

FIN 11 – IPO Trading Strategies

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Total Number of Pages: 14

Total Number of Words: 5845

Abstract:

The financial crisis shocked the world and left less predictable markets where old truths no longer remain. According to Kim, Nofsinger and Sun (2015), well renowned models such as CAPM and Fama-French, which have previously proven to quite accurately predict stock returns, have been unable to do so in the post-2008 era. The Fama-French model constitutes that a stock´s future returns can be predicted by its "beta" – a measurement of risk, the market-to-book-ratio and the size of the firm. However, in the period after the financial crisis, none of the previously trusted factors have proved accurate. This provides an extra incentive to advance new strategies to trade profitably. This is the aim in this paper, where we have back-tested data from the Oslo Stock Exchange for companies that have recently undertaken an Initial Public Offering (IPO), as these have proven to have yielded high initial returns in the past.

This paper is split in four distinct parts. In the first section, we introduce general theory for IPOs and some of the proposed explanations for the underpricing of these stocks. In the second section, we describe the data gathering process and the criteria for including companies in the analysis. In the third section, we introduce the results from the different trading strategies we have selected. We also deduce some general IPO investing rules from these results. In the last section, we test our strategy and reflect around the validity of the data. Furthermore, we name a few complications with our assumptions and findings.

In general, we find a positive abnormal return of the IPOs the first day and first week, while the firms yield an average negative abnormal return in the first month and first six months. We also find that IPOs perform better when the market is less volatile, in bear markets leading up the IPO and that medium sized firms outperform smaller and larger ones.

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1. Introduction

An Initial Public Offering (IPO) is when a company offers shares for the first time to the public through a stock exchange listing (Ibbotson & Ritter, 1995). Historically, companies which have recently undertaken an IPO, have been regarded as attractive investment opportunities. This is due to the *"underpricing anomaly"*. In this case, firms outperform the market within a few weeks of the first offering date.

The underpricing phenomena has been heavily researched and several theories advance arguments for its occurrence. However, few have managed to originate specific IPO trading strategies.

The aim of this paper is therefore to investigate how IPOs at the Oslo Stock Exchange perform compared to the market index in the aftermath of the first offering, both short- and long-term. We will examine how IPOs perform under different market conditions and look at how the firm´s size impacts its performance. We will from these results attempt to deduce a strategy for the common uninformed investor for IPO-trading.

Consequently, the overall problem of this paper is;

"What trading strategies should an uninformed investor apply for newly issued stocks?"

2. Theory

2.1 Preface to the IPO

An IPO is a formal standardised stepwise process that includes three distinct roles; the issuer, underwriter and investors.

The issuer is the company in question to be publicly offered for the first time. They make the decision of going public and what market they desire to be listed in. The issuer obtains further assistance from one or multiple underwriting firms to achieve this objective.

The underwriter(s) is usually an investment bank, and is the linking component between the investors and the issuing party. Their tasks are to determine the valuation and pricing of the issuing company, and allocate the company´s stocks in the first offering. The number of underwriters ordinarily varies with the size of the IPO, with more firms customarily operating as underwriters in larger size IPOs. *Figure 1* depicts an example of three underwriters in an IPO.

Tilretteleggere	• Pareto Securities, ABG Sundal Collier og SEB

Figure 1: A case of multiple underwriters in the IPO of Komplett Bank 10th of November 2017.

The investors are those who purchase the newly issued equity. The IPO-literature distinguishes between two distinct investors; institutional and retail (Eckbo, 2007). Institutional investors are professional actors who possess more knowledge than the smaller retail investors. They are ordinarily large investment firms, and have a minimum buy-in of NOK 2,5 million. On the other hand, retail investors are smaller investors who have a minimum limit buy in of NOK 10 500 and a maximum of NOK 2,5 million (See *Figure 2*).

Retail transje	• Tegninger fra NOK 10.500 til 2.499.999
Institusjonell transje	• Minstetegning institusjonelle investorer NOK 2.500.000

Figure 2: Example of restrictions from Komplett Bank IPO 10th of November 2017.

2.2 Rationale of going public

An IPO can provide several benefits for a company. First, going public presents an exit strategy for a magnitude of the initial investors who desire to liquidate their shares. Many firms finance their initial operations by raising capital from a small group of investors and with their own capital. Some of these initial investors may face complications when attempting to liquidate their positions because there does not exist as many buyers for non-listed stocks. Going public will thus provide an exit strategy because there are more investors willing to purchase shares from a listed company.

Second, it will be easier to finance a strategic expansion. An IPO allows a company to raise capital on more favourable terms due to the access to a larger number of investors and increased liquidity (Ibbotson, Sindelar & Ritter, 1994). For instance, it is easier for these companies to secure loans at a lower rate of interest from investors and financial institutions. This may consequently simplify the funding of research and the further development of the company.

Third, being a public company involves a certain symbolic value. A publicly traded company is associated with quality and prestige. These types of companies receive publicity, which can be a novel manner of attracting new groups of investors, managers and customers.

However, there are some disadvantages of going public. First, there are substantial onetime direct costs related to the actual IPO itself. These are primarily the direct costs from the legal, auditing and underwriting fees. The indirect costs are the effort devoted to the offering, and the dilution associated with the selling of the shares which is generally below market price (Ibbotson & Ritter, 1995). Second, there are also increased costs associated with requirements to supply information to investors on a more regular basis. Third, the issuer is also required to reveal proprietary information in an IPO, which can impair the firm´s competitiveness (Draho, 2004). Lastly, there is a risk connected with the new shareholders. They may be more focused on short-term profitability than the long-term development of the firm. This may impede the long-term development (Brau & Fawcett, 2006).

2.3 Pricing Mechanisms

The IPO-pricing mechanisms contrast with respect to popularity. The two main methods are; fixed price and bookbuilding.

Fixed price is when the underwriter, in collaboration with the issuing party, set a predetermined offer price. It is consequently a "take it or leave it" offer for the investors. This includes a certain risk, as the price is often set early in the process, and the firm is in jeopardy of not being able to sell all the shares, or leaving too much money on the table. Consequently, this method is not utilised frequently in Norway or other countries (Sherman, 2002).

Bookbuilding is the process of the underwriting party gathering bids for the shares. The underwriter attends various road shows, where the firm undertaking an IPO is presented to institutional investors. These investors submit bids for how many shares they want to buy, and what price they are willing to pay. This provides the underwriter information about the demand for the stock, which is utilised to set a suitable issuing price. This price mechanism is by far the preferred method when a company is undertaking an IPO, both in Norway and worldwide (Sherman, 2002).

The two methods described above involve some uncertainty concerning the successfulness of the IPO. The company faces the risk of not having a completed IPO because there is not adequate demand. However, the company can receive some assurances from the underwriter, such as a firm commitment. In this instance, the underwriting firm purchases the whole issuance and resells the stocks to investors at the minimum price agreed upon in the secondary market. The underwriter´s income is

therefore contingent on the price they attain, and provides an incentive to narrow the underpricing. This assurance is by far the most used in Norway and the rest of the world (Jenkinson & Ljungqvist, 2001).

In contrast to firm commitment, best-effort is an agreement where the underwriter sells the first issuance in the best viable manner (Sherman, 2002). The underwriter does not guarantee that the sale will be completed, or that all the shares are sold at the desired price. This method is very infrequently used as the menace of an unsuccessful placement exists.

2.4 Share Price Return

An underpricing occurs when the IPO-price is set lower than the fair value of the stock (Rock, 1986). If this underpricing is absorbed in the market the first day, the company will yield a positive return this day because the investors value the stock higher than its IPO price. This has been referred to as the "one-day pop" of the stock and has made IPOs a popular investing instrument. The "money left on the table" will however inflict a large indirect loss for the issuing firm, since they could have obtained a higher issuing price (Ibbotson & Ritter, 1995).

In contrast to the positive short-term performance, most IPOs yield a negative abnormal return in the long run (Ritter, 1991). This period can vary from three years up to five. In many instances, it is the companies that yield the highest abnormal returns in the short term, that end up providing the worst returns in the long run (Ritter, 1991).

2.5 What explains the underpricing?

Since the 1970s, several advances have attempted to explain the IPO underpricing phenomenon. This has prompted a wide spectre of theories. These can be divided into four principle categories; the issuing party, the institutional party, asymmetric information and behavioural causes.

From the point of view of the *issuing party*, the signalling effect of underpricing can symbol that they are of high value. This is because a high-quality firm distinguishes itself from a low-quality firm by underpricing the IPO. The positive yield the first day signals quality and strength. Hence, it is a token of belief in the future of the firm (Welch, 1989). Moreover, it can also allow the firm to sell future offerings at a higher price than would otherwise be the case. This is because investors believe the first underpricing will lead to a subsequent new underpricing of shares (Allen & Faulhaber, 1989).

The *institutional* argument promotes that the underwriting party intentionally allocates underpriced shares to ingratiate themselves with investors. This hypothesis is focused on how the underwriting party takes advantage of their superior informational knowledge of market conditions to underprice IPOs (Baron, 1982). Since the underwriter plays an influential role in setting the IPO-price, they have an incentive to underprice to ingratiate themselves with existing or new clients. This can help to obtain new business or preserve existing relationships (Loughran & Ritter, 2004).

The theory of the winner´s curse (Rock, 1986) constitutes that underpricing is an intentional choice from the issuer and underwriter to secure a sufficient magnitude of investors. The theory builds on the premise of *asymmetrical information*, and that the market consists of informed and uninformed traders. Since the informed investors are rational, they will only demand stocks in underpriced IPOs. This is because they know that the firm will most likely yield a positive abnormal return[1]. Reversely, the uninformed traders will attempt to purchase shares in both over- and underpriced IPOs. Thus, uninformed investors face an adverse selection risk (Harris, 2001). This will lead to high demand in underpriced IPOs because both informed and uninformed traders wish to buy. On the other hand, in overpriced IPOs only the uninformed investors will buy, which may lead to an inadequate demand to complete the IPO. Underpricing is therefore an intentional choice to induce informed traders to secure sufficient demand for the IPO.

The asymmetrical argument brings forward that the issuing party has an incentive to misrepresent that their business is of a higher quality than it is. The firm can do this because they are asymmetrically well-informed about their own position (Spindt & Beneviste, 1989). Many investors will thus over-evaluate the stock in the opening stages of its listing. This will make them pay more than the fair value of the stock; prompting a positive initial yield.

The kingpin of the *behavioural argument* is that the high interest, irrationality and "sheep mentality" from investors for IPOs will lead to a substantial initial yield. The high interest from investors has been referred to as the "new stock fever" (Reilly & Hatfield, 1969). Because investors know that IPOs have historically outperformed other stocks, they believe that the next one will do so as well. In other words, they are overoptimistic and execute forecasting errors of the fair value of IPO stocks (Aggarwal and Rivioli, 1990). Investors also pay attention to who invests in IPOs. If others are not buying, an investor may opt not to purchase, and vice versa. To ensure that some investors are buying and inducing a "cascade effect", the underwriting party stipulates a low price (Welch, 1992).

3. Data

3.1 Data Gathering

The data utilised in this paper is limited to the Norwegian Stock Market. This stock market comprises of three different listings; Oslo Børs, Oslo Axess and Merkur Markets. In this analysis, we select to scrutinize data from Oslo Børs in detail. This is because the companies listed on this exchange are more homogenous in terms of size and structure. They are also regarded as safer investments than Oslo Axess and Merkur Markets. We consider these two stock listings as too illiquid and risky to harmonise with the investment portfolio of a common investor.

Most of the data collection is obtained from Oslo Stock Exchange and includes statistics from each trading day since the IPO[2]. We have also utilised Yahoo Finance, Pareto Securities, Bloomberg and various prospectuses from the IPO underwriter(s) to confirm the correct offering-price of the IPO.

3.2 Data exclusion

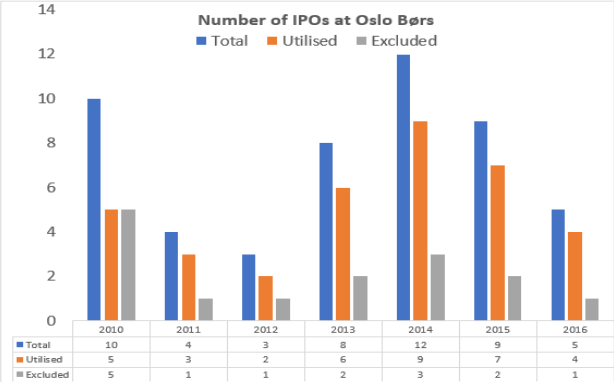
To improve the quality of the sample selection of companies we investigate, we chose to exclude several companies on various criteria from the original sample selection. First, if the company has just been transferred from one exchange to another, they have been eliminated. This is because it would not be the first time the company offers stocks to the public. This is also the case with IPOs from firms that have undertaken an acquisition or merger, thus merely being publicly traded under a new name. We were also required to exclude companies that went bankrupt within a year after the first listing. This was due to a lack of available data.

[1] See a further explanation of the term abnormal return in section 3.4

[2] Trading data available at https://www.oslobors.no/markedsaktivitet/#/details/SBO.OSE/overview

3.2.1 Sample Selection

The sample selection consisted of a total of 51 companies before any of the exclusion factors were applied. After utilising the exclusion criteria, a total of 34 companies remained for the analysis. *Figure 3* provides an overview of the firms utilised for further analysis. *Figure 3, 4 & 5* provide graphical overviews of the number of IPOs in total, the number and percentage included and excluded, and the remaining companies included in the analysis.



	2010	2011	2012	2013	2014	2015	2016
Total	10	4	3	8	12	9	5
Utilised	5	3	2	6	9	7	4
Excluded	5	1	1	2	3	2	1

Figure 3: Number of IPOs at OSBX in the relevant period 2010-2016.

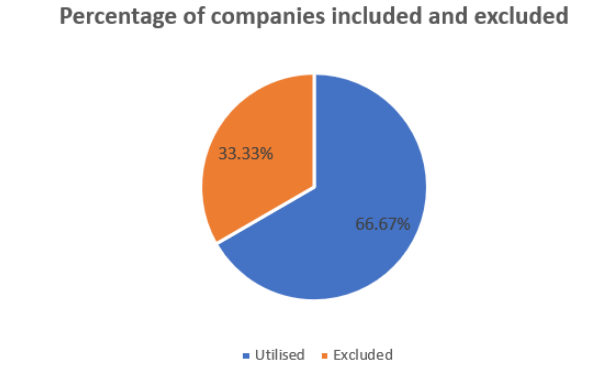


Figure 4: Percentage of companies included and excluded from original sample.

2010	**2013**	**2015**
P/F Bakkafrost	Atlantic Petroleum P/F	Kid ASA
Panoro Energy ASA	Napatech A/S	Skandiabanken ASA
Avocet Mining PLC	BW LPG Limited	Europris ASA
Storm Real Estate ASA	Ocean Yield ASA	Schibsted ser, B
Gjensidige Forsikring ASA	Asetek AS	Multiconsult ASA
2011	**2014**	Nordic Nanovector ASA
Norway Royal Salomon ASA	RAK Petroleum plc	Team Tankers International Ltd
Höegh LNG Holdnings Ltd.	Entra ASA	**2016**
Kværner ASA	XXL ASA	Arcus ASA
2012	Scatec Solar ASA	Norwegian Finans Holding ASA
Selvaag Bolig ASA	Havyard Group ASA	B2Holding ASA
Borregaard ASA	Zalaris ASA	Tressure ASA
	Avance Gas Holding Ltd	
	Tanker Investments Ltd	

Figure 5: A list of the companies included in the analysis

3.3 Indexes

3.3.1 Market Index

As the comparing market index to the IPO performance, we have selected OSEAX (Oslo Børs All Share Index). This includes all the companies listed on Oslo Børs, and serves as the best index for a point of reference. This will be utilised to measure the abnormal rate of return for the various companies in the sample selection. As seen in *Figure 6*, the return has been quite positive in the time span we examine.

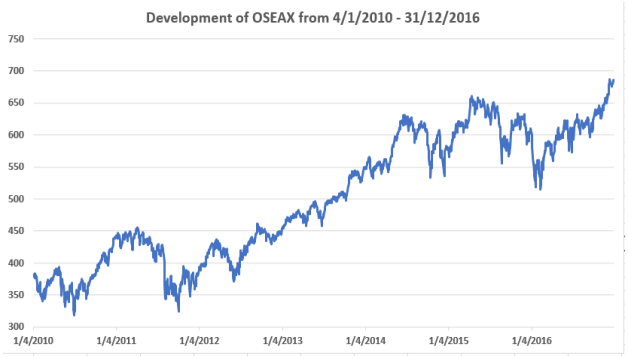


Figure 6: Development of OSEAX 04/01/2010-31/12/2016

3.3.2 VIX- Index

The VIX-Index is an index of volatility and overall fear in the market. The index indicates how open new investors are to participate in the market, and implies the willingness to invest in IPOs. A lower VIX-index leads to higher market activity, and vice versa. The index is forward-looking, and calculates the expected volatility in the market for the next 30 days. Thus, we have calculated the average VIX-number for the 30 days leading up the distinct IPOs. VIX-levels above 25 implicate a high volatility, while values less than 15 are signals of low volatility. Values in between those are denominated with medium volatility. As depicted in *Figure 7*, the index has rarely been above 30 the last seven years.

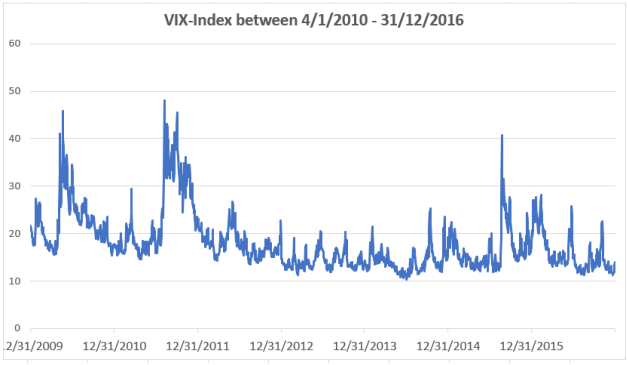


Figure 7: Development of VIX-Index between 2010-2016

3.4 Calculations

We define the stock return by the using the following formulas;

$$R_i = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}}$$

This formula is utilised to calculate the initial return of the stock for the first day, first week, first month and first six months. The symbols used are;

$\mathbf{P_{i,\,t}}$ = Stock Price at Closing

$\mathbf{P_{i,\,t-1}}$ = IPO Price

$$R_i = Ri - R_m = \frac{P_{i,t} - P_{i,t-1}}{P_{i,t-1}} - \frac{P_{M,t} - P_{M,t-1}}{P_{M,t-1}}$$

The second formula does not only evaluate how the stock performed, but also how it performs compared to the market in the same period. We do this because we desire to benchmark the performance against an index to identify potential opportunity losses. The second formula considers ***abnormal returns***; namely the return of the stock compared to the return of the market in the same period. The symbols used are;

$P_{M,\,t}$ = Index Price at Closing

$P_{M,\,t-1}$ = Index Price

3.4.1 Market Conditions

When investigating how IPOs perform under different market conditions, we define five categories; Boom, Bull, Close to zero, Bear and Recession (see *Table 1*).

Category	Applies for OSEAX returns in percent (%) three months before the IPO
Boom	X > 5 %
Bull	$1\ \% \leq X < 5\ \%$
Close to zero	$-1\ \% \leq X < 1\ \%$
Bear	$-5\ \% \leq X < -1\ \%$
Recession	$X < -5\ \%$

Table 1: Distinct market conditions

The total number of companies in the different categories is depicted in *Figure 8*.

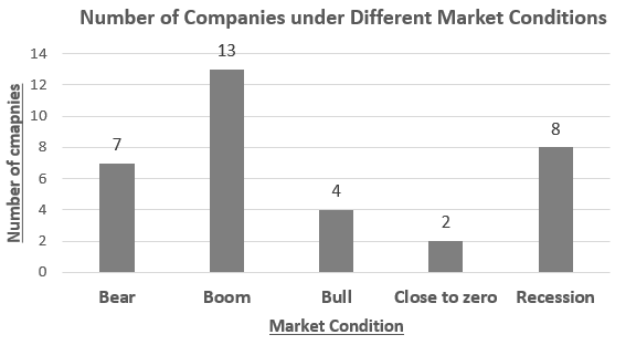


Figure 8: Number of Firms in Different Categories

3.4.2 Market Volatility

When investigating how the volatility in the market affects the IPO performance, we define the three categories low volatility, medium volatility and high volatility.

Category	Applies for VIX-values
Low volatility	X < 15
Medium volatility	$15 \leq X \leq 25$
High volatility	X > 25

Table 2: Definitions of volatility

The total number of companies under different volatility conditions is illustrated in *Figure 9*.

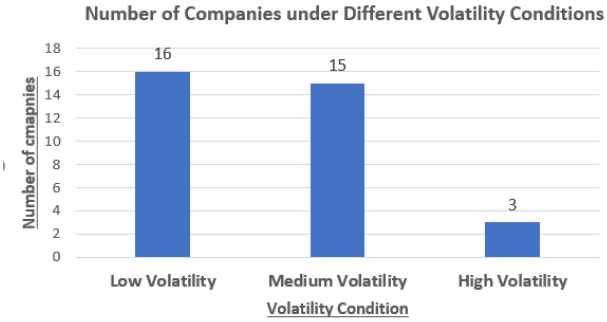


Figure 9: Number of Firms in Different Categories

3.4.3 Firm size

Lastly, when examining how the size of the firm affects its IPO performance, we define three firm categories; small size, medium size and large size.

Firm Category	Applies for firm value (NOK)
Small size	X < 1 500 000 000
Medium size	1 500 000 000 ≤ X ≤3 000 000 000
Large size	X > 3 000 000 000

Table 3: Definitions of firm size

The total number of firm sizes in our sample selection is showcased in *Figure 10*.

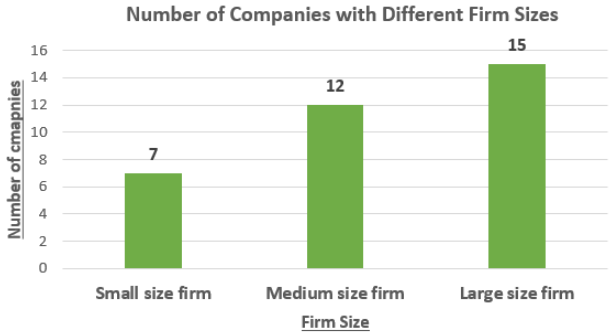


Figure 10: Number of Firms in Different Categories

3.5 Statistical Tests

To test whether the results in our data selection can be applied as trading strategies, we utilise an unpaired Wilcoxon Mann Rank Sum Test. This is because it is one of the few tests where non-normalised data can be used, which we must assume for stocks in general.

We calculate the Wilcoxon Mann Rank Sum Test with the following formula;

$$Z = \frac{W - \mu}{\sigma}$$

Where **W** is the sum of the position rankings, $\boldsymbol{\mu}$ is the expectancy, and $\boldsymbol{\sigma}$ is the standard deviation for the sample selection.

To be able to conclude that a factor impacts the performance of an IPO, we formulate a null hypothesis and an alternative hypothesis. The null hypothesis ($\mathbf{H_0}$) states that the factor does not impact the performance, while the alternative hypothesis ($\mathbf{H_A}$) conveys that the factor impacts the performance. Moreover, we utilise a confidence interval of 95 %,

meaning that the data – or Z – needs to be a minimum of 1,96 standard deviations from the expectancy for us to accept the alternative hypothesis. Consequently, we have this set-up:

If

$$Z \leq 1{,}96$$ we keep the null hypothesis

If

$$Z > 1{,}96$$ we discard the null hypothesis, and accept the alternative hypothesis.

4. Results and strategies

In this section, we examine the results we have obtained from analysing the data set. Furthermore, statistical tests are applied to attempt to advance whether some trading strategies can be utilised successfully. The chosen time periods are one day, one week, one month and six months after the IPO. The first equity offering is also compared to the VIX-index, the market conditions leading up the IPO and the firm size.

4.1 Period strategies

4.1.1 First Day Strategy

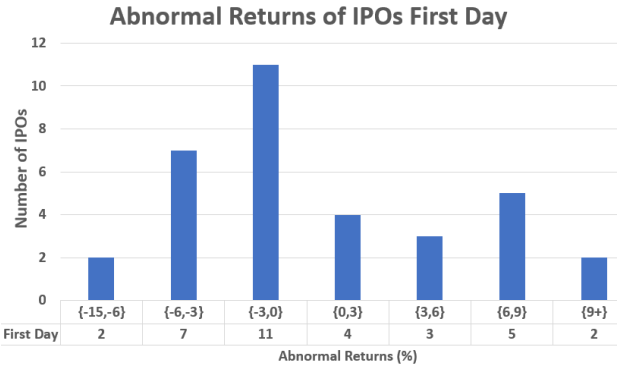


Figure 11: Abnormal Returns for the First Day

Average	Median	Variance	Minimum	Maximum
0.42%	-0.95%	6.15%	-14.39%	19.13%

Table 4: Key Distribution Statistics for the First Day

Figure 11 demonstrates the abnormal return for the First Day of trading for the 34 companies in the sample selection. As the chart demonstrates, most of the firms yield a negative abnormal return the first day. The median is– 0.95 % (see *Table 4*), meaning that half of the companies has an abnormal return above this level and the other half below this level. Hence, the theory of the "one-day pop" may necessarily not be true for most instances at Oslo Børs. An interesting fact is, however, that the average abnormal rate of return is positive, namely 0,42 %. Even though a large majority of the companies yields a negative abnormal return the first day, there are some instances of substantial underpricing. For example, there is one IPO with a first day abnormal return of 19,13 %. This contributes to offset the smaller losses from the IPOs that are not underpriced.

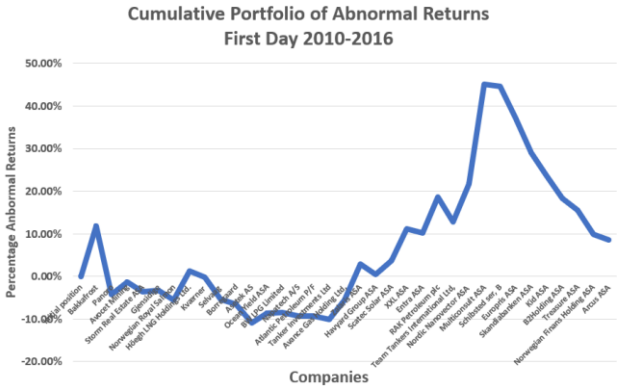


Figure 12: How a portfolio of buying at IPO-price and selling the same day would perform from 2010 – 2016

Accumulated Abnormal Return for First Day Portfolio	*8.50 %*

Table 5: Accumulated Abnormal Rate of Return for First Day Portfolio

The opportunity of profiting from underpriced IPOs exists if you would subscribe to each IPO-price and sell at closing the same day. This is supported by the first day portfolio presented in *Figure 12*. This is a cumulative portfolio from implementing this strategy for every IPO from the beginning of 2010 to the end of 2016. This portfolio would accumulate to a total abnormal return of 8,50 %. Thus, it can be an interesting strategy to apply.

4.1.2 First Week Strategy

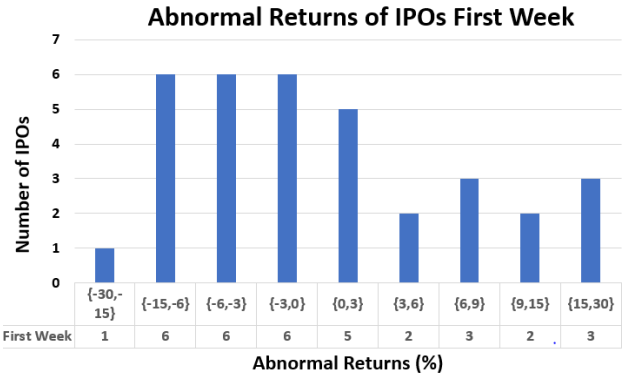


Figure 13: Abnormal Returns for the First Week

Average	Median	Variance	Minimum	Maximum
0.49%	-1.19%	0.97%	-26.26%	31.08%

Table 6: Key Distribution Statistics for the First Week

Figure 13 illustrates the abnormal return for the first week. Yet again, most of the companies have a negative abnormal rate of return the first week. Half of the companies have an abnormal rate of return below -1,19 %, while the other half has one above this number. Nevertheless, the average abnormal return is positive. This demonstrates that there are some companies that yield a higher positive abnormal return that offset the slightly smaller negative abnormal returns. For instance, the number of companies that has a substantial positive abnormal return the first week, is higher than the ones with a substantial negative one. [3]

[3] See for instance 3 companies in Figure 13 in the section 15-30 %, in contrast to 1 company in the equivalent section for negative returns.

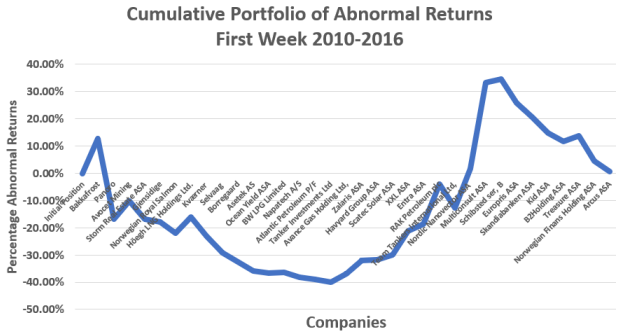


Figure 14: How a portfolio of buying at IPO-price and selling after one week would perform from 2010-2016

Accumulated Abnormal Return for First Week Portfolio	0.51%

Table 7: Accumulated Abnormal Return for First Week Portfolio

The abnormal return for a First Week buy and sell strategy is quite slim, with the portfolio beating the market with a mere 0,51 % during the seven years of trading. *Figure 14* demonstrates that the abnormal returns for the portfolio are mostly negative for the period 2010-2016. At its worst, the portfolio is down 40 % from its initial position. However, due to a positive period in 2013-2016, the portfolio recovers from its negative position. This is mostly caused by two extremely positive IPOs; Multiconsult and Nordic Nanovector.

4.1.3 First Month Strategy

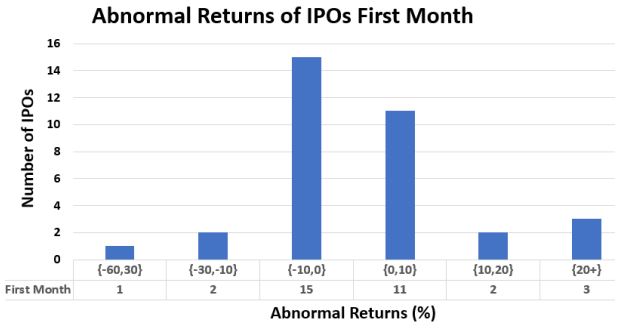


Figure 15: Abnormal Returns for the First Month

Average	Median	Variance	Minimum	Maximum
-2.49%	-2.03%	2.18%	-57.10%	26.21%

Table 8: Key Distribution Statistics for the First Month

The first month portfolio of abnormal returns is quite negative. IPO-literature suggest that IPOs that have performed well in the opening phases, will commence to correct its value in later stages by performing worse (Ritter, 1991). This harmonises with the findings in *Table 8*. Most of the companies have a negative monthly abnormal return, and the average abnormal return is -2,49 %. This is mostly caused by one substantial plummet in the Panoro stock in the beginning of 2010 of -57,10 %.

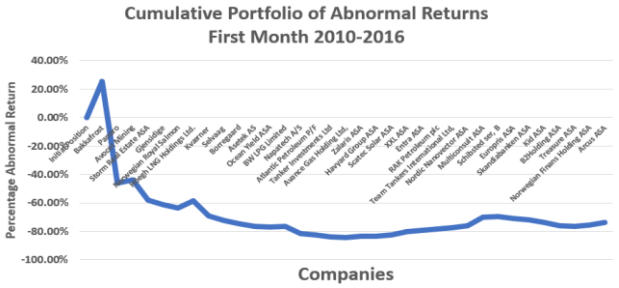


Figure 16: How a portfolio of buying at IPO-price and selling after 30 days would perform from 2010-2016

Accumulated Abnormal Return for First Month Portfolio	-74.02%

Table 9: Accumulated Abnormal Return for First Month Portfolio

The abnormal return for the first month portfolio is quite negative (See *Figure 16)*. This is mostly due to an instance where the portfolio loses 57,10 % of its value from the Panoro IPO. Nevertheless, there are no returns from the other companies that manage to recoup some of the losses. Hence, it appears that pulling out the money one month after the IPO is a worse strategy.

4.1.4 Six Months Strategy

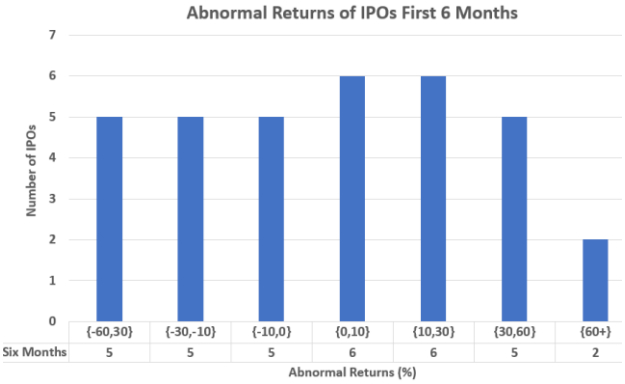


Figure 17: Abnormal Returns for the First Six Months

Average	Median	Variance	Minimum	Maximum
2.98%	0.58%	9.77%	-48.29%	89.71%

Table 10: Key Distribution Statistics for the First Six Months

The six-month abnormal return is more equally divided between large negative returns and large positive returns. The average is however positive, mostly because Scatec Solar almost doubled its value in 2013.



Figure 18: How a portfolio of buying at IPO-price and selling after six months would perform from 2010-2016

Accumulated Abnormal Return for First Six Months Portfolio	-45,37 %

Table 11: Accumulated Abnormal Return for First Six Months Portfolio

The abnormal return for the first six months is also quite negative (See *Figure 18*). This is because a large portion of the companies in the years 2010 and 2011 yields a negative six-month abnormal return. At that time, Oslo Børs was in a period of correction. This impacted several of the first IPOs in our sample selection, and made the portfolio lose a large portion of its value. Pulling out the money after a total of six months will therefore be a worse strategy than doing so after solely a day or a week.

The results in this section imply that it will be difficult to discover a good long strategy after one month and six months. This would make it intuitive to examine short strategies more in detail. However, because investors would also be required to manage their portfolio more actively and put up collateral for any losses, we assume that this will be too

complicated for a common uninformed retail investor. We will therefore only focus on long strategies. Moreover, as the first day and the first week appear to yield the highest returns, we will examine these further to attempt to advance a good trading strategy.

4.2 Market Condition Strategy

In this section, we look at the abnormal returns compared to the market conditions. We do this by investigating the performance of the companies the first day and first week. Because we want to develop a trading strategy an investor can apply before purchasing an IPO, we examine how the market has performed the last three months before the first equity offering.

4.2.1 First day

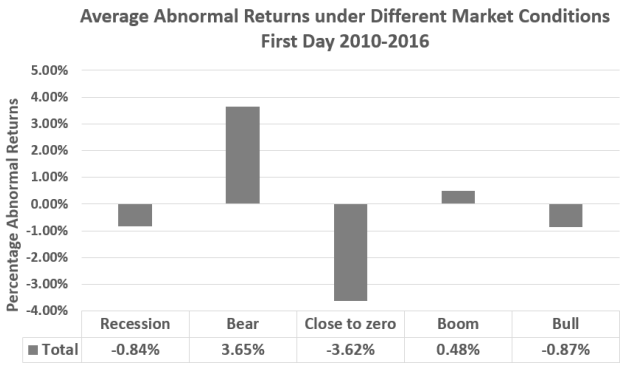


Figure 19: Performance of IPOs First Day Under Different Market Conditions

Z-value	1.469416099

Hypothesis test 1: Result for Bear Market the First Day

Figure 19 demonstrates how the companies in the sample selection perform during the distinct market conditions leading up to the first equity offering. Surprisingly, the best abnormal returns appear in bear markets – namely that the market has yielded a negative return between [-5%, -1%] three months before the IPO. One would perhaps expect the largest abnormal returns to occur in instances where the market has experienced an upswing in the three months leading up to the IPO. This is mainly because overall psychology in the market may be positive, and that this would attract investors to the market. But as showcased from our data sample, this is not the case. As demonstrated in *Hypothesis test 1*, we have no statistical grounds to state that bear markets have an impact on the abnormal return the first day of the IPO as the Z-value is less than 1,96.

4.2.2 First Week

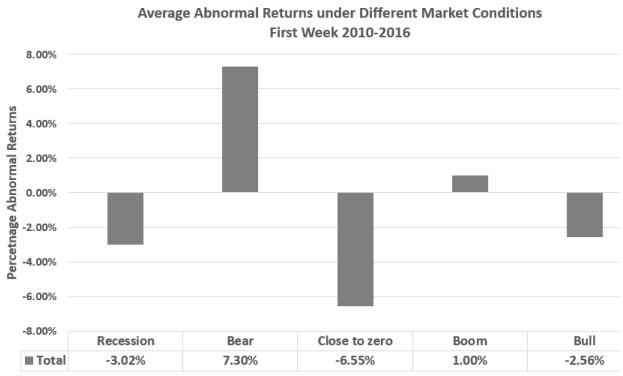


Figure 20: Performance of IPOs First Week Under Different Market Conditions

Z-value	2.150884435

Hypothesis test 2: Result for Bear Market the First Week

We find similar results when implementing the same strategy for one week after the IPO. A bear market is from our sample selection the optimal market condition leading up to the IPO in general. This would in the period have yielded an average abnormal return of 7,30 % for each instance. We also have statistical grounds to claim that bear markets impact the performance of IPOs the first week between 2010-2016 because the Z-value is above 1,96 (see *Hypothesis test 2*). Nevertheless, we should be cautious of stating that this because it can be a mere correlation. We discuss this problem further in Section 6.

An interesting question is why firms undertaking IPOs in bear markets outperform the other types. There are two logical solutions as to why the underpricing occurs in bear markets. First, the companies undertaking an IPO in this market condition must secure an adequate demand to complete the IPO. In bear markets, fewer investors are inclined to risk capital in unpredictable offerings. Hence, the firm must provide an incentive to profit for these investors by allocating stock priced below its fair value. Second, the firms inclined to undertake an IPO in bear markets, could be of a superior caliber than those in bull markets. This is because these companies signal that they do not need the suitable bull market conditions for them to complete an IPO.

4.3 Volatility Strategy

In this section, we examine whether the overall volatility in the market impacts the performance of IPOs. We do so by looking at the IPO performance for the first day and the first week.

4.3.1 First Day

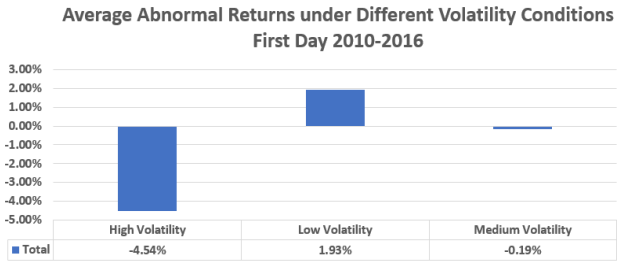


Figure 21: Performance of IPOs First Day Under Different Volatility Conditions

Z-value	1.311124563

Hypothesis test 3: Results for Low Volatility the First Day

Figure 21 demonstrate the average abnormal return for the first day under the three volatility conditions; high, medium and low. We find that IPOs on average perform 1,93 % better than the market the first day when the volatility is low. When the volatility is medium, the average abnormal return is close to zero. However, when the volatility and overall fear in the market are high, the IPOs perform poorly. The average abnormal return is then -4,53 %. Thus, we find that IPOs perform better when the volatility is low. We do however not have statistical grounds to claim that low volatility impacts the performance of IPOs the first day, as the Z-value is below 1,96.

4.3.2 First Week

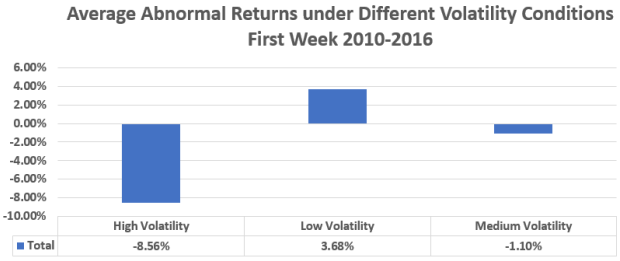


Figure 22: Performance of IPOs First Week Under Different Volatility Conditions.

Z-value	1.966686844

Hypothesis test 4: Results for Low Volatility the First Week

The results from the first day become more evident when we run the same test for the average abnormal return the first week. Under conditions of high volatility, the average abnormal return is -8,56 % the first week. When the market has a medium volatility, the average abnormal return is slightly negative. Reversely, under conditions of low volatility, the average abnormal return the first week is 3,68 %. Consequently, we can conclude that there is a strong link between the volatility in the market and performance of the IPOs in the sample selection. From the sample selection, we have statistical grounds to state that low volatility impacts the performance if IPOs the first week (See *Hypothesis test 4*).

4.4 Firm Size Strategy

The Fama-French Model considers how the beta, the market-to-book ratio and the size of the firm impacts its performance. The theory indicates that smaller firms outperform larger firms, as well as the market. However, this has not been the case in the post 2008-era. Regardless, we will enquire into whether the size of the firm impacts its performance in this section. This is executed by looking at average abnormal returns for the first day and the first week.

4.4.1 First Day

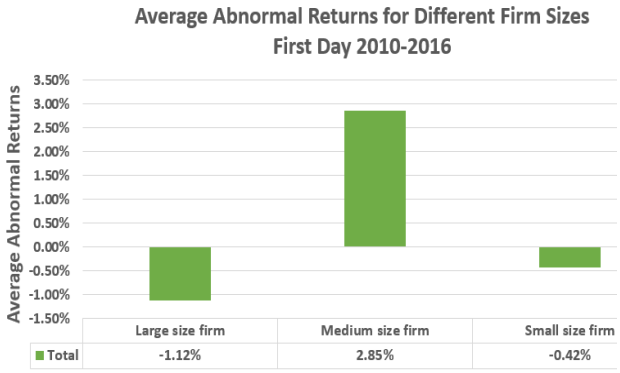


Figure 23: Average Abnormal Return for Different Firm Sizes the First Day

Z value	1.117162454

Hypothesis test 5: Result for Medium Size Firm the First Day

In the data analysis, we find that it is the medium size firms that outperform the smaller and larger firms the first day. In general, the medium sized firms yield an average of 2,85 % the first day, while the other firm sizes provide negative returns (See *Figure 23*). IPO-literature states that as the size of the firm decreases, the higher the degree of underpricing will occur. This is because these equity offerings normally do not provide the same attention for the underwriter as larger ones. Then, they are more inclined to underprice the offering to please other clients. The findings in this study contradict this theory. However, as *Hypothesis test 5* demonstrates, we do not have statistical grounds to state that a medium sized firm perform better than other firm sizes the first day of their offering.

4.4.2 First Week

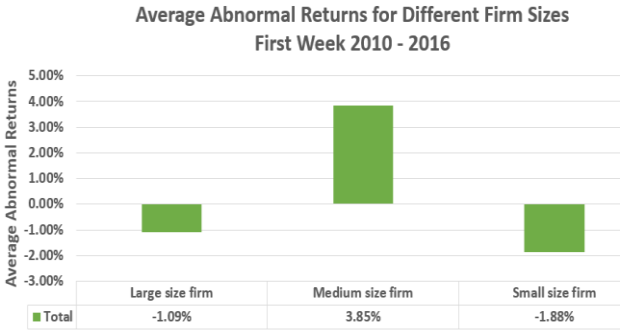


Figure 24: Average Abnormal Return for Different Firm Sizes the First Week

Z-value	0.79282497

Hypothesis test 6: Result for Medium Sized firm the First Week

Lastly, we also find that the medium sized firms yield a high positive abnormal return on average for the first week. This is also contradictory to what one normally would expect to find in line with the Fama-French theory. Nevertheless, we do not have statistical grounds to state the medium sized firms perform better than small or large sized ones (see *Hypothesis test 6*).

5. Testing a strategy

From the different market conditions and aspects explored above, we find that;

(1) Investing in markets of low volatility is beneficial.
(2) Investing in medium sized firms is beneficial.
(3) Investing in a bear market is beneficial.

In this section, we implement this strategy for IPOs in 2017. However, because the sample selection from 2017 is a lot smaller, one should not place much emphasis on these results.

5.1 Low Volatility Performance

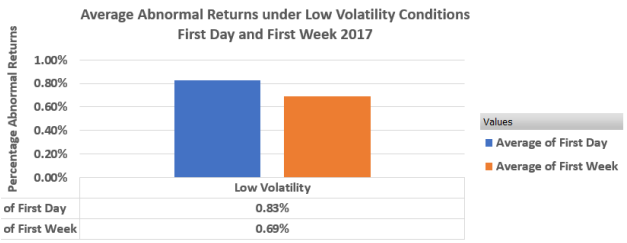


Figure 25: Average Abnormal Returns for Low Volatility the First Day and First - Week 2017

As *Figure 25* demonstrates, investing in IPOs when the volatility is low, is also beneficial for the first offerings in 2017. As pointed out earlier, the first day performance trumps the first week.

5.2 Medium Sized Firms Performance

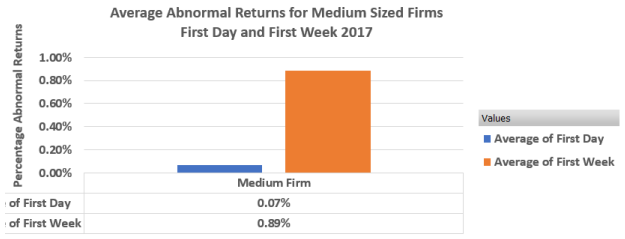


Figure 26: Average Abnormal Returns for Medium Sized Firms the First Day and First Week of 2017

Investing in medium sized firms also appears to be an advantageous strategy as an investor would beat the market on average with 0,07 % the first day and 0,87 % the first week when merely investing in such companies.

5.3 Bear Markets Performance



Figure 27: Average Abnormal Returns for Bear Markets the First Day and First Week of 2017

The results of investing in bear markets in 2017 are a bit contradictory to the findings in section 4. Here, average abnormal returns for bear market conditions are quite negative, with -4,60 % and -3,67 % respectively the first day and the first week.

6. Reflections

6.1 The Results

After having examined the companies from the beginning of 2010 to the ending of 2016, we initially find that the short-term strategies outperform the long-term ones. This is mostly due to the quality of the companies. It will after some time often become more evident to the stock market that some firms do not justify their value. Investors will then be more open to selling the stock, and the price will plummet. The probability of similar instances occurring intensifies as time passes. Hence, a common investor without specific knowledge of the quality of the firm, will reduce his/her risk by selling swiftly after the IPO.

6.2 Validity

Furthermore, there are questions regarding the validity of the results; both internal and external. First, can we express suspicions about the internal validity of the results. For instance, are they merely correlations and coincidences? This is a reasonable question. We have no grounds to claim causality for our results. Moreover, we have also excluded companies that we were unable to recover data from. The results could therefore have been different if the data were used as well. Hence, further research is needed in this area.

Additionally, there are doubts about the external validity of the results from our data. For instance, given that we could prove that a specific market condition impacts the performance of IPOs, it cannot necessarily be utilised outside of the context we have developed a strategy for. This is because markets are structured differently and behave in different manners. A rewarding trading strategy that works in Norway, may be a losing game plan in the United States.

6.3 Ability to Trade

In this paper, we have assumed that the common investor can subscribe to all IPO prices. This is highly questionable. In the "real world", much of the IPO subscriptions are based on relationships with the underwriting party. First, the underwriting party normally gives special grants to investors with whom they have good relationships. This applies particularly to institutional investors, who are preferred to retail investors (Stoughton & Zechner, 1989). Second in line are the retail investors who are clients to the underwriters. Consequently, it complicates the matter of obtaining stocks in each new IPO if you do not have a bond with the underwriter. There is also a complication in our model concerning the number of shares available. Each IPO will only have a specific number of shares outstanding for sale in the first market. Then, it will be a case of "first come first serve" in instances of oversubscriptions. An investor may not be able to subscribe to the IPO because all the shares may already have been allocated.

Second, there is also a question of whether the investor can obtain new liquidity for each new IPO. This would require the investor to either have extra money spared up to invest in each IPO, or that they can pull their money out of other investments to subscribe to the IPO. It may indeed be possible to do this, but it can be complicated.

Lastly, we have assumed that the investor does not incur transaction fees when either purchasing or selling stocks. This will not be the case in the real world, as brokers receive fees for their role in facilitating the exchange. However, we ignored this aspect because the fees can be miniscule in practice.

7. Summary

In this paper, we have attempted to propose trading strategies for the common uninformed investor for IPOs. First, we investigated how IPOs perform in different time periods, such as a week, a day, a month and six months. We find that short-term strategies – e.g. one day and a week - outperform the long-term ones – one month and six months. Second, we examined how first equity offerings perform related to the overall volatility in the market. We find that it is more favourable to invest when the market is less volatile. Third, we enquired if the market conditions will affect the IPO performance. We find that the sample selection performs better in bear markets in contrast to the other conditions. Furthermore, we analysed how the firm size affects the IPO performance. We find that that it may be more beneficial to invest in companies of a medium size, compared to the smaller and larger ones. Lastly, we tested a strategy and reflected around the complications that may arise from our models.

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https://finance.yahoo.com

https://www.oslobors.no

http://www.paretosec.no (Personal Account)

Appendix Data

Company	First Day	First Week	First Month	First Six Months	Volatility	Market Condition	IPO price	Number of shares	Market Cap at IPO (NOK)	Category
Bakkafrost	1.16	12.85%	25.32%	29.37%	Medium Volatility	Bear	31	48858065	1514600015	Medium size firm
Panoro	-14.39%	-26.26%	-57.10%	-48.29%	High Volatility	Recession	106.5	42502196	4526483874	Large size firm
Avocet Mining	3.10%	7.96%	4.16%	59.53%	High Volatility	Bear	120	20949671	2513960520	Medium size firm
Storm Real Estate ASA	-2.32%	-7.38%	-25.66%	-46.09%	High Volatility	Recession	4.2	88345623	371051616.6	Small size firm
Gjensidige	0.29%	-1.16%	-6.69%	13.79%	Medium Volatility	Boom	59	500000000	29500000000	Large size firm
Norwegian Royal Salmon	-2.28%	-5.02%	-6.78%	-33.74%	Medium Volatility	Close to zero	21	42572191	894016011	Small size firm
Höegh LNG Holdings Ltd.	7.09%	7.40%	14.45%	43.98%	Medium Volatility	Recession	38	77244746	2935300348	Medium size firm
Kværner	-1.41%	-8.34%	-26.16%	-13.30%	Medium Volatility	Recession	14	269000000	3766000000	Large size firm
Selvaag	-5.22%	-7.98%	-9.64%	-27.14%	Medium Volatility	Recession	20	93765688	1875313760	Medium size firm
Borregaard	-1.20%	-4.61%	-8.44%	0.71%	Medium Volatility	Boom	21	100000000	2100000000	Medium size firm
Asetek AS	-4.59%	-5.15%	-6.97%	-0.84%	Low Volatility	Boom	36	45202030	1627273080	Medium size firm
Ocean Yield ASA	2.52%	-0.87%	-1.62%	10.41%	Low Volatility	Bull	27	148351432	4005488664	Large size firm
BW LPG Limited	0.06%	0.07%	0.17%	0.46%	Low Volatility	Boom	47	141938998	6671132906	Large size firm
Napatech A/S	-0.88%	-2.56%	-21.22%	6.26%	Medium Volatility	Boom	58	23877672	1384904976	Small size firm
Atlantic Petroleum P/F	0.11%	-1.22%	-3.89%	-36.32%	Low Volatility	Bull	140	3697860	517700400	Small size firm
Tanker Investments Ltd	-1.02%	-1.69%	-9.55%	7.20%	Medium Volatility	Bull	78	38413000	2996214000	Medium size firm
Avance Gas Holding Ltd,	5.17%	5.11%	-2.66%	7.19%	Medium Volatility	Bear	115.75	64627972	7480687759	Large size firm
Zalaris ASA	8.86%	7.69%	6.53%	54.55%	Low Volatility	Boom	23	19858973	456756379	Small size firm
Havyard Group ASA	-2.31%	0.25%	-0.91%	-48.13%	Low Volatility	Boom	33.5	24781150	830168525	Small size firm
Scatec Solar ASA	3.25%	2.74%	6.89%	89.71%	Low Volatility	Recession	19	101196230	1922728370	Medium size firm
XXL ASA	7.17%	12.39%	14.42%	19.85%	Low Volatility	Recession	58	138512123	8033703134	Large size firm
Entra ASA	-0.85%	3.31%	3.86%	-16.03%	Low Volatility	Recession	65	183732461	11942609965	Large size firm
RAK Petroleum plc	7.64%	17.93%	4.15%	-17.59%	Low Volatility	Bear	17.1	190142717	3251440461	Large size firm
Team Tankers International Ltd,	-4.90%	-8.96%	4.42%	32.03%	Medium Volatility	Boom	11.35	188482074	2139271540	Medium size firm
Nordic Nanovector ASA	7.93%	16.40%	5.18%	-25.74%	Medium Volatility	Bear	32	49044402	1569420864	Medium size firm

Multiconsult ASA	19.13%	31.08%	26.21%	35.52%	Low Volatility	Boom	78	26970394	2103690732	Medium size firm
Schibsted ser, B	-0.30%	1.02%	1.55%	23.60%	Low Volatility	Boom	250	130684373	32671093250	Large size firm
Europris ASA	-5.09%	-6.44%	-5.14%	-1.18%	Low Volatility	Bull	45	166968888	7513599960	Large size firm
Skandiabanken ASA	-6.02%	-4.27%	-3.41%	22.14%	Low Volatility	Bear	46	106869333	4915989318	Large size firm
Kid ASA	-4.14%	-4.89%	-6.30%	-8.38%	Medium Volatility	Bear	31	40645162	1260000022	Small size firm
B2Holding ASA	-4.30%	-2.49%	-8.24%	-9.38%	Medium Volatility	Boom	13	369520598	4803767774	Large size firm
Treasure ASA	-2.33%	1.69%	-2.43%	2.50%	Medium Volatility	Boom	20	220000000	4400000000	Large size firm
Norwegian Finans Holding ASA	-4.95%	-8.08%	3.51%	-20.46%	Low Volatility	Close to zero	80	186688897	14935111760	Large size firm
Arcus ASA	-1.25%	-3.83%	7.35%	-5.02%	Low Volatility	Boom	43.9	68023255	2986220895	Medium size firm