

Does an anchor[§] help you float?

Nordic IPOs: Underpricing, aftermarket performance and the effect of cornerstone investors

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Abstract

This paper studies mainly the underpricing and aftermarket performance of 145 Nordic initial public offerings in two separate time periods, 2005-2007 and 2013-2016. This paper also examines the presence of cornerstone investors in recent IPOs. We have defined these two time periods as hot IPO activity periods due to the extraordinary frequency of new listings. We conduct underpricing and aftermarket performance tests based on the entire data sample as well as on a country and time period basis. Our findings on a Pan-Nordic basis indicate that the level of underpricing in the Nordics is in line with previous literature and that the IPOs outperform their corresponding national benchmark index on a medium-term basis. We cannot however conclude whether underpricing and aftermarket performance have changed between the two time periods. Our findings suggest that IPOs backed by cornerstone investors have a more narrow price range in the prospectus and experience a higher level of underpricing. We cannot draw any conclusions on the aftermarket performance of cornerstone-backed IPOs.

Keywords: Nordic IPOs, underpricing, aftermarket performance, cornerstone investors

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1 Introduction

This study focuses on the two most recent initial public offering (IPO) booms on the Nordic market and aims to explain a number of anomalies and features related to the IPO process, these anomalies include well debated topics such as underpricing and after-market performance, as well as more recent features such as cornerstone investors.

IPOs in general is a lively debated topic within the finance literature and in society. The IPO market can be seen as an indicator of the world economy and plays a vital role for firms to raise capital or as the ultimate way for owners to exit an investment. The reason for the debate is that there are several areas with regard to IPOs that are considered as anomalies such as underpricing, long-term performance and the cyclical nature of the IPO market. These anomalies have been studied previously but not during the same time span and in the same geographic area as we have chosen to focus on. Another interesting feature on the IPO market are the cornerstone investors, this phenomenon came to Europe in the wake of the financial crisis. This feature has changed the IPO process in the Nordics and is something that has not been academically studied in this geographical subset. The Nordic countries (Sweden, Norway, Finland and Denmark) as a region provides a unique subset for looking at the IPO market. The market infrastructure is well developed and together the countries span over most sectors within the economy. All but one of the Nordic countries are connected to the same stock market. Sweden, Denmark and Finland are all part of NASDAQ OMX while the Norwegian stock exchange is independent, making it possible to compare the listings without any major institutional differences.

Most of the earlier studies on the IPO market have focused on one of three major IPO anomalies; underpricing, long-term underperformance or the cyclical nature of the market. The studies of the first one has led to a consensus that underpricing exists, however, the reason for explaining it ranges from signalling Rock (1986) to a change in cost of capital, Guo (2011). The underperformance of newly issued shares is an area where consensus has not been reached. The studies of Aggarwal and Rivoli (1990) as well as Loughran and Ritter (1995) suggest that newly issued shares underperform the market on a one to five year horizon. This is in sharp contrast to Krigman et al. (1999) and Affleck-Graves et al. (1996) who suggest that newly issued shares outperform the market. The last major topic discussed with regard to the IPO market is the cyclical nature of the market and the so called IPO window. Here there are a number of ways to classify hot and cold markets whereas most studies follow the example of Ritter (1984) who defines a hot market as a period with a lot of IPOs.

The main focus of our study will be centered around underpricing and aftermarket performance on the four Nordic main markets during two separate periods that we have defined as “IPO booms”. We have noticed that between 2005-2007 (former boom) and 2013-March 2016 (recent boom), investor sentiment and number of new listings on the main markets have been particularly high. Our final data sample consists of 145 new main market listings, excluding spin-offs to shareholders and list changes from alternative markets. In order to investigate different aspects of these two phenomena, we have three categories of groups that will be the foundation when presenting results. First we group our IPOs based on country, the sample includes; 54 Swedish IPOs, 17 Danish IPOs, 61 Norwegian IPOs and 13 Finnish IPOs. Secondly, we group our total sample based on whether which time period the IPO occurred; 78 IPOs in the former time period and 67 IPOs in the recent time period.

The recent emergence of cornerstone investors; that is investors committing to buying shares in an IPO before the formal book building period starts, can be traced to the Swedish IPO of Lifco in 2014. Due to this, the amount of previous research covering cornerstone investors on the Nordic market is limited. At the point of the study, the Swedish cornerstone phenomenon has not been established in the other three countries in our study. Hence, when conducting tests on the effect of cornerstone investors, we only include the Swedish IPOs in the recent time period. The sample includes: 20 cornerstone backed IPOs and 16 non-cornerstone backed IPOs.

We can conclude, in line with previous studies covering the Nordic IPO market, that the underpricing phenomenon is present in all countries. We also observe that the level of underpricing has not changed between the time periods described above, indicating that the two hot markets in our sample are of similar nature. The most interesting finding compared to other studies is how much the level of underpricing has changed since previous studies in which the dot-com bubble was included in their samples. This indicates that the Nordic market has changed institutionally after the dot-com bubble, the reasons and theories behind the changes will be discussed later in the thesis.

Our findings regarding the aftermarket performance of Nordics IPOs indicates that they outperform the market on a medium-term basis. This is in line with previous studies on the American IPO market, however due to the high noise of publicly traded shares we cannot draw any conclusions regarding the causes of the abnormal return.

The most interesting part of our findings relates to cornerstone backed IPOs. We have concluded that IPOs with cornerstone investors have in general a more narrow price range published in the prospectuses, it can be argued to decrease the uncertainty of the valua-

tion in an IPO. By studying the level of underpricing in cornerstone backed IPOs it is also possible to observe an increased level of underpricing in IPOs with cornerstone investors. This can be argued to imply that the selling shareholders are leaving money on the table in terms of underpricing in order to reduce the uncertainty of the listing. We do not see any differences in aftermarket performance of IPOs with cornerstone investors in relation to non-cornerstone backed IPOs.

1.1 Practical relevance

The focus of our study is of highly practical relevance as it covers several topics of interest for entrepreneurs, underwriters, regulators, institutional and retail investors. Making an IPO in general is one of the most important ways to raise capital or to make a financial exit. Another important aspect is the cyclical nature of the IPO market. Investors and owners of companies could learn a lot from the research when it is time to take a company public and how a hot market climate affect the performance of a newly issued company. Since we aim to discuss and investigate the aftermarket performance of newly issued shares, investors could benefit from the result of the study since it evaluates if it is a good idea to invest in newly issued shares. In more detail, we believe the following stakeholders within the financial system could benefit from this study;

- *selling shareholders (e.g. entrepreneurs)* who are interested in maximising the capital raised or the money obtained in an exit. This study would be useful for the selling shareholders in choosing the best underwriter for the sellers own preferences. If cornerstone investors have a positive impact on the IPO process, selling shareholders should try to find an investment bank with good relationships with potential cornerstone investors
- *underwriters* could benefit since we look at certain parameters that they can affect, such as price range and the presence of cornerstone investors
- *institutional investors* who can act as cornerstone investor and potentially earn additional returns for their clients
- *other investors (e.g retail investors)* who can use the information about cornerstone investors to determine whether an IPO is worth buying shares in

2 Theoretical Framework

In order to conduct a literature review, all three anomalies related to IPOs will be presented to fully understand the IPO process. The first area is underpricing, how it can be defined, what causes it and how it can be explained. The second subject to look at is the aftermarket performance of IPOs; do they under- or overperform the market and how it can be explained. The third subject is the cyclical nature of the IPO market; is the performance and the underpricing affected by when a company chooses to go public. After these three areas have been reviewed, we will move forward to deal with cornerstone investors and how they have affected the IPO process globally and in the Nordics.

2.1 Underpricing

One of the most discussed topics within financial literature regarding IPOs is the anomaly called underpricing. Underpricing, or money left on the table, is the first day positive return of a newly listed share. Van der Geest and Van Frederikslust (2001) define underpricing as the following:

“Underpricing is the positive return that a shareholder can achieve when a newly public share is bought at its offering price and sold at its first closing day price”

2.1.1 Signalling theory

The reason underpricing has puzzled researchers is that the seller gives up value on the first day of trading. One of the first to define and discuss underpricing was Rock (1986). He chose to explain the underpricing with a model where investors are either informed or uninformed. The uninformed investors will not be able to distinguish between a good and a bad offering, they are therefore likely to be the only investors interested in bad IPOs. They are also likely to be squeezed out in a good IPO. He centers his reasoning by suggesting that the only way for underwriters to attract enough investors is to leave some money on the table in order to attract both informed and uninformed investors. Uninformed investors will then be happy participating in IPOs, sometimes earning money due to underpricing and sometimes losing money. The underpricing can therefore be seen as a necessity to ensure enough capital raised.

Allen and Faulhaber (1989) also discuss signalling as a reason for underpricing. They suggest that the underpricing is a way of signalling quality. They develop this reasoning by suggesting that owners of a good firm can leave money on the table and be sure that they will regain it by a favourable stock price development and future results. This momentum effect starts with underpricing. Owners of bad companies know they will not

be able to regain the underpricing and therefore they need to price their shares higher. They further suggest that owners of good companies are forced to give up even more value when the market is hot, leading to a even higher level of underpricing during these time periods.

2.1.2 Other theories

Habib and Ljungqvist (2001) chose another angle when they approached the IPO anomaly concerning underpricing. Their main argument is that it is not the company that is the most important factor in prediction of underpricing, it is the seller. They suggest that an owner who sells a lot of shares will try to avoid underpricing and when only a part of the company is sold, the owner will allow more money to be left on the table. In order to test their hypothesis, they look at different marketplaces and compare underpricing. The underpricing was significantly higher on the marketplaces where owners could float a rather small part of their shares. Habib and Ljungqvist suggest that underpricing is not a requisite for a successful IPO and it is something that the selling shareholders want to avoid.

Another interesting study about underpricing is written by Loughran and Ritter (2003) that investigated how underpricing has developed over time by studying the American IPO market. They observed that underpricing has developed from a modest 7% between the years 1980-1989 to 15% between the years 1990-1999 and peaking during the dot-com bubble when the average underpricing was close to 65%. Loughran and Ritter (2003) see two explanations for this development which are non-mutually exclusive. The first reason is that the increased underpricing is a reward for the increased riskiness of IPOs. Companies taken public during the dot-com era were often not profitable. Ritter and Loughran argued that the first explanation was not sufficient to entirely explain the extreme magnitude of underpricing. The complementary explanation suggests that the incentives for managers and underwriters had changed during the dot-com era. Sellers chose underwriters based on who could most benefit them personally. In exchange for choosing a particular underwriter, the seller will be allocated shares in other hot market issues. This is in sharp contrast to the earlier periods when underpricing was a tool for signalling as described above. It could be argued that this explanation aims to specifically explain the extreme underpricing during the dot-com era and is not applicable to later hot periods.

It is not all studies that agree that underpricing is an anomaly or that it is caused by signalling. Guo (2011) studied American IPOs between 1960 and 2006 and suggested that the explanations discussed above are not sufficient to describe underpricing and another explanation is needed. In order to understand underpricing, Guo looked at the owner who chooses to float their companies as well as their nature. By comparing the seller's

cost of capital and the equity market cost of capital it is possible to conclude that the IPO underpricing can be traced to the change in required rate of return. Venture capital and buyouts funds both have a higher cost of capital than the public stock market in general and when the shares are floated the present value of future cash flows increase, leading to a higher present value. This model also gives an explanation as to why underpricing is different in specific time periods. During the dot-com bubble, a large part of the IPOs were venture capital backed and due to its previous owners requirement for a high rate of return, their entrance to the public market implied a dramatic change in the cost of capital. More recently, traditional buyout firms, with a relatively lower cost of capital compared to the venture capital firms, exit their holdings via the IPO market consequently the underpricing has not reached the same level as the dot-com bubble.

Westerholm (2006) investigated underpricing in the Nordics between the years 1991 and 2001. He concluded that underpricing is present and is relatively extensive, on average 17%, during the time period in the Nordics. He also suggested that underpricing is linked to certain hot sectors and time periods, such as the IT sector during the years 1997-2000. This can be linked to the studies of Loughran and Ritter (2003) and Allen and Faulhaber (1989).

In contrast to Allen and Faulhaber (1989) who described investment banks to be quiet intermediaries, the study of Baron (1982) suggested that underpricing is linked to the presence of an investment bank's dual roles when acting as the underwriter in the IPO process. Investment banks provide both advisory services to the selling shareholder and distribution of shares to brokerage customers. The underpricing is a form of compensation for the advisory services provided by the bank. It is kept at a relatively constant level in order to satisfy both the selling shareholders and the brokerage customers of the investment bank. This study was confirmed by Beatty and Ritter (1986) who suggested that investment banks who "cheated" clients by having unjustified level of underpricing did not receive any new underwriting mandates. They further suggested that if the underwriter did not deliver the expected underpricing, they would lose clients in their brokerage business. Their conclusion is, therefore, that the balance of interest between these two clients during IPOs creates an equilibrium level of underpricing.

2.2 Aftermarket performance

Long-term IPO underperformance is described by Shefrin (2000) as one of three behavioral phenomena associated with floating new shares on the market. The term refers to the negative aftermarket performance of newly issued shares in relation to a benchmark (Van der Geest and Van Frederikslust (2001)). However, there is no clear consensus

among academic literature whether this phenomenon actually exists, Ritter and Welch (2002) concluded that their results highly depend on the chosen time period and methodology.

Aggarwal and Rivoli (1990) were early to document this anomaly when they found that 1,598 IPOs in the US between 1977-1987 on average underperformed the market index by 14% considering a holding period of one year. Loughran and Ritter (1995) examined 4,753 companies going public in the US between 1970-1990 and found that newly issued shares are poor investments for investors five years after going public. The average annual return of IPOs amounted to 5% while benchmark firms averaged 12% during the same time period. Ritter (1991) covered 1,526 IPOs between 1975-1984 in his paper and found that IPOs underperform peer companies over a time horizon of three years after issue. In the same paper Ritter also concluded that there is variation of long-term aftermarket performance across industries and time periods, where younger companies and companies issuing in heavy volume markets, so called “hot markets”, performed the worst in relation to benchmark firms.

The underperformance phenomenon in a Nordic context is not as documented or studied compared to studies covering American data. Westerholm (2006) examined 254 Nordic IPOs between 1991-2002 and found that there was underperformance amongst the Swedish IPOs while the Norwegian and Danish IPOs outperformed their corresponding market index, suggesting there is no underperformance phenomenon in Norway and Denmark.

A number of studies partially contradict the conclusions discussed above, an example is Krigman et al. (1999) who studied American IPOs between the years 1988-1995. He concluded that there are three groups of IPOs; cold, hot and super-hot. In his data set, the hot IPOs which are defined as IPOs with an underpricing between (10-60%) overperform on a one-year time horizon while cold and super-hot IPOs underperform on the same time horizon. This is in line with a study performed by Affleck-Graves et al. (1996) who suggested that momentum is important in IPOs and that a first day winner, i.e. underpriced issue, will outperform the market in one and three months of trading. They also find that IPOs which return negatively on the first day of trading will continue to be losers due to negative momentum. After the first three months the newly issued shares continue to perform in line with peers. An important caveat to take into account when looking at the study of Affleck-Graves et al. (1996) is that they used another method when determining abnormal returns. They chose to match each newly issued firm with a public peer company and compared the performance between the two stocks rather than comparing the IPO against a benchmark index.

Buser and Chan (1987) looked at the two-year aftermarket performance of over 1,000 IPOs on the NASDAQ Stock Exchange between the years 1981-1985. They found that newly listed companies outperformed the NASDAQ Composite over that time period. However, Ritter (1991) suggested the reason for Buser and Chan's findings is that they looked at a shorter time period than the one Ritter covered and he concludes that the performance of newly issued shares highly depends on the investment horizon.

In conclusion, there is no consensus on the aftermarket performance of IPOs. There are a lot of studies that conclude that the long-run (three to five years) aftermarket performance of IPOs is negative. On the other hand, studies covering aftermarket performance with shorter time horizons show the opposite in which IPOs outperform their benchmark firm or indices during a time period of six months up to two years. We also conclude that the aftermarket performance is closely linked to industry trends. If companies are going public in hot sectors, an eventual industry downturn will result in that specific sectors underperform in relation to the general stock market.

2.3 Hot and cold markets

There have been several studies on how investor sentiment and bull markets affects the IPO cycle. Ritter (1984) studied what he called the hot issue market of 1980. 1980 was a year when a large number of firms went public, most of them in the booming natural resource industry. What he observed by studying this period was that the number of IPOs during a specific time period is highly correlated with the previous time period indicating that IPOs are seasonal. Furthermore, during the hot year of 1980 the underpricing increased from the previous average of 16% to 48%. Another interesting observation by Ritter (1984) was that the companies taken public during the hot issue period were often smaller and less mature. Thus indicating that there is a so called IPO window when owners tend to exit their companies when opportunity exists, in contrast of waiting until when it's optimal for the company.

There are many different methods of determining whether a market is hot. The most common methodology is the one used by Ritter (1984). He chose to count the numbers of IPOs and by doing so setting a threshold for when a market is hot or cold. He concluded that during hot markets, underpricing increases and companies that are not ready for the stock exchange rush to get public since the window of opportunity is open.

A more recent study of hot and cold markets was conducted by Ljungqvist et al. (2006). They chose to study if the IPO market is suffering from a pattern of recurring booms and busts and if fading irrational exuberance can hit investors in the aftermarket. Their

conclusion is that many of the IPO anomalies such as underpricing, long-term underperformance and hot markets are a result of an irrational exuberance among a certain set of investors. Investors always want to participate in IPOs since they are seen as hot commodity and often take place in hot sectors. Given that it is not possible to short sell IPOs, only the most optimistic investors will participate in the IPOs and thus increasing the underpricing. Another interesting conclusion that Ljungqvist et al. (2006) found in their study is that the size and quality among companies that go public decrease in hot market, relating to the IPO window hypothesis by Ritter. It is plausible to assume that the decreased quality eventually leads to a bust of the IPO window.

Helwege et al. (2004) also chose to study the cyclical nature of the IPO market. They start by defining hot market as times when the volume of IPOs is high i.e. when the IPO window is open. As with many other studies previously mentioned, Helwege et al. noticed as the number of IPOs increase, the quality, size and maturity of companies decrease which eventually lead to a bust. There are also some studies covering hot and cold markets with regard to the Nordic IPO markets. Westerholm (2006) chose to look at the trends and clustering on the Nordic IPO market between the years 1991 and 2002. He concludes unsurprisingly that IT IPOs dominated the market in the Nordic during the years leading up to the dot-com bubble.

One potential reason for the cyclical nature of IPO market is that many companies which go public are private equity backed. The cyclical nature of private equity backed IPOs was examined by Schöber (2008). He found that there have been five major private equity backed IPO windows between the years 1980 to 2006 (1983, 1986-87, 1991-93, 1995-97 and 2004-06). The most recent of these periods corresponds roughly to the former boom period defined in our study. By looking at the time span in between the hot IPO windows, it is worth noticing that it corresponds to the usual private equity holding period.

When summarising the findings of earlier studies of hot and cold IPO markets it is possible to see that it's highly cyclical due to several reasons, with investor sentiment around certain sectors as one of the main explanations. This cyclical nature of the market makes opportunistic firms go public instead of waiting for a moment when the company is fundamentally ready. These companies are not actually ready to go public, leading to poor aftermarket performance and the eventual closure of the IPO window.

2.4 Cornerstone investors

Cornerstone investors are a relatively new phenomenon in Europe that arose in the wake of the financial crisis. Practical Law Magazine (2015) refers to the IPO of Glencore in

2011 as the first major cornerstone backed IPO in Europe. Glencore, an Anglo-Swiss mining company, was floated on the London Stock Exchange and had twelve cornerstone investors, ranging from the Abu-Dhabi Sovereign Wealth Fund to the US asset manager Blackrock. The reason for the emergence of cornerstone investors in Europe is unclear but can be linked to the same logic why cornerstone investors became popular in Asia, from where it originates. The reason for the rise of this phenomenon was that institutions wanted to be guaranteed to gain a substantial portion of shares in hot issues. This by committing to buying a large chunk of shares before the book building period and by being subject to lock-up periods. Due to the hot nature of the Asian IPO markets, having a large portion of the shares in hot IPOs turned out to be very profitable, resulting in an increasing demand among leading institutional investors to become cornerstone investors. The Asian cornerstone trend first spread to the City of London and later to continental Europe. Examples of cornerstone backed IPOs are Zalando and Rocket Internet on the Frankfurt Stock Exchange as well as Lifco on the OMX Stockholm, all in 2014.

However, the theory of cornerstone investors is not completely new according to a Swedish hedge fund manager that we interviewed. There have been informal cornerstone investors previously i.e. investors who commit to buying shares before the offering period in exchange for a higher allocation of shares. Furthermore, the rationale of cornerstone investors is also found in secondary offerings and offerings of hybrid capital such as preference shares and convertibles. These offerings are often guaranteed by a well-respected investor, sending a strong signal to the market. A high-profile example of a guaranteed secondary offering in the Nordics was the Ericsson secondary offering in 2002 when two of the leading financial institutions in the Nordic region (Industrivärden and Investor) guaranteed buying shares for eight SEKbn.

The importance and use of cornerstone investors was already predicted in a study made by Ljungqvist et al. (2006). They concluded that the best way of maximising shareholder value in an IPO is to gradually sell shares to large institutions who later can benefit from high investor sentiment among other investors. The partially selling shareholders can then look forward to a share price appreciation of the retained shares in the time leading up to the end of the lock-up period. In a way cornerstone investors take this idea further by having an additional book building process for a selected number of investors. Loughran and Ritter (2003) also predict the rise of cornerstone investors, they suggested that the best way for an underwriter to conduct an IPO was to allocate as many shares as possible to buy and hold institutions in order to avoid any costly price stabilisation due to share flipping.

Tan and Ong (2013) who studied this phenomenon on the Asian market observed that

cornerstone investors can attract investors in an economic downturn as they signal that the company is of high quality. However, cornerstone investors were criticised due to the lack of transparency and led to a new legal framework regarding IPOs in Hong-Kong. In this framework cornerstone investors were subject to the same insider rules as the selling shareholder and were forced to be disclosed already in the prospectus and could not demand representation on the board of directors. Tan and Ong (2013) also concluded in their study that cornerstone investors play a vital role in Asia in securing retail interest in IPOs. They further suggested that cornerstones investors are of such importance that the main selling point for Asian underwriters is good relationship with potential cornerstone investors.

Since cornerstone investors are a relatively recent part of the IPO process in Europe, there is no legal definition or framework surrounding cornerstone investors. It has been discussed to introduce a legal framework in Europe which would be inspired by the Asian legal framework. According to Practical Law Magazine (2015) there are some unofficial criterias that needs to be fulfilled in order to be seen as a cornerstone investor.

1. *Are subject to an unofficial or official lock-up period after the IPO, usually six months*
2. *Are disclosed in the prospect, hence has committed to buy shares before the offering period*
3. *Buy shares at the offering price*
4. *Do not aim to gain board representation*

McGuinness (2014) studied several effects that cornerstone investors had on the Asian IPO market and concluded that the presence of a cornerstone investor justified a higher valuation. By looking at the Tobin's Q of cornerstone and non-cornerstone backed IPOs, he concluded that the cornerstone investors increased the valuation. In line with the main sales argument of Asian underwriters, sellers should approach investment banks with good relationship to potential cornerstone investors as it proves to increase value. Another finding of importance by McGuinness (2014) was that the presence of cornerstone investors decreased the volatility of the newly issued shares. This is of significance for the underwriter since high volatility leads to expensive price stabilisation during the first period post the IPO. The result of this study coincide with the study of Boehmer et al. (2006) who suggested that large institutions tend to get better allocation in good issues and that share flipping and noise trading tend to lead to worse performance for the newly issued shares. Therefore, underwriters should aim to sell the book in as large chunks as possible while still complying with the listing requirements. The last finding of McGuinness (2014) suggested that cornerstone investors are a sign of quality, supported

by the positive development of earnings post the IPO. McGuinness concluded cornerstone investor backed IPOs have the highest earnings growth, which strengthens the hypothesis of Tan and Ong (2013) who suggested that cornerstone investors is a sign of quality IPOs with sustainable growth.

Due to the recent rise of cornerstone investors in the Nordics, the number of academic studies of the subject are limited. Therefore, in order to get a more detailed view of the phenomenon we chose to interview two high-profile investment bankers from Skandinaviska Enskilda Banken (SEB), the leading investment bank in the Nordics. They both agree with the increased importance of cornerstone investors during the recent boom and that Sweden is relatively unique in the sense of how fast cornerstone investors have become the norm. This can be linked to the cyclical nature of the IPO market and also the importance of trends within finance. As soon as something is deemed hot it will fast become the norm. We also interviewed a portfolio manager and partner at RAM Rational Asset Management, a Swedish hedge fund, in order to understand the buy-side perspective of the phenomenon.

According to the investment bankers of SEB, the main reason for the rise of cornerstone investors is that they function as a sort of insurance for the seller. By having a cornerstone investor present, the selling shareholder does not have to sell as many shares in the less predictable book building period. In exchange for what the bankers call IPO insurance, the selling shareholder would have to compensate the cornerstone investors for the risk they are taking by leaving more money on the table, i.e. higher level of underpricing. Another aspect regarding the so called IPO insurance discussed with the SEB bankers concerned industries that were relatively new to the stock exchange or associated with high media attention, hugely benefited from cornerstone investors. By having the right cornerstone investors in such IPOs, it signals quality and stability. This is in line with the Asian arguments for cornerstone investors acting as a stamp of approval for a high-quality IPO.

Like all new features in the economy, the rise of cornerstone investors is a debated topic. The main question discussed in Asia and Europe is if cornerstone investors are good or bad for retail investors. Günther Mårder, the former CEO of the Swedish Shareholders' Association, wrote in *Dagens Industri* (2015) that he is very critical of cornerstone investors claiming that they make it harder for retail investors to participate in good IPOs. This criticism was confirmed by McGuinness (2014) findings that the cornerstone backed IPOs are the companies that experienced the highest earnings growth. McGuinness criticised cornerstone investors in a similar way claiming that they squeeze out retail investors in attractive IPOs. The investment bankers at SEB acknowledge the criticism. One neutral

way of seeing it is that the presence of a cornerstone investor helps retail investors in choosing which IPOs to participate in. Another approach is that cornerstone investors decrease short-term share flipping which makes the stock market less volatile.

We also discussed with the SEB bankers how the rise of cornerstone investors has changed the IPO process. The IPO process begins with a early-look meeting with potential investors. During pilot-fishing, a pre-marketing activity, investors with a high level of interest in the company indicate a potential interest to become cornerstone investors in the IPO. If the potential cornerstone investor wants to receive more information about the IPO (draft of prospectus, meeting with research analysts), they have to sign a non-disclosure agreement (NDA) in order to receive this fact pack. As soon as possible, the cornerstone investor has to indicate a valuation level. Cornerstone agreement is usually signed after the IPO announcement, Intention to Float (ITF), but can also occur before the ITF. It is important to notice that the agreement with cornerstone investors has to be reached prior to the publication of prospectus and book building period.

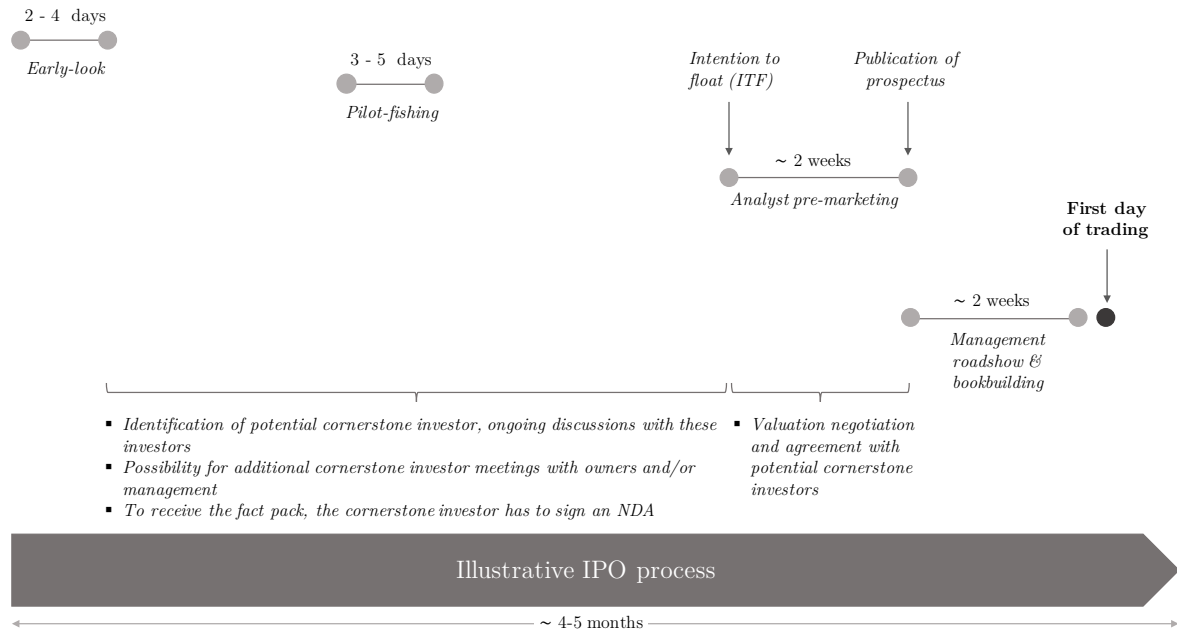


Figure 1: *Brief overview of the IPO process with regard to cornerstone investors*

2.5 Summary and research questions

In order to conduct a study of the Nordic IPO market we aim to perform a number of tests. The tests will follow a top-down methodology with regard to the areas described in the introduction. By top-down methodology we mean starting with a general test of

the data sample and subsequently narrow the sample down into smaller groups, based on country and time period.

The first hypothesis is connected to underpricing of our entire data sample:

Hypothesis I: *Underpricing is present on the Nordic IPO market*

Our second group of hypotheses aim to test the level of underpricing in the different Nordic countries, irrespective of time period:

Hypothesis II (a): *Underpricing is present in Sweden*

Hypothesis II (b): *Underpricing is present in Denmark*

Hypothesis II (c): *Underpricing is present in Norway*

Hypothesis II (d): *Underpricing is present in Finland*

The following hypotheses were inspired by Loughran and Ritter (2003) who studied the dot-com IPO market. They suggested that underpricing reached extreme levels due to changes in incentives for management and underwriters. We will first measure the underpricing in the two periods separately and subsequently measure if the underpricing has changed between the periods, perhaps indicating institutional changes in recent times.

Hypothesis III (a): *Underpricing is present in the recent period*

Hypothesis III (b): *Underpricing is present in the former period*

Hypothesis IV: *Underpricing has increased between the two periods*

The aftermarket performance of IPOs is a topic where no clear consensus has been reached, Ritter and Welch (2002) concluded that the aftermarket performance differed depending on method and time period used. Studies such as Ritter (1991) and Loughran and Ritter (1995) suggested that there is an underperformance while Krigman et al. (1999) suggest that newly issued share outperform the market. An interesting study which looks at the Nordic market is written by Westerholm (2006). He suggested that the Swedish IPOs suffered from underperformance while the Danish and Norwegian did not. Our hypotheses below aim to study the aftermarket performance of Nordic IPOs, both in general and by country, irrespective of time period.

Hypothesis V: *Nordic IPOs outperform the market on a medium to long-term basis*

Hypothesis VI (a): *Swedish IPOs outperform the market on a medium to long-term basis*

Hypothesis VI (b): *Danish IPOs outperform the market on a medium to long-term basis*

basis

Hypothesis VI (c): *Norwegian IPOs outperform the market on a medium to long-term basis*

Hypothesis VI (d): *Finnish IPOs outperform the market on a medium to long-term basis*

We also believe that it would be interesting to investigate if the aftermarket performance has changed over time, we therefore aim to test the aftermarket performance in the two periods separately as well as looking if performance has changed between the two time periods.

Hypothesis VII(a): *Nordic IPOs in the recent time period outperform the market on a medium to long-term basis*

Hypothesis VII(b): *Nordic IPOs in the former time period outperform the market on a medium to long-term basis*

Hypothesis VIII: *The aftermarket performance of Nordic IPOs has increased between the two periods*

The last group of hypotheses cover whether IPOs with cornerstone investors have different levels of spread in relation to price range, underpricing and aftermarket performance. The reason for these tests is to see if it is rational for a seller to pay a potential premium for an underwriter with good connections with financial institutions. It is also of interest to see if any of the information presented in the prospectus can be used to predict the aftermarket performance.

Hypothesis IX: *The price range is more narrow in IPOs with cornerstone investors*

Hypothesis X: *The level underpricing is higher in IPOs with cornerstone investors*

Hypothesis XI: *The level of aftermarket performance is higher in IPOs with cornerstone investors*

3 Methodology

This study aims to describe and analyse two well-known topics concerning initial public offerings, underpricing and long-run performance, on the Nordic market. First we describe the methodology and important considerations when calculating underpricing. Then we discuss the selection process of time regimes, abnormal return measures and benchmarks in relation to performing test on aftermarket performance. Thirdly, we present the statistical methods used throughout our study. Lastly, we present the robustness tests used to validate our results.

3.1 Underpricing

The general formula for measuring underpricing in IPOs is simple but Schöber (2008) points out that there are three issues to be considered as previous studies use different definitions; the period following the IPO that is used to calculate initial return, whether to adjust for market movements and which aftermarket price to use when calculating underpricing.

Firstly, there is no clear consensus in previous studies on which time period to use when calculating the initial return. In general, older studies tend to use a longer horizon when calculating underpricing, one extreme example is Ibbotson and Jaffe (1975) that used the first month of trading to determine underpricing. One possible explanation that previous studies used a longer period is that stock markets were not as liquid as they are today. Schöber (2008) noticed that recent studies on this topic more frequently use the first day of trading to determine underpricing. Both Ritter and Welch (2002) and Westerholm (2006) used this definition when calculating underpricing. In our paper we will follow recent studies and use the first day of trading as our event window when measuring underpricing.

Schöber (2008) also mentioned that most previous studies do not adjust the underpricing with the corresponding market movement the same day, which is known as unadjusted (raw) initial returns. Beatty and Ritter (1986) argued in their paper that the daily average market return is relatively small in comparison with the initial stock return that such effect is negligible and thus no adjustment is needed.

Lastly, previous academic papers that cover underpricing use different prices in their calculation to measure underpricing. Schöber (2008) highlight that some authors use closing prices (Loughran and Ritter (2003)) while other use closing bid prices or the average between bid and ask prices (Ritter (1984)). Barry and Jennings (1993) have the most narrow approach when calculating underpricing as they compare the offer price with the

opening price of the first day of trading. Throughout this paper we will define underpricing as the difference between offer price and the first day closing price in accordance with most previous studies.

The general methodology of measuring underpricing is defined as:

$$\text{Underpricing } (R_i) = \frac{P_{i,1} - P_{i,0}}{P_{i,0}} \quad (1)$$

where R_i is the first day return of the IPO firm i , $P_{i,1}$ is the first day closing price of IPO firm i and $P_{i,0}$ is the offer price of IPO firm i .

To measure underpricing over a large sample and to observe country and time period trends, we will sort our data sample into so called measurement groups (defined g). The measurement groups follow the same logic as we have used throughout this study. The first measurement group, defined All, contains the entire data sample of 145 IPOs. Four measurement groups are defined for the entire data sample representing each country in our study, as we would like to measure underpricing on a country basis. Two measurement groups are based on which time period the IPO occurs in, namely Former and Recent. The last measurement group is based on the Swedish IPOs in the recent sample and whether the IPO has cornerstone investors or not. These measurement groups are defined “Cornerstone” and “No cornerstone”.

For each measurement group, we calculate each the equally-weighted (ew) and value-weighted (vw) means. As the market capitalisation of new listings differ across and within countries, we control for this when conducting the mean of our different measurement groups by using the value-weighted method.

$$\text{Underpricing}_g^{ew} = \frac{1}{N_g} \sum_{i=1}^{N_g} R_{i,g} \quad (2)$$

$$\text{Underpricing}_g^{vw} = \sum_{i=1}^{N_g} \frac{1}{w_g^i} * R_{i,g} \quad (3) \quad \text{where } w_g^i = \frac{mc_{i,g}}{\sum_{i=1}^{N_g} mc_{i,g}} \quad (4)$$

where N_g represents the number of IPOs in measurement group g , w_g^i represents the value-weight for IPO i in measurement group g and mc_i represents the market capitalisation based on the closing price at the day of listing for IPO i .

3.2 Aftermarket Performance

Measuring aftermarket performance of initial public offerings is a commonly occurring topic in previous studies but Barber and Lyon (1997) state that there is no single preferred methodology measuring abnormal returns. Thus, several considerations have to be done. First, we discuss the selection process of time regime and time period when measuring aftermarket performance. Secondly, we describe the selection of the abnormal return metric used in this study. Lastly, we go through the selection process when choosing the several benchmarks used in our study to calculate abnormal returns.

3.2.1 Time considerations

In our paper we are focusing on the first twelve months of trading and measuring aftermarket performance on five separate event windows (one, three, six, nine and twelve months). Our twelve month measure lies within the interval that both Certo et al. (2009) and Schöber (2008) defined as the time-span to measure long-term aftermarket performance. Bergström et al. (2006) on the other hand defined long-term performance as all time horizons longer than six months. In conclusion, in our study we will define our observations for one to three months as medium-term and six, nine and twelve as long-term.

As this paper investigates the performance of IPOs in what we define as the former IPO boom (2005 - 2007) as well as the current (2013 – ongoing), we have a natural constraint that limit our event window. Another rationale for choosing a time horizon in the lower span is that Harvard Business Review (2014) mention that "too many" of the large asset managers using short-term investment strategies and that those managers are increasingly setting the prices in the public market. Thus, we believe that evaluating the aftermarket performance of IPOs over three or five years is not as relevant as our shorter horizons. As we are measuring aftermarket performance, the starting point of our measurement period is the closing price of the first day of trading, in line with previous research on the same topic (Ritter (1991)). One of the underlying rationales behind this choice is that all investors do not get the desired share allocation at the offer price and thus need to buy shares on the aftermarket. Hence, the period of measuring aftermarket performance starts after the first day of trading during which all investors have had the opportunity to buy their desired number of shares on the aftermarket.

There are two methods of bundling abnormal returns, so called time regimes, that are commonly used when measuring aftermarket performance. The two approaches, calendar-time and event-time, both have their own strengths and weaknesses which will be discussed below. In the event-time approach, the aftermarket returns are bundled according to their relative age and not considering when the IPO occurred. For example, the first year-

returns are bundled together, irrespectively whether the IPO happened in 2006 or 2014. The calendar-time approach instead bundles returns in accordance to their calendar-time and disregards the age. In other words, the first year return of an IPO in 2015 are bundled together with the second year return of an IPO that went public in 2014. The two bundling approaches are shown below in a fictitious example to illustrate the differences:

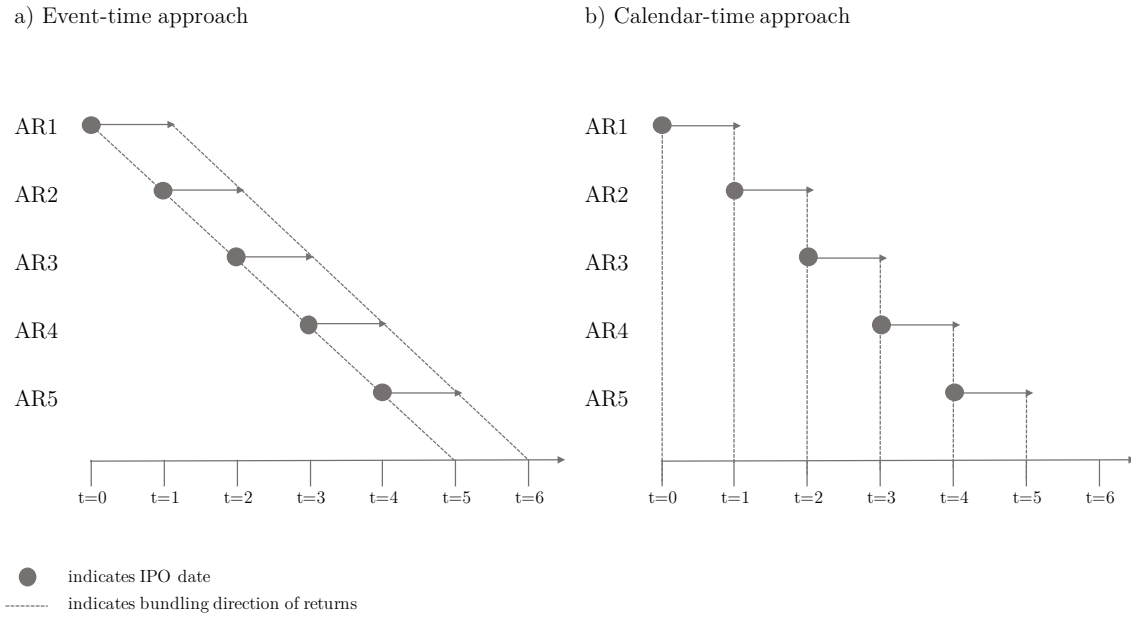


Figure 2: *Bundling of returns with regard to the two time regimes: event-time and calendar-time*

Schöber (2008) mentioned that the event-time approach is more widely used in previous studies that measure aftermarket performance. However, the event-time approach assumes that the returns of the different IPO firm are independent when in fact IPOs tend to cluster in times of high market valuations and thus returns will be overlapping. As there in fact is a cross-sectional dependence of IPO returns as common shocks to the stock market influence the return of several IPO firms, t-statistics can often be overestimated. How we handle this will be discussed later. The calendar-time approach eliminates the cross-sectional dependence as it bundles abnormal returns across stocks, for each calendar period. Another important consideration is that event-time metrics tend to capture an investor's ultimate return more precisely than the calendar-time approach (Krigman et al. (1999)). Ultimately, as this paper aims to conclude aftermarket investment strategies of newly issued shares, together with the wide use of event-time metrics in previous studies, we choose to only use the event-time approach when measuring aftermarket performance.

3.2.2 Measure of aftermarket performance

The two most commonly used metrics when measuring aftermarket performance in event-time are buy-and-hold abnormal returns (BHAR) and cumulative abnormal returns (CAR). Both metrics measure the difference between the return of a stock and its corresponding index over a period of time. The difference is that in the CAR metric, single-period (months) returns are summed up while in the BHAR metric the same returns are compounded. The metrics are calculated according to the formulas below:

$$BHAR_{0,T}^i = \prod_{t=1}^T (1 + R_t^i) - \prod_{t=1}^T (1 + R_t^{Benchmark}) \quad (5)$$

$$CAR_{0,T}^i = \sum_{t=1}^T (R_t^i - R_t^{Benchmark}) \quad (6)$$

The difference in measuring abnormal returns have both an impact on the level of aftermarket performance and their corresponding statistical interpretation. First of all, as the BHAR metric includes the monthly compounding of returns it reflects the return of a buy-and-hold investor more accurately in relation to the CAR metric. However, in some cases the BHAR metric produces extreme values due to the compounding effect over several periods. Thus, previous studies have shown that the distribution of the BHAR returns tend to be generally more skewed than their CAR counterparts (Kothari and Warner (1997)). We use BHAR as our study methodology in order to make our results comparable with other studies on this topic, such as Loughran and Ritter (1995), Schultz (2003) and Westerholm (2006) among others.

When computing average BHAR across our measurement groups, we will both compute averages based on equally-weighted basis as well as value-weighted basis. Value-weights are calculated based on the market capitalisation of the IPO firm at the day of listing. Previous literature have in many cases chosen to adjust their market capitalisations for inflation. However, as our time period is more limited and due to the historic low-inflation environment, we have chosen not to adjust for inflation.

$$BHAR_g^{ew} = \frac{1}{N_g} \sum_{i=1}^{N_g} BHAR_{i,g} \quad (7)$$

$$BHAR_g^{vw} = \sum_{i=1}^{N_g} \frac{1}{w_g^i} * BHAR_{i,g} \quad (8)$$

$$where w_g^i = \frac{mc_{i,g}}{\sum_{i=1}^{N_g} mc_{i,g}} \quad (9)$$

where N_g represents the number of IPOs in measurement group g , w_g^i represents the value-weight for IPO i in measurement group g and $mc_{i,g}$ represents the market capitalisation at listing date for IPO i in measurement group g .

3.2.3 Benchmarks

Previous studies on measuring aftermarket performance have concluded that there are mainly two types of benchmarks in order to generate abnormal returns (Schöber (2008)). One way is to benchmark the IPO returns to broad equity market indices while the other methodology uses comparable firms with similar risk characteristics. The majority of studies (Bergström et al. (2006), Westerholm (2006), Van der Geest and Van Frederikslust (2001)) use the former as that methodology is easily implemented and according to Bergström et al. (2006), broad market indices are exposed to the same fundamental risks as IPO firms and thus relevant for comparison. Other studies (Ritter (1991), Loughran and Ritter (1995)) have chosen the latter and paired IPOs with a matching firm to control for size and industry effects. We have ultimately chosen to follow the methodology of Westerholm (2006) who used the all-share index as benchmark for his study on aftermarket performance. Thus, in our study we use the all-share gross indices of Sweden, Denmark, Finland and Norway. Namely OMX Stockholm GI, OMX Copenhagen GI, OMX Helsinki GI and OBX Total Return Index. We use the gross indices (total return, including dividends) for all countries in order to replicate the corresponding return for an average investor on the Nordic stock markets.

3.3 Statistical tests

3.3.1 Underpricing

According to our top-down methodology used throughout the study, the first three hypotheses cover whether underpricing exists in the Nordics on a general level, by country and by our defined time periods. We conduct our tests by measuring whether the underpricing in our data sample (including subsamples divided by country and time period) can be differed from zero. In order to choose the appropriate methodology for the testing of underpricing we studied previous literature on this topic and found that several previous studies use parametric tests, specifically t-tests. (Westerholm (2006), Johnson and Miller (1988)). By studying the Q-Q plots and histograms of the data sample we believe

that it is plausible to use a parametric model to test underpricing. In other words, as the direction of underpricing is not completely certain, we use the same methodology as Westerholm (2006) who used a two-sided t-test to check whether underpricing differs from zero.

As mentioned, the tests were conducted in three levels according to our top-down methodology. First of all underpricing of the entire data sample was tested, secondly the underpricing for each separate country and thirdly, testing our hypothesis whether underpricing exists in each time period. Lastly, in hypothesis IV we conduct a test on the difference between the two time periods in order to see if the level of underpricing has changed. Results in level of underpricing and their corresponding statistical significance are found in the section where the findings are presented.

3.3.2 Aftermarket performance

The second area to conduct tests concerns the aftermarket performance of newly listed companies, corresponding to hypothesis V - VIII. As discussed in the methodology section, the basis of our tests will be the BHAR metric to measure abnormal returns over five separate time periods, which test medium and long-term aftermarket performance. We will continue with our top-down methodology. First measuring aftermarket performance in general across our data sample. Secondly, we test if there is evidence for any deviation from zero aftermarket performance in each of the Nordic countries. Thirdly, we test the aftermarket performance of IPOs in our two time periods separately. Lastly, we test if the level of aftermarket performance changed between our two time periods.

As discussed previously when presenting abnormal return metrics, testing compounded data has been shown to be difficult. Studies such as Cowan and Sergeant (2001) suggest that the overlapping periods in the sample can create a positive dependence between the returns leading to what they call an overlapping-horizons bias. This overlapping-horizons bias leads a positively skewed data and rejecting the null hypothesis too often. They suggest that a nonparametric test, for example the Wilcoxon Signed Rank test, should be used in order to deal with the skewness. The Wilcoxon Signed Rank test better copes with skewness than parametric tests and is according to Barber and Lyon (1997) the most suitable one to use when dealing with this kind of data.

We consider the skewness issue when analysing our results but since a majority of the studies in aftermarket performance, such as Van der Geest and Van Frederikslust (2001), Ritter (1991), Affleck-Graves et al. (1996) and Loughran and Ritter (1995) use parametric tests, we have chosen to do so as well. This since we believe that it is important to make our test results comparable with a majority of previous studies. Furthermore, as can be observed by the Q-Q plots and histograms presented in the appendix, we believe that it

is plausible to assume a normal distribution of our data sample. We will however conduct nonparametric tests, such as the Wilcoxon Signed Rank test, recommended by Barber and Lyon (1997), in order to check the robustness of our results, these results can also be found in the appendix.

3.3.3 Effect of cornerstone investors

When testing the last group of hypotheses, we will use an ex-ante approach to determine whether IPOs with cornerstone investors has different levels of price range spread, underpricing and aftermarket performance. These tests relate to hypothesis IX to XI. Further, we haven chosen to do all our tests relating to cornerstone investors purely on the subsample consisting of all Swedish IPOs in the recent time period. The main reasoning behind this choice is that the cornerstone phenomenon is only present in Sweden and the recent time period, with the successful IPO of Lifco in 2014 regarded as the starting point. Thus, there would be little economic interpretation by including the data sample of the former time period as well as the other Nordic countries when testing the cornerstone related hypotheses.

We have defined the spread of a price range as the following:

$$Spread = \frac{Price_{i,Max} - Price_{i,Min}}{Price_{i,Min}} \quad (10)$$

where $Price_{i,Max}$ is the upper price level presented in the prospectus of IPO i and $Price_{i,Min}$ is the lower price level presented in the prospectus of IPO i. If the offering is fixed-price, the spread is assumed to be zero in our study.

To test whether there is a connection between cornerstone investors and the price range, underpricing and aftermarket performance of the IPO, we were inspired by the methodology used by Bergström et al. (2006) and Van der Geest and Van Frederikslust (2001). Bergström et al. measured the effect of different private equity owners, using dummy variables, on the aftermarket performance and underpricing. In order to control for year effects, Bergström et al. also included year dummies. We will construct three different cross-sectional regression models where the only difference is the dependant variable, which will be price range spread, underpricing and aftermarket performance. These corresponds to hypothesis IX to XI. In relation to the aftermarket performance, we will only conduct tests on one, three and six months time horizon. The reason for this is that the number of observations among cornerstone backed IPOs drop significantly after six

months. Below are the three regressions relating to hypothesis IX through XI.

$$Spread = \beta_0 + \beta_1 * Cornerstone + \beta_2 * Y2014 + \beta_3 * Y2015 + \varepsilon \quad (11)$$

$$Underpricing = \beta_0 + \beta_1 * Cornerstone + \beta_2 * Y2014 + \beta_3 * Y2015 + \varepsilon \quad (12)$$

$$BHAR = \beta_0 + \beta_1 * Cornerstone + \beta_2 * Y2014 + \beta_3 * Y2015 + \varepsilon \quad (13)$$

where *Cornerstone* is a dummy variable that takes the value of one when a cornerstone investor is present and zero if not, *Y2014* is a dummy variable that takes the value of one if the year of the observation is 2014, and zero otherwise. Lastly, *Y2015* is a dummy variable that takes the value of one if the year of the observation is 2015, and zero otherwise.

3.4 Robustness tests

As we solely use the t-test (parametric method) for hypothesis I-IV, our main robustness test was to redo our testing by using nonparametric methods. This because we observe positive skewness of the data that might have an effect on the results. In the results presented in the study, we conduct all of our parametric tests on the equally-weighted measures of underpricing. The results of all robustness tests can be found in the appendix.

As described earlier in the methodology, using compounded data can according to Cowan and Sergeant (2001) result in an overlapping-horizons bias and a high positive skewness. In such cases, the result being that the null hypothesis is too often rejected. They suggested in order to cope with the problem, that a nonparametric test should be used, such as the Wilcoxon Signed Rank test. To make our results more robust we have tested hypothesis V-VIII, relating to aftermarket performance, with nonparametric methods. The results presented in our study are the abnormal returns in relation to the country indices.

Lastly, in order to check the robustness of our regressions that cover the effect of cornerstone investors (hypothesis IX - XI), we ran the regression using White's standard errors which adjusts for heteroscedasticity.

4 Data

The following section aims to present the descriptive statistics of our data set. First, we will present the data on an aggregated level. Following this, we will describe how the data sample was collected and which considerations were made. Lastly, we present limitations of our data set and how we deal with it.

To start the data section, we present some summary tables of our data sample in order to better understand our study and the subsequent results.

Table 1: Overview of data sample

<p>The Market Value in the listing refers to the equally-weighted market capitalisation average as per the closing price on the first day of trading, for each measurement group or year. No adjustments for inflation have been made. SE refers to Sweden, DK refers to Denmark, NO refers to Norway and FI refers to Finland. The years 2005, 2006 and 2007 refer to the former time period in our study. The years 2013, 2014, 2015 and 2016 refer to the recent time period.</p>										
	# of IPOs					Market Value at listing (EURm)				
	SE	DK	NO	FI	All	SE	DK	NO	FI	All
2005	4	2	18	1	25	185	1 190	140	74	229
2006	10	5	16	3	34	434	134	702	476	520
2007	4	5	8	2	19	226	2 446	386	274	883
2013	2	1	6	2	11	502	651	431	50	395
2014	12	2	8	0	22	405	2 676	459	n.a.	631
2015	18	1	5	5	29	671	528	380	150	526
2016	4	1	0	0	5	259	1 340	n.a.	n.a.	208
Total	54	17	61	13	145	462	1 362	410	223	515

Below, we present a table showing the number of observations that went public during the two Nordic IPO booms, split by industry. The data set shows what the casual observer might suspect; that the largest country in the Nordics, Sweden, has the most active capital market by size of total market capitalisation. By instead looking at the number of IPOs and disregarding the size, the Norwegian main market was highly active during the former boom.

From our data, we observe a similar pattern as the one described by Westerholm (2006) who noticed IPO clustering on the Nordic market in relation to separate industries. For example, we notice clustering of IPOs related to oil and gas in Norway during the earlier time period. What can also be observed in the table presenting the number of IPOs split by country is that there are far more Swedish and Norwegian IPOs. There are several

Table 2: Data sample split by industry

The table below presents our entire data sample of 145 IPOS, split by the IPO year and by their broad industry classification								
---	--	--	--	--	--	--	--	--

Industries	2005	2006	2007	2013	2014	2015	2016	
Basic Materials	0	3	0	0	0	0	0	3
Consumer Goods	7	6	2	1	3	4	1	24
Consumer Services	0	2	0	1	0	2	2	7
Financials	2	4	4	2	5	7	0	24
Health Care	4	5	4	0	2	5	1	21
Industrials	4	5	3	2	8	8	1	31
Oil & Gas	4	4	3	3	2	0	0	16
Technology	4	5	1	2	0	3	0	15
Telecommunications	0	0	0	0	1	0	0	1
Utilities	0	0	2	0	1	0	0	3
	25	34	19	11	22	29	5	145

explanations why the number of IPOs in our data sample are lower in Denmark and Finland. For instance, after the bankruptcy of OW Bunker in 2014, the public market for newly issued stocks in Denmark dried up. On the other hand, the Norwegian stock market is regarded one of the most prominent stock markets concerning energy and shipping companies. This can partly explain the unproportionate number of IPOs in Norway during the former time period.

The upper table also presents the average market capitalisation of the companies that went public, split by year and country. However, the averages by year and country are somewhat unclear. This, we believe, is due to a few observations in Denmark that all are of significant size, for example: ISS and DK Trends Invest. On the other hand, several small IPOs occurred on the Norwegian stock market in the former time period. In conclusion, we cannot see any trends that could be reflected by differences in listing requirements.

What can be observed in our data sample is that many of the companies floated on the main Nordic stock exchanges during the recent time period are former private equity portfolio companies. This can be seen as a result of many private equity vintages dating before the financial crisis now have the opportunity to make financial exits.

4.1 Selection of companies and time period

To make our study more relevant for institutional investors we only chose to look at the main markets, NASDAQ OMX Nordic and Oslo Stock Exchange. Furthermore, features such as cornerstone investors are only present on the main listing, with two exceptions; LeoVegas and Catena Media on First North Premier. The rationale behind including two

IPOs from First North Premier is that the regulation changes from 1st of January 2016, aligning the requirements of First North Premier with the NASDAQ main list. Among the changes were increased free float requirement from ten to twenty five percent as well as recommendation for companies to apply domestic corporate governance code.

A Pan-Nordic approach was chosen to broaden the sample and cover more sectors in the study. We agree with Westerholm (2006) that the Nordic countries are similar institutionally and economically which enable us to group the IPOs. Furthermore, we also agree with Westerholm to exclude the smallest country of the Nordics, Iceland, due to its small stock market.

Another aspect to consider is whether spin-offs and carve-outs should be included in the data sample. We chose to include spin-offs where the previous owner performed a full IPO process rather than just distributing shares of the new entity amongst existing shareholders. One example of such a spin-off that is included in the data sample is the IPO of NNIT. The firm was the internal IT consultant of Novo Nordisk and was floated on the Copenhagen Stock Exchange in March 2015. On the other hand, the spin-off of Husqvarna from Electrolux in 2006 is not included in our data sample as the shares were directly distributed to the shareholders of Electrolux. An overview of the different listing requirements is presented below:

Table 3: Listing requirements by market place

	NASDAQ OMX Main lists	First North	Markets First North Premier	Oslo Main List	Oslo Axess
Prospectus required	Yes. Needs prepared, published and approved by financial authorities	Only needed if shares are offered to the public	Same as First North	Yes	Yes
Minimum Market Capitalisation	1 EURm	No requirement	10 EURm	EUR 40m	EUR 1m
Free float	25%	Sufficient number of shareholders and at last 10% free float or an assigned liquidity provider	25%	25%	25%
Corporate Governance Code	Needs to comply with national Compliance Code	Not needed	Same as main market	Norwegian corporate governance code	Norwegian corporate governance code
Financial condition	Documented profitability and sufficient financial resources	Not needed	Same as First North	The company must have sufficient liquidity to continue its business activities for at least 12 months from listing	Same as main list
Accounting History	Sufficient operating history and three years of IFRS annual accounts	Not needed	Same as First North	History and business activity spanning at least three years. Exemption can be granted.	Submitted at least one annual or interim report. Commenced planned business activity

Source: NASDAQ OMX (2016) and Oslo Børs (2016b)

In order to determine periods which can be defined as hot IPO markets, we gathered data from NASDAQ OMX and Oslo Stock Exchange on the total number of new listings on the main markets.

As previously described in the literature review, the most common way of determining hot and cold markets is by looking at the total number of IPOs per year. We used a similar method and concluded that the two most recent hot IPO markets occurred between 2005-2007 and 2013 - ongoing. These two periods will be the basis for the tests described and conducted later in the study. The main reason for excluding 2004 was the merger between OMX and Copenhagen Stock Exchange that occurred in 2005 which decreased the institutional differences between the countries. In addition, excluding 2004 makes our data sample across time periods roughly equal in size. The SEB bankers validate our choice of time periods as they point out that the years between 2005 and 2007 were especially hot.

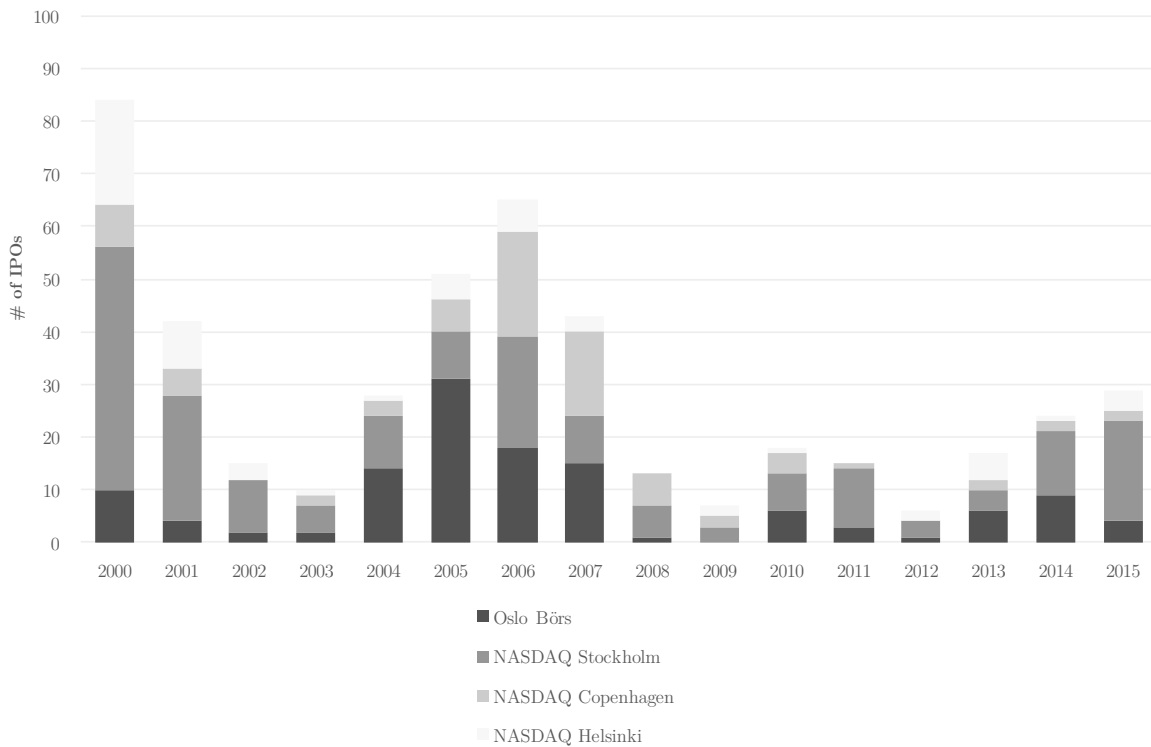


Figure 3: *Number of main market listings in the Nordics between 2000 and 2015.*

Source: NASDAQ OMX (2014) and Oslo Børs (2016a)

4.2 Method for data collection

In order to find data, such as prospectuses and issue prices for all IPOs, a combination of databases from national Financial Supervisory Agencies, S&P Capital IQ, Bloomberg and

media sources were used. In total we have chosen to study 145 IPOs across the Nordics. Below is the final data sample, split by the different measurement groups used in our study; countries, time periods and by cornerstone investors.

Table 4: Measurement Groups

The table below presents the four different measurement groups upon which we conducted tests. The split by cornerstone investor is done only on the Swedish IPOs in the recent period, due to the phenomenon recent emergence in Sweden			
<i>Group</i>	<i>n</i>	<i>Group</i>	<i>n</i>
All observations	145	Split by time period	
		Former	78
		Recent	67
Split by country		Total	145
Sweden	54		
Denmark	17	Split by cornerstone investor	
Norway	61	Cornerstone	20
Finland	13	No cornerstone	16
Total	145	Total	36

A number of IPOs had to be excluded during the data collection process. The reason for exclusion varied from lack of information in relation to price data of companies that were traded on an OTC market before they went public on the main market. We observed that a large part of the IPOs excluded were dated to the early period and were floated in Norway. A large number of the new listings on the Norwegian main market was de facto companies switching market place (from the OTC market and Oslo Axess). This is partially explained by the institutional nature of the Norwegian Stock Exchange where listing requirements are different from the other Nordic countries in combination with small companies in oil and oil services using the industry specific IPO window during the former boom.

All daily price data was collected using a Bloomberg Terminal and the reason for this was that we found it having the most complete market data, especially in finding share prices from delisted shares. Bloomberg was also used when collecting some of the data related to the IPO, price ranges and IPO dates, when it could not be found in primary sources such as the National Financial Supervisory Agencies.

All information regarding cornerstone investors, price range and other features of the IPO were collected from the published IPO prospectuses. In cases where the prospectus was not found, we relied on primary sources from the media, such as company websites or Bloomberg. The issue price was collected by looking at press releases from the issuing

company or by looking at Bloomberg’s information regarding the issue.

4.3 Simplifications and assumptions

The most significant simplification we have made is to use an index to measure over- and underperformance in the aftermarket. There could be an argument that the Fama-French factors should be used in order to control for size and value when explaining the aftermarket performance of newly issued shares. However, we have chosen this methodology based on previous finding of Loughran and Ritter (1995) who suggested that book-to-market and momentum only have a modest effect in explaining the performance of recently listed companies. The same conclusions were drawn by Krigman et al. (1999) who suggested that book-to-market and momentum had non-significant effects on their results.

Another major assumption we have made is regarding the cornerstone investors. As discussed in the section describing cornerstone investors, there is no legal definition of cornerstone investors in the Nordics and Europe. Therefore, we have chosen to define cornerstone investors as an investor disclosed already in the prospectus committing to acquire a certain number of shares or value at the issue price.

4.4 Qualitative data

In order to see how the market participants look at IPOs and the different aspects of this study, we conducted two interviews. The first interview was conducted with two senior investment bankers at SEB discussing the underwriters’ role in an IPO process, especially when cornerstone investors are present. We also interviewed a senior hedge fund manager at RAM Asset Management, a hedge fund that has been a cornerstone investor in three recent Swedish IPOs (CLX Communications, Catena Media and Tobii) to get the buy-side perspective of the IPO process, especially in relation to cornerstone investors. As the cornerstone investor phenomenon is relatively new and the number of previous studies on this matter is limited, we believe the interviews give us additional and essential information to complement previous research and to give additional depth to our analysis.

4.5 Criticism of the data set

The following section aims to discuss our data set critically and how we have chosen to deal with these problems. One problem that arose and that is mentioned previously is that there are a number of companies that have been public for less than a year. These companies were not excluded from the data set; the tests were conducted only for the period they have been active, rounded down to the closest month. As most of the corner-

stone investor backed IPOs were conducted during 2015, at the time of this study all firms had not been public for the entire time period of twelve months. This was the reason for focusing on the one, three and six months aftermarket performance for the cornerstone test in order to include as many observations as possible.

Another problem was the risk of missing historical IPOs. In order to mitigate this risk, we cross-checked our collected data sample from the National Financial Supervisory Agencies with the IPO database of S&P Capital IQ. By comparing our collected data sample across several databases, we could easily find out which listings were de facto stock market switches, spin-offs or carve-outs.

5 Findings

We will present the findings in three separate sections, according the top-down methodology used throughout the study. First we present our result in connection to underpricing, covering hypothesis I to IV. Secondly, we show our results related to the aftermarket performance of IPOs, corresponding to hypothesis V to VIII. Lastly, we present the results for the three regressions that measure the level of price range spread, underpricing and aftermarket performance in IPOs with cornerstone investors, corresponding to hypothesis IX to XI.

5.1 Underpricing

The table below summarises the underpricing in three levels, in general, by country and time period. We present the equally-weighted average in the table below and the value-weighted average in the appendix. We perform our tests solely on the equally-weighted averages of underpricing.

Table 5: Findings: Underpricing

<p>The table below presents the results for the first four hypotheses. Statistical tests have only been performed on equally-weighted averages of underpricing. P-stat refers to the smallest significance level at which the null hypothesis can be rejected. Max refers to the maximum observation in the specific measurement group. Min refers to the minimum observation in the specific measurement group</p>					
Hypothesis	Groups	n	First Day Underpricing		
			<i>Equally Weighted</i>	<i>max</i>	<i>min</i>
<i>H1</i>	All	145	9%	163%	-17%
	<i>p-stat</i>		0.0000		
<i>H2</i>	a) SE	54	10%	50%	-17%
	<i>p-stat</i>		0.0000		
	b) DK	17	28%	163%	-1%
	<i>p-stat</i>		0.0225		
	c) NO	61	3%	31%	-16%
	<i>p-stat</i>		0.0125		
<i>H3</i>	d) FI	13	6%	24%	0%
	<i>p-stat</i>		0.0083		
	a) Recent	67	9%	40%	-17%
	<i>p-stat</i>		0.0000		
	b) Former	78	9%	163%	-12%
	<i>p-stat</i>		0.0016		
			First Day Underpricing		
			<i>Difference between periods</i>		
<i>H4</i>	Former - Recent		0%		
	<i>p-stat</i>		0.9023		

As described in the methodology section, we first test on a Pan-Nordic level whether underpricing exists. Our results show with strongest possible statistical significance that underpricing exists with a mean of 9% across all observations. The rejection of the null hypothesis was also confirmed by our nonparametric robustness test. The observed mean is within the range previous academia have concluded as well as confirmed by the SEB bankers who mentioned their ballpark figure of between 5% to 10%. Historical levels of underpricing was presented by Ritter and Welch (2002) that covered the years of 1980-2000. They concluded that the underpricing level changed from a modest 7% between the years 1980-1989 to 15% between the years 1990-1999 and peaking during the dot-com era when it reached 65%. In our data sample, some IPOs can be seen as extreme outliers such as the Danish IPO of Chemometec which experienced an initial return of 163% the first day of trading.

After we have concluded that underpricing exists among the Nordic IPOs, we test the level of underpricing in the four Nordic countries, corresponding to hypothesis II. We can also conclude with high certainty that the level of underpricing in Sweden has been 10% across the two IPO booms. However, in Norway the underpricing level is substantially lower amounting to only 3%. We suggest that it can partially be related to institutional differences. A relatively lower level of underpricing in Norway has been confirmed by several previous studies, such as Banerjee et al. (2011) who covered IPOs in Norway during 2000-2006 and found an average underpricing of 4%. For the findings of Danish and Finnish IPOs, we can conclude that underpricing exists but due to their relatively smaller sub sample size, we do not draw any major conclusions from the results. The Danish subsample includes the Chemometec IPO mentioned previously which move the equally weighted underpricing upwards. The presence of underpricing in the different countries was confirmed by our nonparametric robustness tests presented in the appendix. What is worth noticing is that the level of underpricing in Norway cannot be differed from zero using nonparametric methods.

The value-weighted average underpricing is found in the appendix. It is worth noticing that the value-weighted underpricing in Norway equals 9.6% which is higher than the equally-weighted underpricing (3.0%). This indicates that there were a large of number of smaller IPOs experiencing a lower level of underpricing in relation to the Norwegian mean. The difference between value-weighted and equally-weighted underpricing averages are especially high in the former boom, indicating that a large number of non-mature firms entered the stock market.

We also test the level of underpricing in each time period, regardless of country. We find that the level of underpricing amounts to 9% in both time periods, relating to hy-

pothesis III. When testing whether the underpricing has changed over time, we can not find any statistical proof of such change. However, due to the similar level of underpricing in each period separately, we can observe results which indicate that there has not been any dramatic institutional changes during this time.

5.2 Aftermarket performance

Below we present the aftermarket performance of the Nordic IPOs in our data sample. As described in the methodology section, we have chosen to focus and conduct our tests only on the BHAR metric and to use the country market indices as benchmark. BHAR metrics using the industry specific indices are presented in the appendix.

Table 6: Findings: Aftermarket performance

<p>The table below presents the results relating to hypotheses 5-8 which cover the aftermarket performance of IPOs. We present the BHAR (Buy-and-Hold Abnormal Returns) across five time periods (1M, 3M, 6M, 9M and 12M). P-stat refers to the smallest significance level at which the null hypothesis can be rejected</p>						
Hypothesis	Groups	BHAR (Equally Weighted)				
		Time period				
		1M	3M	6M	9M	12M
H5	All	-1%	6%	6%	4%	1%
	<i>p-stat</i>	0.3889	0.0014	0.0466	0.2485	0.7794
H6	a) SE	1%	5%	11%	9%	9%
	<i>p-stat</i>	0.198	0.0049	0.0235	0.0529	0.1433
	b) DK	-6%	-5%	-9%	-8%	-6%
	<i>p-stat</i>	0.0179	0.1107	0.0789	0.3475	0.4672
	c) NO	-1%	11%	9%	5%	2%
	<i>p-stat</i>	0.5316	0.0027	0.0898	0.4052	0.829
	d) FI	-1%	-3%	-8%	-7%	-20%
	<i>p-stat</i>	0.5158	0.3146	0.3933	0.4912	0.1042
H7	a) Recent	0%	5%	9%	6%	-1%
	<i>p-stat</i>	0.9234	0.0057	0.0349	0.2590	0.9152
	b) Former	-1%	6%	4%	3%	2%
	<i>p-stat</i>	0.2706	0.0338	0.3426	0.5744	0.6910
H8	Former - Recent	BHAR (Equally Weighted)				
		Difference between periods				
		1M	3M	6M	9M	12M
		-1%	1%	-5%	-4%	3%
	<i>p-stat</i>	0.3648	0.7415	0.4220	0.6039	0.7477

When looking at the aftermarket performance it is not possible to observe a clear pattern across all countries or time periods. However, the majority of our statistically significant

results come from the BHAR metrics with time horizon of three to six months. The reason for not finding any clear pattern could be potentially explained by the noise related to stock market data.

We find that all IPOs in our data sample outperform the market with 6% over both three to six months. Thus, we can observe the same trend as Krigman et al. (1999) and Affleck-Graves et al. (1996) who found IPOs to be an good investment on a medium to long-term basis. Both studied the American IPO market and concluded that IPOs outperform the market over one, three and twelve months. However, IPO anomaly regarding the long-term underperformance of IPOs usually relate to time horizons between two and five years (Loughran and Ritter (1995)). Both the three and six month aftermarket overperformance are supported by our parametric tests. However, when conducting non-parametric test to validate our results, only the three month aftermarket overperformance is still statistically different from zero.

After we have concluded that the IPOs in our data sample outperform the market on three to six months, we test whether there are different levels of aftermarket performance in the four Nordic countries. From our findings, we can determine that the Swedish IPOs, regardless of time period, outperform the market on average by 5% and 11% during three to six months after they went public. An interesting observation is that the nine month overperformance in Sweden is statistically significant using nonparametric methods, while that specific measure could not be differed from zero using a parametric test. We can also conclude that the Norwegian IPOs outperform the Norwegian market index by 11% during the three first month public. However, more or less all other country specific BHAR metrics are not statistically significant which limits our ability to draw any further conclusions. The numbers presented in thus paragraph are also statistically significant when performing nonparametric robustness test. Details of the test can be found in the appendix.

Next we test the aftermarket performance of IPOs in the two defined time periods, regardless of country. Here, we find almost the same level of overperformance as in the previous tests. On a three month time horizon both the recent and former group of IPOs outperform the market with 5% and 6% respectively. We can also conclude that the recent sample of IPOs outperform the market with an average of 9% on a six month basis. The findings regarding the recent time period are strengthened by our nonparametric robustness test. The details can be found in the appendix. However, in relation to hypothesis VIII we do not have any significant proof of a change in the level of aftermarket performance between the periods.

5.3 Effect of cornerstone investors

Below are the results from our three cross-sectional regression models that measure the level of price range spread, underpricing and aftermarket performance in IPOs with cornerstone investors. All significant results were rerun using White standard errors in order to test for heteroscedasticity.

Table 7: Findings: Effect of cornerstone investors

The table below presents the results of hypotheses 9 to 11 which cover the effect of cornerstone investors in IPOs. Standard errors are reported in parentheses. *, ** indicates significance at the 95% and 99% level, respectively					
Hypothesis	H9	H10	H11		
Dependent Variable	<i>Spread</i>	<i>Underpricing</i>	<i>BHAR 1 M</i>	<i>BHAR 3M</i>	<i>BHAR 6M</i>
Constant	0.173** (0.037)	0.046 (0.060)	-0.030 (0.040)	0.092 (0.076)	0.122 (0.228)
Cornerstone	-0.072* (0.033)	0.186** (0.054)	0.006 (0.036)	-0.005 (0.058)	0.124 (0.178)
Year 2014	-0.031 (0.041)	0.022 (0.067)	0.040 (0.045)	-0.068 (0.083)	-0.076 (0.247)
Year 2015	0.011 (0.034)	-0.073 (0.056)	0.062 (0.038)	0.003 (0.094)	0.024 (0.281)
R-squared	0.1325	0.3048	0.0865	0.0953	0.1003
Adjusted R-squared	0.0512	0.2397	0.0008	-0.0016	-0.0122
No. observations	36	36	36	32	28

When studying the regression results as to whether the presence of cornerstone investors in an IPO affects the price range presented in the prospectus, we can observe one clear pattern. We observe that IPOs with cornerstone investors have a more narrow price range. This was confirmed when we reran the regression using White standard errors. The implication and reasons for this will be discussed in the contribution section. We can conclude that the year dummies that control for year effects do not have any statistically significant relevance when explaining the price range.

The second regression model describes the relationship between underpricing in an IPO and the presence of a cornerstone investor. Here we find a strong correlation between underpricing of the recent Swedish IPOs and the presence of cornerstone investors, even when controlling for the year 2014 and 2015. As it is possible to observe the cornerstone dummy still has a strong positive significance even when we control for which year the company went public. The cornerstone effect was confirmed when White standard errors were used. The implications of this will be discussed in the contribution section.

The next parameter to test concerns the aftermarket performance of cornerstone backed IPOs. However, we find that we can not explain the impact of cornerstone investors on the subsequent aftermarket performance, irrespective of time horizons. This is in line with our expectations since the aftermarket performance metric is an extremely noisy parameter to test as can be observed with the earlier tests conducted on aftermarket performance.

6 Contribution

6.1 Underpricing

Underpricing is a widely discussed phenomenon and has been studied before. This section looks at underpricing and discusses what can be said about it in relation to the two most recent Nordic IPO booms. A theory that rather neatly explains the level of underpricing presented in this study, which is also applicable on our findings, is the theory of Guo (2011) who suggested that underpricing reflects the different costs of capital for the owners before and after IPOs. This theory gives a good explanation as to why underpricing is lower now compared to the study of Westerholm (2006) who concluded that the average Nordic underpricing was around 17% between the years 1991-2001. During the years Westerholm examined, a lot of IT companies went public. These companies were often backed by venture capital funds with a higher cost of capital than the standard buyout firms, whose portfolio companies are more common nowadays to go public. This is a plausible explanation as to why the underpricing we observe in our study is lower than the one Westerholm presented. What we can conclude by looking at our results is that the recent IPO boom has not led to the change in incentives described by Ritter and Welch (2002), as the underpricing has not changed since the former boom. Ritter believed the reason for underpricing reached an average of close to 65% during the dot-com bubble was that the underwriters and selling shareholders started to act with new incentives. The reason for rejecting Ritter's theory in the Nordics is that we do not observe any statistically significant changes to the underpricing between the two periods.

When discussing the IPO market with the investment bankers of SEB, they referred to underpricing as the IPO discount. This indicates that professionals do not consider this phenomena to be an anomaly, which the underpricing term suggests. As can be observed in the findings section, the underpricing level we observed was completely in line with what the SEB bankers expected, somewhere between 5-10%. One of many explanations for underpricing is that it creates a positive momentum and a good aura surrounding the company. This is in line with the reasoning of Affleck-Graves et al. (1996) and Krigman et al. (1999) who both suggested that a modest underpricing creates a positive momentum for newly listed companies. Krigman et al. also suggested that companies with negative initial return suffer from negative momentum during the first six months of trading. The good aura theory was confirmed by the SEB bankers who said that the underwriter use their mandate for price stabilisation if necessary, in order to avoid a negative return the first day. However, since a significant majority of the IPOs experience positive initial returns during the recent time period, price stabilisation has rarely been used according to the SEB bankers.

A recent example of the negative aura of a newly issued company was the IPO of Bac-tiguard in 2014. The stock fell 17% on the first day of trading and for this reason the Swedish daily newspaper Svenska Dagbladet (2014) called the IPO a total failure. The company and the management later received criticism from the Swedish Shareholders' Association calling the company not mature enough for the stock exchange. Publicity like this is never good for the management and it is arguable that if the company had been underpriced, the criticism would not have been as severe. Another aspect of this particular IPO was that the sole underwriter has had a hard time gaining new IPO mandates post this issue, relating to the theories of Beatty and Ritter (1986). This indicates that underpricing and subsequent aftermarket performance are important when evaluating the success of a particular underwriter. This incident highlights why it is in the interest of the underwriter to deliver a modest underpricing, or so called IPO discount, as well as choosing mandates carefully.

To conclude, underpricing has both economical causes, discussed mainly by Guo (2011) and behavioral causes discussed by Krigman et al. (1999) and practitioners.

6.2 Aftermarket performance

The aftermarket performance of IPOs is a heavily debated topic within the studies of IPOs. Several studies such as Ritter (1991), Loughran and Ritter (1995) and Aggarwal and Rivoli (1990) suggested that IPOs underperform on the long-term horizon of one to five years. This does not contradict our results that suggest that the abnormal return of Nordic IPOs is significantly positive on a three to six month basis, mostly because we look at a different market and different time horizon. Westerholm (2006) analysed the Nordic IPO market between the years 1991-2001 and suggested that Swedish and Finnish IPOs underperform the market while Norwegian IPOs outperform, these results do not contradict ours since we look at a different investment horizon and during a different time period.

We do not observe any major differences between the BHAR metrics when using the industry specific indices in relation to the country specific indices presented in our study. Descriptive statistics of the BHAR returns are presented in the appendix. The lack of difference suggests that the explanation of Ljungqvist et al. (2006), that the IPO aftermarket performance suffers from an irrational exuberance in certain sectors can not be applied on our data set. Their explanation would have been more plausible if it had been a difference between the abnormal returns on the broad market index and the industry specific indices.

We believe that the long-term underperformance of IPOs described by other studies can be linked to a phenomenon that we discussed in our SEB interview, flight to quality. As

can be observed in our sample and previous studies, IPOs booms coincide with strong equity markets. The subsequent years after IPO booms are often linked with a downturn in the economy; in these times asset managers tend to run to safety by selling companies with short history and unproven track record. In other words, selling recently public companies. It would therefore be interesting to see how the recent vintage of IPOs will handle a future downturn in the economy. Until then, it will not be possible to see if the Nordic IPO market has changed since the studies of Westerholm.

6.3 Effect of cornerstone investors

6.3.1 Price range

The price range of an IPO is an area that has not been covered in academia as much as other features of the IPO market. By our findings, we observed that the price range is more narrow in IPOs backed by cornerstone investor. The reasoning for this can be partially explained by our interview with a Swedish hedge fund manager who suggested that a more narrow price range can be explained by the facilitated process of negotiating the value with cornerstone investors, instead of having a book building process. However, we suggest the selling shareholders should be aware of the potential drawbacks of having a fixed price offer. Mainly because a price interval helps the selling shareholder to adjust for unforeseen macro factors in the economy. For example, in the fixed-price IPO of Lifco in 2014, the stock market rallied during the book building process, making the valuation of the company lower than peers and leading to a subsequent underpricing close to 33%.

6.3.2 Underpricing

The most interesting part of our findings is that the IPOs backed by cornerstone investors experienced a higher level of underpricing. We believe this is the most interesting part of our findings as there is limited previous research on this topic covering Nordic IPOs. Previous studies on cornerstone investors have focused mainly on the Asian market where the phenomenon has its roots. One of the theories explaining our results was presented during the interviews with the underwriters and hedge fund manager. They both agreed that cornerstone investors function as a form of insurance when taking a company public as the seller knows that a large part of the offer is already sold to institutional investors. The payment for this insurance could be argued to be traced to the increased underpricing that is observed in our findings.

As suggested by Tan and Ong (2013), cornerstone investors can provide valuable signalling when a company enters the stock market. The idea of cornerstone investors acting as positive signals was confirmed in our interview with the underwriters when we discussed IPOs in sectors that were new to the stock exchange or companies that in some

way were controversial according to media. The rationale behind this theory is that well respected cornerstone investors signal quality in these IPOs and thus potentially reducing the controversy of the firm. It can be argued that the price the selling shareholder pays is an increased underpricing and it is possible to see that in controversial sectors such as health care and gambling, the cornerstone investors take a larger portion of the free float together with a higher observed level of underpricing. This indicates that the “insurance premium” works and adjusts to different level of risks.

This cornerstone effect corresponds with the theories we discussed with SEB, that the selling shareholders pay for the presence of a cornerstone investor by giving away part of the up-side in the form of underpricing. However, it can also be argued that the presence of cornerstone investors justify a valuation that is higher relative to a situation without cornerstone investors. This is in line with McGuinness (2014) that observes a higher valuation multiple of cornerstone backed IPOs in relation to non-cornerstone backed IPOs.

6.3.3 Aftermarket performance

The next of our hypothesis relates to the aftermarket performance of IPOs backed by cornerstone investors. Due to limited number of observations in general covering cornerstone backed IPOs and especially post six month time horizon, we cannot observe any significant impact of cornerstone investors on aftermarket performance. Aftermarket performance data covering several months is in general noisy which makes it more sensitive when the number of observations is low.

An interesting aspect discussed in both interviews was the supply and demand for cornerstone investors on the market. The underwriters stated that there is high demand for participating as a cornerstone investor due to the opportunity of acquiring a large, certain, number of shares. The hedge fund manager at RAM states that the attractive aspect of being a cornerstone investor is the possibility to evaluate the investment opportunity over a longer period of time and more thoroughly since you get the opportunity to meet the management outside the formal IPO roadshows. RAM also stated that the main competitive advantage when being a cornerstone investor is having a track record of being a fundamentally oriented long-term investor. This is in line with theories of Loughran and Ritter (2003) who mentioned that the best way for an underwriter to conduct an IPO is to sell large chunks of shares to investors who will not flip them in the aftermarket. The main reasoning behind this theory is to avoid expensive price stabilisation for the underwriter while the shareholders make a profit from the eventual price appreciation resulted by the high demand of shares in the aftermarket.

6.3.4 Critical interpretation of findings

Our cross sectional regressions show that there is a relatively strong correlation between the dependent variables price range and underpricing and the independent variable, the presence of a cornerstone investor. What is important to notice is that this does not necessarily imply causality. In our study this might imply that increased underpricing and decreased price range when a cornerstone investor is present can be explained by company specific factors, a certain sector or by the choice of underwriter rather than the presence of cornerstone investor. The sector explanation would not be applicable in our sample since it is possible to observe that non-cornerstone backed IPOs are relatively mixed. However it illustrates a potential problem and we therefore suggest that the reader should view our results primarily as correlation and be careful when assuming causality, despite the suggestions of causality made by both investment bankers and fund managers in our interviews. What can be said for certain is that the Swedish IPO market has changed during the last couple of years.

7 Conclusion

In line with previous studies of the IPO market, we found that underpricing exists in the Nordics during the two most recent IPO booms. However, the level of underpricing has decreased significantly since the dot-com era, indicating that companies going public nowadays differ from the ones during the bubble, when many companies were backed by venture capital. In contrast, we do not see any particular difference of underpricing between our two time periods, 2005-2007 and 2013 and onwards. From this, we conclude that there are no drastic differences in the type of owner making financials exists during these two booms, in comparison with the dot-com bubble which is characterised by previous owners having extremely high required rates of return.

Table 8: Summary of results

The table below states our 11 hypotheses, divided into three separate groups, and the corresponding result as well as the level of statistical certainty. * refers to significant buy-and-hold abnormal (BHAR) returns on three month time horizon. ** refers to significant buy-and-hold abnormal returns (BHAR) on both three and six months time horizon. The column support presents whether we have statistical support for our hypotheses. The α level is the probability of rejecting the null hypothesis given that it is true.		
Section 1: Underpricing	<i>Support</i>	α
H1: Underpricing is present on the Nordic IPO market	<i>Yes</i>	0%
H2 (a): Underpricing is present in Sweden	<i>Yes</i>	0%
H2 (b): Underpricing is present in Denmark	<i>Yes</i>	2%
H2 (c): Underpricing is present in Norway	<i>Yes</i>	1%
H2 (d): Underpricing is present in Finland	<i>Yes</i>	1%
H3 (a): Underpricing is present in the recent period	<i>Yes</i>	0%
H3 (b): Underpricing is present in the former period	<i>Yes</i>	0%
H4: Underpricing has increased between the two periods	<i>No</i>	<i>n.a.</i>
Section 2: Aftermarket performance		
H5: Nordic IPOs outperform the market on a medium to long-term basis	<i>Yes</i>	5%**
H6 (a): Swedish IPOs outperform the market on a medium to long-term basis	<i>Yes</i>	5%**
H6 (b): Danish IPOs outperform the market on a medium to long-term basis	<i>No</i>	<i>n.a.</i>
H6 (c): Norwegian IPOs outperform the market on a medium to long-term basis	<i>Yes</i>	5%*
H6 (d): Finnish IPOs outperform the market on a medium to long-term basis	<i>No</i>	<i>n.a.</i>
H7 (a): Nordic IPOs in the recent time period outperform the market on a medium to long-term basis	<i>Yes</i>	5%**
H7 (b): Nordic IPOs in the former time period outperform the market on a medium to long-term basis	<i>Yes</i>	5%*
H8: The aftermarket performance of Nordic IPOs has increased between the two periods	<i>No</i>	<i>n.a.</i>
Section 3: Effect of cornerstone investors		
H9: The price range is more narrow in IPOs with cornerstone investors	<i>Yes</i>	5%
H10: The level underpricing is higher in IPOs with cornerstone investors	<i>Yes</i>	1%
H11: The level of aftermarket performance is higher in IPOs with cornerstone investors	<i>No</i>	<i>n.a.</i>

Furthermore, we look at the one to twelve month aftermarket performance of IPOs in the Nordic region, finding that they overperform the market during a time period of three to six months. For short-term investors, this confirms the theory that newly issued companies are a good investment. Regarding time periods, IPOs outperformed the market in both booms on a three months time horizon but we cannot conclude whether the aftermarket performance has changed over time.

Since academia concerning cornerstone investor is limited in a Nordic setting, we believe that our findings regarding its presence in IPOs will be a stepping stone for further studies on this topic. The observed effects of cornerstone investors in our study were in line with previous literature that anticipated the rise of a process that resembles the

idea of cornerstone investors (Ljungqvist et al. (2006)). Due to the limited number of observations as a result of the recency of the phenomena, we only find results that are statistically significant for the two tests concerning the cornerstone effect on price range and underpricing. Our finding is that IPOs with cornerstone investors experience more underpricing the first day of trading is the most interesting conclusion. During the interview with the underwriters, the reason for this positive effect was discussed in the terms of insurance premium. We believe that the cornerstone investors are rewarded additional underpricing in order to commit early in an IPO process and not flipping the shares, working as an insurance for the selling shareholders. In conclusion, the cornerstone backed IPOs in Sweden differ from earlier IPOs in recent years. Whether this change is driven by the emergence of cornerstone investors is not clear, but the characteristics of the Swedish IPO market has in fact changed.

7.1 Suggestions for further research

An interesting area for further studies would be to check whether the size or reputation of cornerstone investor has an impact on underpricing and aftermarket performance. A suggested research question would be whether it is worth giving up value in underpricing to get a high-profile investor. These particular research questions would also be relevant for retail investors, whether it is profitable to piggyback on reputable cornerstone investors.

Another suggestion is to look at the current vintage of cornerstone backed IPOs and how they perform during a longer time period, for example two to five years. As some argue, cornerstone investment is a sign of quality which would generate favorable aftermarket performance. Thus, it would be interesting to see if cornerstone backed IPOs over- or underperform the market on a long-term horizon.

A last interesting aspect to study concerns the presence of cornerstone investors and the valuation multiple, following McGuinness (2014) who studied cornerstone backed IPOs in Asia. He suggested that the presence of a cornerstone investor increases the Tobin's Q, indicating that sellers both get a higher valuation multiple as well as potentially increased underpricing that can be implied by having cornerstone investors.

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Appendix

Table 9: Data sample

The table below presents all 145 IPOs included in our data sample, the country in which the IPO occurred, IPO date, whether cornerstone investors are present, price data relating to the Max and Min price in the offering as well as offering price. In the parentheses are the current names of the IPO companies

Stock information				Price data (LCY)		
<i>Stock</i>	<i>Country</i>	<i>IPO Date</i>	<i>Cornerstone</i>	<i>Min</i>	<i>Max</i>	<i>Offer</i>
Ability Group	Norway	2006-07-03	No	45,00	53,00	47,00
AffectoGenimap (Affecto)	Finland	2005-05-27	No	4,80	4,80	4,80
Agility Group (Grenland Group)	Norway	2005-12-12	No	18,00	18,00	18,00
Ahlstrom	Finland	2006-03-14	No	20,00	24,00	22,00
Aker American Shipping	Norway	2005-07-11	No	65,00	65,00	65,00
Aker Seafood (Havfisk)	Norway	2005-05-13	No	29,00	34,00	29,00
AKVA Group	Norway	2006-11-10	No	33,00	40,00	35,00
Algeta	Norway	2007-03-27	No	41,00	51,00	47,00
Alimak	Sweden	2015-06-17	Yes	80,00	95,00	93,00
Allenex	Sweden	2006-12-12	No	65,00	75,00	70,00
APL	Norway	2005-03-18	No	44,00	49,00	49,00
Asetek	Norway	2013-03-20	No	33,00	40,00	34,00
Asiakastieto	Finland	2015-03-30	No	12,50	15,50	14,75
Attendo	Sweden	2015-11-30	Yes	50,00	50,00	50,00
Austevoll Seafood	Norway	2006-10-11	No	38,00	43,00	39,00
Awilco Offshore	Norway	2005-05-11	No	22,00	22,00	22,00
Bactiguard	Sweden	2014-06-19	No	37,00	50,00	38,00
BE Group	Sweden	2006-11-24	No	52,00	62,00	62,00
Besqab	Sweden	2014-06-12	No	67,00	74,00	73,00
Biotec Pharmacon	Norway	2005-11-04	No	25,50	28,50	24,50
Block Watne Gruppen	Norway	2006-03-17	No	28,00	33,00	33,00
Bluewater Insurance	Norway	2005-10-13	No	27,00	30,00	30,00
Bravida	Sweden	2015-10-16	No	36,00	44,00	40,00
Bufab	Sweden	2014-02-21	No	44,00	50,00	46,00
BW LPG	Norway	2013-11-21	No	40,00	50,00	47,00
Camurus	Sweden	2015-12-03	Yes	51,00	61,00	57,00
Capio	Sweden	2015-06-30	Yes	48,50	48,50	48,50
Catena Media	Sweden	2016-02-11	Yes	27,00	34,00	33,00
Cermaq	Norway	2005-10-24	No	37,00	44,00	44,00
Chemometec	Denmark	2006-12-18	No	8,35	8,35	8,35
CLX Communications	Sweden	2015-10-08	Yes	54,00	59,00	59,00
Codfarmers	Norway	2006-10-19	No	21,00	26,00	26,00
Collector	Sweden	2015-06-10	Yes	55,00	55,00	55,00
Com Hem	Sweden	2014-06-27	No	44,00	62,00	58,00
Comendo (Copenhagen Networks)	Denmark	2006-12-28	No	7,50	7,50	7,50
Consti Yhtiöt	Finland	2015-12-11	No	9,50	11,50	9,50
Coor Service Management	Sweden	2015-06-16	No	32,00	39,00	38,00
Crew Minerals (Intex Resources)	Norway	2006-12-21	No	12,00	12,00	12,00
Deltaq	Denmark	2007-09-28	No	104,00	104,00	103,50
Diös Fastigheter	Sweden	2006-05-22	No	30,00	34,00	31,00
DK Trends Invest	Denmark	2007-06-06	No	103,75	103,75	103,75
Dolphin Interconnect Solutions	Norway	2006-04-20	No	17,50	17,50	17,50
Dometic	Sweden	2015-11-25	Yes	43,00	52,00	48,00
Duni	Sweden	2007-11-14	No	50,00	56,00	50,00
Dustin	Sweden	2015-02-13	Yes	45,00	51,00	50,00
Eitzen Chemical	Norway	2006-11-02	No	27,60	31,50	28,00
Electromagnetic Geoservices	Norway	2007-03-30	No	100,00	125,00	135,00
Eltel	Sweden	2015-02-06	Yes	55,00	70,00	68,00
Entra	Norway	2014-10-17	No	61,00	72,00	65,00
Europpris	Norway	2015-06-19	No	43,00	53,00	45,00
Evli Bank	Finland	2015-12-02	No	6,75	6,75	6,75
Exiqon	Denmark	2007-05-29	No	32,00	42,00	40,00
Faktor Eiendom	Norway	2006-12-08	No	34,00	42,00	35,00
FIM Group Corporation	Finland	2006-04-19	No	5,25	5,75	5,75
FirstFarms	Denmark	2006-12-12	No	105,00	105,00	105,00
Funcom	Norway	2005-12-13	No	15,00	20,00	15,00
Gant Company	Sweden	2006-03-28	No	141,00	141,00	141,00
Garö	Sweden	2016-03-16	Yes	73,00	73,00	73,00
Gränges	Sweden	2014-10-10	No	42,00	50,00	42,50
Havyard Group	Norway	2014-07-01	No	49,50	54,00	36,00
Hemfosa	Sweden	2014-03-21	No	88,00	96,00	93,00
Hemtex	Sweden	2005-10-06	No	47,00	56,00	56,00
HMS Networks	Sweden	2007-10-19	No	65,00	80,00	74,00
Hoist Finance	Sweden	2015-03-25	Yes	50,00	60,00	58,00
Humana	Sweden	2016-03-22	Yes	54,00	62,00	62,00
ICA/Hakon Invest	Sweden	2005-12-08	No	68,00	77,00	77,00
Indutrade	Sweden	2005-10-05	No	55,00	65,00	65,00
Infratek (Hafslund Infratek)	Norway	2007-12-05	No	20,00	25,00	18,00
Inwido	Sweden	2014-09-26	No	63,00	74,00	68,00
ISS	Denmark	2014-03-13	No	140,00	175,00	160,00
KappAhl	Sweden	2006-02-23	No	52,00	60,00	56,00

Stock information				Price data (LCY)		
Stock	Country	IPO Date	Cornerstone	Min	Max	Offer
Kid	Norway	2015-11-02	No	31,00	37,00	31,00
KlimaInvest	Denmark	2007-10-30	No	12,50	15,50	104,00
Kongsberg Automotive Holding	Norway	2005-06-24	No	45,00	49,00	46,00
Kotipizza Group	Finland	2015-07-07	No	9,00	11,00	5,00
LeoVegas	Sweden	2016-03-17	Yes	28,00	32,00	32,00
Lifco	Sweden	2014-11-21	Yes	93,00	93,00	93,00
Lifecycle Pharma (Veloxis)	Denmark	2006-11-13	No	38,00	50,00	44,00
Lindab	Sweden	2006-12-01	No	93,00	110,00	110,00
Matas	Denmark	2013-06-28	No	100,00	120,00	115,00
Multiconsult	Norway	2015-05-22	No	75,00	78,00	78,00
Napatech	Norway	2013-12-06	No	58,00	73,00	58,00
Neas	Norway	2007-03-23	No	33,00	41,00	33,00
Nederman Holding	Sweden	2007-05-16	No	74,00	89,00	87,00
NNIT	Denmark	2015-03-06	No	100,00	120,00	125,00
Nobina	Sweden	2015-06-18	No	33,00	40,00	34,00
Nordax Bank	Sweden	2015-06-17	Yes	38,00	45,00	45,00
NorDiag	Norway	2005-12-14	No	9,50	11,00	10,00
Nordic Nanovector	Norway	2015-03-23	No	27,00	33,00	32,00
Nordic Tankers	Denmark	2007-06-12	No	82,00	94,00	85,00
Norgani Hotels	Norway	2005-11-16	No	53,00	58,00	56,00
Norwegian Property	Norway	2006-11-15	No	50,00	55,00	53,50
NP3 Fastigheter	Sweden	2014-12-04	No	30,00	30,00	30,00
Nötterö Sparebank	Norway	2007-10-29	No	110,00	110,00	110,00
Ocean Yield	Norway	2013-07-05	No	30,00	34,00	27,00
Odffell Drilling	Norway	2013-09-27	No	37,00	48,00	42,00
Odin	Norway	2005-11-18	No	33,00	39,50	30,00
Orava Residential Real Estate Investment	Finland	2013-10-14	No	10,30	10,30	10,30
Orexo AB	Sweden	2005-11-09	No	90,00	105,00	90,00
OW Bunker	Denmark	2014-03-28	No	120,00	150,00	145,00
Pandox	Sweden	2015-06-18	Yes	100,00	110,00	106,00
Petrojarl	Norway	2006-06-30	No	37,00	47,00	43,00
Pihlajalinna	Finland	2015-06-04	Yes	9,00	10,75	10,50
Platzer	Sweden	2013-11-28	No	25,00	28,00	26,50
Powel	Norway	2005-10-24	No	18,00	21,00	15,00
Promens (Polimoon)	Norway	2005-04-26	No	19,00	21,50	21,50
Pronova Biopharma	Norway	2007-10-11	No	23,00	29,00	23,00
Rak Petroleum	Norway	2014-11-07	No	12,48	15,25	14,10
Recipharm	Sweden	2014-04-03	No	72,00	86,00	78,00
Rem Offshore	Norway	2007-03-30	No	38,00	44,00	40,00
Renewable Energy Corporation (REC)	Norway	2006-05-09	No	69,00	88,00	95,00
RenoNorden	Norway	2014-12-16	No	39,00	53,00	47,00
Restamax	Finland	2013-11-28	Yes	4,60	4,60	4,60
Revus Energy	Norway	2005-06-27	No	34,00	42,00	42,00
Rezidor	Sweden	2006-11-28	No	43,00	52,00	52,00
Salcomp	Finland	2006-03-13	No	3,20	4,00	3,20
SalMar	Norway	2007-05-08	No	39,00	39,00	39,00
Sanitec	Sweden	2013-12-10	No	54,00	66,00	61,00
Scandi Standard	Sweden	2014-06-27	No	33,00	40,00	40,00
Scandic Group	Sweden	2015-12-02	Yes	66,00	81,00	67,00
Scandinavian Tobacco Group	Denmark	2016-02-10	No	93,00	110,00	100,00
Scatec Solar	Norway	2014-10-02	No	28,00	36,00	19,00
SeaBird Exploration	Norway	2006-04-11	No	16,00	20,00	20,00
Skandiabanken	Norway	2015-11-02	No	43,00	54,00	46,00
SOBI (Biovitrum)	Sweden	2006-09-15	No	100,00	100,00	100,00
Sparekassen Himmerland (Jutlander Bank)	Denmark	2006-12-01	No	250,00	250,00	250,00
Spits	Norway	2006-12-12	No	20,00	23,00	16,00
SRV Group (SRV Yhtiöt)	Finland	2007-06-12	No	8,00	9,75	9,00
Suomen Terveystalo	Finland	2007-04-03	No	2,40	3,00	2,40
Systemair	Sweden	2007-10-12	No	65,00	78,00	78,00
Thule	Sweden	2014-11-26	No	64,00	74,00	70,00
Tilgin	Sweden	2006-12-15	No	25,00	25,00	25,00
Tobii	Sweden	2015-04-24	Yes	22,00	25,00	25,00
Topotarget	Denmark	2005-06-10	No	20,50	25,50	22,50
TradeDoubler	Sweden	2006-11-08	No	90,00	120,00	110,00
Troax	Sweden	2015-05-17	Yes	62,00	66,00	66,00
Trolltech (Qt Company)	Norway	2006-07-05	No	14,00	20,00	16,00
Trygvesta	Denmark	2005-10-14	No	195,00	230,00	230,00
Vardia Insurance Group	Norway	2014-04-08	No	30,00	40,00	30,00
Weifa (Clavis Pharma)	Norway	2006-07-07	No	45,50	45,50	45,50
Wentworth Resources Limited (Artumas Group)	Norway	2005-07-08	No	29,25	35,75	33,15
Western Bulk	Norway	2013-10-25	No	15,00	22,00	12,00
Via Travel Group (Via Egencia)	Norway	2005-06-09	No	34,00	42,00	29,00
XXL	Norway	2014-10-03	No	45,00	65,00	58,00
Zalaris	Norway	2014-06-20	No	20,00	26,00	23,00

Table 10: Industry classification

In order to group our data sample into broader industry definitions across marketplaces, we have categorized actual market indices from NASDAQ OMX and Oslo Børs into common groups

Industries	Indices	Stock Exchange
<i>Basic Materials</i>	N Basic Materials EUR GI N Basic Resources EUR GI OSE15GI - Materials	NASDAQ OMX NASDAQ OMX Oslo Børs
<i>Consumer Goods</i>	N Consumer Goods EUR GI N Food & Beverage EUR GI N Personal & Household Goods EUR GI N Retail EUR GI OSE25GI - Consumer discretionary OSE30GI - Consumer staples	NASDAQ OMX NASDAQ OMX NASDAQ OMX NASDAQ OMX Oslo Børs Oslo Børs
<i>Consumer Services</i>	N Consumer Services EUR GI N Media EUR GI N Travel & Leisure EUR GI	NASDAQ OMX NASDAQ OMX NASDAQ OMX
<i>Financials</i>	N Financials EUR GI N Banks EUR GI N Insurance EUR GI N Real Estate EUR GI N Financial Services EUR GI OSE40GI - Financials	NASDAQ OMX NASDAQ OMX NASDAQ OMX NASDAQ OMX NASDAQ OMX Oslo Børs
<i>Health Care</i>	N Health Care EUR GI OSE35GI - Health care	NASDAQ OMX Oslo Børs
<i>Industrials</i>	N Chemicals EUR GI N Industrials EUR GI N Construction & Materials EUR GI N Industrial Goods & Services EUR GI N Automobile & Parts EUR GI OSE20GI - Industrials	NASDAQ OMX NASDAQ OMX NASDAQ OMX NASDAQ OMX NASDAQ OMX Oslo Børs
<i>Oil & Gas</i>	N Oil & Gas EUR GI OSE10GI - Energy	NASDAQ OMX Oslo Børs
<i>Technology</i>	N Technology EUR GI OSE45GI - Information technology	NASDAQ OMX Oslo Børs
<i>Telecommunications</i>	N Telecommunications EUR GI OSE50GI - Telecommunications services	NASDAQ OMX Oslo Børs
<i>Utilities</i>	N Utilities EUR GI OSE55GI - Utilities	NASDAQ OMX Oslo Børs

Table 11: Descriptive statistics: Underpricing & BHAR

The table below presents all descriptive statistics with regard to underpricing and BHAR (buy and hold abnormal returns) for our main sample and sub samples; maximum observation, minimum observation, median observation and mean (equally-weighted) and mean (value-weighted). The sub samples consist of our different measurement groups.

Underpricing	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	163,5%	-17,1%	3,5%	9,0%	9,7%
Sweden	50,0%	-17,1%	8,1%	10,5%	10,6%
Denmark	163,5%	-1,0%	10,9%	27,8%	9,0%
Norway	31,2%	-15,7%	0,2%	3,0%	9,6%
Finland	24,0%	-0,3%	3,8%	5,9%	8,7%
Recent	40,0%	-17,1%	6,9%	8,8%	9,6%
Former	163,5%	-12,0%	2,0%	9,2%	9,8%
Cornerstone	40,0%	-4,9%	15,7%	17,8%	14,1%
No cornerstone	17,5%	-17,1%	6,3%	4,7%	5,7%

BHAR 1M	Country Indices as Benchmark					Industry Indices as Benchmark				
	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	35,5%	-36,2%	-0,8%	-0,7%	-2,3%	35,0%	-34,6%	-0,3%	-0,6%	-2,5%
Sweden	20,4%	-13,9%	0,5%	1,4%	2,4%	19,4%	-13,2%	0,5%	1,4%	1,5%
Denmark	5,3%	-36,2%	-4,9%	-6,2%	-3,8%	6,7%	-34,6%	-3,9%	-5,7%	-4,4%
Norway	35,5%	-19,2%	-0,7%	-0,8%	-5,8%	35,0%	-21,7%	-0,6%	-0,7%	-4,9%
Finland	11,6%	-13,0%	-2,4%	-1,3%	-0,5%	11,4%	-17,4%	-2,6%	-1,6%	-1,4%
Recent	20,4%	-19,2%	-0,2%	0,1%	1,0%	16,9%	-21,7%	0,2%	-0,2%	0,0%
Former	35,5%	-36,2%	-1,6%	-1,3%	-5,3%	35,0%	-34,6%	-0,6%	-0,9%	-4,7%
Cornerstone	20,4%	-9,7%	0,8%	2,5%	2,6%	16,9%	-9,9%	-0,2%	1,1%	0,4%
No cornerstone	12,6%	-11,4%	-0,6%	0,9%	2,0%	16,4%	-10,1%	0,3%	1,6%	1,8%

BHAR 3M	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	142,4%	-39,0%	3,4%	5,9%	0,8%	144,3%	-42,7%	1,4%	5,0%	0,4%
Sweden	29,5%	-24,6%	6,1%	5,3%	6,5%	30,1%	-19,8%	3,4%	4,2%	4,5%
Denmark	12,1%	-39,0%	-5,0%	-5,3%	-4,6%	13,0%	-34,6%	-3,9%	-3,1%	-2,3%
Norway	142,4%	-26,9%	6,7%	11,2%	0,5%	144,3%	-42,7%	2,5%	9,6%	-0,9%
Finland	26,0%	-18,9%	-5,3%	-3,1%	-3,9%	20,7%	-27,9%	-2,0%	-3,8%	-1,8%
Recent	63,7%	-21,6%	4,8%	5,5%	5,0%	49,4%	-42,7%	2,3%	2,5%	2,7%
Former	142,4%	-39,0%	2,7%	6,2%	-3,0%	144,3%	-34,6%	1,0%	7,0%	-1,6%
Cornerstone	21,9%	-7,6%	10,0%	8,5%	8,1%	21,9%	-10,7%	4,8%	5,8%	4,8%
No cornerstone	29,5%	-15,6%	4,9%	4,5%	4,0%	27,9%	-14,9%	3,4%	4,3%	4,1%

BHAR 6M	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	206,5%	-53,7%	1,9%	6,1%	1,3%	224,3%	-49,4%	1,7%	4,6%	1,1%
Sweden	134,2%	-53,7%	6,3%	10,8%	13,0%	125,7%	-49,4%	9,3%	9,1%	10,4%
Denmark	18,1%	-43,1%	-9,4%	-8,6%	-8,4%	24,7%	-31,4%	-10,5%	-7,2%	-4,6%
Norway	206,5%	-45,1%	2,3%	9,0%	-0,1%	224,3%	-49,1%	1,6%	7,1%	-1,6%
Finland	54,1%	-50,2%	-11,7%	-8,0%	-10,3%	48,5%	-46,3%	-17,2%	-10,2%	-10,6%
Recent	134,2%	-51,0%	6,7%	9,0%	5,5%	125,7%	-49,4%	3,3%	5,2%	3,4%
Former	206,5%	-53,7%	-2,4%	4,0%	-2,5%	224,3%	-49,1%	-2,8%	4,3%	-1,0%
Cornerstone	134,2%	-13,2%	15,0%	26,2%	16,7%	125,7%	-9,6%	15,3%	22,9%	13,1%
No cornerstone	39,8%	-51,0%	10,5%	7,5%	11,1%	31,3%	-49,4%	9,6%	7,0%	11,0%

BHAR 9M	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	219,9%	-106,5%	2,1%	4,0%	2,4%	242,7%	-103,9%	1,0%	2,5%	2,2%
Sweden	110,1%	-75,1%	5,5%	9,5%	9,9%	106,4%	-81,7%	5,6%	6,2%	7,7%
Denmark	31,4%	-106,5%	-7,2%	-7,8%	-8,5%	16,0%	-103,9%	-5,3%	-9,0%	-9,0%
Norway	219,9%	-73,8%	3,6%	5,1%	6,7%	242,7%	-71,6%	2,3%	5,3%	9,2%
Finland	46,2%	-46,8%	-19,7%	-6,6%	-12,9%	29,9%	-35,9%	-16,6%	-10,2%	-16,1%
Recent	110,1%	-106,5%	3,5%	6,2%	1,9%	106,4%	-103,9%	2,5%	2,4%	0,9%
Former	219,9%	-73,8%	-0,4%	2,5%	2,8%	242,7%	-71,6%	0,8%	2,6%	3,4%
Cornerstone	110,1%	-19,2%	28,0%	27,9%	15,3%	106,4%	-16,7%	18,9%	22,8%	10,8%
No cornerstone	45,6%	-75,1%	6,1%	4,6%	6,8%	46,8%	-81,7%	5,9%	4,3%	8,9%

BHAR 12M	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>	<i>max</i>	<i>min</i>	<i>median</i>	<i>mean (ew)</i>	<i>mean (vw)</i>
All	358,8%	-106,5%	2,7%	1,3%	1,3%	383,6%	-122,8%	-1,7%	-1,6%	-1,6%
Sweden	86,7%	-86,2%	8,6%	9,1%	7,2%	74,2%	-97,1%	2,4%	4,2%	6,6%
Denmark	27,8%	-106,5%	-4,2%	-6,2%	-7,4%	32,4%	-103,9%	-2,7%	-9,7%	-17,4%
Norway	358,8%	-74,3%	-4,1%	1,9%	5,3%	383,6%	-122,8%	-3,1%	0,4%	7,0%
Finland	20,5%	-82,8%	-17,6%	-19,6%	-13,9%	15,1%	-69,0%	-23,4%	-22,7%	-19,1%
Recent	123,0%	-106,5%	3,2%	-0,8%	-0,9%	85,3%	-103,9%	-1,1%	-5,1%	-0,5%
Former	358,8%	-82,8%	2,7%	2,4%	3,3%	383,6%	-122,8%	-1,7%	0,3%	-2,6%
Cornerstone	68,4%	8,3%	25,7%	35,4%	5,6%	74,2%	8,6%	24,4%	35,1%	5,5%
No cornerstone	86,7%	-86,2%	8,9%	12,5%	16,4%	71,1%	-97,1%	9,4%	8,7%	15,8%

Table 12: Overview of cornerstone investor backed IPOs

The table below presents the 20 cornerstone-backed IPOs in our data sample. The table shows the cornerstone investors present in the IPO, the ownership of cornerstone investors at the day of the offering and the three categories of advisors; global coordinator/s, bookrunner/s and co-lead manager/s. * refers to global coordinator and joint bookrunner. ** refers to joint coordinator and joint bookrunners

<i>Stock</i>	Cornerstones		Advisors		
	<i>Investors</i>	<i>% of total shares</i>	<i>Global Coordinator/s</i>	<i>Bookrunner/s</i>	<i>Co-lead manager/s</i>
Alimak	Peder Prähl, Lannebo Fonder, Swedbank Robur	15,61%	Citi, SEB	Carnegie	
Attendo	Nordstjernan, Swedbank Robur, Didner & Gerge, Carve, Elo	36,50%	Carnegie, SEB	Nordea, Danske Bank	
Camurus	Backahill Utveckling, Catella, AP4, Gladiator, Grenspecialisten	11,00%	Carnegie, Handelsbanken		
Capio	R12 Kapital, AP4, Swedbank Robur, Handelsbanken Fonder	20,10%	J.P Morgan, SEB	Deutsche Bank, Carneie	
Catena Media	Investment Öresund, Swedbank Robur, Niclas Eriksson, RAM One, Knutsson Holdings, Skandrenting, AMF	26,20%	Carnegie		
CLX Communications	Alecta, AP4, AP1, Swedbank Robur, Zenit, Grenspecialisten, LMK, Ram One	32,70%	Carnegie, Handelsbanken		
Collector Dometic	AP2, Swedbank Robur	6,00%	SEB		
	AMF, Handelsbanken Fonder, Nordea Fonder	9,80%	Jefferies, Morgan Stanley, SEB	Carnegie, UBS	Handelsbanken
Dustin	Axel Johnson, AP4, Swedbank Robur	20,00%	Carnegie, Nordea	ABG Sundal Collier, SEB	
Eltel	Zeres, AP4, Swedbank Robur, Lannebo Fonder	29,00%	BNP Paribas, Morgan Stanley, SEB		Pohjola
Garo	Svolder, Vätterledens Invest	14,00%	Carnegie		
Hoist Finance	Carve Capital, Lancelot, Zenit	18,00%	Carnegie, Morgan Stanley	Citi	
Humana	Zeres, Swedbank Robur, ODIN Fonder, Handelsbanken Fonder, Incentive, Bodenholm Capital	14,50%	Carnegie, SEB	ABG Sundal Collier, DNB	
LeoVegas	Catella Fonder, Handelsbanken Fonder, Swedbank Robur, Carnegie Asset Management, Keel, Alcur, AMF	12,50%	Carnegie, SEB		
Lifco	Didner & Gerge Fonder, AP4	12,20%	SEB	ABG Sundal Collier, Carnegie	
Nordax Bank	Swedbank Robur	9,50%	Carnegie, Morgan Stanley	Citi	ABG Sundal Collier
Pandox	Swedbank Robur, AMF	14,00%	ABG Sundal Coordinator*	Handelsbanken**, Carnegie, Morgan Stanley**	DNB, SEB
Scandic Group	Provobis	5,00%	Morgan Stanley, SEB	ABG Sundal Collier, Deutsche Bank	
Tobii	Invifed, AP6, Ram One	12,92%	Carnegie	ABG Sundal Collier	
Troax	Investment Latour, Svolder	40,00%	Carnegie	Handelsbanken	

Table 13: Data sample split by industry classification

The table below presents our data sample in terms of the broader industry classification.

Basic Materials (3) Ahlstrom BE Group Crew Minerals (Intex Resources)	Health Care (21) Algeta Allenex Attendo Bactiguard Biotec Pharmacon Camurus Capio Chemometec Exiqon Humana Lifecycle Pharma (Veloxis) NorDiag Nordic Nanovector Orexo AB Pihlajalinna Pronova Biopharma Recipharm SOBI (Biovitrum) Suomen Terveystalo Topotarget Weifa (Clavis Pharma)	Oil & Gas (16) Ability Group Agility Group (Grenland Group) Awilco Offshore BW LPG Electromagnetic Geoservices Nordic Tankers Ocean Yield Odfjell Drilling OW Bunker Petrojarl Rak Petroleum Rem Offshore Renewable Energy Corporation (REC) Revus Energy SeaBird Exploration Wentworth Resources Limited (Artumas Group)
Consumer Goods (24) Aker Seafood (Havfisk) Austevoll Seafood Cermaq Codfarmers Dometic Duni Dustin Europris FirstFarms Gant Company Hentex ICA/Hakon Invest KappAhl Kid Kongsberg Automotive Holding Matas Norgani Hotels SalMar Scandi Standard Scandinavian Tobacco Group Spits Thule Via Travel Group (Via Egencia) XXL	Industrials (31) Aker American Shipping AKVA Group Alimak APL Block Watne Gruppen Bravida Bufab Consti Yhtiöt Coor Service Management Eitzen Chemical Eltel Faktor Eiendom Garø Gränges Havyard Group Indutrade Inwido ISS Lifco Lindab Multiconsult Nederman Holding Nobina Promens (Polimoon) RenoNorden Sanitec SRV Group (SRV Yhtiöt) Systemair Troax Western Bulk Zalaris	Technology (15) AffectoGenimap (Affecto) Asetek CLX Communications Comendo (Copenhagen Networks) Dolphin Interconnect Solutions Funcom HMS Networks Napatech NNIT Odim Powel Salcomp Tilgin Tobii Trolltech (Qt Company)
Consumer Services (7) Catena Media Kotipizza Group LeoVegas Restamax Rezidor Scandic Group TradeDoubler		Utilities (3) Infratek (Hafslund Infratek) Neas Scatec Solar
Financials (24) Asiakastieto Besqab Bluewater Insurance Collector Deltaq Diös Fastigheter DK Trends Invest Entra Evli Bank FIM Group Corporation Hemfosa Hoist Finance KlimaInvest Nordax Bank Norwegian Property NP3 Fastigheter Nötterö Sparebank Orava Residential Real Estate Investment Pandox Platzer Skandiabanken Sparekassen Himmerland (Jutlander Bank) Trygvesta Vardia Insurance Group		

Table 14: Underpricing by industry

The table below presents the equally-weighted underpricing for our total 145 observations, split by their respective industry classification determined by their stock exchange.

Industry	Underpricing (ew)	n
N Oil & Gas EUR GI	15,1%	2
N Basic Materials EUR GI		0
N Chemicals EUR GI		0
N Basic Resources EUR GI	8,0%	2
N Industrials EUR GI		0
N Construction & Materials EUR GI	8,7%	6
N Industrial Goods & Services EUR GI	11,0%	12
N Consumer Goods EUR GI		0
N Automobile & Parts EUR GI	2,4%	1
N Food & Beverage EUR GI	8,3%	2
N Personal & Household Goods EUR GI	6,7%	4
N Health Care EUR GI	19,3%	15
N Consumer Services EUR GI		0
N Retail EUR GI	14,5%	6
N Media EUR GI	35,9%	2
N Travel & Leisure EUR GI	4,3%	5
N Telecommunications EUR GI	8,6%	1
N Utilities EUR GI		0
N Financials EUR GI	0,0%	1
N Banks EUR GI	40,5%	3
N Insurance EUR GI	10,9%	1
N Real Estate EUR GI	3,8%	7
N Financial Services EUR GI	6,4%	6
N Technology EUR GI	20,5%	8
OSE10GI - Energy	9,1%	14
OSE15GI - Materials	-2,9%	1
OSE20GI - Industrials	3,4%	12
OSE25GI - Consumer discretionary	0,5%	4
OSE30GI - Consumer staples	-0,4%	8
OSE35GI - Health care	1,4%	6
OSE40GI - Financials	-1,0%	6
OSE45GI - Information technology	3,3%	7
OSE50GI - Telecommunications services		0
OSE55GI - Utilities	-1,9%	3
		145

Table 15: Aftermarket performance by industry

The table below presents the equally-weighted aftermarket performance (BHAR) for our total 145 observations over one month (1M), three months (3M), six months (6M), nine months (9M) and twelve months (12M), split by their respective industry classification determined by their stock exchange. The table presents both the BHAR in relation to an IPOs corresponding country index, as well as industry specific index.

Industry	Country Indices as Benchmark					Industry Indices as Benchmark				
	1M	3M	6M	9M	12M	1M	3M	6M	9M	12M
N Oil & Gas EUR GI	-2,0%	1,0%	-7,0%	-37,6%	-58,9%	-5,1%	1,3%	-0,9%	-45,8%	-78,5%
N Basic Materials EUR GI										
N Chemicals EUR GI										
N Basic Resources EUR GI	-1,2%	11,2%	5,5%	-8,6%	-16,2%	-1,0%	14,1%	3,6%	-8,7%	-12,6%
N Industrials EUR GI										
N Construction & Materials EUR GI	-1,2%	0,2%	6,4%	11,4%	8,6%	-2,5%	1,0%	3,1%	4,6%	-1,4%
N Industrial Goods & Services EUR GI	2,1%	7,5%	10,4%	7,3%	17,1%	2,9%	7,7%	11,6%	10,4%	22,3%
N Consumer Goods EUR GI										
N Automobile & Parts EUR GI	-5,3%	7,1%	26,6%	7,1%	0,4%	0,6%	7,6%	13,8%	-5,5%	-14,7%
N Food & Beverage EUR GI	-4,2%	0,5%	-9,7%	-9,4%	6,2%	-1,1%	5,7%	-0,5%	2,8%	16,1%
N Personal & Household Goods EUR GI	2,9%	3,7%	8,7%	12,2%	18,7%	4,2%	1,2%	-9,1%	-5,8%	-18,8%
N Health Care EUR GI	-3,1%	-2,0%	-5,3%	-12,8%	-13,0%	-3,5%	-1,2%	-1,4%	-9,7%	-14,3%
N Consumer Services EUR GI										
N Retail EUR GI	0,3%	4,1%	9,9%	11,7%	14,1%	1,3%	1,3%	9,3%	8,7%	11,6%
N Media EUR GI	4,0%	28,6%	2,3%	-14,7%	-6,0%	6,0%	26,1%	13,0%	-5,4%	-2,0%
N Travel & Leisure EUR GI	-2,8%	-5,9%	-7,4%	1,3%	-35,1%	-5,5%	-16,7%	-22,4%	-9,3%	-32,9%
N Telecommunications EUR GI	-2,6%	-15,6%	-4,9%	-8,6%	4,0%	-4,8%	-13,7%	2,3%	7,2%	13,0%
N Utilities EUR GI										
N Financials EUR GI	4,0%	8,8%	18,1%	27,5%	27,8%	6,7%	10,6%	1,7%	9,2%	4,7%
N Banks EUR GI	-6,2%	-6,7%	-2,7%	0,3%	15,5%	-7,0%	-8,7%	3,0%	8,3%	27,3%
N Insurance EUR GI	3,7%	12,1%	16,0%	31,1%	20,7%	2,3%	6,5%	3,1%	15,9%	10,8%
N Real Estate EUR GI	-1,2%	3,9%	7,5%	14,6%	17,2%	-1,1%	0,7%	4,0%	7,1%	12,6%
N Financial Services EUR GI	0,9%	1,0%	20,9%	24,6%	11,1%	0,4%	2,5%	14,4%	13,5%	-6,3%
N Technology EUR GI	1,5%	-1,0%	-8,8%	-5,9%	-14,1%	1,8%	2,2%	-7,1%	-9,3%	-13,1%
OSE10GI - Energy	2,2%	13,7%	5,6%	8,0%	2,4%	3,0%	12,9%	5,1%	8,6%	2,7%
OSE15GI - Materials	-7,1%	40,0%	58,8%	-9,8%	-34,8%	-16,7%	24,7%	53,8%	7,4%	-36,5%
OSE20GI - Industrials	-2,4%	3,8%	-4,7%	-9,8%	-20,0%	-2,5%	3,7%	-10,5%	-15,6%	-25,3%
OSE25GI - Consumer discretionary	1,0%	10,4%	-2,3%	2,1%	11,1%	-3,1%	-0,8%	-18,2%	-2,6%	-4,5%
OSE30GI - Consumer staples	-6,0%	3,4%	13,3%	11,4%	2,0%	-5,6%	0,4%	4,2%	5,8%	6,7%
OSE35GI - Health care	-1,3%	-2,1%	-12,5%	-20,1%	-12,0%	0,8%	-0,5%	-2,9%	-4,1%	-0,3%
OSE40GI - Financials	0,2%	9,1%	18,8%	11,0%	-1,2%	-0,4%	9,7%	19,6%	13,8%	-0,1%
OSE45GI - Information technology	-1,7%	33,0%	34,7%	25,1%	31,6%	0,9%	31,8%	38,3%	29,1%	23,0%
OSE50GI - Telecommunications services										
OSE55GI - Utilities	5,7%	21,4%	29,8%	36,5%	48,8%	4,1%	19,4%	31,3%	28,0%	35,0%

Figure 4: Q-Q normality plots

Q-Q normality plots illustrate whether a data sample can be assumed to follow a normal distribution. Deviations from the straight line suggest departures from normality. The BHAR metrics were calculated using the corresponding country index as benchmark.

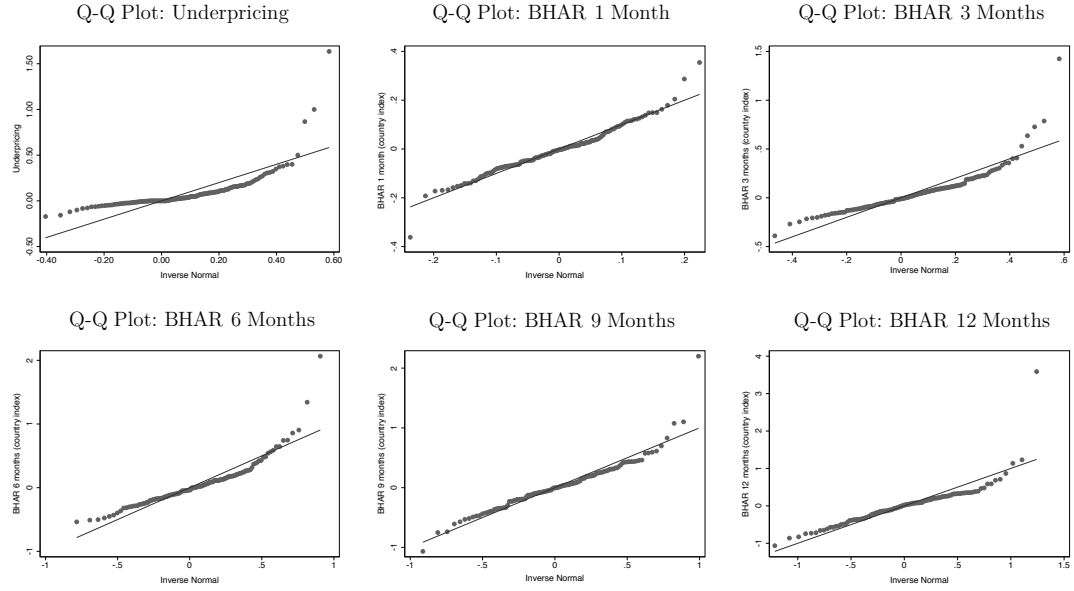


Figure 5: Histograms

Histograms plot the frequency distribution of a data sample. The observations are grouped into bins with constant interval. The line represents a normal distributed sample. The BHAR metrics were calculated using the corresponding country index as benchmark.

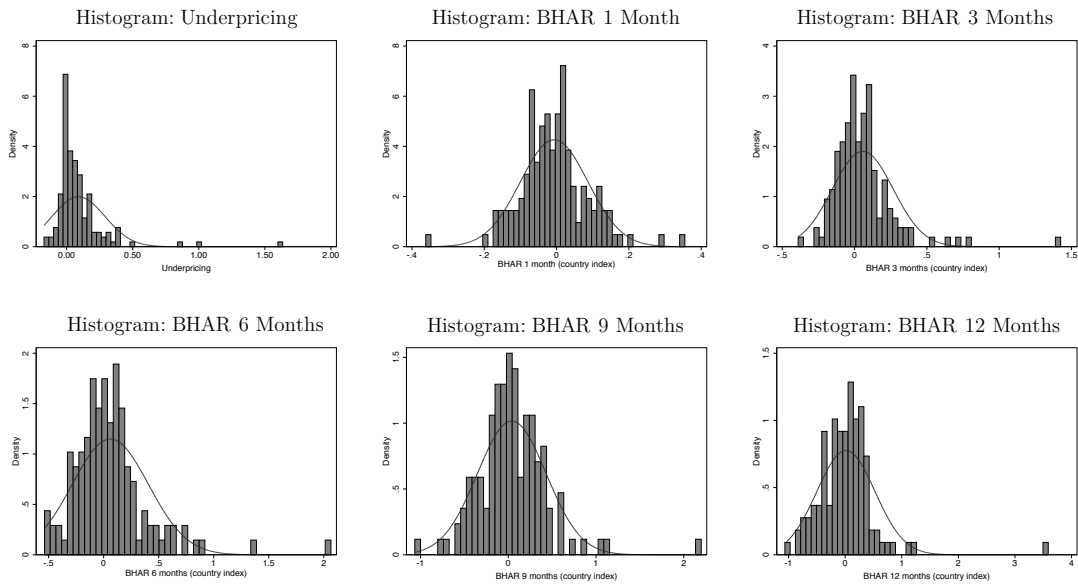


Table 16: Nonparametric robustness test

The table below shows the results using Wilcoxon Signed Rank Test. We have only conducted a nonparametric test on those hypotheses that rejected the null hypothesis using a t-test with an exception of H6 a) 9 Months. The reason for the exception is that the t-test p-value for H6 a) 9 months was 0.0529, hence very close to our rejection threshold of 0.0500. Z-value (z) refers to the standard score. Prob > |z| refers to the p-value.

Hypothesis		Sign			Null hypothesis	z	Prob > z
		Positive	Negative	Zero			
H1	obs	93	36	16	Underpricing (All) = 0	6.411	0.0000
	sum ranks	8470	1979	136			
H2 a)	obs	38	9	7	Underpricing (SE) = 0	4.703	0.0000
	sum ranks	1274	183	28			
H2 b)	obs	13	1	3	Underpricing (DK) = 0	3.303	0.0010
	sum ranks	143	4	6			
H2 c)	obs	31	25	5	Underpricing (NO) = 0	1.825	0.0680
	sum ranks	1192	684	15			
H2 d)	obs	11	1	1	Underpricing (FI) = 0	2.937	0.0033
	sum ranks	87	3	1			
H3 a)	obs	46	21	11	Underpricing (Former) = 0	4.101	0.0000
	sum ranks	2330	686	66			
H3 b)	obs	47	15	5	Underpricing (Recent) = 0	4.889	0.0000
	sum ranks	1914	349	15			
H5	obs	81	59	0	BHAR 3 Months (All) = 0	2.717	0.0066
3 months	sum ranks	6241	3629	0			
H5	obs	70	62	0	BHAR 6 Months (All) = 0	1.105	0.2692
6 months	sum ranks	4876	3903	0			
H6 a)	obs	32	18	0	BHAR 3 Months (SE) = 0	2.727	0.0064
3 months	sum ranks	920	355	0			
H6 a)	obs	28	18	0	BHAR 6 Months (SE) = 0	2.300	0.0215
6 months	sum ranks	751	330	0			
H6 a)	obs	29	15	0	BHAR 9 Months (SE) = 0	2.124	0.0337
9 months	sum ranks	677	313	0			
H6 b)	obs	3	14	0	BHAR 1 Month (DK) = 0	-2.627	0.0086
1 Month	sum ranks	21	132	0			
H6 c)	obs	40	21	0	BHAR 3 Months (NO) = 0	2.629	0.0086
3 months	sum ranks	1312	580	0			
H7 a)	obs	43	35	0	BHAR 3 Months (Former) = 0	1.427	0.1536
3 months	sum ranks	1827	1254	0			
H7 b)	obs	38	24	0	BHAR 3 Months (Recent) = 0	2.563	0.0104
3 months	sum ranks	1342	611	0			
H7 b)	obs	34	20	0	BHAR 6 Months (Recent) = 0	1.967	0.0491
6 months	sum ranks	971	514	0			

Table 17: Number of cornerstone investor backed IPOs by year

The table below presents the number of Swedish IPOs in the recent time period, the sub sample used to measure the effect of cornerstone investors, by year

Year	2013	2014	2015	2016
Cornerstone	0	1	15	4
No cornerstone	2	11	3	0
Total	2	12	18	4

Table 18: Number of observation by time horizons

The table below presents the number of observations in relation to the five time horizons used in our study, grouped according to our measurement groups.

	Time period				
	<i>1 month</i>	<i>3 months</i>	<i>6 months</i>	<i>9 months</i>	<i>12 months</i>
a) Total number of IPOs					
All	145	140	132	130	117
b) # of firms: by country					
Sweden	54	50	46	44	36
Denmark	17	16	16	16	16
Norway	61	61	59	59	56
Finland	13	13	11	11	9
Total	145	140	132	130	117
c) # of firms: by time period					
Former	78	78	78	78	77
Recent	67	62	54	52	40
Total	145	140	132	130	117
d) # of firms by cornerstone investors					
Cornerstone	20	16	12	11	5
No cornerstone	16	16	16	15	13
Total	36	32	28	26	18