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**Investor reactions to negative audit
remarks in different economic climates**

**Evidence from listed companies in Norway from
2007 to 2019**

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Abstract

Using event study methodology, I find evidence of heuristics and biases influencing stock prices of Norwegian firms receiving negative audit remarks. Price data and audit remarks are collected from 2007 to 2019 to capture different business cycles. Data is collected manually to increase event date precision. A benchmark index is used to create a mood state proxy that can be compared to abnormal returns calculated from a market model. A positive correlation is found, such that a negative (positive) mood state results in a downward (upward) bias in abnormal returns at the event.

Preface

I want to thank my supervisor Einar Belsom for bringing a sense of normalcy while working on this project as all of us are sitting at home waiting for the pandemic to end. Things we take for granted in everyday life are sorely missed when they are not an option to us. Thank you for sharing your knowledge, time and experience. Frequent discussions and new milestones have been invaluable for progressing the project.

I also want to thank my family and friends for good advice and for lending me hours of your time listening to me. It will not be forgotten. A special thanks go to my daughter, who at 7 years old probably wish I would work as something more exciting to 7-year-olds. Like a policeman or perhaps a firefighter. It will forever be a cherished memory when she asked about my studies and what I would work as, and then listened dutifully for the five minutes I dared take to explain it.

Index

- Abstract 2
- Preface 3
- 1 Introduction 6
- 2 Theoretical foundation 8
 - 2.1 Market Reactions to new information 8
 - 2.2 Human limitations in complex environments 8
 - 2.2.1 Representativeness 8
 - 2.2.2 Endowment effect 9
 - 2.2.3 Availability 9
 - 2.2.4 Adjustment and anchoring 9
 - 2.2.5 Loss aversion 10
 - 2.3 Auditor communication 10
 - 2.4 Market reactions to audit remarks 11
 - 2.5 Audit explanatory language 12
- 3 Research methods 12
 - 3.1 From human to market 12
 - 3.2 Information and value 13
 - 3.3 The information event 13
 - 3.4 Time length 14
 - 3.5 Firm selection and price data 14
 - 3.6 Price data limitations 15
 - 3.7 Audit remark observations 15
 - 3.8 Defining operational variables 16
 - 3.8.1 Dependent variable 16
 - 3.8.2 Independent variable 17

3.9 Statistical model	18
4 Results	18
5 Conclusion.....	21
Reference list.....	23

1 Introduction

As the business cycle moves through its peaks and troughs, I want to explore how the human in us react to changing environments. Does the market respond to information revealed through audit statements differently in different phases of the business cycle? Overstating negative information during contracting phases of the cycle and understating negative information during expanding phases. Much of our standard economic model rests on the shoulders of Homo Economicus. A being with almost limitless computational power that always make statistically correct decisions to maximize its own utility, and by extension of that, the collective utility of everyone. How reasonable is this assumption even for a highly educated sector such as finance? Probably not as reasonable as we want to believe when even sunshine gives predictions for market returns (Hirshleifer & Shumway, 2003).

Kahneman and Tversky (1979) found that as rational decision makers we are prone to several biases and use of heuristics. Their prospect theory states that investors are biased by past losses and are risk averse. This means they demand a higher risk premium than the observed fundamentals of the investment object suggest. Taffler and Tucket (2010, 95-112) expands on this using the psychoanalytical framework of Freud. Their argument is that these behaviors exist even when investors are made aware of them. Markets consist of human investors, and the sum of all of us does not detach us from our evolutionary traits. These persist in the humans that bring markets to life. As Herbert Simon (1979, 496) puts it “The classical theory of omniscient rationality is strikingly simple and beautiful...Behavioral theories of rational choice – theories of bounded rationality – do not have this kind of simplicity”.

The aim of my thesis is to find evidence for decisions being influenced by the environment, moving us away from the previously accepted concept of Homo Economicus. Barber and Odean (2008) for instance find evidence of how positive news influence us in their aptly named study “All That Glitters: The Effect of Attention and News on the Buying Behavior of Individual and Institutional Investors”. We survived by adapting to our environment, and it stands to reason that we have not evolved past the point where our environments do not influence us. We have extended intelligence from accumulated knowledge in repositories around the globe, but we remain human with limited capacity.

Using event study methodology from MacKinlay (1997), I try to answer my research question of “How does the market react to negative audit statements for listed companies in Norway

during different phases of the business cycle?” Previous studies have seen market anomalies around audit statements. See for instance Kausar et al. (2009) and Menon and Williams (2010). Auditors are not experts at predictions or valuations, but their information access can nonetheless serve as an anchor for an unbiased view of economic position. As such, audit statements will be used as a proxy for a risk neutral assessment as they are produced by an independent third party. Each event is defined as publication of audit remarks. Abnormal returns from each event are compared to mood state proxies. Ex ante average market returns measured by Oslo Børs Benchmark Index (OSEBX) are used as mood state proxy.

The sample of firms included in the study consist of non-financial firms listed at the Oslo Stock Exchange and Oslo Axess. I do not separate the two and abbreviate both markets together as OSE. I use a time period of 13 years to include at least one full cycle of the economy. My study deviates from previous mood misattribution studies as audit remarks are not unrelated to stock returns like the weather is. As each audit statement is looked at individually with corresponding timestamp of publication, making the dataset precise in event timing.

The remaining parts of the thesis is organized as follows:

Part 2 will discuss the theoretical foundation of my study. Part 3 will explain my research methods. Part 4 presents the results and part 5 concludes.

2 Theoretical foundation

In this part I will look at theories of market mechanics and investor behavior. I will also give a brief overview of auditor communication and its legal requirements.

2.1 Market Reactions to new information

In the survey study “Efficient Capital Markets” by Fama (1970) capital markets are described as having three possible forms of efficiencies. These are the weak form of efficiency where prices reflect all historical information, the semi-strong form where prices reflect all publicly available information and the strong form where prices reflect all information. The difference between semi-strong and strong form of market efficiency is effectively insider information, which is not actionable information. The efficient market hypothesis is further supported in “The Efficient Market Hypothesis and Its Critics” by Malkiel (2003). He concludes that after 30 years the efficient market hypothesis still describes markets well, despite there being deviations from it. These deviations are mostly short lived, and markets are efficient in the long run. Under the assumption that OSE has a semi-strong form of efficiency like other global markets, information from audit remarks will be reflected in the daily price data I use in the study.

2.2 Human limitations in complex environments

From the field of behavioural economics there are several studies and theories for how humans behave, and how we make our decisions. The world is too complex to analyse all the input data for each decision, and so we are forced to reduce the amount of information down to a manageable level. A. Tversky and D. Kahneman explored this at length in their 1974 study “Judgement under Uncertainty: Heuristics and Biases”. Their study forms the framework for how I want to explore investor behaviour across business cycles and economic climates.

2.2.1 Representativeness

This heuristic shows a weakness in how we use statistics improperly. In their study they show that if A is highly representative of B, a higher probability is put on A originating from B compared to when A is not representative of B. A multiple based approach to valuation bears a striking resemblance to this heuristic. This is a method in which the investor finds assets that are like the one being evaluated. By using financial ratios like price/earnings ratio, a multiple between the assets can be used to extrapolate a value from the similar asset. A pitfall with

representativeness is that base rate of occurrence is overlooked in favour of similar characteristics. For investors this means that there is an accepted method of valuation that coincides with a cognitive bias. In the context of my study, this could mean that the stock price of a firm is valued too closely to the performance of other firms in the same sector even when fundamental financial variables would suggest that its operational conditions differ greatly from other firms.

2.2.2 Endowment effect

List (2004) showed that participants in a sports card show would put a higher value on items they felt were in their possession. List had two items that participants would assign a value. The item that participants held in their hands was consistently valued higher than the one they did not. This was true even when the items were switched for other participants in the study. The study showed different results for professional card traders. They were less likely to assign a higher value to the item in their possession. Parallels can be drawn from the professional card traders to investors, but even if the endowment effect found by List should be less prevalent in professionals, it is nonetheless a bias that can occur whenever an investor buy or sell stocks.

2.2.3 Availability

The ease by which we can imagine a scenario happening distorts our judgement of how probable the event is. Economic downturns and stock market levels are always covered in the financial press and media. Downturns affect almost everyone, and so it garners a tremendous amount of interest in the general public. New negative information about a stock price could lead to a false assumption that the stock will perform worse than the information would indicate under normal circumstances. Mental scenarios of stock market failures are easily available under constant coverage of economic hardships and can influence how the stock price is expected to develop.

2.2.4 Adjustment and anchoring

In Tversky and Kahneman's (1974) study a wheel of fortune was used to generate a random number between 0 and 100. Participants in the study was asked to estimate the proportion of African countries that are members of United Nations. Their study showed that a random number had a large impact on how the participants estimated the membership proportion. Ariely et al. (2003) found similar results of this anchoring effect, but this time with last digits of social security numbers and payment willingness for a box of chocolates. The frame of

mind we have when making predictions and assigning value to something matters. When stock prices start to fall during economic downturns, and news of this is all around, this will be a part of the mental landscape of investors as well. If investors receive new information through audit statements during this period, a new valuation of the asset will be made with a potentially negative anchoring effect from economic downturns.

2.2.5 Loss aversion

Prospect theory (Kahneman & Tversky, 1979) show that we put a stronger subjective emphasis on the feeling of loss than we do gains. We deviate from utility maximisation when faced with a potential for loss. With the inherent volatility of stock markets, stock prices can change several times every day, creating potential loss and gains scenarios for investors. It is only when the stock is sold that a potential loss or gain becomes a real loss or gain. An investor that holds a stock that has had a negative trend knows that there is a possibility of the stock price recovering. Evaluating the stock price with this frame of mind can move investors away from the fundamental value of their assets. The subjective notion of loss aversion on the investor's part is completely independent from the objective value of the asset. Shefrin and Statman extends the discoveries of Kahneman and Tversky on loss aversion. They find that it applies to real financial markets with a disposition effect among investors. Investors have a "disposition to sell winners and ride losers" (Shefrin & Statman, 1985, 788). Further evidence of a disposition effect is found by Odean (1998) where he looks at a large amount of trading records and find a disposition effect in all months but December due to tax motivated selling. No event window in my study coincides with periods where tax motivated selling could show a spurious connection.

2.3 Auditor communication

Listed firms in Norway must be organized as a public limited liability company (LLC) for their stocks to be tradeable as per the requirements in LOV-2007-06-29-75 om verdipapirhandel (vphl.) §2-4 and follow the reporting requirements in vphl. §§5-4 and 5-5. Required reporting is among others audited financial statements. Audited financial statements increase informational value as auditors are independent third-party experts. Freely translated from LOV-2020-11-20-128 om revisjon og revisorer §9-1 on the purpose of statutory audits: the auditor is the trusted representative of the public in the execution of statutory audits. The auditor expresses an opinion in one of four categories.

(1) Unmodified opinion when no material misstatements have been found.

(2) Qualified opinion when material misstatements have been found, but they are not of such a character that the rest of the financial statements do not present a true and fair view.

(3) Adverse opinion when material misstatements have been found and they are of such a character that the financial statements do not present a true and fair view.

(4) No opinion when the auditor has been hindered from forming an opinion on the financial statement.

The language used for opinions have changed over time, but they have the same content. As audit language is standardized through law, it is the same for all intra-year reports. Qualified opinion is sometimes referred to as modified opinion, adverse opinion as negative opinion and disclaimer as no opinion. The auditor can also communicate through emphasis of matter. This is information that is present in the financial statements but is in the auditor's opinion fundamental for understanding the financial statements. An emphasis of matter material uncertainty of going concern remark is therefore a remark given together with an unmodified opinion. This is the most common remark in my study. Qualified opinion follows from International Standard on Auditing (ISA) 705 and emphasis of matter follows from ISA 706 (IAASB, 2021). The audited financial statements must be approved by the general assembly according to LOV-1997-06-13-45 om allmennaksjeselskaper §5-6.

2.4 Market reactions to audit remarks

Studies on how markets react to audit statements since 1980 have for the most part not given a conclusive answer if audit statements provide any new information. Studies done in 1982 by Elliot and 1984 by Dodd et al. find that the market does not react to going concern audit reports. Fleak and Wilson in 1994 and Jones in 1996 find that they do and again Blay and Geiger in 2001 and Herborn et al. in 2007 find that they do not (as cited in Menon & Williams, 2010). Menon and Williams use a “substantially larger sample than previous studies” (Menon & Williams, 2010, 2075) and find negative abnormal returns when a going concern audit report is given. Their study consists of firms under The United States of America's (US) legislation. Kausar et al. (2017) find that reactions to going concern audit reports in The United Kingdom (UK) were more adverse than reactions in the US due to a more creditor friendly bankruptcy legal regime in the UK. This supports my use of audit studies under US legal regimes for Norwegian firms. My emphasis is on the study from 2010 by Menon and Williams.

2.5 Audit explanatory language

Implicit in the audit assignment is a form of mutual control as the audit client pays the auditor for the statutory service. Evidence of this was found after the financial crisis, where auditors were less likely to give a going concern audit report when audit fees were pressured (Ettredge et al., 2017). This means that the threshold for communicating negative information, even as explanatory language from emphasis of matter, is high. The informational value of emphasis of matter remarks should not in itself reveal any new information to update valuations, but due to the scarcity of communication channels available it has a signalling effect. This is supported by Czerney et al. (2014) when they find that explanatory language in audit statements correspond to a later restatement in the matters communicated.

3 Research methods

To interpret real world investors and markets I go from a complex world to a simplified model. In part 2 I presented theories for interactions between investors and markets. In part 3 I will express these theories as statistical variables in an event study framework. During this I will explain what each variable represents and the limits of what they represent.

3.1 From human to market

A connection between investor behaviour and how that behaviour is influenced is not something that can easily be measured or observed. By looking at market returns we get a measurement of *current* collective valuation of securities listed on the stock market. There's no attribute about these prices that will tell us if they are correct measurements of economic values. They are simply the prices the market converged at on that day. In the words of Adam Smith (1776, 349) "...he intends only his own gain, and he is in this, as in many other cases, led by an invisible hand to promote an end which was no part of his intention." We believe our own conclusions to be autonomous, but due to our human limits we rely on input from our environment to reach conclusions. We can never be certain that these inputs reflect how the world is; it is merely our own interpretation of them. A possible exception from this is machine learning algorithms that search for correlations in huge data sets. These algorithms have reduced any human bias to a minimum as all inputs are statistical in nature. All other algorithms have a human bias as their parameters are defined by humans. Investors that are managing their own funds and investors that are managing outside funds have a subjective

connection to security returns. Directly for investors managing their own funds, and indirectly through salary and bonus payments for investors managing outside funds. This subjective connection is susceptible to bias that we can explore with an objective measurement of stock performance.

3.2 Information and value

Insider information is realistically the closest we can get to an objective measure of firm value. Use of insider information is however strictly prohibited in all jurisdictions considered in my study. An approximation will therefore be the independent auditor's conclusion on financial statements. Auditors gain access to privileged information through their audit, but the communication of this information is strictly regulated. Audit statements are therefore standardized, and the threshold for releasing adverse audit opinions are high. To study this relationship between behaviour and influence I will use event study methodology. "Using financial market data, an event study measures the impact of a specific event on the value of a firm" (MacKinlay, 1997, 13). An alternative method for studying this topic would be a time series panel study, where individual investor interviews replace datapoints collected from a market. A study using such a method would give us a richer information environment, but it is out of scope for this study. Financial market data and event study methodology is a more economical approach to gather information. Instead of interviewing investors I am using a negative event, audit remarks of different categories, and measuring the effect this event has on the market. Financial statements and audit statements are usually published the same day they are approved by the board of directors. If the full financial statements are not published, an early press release informing of change/no-change compared to preliminary un-audited financial statements are usually made. Following the efficient market hypothesis (Fama, 1970) information from publishing audit remarks is reflected in the price data with daily data resolution.

3.3 The information event

Dodd et al. (1984) discuss the problem of finding the event date for studying audit remarks. They find four different types of dates, but their study was done in a different communication environment than today's. Since the start of the millennium, news spread quickly over the internet. In addition to this there are strict rules for publishing financial information. In my study, I have looked at information released through the stock market's news portal, NewsWeb. News is timestamped, so each event can be assigned an exact date for when it is

actionable information. I have used a cut-off time when ordinary trades close at 16:20. If information is released after this it is recorded as actionable the next trading day. Weekends and other holidays when the stock market is closed are not counted. Only three observations in the study have an early press release with auditor remarks. Event date for these observations is set as the early press release. I use the Post-Earnings-Announcement Drift study by Bernard and Thomas (1989) as a starting point to find an appropriate event window. Their study find that a disproportionately large amount of the drift happens within the first 5 days. There is however no 10-day window, but 1-5 days and 20+. From visual inspection of the graphs in the study there is diminishing drift after 10 days. From increased information speed since their study, I assume that the drift has shifted closer to the event day. The event window is therefore set to ± 10 days of the event in my study to look at surrounding data. 3-day cumulative abnormal return (CAR) with ± 1 day of the event is included based on previous studies (Dodd et al., 1984). They refer to a 3- and 5-day window as narrow, but from the more precise event timing in my study I estimate that the 3-day CAR in my study contain much less information compared to theirs. Emphasis is therefore placed on event day data.

3.4 Time length

Stock price and market data is collected from 2007 to 2020. Financial statements corresponding to this period are statements for the years 2007 to 2019 released the following year. Stock price and market data has a longer period due to historical beta estimation. I use a 13-year period to capture as many data points as possible over different economical climates. Burns and Mitchell (1946, 7) defines a business cycle as "... 'more than one year' as the lower limit of duration of business cycles, and 'ten or twelve years' as the upper limit". Diebold and Rudebusch (1994, 3) use a two-to-eight-year period for a business cycle. Finding a precise measure of where in the business cycle each datapoint resides is not the goal of this study. Instead, the existence of a business cycle is just a backdrop for the study. Using a long time period gives a strong assumption that it captures at least one full business cycle. The period limit is due to practical reasons as it is the longest time period for digitally available financial statements from The Brønnøysund Register Centre (brreg).

3.5 Firm selection and price data

Firms included in the study are non-financial firms listed at OSE. Included firms are not limited to firms listed in the entire period. This would introduce a survivorship bias. Criteria for being included is a remark in the audit statement and historical stockprices both in the

event window and at least 6 months prior. Sample selection started with all firms with price data in the TITLON database. The historical stock price in my study is an adjusted close price collected from the TITLON database. Using the close price gives us an estimate for what the market consensus was each day. The price is then adjusted for factors that do not represent returns from financial performance. Stock splits, dividends and rights offerings are all adjusted for historically. This adjustment is done by TITLON. The resulting adjusted close price allows us to measure security performance over time. Daily stock price data is downloaded with an ISIN (International Security Identifying Number) for each stock, and cross referenced with an overview table from TITLON that contains firm name, firm sector, organisational number, ISIN and which market the stock is listed at. A few firms have some degree of financial activity and are therefore also categorized in the financial sector by TITLON. Firms where financial activity is not the core function are included as non-financial firms. Other factors that are usually considered such as size and market-to-book ratio after Fama-French three-factor model (Fama & French, 1997) have not been included due to scope limitations. The same scope exclusion has been done with the ownership side of stocks, where the degree of institutional ownership factors in on price reactions to going concern audit reports. Institutional investors react faster to going concern audit reports (Menon & Williams, 2010). Market return is measured as daily return of OSEBX. The initial sample consist of 251 firms categorized as non-financials with adequate stock price history.

3.6 Price data limitations

A challenge with using Norwegian firms is a low degree of liquidity for some stocks. Two solutions have been used to overcome this. Firms with less than 80% activity for relevant years are not included. Each year is considered separately if overall activity is below 80%. Activity is measured as number of days where any trade in the stock happened as a fraction of total number of days the firm was listed between 2007 and 2020. 53 firms included in the initial sample have not been considered due to low activity levels. These firms have not been checked for audit remarks. For all firms with activity above 80% but below 100%, trading days for both market and stock are matched so that return intervals are the same.

3.7 Audit remark observations

Signed financial statements are downloaded from brreg and audit remarks are then codified into different categories according to the different types of audit statements required by law. A total of 1513 financial statements were checked. Total auditor remarks for firms with ex

ante activity above 80% is 130. 1 opinion is adverse, 1 is a no opinion statement and 8 are qualified opinions. Of the 130 remarks, 4 of them are from accounting errors in previous periods. There are 120 emphasis of matter remarks and 103 of them are due to material uncertainty of going concern.

3.8 Defining operational variables

Finding objective measurements is the most challenging aspect of my study. OSE is not as thoroughly analyzed as US stock markets. Analyst forecasts of most stocks are therefore limited. Finding relevant control firms at OSE is also challenging due to market size. Randomness quickly becomes a large factor in evaluating firm and stock performance as Norway is a small economy. On the other hand, the strength of this small economy is transparency and early adaptation of digital reporting. This can give my study an edge over previous studies, as data I have collected is more precise. Norway is also one of the least corrupt economies in the world, ranking 7th of 180 countries for 2018 in the corruption perceptions index by Transparency International (2021). In line with a low degree of corruption, I expect a low degree of insider trading. A small, transparent economy makes it more difficult to hide. It is by no means impossible to act on information before others, but I consider the likelihood of this being a pervasive feature of OSE as lower than in bigger comparable economies and markets. There is also the validity threat of auditor integrity in issuing audit remarks. For the same reasons as above, I do not consider this to be a higher risk in Norway. A more general threat to validity is if auditors are truly independent of their economic climate as mentioned in part 2.5. A high degree of digitally available timestamped data and an assumed low degree of insider trading increase reliability of my event date estimates.

3.8.1 Dependent variable

To measure the impact of each event an abnormal return (AR) is calculated for each active trading day in the event window using a market model and regression beta.

$$AR = r_{observed} - \beta \times r_{market}$$

where $r_{observed}$ is observed daily log stock return, β is regression beta calculated using the last 250 active trading days between stock price and benchmark before the event window and r_{market} is observed daily log benchmark index return. For observations with less than 100% activity, the estimation window is longer as only active trading days are counted in the model.

For three observations beta is calculated using a 108-, 167 and 189-day window respectively due to a smaller amount of previous trading days. This translates into an actual time period of 164, 249 and 273 days for these observations. I do not consider this to impact beta estimation enough to exclude the observations. 3-day CAR is symmetrical around the event day as $\sum_{t=-1}^1 AR_t$ where t_0 is the event day. Each variable is then weighed using their respective regression standard error (RSE) to create a new variable with suffix θ so that accurate estimates weigh more than less accurate estimates in accordance with event study methodology. Event day θ is calculated as

$$\theta_{EventDay} = \frac{AR_0}{RSE}$$

and three-day CAR as

$$\theta_{3-Day CAR} = \frac{\sum_{t=-1}^1 AR_t}{RSE}$$

3.8.2 Independent variable

Measuring investor state of mind requires use of a proxy in my study. A Norwegian equivalent to the Chicago Board Options Exchange's Volatility Index (VIX) would have provided a more reliable historic measurement of investor sentiment. In the absence of a volatility index for OSE I use ex ante arithmetic average of OSEBX daily log returns. This does not capture changes in volatility, but periods with persisting negative (positive) returns before each event are captured as a negative (positive) variable I have named trailing index return (TIR). Three different TIR measurements are used. These are calculated using a ten-, fifteen and twenty trading-day period from the event day, corresponding to a respective two-, three-, and four-week period such that

$$TIR_x = \frac{1}{x} \sum_{t=1-x}^0 r_{market,t}$$

where x is length of the trading-day period, $r_{market,t}$ is observed daily log benchmark return and t_0 is the event day.

3.9 Statistical model

In my study, I use an OLS regression with one regressor to test the relationship between abnormal stock return θ values and selected proxy variables for investor state of mind.

$$\theta_{EventDay} = \alpha + \beta TIR_{x-Day} + \varepsilon$$

$$\theta_{3-day CAR} = \alpha + \beta TIR_{x-Day} + \varepsilon$$

The result from OLS regression with one regressor gives correlation between the two variables with p-value given by the t-stat of the independent variable.

A scatterplot for standard errors was first used to assess homoskedasticity. The scatterplot showed a flat band and no fan formation, suggesting that they are homoscedastic. A Breusch-Pagan test for heteroskedasticity was used to further examine the standard errors, and the null hypothesis of equal variance was kept with p-value 0,939. I do not use robust standard errors as there is evidence of homoscedastic standard errors.

4 Results

Financial statements play an important role in how firms are valued. To fulfill that role the information in them must be reliable. Stockowners cannot themselves directly control or verify the information. To reduce this agent-principal problem of LLC ownership and the asymmetrical information gap, an auditor is elected to verify if the financial statements are, in their opinion, without material misstatements. When an auditor shares a negative opinion, a negative reaction is expected if their opinion is seen as having additional information. For stock market returns we expect that abnormal returns have zero mean and follow a random walk with drift.

H1: Average return for days with negative audit remarks are non-zero.

Mean return against zero mean						
μ	σ	n	$\frac{\sigma}{\sqrt{n}}$	df	$t-Stat$	$P-value$
-0,0234	0,0897	130	0,0079	129	-2,97	0,0035

The null hypothesis is rejected at a <1% level and I conclude that when audit remarks are published there is on average a negative abnormal return. This is in line with what we have seen from international studies. However, audit remarks are published together with other financial information such that if there are earnings surprises this will be included in same day returns. There are a few instances of concurrent news from NewsWeb in the event window, but this information is omitted as there are no expectations to control for from limited analyst forecasts.

H2 Investors react differently to audit remarks across different economic climates

If all investors behaved as Homo Economicus, economic climates would have no impact on abnormal returns. In my study I find that economic climates have an impact on how the market react to bad news.

$\theta_{EventDay}$						
<i>Variable</i>	<i>Coefficients</i>	<i>Standard error</i>	<i>t-Stat</i>	<i>P-value</i>	<i>Correlation</i>	
10-day TIR	62,396	36,217	1,72	0,0873	0,151	
15-day TIR	84,918	35,034	2,42	0,0168	0,209	
20-day TIR	67,222	39,804	1,69	0,0937	0,148	

$\theta_{3\text{-day CAR}}$						
<i>Variable</i>	<i>Coefficients</i>	<i>Standard error</i>	<i>t-Stat</i>	<i>P-value</i>	<i>Correlation</i>	
10-day TIR	-1,234	45,654	-0,03	0,9785	-0,002	
15-day TIR	55,082	44,384	1,24	0,2169	0,109	
20-day TIR	66,475	49,809	1,33	0,1844	0,117	

Event day results are statistically significant for all variables used for mood state proxies in the study at the <5% or <10% level. There is no statistically significant correlation for 3-day CAR and any of the mood state proxies. Information from the event seem to be absorbed by the market at the event day as expected. 5-day CAR values were calculated using the same method as 3-day CAR, but the results were like 3-day CAR. They added no new information and are therefore not included. 15-day TIR was the first hypothesized return period for accumulated news, 10- and 20-day periods were added as \pm one-week periods. The positive correlation between $\theta_{EventDay}$ and TIR means that negative (positive) ex ante average market return leads to a downward (upward) bias for event day abnormal stock return.

Most audit remarks in my study are emphasis of matter going concern remarks. Czerney et al. (2014) find no signaling effect for emphasis of matter going concern remarks in their study. Their study is done with firms under U.S. Securities and Exchange Commission guidelines which prohibit any audit conclusion other than unmodified. My results differ from theirs in that I do find a reaction for it in Norwegian stock prices.

Both the information environment, and the investors operating in it, are complex objects to study. This makes it difficult to draw a singular conclusion from it. As Hirshleifer (2001, 1534-1535) a bit playfully reminds us with common objections for a psychological approach or fully rational approach: “It is too easy to go theory fishing for psychological biases to match data ex post” and “it is too easy to go theory fishing for factor structures and market imperfections to match data ex post” respectively. He does however introduce this parallelism with “lining up each objection with its counterpart does not imply parity in the *validity* of the arguments”.

The five behavior theories I seek to find evidence for can be separated into two categories. Ex ante and ex post behavior, where ex ante behavior reinforce ex post behavior.

Representativeness and endowment effects can both describe situations where the stock price is overvalued as previously discussed. To reiterate, representativeness can form a bias from like-to-like comparisons such as multiple-valuation that underestimate fundamental differences. In small markets like OSE this bias can be exacerbated from fewer comparable firms. Once the stock is bought an endowment effect can influence valuations upward due to it being in the investor’s possession and not its performance. These two limitations give valuations an upward bias. Even for experts, valuations are complex tasks. With limited resources we seek to make the process simpler and more manageable. In doing so we transfer our own limitations into the valuation. Persisting through this is the investor aversion to loss realization. If a stock with unrealized loss remains unsold it is only a potential loss, and so the sale can be postponed avoiding loss realization.

The pivotal moment is when investor aversion to realize losses is overcome. In my study I hypothesized that a negative audit remark is enough to overcome this. When a new ex post valuation is done, the mindset is different if a period of negative returns preceded the event. Availability bias can lead to underestimated values by means of how easy it is to conjure up negative scenarios. If the market returns preceding the events have been negative, the ease by which an investor can think of negative returns increase. In addition to this, an anchoring

effect of preceding negative returns can lead to further exaggerated negative estimates. Conditional on negative ex ante market returns, these mental states cause an overreaction to audit remarks. As positive market periods do not set the same frame of mind as negative market periods, we do not see the same adverse investor reaction. According to applied theories, I hypothesize that this is just an extension of ex ante behavior such that positive ex ante market returns lead to a positive bias in negative audit remark stock re-valuations. There could however be a delayed response after positive periods. Average $\theta_{10\text{-day post CAR}}$ from the event is -1,005 when $\theta_{EventDay}$ is positive and -0,131 when negative. 5% of observations in both directions, for a total of 10%, around zero are not included to reduce sensitivity as the margins around zero are small. This suggest that investors take longer to absorb negative news in a positive environment.

With business cycles as the backdrop for my research it has only been natural to also consider GDP. There is a strong correlation of 0,56 significant at a <5% significance level between change in GDP year over year and yearly $\theta_{EventDay}$ average. Further research into was outside the scope of my study.

5 Conclusion

I have found evidence for investors showing behavior bias and heuristics that influence stock prices depending on mood state proxies in Norway. Ex ante negative (positive) market returns create a downward (upward) bias for negative audit remarks. This result is robust over a 13-year period during different macroeconomic climates. A potential window for abnormal returns is to buy put options or short the stock of firms that receive negative audit remarks when there has been ex ante positive market sentiment. I do not consider there to be any realistic window for abnormal returns for ex ante negative market sentiment. This would posit knowledge of who will receive negative audit remarks to be actionable. It has however not been the goal of this study to develop trading strategies as the studied event is limited to once a year. Margins have therefore not been measured.

Collecting audit remarks manually created a larger dataset with more information than available databases. Event timing is an important part of event studies, and the precise event timing separates my study from others that use existing databases. While collecting data I have used autonomous checks to validate data input. A limitation for smaller markets, such as

OSE, is their illiquid nature. Because of scope restraints and illiquidity concerns I have not set up control firms. I concluded that the time cost outweighed the potential benefit of it. Limited access to analyst forecasts precluded me from measuring audit remark reactions against expected price development. Since audit statements are released at the same time as financial statements, I have not been able to control for earnings surprises. For further research this is an important consideration. A study with access to analyst forecasts to be, or which by other means are, able to control for earnings surprises is important to assess the validity of my results.

The data I have collected largely consist of emphasis of matter going concern remarks. The results I get from these are non-conclusive to previous studies on signaling effect of explanatory audit language (Czerney et al., 2014). I have not found any systematic concurrent news or other information events that could explain it. Further research as to why such a difference is found could possibly clarify if and how investors from different markets react to audit remarks based on similar auditing standards. Further research that combines controls for earnings surprises and panel data information for investor state of mind would bring us closer to understanding the limitations we exhibit when making valuations across different economic climates.

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