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Stock market reaction of private placement announcements on Oslo Stock Exchange

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Abstract

In our study we investigate the stock market reactions following private placement announcements of firms on Oslo Stock Exchange. Further, we investigate whether factors related to firm performance influences the stock market reaction. Our findings show, on average, a negative announcement effect in the stock market, and that firms with higher return on assets have a less negative stock market reaction. In contrast, we find that firms with a higher earnings pr. share display a more negative market reaction. Interestingly, the announcement effect is stronger during 2020 compared to the other years in our sample. Our evidence is consistent with information asymmetry and signalling hypothesis.

Preface

This thesis completes our master's degree in Economics and Business Administration at Oslo Metropolitan University (OsloMet). Both authors of this thesis have majored in financial economics and have a common interest in financial markets and what factors influences them. The topic was introduced to us through the media and the abnormal stock reaction to a rights issue offered by Norwegian Air Shuttle (NAS) in May 2021. This caught our interest and we wanted to examine what reaction one usually can expect of an equity offering and why.

The process has been both challenging and time consuming, but also very educational and exciting. We have gained valuable insight into the Norwegian equity market and learned how to apply economic theories and analysis in practice. Finally, we would like to express our sincere gratitude to our supervisor, Danielle Zhang, for your formidable guidance, availability, and helpful discussions.

List of abbreviations

SEO = Seasoned equity offering

IPO = Initial public offering

PP = Private placement

AR = Abnormal return

AAR = Average abnormal return

CAR = Cumulative abnormal return

CAAR = Cumulative average abnormal return

Mkt cap = Market capitalization

n = Number of observations

$p_{i,t}$ = The closing price for stock i on day t

$r_{i,t}$ = Return on stock i on day t

r_m = Market return

r_f = Risk free return

α = Alpha

β = Beta

σ = Standard deviation

X = Independent variable

Y = Dependent variable

u_i = Error term

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1. Introduction

Private placement is aimed for one or several accredited investors to provide new firm capital (Eckbo, 2008). In this thesis we examine the stock market reaction of private placement announcements on Oslo stock exchange. Previous studies before the 20th century finds positive abnormal returns after announcement of private issuance (Holderness, 2018). The certification and monitoring hypothesis is one of the explanations for the positive stock market reaction (Wruck, 1989). However, multiple theories contradict these results and suggests that shareholders prefer that the firm use internal financing rather than external financing sources. Therefore, information asymmetry occurs and subsequently a negative stock market reaction (Myers & Majluf, 1984). The equity issuance can signal firm value and imply that the management issues equity when they perceive the firm as overvalued (Ross, 1977).

In recent years, private placement has become the preferred choice of equity offering among firms in Norway (Euronext, 2022a). The capital raise is a crucial part of a firm's life cycle and affects the management and shareholders. There has been surprisingly little research on the Norwegian equity market. Thus, it's a great opportunity and an interesting event that deserves proper scrutiny and research.

To investigate the stock market reaction to private placement we use event study methodology with a sample of 89 firms between 2015 and 2020. By using CAPM and Fama and French 5-factor model as estimation models, we find that there is, on average, a negative stock market reaction to the announcement of private placement. Further, we construct a multiple regression model to examine if variables related to firm performance influence the stock market returns. Our finding suggests that the stock market react differently to announcement of private placement in 2020 compared to prior years, and firms return on asset before the announcement have a significant positive impact on the returns following the event. Additionally, earnings pr. share seems to affect the stock market reaction of private placement negatively.

Our research contributes to the literature in two folds. First, we elaborate on the announcement effect of private placements in the Norwegian equity market. To our knowledge, there are no modern studies that focus on this field. Secondly, the existing

literature mainly look at long-run performance, and factors related to firm performance are rarely used. Our study differs from the existing literature by controlling for such variables.

The rest of the thesis proceeds as follows. Section 2 summarize the literature to provide the framework of our research question and hypotheses. Section 3 introduces our hypotheses development. We examine our research design, describing event study methodology, multiple regression model and sample in section 4. Lastly, we discuss our findings in section 5 and conclude in section 6.

2. Literature

In this section we want to review previous literature and the theoretical framework related to our study. We present previous findings on private placement and the relevance for the Norwegian market. To find what factors distinguish the findings around the world, we also look at laws and regulations of the Norwegian market compared to other markets. Moreover, to get an understanding of the fundamental financial concepts, the section elaborates on essential theories regarding equity issuance.

2.1 Stock market reactions to announcement of equity issuance

There are numerous of studies on the announcements effect of SEOs before the 20th century. The consensus of the market reaction after the announcements is a short-term price fall. Asquith and Mullins (1986) find that announcement of equity issuance reduce stock prices significantly. Studies done by Kothari and warner (2007), Eckbo and Masulis (1992) and Bayless and Chaplinsky (1996) show similar results. It seems like firm commitments have an abnormal return of approximately negative 2 percent (Eckbo, 2008).

When a firm announces an SEO the share price generally falls. An explanation is that firms has information that investors lack, and therefore the SEOs reveals negative information to the investors (Myers & Majluf, 1984). Equilibrium firms with positive information prefer not to issue equity because they already feel undervalued and won't accept a negative stock price. On the other hand, firms with negative information issue equity and accept the negative share price because the SEO provides funding for a profitable investment (Bond & Zhong, 2016). Managers decide wheatear to issue new equity based on their private information and if they believe the share price is overvalued. The market participants take this into account and adjust the stock price downwards upon the announcement of new issues (Myers & Majluf, 1984).

Firms tend to announce SEOs after a significant stock price increase, and then experience a significant reversal of returns (Huang et al., 2016). The price decline may be explained by the increase of outstanding shares and how a sizeable sale of common stock leads to temporary, or permanent, downward pressure on the stock price. In an efficient market, the price effect associated with the increased supply should be adjusted by the market on the announcement day rather than the offer day (Intintoli & Kahle, 2010). A higher offer price is beneficial for the issuer because of the possibility to receive more cash for less dilution of ownership.

Equity issuers have incentives to boost their earnings before the offering to push the price upwards, leading to increased offering proceeds (Kim & Park, 2005).

Baker, Stein and Wurgler (2003) find that the stock prices have a strong influence on the investments of firms that need external equity to finance marginal investments. Large percentage of firms avoid equity offerings when they perceive the stock undervalued (Graham & Harvey, 2001). Also, firms exploit transitory windows of opportunity by choosing when to issue equity (Loughran & Ritter, 1995).

However, private placement has gotten less attention in the studies of corporate capital raising. In Europe there is evidence of an overall positive market reaction. Cronqvist and Nilsson (2005) did a study of 136 private placements in Sweden between 1986-1999 and found a significant positive market reaction of 7.3% in an event window of [-1,1]. Another study completed by Eckbo and Norli (2004) examined 136 firms that announced private placements between 1980-1996 in Norway. Their findings show a significant positive return of 2.66% in a four-day event window, whereas shorter event windows are showing a non-significant positive market reaction. Similar market reactions are confirmed in the United Kingdom by Slovin et al., (2000).

There has also been conducted several studies outside Europe. Wruck (1989) found a positive abnormal of 1.89% in the United States between 1979-1985. The same pattern is found by Chaplinsky and Haushalter (2005), who discovered a cumulative average abnormal return of 3.49% by 1050 private placements between 1995-2000. Previous studies show an expected positive market reaction of approx. 2.45% in the United States (Eckbo, 2008). Other Asian studies show similar positive market reactions. Evidence from Japan is researched by Kato and Schallheim (1993) and Kang and Stulz (1996) and show a significant positive return. The same applies for Wu et al., (2005) study in Hong Kong.

Previous studies show that the market reaction following a private placement is different compared to other forms of SEOs. The explanations of why there might be a difference is that private placement offerings might incentivise and enable communication between the issuer and the investor, which alleviate future investors nervousness of the possibility of an overpriced offering (Eckbo, 2008).

The positive announcement effect may be related to the fact that the firm are willing to expose itself to increased monitoring and certification by large investor(s) (Wruck, 1989). However, some empirical evidence suggests that there is little direct evidence of monitoring and certification activities by private placement investors, and the evidence points towards managerial entrenchment as a bigger contributor to the positive stock price reaction (Chaplinsky & Haushalter, 2005).

The positive announcement reaction portrays an opposing reaction compared to an economic intuition. The subscription price is oftentimes at a discount; thus, the expectation is a value reduction per share (Holderness, 2018). Despite the positive reaction of private placement, there is evidence of significant long-run underperformance compared to several benchmarks. The reason might be an overoptimism of the investment opportunities (Hertzel et al., 2002). The investors that participate in the placement get a discount and therefor earn normal returns, while the non-participating investors experience post-issue negative long-term abnormal returns (Krishnamurthy et al., 2005).

As mentioned earlier, there is evidence that firms attempt to announce equity issuance when the market is overoptimistic. There is an argument that in private placements it might be less likely because the participating investors are well informed, institutional, or high net worth people that possess great knowledge of the firm's future cash flow and prospects. However, the results are still showing a significant stock price run-up before the announcement and a significant negative abnormal return after the placement (Krishnamurthy et al., 2005).

Crises has the potential to disrupt the stock market, thus the market reaction of events might be biased during this period. For a period to be defined as a crisis there is three criteria's that need to be fulfilled. Firstly, the crisis event should be unexpected, negative, and have sufficient economic magnitude such that investors' attention increases. Secondly, the expected market volatility increases. Finally, these criteria's need to stand out relative to recent market conditions (Burch et al., 2016). The investors return expectations and risk tolerance change during crisis. The trading and risk-taking behaviour is driven by the investor's fluctuation of perceptions during the crisis (Hoffmann et al., 2013). Behavioural finance proposes that psychological biases impact the financial decisions in the markets. Unforeseen events impact the stock prices, and the investor's perceptions and behaviour affect the financial markets (Werner De et al., 2008). Investors are less willing to undertake risk

during recessions (Campbell & Cochrane, 1999). It would be natural to believe that private placement announcements would have a different impact during crises. The investors will have different perceptions on why the firm is initiating such event, thus the market reaction differ. Some market participants are less rational, resulting in pricing irregularities (Malkiel, 2003).

There is numerous theories and hypothesis on how the market should react on announcement of SEOs. "Pecking order" theory is an economical theory of financing and capital structure. The theory suggests that to avoid financial costs due to information asymmetry, the firm prefer to use internal financing rather than external financing sources. The preferred external financing is debt rather than equity issuance (Myers & Majluf, 1984).

Information asymmetries propose that mangers know more than their investors about their firms' prospects, risks, and values. A higher asymmetric information will impact the market reaction negatively to the announcement of equity issues (Myers & Majluf, 1984). The signalling hypothesis suggest that the managers capital structure decisions can indicate the firm value. It therefore rises an adverse selection problem where outside investors rationally discount the firms stock price due to the issuance of equity, and the belief that managers perceives the firms as overvalued (Ross, 1977). However, the change in ownership concentration can be seen as a positive occurrence for existing shareholders. This monitoring and certification hypothesis argues that the discounted stock price might reflect a compensation for expert advice and monitoring services by the accredited investors (Wruck, 1989).

The pecking order theory is problematic because it anticipates that firms do not issue equity when they have untapped dept capacity. However, firms tend to announce SEOs after a significant price run-up, which indicates an increase of future cash flows that could support additional debt (Huang et al., 2016). Thus, market timing hypothesis has become the most prominent theoretical explanations of SEOs (DeAngelo et al., 2010)**.** The equity market timing is building on intentions to exploit temporary fluctuations between the cost of equity and other forms of capital. Firms attempt to issue shares at high prices and repurchase at low prices.

The stock market is efficient if it accurately reflects all relevant information (Malkiel, 1989). The idea is that the flow of information is unimpeded and immediately reflected in the stock price. The news is unpredictable, which means the price fluctuation follows a "random walk" (Malkiel, 2003). The irrelevance theorem proposed by Modigliani and Miller (1958), states that shareholder are indifferent to the capital structure of the firm. In an efficient capital marked the costs of different capital do not vary independently, and therefore there is nothing to gain from opportunistically swich between equity and debt. However, in inefficient markets the managers have incentives to time the market, if possible, and they care about ongoing shareholders, which will go on the expense of entering and existing shareholder (Baker & Wurgler, 2002). Opportunistic managers may exploit information asymmetry and issue equity when the stock is overvalued (Dasilas & Leventis, 2013).

The motives for managers should be to maximize the firm's profitability such that it creates more value for investor. The management (agents) are the representatives for the firms and are authorized to act on behalf of the shareholders (principal). However, if both parties are utility maximisers there is reason to believe that there might arise a conflict between the agent and principal. The agents might retain ulterior motives that differ from the firms' interests. A greater gap between the firm and agent's interests increases the agency costs. An increase in ownership percentage by the management can align the interests of firm and agents (Jensen & Meckling, 1976). In private placement large existing shareholders are prioritized over small ones, thus there is potential for an agency conflict between these two parties. This makes it a discussion about the equal treatment principal.

2.2 Factors related to firm performance

There is a lot of literature focusing on what firm specific factors influences their performance. When undertaking a private placement, it is interesting to see whether these factors have an impact on how the market reacts to the announcement. We believe firms who perform well in the factors related to firm performance prior to the issuance will withstand large fluctuation in stock returns. The factors related to firm performance is explained below.

Growth opportunity

A firms growth opportunity is measured by their price-to-book ratio. If a firm has a higher growth opportunity, it is an indicator of the market's confidence in the firm's growth prospects. The importance of price-to-book ratio (or equivalently book-to-market) as a factor

explaining stock return is widely researched. Fama and French (1992) has demonstrated that the book-to-market ratio explains cross-sectional stock returns. Moreover, the research by Basu (1983), Jaffe et al., (1989) and Jensen et al., (1997) concludes that a low price-to-book ratio is associated with positive return.

PP/Mkt Cap

There is no relevant literature on how the ratio between the size of the private placement and firm size affect the stock return. However, we believe that firms who have issued a higher percentage of their firm size will have a bigger reaction in the market, as their change is more extensive, and the investors might face a higher dilution. There are huge gaps between the sizes of the completed private placements, and we believe that by considering their firm size, we will address the effect of the private placement better.

Return on assets

The return on assets (ROA) is a profitability measure which indicates how profitable a firm is. ROA shows how profitable a firm is related to its total assets. This is helpful when comparing the profitability of firms with different capital structure (Brealey et al., 2020, p. 752) Manoppo (2016) and Allozi and Obeidat (2016) have studied the effect ROA have on the stock return and found a significant positive influence. Additionally, Sraer and Thesmar (2007) finds a significant negative relation between the standard deviation of the firm's stock price and ROA.

Earnings pr. share

Earnings per share (EPS) is a profitability measure that indicates a firms profit per outstanding share. Earnings are the most important financial metric for investors, failure to hit earnings benchmarks creates uncertainty about the firms' prospects. This raises the belief of hidden problems (Graham et al., 2005). The effect of EPS on stock return have been studied by Allozi and Obeidat (2016). The results of the study showed that EPS have a positive significant impact on stock return. This effect is confirmed by Emamgholipour et al., (2013) and Mangoppo (2016).

Firm size

There are mixed results in previous literature on the effect of firm size on firm profitability and performance. Lee (2009) have examined the role that firm size plays in profitability. The

results shows that firm size plays an important role in explaining a firms profitability. This effect is confirmed by Papadognas (2007) who revealed that firm's profitability is positively influenced by firm size. However, Amato and Wilder (1985) also tested the size and profitability relationship but their results showed no relationship between firm size and profit.

2.3 Equity issuance on Oslo Stock Exchange

2.3.1 Capital raise

Private firms may raise capital through issuing equity or dept to realize capital-intensive business plans. The incentives for a security offering are often related to capital expenditures and investment opportunities. However, other reasons might be refinancing, mergers and acquisitions, restructuring, or exploitation of periods with low financing costs etc. The equity issue causes an increase of the outstanding shares, thus inflating the overall number of shares. Consequently, the share price falls, however the firm increase its cash balance and offset the dilutive effect. If the firm prices the equity offering correctly the existing shareholders will theoretically be neutral to such event (Eckbo, 2008).

Another way for firms to raise capital is to issue for bonds. The increased debt levels might increment the risk of bankruptcy; however, the shareholders avoid dilution. To make sure the firm meets its debt obligation the bondholders require priority over shareholders claims on future cashflows. The active private placement market has evolved for corporate debt (Brealey et al., 2020, p. 413).

A common way to raise equity capital is through a public listing known as initial public offering (IPO). After a firm has gone public, it can issue additional equity through a seasoned equity offering (SEO). To attract potential new investors, the firm usually offer new shares at a discounted price in relation to the prevailing market price. The two most common seasoned equity offerings are rights issues and private placements. The rights issue is an in-the-money warrant to buy a fixed number of shares for a fixed price. This right is exclusively offered to existing shareholders on a pro rata basis, and shareholders who don't wish to participate can sell their rights. Private placements, on the other hand, aims for one or several accredited investors. The issuance is offered to a specific group of investors, often existing shareholders and occasionally one or several new investors (Eckbo, 2008).

The managements choice between different SEOs is selected to maximize the expected net proceeds of the equity issue. Instinctively firms want to minimize the costs related to their offering. However, it is difficult to estimate the cost related to the issuance. These costs are called flotation costs and are divided by direct and indirect costs. The direct flotation costs include underwriting fees as well as other out of pocket expenses such as accounting, legal expenses and the costs of the managements time and efforts. In contrast, the indirect flotation costs can be more difficult to measure. The most common indirect cost is underpricing costs, which occur when the firms offer the new issued shares at a discount. There are also potential costs of a negative market reaction following the announcement as well as costs related to delays or cancellations which affects the management time and efforts devoted to the offering process (Eckbo, 2008).

Moreover, the flotation costs might differ between countries. There are rarely any underwriting fees in Norway because the primary SEO approach is private placements. In private placements there is no need for the issuance to be guaranteed by an investment bank. However, in other countries underwriting fees are an important factor of most offerings. This makes the costs related to issuances in Norway less expensive than other markets. There are also regulatory requirements and variations in timelines of the different SEO approaches (Eckbo, 2008).

The regulatory requirements vary between different approaches of SEOs in Norway. A listing and offering prospectus are required for rights issues and is usually drafted by its underwriter. The prospectus is a document describing the security offering and its financial information. Thus, the prospectus is one of the main direct flotation costs of rights issues. When completing a rights issue, the subscriptions rights must be available for a minimum of 14 days. This is called the subscription period. Therefore, it creates the risks that the share price could decrease during the subscription period which makes the offering less attractive for investors (Eckbo, 2008).

As mentioned, there are bigger flotation costs when completing a rights issue compared to private placements. Bigger costs make the issuance less desirable for investors. It is also important to be careful to conclude regarding the Norwegian market using results from other markets. This is because the costs and regulatory frameworks for the different approaches can vary between countries.

2.3.2 Private placements

Private placements might be a more desirable approach to raise capital in Norway because there are less costs attached to the issuance compared to rights issues. In contrast to rights issues, a prospectus and listing of subscriptions rights is not required in a private placement. Moreover, the timeline is beneficial for private placements.

A financial advisor from an investment bank or brokerage firm has placing power in a private placement. The advisor usually contacts large existing shareholders, costumers and/or other potential investors when planning for a private placement. Moreover, the advisor has a network of investors who could participate in a private placement. This mitigates the risk related to securing the desired proceeds. Normally the number of investors participating in a private placement is less than 150. This is to avoid the requirement of a prospectus (Eckbo, 2008).

The subscription price is normally at a discount to the prevailing share price to attract investors. Therefore, the investors can increase their ownership in the firm for a lower price than other existing shareholders who didn't partake in the issuance. Non-participating shareholders face dilution of their ownership and shares with a lower market price (Holderness, 2018).

The announcement of a private placement is usually after the market close to avoid any disturbance on the market price whilst placing the offering. The announcement usually contains details regarding the offering such as an estimation of issued shares, the subscription price and what the proceeds intended use are. A second announcement is posted before the market opens the following trading day. The second announcement is a confirmation of the completed private placement which contains the number of shares issued and the proceeds.

Private placements are the dominant approach for equity issuance in the Norwegian market. Figure 1 shows the evolution of equity issues completed in the last decade in Norway. The dominance of private placements as the main issuance has risen in recent years, where 98.53% of SEOs completed in 2020 was through private placements. It's also worth noting that as the number of private placements has risen, the number of rights issues has subsequently declined. This gives an indication that firms in Norway probably prefer private placements as an approach when issuing equity.

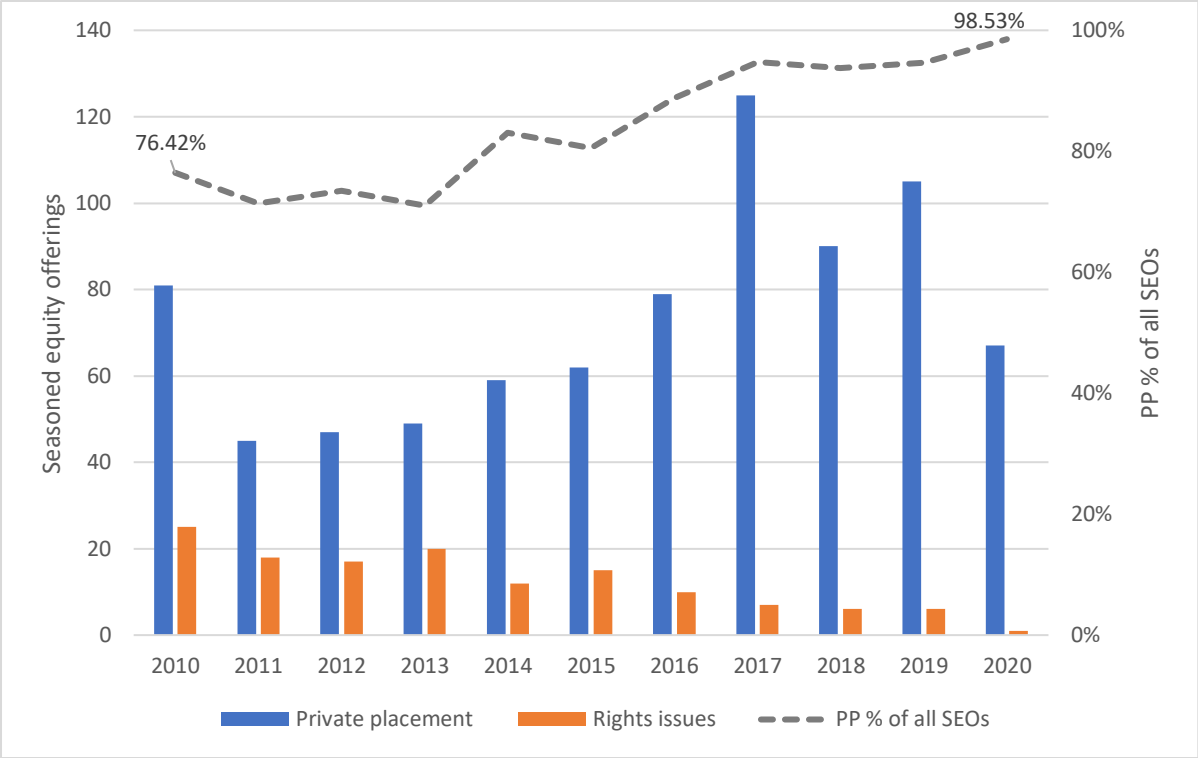

Figure 1: Annual number of equity issuance on OSE (Euronext, 2022a)

Equity issuance can massively change the ownership structure of a firm, hence tight restrictions are usually set. Shareholders must vote to approve the equity issuance approach. This is regulated by chapter 5 in the Norwegian Public Limited Liability Companies Act (Aksjeloven, 1997). The majority requirement of the general meeting is by a majority vote which usually is more than 50%. However, the majority requirements for equity issuance are different from the ordinary majority requirement. In section 5-18 of the Norwegian Public Limited Liability Companies Act it states that Norwegian firms needs a two-thirds majority vote to pass a vote on equity issuance. The vote is held in a general meeting (Lovdata, 2013).

Norwegian law does not distinguish between the issuances voting requirements. The only other countries who don't distinguish between the different issuances is Finland and Malaysia (Holderness, 2018). In other countries there is generally lower vote requirement for rights issues than private placements. Private placements generally have the strictest requirements and might be an explanation to why some countries don't partake in private placements at all.

Because the requirements of rights issues and private placements is similar, it makes sense that the likelihood of managements issuing through private placements in Norway increases. As previously discussed, there are less costs attached to private placements, the process is

more efficient, and it secures the proceeds faster. However, there is a problem in private placements where larger shareholders are prioritized over smaller ones and agency issues could potentially be a problem. Lower majority might make the management decide on plans for the firms that many shareholders disagree with.

Furthermore, several studies find that there is a relation between shareholder approval and announcement returns of SEOs. The studies find a correlation between shareholder approval and positive returns, and subsequently less positive return if the issue is only approved by the management or board directors (Holderness, 2018). For instance, Cronqvist and Nilsson (2005) finds that private placement to insiders (90% majority) in Sweden is connected to a larger positive abnormal announcement return, as opposed to private placement issued to outsiders (66% majority).

2.3.3 The Norwegian equity market

The Oslo Stock Exchange (OSE) is a small marketplace compared to other larger markets such as the New York Stock Exchange (NYSE). To give an idea of the difference, the market cap of all the stocks on the OSE is approx. 433 million USD, while the NYSE have a market cap of approx. 27.21 trillion USD. What separates the OSE from other markets is the large state ownerships in big firms on the exchange. Equinor (67.0%), Telenor (54.0%) and DNB (34.0%) is examples of large firm on the exchange where the state holds a majority stake (Equinor, 2021; Telenor, 2021; DNB, 2021). The Norwegian market is also dominated by firms in the energy, shipping, and seafood sector. These traits make the Norwegian market especially sensitive to changes in oil prices, as well as global sentiments. As seen in figure 2, the OSE Benchmark Index (OSEBX) has had a positive cumulative return of 94.08% over the last decade with a compounded annual growth rate of 8.93%. Moreover, the figure shows a large price drop in 2020, due to the Covid-19 outbreak.

Figure 2: OSEBX returns 2010-2020 (Euronext, 2022c)

When the new information of Covid-19 reaches the market, investors will re-evaluate their opinions about the value of their assets and as a result will change the volatility in the market. The volatility of a market measures the spreads of returns and indicates the risk (Stock & Watson, 2020, p. 61). To illustrate how Covid-19 impacted the market we have depicted the volatility index (VIX) over the last decade in figure 3. The VIX is an index of the implied volatility of 30-day options on the S&P 500 (Hull, 2018, p. 216). Unsurprisingly, it shows that the highest volatility value over the last decade was in 2020. The financial markets were hit with a lot of uncertainty during the pandemic and a lot of firms were unable to conduct their business in the same way. Thus, there is a possibility that firms that issue for equity during that time has different incentivizes to collect capital.

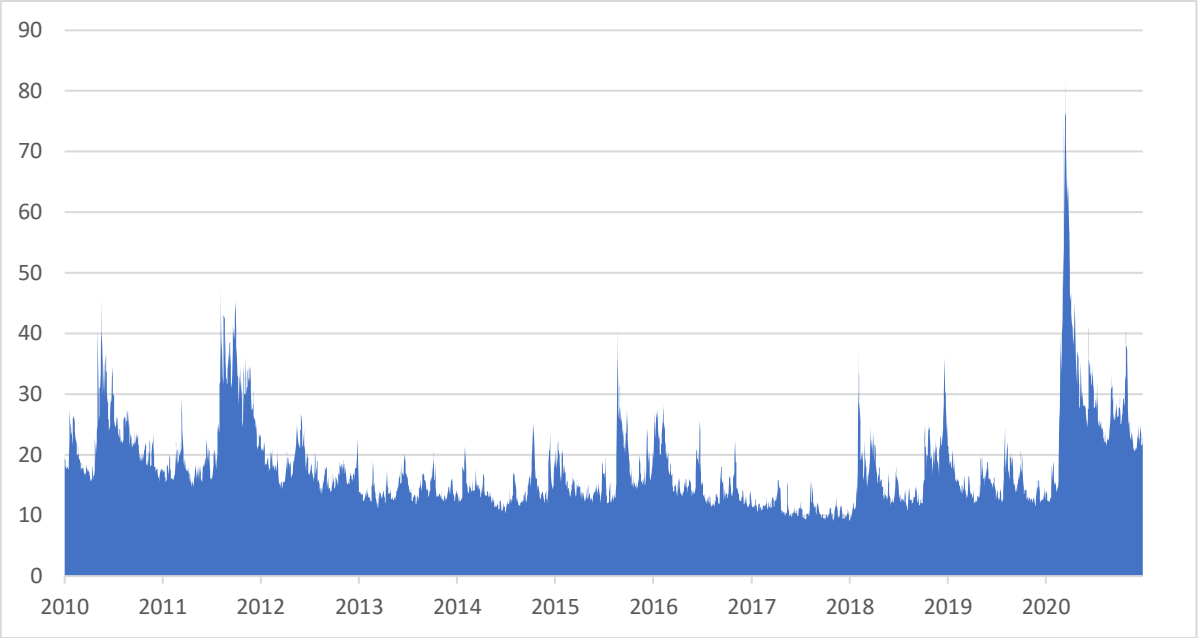

Figure 3: The volatility index 2010-2020 (Yahoo, 2022)

3. Hypotheses development

The literature and theories in the previous section is the basis for our motivation and hypotheses development. From the literature review there is clear evidence suggesting announcements of private placement is resulting in a positive market reaction. However, these studies might not be representative since the results are from two-three decades ago and there are methodological dissimilarities between the studies. There are multiple theories that contradict this stock market reaction and suggests that shareholders prefer that the firm use internal financing rather than the external financing sources, thus it occurs information asymmetry and a negative market reaction (Myers & Majluf, 1984). The equity issuance can signal firm value and imply that the management issues equity when they perceive the firm as overvalued (Ross, 1977). Based on these theories we develop the following hypothesis:

Hypothesis 1: *There is a significant negative stock market reaction to the announcement of private placement on Oslo Stock Exchange*

The evaluation of the average abnormal return depends on how far the expected return differentiate itself from the realized return. To find the expected return we use CAPM and Fama and French 5-factor model, which will be elaborated later. There might be information inherent in the market that overstate or understate the impact of the announcement of private placement. It isn't always possible to see the effect by only using one day, thus different event windows can give a greater overview. We construct a multiple regression model to research potential characteristics that may affect the returns. Based on covid-19 and the high volatility in 2020 and Hoffmann et. al (2013) and Werner De et al. (2008) findings of invesors behaviour during crisis we develop the following hypothesis:

Hypothesis 2: *The stock market react differently to private placement announcements during 2020*

Profitability measures such as price-to-book ratio are explained to have a relation to stock returns. Based on the findings of Basu (1983), Jaffe et al., (1989) and Jensen Johnson, and Mercer (1997), the stock market seems to exhibit a positive abnormal return associated with low price-to-book values. Therefore, we develop the following hypothesis:

Hypothesis 3: *The announcement returns are dependent on the firm's growth opportunity*

As discussed in 2.2 we believe firms that issue a high percentage of their market capitalization will ha larger market reaction. The discounted shares will consequently make non-participating shareholders face dilution of their ownership; thus, we expect a negative market reaction. Based on this we propose the following hypothesis:

Hypothesis 4: *The announcement returns are dependent on the firms PP/Mkt cap*

The findings of Manoppo (2016) and Allozi and Obeidat (2016) indicates that ROA has a significant positive influence on the stock price. Whether the same applies for announcements of private placement is unclear. Sraer and Thesmar (2007) finds significant negative relation between the standard deviation of the firm's stock price and ROA. Thus, we believe firms with a higher ROA perform better during the private placement announcement. Our hypothesis is therefore:

Hypothesis 5: *The announcement returns are dependent on the firms return on asset*

As discussed in section 2.2, Allozi and Obeidat (2016), Emamgholipour et al. (2013) and Mangoppo (2016) finds that EPS have a significant influence and positive relation to the stock price. Based on this we expect firms with higher EPS to exceed during the event. Hence, the hypothesis is:

Hypothesis 6: *The announcement returns are dependent on the firms earning pr. share*

Findings from Lee (2009) and Papadognas (2007) indicates that the firm size plays an important role in profitability. It would be interesting to see whether the size of the firm affect the market reaction of private placement announcement. We therefore develop the following hypothesis:

Hypothesis 7: *The announcement returns are dependent on the firm size*

4. Methodology and Data

In this section we review our research design. We use event study to capture the impact of the announcement of private placements and apply CAPM and Fama and French 5-factor model to calculate the expected return. We utilize multiple regression analysis to test which independent variables affect the cumulative average abnormal return.

4.1 Event study

An event study tries to examine the return behaviour for a population of firms experiencing a common type of event, and whether the cross-sectional distribution of returns is abnormal (Kothari & Warner, 2007). These studies can reveal important information on how a security is likely to react to the event. Some examples of such events can be SEOs, IPOs, stock split, etc. These events can either have a positive or negative effect on the stock and is evaluated by collecting financial market data. It's important to be able to identify precisely the date of the event to have a successful event study (MacKinlay, 1997).

When performing an event study, the first thing to do is defining the event window and estimation window. The event window is the day the event of interest occurs, and it might be important to include some days prior and after the event day. The announcement might occur while the stock market is open, and therefor impact the effect on the event day (MacKinlay, 1997).

The estimation window is determined as a fixed window prior to the event date (Aktas et al., 2007). To prevent the event from influencing the normal performance it generally is not included in the estimation window (MacKinlay, 1997). The estimation window is used to estimate the expected normal and indicate what the return should be during the event window. Studies that use daily data usually define the window between -250 to -30 relative to the event date. It's important to be aware that there might be complications with unrelated events during the estimation window. This will bias the estimation of the expected normal return and is difficult to control for with large samples (Aktas et al., 2007).

Our event is based on the announcements of private placement by firms between 2015 and 2020. The event window lasts from 6 trading days prior to 9 trading days after the announcement. Where day -1 is the last whole trading day before the announcement. Further

we used an estimation window of 252 trading days where we exclude a control window between the estimation window and event date. This control window consists of 25 days, and we do this to make sure that the event doesn't influence the estimation window.

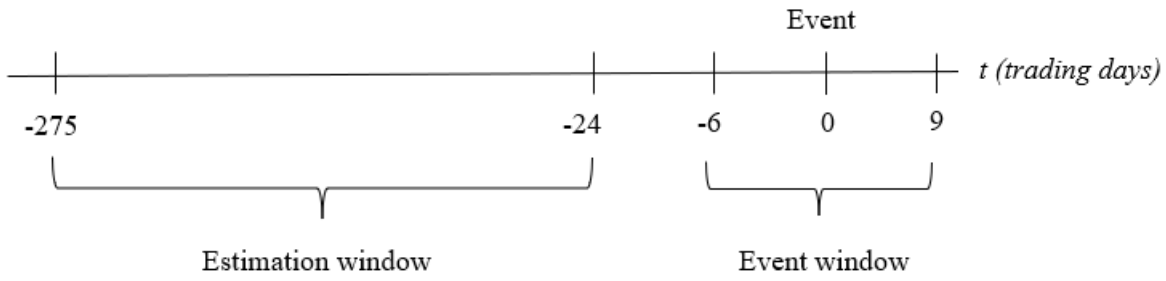

Figure 4: Event study timeline

This figure is showing the estimation and event window used for all the firms. The estimation window is -275 to -24 trading days before the event day. The event window is from 6 trading days prior to the event and 9 trading days after the event.

The abnormal return shows the impact of the event. This is calculated by finding the difference between the expected and realized return. This can either be positive or negative and will show if there is any unusual movement during the event. The cumulative return is the sum of the abnormal returns in the given period. We use five different cumulative average abnormal returns to get a sense of the aggregate effect of the abnormal returns. This makes it possible to evaluate the abnormal returns before and after the event day. It is important to be wear of that adding to many trading days in the CAAR window might produce bias in the results and will make the interpretation difficult. We use [-2,2], [-1,1], [-1,0], [0,1] and [0,2] as the cumulative average abnormal returns. The longest window is five trading days and the rest of them are between two and three days.

4.1.1 Abnormal return

Abnormal return can be defined as the realized return minus the expected normal return (MacKinlay, 1997). To calculate the daily realized return, we use the adjusted closing price of the stock.

$$R_{i,t} = \ln\left[\frac{P_{i,t}}{P_{i,t-1}}\right] \quad (1)$$

The normal or expected return can be calculated in numerous ways. In our study we have chosen CAPM and Fama and French 5-factor model. The abnormal return is given by AR for firm i, in period t.

$$AR_{i,t} = R_{i,t} - E(R_{i,t}|X_t) \quad (2)$$

Further the calculation of average abnormal return is given by the sum of abnormal returns for all the firms in period t, divided by the amount of firms n (MacKinlay, 1997).

$$AAR_t = \frac{\sum AR_{i,t}}{n} \quad (3)$$

4.1.2 Cumulative abnormal return

Calculation of abnormal returns over multiple days is done by using cumulative abnormal returns, this is the sum of the abnormal returns in the chosen period. The CAR for firm i for period t_1 to t_2 (MacKinlay, 1997).

$$\mathrm{CAR_i}(t_1,t_2) = \sum_{t1}^{t2} AR_{i,t} \quad (4)$$

The cumulative average abnormal return is calculated by taking the sum of the cumulative abnormal return for each firm i, in period t_1 to t_2, and divide by the amount of firms n (MacKinlay, 1997).

$$\mathrm{CAAR_t} = \frac{\sum CAR_{i,t}}{n} \quad (5)$$

Event day	N	AAR	Median	Std.dev	10th percentile	90th percentile
-2	89	0.71	0.56	10.89	-3.10	4.89
-1	89	-0.04	-0.36	5.56	-4.79	6.02
0	89	-3.03	-2.09	11.03	-14.86	9.47
1	89	-2.01	-0.48	5.98	-8.29	3.57
2	89	-1.88	-0.62	7.85	-6.29	3.07
Volatility (Estimation window):		0.88				
Volatility (Event window):		26				

Table 1: Summary of data

This table show the summary of average abnormal returns (AAR) around event day 0. The volatility is the standard deviation in each window, calculated with the data set in Fama and French 5-factor model.

4.2 Model selection

In this section we cover the models we use to calculate the expected return. During our thesis we will focus on Fama and French 5-factor model and use CAPM to make our findings robust. Another well-known model we contemplated using was Carhart's four-factor model. However, this model is more restricted than Fama and French 5-factor model and it doesn't consider alternative factor definitions (Fama & French, 2015).

The well-known Sharper-Lintner-Black capital asset pricing model (CAPM) is one of the models we use to calculate the expected return (Sharpe, 1964). The CAPM is widely used because of its simplicity yet plausible predication. It's important to notice that the model is building on some assumptions and is far from perfect. It appears that the model has difficulty to capture risks related to stocks of small companies, and stocks with high book value relative to market price (Brealey, 2020, p. 217). The essence of CAPM is that the investment is expected to lay on the security market line. If it isn't the investor will either want to buy or sell dependent on the relation between expected return and the beta. The expected return on asset $_i$ is given by:

$$E[r_i] = r_f + \beta_i^M(E[r_m] - r_f) + \alpha_{i,t} \quad (6)$$

r_i is the return on the asset, r_f is the risk-free return and r_m is the return on the market portfolio. The β_i^M is the systematic risk of the asset in relative to the market portfolio and is the beta. This calculated by:

$$\beta_i^M = Cov(r_i, r_f)/\sigma^2 \quad (7)$$

σ^2 is the variance of the market portfolio (Bartholdy & Peare, 2005). The historical beta can primary be found with a linear regression between return on the stock and a market index. The α of an investment is the intercept in the time-series regression of an asset's excess returns on a market portfolio. The alpha plays an important role in analysing the performance of a stock (Barillas & Shanken, 2017)

The value of the true beta changes over time and therefore a long estimation period for beta will likely be biased. Also, there is required substantial adjustments to eliminate the interval-effect bias in betas estimated from short periods (Cohen et al., 1983). There is no consensus in

which time frame that is preferred for the best estimate, but there is a trade-off between the length of the time period and sampling frequency (Bartholdy & Peare, 2005). We therefore chose one year of trading days as the estimation period.

Empirical evidence shows that factors other than market portfolio contribute to stock return variation (Zabarankin et al., 2014). This is where the five-factor model provides an alternative to CAPM. Like CAPM, the model builds on beta and the market premium, but differently it adds four other factors. The five-factor model is an extended version of a three-factor model made by Fama and French. The three-factor model is supposed to capture the relation between the average return and market capitalization, and the relation between the average return and price ratios like B/M. However, the model does not capture the variation in average returns related to profitability and investment, hence the five-factor model is made. These two known patterns in average returns is left unexplained by the CAPM (Fama & French, 2015).

$$r_{it}-r_{ft} = \alpha_i + b_i(r_{mt}-r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it} \quad (8)$$

The $(r_{Mt} - r_t)$ is the excess return on a value-weighted portfolio, SMB_t is the return on a diversified portfolio of small stocks minus the return of a portfolio of big stocks. The HML_t is the difference between the returns on diversified portfolios of high and low B/M stocks. RMW_t is the difference between the returns on diversified portfolios of stocks with robust and weak profitability. The CMW_t is the difference between the returns on diversified portfolios of the stocks with conservative and aggressive investment behaviour. e_{it} is the zero-mean residual. All the coefficients b_i, s_i, h_i, r_i and c_i are the factor loadings or betas to the five risk factors and is found by using the estimation window. It's supposed to captures all the variation in expected returns, and if that's the case the α_i is zero (Fama & French, 2015).

It is estimated that the model explains between 71-94% of the cross-section variance of expected returns for the size, B/M, profitability and investment (Fama & French, 2015). When the sole interest is to look at abnormal returns through regression intercepts a four-factor model that drops HML performs as well as the five-factor model. If there is also interest towards size, value, profitability and investment premiums, the five-factor model is the choice (Fama & French, 2015). By adding more factors, the correlation among the variables is likely resulting in poor diversification of some of the portfolios that are used to

construct factors. By excluding some of the factors one should reconstruct the factors because controlling for unused characteristics is potentially harmful.

4.3 Multiple regression

We want to use multiple regression in our study to investigate the effect of independent variables on the returns during the event. To our knowledge there are no previous studies that control for factors related to firm performance. We try to explain whether these variables influence the stock market reaction and to prevent omitted variable bias in our results. We use the regression model to find the answers to hypothesis 2-7.

A regression analysis is a statistical technique to estimate relationships among variables. Predictive modelling is a typical method that is about predicting new or future observations where the goal is to make predictions about one variable based on different observed values (Stock & Watson, 2020, p. 143). Ordinary least squares (OLS) are a method estimating parameters of a linear regression model. The estimators are random variables that are dependent on data from a random sample and are relaying on a large sample to make the OLS estimators normally distributed (Stock & Watson, 2020, p. 211). In a multiple regression model, there is important to avoid omitted variable bias. If the omitted variable is correlated with the included regressors and the omitted variable is determinant of the dependent variable, then the OLS estimator will obtain omitted variable bias (Stock & Watson, 2020, p. 212).

The multiple regression model makes it possible to estimate the effect on the dependant variable by changing one of the independent variables while holding the other regressors constant (Stock & Watson, 2020, p. 217). The multiple regression model is given by:

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_k X_{ki} + u_i,\ i = 1, \ldots, n \qquad (9)$$

Y_i is the i^{th} observation on the dependent variable and the X_{1i}, X_{2i}, …, X_{ki} are the i^{th} observation on each of the k regressors. The u_i is the error term and consists of the factors that determines the dependent variable that are not included in the function. This term is homoskedasticity if the variance of the conditional distribution of u_i is constant for i = 1, …, n. If not, the error term is heteroskedastic (Stock & Watson, 2020, p. 219).

There are three measures of fit that can be applied in a multiple regression. These are the standard error of the regression (SER), R-squared and adjusted R-squared. SER estimates the standard deviation of the error term (Stock & Watson, 2020, p. 222). The R-squared is the fraction of the sample variance of the dependent variable that is explained by the regressors. A problem with using R-squared as a measure of fit is that by adding more variables R-squared generally increases even if the variables offer no explanatory power to the dependent variable. The Adjusted R-squared takes this into account and gives a better sense of the goodness of fit (Stock & Watson, 2020, p. 223).

4.3.1 Testing for significance

By examining whether the CAAR and AAR are significant different from zero, we can test our hypothesis. We use parametric test to examine the statistical significance of abnormal returns, this test assumes there is normal distribution (MacKinlay, 1997). The central limit theorem states that if the excess returns of securities are independent and identically distributed and the number of securities increases, the distribution of the sample mean excess return converges to normality. Event study methodology often assume that there is constant variance. When this assumption does not hold, there become bias in the results. The statistical tests might over-or understate the abnormal returns (Brown & Warner, 1985).

A way to test the significance is to use the confidence intervals. This is done by calculating the standard deviation of all firms for each day in the event window. Further calculate the standard error by dividing the standard deviation by the square root of the number of trading days in the estimation window. Then multiplied the standard error by the critical value. Lastly, calculate the t-stat to test the significance.

$$t = \frac{\bar{x} - \mu_0}{\frac{s}{\sqrt{n}}} \qquad (10)$$

4.4 Sample and data

4.4.1 Sample

In our study we have used quantitative research method because we needed to acquire a big sample of daily stock prices for our analysis. We gathered the data from Yahoo finance who

has an overview of historical data on stocks including opening price, highest price, lowest price, closing price, closing price adjusted for dividend, stock split and new stock offerings. We chose to use the adjusted closing price in our study to account for any corporal action that might have taken place.

The Oslo Stock Exchange keeps statistics on all seasoned equity offerings registered by companies on the stock exchange between 1997 and 2020. The statistics is available through Oslo Stock Exchange's website and specifies the company, date, share price, number of shares issued, total proceeds as well as the type of issue that has been implemented (Euronext, 2022a). To ensure that the information on the announcement of the SEO was correct and easily available, we focused on offerings completed between 2015 and 2020. To be included in the sample, the firms must have been listed on the stock exchange for a minimum of 276 trading days before the announcement, and a minimum of 9 trading days after.

Some offerings did not qualify for our sample. Given that we wanted to focus on the two most common offerings, rights issues and private placements, all offerings completed through IPO's, repair offerings and employee bought shares were removed from our sample. We also excluded completed offerings of less than 100 million NOK to eliminate events of negligible size. These exclusions left us with a sample of 222 issues completed through private placement and rights issues that were eligible for further research.

There were some shortcomings in the dataset that had to be addressed before further research was conducted. Firstly, the date column in the statistics from Oslo Stock Exchange reflected the date of when the equity issues was filed in the Brønnøysund register. The date of the filing in the register is irrelevant since our study measures announcement returns. Additionally, the dataset does not describe any further detail concerning the issues or what the firms intend to use the proceeds for. Consequently, we had to find each firms announcements to clarify if the offerings had the necessary characteristics to be a part of our study.

To find the announcement of the various issues, we have used Newsweb. From the 222 issues in our sample, we had to exclude issues where we couldn't find the announcement, the announcement contained the intention to complete several equity offerings, the issue was a part of an acquisition or a merger, or the offering was split in different tranches. In such instances, we believe that the effect of the announcement would be disturbed.

Even when we could find the announcement, we encountered a problem with several firms that are no longer listed on the exchange or haven't been listed one year prior to the event. There was also a problem with several rights issues which had very low trading volume during the event, which resulted in no change in the stock price. These offerings were excluded and left us with 100 issues, where 89 of them were private placement. After being left with only 11 rights issues, we chose to remove these from our sample since it is not enough to conclude in our thesis. Our final sample consisted of 89 private placements, and table 2 shows the distribution of the private placements in our sample across time. The average gross proceeds are approximately 634.5 million and the year 2020 is highly represented in the sample.

Table 2: Distribution of private placement by year

	Private placement	
Year	No. of offerings	Aggregate gross proceeds
2015	7	504 823 011
2016	13	756 145 766
2017	14	735 193 495
2018	12	643 047 160
2019	15	565 310 313
2020	28	602 244 497
Total	89	634 460 707

The sample includes private placements and rights issues offered by firms on Oslo Stock Exchange over the period 2015-2020 that meet the following criteria: (1) The SEO size exceeds 100 million NOK; (2) The issue is primarily private placement; (3) The firm is not a regulated utility; (4) The firm have been listed on the Oslo Stock Exchange at least 277 trading days before the event and 9 trading days after the event.

4.4.2 Risk factors

We collected the factors for Fama and French's 5-factor model through their website (French, 2022). Fama and French have constructed factors based on data from developed European countries, where Norway is represented. We used this dataset as these countries have the most

similar traits to the Norwegian market. Moreover, the risk-free rate quoted in Fama and French's dataset is similar to the risk-free rate in Norway. Both rates are close to zero and changing it would give little to no effect. The dataset we collected contained the factors for the 5-factor model for the period 2014-2020, where all data is daily and the factors are constructed to capture variation in expected returns (Fama & French, 2015). The factors are described below.

RMRF

RMRF is market return minus the risk-free rate, also called market premium. The market return is the return on a region's value-weighted market portfolio, while the risk-free rate is the U.S. one-month T-bill rate (French, 2022).

SMB (Small Minus Big)

The SMB factor is meant to mimic the risk factor in returns relative to size and is the difference between the average return on nine small-stock portfolios and the average return of nine big-stock portfolios. Therefore, the SMB factor focuses on the different return behaviors of small and big stocks (Fama & French, 1993).

HML (High Minus Low)

The HML factor is similarly defined as the SMB factor and is meant to mimic the risk factor in returns related to book-to-market equity. The factor is the difference between the average returns on two high book-to-market equity portfolios and two low book-to-market equity portfolios. This factor focuses on the different return behaviors of firms with high and low book-to-market equity (Fama & French, 1993).

RMW (Robust Minus Weak)

RMW is used to capture the variation in average returns related to operating profitability and is calculated by subtracting the average return on two weak operating profitability portfolios from the average return on two robust operating profitability portfolios (Fama & French, 2015).

CMA (Conservative Minus Aggressive)

CMA is the difference between the returns on diversified portfolios of conservative and aggressive investment firms. The factor captures the variation in average returns related to

investment and is calculated by subtracting the average returns on two aggressive investment portfolios from the average returns on two conservative investment portfolios (Fama & French, 2015).

In the data set for the CAPM calculations we used the same risk-free rate as in the Fama and French 5-factor model. To find the market return, we used information from Oslo Benchmark Index (OSEBX). OSEBX is an investible index which include the largest and most traded shares listed on Oslo Stock Exchange (Euronext, 2022b). The index is updated twice a year, in March and September, and is adjusted for dividend payments. We downloaded a dataset with daily observations for OSEBX from Euronext's website. The dataset contains the daily closing prices for the index between 2014-2020.

4.4.3 Variables for multiple regression

For the multiple regression analysis, we looked at Fama and French's 5-factor model. To find out if there are any factors that had a significant effect on the abnormal return after the announcement of a private placement, we created five data sets with cumulative average abnormal return as a dependent variable. The dataset also contains the independent variables we believe influences the CAAR during the event. We have different CAARs for each event window depending on which days we are testing for.

The independent variables we have included in our data set are 2020, growth opportunity, PP/Mkt Cap, Return on assets, earnings pr. share and firm size. The data for these variables are all collected from the Thomson Reuters Eikon program. The independent variables are based off numbers from the quarterly report closest to the announcement to best see what factors played a role. All the variables are explained in detail and listed below.

2020: This is a dummy variable for all announcements of private placements registered during 2020. This year was massively impacted by the Covid-19 pandemic; hence the recorded volatility was at its highest in the last decade (figure 3). When the volatility is high, we expect bigger movements in the share price. The risk changes and therefore the investors behavior change. The larger volatility could make our results biased because the higher volatility is an additional event that could disturb the effect of the announcement.

Growth opportunity: The price-to-book ratio is calculated by dividing the firm's market capitalization by its total equity. The price-to-book ratio is a measure of a firm's growth opportunity.

PP/Mkt Cap: This is calculated by dividing the size of the private placement with the firm's market capitalization. This is done to see how big of the collected capital is compared to the size of the firm. It's included because we believe that the higher percentage of the market cap is collected, the bigger effect it has on the stock price.

Return on assets: The ratio of the return on assets determines how efficient a firm is using its assets generate revenue. It's calculated by dividing the firm's net income by its total assets. The return on assets will present itself as a percentage number and is used to determine a firm's profitability (Menaje, 2012)

Earnings pr. share: The earnings per share is calculated by taking subtracting dividends from net income and divide that by the average number of outstanding shares. Admittedly, it has a similarity with ROA because the net income is used in the formula for both variables.

Firm size: The size of the firm is determined by their market capitalization. This is calculated by multiplying the latest closing price by the number of outstanding shares. We have taken the logarithm to scale this variable.

In table 3 we summarize the statistic of the independent variables. It's worth noting that a higher standard deviation indicates a bigger spread in the data. (Stock & Watson, 2020, p. 61). Earnings pr share had two large outliers with extreme values which made the standard deviation very large. Both outliers where from two different private placements from Norwegian Air Shuttle and we removed those values to get a more precise regression model.

Table 3: Summary statistics with independent variables

	N	mean	median	Std.dev	10th percentile	90th percentile
2020	28	-0.10	0.00	5.74	-4.65	4.29
Growth opportunity	89	3.05	2.13	2.82	0.4	6.9
PP/Mkt Cap	89	0.30	0.13	0.76	0.06	0.56
Return on assets	89	-10.01	-0.89	31.26	-53.87	8.06
Earnings pr. share	87	-1.10	-0.09	3.56	-4.23	1.55
Firm size	89	21.67	21.64	1.36	20.12	23.48

The variable 2020 is the average abnormal return in the event window only for firms that issue for private equity in 2020. Growth opportunity is the price-to-book ratio. PP/Mkt cap is the size of private placement compared to the firm's market capitalization. Return on asset is the income after tax divided by the total assets. Earnings pr. share is income divided by the average shares. The firm size is the logarithm of market capitalization. All values that are not ratios are in NOK.

The independent variables give us the following regression estimation equation:

$$CAAR_t = \alpha + \beta_1*2020 + \beta_2*\text{growth opportunity} + \beta_3*\text{PP/Mkt cap} + \beta_4*\text{return on assets} + \beta_5*\text{earnings pr. share} + \beta_6*\text{firm size} + u_i \quad (11)$$

4.4.4 Data processing

For our sample of private placements, we added the name of the firm to each announcement, as well as numerating the entire event window from -276 trading days to +9 trading days. This was done to easily separate the announcements and to make it easier to find the average abnormal return on any given day in the event window across all firms. Due to the private placements being announced at different times, all announcements have been registered with the closing price of the trading day before the announcement. For example, if a firm announced a private placement at 1pm on a Tuesday, the announcement is registered with the closing price for Monday, given that Monday was a trading day.

To carry out the analysis in our study we mainly used the statistic program Stata, however for our CAPM calculations we used Excel. This was done to verify if our findings are trustworthy, and whether we could find similar movements in AAR and CAAR using different models. For our Excel analysis, we assembled the different data sets from our sample of private placements, market return from OSEBX and the risk-free rate from Fama and French 5-factor model. The data sets were assembled in Excel by their dates.

For our Stata analysis we used the dates to pair our sample of private placements with Fama and French's 5-factors and the independent variables for our regression. The pairing was done

in Excel and subsequently saved as a CSV file to use in Stata. The do-file for our Stata calculations can be found in the appendix.

5. Empirical analysis and results

In this section we present the results of the estimated AAR and CAAR of the 6 trading days before, and 9 trading days after the announcement. The preliminary findings of the returns using both CAPM and Fama and French 5-factor model is presented first. Secondly, we present the results of different event windows using the 5-factor model and the results. Finally, we show the findings of our regressions with the independent variables.

5.1 Announcement effect of private placements

We will now look at the results of the announcement effect of the private placements in our sample. The effect is analysed using CAPM and Fama and French 5-factor model and we can answer Hypothesis 1: *There is a significant negative stock market reaction to the announcement of private placement on Oslo Stock Exchange.*

In figure 5 we get an overview of the average abnormal returns 6 trading days prior and 9 trading days after the event using CAPM and Fama and French 5-factor model. Day -1 is the last trading day where there is no information about the announcement of the private placement, which means that day 0 is the first trading day where there is a market reaction from the announcement. Some firms announced the private placement during trading day 0, therefore it doesn't always capture the full effect from the announcement. The plot is showing similarities between the models even though the Fama and French 5-factor model includes more factors. It is previously shown that the market risk premium ($Rm - R_f$) has the most explanatory power of the factors (Dewa Nyoman Wiryasantika et al., 2022). CAPM are heavily relying on this factor, and Fama and French 5-factor model captures this effect as well. Therefore, it is not surprising that the abnormal returns are showing a similar pattern.

Both models show a negative average abnormal return after the announcement of private placement. We´ve added the confidence interval to be able to conclude if the abnormal returns are significant. From figure 5 we can see that both models display a similar abnormal return in the two days after the announcement. Thus, we can reject the null hypothesis and conclude that the market reaction of private placement announcement impacts the stock market negatively. Moreover, we see that the returns stabilize after the first three trading days and day 7 shows a significant negative abnormal return. Interestingly, prior to the announcement there is some difference in the two models. CAPM shows a significant positive abnormal return in the days -3, -4 and -5, while Fama and French 5-factor model shows no significant

average abnormal returns prior to the event. The abnormal returns are quite similar, however there is a difference in the confidence interval. This can be explained by the different factors the models include, where Fama and French 5-factor model try to explain more of the variance and are more restrict than CAPM. Because the significance level in the days prior to the event is different in the two models, we cannot conclude that there is a positive abnormal return the days prior to the event. It might however be significant if we use CAAR.

Previous research suggests that the market reaction to private placement is consistently positive and large across countries (Eckbo, 2008). However, looking at figure 5 our results propose the opposite market reaction. The AAR the first three days during the event is negative between 2-3% and is consistent with both estimation models. The result contradicts a lot of similar studies done before the 20th century, where the international consensus is that the announcement of private placement gave a positive market reaction (Holderness, 2018).

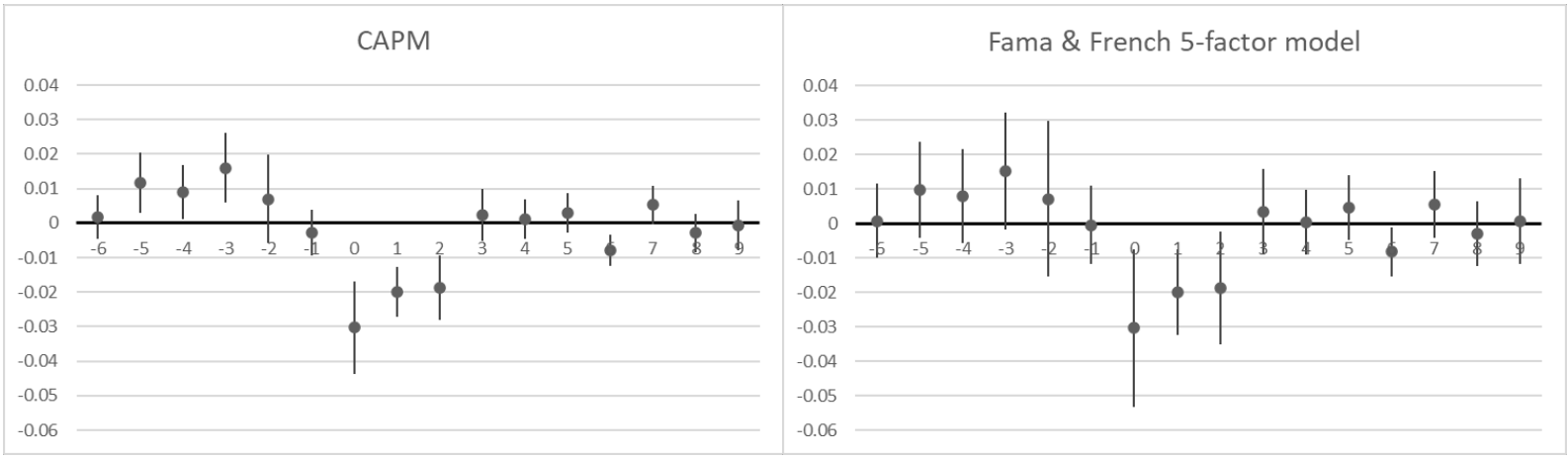

Figure 5: Average abnormal returns

Average Abnormal Returns (AAR) is calculated as $\frac{\sum ARi,t}{n}$, where abnormal return (AR) is calculated as Ri,t – E(Ri,t|Xt). R_{it} is the return on stock i for period t. The $E(R_{i,t}|X_t)$ is the expected return which is calculated with the use of CAPM: $E[r_i] = r_f + \beta_i^M(E[r_m] – \alpha_{i,t}$ and Fama and French 5-factor model: $(r_{it}-r_{ft} = \alpha_i + b_i(r_{mt}-r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it})$. The plot is showing 6 days prior and 9 days after the announcement of private placement. The 95% confidence interval is given by $\hat{\beta}_1 \pm 1{,}96 \cdot SE(\hat{\beta})$. The AAR is significant if both lines of the confidence interval is below or above the 0 return

The cumulative average abnormal return in figure 6 is showing a significant positive abnormal return before the announcement of private placement. Between trading day -4 to 1 the CAAR shows a positive return of approx. 4%. The AAR model with Fama and French 5-factor model couldn't capture any significant abnormal return, however the CAAR model is significant at a 5% level. This means that we can reject the null hypothesis and conclude that there is a positive CAAR before the event.

This might be an indication that managers and firms announce the private placement after a significant positive return, such that the discounted price is higher and overvalued. This is supporting the market timing hypothesis, which state that firms exploit temporary fluctuations in the stock price and attempt to issue shares at high prices and repurchase at low prices (Baker & Wurgler, 2002). In an inefficient market this might be possible, and managers will have incentives to time the market if they care about ongoing shareholders, rather than entering and existing shareholders (Baker & Wurgler, 2002). A study in China found a significant increase in stock prices prior to the initial announcement and a reduction after the announcement. Managers might offer large discount after a large price run-up to mitigate problems due to information asymmetry (Huang et al., 2016). Loughran and Ritter (1995) fins that firm exploit transitory windows of opportunity by choosing when to issue equity.

There is argument that it is less likely for managers to time the market when the firm raise capital through private placement, since participating investors are likely well informed and possess a lot of knowledge about the firm. It would be natural to think that these investors wouldn't allow the firm or managers to capitalize on the fluctuating price. The investors would likely not participate if they felt exploited. Our results resemble the findings of Krishnamurthy et al., (2005), who found a significant price run-up prior to the announcement of private placement and a significant negative abnormal return after the announcement. Huang et al., (2016) find evidence that even though managers offer discounted share price, they still manage to sell shares for an overvalued price. It is difficult to conclude on why there is a price increase before the announcement. A higher offering price benefit the issuer because of the possibility to receive more cash for less dilution of ownership (Kim & Park, 2005). What we can say is that there is a chance the market timing hypothesis is a reason, however there might be noise in the data. It is possible the data set include bias from other events and market sentiments that influences the return and significant levels.

There is a clear drop between day -1 and 0, which display the effect from the announcement. Between trading day 0 to 2 the positive CAAR adjust itself by including the negative effect of the event. The negative CAAR is significant from trading day 2 to 9. The positive CAAR before the event influences the effect of the private placement such that the negative CAAR after the announcement is approx. 2.5%.

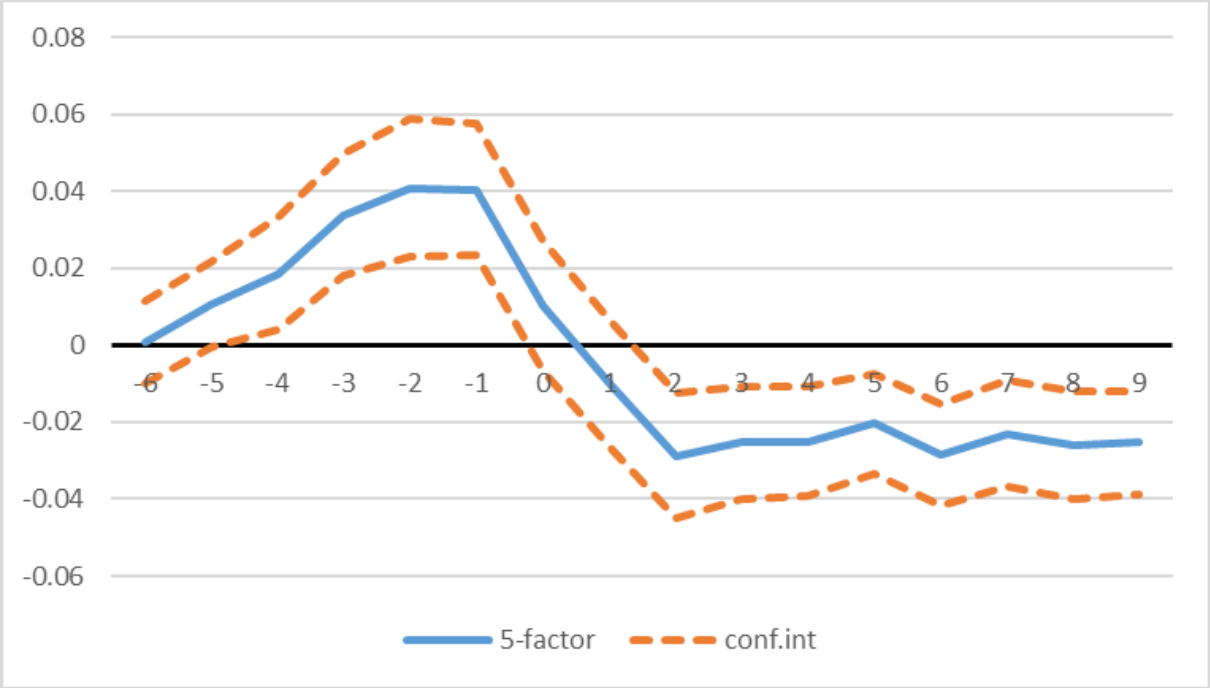

Figure 6: Cumulative average abnormal return

In this figure, we plot the cumulative average abnormal return (CAAR), which is calculated as $CAAR_t = \frac{\sum CAR_{i,t}}{n}$, The cumulative abnormal return (CAR) is calculated as $\sum_{t_1}^{t_2} AR_{i,t}$, The Abnormal return (AR) is calculated as $R_{i,t} - E(R_{i,t}|X_t)$, R_{it} is the return on stock i for period t. The $E(R_{i,t}|X_t)$ is the expected return which is calculated with the use of Fama and French 5-factor model ($r_{it}-r_{ft} = \alpha_i + b_i(r_{mt}-r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it}$). The 95% confidence interval is given by $\hat{\beta}_1 \pm 1{,}96 \cdot SE(\hat{\beta})$ and is significant if both lines of the confidence interval are below or above the 0 return. The event window lasts from 6 days prior to *9* days after the announcement of private placement.

We include different event windows for CAAR in both CAPM and Fama and French 5-factor model. We can see that the returns are similar in both models, likewise the significant levels. All the event windows are significant at a 1% level, which means that on average there is a negative stock market reaction due to private placement announcement. The event window [0,1] show a negative abnormal return of approximately 5% in both models. The window that includes 2 days after the announcement is even higher, with a CAAR of almost -7%. This is high abnormal returns compared to previous findings. Our results are resembling stock market reaction of SEOs in general. Asquith and Mullins (1986), Kothari and warner (2007), Eckbo and Masulis (1992) and Bayless and Chaplinsky (1996) finds short-term price fall due to SEO announcement and the expected negative return seems to be around 2% (Eckbo, 2008).

By looking at figure 6 and table 4 we can conclude that the stock market reaction is negatively affected by private placement announcements. The negative market reaction challenges the certification and monitoring hypothesis and give a stronger support for asymmetric information. Which indicates that the negative reaction arises from the shareholders belief that

the managers decisions of capital structure signals firm value. The announcement of private placement might indicate that the managers believe the firm is overvalued, thus the investors discount the stock price (Ross, 1977). Chaplinsky & Haushalter (2005) also find little evidence for the monitoring and certification effect. They argue that the positive market reaction arises from managerial entrenchments, this however do not align with our findings. Our economic intuition is portraying an opposing market reaction compared to these explanations. The new market shares have often a discounted subscription price, thus the outstanding shares are expected to lose value (Holderness, 2018).

Table 4: Cumulative average abnormal returns

Event window	**CAPM (N=89)**		**5-factor (N=89)**	
	%CAAR	t-stat	%CAAR	t-stat
[-2,2]	-6.48***	-5.51	-6.25***	-6.43
[-1,1]	-5.30***	-6.23	-5.08***	-5.89
[-1,0]	-3.31***	-4.32	-3.07***	-3.34
[0,1]	-5.02***	-6.44	-5.04***	-5.05
[0,2]	-6.89***	-7.52	-6.92***	-7.17

This table is showing CAAR in five different event windows around the event of private placement, whereas the CAAR is calculated as $\frac{\sum CAR_{i,t}}{n}$. The cumulative abnormal return (CAR) is calculated by $\sum_{t_1}^{t_2} AR_{i,t}$, The abnormal return (AR) is calculated as $R_{i,t} - E(R_{i,t}|X_t)$, R_{it} is the return on stock i for period t. The $E(R_{i,t}|X_t)$ is the expected return which is calculated with the use of Fama and French 5-factor model ($r_{it}-r_{ft} = \alpha_i + b_i(r_{mt}-r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it}$) and the capital asset pricing model (CAPM): $E[r_i] = r_f + \beta_i^M(E[r_m] - \alpha_{i,t}$. *p-value<0.10, **p-value<0.05, ***p-value<0.001

By analysing our results, we can answer hypothesis 1: *There is a significant negative stock market reaction to the announcement of private placement on Oslo Stock Exchange*. Our main findings confirm this hypothesis, and we observe, on average, a negative stock market reaction due to private placement announcement. This is true in both estimation models CAPM and Fama and French 5-factor model. There are indications that there is positive stock market movement before the event.

5.2 Multiple regression analysis

From previous section we found that private placement announcements gave a significant negative stock market reaction. Therefore, we want to test which factors potentially explain this variation. Mainly we look at variables related to firm performance, but we also control for the year 2020 when the Covid-19 pandemic impacted the stock market.

The dummy variable 2020 is controlling for the volatility caused by Covid-19. As we can see in the regression analysis in table 5, all the event windows are significant except [-1,0]. This event window looks at the reaction from the day prior to the event to the day of the announcement. It looks like the initial stock market reaction is the same for all years in our sample, but in the days following the event the reaction is more negative during 2020. In the event [-2,2] the coefficient is -11.59, which means that announcements in 2020, on average, have a CAAR of -11.59 percentage points lower than announcements outside of 2020, controlled for all the independent variables. This is significant at 1% level and therefore we reject the null hypothesis and conclude that, on average, the announcements in year 2020 have a larger negative impact on the stock market reaction, controlled for the other independent variables.

We can conclude the same with event window [-1,1], but it has less of an impact with a coefficient of -7.12. This is probably because trading day 2 is not included, which we can see in the table has an effect. The event windows [0,1] and [0,2] tests for the first and second trading day following the announcement and are both significant at 1% level. The event window with the largest coefficient is [0,2] with an average CAAR of -12.06 percent point lower than announcements outside of 2020. We can see the effect of trading day 2 by the increase in the coefficient from -7.91 in event [0,1] to -12.06 in event [0,2].

Furthermore, it is natural to assume that the trading days after the event is influencing the event window [-2,2], because the coefficient in the event [0,2] is -12.06 while the coefficient in event [-2,2] is -11.59. As we can see the change is not large when adding the two trading days before the event, which tells us that the days prior to the announcement have little impact on the overall CAAR. As previously seen in figure 5, the returns of the two trading days prior to the announcement are close to zero, thus the effect of these days are relatively small.

Clearly the year 2020 has a negative impact on the effect of the announcement of private placement. It is interesting looking at [-1,0] because this is the only event window that measures the first announcement effect. However, some firms would've made the announcement during day 0, which means that it doesn't fully capture the announcement effect of all firms in our sample. This window is only significant at the 10% level, which is not adequate to reject the null hypothesis. The coefficient is -3.50, but we are not able to conclude that that the initial market reaction in 2020 is differently compared to the other years.

The growth opportunity seems to have a small positive coefficient in all CAAR windows. This means that firms that had high growth opportunity before the announcement would have less negative return. However, only event window [-1,1] and [0,1] is significant at a 10% level. This is not adequate to reject the null hypothesis. The rest of the event windows are not significant, and we therefor keep the null hypothesis and conclude that the CAAR do not depend on the growth opportunity. Fama and French (1992) found that the price-to-book ratio have explanatory power of cross-sectional stock return, but this effect is not found to have any effect after an announcement of private placements. The findings are also not consistent with the study by Jensen et al., (1997), Basu (1983) and Jaffe et al., (1989) who said that a low price-to-book ratio has a positive effect on stock return.

We assumed that the size of the issue related to the size of the firm could influence the stock market reaction, because it would potentially lead to higher dilution of ownership. However, in our results we don't find any evidence of that this is the case. We find that the variable has a small negative effect on CAAR, but it is not significant in any of the event windows. Thus, we keep the null hypothesis and conclude that the CAAR is not affected by their PP/Mkt cap ratio. Our findings do not support our economic intuition that firms who have issued a higher percentage of their firm size, would have a larger influence on the stock price reaction.

Firms return on assets seems to have a small positive influence on CAAR across all event windows. The coefficients of the events are between 0.07 and 0.10 which is an indicator that firms with a higher return on assets before the event will, on average, have a less negative CAAR after the announcement, controlled for all the independent variables. The event windows [-2,2] and [0,2] is significant at 5% level, while event [-1,1], [-1,0] and [0,1] is significant at 1% level. Therefore, we can conclude with 95% and 99% certainty that the

CAAR after the event is, on average, dependent on firms return on assets, controlled for all the independent variables.

Interestingly, earnings pr. share shows a similar, but negative influence on CAAR. This is true for all the event windows, where the coefficients are between -0.61 and -0.79. This indicates that firms with higher earnings pr. share will have a more negative stock market reaction. The event windows [-2,2] and [0,1] is significant on 5% level, while [-1,1], [-1,0] and [-2,2] is significant on 1% level, controlled for all the independent variables. We reject the null hypothesis and presume that the stock market reaction is dependent on earnings pr. share during the event.

Firm size is logarithmically transformed which means that a 1% increase of the firm size will affect the CAAR with 1% increase of the coefficient. The coefficients are positive which indicates that a 1% increase in firm size would, on average, influence the stock market reaction, controlled for all the independent variables. However, none of the event windows are significant and we keep the null hypothesis and believe that the CAAR is not dependent on the size of the firm. As discussed above, the PP/Mkt Cap is not significant either and that variable also addresses the effect of the size of the firms. Therefore, it's not surprising that we couldn't find any effect of the market capitalization and the stock market performance. Our findings resemble the study by Amato and Wilder (1985), who found no relationship between firm size and performance.

The adjusted R-squared measures how well the terms fit in the model. The event window [-0,2] has a R-squared of 0.16, which is the highest and means that the model explains 16% of the variance in CAAR. The interesting part is that the R-squared is a bit lower in the other event windows. This might be the case because the other event windows include days prior to the event, as well as less trading days after the event.

Table 5: Regression analysis on CAAR in different event windows

	Event Window				
Variables	[-2,2]	[-1,1]	[-1,0]	[0,1]	[0,2]
2020	-11.59***	-7.12***	-3.50*	-7.91***	-12.06***
	(-6.10)	(-3.89)	(-1.77)	(-3.75)	(-6.09)
Growth Opportunity	0.29	0.62*	0.39	0.65*	0.58
	(0.85)	(1.88)	(1.09)	(1.70)	(1.62)
PP/Mkt Cap	-0.18	-0.41	-0.74	-0.24	0.60
	(-0.14)	(-0.33)	(-0.55)	(-0.17)	(0.45)
Return on assets	0.07**	0.09***	0.09***	0.10***	0.08**
	(2.24)	(2.89)	(2.67)	(2.85)	(2.56)
Earnings pr. share	-0.64**	-0.70***	-0.73***	-0.61**	-0.79***
	(-2.42)	(-2.73)	(-2.64)	(-2.09)	(-2.87)
Firm Size	0.61	0.97	0.59	0.54	1.34
	(0.78)	(1.27)	(0.72)	(0.61)	(1.64)
Constant	-15.90	-25.37	-15.45	-15.75	-34.38*
	(-0.92)	(-1.53)	(-0.86)	(-0.82)	(-1.91)
N	89	89	89	89	89
Adjusted R^2	0.09	0.10	0.06	0.11	0.16

This table is showing equation of CAAR in five different event windows around the event of private placement, the equation is as followed: $CAAR_t = \alpha + \beta_1$*2020 + β_2*Growth opportunity + β_3*PP/Mkt cap + β_4*Return on assets + β_5*earnings pr. Share + β_6*Firm size + $u_{i,}$ whereas the CAAR is calculated as $\frac{\sum CAR_{i,t}}{n}$. The cumulative abnormal return (CAR) is calculated by $\sum_{t_1}^{t_2} AR_{i,t}$, The abnormal return (AR) is calculated as $R_{i,t} - E(R_{i,t}|X_t)$, R_{it} is the return on stock i for period t. The $E(R_{i,t}|X_t)$ is the expected return which is determined by using Fama and French 5-factor model (r_{it}-$r_{ft} = \alpha_i + b_i(r_{mt}$-$r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it}$). The event window* is different CAAR windows. [-2,2] includes day -2, -1, 0, 1 and 2.
*p-value<0.10, **p-value<0.05, ***p-value<0.001

In table 6 the non-significant variables in each of the CAAR window is removed. The coefficient for each term is conditional and depend upon all independent variables. By removing the non-significant variables, the estimate of the mean square error changes, subsequently the p-value might differ.

Firstly, we want to look at the adjusted R-squared in both multiple regression models. There isn't much of a change, which indicates that both models explain almost the same amount of variance. The variables that are removed do not influence the explanatory power of the models and show us that they should not be included in the model. Growth opportunity,

PP/Mkt cap and firm size were not significant in any of the event windows in table 5, thus they are totally removed from the regression.

There isn't much that has changed between the two different models. Throughout the event windows all the negative coefficients from table 5 have become less negative in table 6, and subsequently the positive coefficients have become less positive when removing non-significant variables. The influence of 2020 is roughly the same, with a minor change in the coefficients in the different event windows. However, the significance level of the variable remains the same as in the previous table. Thus, we reject the null hypothesis and believe that stock market reactions during 2020, on average, have a stronger stock market reaction than the other years in the sample.

During crisis investors are less willing to undertake risk (Campbell & Cochrane, 1999) as their expectations of returns and risk tolerance change due to the fluctuations of perceptions during crisis (Hoffmann et al., 2013). This might explain the larger negative CAAR during 2020. If investors are exposed to a private placement during crisis, they could potentially see it as a large risk and make irrational decisions. During volatile markets investors risk intolerance could affect their decisions and make them more inclined to sell their shares to remove the risk. Furthermore, it's likely that investors' expectations to the possibility of asymmetric information could influence their decisions and consequently challenging their trust and commitment to the firm. A higher asymmetric information will impact the market reaction negatively to the announcement of equity issues (Myers & Majluf, 1984).

Some of the significance levels have changed. After removing non-significant variables, ROA in event window [0,1] have gone from being significant on a 1% level, to significant on a 5% level. This is still adequate to reject the null hypothesis, and we believe that firms with a higher return on assets before the event will, on average, have a less negative CAAR following the announcement. Additionally, most of the significance levels of EPS have changed whereas in event window [-2,2] the variable remains significant on a 5% level. In the event windows [-1,1], [-1,0] and [0,2] the significance level drops from 1% level to 5% level. This is still adequate to reject the null hypothesis and we believe that firms with higher EPS will, on average, have a more negative stock market reaction in the event windows [-2,2], [-1,1], [-1,0] and [0,2]. However, in event window [0,1] the significance level of EPS changes from 5% to 10% and the variable is no longer significant, and we keep the null hypothesis.

ROA is shown to have a positive influence on the stock market return across all the event windows after removing the non-significant variables. Our findings confirm the study by Manoppo (2016) and Allozi and Obeidat (2016) who stated that a higher ROA have a positive influence on a firm's stock returns. In contrast to ROA, EPS seems to have a negative influence on CAAR. This means that firms profit per outstanding share, on average, negatively influences the stock market reaction, which do not align with the finding of Emamgholipour et al., (2013) and Allozi and Obeidat (2016) who found that firms EPS have a positive impact on stock return. Some investors might be attracted to firms with high EPS, and when firm issue for equity there is an expectation for a lower EPS in the future because of the diluted shares. Consequently, these investors might sell when the firm announces private placement.

Table 6: Regression analysis on CAAR excluded non-significant variables

	Event Window				
Variables	[-2,2]	[-1,1]	[-1,0]	[0,1]	[0,2]
2020	-11.54***	-7.00***		-7.80***	-12.10***
	(-6.12)	(-3.81)		(-3.70)	(-6.10)
Growth Opportunity					
PP/Mkt Cap					
Return on assets	0.06**	0.07***	0.08***	0.08**	0.07**
	(2.29)	(2.64)	(2.77)	(2.55)	(2.45)
Earnings pr. share	-0.52**	-0.49**	-0.54**	-0.47*	-0.58**
	(-2.12)	(-2.03)	(-2.09)	(-1.70)	(-2.25)
Firm Size					
Constant	-1.77	-2.62**	-2.66***	-2.30*	-3.24***
	(-1.63)	(-2.48)	(-2.70)	(-1.91)	(-2.85)
N	89	89	89	89	89
Adjusted R^2	0.09	0.08	0.05	0.10	0.15

This table is showing equation of CAAR in five different event windows around the event of private placement, the equation is as followed: $CAAR_t = \alpha + \beta_1*2020 + \beta_2*$Growth opportunity $+ \beta_3*$PP/Mkt cap $+ \beta_4*$Return on assets $+ \beta_5*$earnings pr. Share $+ \beta_6*$Firm size $+ u_{i,}$ whereas the CAAR is calculated as $\frac{\sum CAR_{i,t}}{n}$. The cumulative abnormal return (CAR) is calculated by $\sum_{t_1}^{t_2} AR_{i,t}$, The abnormal return (AR) is calculated as $R_{i,t} - E(R_{i,t}|X_t)$, R_{it} is the return on stock i for period t. The $E(R_{i,t}|X_t)$ is the expected return which is determined by using Fama and French 5-factor model ($r_{it}-r_{ft} = \alpha_i + b_i(r_{mt}-r_{ft}) + s_iSMB_t + h_iGML_t + r_iRMW_t + c_iCMA_t + e_{it}$). Event window* is the different CAAR windows. [-2,2] includes day -2, -1, 0,1 and 2.
*p-value<0.10, **p-value<0.05, ***p-value<0.001

After investigating the effects of our independent variables, we find evidence that variables related to firm performance have an influence on stock market reactions. However, it might be other external market factors that could explain the variance. The difference of laws and regulations in the markets must be considered as a possible explanation for the negative return in the Norwegian market, since private placements that require a larger shareholder approval tend to display less negative stock market reactions (Cronqvist & Nilsson, 2005; Holderness, 2018). As discussed in section 2.3.2, the requirements for shareholder approval are not larger for private placements in Norway, resulting in lower protection of the existing shareholders. Additionally, private placements priorities the biggest shareholders and the principal-agent

issue discussed in section 2.1 might be a problem. Smaller investors may feel dismissed, and one can argue that the differential treatment and lack of protection could convince existing shareholders to lower their commitment to the firm and sell their shares following the announcement.

To summarize, we see that private placements announced during 2020, on average, have a more negative stock market reaction than the other years in our sample. This confirms our hypothesis that the stock market reactions of private placements are different in 2020 compared to other years in our sample. Furthermore, we found evidence to support our hypotheses that firms return on assets and earnings per share, on average, influences the CAAR after the announcement. These findings confirm our hypothesis 2,5 and 6. Finally, we found no evidence that factors related to growth opportunity, pp/mkt cap and size influence the stock market announcement reaction. This means that our findings do not support hypothesis 3, 4, and 7.

6. Conclusion

The main objective of this thesis was to research the stock market reaction of private placement announcements on Oslo Stock Exchange, and which factors that had an impact on the abnormal returns. To achieve this, we conducted an analysis of event study methodology and multiple regressions. For robustness we use CAPM and Fama and French 5-factor model as the estimation models. The variables included in the multiple regressions are growth opportunity, PP/Mkt cap, return on assets, earnings pr. share, firm size, and a dummy variable of the year 2020.

The main results show a statistically significant negative stock market reaction due to the announcement of private placement. The negative announcement effect contradicts contemporary studies, and the certification and monitoring explanations. Thus, there is stronger evidence for information asymmetry and signalling hypothesis. We find evidence for positive market movements before the event. This might support the market timing hypothesis, and that management try to time the market (Baker & Wurgler, 2002). However, there is an argument that this is less likely in private placement, because the accredited investors possess a lot of knowledge about the firm and would not participate if the managers exploited the situation.

The regression model shows that the stock market reacts differently to private placement announcements in 2020 than years before. The announcement reaction for firms in 2020 is significantly more negative than the contemplated firms. The high volatility due to the Covid-19 pandemic seems to impact the stock market reaction more negatively. Furthermore, it looks like the firms return on assets affect the stock market reaction more positively, which indicates that the firm's profitability is valuable for the investors during private placements. Whereas it seems like the earnings pr. share has a negative impact of the stock market reaction. Additionally, the regulation in Norway makes it easier and cheaper for firms to choose private placement. Thus, the private placement market has evolved as a form of debt. The necessary approval majority and agency problem between small and large investors might explain the results.

The issuance of private equity has increased in recent years. However, it is difficult to explain why previous studies find a contrary stock market reaction. The private equity market might

have evolved, and the investors have different expectations than before. The announcement effect seems to support the pecking order theory and signalling hypothesis, which states that investors believe the firm announces private placement when they are overvalued. The discounted subscription price is another explanation why the price fall.

6.1 Limitations and future research

In our study we have focused on the short-run reactions to private placement announcements, but we do not know what the long-run effect is. For further research it would be interesting to look at the long-run reactions and whether the stock price recovers. Additionally, it would be interesting to test for other variables, for instance how different industries reacts to the announcement as well as comparing the theoretical price to the actual market price. Furthermore, it would be worth looking at how different regulations affect the market reaction and what influence shareholder approval has.

6.2 Implications

There are several findings in our study that different people can benefit from. As an investor it is important to possess the knowledge that a potential private placement announcement could negatively influence the share prices in the short term as well as potential dilution of their ownership. This effect seems to be stronger during crises and the short-term stock price seems to have a significant larger negative return. Moreover, it appears that there is a change in the market perception of private placements, where previously there was a positive announcement reaction. Finally, management and board directors who is contemplating to conduct a private placement might want to avoid doing so during crisis if possible.

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8. Appendix

8.1 All firms in our sample

Name	Size of SEO	Year
SCATC	3 166 704 400	2020
SCATC_1	1 968 000 000	2020
NEL	1 300 000 007	2020
NOD	1 144 000 000	2020
HEX_2	907 288 668	2020
ASA	905 500 002	2020
PGS_2	849 999 960	2020
NEL_1	845 500 000	2020
KOA	691 094 787	2020
ACR	517 500 000	2020
BGBIO	499 687 500	2020
NAS_2	400 000 000	2020
NRC_1	700 000 003	2020
RECSI	302 205 600	2020
CRAYN	300 000 025	2020
BORR	297 692 307	2020
CARA	286 468 431	2020
MPCC	266 353 127	2020
BORR_1	259 952 833	2020
PHO	190 000 000	2020
SOLON_2	160 000 026	2020
PHO_1	142 766 289	2020
MPCC_1	125 062 500	2020
NANOV_3	231 501 725	2020
IDEX	104 546 261	2020
TRVX	101 021 472	2020
XXL_2	100 000 005	2020
ENDUR	100 000 001	2020
AKERBP	4 117 264 592	2017
SASNO	1 233 750 000	2017
STB	1 221 749 567	2017
ARCH	840 000 000	2017
GOGL_1	520 778 764	2017
GOGL_2	516 468 000	2017
DOF	500 000 000	2017
SCATC_3	379 890 000	2017
NEL_5	220 000 000	2017
QEC	198 930 000	2017
NEXT_1	156 378 000	2017
QEC_1	154 000 000	2017
INSR	126 000 000	2017
ACR_1	107 500 000	2017
PGS_1	849 419 961	2015
HLNG	844 240 000	2015
DNO	802 087 505	2015
ACR_3	400 000 000	2015
RECSI_1	356 500 000	2015

NEL_4	111 000 000	2015
ENSU	170 513 612	2015
LSG	2 075 000 000	2016
PGS	2 423 925 000	2016
GOGL	1 718 420 000	2016
FRO	842 952 970	2016
HEX_1	666 660 000	2016
NANOV_2	498 663 816	2016
AGAS	454 750 000	2016
ACR_4	374 680 000	2016
NRC	210 000 000	2016
NEXT	164 920 000	2016
SOLON	160 000 000	2016
QFR	133 835 168	2016
ACR_2	106 088 000	2016
FLNG	2 464 379 995	2018
ODL	1 368 000 000	2018
NOD_1	815 000 000	2018
B2H	747 468 000	2018
SPOL	699 999 924	2018
SCATC_4	600 000 000	2018
NEL_2	280 800 000	2018
PEN_1	250 838 000	2018
GEG	150 000 000	2018
GEG_1	120 080 000	2018
EIOF	120 000 000	2018
SDSD	100 000 001	2018
BAKKA	2 400 000 000	2019
SCATC_2	1 319 500 000	2019
NAS_1	1 090 000 000	2019
HEX	493 218 288	2019
NEL_3	462 740 752	2019
XXL	400 000 005	2019
PARB	399 999 970	2019
AFG	399 771 575	2019
SSG	249 999 981	2019
MOWI	242 965 742	2019
SOLON_1	230 897 158	2019
NANOV	222 439 230	2019
AWDR	176 490 000	2019
PEN	149 106 364	2019
NANOV_1	242 525 624	2019

8.2 Excluded firms

Name	Size	Type of SEO	Year
NAS	2 998 753 494	Rights issue	2019
KOG	4 997 172 415	Rights issue	2018
PCIB	360 000 000	Rights issue	2018
DOF	1 059 869 852	Rights issue	2016
BWO	855 981 000	Rights issue	2016
SVEG	749 999 993	Rights issue	2015
EMGS_1	278 000 000	Rights issue	2015
SCANA	100 000 000	Rights issue	2015
JIN	201 708 816	Rights issue	2017
EMGS	143 655 101	Rights issue	2017
XXL_1	400 036 235	Rights issue	2020
HELG	129 999 940	Private Placement	2016

8.3 Stata do-file

```
*Cleaning the data and calculating the event and estimation window

sort id
by id: gen event=1 if eventwindow>=-5 & eventwindow<=10
egen count_event_obs=count(event), by(id)
by id: gen estimation_window=1 if eventwindow>=-275 & eventwindow<=-24
replace event=0 if event==.
replace estimation_window=0 if estimation_window==.


*Estimating normal performance
set more off
gen expected_return=.
egen ID_G=group(id)
gen excess_return=return-rf
gen ln_marketcap=ln(marketcap)
forvalues i=1(1)89 {
        l ID_G id if ID_G==`i' & event==0
        reg excess_return rmrf smb hml rmw cma if ID_G==`i' & estimation_window==1
        predict p if ID_G==`i'
        replace expected_return = p if ID_G==`i'
        drop p
}


*Abnormal and cumulative abnormal returns

sort ID_G eventwindow
```

```
gen abnormal_return=return-expected_return
by ID_G: egen CAR = total(abnormal_return) if event==1
reg CAR if eventwindow>=-5 & eventwindow<=10, robust

*Testing for significance
sort ID_G eventwindow
by ID_G: egen ar_sd = sd(abnormal_return) if event==1

*Generate dummy variable
gen date_num = date(date,"DMY")
format %tdDD/NN/CCYY date_num
gen covid=1 if event==1
replace covid=0 if date_num < td(01/01/2020)

*Run multiple regression
reg CAR covid pbratio seoratio roa eps ln_marketcap if eventwindow>=-2 &
eventwindow<=2, robust
```

-run another multiple regression with the significant variables from the previous regression.

Repeat steps for all event windows.