Consumer Staples	40	2010	2020
Mamut ASA	Information Technology	16	2005	2010
Marine Farms AS	Consumer Staples	11	2007	2010
MediStim ASA	Health Care	18	2016	2020
Mowi ASA	Consumer Staples	40	2010	2020
MPC Container Ships ASA	Industrials	5	2019	2020
Multiconsult ASA	Industrials	17	2016	2020
Nekkar ASA	Industrials	22	2010	2016
NEL ASA	Health Care	17	2011	2020
Nera ASA	Information Technology	3	2005	2006
Next Biometrics Group AS	Information Technology	10	2016	2019
NextGenTel Holding ASA	Communication Services	32	2008	2017
Norda ASA	Health Care	2	2010	2011
Nordic Nanovector AS	Health Care	3	2017	2017
Nordic Vlsi As	Information Technology	40	2010	2020
Norgani Hotels ASA	Financials	2	2006	2007
Norse Energy Corp ASA	Energy	26	2005	2012
Norsk Hydro ASA	Materials	40	2010	2020
Norwegian Air Shuttle ASA	Industrials	39	2010	2020
Norwegian Car Carriers ASA	Industrials	7	2008	2013
NRC Group ASA	Information Technology	36	2010	2020
NTS ASA	Industrials	16	2016	2020
Ocean Heavylift	Energy	2	2008	2008
Ocean Rig ASA	Energy	11	2005	2007
Odfjell SE	Industrials	39	2010	2020
Odim ASA	Industrials	12	2006	2009
Orkla ASA	Industrials	40	2010	2020
Otello Corporation ASA	Information Technology	36	2010	2020
P/F Bakkafrost Holding	Consumer Staples	37	2011	2020
PGS ASA	Energy	40	2010	2020
Photocure ASA	Health Care	34	2010	2020
Profdoc ASA	Health Care	8	2005	2007
Pronova Biopharma ASA	Health Care	16	2008	2012
Q-Free ASA	Information Technology	33	2010	2019
Reach Subsea ASA	Industrials	11	2010	2019
REC Silicon ASA	Industrials	34	2010	2019
REC Solar ASA	Information Technology	1	2014	2014
Rieber & Son ASA	Consumer Staples	27	2005	2011
Rocksource ASA	Energy	23	2007	2014
Salmar ASA	Consumer Staples	40	2010	2020
Sas Ab, Stockholm	Industrials	33	2010	2020
Scana ASA	Materials	12	2010	2014
Scatec ASA	Utilities	20	2015	2020
Schibsted ASA	Consumer Discretionary	40	2010	2020
Simrad Optronics ASA	Industrials	9	2007	2009
Smedvig ASA	Energy	1	2005	2005
Stolt-Nielsen Ltd	Industrials	39	2010	2020
Strongpoint ASA	Information Technology	16	2010	2020
STX Europe ASA	Industrials	3	2005	2007
Subsea 7 Inc	Energy	19	2005	2010
Subsea 7 S.A.	Energy	36	2010	2020

Table A.2 – *Continued*

Legal.name	Sector	Announcements	From	To
Tandberg ASA	Information Technology	19	2005	2009
Tandberg Television ASA	Information Technology	8	2005	2006
Targovax ASA	Health Care	3	2019	2019
Techstep ASA	Information Technology	1	2010	2010
Telenor ASA	Communication Services	40	2010	2020
TGS ASA	Energy	40	2010	2020
Tomra Systems ASA	Industrials	39	2010	2020
Trefoil Ltd	Energy	1	2007	2007
Trolltech ASA	Information Technology	3	2007	2007
Veidekke ASA	Industrials	40	2010	2020
VI(Z)RT Ltd, Shefayim	Information Technology	26	2007	2014
Vmetro ASA	Information Technology	10	2005	2008
Wallenius Wilhelmsen ASA	Industrials	37	2011	2020
Wavefield Inseis AS	Energy	3	2008	2008
Weifa ASA	Health Care	18	2009	2017
Wilh Wilhelmsen Holding ASA	Industrials	40	2010	2020
XXL Sport & Villmark AS	Consumer Discretionary	20	2015	2020
Yara International ASA	Materials	40	2010	2020

A3 Abnormal Returns with Restricted Samples

Table A.3: Abnormal stock returns using restricted samples for the whole period, 2005-2020. Panel A contains all companies with at least 5% of their announcements on Friday and Non-Friday each. Panel B contains all companies with at least ten announcements. Panel C contains all companies which satisfies both restrictions. Columns one and four contains the immediate window [0,1]. Columns two and five contains the delayed window [2,60]. Columns three and six contains the combined window [0,60]. The three first columns includes all earnings announcements, while the last three are limited to earnings announcements from surprise quantiles 1, 2, 10, and 11. All regressions include the following control variables: dummies for year of announcement, dummies for how many months after the end of the quarter the announcement is published, and dummies for market capitalization deciles. All the regressions include individual and time fixed effects.

Panel A
Sample: $(0.05 <= Friday <= 0.95)$

	Dependent variable: Abnormal returns					
	All			Top/Bottom Surprise		
	[0,1]	[2,60]	[0,60]	[0,1]	[2,60]	[0,60]
Friday	−0.004	−0.017	−0.021*	0.001	−0.016	−0.015
	t = −0.795	t = −1.290	t = −1.664	t = 0.067	t = −0.461	t = −0.393
Top Surprise	0.013**	0.042**	0.055***	0.019**	0.064**	0.082***
	t = 2.438	t = 2.305	t = 3.178	t = 2.257	t = 2.477	t = 3.051
Bottom Surprise	−0.009	−0.016	−0.024			
	t = −1.590	t = −0.956	t = −1.404			
Friday:(Top Surprise)	0.005	−0.033	−0.029	−0.002	−0.035	−0.037
	t = 0.453	t = −0.837	t = −0.730	t = −0.175	t = −0.690	t = −0.683
Friday:(Bottom Surprise)	0.004	0.009	0.013			
	t = 0.384	t = 0.274	t = 0.386			
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,010	2,010	2,010	749	749	749
R^2	0.023	0.115	0.095	0.047	0.122	0.114

Note: *p<0.1; **p<0.05; ***p<0.01

Panel B
Sample: $(N >= 10)$

	Dependent variable: Abnormal returns					
	All			Top/Bottom Surprise		
	[0,1]	[2,60]	[0,60]	[0,1]	[2,60]	[0,60]
Friday	−0.004	−0.022*	−0.027**	0.005	−0.015	−0.010
	t = −0.852	t = −1.722	t = −2.170	t = 0.507	t = −0.432	t = −0.267
Top Surprise	0.014***	0.023	0.037***	0.022***	0.048**	0.069***
	t = 3.077	t = 1.618	t = 2.688	t = 3.266	t = 2.305	t = 3.185
Bottom Surprise	−0.009**	−0.020	−0.029**			
	t = −2.042	t = −1.520	t = −2.103			
Friday:(Top Surprise)	0.007	−0.020	−0.013	−0.004	−0.027	−0.031
	t = 0.681	t = −0.508	t = −0.334	t = −0.323	t = −0.552	t = −0.594
Friday:(Bottom Surprise)	0.008	0.021	0.029			
	t = 0.831	t = 0.669	t = 0.924			
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,555	2,555	2,555	942	942	942
R^2	0.023	0.101	0.086	0.048	0.098	0.092

Note: *p<0.1; **p<0.05; ***p<0.01

Panel C
Sample: $(N >= 10)$ & $(0.05 <= Friday <= 0.95)$

	Dependent variable: Abnormal returns					
	All			Top/Bottom Surprise		
	[0,1]	[2,60]	[0,60]	[0,1]	[2,60]	[0,60]
Friday	−0.003	−0.019	−0.022*	0.006	−0.007	−0.001
	t = −0.601	t = −1.395	t = −1.722	t = 0.506	t = −0.185	t = −0.026
Top Surprise	0.012**	0.043**	0.056***	0.020**	0.069**	0.089***
	t = 2.255	t = 2.320	t = 3.180	t = 2.271	t = 2.556	t = 3.128
Bottom Surprise	−0.010*	−0.020	−0.031*			
	t = −1.880	t = −1.210	t = −1.761			
Friday:(Top Surprise)	0.008	−0.030	−0.022	−0.003	−0.046	−0.049
	t = 0.727	t = −0.692	t = −0.520	t = −0.233	t = −0.861	t = −0.866
Friday:(Bottom Surprise)	0.008	0.021	0.029			
	t = 0.745	t = 0.614	t = 0.839			
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,871	1,871	1,871	701	701	701
R^2	0.027	0.109	0.090	0.053	0.118	0.109

Note: *p<0.1; **p<0.05; ***p<0.01