NEW KID ON THE BLOCK

HOW IPOS AFFECT LISTED INDUSTRY PEERS SHORT-TERM STOCK PRICE PERFORMANCE

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Bachelor Thesis

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New kid on the block: How IPOs affect listed industry Peers short-term stock price performance

Abstract:

We analyze the effect of completed initial public offerings (IPOs) on listed industry peers around the time of an IPO within the same industry, in the Swedish market. Providing evidence that industry peers experience negative stock price reaction, in relation to a comparable index, in the period before the IPO. After the IPO however, we do not find any significant results about the incumbent peers' stock price reactions, in relation to the index or to that of the IPO itself. Further, our thesis provides evidence that the stock price of peers correlates with the index movements before and after the IPO, as well as correlating with the stock price of the IPO in the period after its completion. Our results are consistent with the existence of IPO underpricing and IPO related competitive advantages. Other mechanisms such as uncertainty, fund flows and market cyclicality are extensively discussed to explore how the IPO, the new kid on the block, affects the market.

Keywords:

Sweden, IPOs, Short-Run Performance, Industry Peers, Stock Price Reaction

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1. Introduction

1.1 Background

Initial public offerings (IPOs) is the process in which a company becomes a publicly traded company and is characterized by an intensive time-period to prepare legal structures, receive approvals, attract financing as well as to spread information to potential investors. IPOs are an important process for companies to gain capital for further expansion, founders and investors to sell off shares and for the public market to broaden its array of companies available to the public (Forbes, 2022). Studies by Jean Helwege and Nellie Liang (2004) show that the IPOs tend to be most frequently occurring in hot periods with growing economy, low interest rates as well as high valuations of public companies.

Earlier studies have researched extensively the performance of IPOs both operationally as well as from the standpoint of an investment. Jay Ritter (1991) researched this area extensively back in the nineties. His research showed that IPOs will have the initial trading price and valuation will often be higher than subsequent years after the IPO. Ritter also showed that IPOs will generally underperform the market and comparable peers in subsequent years. A study by Jain Bharat and Kini Omesh (1994) into the operational performance of companies before and after going public showed that companies underperformed significantly in the time period after the IPO. Overall IPOs tend to be a symptom of hot markets, and generally a lucrative way for founders, as well as PE- and VC- firms to make an exit (Crunchbase, 2021). On the other hand, new investors tend to, in the long-run, have been better off investing in other companies rather than the IPO (CBS NEWS, 2012).

With IPOs being an important function for the public market as well as having historically been a characteristic of certain periods, its competitive advantages and performance provides insight into other aspects of the public market apart from the IPO. Already listed competitors or peers are affected by the IPO, with regards to operational performance, which has been documented by Hsu, Reed and Rocholl (2010). Given the extensive process and preparation for an IPO, as well as critical information reaching the market just weeks before, new information is priced in real time for both the IPO and the peers. (Forbes, 2022). This paper has the purpose of finding additional evidence for this effect by answering these two research questions:

- *Is there an effect on the short-term stock price performance of listed peers around the completion of an IPO within the same sector?*
- *Can potential effects from the IPO be explained by characteristics of the IPO as well as the identified peers?*

By looking at IPOs completed at the Nasdaq Stockholm main exchange in the time period 2010 to 2022 and comparing the short-term stock price returns for peers and IPOs against the relevant index for this market, OMXSPI, we aim to find if peers performs significantly worse or better than the comparable index 30 days before respectively 30 days after the IPO in the industry and why this could be the case. Our findings suggest that industry peers perform significantly worse than OMXSPI in the period before the IPO. The performance of the peers also covariates with both the performance of OMXSPI and that of the IPO. However, in the period after the IPO, the only certainty about the direction of the stock price development of peers and IPOs, in relation to OMXSPI, is that it is uncertain. A mechanism discussed for why these findings are obtained are due to fund flows from investors, specifically institutional investors, who hold around 73 to 80 percent of the public equity market capitalization according to the SEC (2013)

and Pensions & Investments (2017). In order to avoid the uncertainty of the stock price returns associated with the period after the IPO, they sell-off the industry peers. Simultaneously, these findings could be consistent with IPO underpricing, incentivizing institutional investors to sell-off the industry peers, to keep the same industry exposure, and invest in the IPO, which has a greater expected short-run performance. This would lead to a significant decrease in the peers' stock price in the period before the IPO. Furthermore, Sweden being a relatively small market could potentially be another contributing mechanism explaining our results as well, since this leads to relatively fewer peers. Resulting in IPOs having a higher relative impact on listed industry peer's performance compared to studies conducted in the U.S, where there are more peers in each industry leading to a larger and more dispersed market setting. As an effect, each IPOs relative size to the industry as a whole is much smaller compared to the Swedish market. Another mechanism being discussed is how the timing of IPOs with regard to the number of occurrences is different months, affects the measured returns in the study. We find that certain months are overrepresented and have different average returns than other months, as recorded by Dagens Industri (2021). The average performance for OMXSPI in our study is affected by this in-year market cyclicality.

1.2 Literature review

There has been wide and particular research into the area of IPOs historically. A critical article is the Long-Run Performance of Initial Public Offerings by Jay Ritter (1991), which examines the underpricing of IPOs, showing that underpricing is a short-run phenomenon. The article also concludes that IPOs significantly underperformed a sample of matching firms when measuring 3-year price development from the closing price of the first day of trading. The article researches IPOs between 1975 to 1984 and solely on the U.S market. There are two main takeaways from the findings presented. First is that companies doing an IPO will often have a higher initial trading price and valuation than in the subsequent years after the IPO. Second is that IPOs will generally underperform the market and comparable peers in subsequent years. The article also suggests that several other factors may be essential in determining subsequent price development of the IPO.

Paula Gompers and Alon Bravan (1997) published their research specifically examining the effects of venture capital prior to an IPO for the performance of the company. The notion seems to only hold true for the smallest venture-backed IPOs. Another factor was analyzed by Chris Yung, Gönül Çolak and Wei Wang, who examined the cyclicality in the market and its effects on IPO underpricing and adverse selection. For instance IPOs during hot periods, tend to have greater cross-sectional return variance and higher incidence of delisting. The implication of which is that IPOs in hot markets tend to underperform to a greater extent.

One critical phenomenon related to the performance of IPOs is underpricing, which contributes to generating extraordinary first day returns for IPOs. Underpricing of IPOs is defined, by Philip Lee et al (1999) as setting the price at level below the expected real value on the stock market. The purpose of which is to attract institutional as well as retail investors to invest in the company. This is related with the documented empirical evidence from Laura Field and Michelle Lowry (2009) about sophisticated and unsophisticated investors, where institutional investors (sophisticated) to a higher degree subscribe to IPOs that are expected to perform well and retail investors (unsophisticated) cannot assess whether the IPO will perform well or not. Leading to sophisticated investors getting full allocation in "good" IPOs and retail investors only getting full allocation in "bad" IPOs. Thus, IPOs have to be underpriced in order for retail investors to want to participate. Underpricing is related to the scope of our thesis by providing a clear incentive for institutional investors such as pension- and index funds to invest in IPOs,

which in turn could create a need to reallocate capital to free up sufficient funds to invest in the IPO. However, other studies have found that the long-term stock price performance is worse for the IPO, when comparing the development to that of industry peers. In addition to this, another study found that IPOs operational performance and financial performance decreases in the year after completing an IPO according to Jain Bharat and Kini Omesh (1994).

The angle of approach for this thesis paper correlates well with the research into performance of companies conducting IPOs, since the research also carries implications for the comparable peers. For instance, many companies tend to have their peak valuation at the point of IPO (Jay Ritter, 1991), and also that this tendency increases when the IPO is conducted during a hot-market period (Paula Gompers and Alon Bravan 1997). The implication could be interpreted that IPOs could be a symptom of sector specific hot periods. Resulting in an incentive for founders and other shareholders to IPO when valuations and trading multiples are high, which would then also implicate how sector peers will perform and should be valued based on the IPOs implication for the future development of the listed peers.

One of the most eminent studies looking specifically at the immediate stock price reaction for peers, when there are plans for an IPO from an industry competitor, was performed by Hsu, Reed and Rocholl (2010). The analysis was performed by looking at 134 completed IPOs and 37 withdrawn IPOs, with a total of 8,966 and 3,903 peers respectively. Their study provided two main takeaways relevant for our thesis. The first area being the effect on the operational performance. The argument being that being a listed company provided competitive advantages such as losing financial constraints, financial intermediary certification and the presence of knowledge capital. The study found significant negative effects on the operational performance of the peers after a completed IPO, with regards to both sales growth and financial metrics such as ROA. The second takeaway being that incumbent firms (i.e. peers) saw a statistically significant negative abnormal return prior to a completed IPO within the same sector. As indicated by the following graph, from their paper, average returns for incumbent firms is shown for completed and withdrawn IPOs.

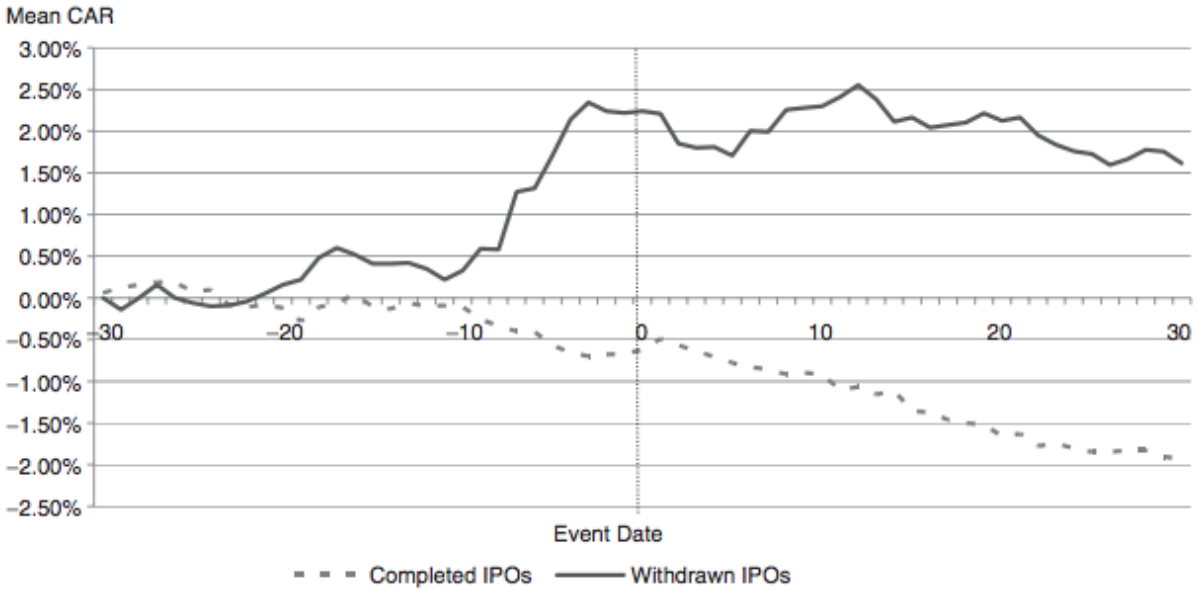


Illustration 1: Mean cumulative abnormal return (CAR) for incumbent industry firms to completed and withdrawn IPOs (Hsu, Reed and Rocholl, 2010).

On the other hand, Hsu, Reed and Rocholl (2010) shows that peers have a positive reaction for non-completed IPOs. They conclude that the reason for this is that incumbent firms will not be

negatively affected by the competitive advantages that the IPO company would have experienced. They point out three key competitive advantages for a listed company, being the loosening of financial constraints, financial intermediary certification and the presence of knowledge capital, which combined would explain the decreased operational performance of the peer after an IPO within their sector. Hsu, Reed and Rocholl (2010) conducted their study by measuring abnormal returns of peers within a 61-calendar day period around the IPO. Abnormal returns for incumbent firms were calculated using the difference between the actual stock price return for each day and the estimated average return using daily returns for the 255 days ending 42 days prior to the first trading day of the IPO.

1.3 Contribution

From the previous literature there is a void with regards to the specific mechanism at play in explaining the short-term decrease in stock prices prior to an IPO within the same industry. This thesis paper provides an additional perspective by focusing exclusively on the Nasdaq Stockholm main stock exchange, which is in number of listed and average market capitalization smaller than previous studies conducted in this research area. As a result, IPOs tend to be more significant to the particular sector they are active in, since there are relatively fewer peers. This thesis also takes place in a more modern setting, focusing on listenings between 2010 and 2022. Comparing the listed industry peer's short-term stock price return with the benchmark index OMXSPI also makes the study more relevant for industry practitioners, such as mutual funds managers, whose performance often is benchmarked against a specific index. In addition, the index benchmarking of the stock price developments, in order to find whether or not differences in returns are significant, is also considered to be a method improvement compared to previous research on the topic. Another method improvement from previous research is our quantitative method of selecting industry peers. This is considered to be more accurate than previous research peer selection criteria. Further, looking at companies listed on the same stock market exchange and thus having to follow the same regulations provides a more just and equal competition environment for the companies in the study.

2. Hypothesis development

Wanting to investigate whether and how IPOs impact the short-term stock price development of listed industry peers on Nasdaq Stockholm's main exchange, and if this impact is significant compared to the comparable OMXSPI index development during this period we have formulated the following four hypotheses:

- *Hypothesis 1: Listed industry peers' stock price will decrease more than index in the period before the IPO.*

We believe that this could be the case since investors would rationally want to decrease their exposure in a specific sector, sell-off peer stocks, in order to invest in order to reduce their uncertainty. This was also implicated by the previous study performed by Hsu, Reed and Rocholl (2010). This should short-term lead to a decrease, greater than index, for the incumbent industry peers if this is the case.

- *Hypothesis 2: IPOs and peers together will outperform index in the period after the IPO.*

IPOs and peers should receive increased attention and fund flows from investors due to extensive marketing by the financial industry in the period before and during the IPO., In addition to reduced uncertainty in the industry after the IPO completion, should lead to increased investor funds flows and thus an increase in the industry's short-term stock prices to a greater extent than that of the index.

- *Hypothesis 3: The incumbent industry peers' stock price development will outperform index in the period after the IPO.*

This is in line with hypothesis 2, that increased industry attention and reduced uncertainty in the period after the IPO, should increase investor fund flows to incumbent peers as well. Thus, leading to an increase in their stock price greater than index in the period after the IPO.

- *Hypothesis 4: IPOs will outperform peers' stock price development in the period after the IPO.*

This is reasonable to assume due to IPO expected high initial returns of the IPOs in the short-run in relation to incumbent industry peers. There could also be a large influx of capital from investors that did not receive allocation in the IPO offering at first.

3. Data

3.1 Data description and collection

3.1.1 Time period and short-term return

We have delimited the timeframe of our study to looking at IPOs for the years 2010 to 2022. This was done in order to balance getting as high relevance as possible, while still getting enough data to properly research the chosen subject. The second component of this study is to define the short-term period, which will be measured and examined. A previous study performed in the U.S by Hsu, Reed and Rocholl (2010) provides inspiration. They measure the short-term stock price performance reaction from 30 calendar days before, and 30 calendar days after the IPO. In this study, the time period for each IPO will be based on the first trading day constituting day 0, and 30 days prior as -30 and 30 days after as 30. We deem this period to be long enough to not miss any potential effect an IPO has on existing industry peers' stock price, while also being short enough that the short-term return is to the least extent possible, affected by other events such as quarterly reports, change in other market conditions etc. On the other hand, Hsu, Reed and Rocholl (2010) set the base value for day -30, constituting the first day from which returns are calculated. This study will set the basis value to day 0, being the first trading day. The reason for doing so is to compare with the IPOs which lack stock prices for the first 30 days. Also, it provides a better benchmark when putting all dates in relation to the event date, being the first trading day of the IPO.

3.1.2 Stock market selection

Three out of our four hypotheses look at whether the peers' stock price performs worse or better than index short-term. There are several reasons for why we benchmark their performance against a stock market index.

One is that it becomes an important delimitation criterion when selecting which IPOs and respective peers to include in our study. By only including IPOs and peers from a specific stock exchange we make sure that they all have to follow the same financial market regulations and reporting standards and thus face as much as possible similar market conditions as one another. We have found that many other studies look at IPOs' short-term stock price performance, in a specific country, overall and not separately for which stock exchange they become listed on. This we believe makes the results more difficult to interpret since the difference in regulations, liquidity and reporting standards can be vastly different between different stock exchanges, creating different market conditions for the IPOs and peers depending on where they are listed. Thus, by choosing to look at IPOs and peers in a specific stock market minimizes the difference in market conditions and their possibility of affecting the data collected.

Another reason for looking at a specific stock market is to stay relevant for industry practitioners, such as mutual fund managers, since their performance often is benchmarked against a specific stock market index. Thus, we hope that by benchmarking our selected industry peers to the development of a stock market index for the same period we will get more relevant results and provide information with our research so as to help them in their work of allocating capital as efficiently as possible.

Having motivated the selection of a specific stock exchange to look at, we have decided to look at the Swedish stock market and more specifically Nasdaq Stockholm’s main stock exchange.

Being a smaller market with similar reporting standards, currency, laws and taxation also increases the comparability between the companies being studied.

The Nasdaq Stockholm main stock exchange is covered via an index called OMXSPI. The index is the largest and broadest index in Sweden. So, by choosing to look at IPOs and peers listed and included in this index only, we make it possible to get data on as many IPOs and peers as possible since no other index in Sweden includes more companies. It also allows the performance of the peers and IPOs to be compared to companies in the same market in order to identify extreme performance.

3.1.3 Industry definition and identifying sectors

The aforementioned study by Hsu, Reed and Rocholl (2010) used two digits SIC codes, which sorts companies into 62 different industries, in order to obtain relevant listed peers to the company doing an IPO. However, we found this industry definition to be too broad. Since when implemented on the U.S market as well as the Swedish market generated many peers that did not provide the same services or products as the firm doing the IPO. Thus, a decision was made to use the Thomson Reuters Business Classification (TRBC) instead, which is widely used in the financial investment and advisory space to identify and select groups of comparable companies. Using this industry classification, a much higher accuracy was achieved when identifying industry peers to the company doing an IPO. Using the TRBC industry classification on the fourth-level of detail, where companies are sorted into a total of 154 different industries, the classification system provided enough granularity in the data so that the companies are similar while still not missing relevant peers. No industry definition is of course perfect but looking at other industry classifications and comparing the SIC two-digit peers with the TRBC peers the accuracy was higher and an obvious better choice. Another option would have been to implement a more qualitative approach, but for the purpose of this study and possible replication studies in the future we choose to go with the latter option relying on a third-party quantitative classification rather than inventing our own qualitative classification system.

3.1.4 IPO dataset

In order to generate data for the IPOs completed at Nasdaq Stockholm main market, for the relevant time period, the Refinitive Eikon database was used. A total of 164 IPOs was identified, following the predefined time criteria, in a total of 54 different industries. The dataset only included completed IPOs as well as companies that had delisted or gone bankrupt after completing the IPO. For the total dataset of 164 IPOs some data points were collected. The first datapoint was the sector according to TRBC industry classification. The second datapoint was the first trading day of the IPO.

Based on the defined TRBC industry classification for each IPO as well as the data of the first trading day, the Refinitive Eikon database was used to identify companies within the same industry that were listed at the same time as the completion of the IPO. In order to find the relevant industry peers at the time of the listening, peers that had gone bankrupt or delisted at the time of the data collection, but still were listed at the time of the IPO in that specific industry, were included in the dataset. Similarly, for the peer dataset data points were collected for the market capitalization (MCAP) of peers at the point of IPO, MCAP of the company completing an IPO, sector and subsector of each peer as well as the relative size of the peer in relation to the IPO. The MCAP here refers to the closing price of the first day of trading times the outstanding shares at the time. The relative size was calculated as:

$$\frac{\text{MCAP}\,{}^{0}_{\text{Peer}}}{\text{MCAP}\,{}^{0}_{\text{IPO}}} = \text{Rel. size}$$

The total dataset generated containing all the identified peers for each IPO included a total of 1714 peers related to 141 of the 164 IPOs. The IPOs that were excluded did not have any peers in the same sector at the point of listing. These IPOs were therefore excluded from this dataset and provide no use for this study.

4. Methodology

4.1 Refining dataset and generation of stock price

For the 164 IPOs completed in the time period relevant for this study, a total of 1714 peers have been identified. This dataset was then subject to adjustments in order to better fit the scope and purpose of this study. From the 1714 peers, a total of 379 were excluded for not being listed at the time of the IPO they were related to. In addition, some IPOs as well as its identified peers were excluded. The IPOs that were excluded meet two critical criterias. The first critical criteria were if the IPO happened in the Real Estate Rental sector. The reason for excluding this sector specifically was the different market and profitability dynamics, companies often being niched in specific parts of the county. Real estate companies valuation is also to a large extent affected by the reporting standards with regard to IFRS meaning that their assets, mainly buildings, are valued at their market prices, which leads to stock price development being affected by real estate prices, rather than competitive environment. The real estate sector also tends to have a higher degree of cross-ownership in new IPOs as well as other listed peers. The Real Estate Rental sector was also most frequent in terms of IPOs as well having significantly more peers, which would have resulted in the Real estate sector dominating the study, decreasing the study's explanatory value as a whole by getting too focused on a specific sector. The second criteria were a manual adjustment for IPOs with non-relevant peers with regards to operational scope or business models. After the adjustments a total of 88 IPOs met the criterias and were included in our study. Refining the peer dataset for the excluded IPOs a total number of 559 peers were left.

Based on the compiled list of 88 IPOs with the related 559 peers the stock price for the individual IPO and the set of identified peers was generated. As previously mentioned, this thesis focuses on general patterns during a 61-calendar day period. Therefore, intraday trading activity was of low importance and data was exclusively collected for closing prices for each individual day. The price data was generated via Excel and extracting stock price information from Microsoft Bing Corporation. The input values into the Excel model were the IPO and the identified peers, the model then generated the closing stock prices for each day for the chosen time period. For specific calendar days where no closing price could be generated due to weekends or closed trading, the closing price from the prior or subsequent day was used, depending on which was closest to the first trading day. Using the same Excel model, the closing values of the OMXSPI index for each day in the period was also generated. The OMXSPI was also subject to the same adjustments with regards to missing values due to weekends or closed trading.

From the generated stock price series for each peer, covering the 61-calendar day period around a completed IPO, an index for the stock price development of each individual peer was created. Where the closing price on the first trading day constituted the basis value P^0 and where P^t constituted the closing price for any other day in the period. This generated a unique value with the first trading day constituting the basis of 100 and each other date having a comparable value. The model to calculate the index value for day t was:

$$\frac{\mathrm{P^t}}{\mathrm{P^0}} \times 100 = \mathrm{Index^t}$$

For the company completing an IPO, stock price data was available first from day 0, which is the first trading day. This stock price data series, of 31 price points for each IPO was then

indexed, the same way as their peers, by setting their closing stock price on the first trading day to index value 100. This resulted in IPO indexes for each of the 88 IPOs that were studied. For the OMXSPI during the period relevant for each IPO, closing value data was gathered for 30 days before the IPO to 30 days after. This created one index series for the OMXSPI index relating to each of the 88 IPOs studied.

4.2 Aggregate price indexes composition and construction

From the stock price generation there were three groups of indexes: the first group of 88 IPOs, second group of 559 peers and third group of 88 OMXSPI indexes.

To get an overview of the general patterns of the data collected, an aggregate average index for each of the groups was created. Filtering out the series belonging to each group the index values were summarized and divided by the total number n in the group, where $\overline{R}_{xi}$ constituted the index value for the whole aggregated group for one specific day, R_{x1} the index value for each individual within the group and n the total number of individuals.

$$\overline{R}_{xi} = \frac{R_{x1} + R_{x2} + \ldots + R_{xn}}{n}$$

This aggregated series for each group was then showcased graphically alongside the other aggregated series. The aggregation of the data as well as the graph was generated via Excel.

4.3 Design of Statistical Tests

We have used Excel for all the statistical tests performed. In order to test our hypotheses, we have assumed that the stock price returns and index returns for the periods tested are normally distributed. This is the standard convention when looking at previous studies and their used methodology to analyze the results and was made in order to perform relevant statistical tests for the mean returns. For all the statistical tests conducted, in order to test our hypotheses, a significance level of 10 percent is considered to be significant. Meaning that we will reject a specific null hypothesis if the p-value is less than 10 percent.

4.3.1 Testing hypothesis 1

In order to test the validity of hypothesis 1, whether Listed industry peers' stock price will decrease more than index in the period before the IPO. We performed statistical tests with the goal of assessing whether the mean return for the peers was lower than the for the OMXSPI 30 days before the IPO to the day of the IPO. To determine which statistical test to use for testing this we began by looking at the indexed stock price data for the 559 peers and 88 OMXSPI periods. Then we calculated the return from 30 days before the IPO to the day of the IPO by dividing the indexed stock price of day 0 with the indexed stock price at day -30 and then subtracting this with 1.

This was repeated for all 559 peers identified in the study and also repeated for the 88 OMXSPI time period series ranging from day -30 to 0. Since we do not have the full population and only samples of data, we do not know the population variances. Thus, we can't use a Z-Test in order to test the difference in population means, since known population variances are required in order to perform such a test. However, we were able to use the sample variances in order to determine if the population variances for the two samples, the 559 peers and 88 OMXSPI periods, could be similar by using a statistical F-Test. Depending on the result of this F-Test, if

the variances for the population could significantly be the same or different, a T-Test for samples assuming equal or unequal variances was used to further analyze if the mean return for the peers was lower than that of the OMXSPI during these time periods. The decision tree for which statistical test we performed is illustrated below.

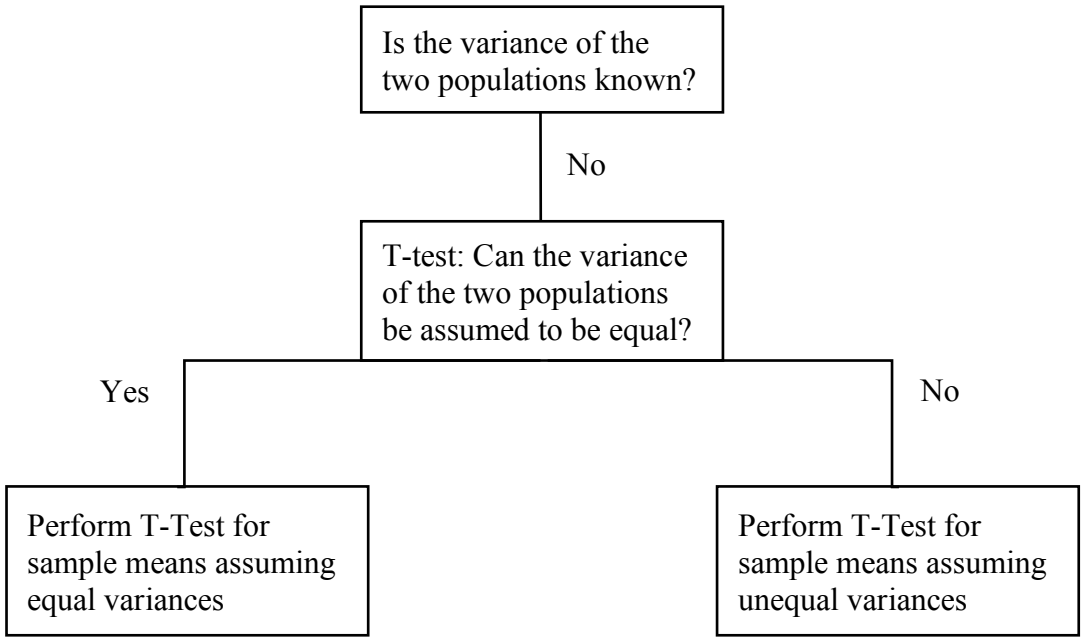


Illustration 2: Decision tree for which statistical tests to use when testing the hypotheses.

The hypothesis tested using the statistical T-Test is as follows:

$$H_0: \mu_{\text{Return of Peers}^{-30:0}} - \mu_{\text{Return of OMXSPI}^{-30:0}} \geq 0$$
$$H_1: \mu_{\text{Return of Peers}^{-30:0}} - \mu_{\text{Return of OMXSPI}^{-30:0}} < 0$$

Thus, if the null hypothesis can be rejected, this result will tell us that the alternative hypothesis is true and that peers mean return is significantly lower than the OMXSPI mean return in the period before the IPO.

4.3.2 Testing hypothesis 2

To test hypothesis 2, that IPOs and peers together will outperform Index in the period after the IPO. We used the same methodology as described above. Beginning with calculating the individual returns for the 88 IPOs, 559 peers and 88 OMXSPI periods based on their indexed stock price development for period 0:30.

Forming two samples of 88 IPOs together with 559 peers and 88 OMXSPI time series, the two samples variance in returns was then analyzed with a F-Test in order to check whether or not they have similar variances, the same test conducted for hypothesis 1. And then based on the result a T-Test for equal or unequal variances assumption was used, in accordance with illustration 2. The hypothesis tested using the statistical T-Test is as follows:

$$H_0: \mu_{\text{Return of IPOs and Peers}^{0:30}} - \mu_{\text{Return of OMXSPI}^{0:30}} \leq 0$$
$$H_1: \mu_{\text{Return of IPOs and Peers}^{0:30}} - \mu_{\text{Return of OMXSPI}^{0:30}} > 0$$

Where a rejection of the null hypothesis leads to an acceptance of the alternative hypothesis and the implication that the IPOs and peers outperforms OMXSPI in the period after the IPO.

4.3.3 Testing hypothesis 3

The same method as the one above was also used to test hypothesis 3. That the incumbent industry peers' stock price development will outperform index in the period after the IPO. With the difference that the samples included returns for the 559 incumbent peers and the corresponding 88 indices return periods, excluding the return of the IPOs from day 0 to 30. Where the incumbent peers refer to the peers that were listed before the IPO. The hypothesis tested using the statistical T-Test is as follows:

$$\mathrm{H}_0\colon \mu_{\text{Return of Peers}^{0:30}} - \mu_{\text{Return of OMXSPI}^{0:30}} \leq 0$$
$$\mathrm{H}_1\colon \mu_{\text{Return of Peers}^{0:30}} - \mu_{\text{Return of OMXSPI}^{0:30}} > 0$$

Thus, we will accept hypothesis 3, that peers outperform OMXSPI, if we can reject the null hypothesis.

4.3.4 Testing hypothesis 4

To test if IPOs will outperform peers' stock price development in the period after the IPO. The same method used for testing the previous hypotheses was used. First performing a F-Test and then a T-Test based on the result of the F-Test. The hypothesis tested using the statistical T-Test is as follows:

$$\mathrm{H}_0\colon \mu_{\text{Return of IPOs}^{0:30}} - \mu_{\text{Return of Peers}^{0:30}} \leq 0$$
$$\mathrm{H}_1\colon \mu_{\text{Return of IPOs}^{0:30}} - \mu_{\text{Return of Peers}^{0:30}} > 0$$

With the implication that if the null hypothesis can be rejected, the alternative hypothesis will be accepted and thus our hypothesis is true, that the IPOs outperform their peers in the period after their listening.

4.4 Multivariate Regression Analysis

The second component of this study is to identify patterns for the immediate stock market reaction and which independent factors may affect the return of the peers prior and after the IPOs first trading day. The regression was performed for two periods. The periods prior (-30:0) and the period after (0:30). The return of this period prior was defined as:

$$\text{Index}^{0} - \text{Index}^{-30} = R^{-30:0}$$

The return for the period after was defined as:

$$\text{Index}^{30} - \text{Index}^{0} = R^{0:30}$$

The $R^{0:30}$ and $R^{-30:0}$ constituted the dependent y variable in the regression model. The model included three independent variables for the proceeding time period and five independent variables for the subsequent time period.

The structure of the regression model used for the time proceeding the first trading day was:

$$Y_i = \beta_0 + \beta_1 x_{1,\,i} + \beta_2 x_{2,\,i} + \beta_3 x_{3,\,i} + \varepsilon_i$$

The three independent variables were defined as:

Log (MCAP of Peer)	The total market capitalization of the peer based on the closing price on the first trading day of the IPO. Values were loged.
Log (MCAP of IPO)	The total market capitalization of the IPO based on the closing price on the first trading day. Values were loged.
Index performance	The total negative or positive return (R) for period -30:0 calculated as: $\text{Index}^0 - \text{Index}^{-30} = R^{-30:0}$

The structure of the regression model used for the subsequent time after the FTD is:

$$Y_i = \beta_0 + \beta_1 x_{1,\,i} + \beta_2 x_{2,\,i} + \beta_3 x_{3,\,i} + \beta_4 x_{4,\,i} + \beta_5 x_{5,\,i} + \varepsilon_i$$

The five independent variables were defined as

Log (MCAP of Peer)	The total market capitalization of the peer based on the closing price on the first trading day of the IPO. Values were loged.
Log (MCAP of IPO)	The total market capitalization of the IPO based on the closing price on the first trading day. Values were loged.
Index performance	The total negative or positive return (R) for period 0:30, calculated as: $\text{Index}^{30} - \text{Index}^0 = R^{0:30}$
IPO performance	The total negative or positive return for the period, calculated as: $\text{Index}^{30} - \text{Index}^0 = R^{0:30}$
Positive IPO performance	A dummy variable defined as if IPO performance is higher or lower than zero, with value 1 attributed to IPOs with positive performance.

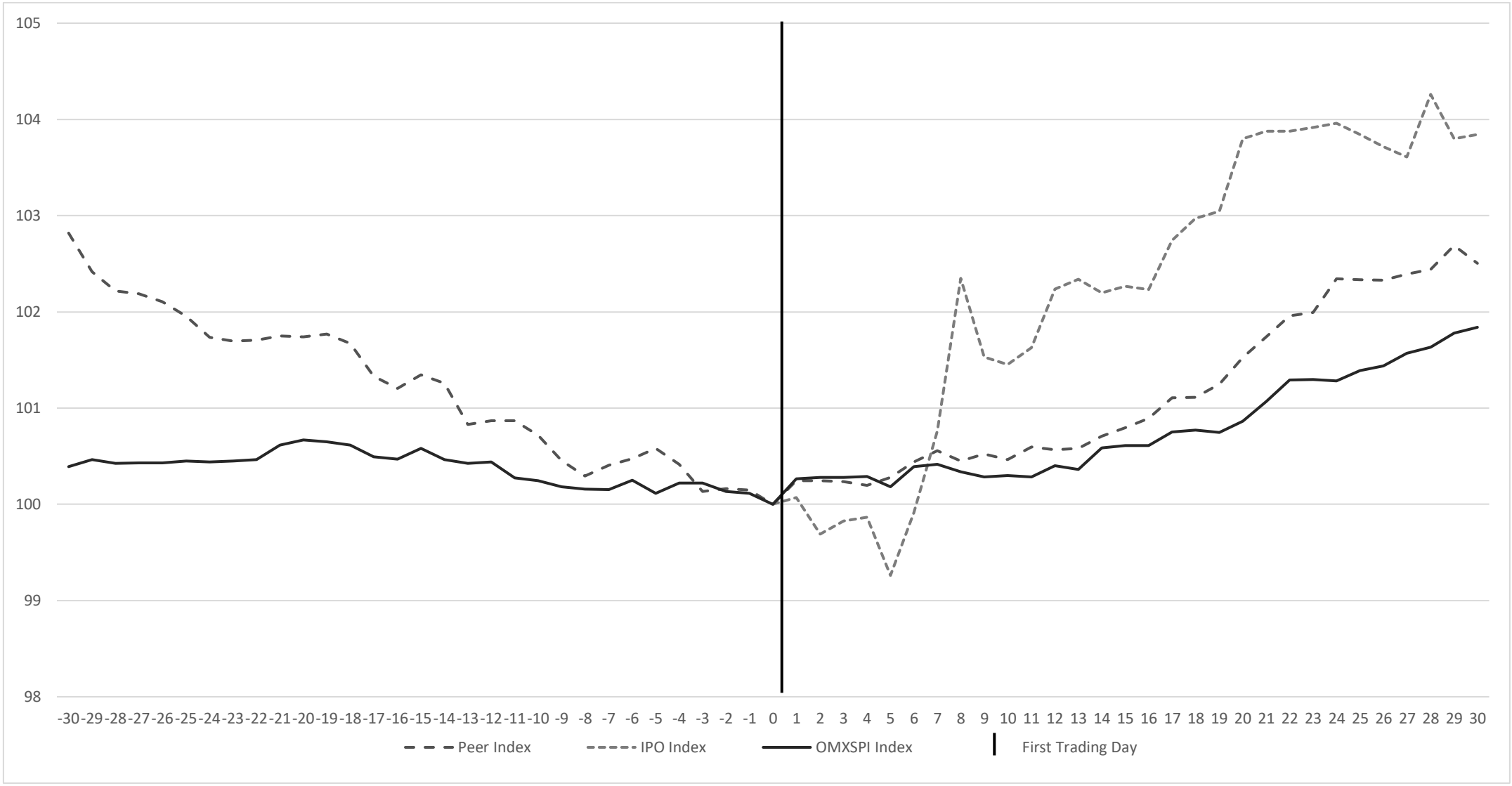
In addition to this, adjustments for fixed factors were performed. Specifically, adjustments for fixed year effects done. The reason for this was that certain years could have higher or lower returns depending on the year in which the IPO was completed. Certain years could for instance have higher volatility due to macroeconomic factors. By adjusting for the fixed year effects such factors do not affect the results of this study. To practically implement this in the regression models dummy variables were created for all years except 2010.

5. Empirical Results

5.1 Aggregate price indices development and analysis

Illustration 3, as seen on the following page, shows the aggregated performance and development during the 61-calendar day period which this study examines. Based on the aggregated development there are some trends that clearly stand out. The peer index can be observed decreasing for the whole time period prior to the IPO and the OMXSPI index decreases less than the peers. This indicates that peers perform worse prior to an IPO, which is not reflected by a general decrease in stock prices across the market. The development of the companies completing an IPO showed the highest return from the time of the IPO to 30 calendar days after, increasing more than both the peer- and OMXSPI index. Based on the graph however, the IPOs can be observed having a higher volatility, with a price decrease of close to 1 percent in the first five days and then having an improved performance and ending up with a positive performance close to 4 percent at the last day of the period. The OMXSPI index can also be observed having a positive development for the period subsequent to the first trading day, ending with a total positive return of close to 2 percent. In addition, the peers which experienced close to a 3 percent decrease for the period prior to the IPO show a positive return and end up at a level similar to what was recorded before the IPO. Based on the observed results in this graph the trends that could be observed visually had to be tested statistically. To test if the trends visible in this graph are in line with our hypotheses. Visually the graph indicates that further analysis and testing could be interesting in order to better understand if there is any significance in the trends observed in the aggregated indices.

Illustration 3: The aggregated price development of Peers, IPOs and OMXSPI for period -30:30



The illustration reports the aggregated price performance for the three independent groups. Each index series was computed summarizing the value of each individual within the group and dividing the by total number of individuals (n). Each group had an average value of 100 on day 0 being the basis for each index series. The event date, being the first trading day of the IPO, is marked by a vertical line in the graph.

5.2 Statistical Test Results

Table 1 below shows the descriptive statistics for the variables used to test our hypotheses. Looking at the table, the difference in return of peers compared to the return of OMXSPI in the time period -30:0 stands out, where the mean return of peers is much lower. Noteworthy is also the higher variance of the return of IPOs, roughly as high as the mean return for the variable. Visible is also the negative return of OMXSPI and peers in the period before the IPO and the positive return for the two variables in the period after the IPO. The return of the IPOs and peers, separately and together, is greater than OMXSPI in the period 0:30 and the variance of the variables, but for OMXSPI, in the same period is also high.

Table 1: Descriptive Statisctics

Time period	Variable	N	Mean	Var
-30:0	Return of Peers	559	-2,743029%	2,045020%
	Return of OMXPI	88	-0,388316%	0,314877%
0:30	Return of IPOs	88	3,553827%	3,542380%
	Return of Peers	559	2,505188%	1,897877%
	Return of IPOs and Peers	647	2,637906%	2,102009%
	Return of OMXSPI	88	1,839920%	0,176955%

The table reports the descriptive statistics for the return of the peers, OMXSPI and IPOs. The time period -30:0 refers to 30 days before to the first trading day of the IPO and the time period 0:30 refers to the first trading day to 30 days after the IPO. Return is calculated by dividing the stock price in the end of the time period with the stock price in the beginning minus one.

As described in the methodology, we first want to test if the variance of the two variables used in each of the four hypotheses is significantly different from one another by using a F-Test. Below follows table 2, showing the result of these tests. The variance of the variables “Return of Peers" and “Return of IPOs and Peers” is tested on whether it is unequal to the variance of the “Return of OMXSPI” for the corresponding time period, -30:0 and 0:30. Whether the variance of “Return of IPOs” is unequal to the “Return of Peers”, for the time period 0:30, is also tested in order to decide which T-Test to perform for hypothesis 4. Looking at the table, all the above described tests show significant results. Meaning that the two variables for each hypothesis have, at a p-value lower than 0.01, different variances than one another.

Table 2: Unequal Variances F-Test Results

Time period	Variable	Var
-30:0	Return of Peers	2,045020%***
	Return of OMXPI	0,314877%
0:30	Return of IPOs	3,542380%***
	Return of Peers	1,897877%***
	Return of IPOs and Peers	2,102009%***
	Return of OMXSPI	0,176955%

The table reports the variance for return of peers, OMXSPI and IPOs. The time period -30:0 refers to 30 days before to the first trading day of the IPO and the time period 0:30 refers to the first trading day to 30 days after the IPO. F-tests were used to test whether the "Return of Peers" and "Return of IPOs and Peers" has unequal variances compared to the variance of the "Return of OMXSPI" for the same time periods. The "Return of IPOs" was tested against the "Return of Peers" to test if they had unequal variances as well.
***p-value<0.01, **p-value<0.05, *p-value<0.10

Due to the results, showing that the variables tested in each hypothesis have significantly different variances, the next step is the performance of Welch's T-Tests for each hypothesis i.e. T-Tests for samples assumed to have unequal variances. Below follows Table 3, which shows the results from the T-Tests used to test our four hypotheses about the mean differences in return.

Table 3: Mean Return Differences T-Test Results

Time period	Variable	Mean
-30:0	Return of Peers	-2,743029%***
	Return of OMXPI	-0,388316%
0:30	Return of IPOs	3,553827%
	Return of Peers	2,505188%
	Return of IPOs and Peers	2,637906%
	Return of OMXSPI	1,839920%

The table reports the means for the return of peers, OMXSPI and IPOs. The time period -30:0 refers to 30 days before to the first trading day of the IPO and the time period 0:30 refers to the first trading day to 30 days after the IPO. Welch's T-Tests were used to test whether the mean of "Return of Peers" was smaller than the mean of "Return of OMXSPI" for the time period -30:0. For the time period 0:30 it was tested whether the mean of "Return of IPOs" is greater the mean of "Return of Peers" and if the mean of "Return of Peer" and "Return of IPOs and Peers" is greater than the "Return of OMXSPI".
***p-value<0.01, **p-value<0.05, *p-value<0.10

For the first hypothesis, testing whether the mean return of peers is lower than that of OMXSPI, the results show that the p-value of that the return of peers is greater than the return of OMXSPI is less than 0.01, leading to the rejection of this null hypothesis. And thus, acceptance of our first hypothesis, that peers indeed has a lower mean return than index in the period before the IPO.

For our second, third and fourth hypothesis we cannot significantly reject the null hypotheses, since they all have p-values greater than 0.10. For hypothesis two and three respectively this means that we cannot reject that the mean return of IPOs and peers and that of the peers alone is lower than that of OMXSPI, for the time period 0:30. For hypothesis four this means that we cannot reject that IPOs mean return is lower than that of the peers in the period after they have been listed.

To conclude, the Welch's T-Test performed shows us that thesis hypothesis one is true and significant due to the acceptance of the alternative hypothesis and that the other hypotheses are false and insignificant due to failure to reject the null hypotheses.

5.3 Multivariate Regression Analysis

5.3.1 Descriptive statistics for datasets

Table 4: Descriptive statistics for IPOs and selected Peers

Variable	Observations	Std. Dev	Mean	Median	Minimum	Maximum
MCAP of IPO (MSEK)	88	16012,10	6124,65	1864,56	13,25	108298,80
No. of peers per IPO	88	4,13	6,26	6,00	1,00	18,00
MCAP of Peer (MSEK)	559	42241,01	15002,79	1972,22	37,19	402429,37
Relative size (Peer/IPO)	559	16,10	4,62	0,55	0,00	163,82

The table presents the descriptive statistics for IPOs and selected Peers. MCAP of IPO refers to the total market capitalization based on the closing price on the first trading day. No. of peers per IPO refers to the total number of peers that have been included in this study. MCAP of Peers refers to the total market capitalization based on the closing price on the first trading day. Relative size refers to the MCAP of each peer divided by the MCAP of the related IPO.

Table 4 presents the descriptive statistics for 88 IPOs that were included in this study. The MCAP refers to the total market capitalization on the closing price for the first trading day, measured in MSEK. No. of peers refers to the total number of peers related to each IPO that has been used in this study. The MCAP refers to the total market capitalization of the peers in the dataset at the point of an IPO in the same sector. Relative size to IPO is based on the market capitalization for the peer compared to the market capitalization of the company completing an IPO.

As can be observed in Table 6 in the appendix there are no occurrences if IPOs having a first trading day in the month January and July, and only one occurrence documented in August. The month June and April however, had the highest number of completed IPOs. For the sectors, the five sectors in which most IPOs occurred were Biotechnology & Medical Research; Medical Equipment, Supplies & Distribution; Construction & Engineering; Software and Pharmaceuticals, which can be found un appendix Table 7. The five largest IPOs, measured in market capitalization, are presented in Table 8 in the appendix. The five largest are Epiroc AB, EQT AB, Storskogen Group AB, Nordnet AB as well as Dometic Group AB.

5.3.2 Regression for factors

Table 5: Regression model and results for period -30:0 and 0:30

Time period	-30:0	-30:0	0:30	0:30
IPO performance			0,084**	0,077*
			(0,037)	(0,042)
Dummy: IPO positive performance			-0,472	-0,208
			(1,469)	(1,522)
Log (MCAP of Peer)	1,671*	1,652	-0,173	-0,236
	(1,028)	(1,053)	(0,317)	(0,32)
Log (MCAP of IPO)	-0,149	-0,339	-0,285	-0,362

	(1,179)	(1,58)	(0,37)	(0,483)
Index Performance	1,598***	1,572***	0,712***	0,656***
	(0,37)	(0,42)	(0,16)	(0,18)
Intercept	-14,387	-13,166	4,312	-0,260
	(10,515)	(21,914)	(3,243)	(6,743)
Adj. for year fixed effects?	No	Yes	No	Yes
Observations	559	559	559	559
R Square	0,036	0,048	0,051	0,084
Adjusted R Square	0,030	0,023	0,043	0,057

The table represents the regression results from four regressions. Two measuring the return for the period prior to the IPO and two for the period after. Return is calculated as the change in index values. Return and Index performance is adjusted depending on the period of study. The regression covers all identified peers of 559. Two different regressions for each period were performed. One only including the independent variables, and one additonal including the independent variables adjusted for fixed year effects from year. First number represents coefficient and paranthesis ( ) represents the standard error.
***p-value<0.01, **p-value<0.05, *p-value<0.10

Table 5 shows the regression analysis performed for the return for the period -30:0 and provides an R Square of 0.048, which indicates that the identified independent variables can indicate about 4.8 percent of the return. Before adjusting for the year fixed effects there are significant results at a p-value of 0.10 for MCAP of the peer as well as index performance. After adjusting for year fixed effects, the results are only significant for the index performance. This is a positive relationship indicating that if OMXSPI has positive return, the peers also have higher returns. The non-significant results MCAP of peers after adjusting for year fixed effects indicates that there are effects, but those effects can be explained via performance differences in years, which decreases the p-value for this variable.

The regression analysis performed for period 0:30 provides an R Square value of 0,084, with two independent variables being significant. The R Square being higher than the period prior to an IPO indicates the independent variables provide higher explanatory value for the period after. Similar to the preceding period there are significant results for index performance in line with the preceding period. The implication of which is that positive index performance has a positive effect on the performance of the peers. Another significant independent variable is the IPO performance from which is the calculated return for period 0:30. There is a small positive coefficient of 0.08, indicating the positive IPO performance corresponds to higher return for the peers. On the other hand, there are no significant results for the dummy variable based on if the IPO return is positive or negative, which indicates that high return has more effect on the peers than smaller return.

6. Discussion

6.1 Analysis

The results of our study based on the aggregated indices presented in Illustration 3 show that prices of the peers decreased for the entire period prior to an IPO. These results are also significant for hypothesis 1 that peers underperform the comparable OMXSPI index leading up to an IPO within the same sector. On average the peers can be observed having a negative return of close to 3 percent for -30:0. These results, however, differ from the results of the U.S study performed by Hsu, Reed and Rocholl, in which the peers started to experience a negative CAR from day -10 to the first trading day with about 0.5 percent. These differences can be explained by two main factors. The first being that the Swedish market is different from the U.S market. Sweden is a relatively smaller market, the consequence of which being that in any given sector the number of companies in the U.S is significantly more than on the Swedish market. This increases the relative importance of the IPO, when comparing with for instance 3 peers instead of 10. This would explain why there are significantly worse returns on the Swedish market compared to the U.S market. In addition to this Sweden is a much more concentrated market and smaller economy which could indicate fiercer competition between the few firms that are listed. This means that the competitive advantages found by Hsu, Reed and Rocholl are intensified on the Swedish market, while companies could for instance be targeted against different geographical markets in the U.S. The second explanation for the differences in performance and timing could be due to the methodology of each study. As previously described Hsu, Reed and Rochol used two digits SIC codes, dividing the market into 62 different industries. Our study however uses the TRBC industry classification dividing the market into 154 industries. As a result, our study could be better at defining the exact comparable peers, which leads to larger effects being recorded rather than if less related competitors were included in the peer group to each IPO.

The methodology is one of the key areas in which this thesis paper provides a development of previous research papers. The first area is with regards to how performance of both peers and IPOs is benchmarked to index performance. The abnormal returns in the paper by Hsu, Reed and Rocholl is calculated as the difference between the actual return for the stock and the expected return using a model with average daily returns for 255 days ending 42 days prior to the first trading day of the new IPO. We consider this to be a flaw since returns and price of a stock is highly volatile and the average return for one period can obviously not be used to predict the return in another period. Our study however provides a materially better model for comparing the abnormal returns with the returns of the OMXSPI index during the same time period. The flaw in the study by Hsu, Reed and Rocholl is that another abnormal event could occur in the studied time period, which causes a large fall in stock prices unrelated to the IPO, which is then captured by the way that the CAR is calculated. This effect would however not affect our study since the same fall would also be reflected in the OMXSPI index. The second area in which our paper is eminent is with regards to industry definition and relevance of peers. The study from Hsu, Reed and Rocholl has a total of 8,966 related to a total of 134 completed IPOs, an average of 66.9 peers for each IPO for a twenty-year time period. Our study however with a total of 88 IPOs, has an average of 6.3 peers for each IPO. This results in a substantially better comparison group which also would correspond to being able to record higher effects on close competitors, which is also proved by the negative return we record being six times as large as the one seen in their paper.

Reviewing the results of our thesis we could say with significance that listed peers' short-term stock prices perform worse and decreased more than the OMXSPI in the 30-day period before the IPO. As well as that there is a significant correlation with the peers' stock price development and that of the OMXSPI price development. However, we cannot say anything with significance about how stock prices for IPOs and peers will perform in relation to OMXSPI, and about how peers will separately perform against OMXSPI or whether or not IPOs will outperform their peers short-term, in the 30-day period after their first initial trading day. What was significant when looking at the period after the IPO was that the peers' stock price development was correlated with both the performance of the IPO and the performance of OMXSPI. Viewing Table 1 as well we see that all the variables mean returns before the IPO is negative and that all the mean returns after the IPOs are positive. To summarize, our results seems to indicate that you can be certain about the fact that peers will perform worse than OMXSPI before the IPO but the only thing you can say significantly about the period after the IPO is that you cannot predict how the stock prices of peers, IPOs and OMXSPI will develop in relation to each other.

Reasons for why we would have these results could be due to several factors. One theory is that investors want to avoid uncertainty and thus act rationally, selling off the peers since they do not know how the IPO will affect the industry regarding short-term stock price development. And then this sell-order on the industry peers, to avoid uncertainty, drives down their stock prices and leads to a performance worse than OMXSPI in the time before the IPO. Thus, since we do not know what the performance will look like after the IPO it could be reasonable to expect that it will depend on how the IPO affects the industry dynamics and this effect is known first after the IPO has taken place. That could explain why we see a significant correlation between peer-, IPO- and OMXSPI performance. That is the performance shows a correlation but we do not know in which direction in relation to one another the performance of peers, IPOs and OMXSPI will go, leading to the uncertainty previously explained created by the IPO. Another reason for why we see a significant decrease in the peers stock price compared to OMXSPI, in the 30 days before the IPO, could be that institutional investors are selling of shares in the incumbent industry peers in order to buy shares in the IPO in order to still keep the same percentage of industry exposure in the fund. Not excluding any peers in order to avoid not getting exposure to the whole industry. In this case they would have to reallocate capital, selling off listed peers in favor of investing in the IPO to keep the same industry exposure not excluding any companies in the industry. These types of actions could supposedly mainly be seen by index funds and pension funds wanting to get a broad and diversified exposure to equity rather than for specialized funds pursuing more niche investing strategies. This would be consistent with the fact that when looking at Illustration 3 the peers recover after the IPO, due to the fact that the sell-off previously having nothing to do with the industry as such being overvalued rather the decrease in stock price is due to this special occasion sell-off done by institutional investors to rebalance their portfolios. Why we believe that this theory could be plausible is due to the fact that institutional investors own 73-80 percent of the public equity market. Thus, they are the one investor category that can affect stock prices the most, which makes it reasonable to assume that they are the ones selling the peers and that a reason for this could be in order to rebalance their portfolios. Since if this sell-off mainly was driven by retail investors we probably would not have significant results for this, due to the fact that they own a too small share of the market capitalization in the public equities market, and thus would not be able to create such a large significant effect. Another reason, that simultaneously could explain, why investors would want to sell-off peers before the IPO could be due to IPO underpricing, which is the fact that the IPOs often are priced well below what they actually are worth in order to attract investor fund flows, often creating a high short-term return on the first trading day of the IPO, an effect which is documented by Philip Lee et al. In order for

institutional investors to invest in underpriced IPOs they would have to free up liquidity, which our study indicates could be done by the selling of peers. IPOs also create several competitive advantages for the firm doing it, such as loosening of financial constraints, financial intermediary certification and the presence of knowledge capital, as found in the study by Hsu, Reed and Rocholl. Which has been found, in the same paper, to affect the operational and financial performance of listed industry peers after the IPO starts benefiting from the competitive advantages of being a listed company. This creates further incentives for investors to divest in the listed peers due to the documented negative effect on operational performance for the peers. All of the above explanations regarding fund flows affecting the short-term stock price, would also be consistent with the higher relative importance of an IPO in Sweden compared to that of an IPO in the U.S. Whereas in a smaller market, with only a handful of companies within each sector, the relative importance of the IPO is very high and could potentially be the cause of a larger sell-off in the already listed companies. Compared to a larger market with tens of listed peers where each peer only experiences a smaller sell-off in order to avoid uncertainty and make sufficient funds available to invest in the IPO.

However, two results that could be inconsistent with this theory about fund flows, is that our regression model does not show significant results with regards to correlation between return of peers and the market capitalization of both the peers and the IPO. Why this is inconsistent with the fund flows theory is because larger IPOs would lead to a greater sell-off in peers, in order to free up liquidity to invest in the IPO. Meaning that there should be correlation between the market capitalization of the IPO and the short-term stock price performance of industry peers. When looking at the data in detail of each IPO however, another picture arises. More specifically we can observe that the largest IPOs in our dataset are Epiroc and EQT, then a large leep down to Storskogen and Nordnet at a market capitalization 61 512 MSEK and 26 250 MSEK. Beginning with Epiroc, which was a spin-off from Atlas Copco, which means this IPO was not subject to a traditional book building process and raising capital. EQT being well financed by largest shareholders Investor. The effect of this is that our dataset includes relatively few relevant large IPOs, this could be an explanation for not finding significant results for MCAP of IPOs. The other aspect being with regards to the market capitalization of peers, it is inconsistent to not find a significant correlation between the market capitalization and peer returns. The intuition behind this being that the larger the peer the more likely it is to be affected by the competition of the IPO, since its broader geography and product portfolio has a greater chance of overlapping with that of the IPO. And since the IPO, as previously explained, gets competitive advantages in the process this will hit this larger peer's short-term stock price harder than a smaller peer not being directly affected by the IPOs competition specifically due to a for example more niche competitive strategy. Another factor that could simultaneously be at play is that larger peers should be relatively less affected by a sell-off caused by an IPO in their industry, since they have a larger relative market capitalization. On the other hand, larger companies also tend to have a higher relative ownership from institutional investors. Meaning that there could be three effects, moving in different directions, between the market capitalization of peers and peer performance when studying the possible explanations above. Which could be why we do not get any significant results for this independent variable. Specifically, this would be consistent with our regression being significant before adjusting for the fixed year effects with a positive coefficient of 1.671 indicating that peers with higher market capitalization tend to have a less negative return than smaller peers. These results were however not significant after adjusting for fixed year effects, meaning that there could be other dynamics at play in different years, like large peers being hit harder because of greater overlap with the competition from the IPO.

A strange trend that can be spotted in our graph for aggregated indices is the increase in the OMXSPI index for the time period after the event date, which is the first trading day of the IPO. This increase in price could logically not be related to the IPO happening. There would also be occurrences of both positive and negative returns in the 61-day period if one picked 88 random dates over the year, and the returns would even each other out. This implies that the increase in OMXSPI recorded after an IPO would be abnormal. The dates when IPOs happen are however not random dates, rather certain periods of the year are heavily overrepresented. This is an effect of the intensive process leading up to an IPO with regards to book building, legal preparations, approvals and coordination with Nasdaq which is disrupted and affected by vacations for different parties in the financial industry. This is also reflected in the data for first trading days for the IPOs. Where no IPOs are completed in January, July and only one in August. In addition, some months during the year historically have higher average return, which means that if months with higher average return for our 12-year time period is overrepresented with IPOs it would correspond to increases recorded in the OMXSPI. Also based on historical performance the status quo is not unchanged but rather slightly positive returns due to inflation, generally growing economy and good stock market environment in the time period we study. The effect of cyclicality with regards to years is also an area that this paper does not explore in great detail, covering the time period between 2010 and 2021 generally being characterized as a hot period as defined by Chris Yung, Gönül Çolak and Wei Wang. This would also provide a great area for future research looking at and comparing returns of peers in hot periods compared to cold periods. Our study has however adjusted for these effects by adjusting for fixed year effects in the regression analysis.

In addition to the explanations we provide for the results being documented in this paper there are other alternative explanations for the results being recorded. Specifically, for the increase in stock prices for the peers after the IPO, these results are however not significant as recorded for failing to reject the null-hypothesis in hypothesis 3. The regression model also fails to find an independent variable other than return for IPOs and OMXSPI that can predict the return for period 0:30. As we examined the negative returns prior to an IPO happening in an industry could be explained by increased uncertainty with regards to the competitive advantages effect on operating performance within the sector, as well as changed fund flows due to rebalancing of fund portfolios and IPO underpricing. An alternative explanation to these results could be that after the IPO is completed the uncertainty is removed and therefore prices recovers for the peers. The intuition behind this being that IPOs can provide a point of reference for valuation of the peers, as well as peers creating this reference point for the IPO. For instance, as recorded in the study by Jay Ritter, companies will often IPO at its peak price and relative valuation based on trading multiples tend to be at its peak upon IPO. As a result of this, peers can also look relatively cheaper when a new IPO has entered the sector and therefore challenge the trading multiples within that sector. This would be consistent with the increase in stock price for the IPOs after the first trading day as well as the positive returns for the peers. This paper has however failed to show that the peer return is significantly higher than the OMXSPI index. Further, uncertainty seen before the IPO, not knowing how it will affect the peers and how their performance will compare to that of the OMXSPI, could partially be resolved after the IPO has taken place. This could explain why we see the recovery of peers, when looking at Illustration 3, which could have caused sell-off in peers in the period before the IPO only due to uncertainties about whether the new company would affect the industry.

6.2 Limitations

The purpose of this study has resulted in measurable results that can be explained by a variety of mechanisms such as fund flows, uncertainty caused by the IPO as well as cyclicality of the

market. There are however limitations and disadvantages with the methodology and way in which the analysis was performed and the extent to which they can explain real world events.

The first limitation being how IPOs were selected. From the total dataset of 164 IPOs a total of 88 ended up being used. The selection process which we used, for instance choosing to exclude companies within the real estate sector can have influenced the results. Especially with regards to the companies that were excluded by manual adjustment based on skewed peer groups. If instead extra effort had been put into manually finding relevant peers supplementing with alternative industry classifications, the results could have been different. However, the reason for these adjustments was that the scope of the study is to specifically examine the effects of IPOs on industry competitors. Companies that are affected by other market dynamics such as reporting standards or cross-ownership have therefore not been included, in order to not skew the results and decrease the relevance of the study. Also, having too many manual adjustments for the selection of peers would also have resulted in larger effects from biases and less replicability of the study. In addition to this, our paper has a relatively high number of IPOs considering that the study from Hsu, Reed and Rocholl, which covered a larger market and longer time period, had a total of 134 completed IPOs.

The second limitation is the time period studied, more specially having a 61-day calendar period. As our results show we see a statistically significant decrease in stock prices for the period -30:0. Being that this decrease is recorded from the first day of the period we are unable to pinpoint exactly when this trend begins, and there could theoretically be other dynamics in play before the 61 day period we study. The same goes for the period subsequent to the IPO. The reason for not extending the time periods is that there was no indication prior to this study that there would be short-term price effects before the period. The study by Hsu, Reed and Rocholl recorded the effects of the first 10 days prior to the first trading day. In addition to this there is often limited information available to the market more than a month prior to the IPO. Prospectus, investor meetings and roadshows may have not been published or performed and final valuation is often not clear until a week before the IPO. If the period was broadened too much other effects would also come into play which could result in other factors being measured unrelated to that of the IPO and its effects on the short-term performance of the peers.

The third limitation is using stock prices as well as OMXSPI index that has not been adjusted to include the positive return effect of dividends. However, this has not had an effect on our study overall. The reason being that we exclude dividends and only look at stock price development for all the peers, therefore the relevant benchmark index should also be excluding dividends since performance could otherwise be affected by dividends from large OMX30 companies which might not be included in the specific peer groups. IPOs also do not perform dividends in the first 30 trading days, being consistent with the way dividends are dealt with for peers and OMXSPI.

The fourth limitation is that the aggregated indices graph, Illustration 3, was generated early in the study. This might have resulted in preconceived notions about the results, which could have influenced the statistical methods that were used as well as the independent variables included in the regression model.

The fifth limitation is that we did not perform comprehensive tests for all the different short-term time periods within the scope of this study. The T-Test and regressions were only performed for returns between -30:0 and 0:30. Leading to the fact that there could be significant results in other time periods such as -10:20 or 0:10 for example. And the potential and unexplored findings in these periods maybe shows a different story than the one being depicted

in our thesis. These periods could especially be explored with regards to the regression analysis where different factors could influence the development for different periods, for instance MCAP of the IPO could have an effect on the immediate period of 10 days closest to an IPO. The reason for not extending this study for this was that previous literature on the topic and the aggregated graph, Illustration 3, did not indicate any such relationships. In addition, performing this analysis could lead to skewed results, measuring such short time periods where the differences in return seems to be even lower in the dataset.

7. Concluding remarks

7.1 Conclusion

Studying whether and how IPOs affect already listed industry peers' short-term stock price development. Our paper has looked at how the returns of industry peers before and after the IPO have developed and benchmarked this development with an appropriate stock price index. In order to see if the change in return is significantly greater or smaller than the change in the index for the same time period. The study takes place in the context of the Swedish stock market looking at IPOs and peers in the period from 2010 to 2022 at the Stockholm Nasdaq main stock exchange specifically. The results obtained is that from 30 days before the IPO to the day of the IPO industry peers stock price return is significantly lower than that of the appropriate index, OMXSPI. In the period after the IPO, from the first trading day of the IPO to 30 days after, we cannot get any significant result of whether IPOs and peers or peers alone outperforms OMXSPI or not. It was also not possible to significantly say if IPOs outperformed their peers' stock price return for this period. In order to analyze the factors that could influence these results, such as performance of the OMXSPI index, performance of the IPOs as well as factors relating to the peers and IPOs with regards to market capitalization, a multivariable regression analysis was performed. The results from this regression model indicate that there is a clear correlation between the OMXSPI index, IPO performance and returns of the peers.

The dynamics that we have used to explain the findings touches four key areas. The first area being the differences between the U.S and Sweden with regards to size of the market as well as number of listed companies. The second area being the fund flows and trading patterns of institutional investors that sell-off prior to an IPO due to uncertainty in competitive environment, rebalancing of fund portfolios, freeing sufficient liquidity for investments into the new IPO. Reasons for why these actions are taken could be due to both IPO underpricing and competitive advantages of the IPO decreasing the operational performance of peers in the long-run. The third key area, being uncertainty leading up to the IPO caused by missing information in the market, specially related to valuation and investor interest in the IPO, and negative price effects caused by the IPOs disappearing once this information is available. The fourth area being that IPOs are affected by the cyclicality in the market, specifically to monthly cyclicalities during the year in which IPOs occur and the trends of hot and cold markets on a year-to-year basis.

Based on the results that have been recorded for the peers, as well as the movements in IPOs and OMXSPI index after an IPO, the key takeaway from these explanations as well as the results of this paper is that there could be a lot of mechanisms at play simultaneously. In line with previous research which has shown that IPOs benefit from competitive advantages after being listed, which in turn has a negative effect on the operational performance of its listed peers. This phenomenon combined with the rebalancing of funds as well as general uncertainty introduced into the sector from the IPO could lead to the negative price effects observed for the listed peers. In conclusion, while IPOs serve as an important function to promote growth and innovation to companies as well as sectors, there is also a high degree of uncertainty introduced as a result of having a new kid on the block.

7.2 Future Research

While IPOs is an established and well researched area there are aspects of it which still lack sufficient studies and research. The area of IPOs effect on the operational performance of its

competitors is one area where studies have found significant effects caused by the competitive advantages of being a listed company compared to private. On the other hand, relatively, few studies have been performed looking particularly at how those competitive advantages as well as uncertainty is priced in for the listed peers. This study fills this void by providing historical data specifically for the Swedish stock exchange and market. The findings of which show that IPOs within a sector leads to increased uncertainty and reduced prices for its peers, in relation to the comparable index, prior to the completion of the IPO. The findings in this paper indicates that those effects could be explained by fund flows as well as general market sell-off due to uncertainty. There are also results indicating that the performance of the IPOs tends to correlate with the performance of the peers for the subsequent time period. One reason for this could be that IPOs can provide guidance for the valuation. For instance, imagine a new electric vehicle (EV) producer completing an IPO with the relevant peers being large auto conglomerates with a product portfolio of both EV, diesel cars, motorcycles, trucks and sports cars. In such a scenario the small EV IPO could show hidden values within a specific division within the large auto-conglomerate. Additional research into this exact relationship could focus on change in trading multiples for peers compared to IPOs, change in reporting standards, change in general approach with regards to investor relations or even increased frequency of spin-offs within the same sector. Another aspect that could be the subject of further research is if it is possible to observe generally increasing interest in a sector where an IPO is completed. The intuition behind this would be that when a company is in the process of going public the IPO attracts interest in that specific sector when the market dynamics of that sector is challenged. Since in the event of an IPO it attracts interest into that specific industry and forces analysts, institutions and retail investors to examine valuations as well as market dynamics within this sector, which could lead to increased interest in the peers. For instance, does the number of analysts covering peers increase, does the number of mentions for peers in newspapers and forums such as Reddit or Twitter increase or even the number of shareholders in peers. Since this study focuses exclusively on the Swedish stock market the component of the sector has not been explored to a large extent. The reason being that most sectors only have few IPOs occurring during the full time period from 2010 to 2022 and most of the sectors not having an IPO at all. Performing a similar study on a larger market such as the U.S or a combination of markets could provide insight into different dynamics in different sectors. For instance, within the medical fields where medicines and other key products can be protected via patent, competition can be different. Resulting in no negative effects from IPOs on peers with regard to competitive advantages. In such sectors the effects of an IPO could be positive, rather than negative as found in this study, due to attracting interest and analytical coverage into its peers. An additional area for future research regards the effects of IPOs on the trading multiples of its listed peers. This would relate to our alternative explanation for the positive return recorded for the peers after the completed IPO.

References

Ashford, Kate, and Schmidt, John, 2022, "*What Is An IPO?"*, Forbes, March 24.

Dagens Industri, 2021, "*"Köp till sillen och sälj till kräftorna""*, June 23.

Excel, via Microsoft Bing Corporation. "STOCKHISTORY function, https://support.microsoft.com/en-us/office/stockhistory-function-1ac8b5b3-5f62-4d94-8ab8-7504ec7239a8)." Accessed Mar. 14, 2022.

Field, Laura Casares, and Michelle Lowry. "Institutional versus Individual Investment in IPOs: The Importance of Firm Fundamentals." *The Journal of Financial and Quantitative Analysis* 44, no. 3 (2009): 489–516.

Helwege, Jean, and Nellie Liang. "Initial Public Offerings in Hot and Cold Markets." The Journal of Financial and Quantitative Analysis 39, no. 3 (2004): 541–69.

Jain, Bharat A., and Omesh Kini. "The Post-Issue Operating Performance of IPO Firms." The Journal of Finance 49, no. 5 (1994): 1699–1726.

Kunthara, Sophia, 2021, "*The Market Minute: How Long Do Startup Founders Lead Their Companies?"*, Crunchbase, December 3.

Lee, Philip J., Stephen L. Taylor, and Terry S. Walter. "IPO Underpricing Explanations: Implications from Investor Application and Allocation Schedules." *The Journal of Financial and Quantitative Analysis* 34, no. 4 (1999): 425–44.

Nasdaq OMX Nordic. "Index > OMX Stockholm_PI > Historiska kurser, http://www.nasdaqomxnordic.com/index/historiska_kurser?Instrument=SE0000744195 ." Accessed Apr. 2, 2022.

Pensions & Investments. "80% of Equity Market Cap Held By Institutions, 2017, https://www.pionline.com/article/20170425/INTERACTIVE/170429926/80-of-equity-market-cap-held-by-institutions#:~:text=Institutions%20own%20about%2078%25%20of,in%20the%20S%26P%20Euro%20index." Accessed Apr. 5, 2022.

Refinitive Eikon. "Market Screening, https://eikon.thomsonreuters.com/index.html." Accessed Mar. 14, 2022.

Refintiteve. " TRBC Sector Classification, https://www.refinitiv.com/en/financial-data/indices/trbc-business-classification#overview." Accessed Mar. 4, 2022.

Ritter, Jay R. "The Long-run Performance of Initial Public Offerings" Journal of Finance 46, no. 1 (1991): 3–27.

Swedroe, Larry, 2012, "*Why IPOs underperform"*, CBS News, November 15.

U.S. Securities and Exchange Commission. "Institutional Investors: Power and Responsibility, 2013, https://www.sec.gov/news/speech/2013-spch041913laahtm." Accessed Apr. 2, 2022.

Appendix

Table 6: Number of IPOs completed in each month

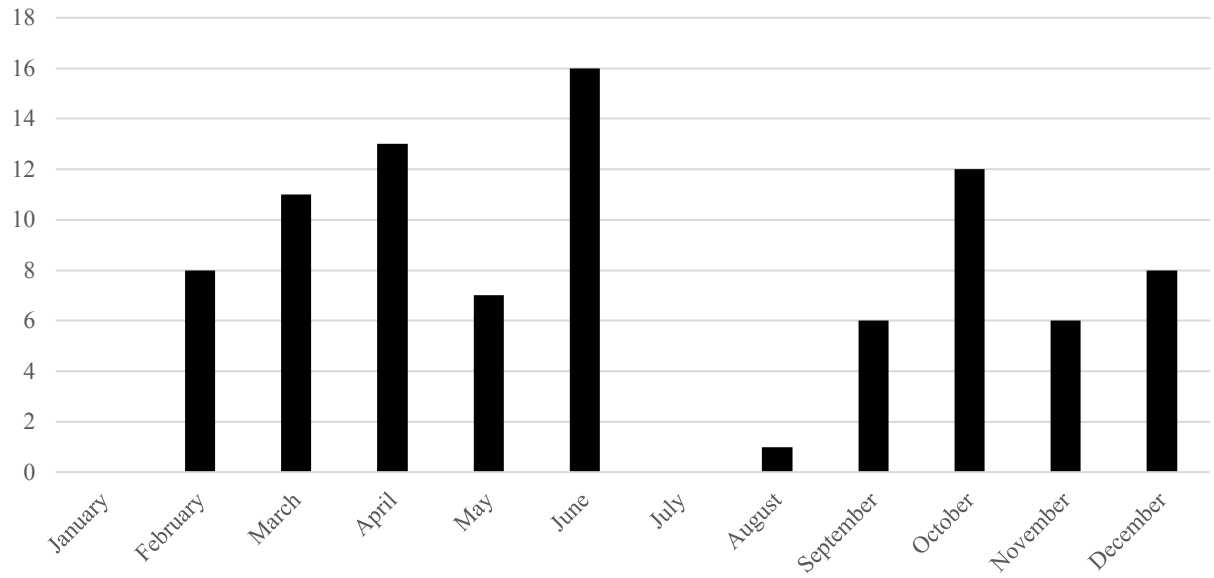


Table 7: Number of IPOs completed within the 12 most occuring sectors

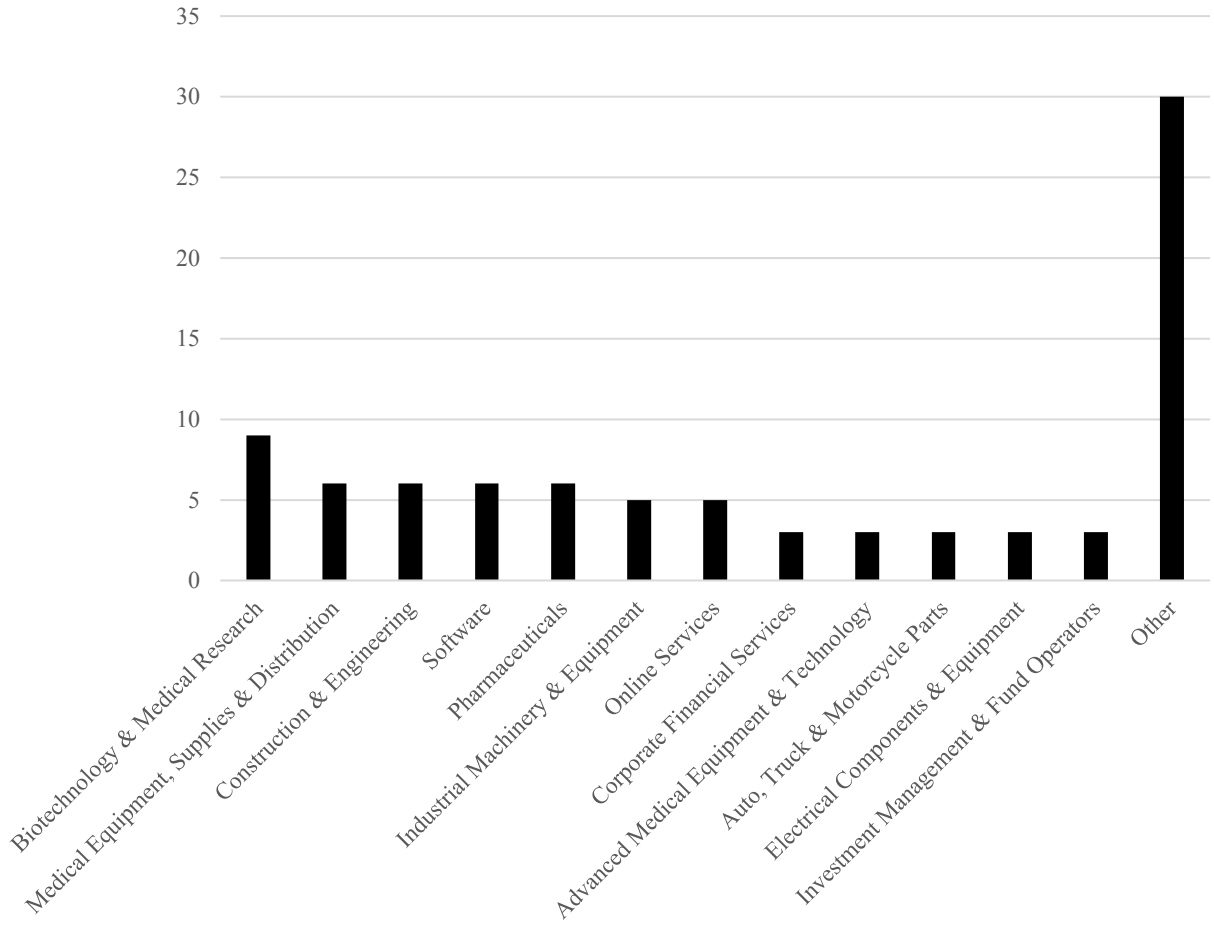


Table 8: Market capitalization of 10 largest IPOs