What factors do affect the underpricing on Swedish IPOs?

A quantitative study of returns on Swedish stock exchange markets

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Preface

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Abstract
The IPO market in Sweden has been on the rise and has had years of record in number of companies that has gone public. The phenomenon of underpricing has been analyzed for years in different markets as well as in different time periods. This thesis analyzes the factors affecting underpricing during the years 2017 to 2022 on the markets: Nasdaq Stockholm, First North Stockholm and Spotlight. Additionally, an investigation of the underpricing between the industries have been done by using several control variables to determine the differences in underpricing between the industries. Various tests use a sample size of 366 companies to determine if the variables have a statistical significance. The results show that the average IPO during the time period is underpriced by approximately 9%.

Key words: IPO, Underpricing, Swedish stock exchange, information asymmetry.

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1. Introduction

1.1 Background

The Initial public offering, IPO, underpricing has historically looked different and has, due to
different eras and events, been changing over time. Loughran & Ritter (2004) present that the
average first day return in the 80s was approximately 7%. It appears that 20 years later, the
level of IPO underpricing doubled. Despite the increase of 100% in first day return over 20
years, that was not the end of extreme cases in IPO underpricing. In the late 90s and in the early
21st century, a new emerging era called the internet bubble marked the whole world and the
first day returns jumped to 65% followed by an increase that landed on 12% just a few years
later. The IPO underpricing during the internet bubble exceeded any level seen before and can
partly be explained by the changes in pre-IPO ownership structure and the selling behavior by
insiders during the same period (Ljungqvist & Wilhelm, 2003).

In recent years, even since the millennial, the high growth in tech has led the world into a new
era. One of the results of this have made the stock market more accessible for the individual
person. Online brokers have emerged and been a driving factor for this and in addition, there
has been a long bull market since the crash in 2007 (Egan et al, 2019.) Due to this long bull
market and positive macroeconomically cycle, a large number of companies have chosen to go
public. The motives behind why companies choose to go public are many. Ibbotson (1975)
names two of the reasons behind why companies do an IPO, it can be either for the current
owners to make an exit on their investment or to raise capital to the firm for expansion and
growth of the business. To get the best offer possible the company wants to carry out the IPO
during a good macroeconomic period where investors are willing to take on risk. In the article,
Ibbotson analyses the short term returns of IPOs in the US market and compares them to the
returns of already listed stocks (Ibbotson, 1975).

IPO is a concept that describes the process of offering shares to the public in a newly listed
company for the first time which also is a way for a company to obtain capital to invest or even
survive in extreme circumstances (Hillier et al., 2016). By entering the financial market, a
company gets the opportunity to raise capital from the sale of the shares on the public stock
market (Investopedia, 2022). The IPOs have increased relatively gradually the last 23 years
except the pandemic affected years, namely the three last years. 2021 was an all-time record
with 1035 IPOs which is more than a doubling compared to the previous year’s record of 480
IPOs (Stock Analysis, 2023). However, the following year 2022, took a turn in the opposite
direction where the IPO activity decreased by 45% globally at the same time as the proceeds sank by 61% compared to 2021. This resulted in lowered valuation among the companies and poor stock market performance which led to the decrease in the number of IPOs (EY, 2022). Simultaneously, the number of IPOs on Swedish stock exchange markets appeared to increase almost 300% in 2021 compared to 2020. This percentage corresponds to 111 Swedish IPOs only on Nasdaq Stockholm which led to an increase of 700% in the value of the IPOs (Realtid, 2021).

At 24th of September, the company CTEK, worth over a billion Swedish crowns, got listed on the stock exchange market. The company operates in the industry called industrials and develops and sells charging stations for vehicle batteries (Affärsvärlden, 2023; Nyemissioner, 2021). The public offering price for CTEK was SEK 69 per share and the closing price on the first trading day was SEK 137.22. At the highest the share price was more than 150% higher compared to the offering price during the first trading day (Affärsvärlden, 2023; Börskollen, 2021). Through the prospectus one possible reason for the great performance is that Investment AB Latour was cornerstone investor and committed to acquire 31% of the shares of the company. This sent out a positive signal to other investors and the subscription offer was heavily oversubscribed (Mölne, 2021). The shareholders seemed to be excited over the rise in CTEK’s share price which pushed the price even higher. A scenario like this is just what explains the concept of underpricing which is not an uncommon phenomenon among IPOs.

Another IPO on the Swedish market was the technology company Checkin Group. The business within the company refers to using advanced technologies in purpose of following up customer’s login, identification and registration and in turn make it easier for consumers to connect with brands (Checkin Group AB, 2023). The offering price per share for Checking Group was 15.5 Swedish crowns. The company got listed on First North 20th of May and on the first trading day the share price closed at 40.50 Swedish crowns which is an increase of approximately 161%, not to mention the continuing skyrocketing increase the following days which resulted in an increase of about 1000% after 9 days (Affärsvärlden, 2023). Similar to CTEK, Checkin Group have well known cornerstone investors such a TIN Fonder and Erik Selin. In addition to this, chairman of the board is Anders Borg former finance minister in Sweden. The IPO was oversubscribed more than 20 times, and this is also a reason for extreme first day returns (Dagens Industri, 2021).

Even on Spotlight, which can be considered as a smaller stock market focusing on growth companies striving to get listed, it turns out that there are similar findings regarding the
underpricing of IPOs as in Nasdaq Stockholm and First North (Spotlight Stock Market, 2023; Nordnet, 2021). Abera Bioscience operates within the industry biotechnology and pharmaceuticals, with focus on the development of vaccines based on their patented platform, BERA (Nyemissioner, 2021). This company got listed on Spotlight at 24th of February 2021 with an offering price of 6,9 Swedish crowns per share. At the end of the first trading day the share price was increased by 60% (Affärsvärlden, 2023). In the case of this IPO, no institutional investors had pre-secured shares, however several private investors pre-secured shares of a total of 75% of the shares according to the prospectus. Therefore, only 25% of the shares were accessible for other investors and this could be one factor for the high first day performance (Abera Bioscience, 2021). A common factor between all three IPOs is that all of them were heavily oversubscribed.

Also, common for all the three mentioned companies is that it has been noticed that these IPOs was significantly underpriced when analyzing the share price the first trading day. An IPO is usually subscribed at a predetermined value during a predetermined period before the IPO takes place which is called the offering price. Researchers have been amazed over the underpricing phenomenon and why IPOs tend to be underpriced in a certain way. Alexander Ljungqvist who has made contributions in the subject of IPOs claims that there are four different areas that describes the concept of underpricing; asymmetric information, institutional reasons, control considerations and behavioral approaches. (Ljungqvist, 2007). Asymmetric information refers to when a party in a transaction is in possession of more information than the other which also is the most well-known among the four categories describing underpricing (Investopedia, 2021).

The most usual way to measure underpricing among IPOs is to observe and investigate how big the difference is between the offering price and the closing price on the first trading day (Ljungqvist and Wilhelm, 2003). IPOs associated with higher risk get to be more underpriced than others which depends on underpricing being a way for investors to get more attracted to trade shares in IPOs (Ritter, 1991).

1.2 Problem discussion

Swedish stock market consists of two stock exchanges; Nordic Growth Market and the Stockholm Stock Exchange, also known as Nasdaq Stockholm. These are regulated markets by Swedish law and under supervision of Finansinspektionen also known as FI. FI’s main mission
is to analyze and monitor the companies who are listed at the markets and ensure that rules and regulations are met correctly (Nasdaq, 2023; FI, 2022).

One of the other markets that also is provided by Nasdaq is First North Stockholm. First North is an alternative market named Multilateral Trading Facility, MTF, where smaller growth companies can get publicly listed. First North Stockholm is not as restricted as the main lists but must undertake a Certified Advisor (Nasdaq, 2023). In addition to First North, Sweden has a couple more MTF markets such as Spotlight Stock Market maintained by Spotlight Group AB and Nordic MTF by NGM (Gustafsson, 2022).

In an article from Ang and Boyer (2009), the writers examine whether the level of underpricing depends on which industry the company operates in. The article discusses if there are any difference in risk depending on new industries or established industries. As a result, the authors find that IPOs in new industries generally outperform established industries in short term as well as long term. However, investors should be aware of the risk since IPOs in new industries tend to have higher volatility and are riskier with a greater likelihood to fail (Ang and Boyer, 2009).

As mentioned in the background section, the three companies Ctek, Checkin Group and Abera Bioscience all had a major increase in share price from the public offering price. These companies are just examples and leads to questioning if this is a common phenomenon. The following questions is whether the phenomenon differs depending on different stock lists or if it is due to what industrial affiliation it is. With great probability, it is the case that a number of different variables influence the phenomenon of underpricing. Therefore, this thesis will examine this topic.

1.3 Purpose

The purpose of this thesis is to analyze if IPO underpricing has varied between the various Swedish stock exchange listings. This thesis will also examine if there is any difference in underpricing between industries. Furthermore, it is intended to investigate a few control variables that might affect the underpricing. In order to test this, data will be collected from companies who got listed on Nasdaq Stockholm, which includes large cap, mid cap and small cap, First North Stockholm and Spotlight Stock Market between the years 2017 and 2022.
1.4 Research question

- What factors do affect the underpricing on IPOs on the three Swedish markets: Nasdaq, First North and Spotlight?
- Which differences in underpricing do depend on industrial affiliation?

1.5 Limitations

The study is focusing this thesis on data from the years 2017 to 2022 in a selection of the Swedish Stock Exchanges. The time frame is a limitation due to the sample size of IPOs, especially the number of IPOs on large cap hence these are less common compared to numbers of IPOs on the other stock exchange lists. Another limitation of this thesis that also impacts the sample size is the choice of stock exchanges as Sweden is chosen for this study and therefore the lists, Nasdaq Stockholm, First North Stockholm and Spotlight Stock Market. To get a more statistically significant result an alternative is to extend the number of years or collect data on another larger market such as the US stock market and consequently increase the sample size.

When performing tests and collecting data one limitation of this thesis is controlling for all variables that affects the outcome of IPO underpricing. The study has used and controlled against a number of variables. However, one may get other results by using other variables to explain and test for underpricing.

1.6 Independent variables

- Industry
- List
- Firm age
- Market value
- Pre-secured shares
- IPO year

1.7 Hypothesis

H1: There is at least one of the independent variables that has a correlation with the level of underpricing.

H2: Underpricing do exist on the Swedish stock exchange markets.
H3: The age of the company, thus the founding year, has a negative relationship with underpricing of IPOs.

H4: Market value has a positive relationship with underpricing of IPOs.

H5: Pre-secured shares have a positive relationship with underpricing of IPOs.

H6: The degree of underpricing varies between the industries.

H7: The degree of underpricing varies between the lists.

H8: The degree of underpricing varies along the years within the investigated period.

1.8 Research contribution

In a way, underpricing for IPOs on different lists is a well-established research area. However, it does not exist any research, to the knowledge of the authors, that investigates the factors affecting underpricing during the years 2017 to 2022 including two major events affecting the economy. For example, Sweden has experienced the effects of the ongoing war in Ukraine in many ways and this research aims to investigate whether there are undiscovered factors that have influenced the independent variables’ degree of explanation of underpricing. Another major event that affected the economic situation around the world, including Sweden, was the Covid-19 pandemic and this is an additional reason behind the choice of topic and time-period. According to Chen, et al (1986) there are several macroeconomic factors affecting the degree of underpricing where inflation, industrial production and the spread of different obligations have affected the share prices and the returns. Since the pandemic resulted in a low inflation with decreasing demands and decreasing interest rates whereas the war made the inflation rate soar, it is eminent examples of possible factors affecting the explanation degree of the variables studied in this research. This research can therefore result in support for future studies within topics that concern underpricing of IPOs and factors affecting it, for example events that are like those included in this research. This research, and hopefully even more future research can together assist with knowledge about what affects underpricing of IPOs, why it does, and which effects underpricing has that is either preferable or something to avoid.
2 Theoretical framework

2.1 Pricing process

To get an understanding of the concept of underpricing, firstly, the steps behind the pricing of an IPO need to be described. It is important to be aware of that the process includes a diverse group of financial actors who perform in different steps of the process. As mentioned earlier, every company needs a prospectus to provide information about the organization in question, financially and operationally. Usually, it is an investment bank or a group of banks that helps the company with different complex assignments in the transaction. These are called underwriters. Due diligence is performed by the underwriters or other advisors to ensure that the financial information provided is correct. Collaboratively with the practical questions such as when and how, the issuer together with the underwriters determine the offering price of the IPO. The way the price is set can vary. Some examples are cash flow valuations, relative valuation or comparing with companies in same sector (D’Agostino, 2007).

The author D’Agostino (2007) mentions an alternative method for the pricing process, perhaps more suited for larger transaction, called Book building. Book building is when the price of the IPO isn't fixed. Instead, a price interval is used, and institutional investors make a bid on price and volume and issuer in consultation with the adviser determine the actual price. Private investors are not able to bid in book building, instead they are obligated to pay up until the highest price in the interval.

The underwriters’ main focus is to sell the shares in the most profitable manner for the issuer. After price or price range is decided, the underwriter markets and promotes the IPO to potential investors, including institutional investors and individual investors. If the IPO is oversubscribed, the underwriters and the company decide on the number of shares to be allotted to each investor. If a large IPO is oversubscribed underwriters can use so called greenshoe option. The greenshoe option is an option granted to the underwriters of an IPO by the issuer. The option allows underwriters to buy additional shares from the issuer at the offer price if there is high demand for the shares after the listing is made on the market. Usually, the timeframe is 30 days after IPO. However, the underwriter is only an advisor and the company in question has the discretion to set the price themselves (D’Agostino, 2007).
2.2 IPO Underpricing

An IPO is when a company offers shares to a predetermined share price to the public for the first time, hence the name Initial Public Offering, which leads to an investing opportunity for private investors, namely, to diversify the personal portfolio. Furthermore, an IPO is described as a process where the company getting listed gets higher liquidity and therefore better access to more capital (Barden et al, 1984). The general changes resulting from an IPO are decreased ownership concentration which means that an IPO leads to companies having owners with decrease share of the votes and therefore reduced power and reduced possibility to hide voluntary information about the business. It is established that there is both advantages and disadvantages with a decreased ownership concentration where the major advantage is that it becomes more difficult for the individual investor to control the business. The major disadvantage, on the other hand, is that these investors can demand some sort of investment discount as a compensation for the lost control over the company (Berk et al, 2017).

At the same time as the listing process generates several advantages, it is also a costly process because of the standards and guidelines that have been created in purpose to protect the investors. Investors protection in financial context has become increasingly significant since business scandals on the 21st century (Berk et al, 2017). A publicized scandal was when Fingerprint Cards’ sales manager, responsible for Asia, was found to have done insider trading year 2010 which resulted in a million profit (Aase, 2017). This technology company specializing within development of technological systems which are used in removal of fingerprints was found and convicted of further insider crimes after the initial one in 2010 (Avanza, 2023; Aase, 2017). The standards that aim to protect investors practically mean for example more accurate accounting and bigger responsibility for companies and these kinds of standards lead to both direct and indirect costs (Berk et al, 2017; Ritter, 1998). The direct costs are the compensation that are paid to the underwriter while the indirect costs are the size of the underpricing when a company gets listed. In other words, the direct costs are those compensating risk-averse investors, often banks willing to take the risk to organize and structure up the coming listing of the company. The work done by this type of investor can include determination of method that will be used when the shares will be signed and even what kind of shares that will be available for sale (Ritter, 1998).
2.3 Efficient market hypothesis

Efficient market hypothesis is a concept stating that when new information reaches the market, it is immediately reflected in stock prices and thus the hypothesis means that other factors do not have any such effects that could generate excess returns. In practice, the reality seems to be different where the financial market is affected differently depending on which information that is released (Hillier et al., 2016). Another assumption is that actors on the stock exchange market are rational and that the value of a company’s share is reflected in all the information that is available for the public. It means that the change of the share price will only occur when new information will be released and get available (Fama, 1970).

Efficiency market hypothesis is further categorized in three forms: the weak form, the semi-strong form and the strong form. The weak form of the efficiency market hypothesis describes that the share price is reflected by the historical information which means that the historical information and data is not usable to predict and analyze future share price. The semi-strong form is also involving all historical information but as well as all publicly available information and it is considered that both historical and today’s information, such as annual reports, is reflected in the share price in this form. The semi-strong form is the reason why there is a limited opportunity for individuals to make high profits since the market is directly adjusted after the information that is published. The strong form, on the other hand, describes that the share price is affected by both historical information and all publicly available information but also by private information that is not available for the public. Private information is what only the company has access to and is also called insider information. This type of information is usually not available for external investors since it can result in abnormal returns (Fama, 1970).

The efficiency market hypothesis also has a relationship with Random walk theory that describes that the changes in share prices is unpredictable where the changes is considered random and that it is not possible to predict future share prices by analyzing past prices (Malkiel, 2003; Investopedia, 2023). Further on, the theory means that the share price will be affected immediately when the information flow is unimpeded. This in turn, means that future asset price will only depend on what future events that will appear, and therefore no future price will be caused by the existing changes of the prices. The reason behind the statement that the share price is unpredictable in this theory is because of the events that also is events that are unpredictable (Malkiel, 2003).
2.4 Factors affecting underpricing

2.4.1 Information asymmetry

In the article “IPO underpricing” by Ljungqvist, the author mentions various theories and explanations for this phenomenon and information asymmetry is one of the most established models. Information asymmetry refers to a situation in which one party, the initial investors, key persons in the company, financial regulator or underwriters, in a transaction has more or better information than the other party. In the context of IPOs, this means that the company going public may have access to information about the value of its shares that is not available to investors. (Ljungqvist, 2007).

Ljungqvist (2007) describe that information asymmetry can lead to underpricing due to investors may be uncertain about the true value of the shares. If investors believe that the shares are worth more than the offer price, they will bid up the price in the market and this will lead to underpricing. By pricing the shares lower than expected, the issuer is indicating that it is confident in the company's prospects and is willing to forgo some of the potential proceeds of the IPO in order to establish a positive reputation in the market. By doing this underpricing, it can be a way for the issuer to send out a signal that the company is of high quality.

Information asymmetries occur in the context of IPOs, where the firm is new to the public markets and may not have a long history record of financial performance. This can make it difficult for investors to properly assess the risks and potential rewards of investing in the company. In the article the authors argue that managing information asymmetry is an important factor in the success of an IPO, and that companies need to take proactive steps to improve their transparency and disclosure to investors (Gajewski, 2006).

2.4.2 Market cycle

In the article "A Review of IPO Activity, Pricing, and Allocations" the authors highlight that IPO activity is cyclical, and that the number of IPOs fluctuates depending on market conditions. Underwriters often underprice IPOs to generate demand and ensure a successful offering, leading to initial returns for IPO investors. During good market conditions, bull market, when investor confidence is high and stock prices are rising, there tends to be a surge in IPO activity as companies look to take advantage of favorable conditions to raise capital. Investors may be more willing to take risks and invest in new, unproven companies, which can help boost demand for IPOs. Contrariwise, during bad market conditions, bear market, when investor confidence is lower and stock prices are falling, IPO activity tends to decline as companies may struggle
to attract investors and may postpone or cancel their offerings. This due to the fact that investors are less willing to add risk in during this condition (Ritter and Welch, 2002).

Ritter and Welch (2002) also mention that IPO activity tends to be concentrated in certain industries and sectors depending on market conditions. Companies in for example sectors such as technology and internet are active during periods of high investor enthusiasm. Ang and Boyer (2009) also argue that there is a significant difference across sectors and the authors highlights internet and biotech as sectors that are very active during good market conditions.

2.4.3 First-Tier market versus Second-Tier market

In the article “Europe’s Second Markets for Small Companies” written by Vismara and Paleari (2012), the authors are examining the different characteristics between companies going public on main markets in Europe, such as Nasdaq Stockholm, compared to going public on second markets such a First North. The study in the article shows that newer markets tend to have a higher level of underpricing. The article highlights several key features of these second markets, including relaxed disclosure requirements, flexible listing rules and simplified trading mechanisms.

The authors note that while these markets have been successful in providing small companies with access to capital, there are also challenges associated with second markets. For example, lower liquidity of these markets can make it difficult for investors to exit their positions quickly, and there is a risk of market manipulation due to the limited oversight and regulation (Vismara & Paleari, 2012).

Furthermore, the authors suggest that second markets represent a promising alternative for small companies looking to raise capital and expand their business, but caution that investors should carefully consider the risks before investing in these markets (Vismara & Paleari, 2012).

2.4.4 Money left on the table.

Money left on the table is a model that is defined as the difference between the closing price on the first day of trading and the offering price (Ritter, 2022). The model describes how companies want to prove the value of their business by offering money at a low price. However, it has been discovered that a more effective method that proves the value for the investors is underpricing even though it explains why IPOs are underpriced but not why the companies are more willing to share information publicly compared to the willingness in sharing information privately (Ritter et al, 2002).
Research by Ritter (2022) got the result after analyzing IPOs during the period 2009-2019 that money left on the table and first day return has a positive relationship. This was proved by discovering that companies that offered higher amount of capital for the investors also experienced a higher return on the first trading day. Companies that did the opposite experienced a lower valuation of the company in the future. Another factor affecting the size of underpricing is the amount companies that is listed on a certain investment bank (Ritter et al, 2002)

2.5 Motive behind Nasdaq Stockholm, First North and Spotlight

2.5.1 Nasdaq Stockholm Main Market

Nasdaq Stockholm is the largest of the two Swedish Stock Exchanges and handles a considerably larger capital and hence the Stock Exchange that will be focused on in this thesis. Nasdaq have divided the main market into three segments. Companies with a share value over EUR 1 billion is listed on large cap, share value between EUR 150 million to EUR 1 billion is listed on mid cap and companies with a share value under EUR 150 million is listed on small cap. Due to the rules and regulations required for listing on Nasdaq Stockholm, all companies receive a higher quality stamp and high visibility compared to companies listed on other markets (Nasdaq, 2023). During 2022, 50 companies were listed on Nasdaq Stockholm whereas 16 on Main Market and 34 on the alternative list at Nasdaq Stockholm called First North (Gruvfors, 2023).

IPOs of larger companies are not that common, especially not listings on large cap where only the largest companies qualify. However, these occurs and over the years 2017 to 2022 listings such as EQT, Traton and Volvo Cars appeared. These larger IPOs usually gets a lot of attention from the press. Nasdaq released a press release on October 29, 2021, same day as Volvo Cars IPO that states that the IPO was the largest listing on Nasdaq in the last 20 years. Head of European Listings at Nasdaq, Adam Kostyál said the following “To welcome an international company like Volvo Cars to Nasdaq Stockholm underscores our strong position as an exchange able to attract global companies” (Nasdaq, 2023).

On mid cap, where fairly large companies are listed, we find well-known ones such as Instalco and K-fastigheter. The last-mentioned company got a lot of media attention due to well-known investors. Among others, Erik Selin was one of the anchor investors (Di.se, 2019).
An example from small cap is Mips, also a well-written company that specializes in helmet-based safety. According to Dagens Industri the interest was huge for private investors as well as instructionally investors (DI, 2017).

To be able to get listed on Nasdaq Stockholm the company in question needs three years of good financials and be able to prove that the company is profitable. Furthermore, a lawyer and an auditor need to do a review of the organization to clarify whether the organization fulfills the rules and requirements needed to be listed on Nasdaq Stockholm. In addition to this, every company need to publish a prospectus containing important financial and operational information, this so that the potential investor is able to do a proper assessment of the company before investing (Aktiespararna, 2023).

On Nasdaq Stockholm, which is a Stock Exchange, in other words a regulated market, there is an obligation to notify the market whenever a major shareholder buys or sells the specific security compared to securities traded on a MTF where there is no such obligation. This needs to be reported to Finansinspektionen to provide transparency between the market and investors. However, something that is required for both Stock Exchanges and MTFs is that the issuer should inform the market about insider information as soon as possible (FI, 2023).

### 2.5.2 First North

Nasdaq First North is an alternative trading place for investors where the companies on this market do not have the same tough demands compared to the companies listed on large, mid and small cap. First north includes small growth companies among the Nordic countries but formally, the shares on Nasdaq First North count as unlisted (Finansakademin, 2019). In other words, first north is a Multilateral Trading Facility and the biggest difference between First North and the OMX Stockholm is that the listing costs at first north is considerably lower at the same time as this market seems to be less regulated which also is associated with higher risk (Avanza, 2023). The benefit with a less regulated market like first north is that the companies get opportunities to increased liquidity and also to be more available to the market which will be like a startup phase for those companies striving for bigger lists in the future (Finansakademin, 2019). On the other hand, research has shown that those markets with harder regulation tend to have shares with higher rate of underpricing. Mark Bottenberg has researched about underpricing on the Chinese market which is hardly regulated. An independent agency in China that enforces the security laws protecting and informing investors, called CSRC, had a requirement on the IPOs which was that the price-earnings ratio must not exceed 30. When Bottenberg investigated this regulation, it was figured out that this regulation resulted in much
lowered offering prices, in other words the underpricing was increased due to this certain requirement (Bottenberg, 2016). Since the underpricing is more noticeable on an unregulated market, it is a relevant to use Nasdaq First North as a basis to this research.

Further, first north was the Swedish list that had most IPOs during the years 2017 to 2022 which is the data period for this research. Since the number of IPOs on Nasdaq Stockholm, where the large cap, mid cap and small cap are summed up, is approximately the same as the number of IPOs on first north, it is necessary for this research to be based on both of these lists that both have an adequate number of IPOs (Nordnet, 2021).

Another argument for investigating the IPOs on first north is that this market usually contains smaller companies with businesses related to future innovations such as pharmaceutical technology and environmental engineering. Companies within these areas have been affected by the circumstances during the years 2017 to 2022 including both a pandemic and a war which in turn have led to differences in the IPOs (Nordnet, 2021). Additionally, first north as a less regulated market include a greater amount of private equity financed companies which is relevant to the researched period because of an increased number of private investors lately (Avanza, 2021).

Overall, first north is useful market to investigate, also as a complement to Nasdaq Stockholm because it has been shown that there has been a sharp increase of IPOs in 2020 and 2021 compared to 2017 and 2018 but also because the number of IPOs are relatively high which is considered as enough in this research that includes two more markets to investigate. Moreover, a high number of IPOs facilitates the possibility to investigate the factors behind underpricing.

### 2.5.3 Spotlight

Spotlight stock market is an unregulated, trading place, so called Multilateral Trading Facility, that initially was started more than 20 years ago under the name Aktietorget with the idea to make it easier and more visible for growth companies to be listed (Börsvärlden, 2018; Spotlight, 2023). Spotlight describes their platform on their website that their ambition has always been to help growth companies get listed to make it easier for these companies to focus on growing and reach their long-term goals. At the same time, Spotlight aims to make it easier for investors to become shareowners in a growth company regardless of which growth phase it is in. In short, the goal of Spotlight’s business is to become the marketplace in Nordic where mainly growth companies believe that it is easiest, safest, and most visible to be listed (Spotlight, 2023).
The companies getting listed on Spotlight Stock Market get the benefits of being listed, as mentioned earlier mainly to obtain more capital, at the same time as the company avoids the high requirements compared to a regulated stock market such as Nasdaq Stockholm. These kinds of companies usually have less assets compared to those on Nasdaq Stockholm because of them being in growth phase which makes it even more interesting to analyze (Spotlight, 2019). Furthermore, underpricing could lead to the company not getting enough capital as with an IPO compared to if the company would be correctly priced from the beginning (Ljungqvist, 2006). For this research, it is highly intriguing to study companies listed on Spotlight and investigate whether it matters that the company is a growth company with less assets in the rate of underpricing.

In Sweden, there is approximately 160 companies listed on Spotlight today and therefore it can be perceived as unnecessary to include this market in the research, but since this market, just as first north, is unregulated, it is an opportunity to have interesting results regarding underpricing by investigating this very companies listed on Spotlight (Aktieskolan, 2022). In other words, Spotlight has smaller companies listed on their marketplace which means higher risk and often higher return for investors investing in these companies. This means in turn that underpricing to a greater extent than on a regulated marketplace.

3 Data and method

3.1 Research approach

This study is based on hypothetical-deductive method where the research questions are answered through a hypothetical relationship between premise and conclusion. According to Wilson (2014), a deductive process consists of a hypothesis developed by the researcher which is based on an existing theory. Then, a research strategy is designed to test the hypothesis. The hypotheses in this study is based on the theoretical framework consisting of the pricing process, underpricing of IPOs, Efficient market hypothesis, information asymmetry, market cycle, first- and second-tier market and the phenomenon money left on the table. These theories aim to explain the factors affecting underpricing, but also to serve as a basis for the research into underpricing of IPOs. Furthermore, the aim of this study is only to accept or reject the formulated hypotheses and therefore not to reformulate or create new theories.
3.2 Data gathering

Data for the analysis in this thesis is collected mainly from the IPO-screener at Affärsvälden.se. The sample for our thesis is based on data from IPOs in the lists Nasdaq Stockholm including large cap, mid cap, small cap, First North and Spotlight Market during the years 2017 to 2022 which was collected by using the filter at the IPO screener. At Affärsvälden.se, it was also possible to filter out IPO date, market value, statistics for the first trading day and share secured via guaranteed commitment. Information regarding the age of the companies were collected from allabolag.se that offered approachable business information about Swedish companies. When the data for the IPOs was found, it was putted together in a spreadsheet where it was possible to sort the variables as required and thereafter create desired tables and diagrams.

<table>
<thead>
<tr>
<th>Data</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Key figures and variables</td>
<td>Affärsvälden</td>
</tr>
<tr>
<td>Companies’ IPO year and lists</td>
<td>Affärsvälden</td>
</tr>
<tr>
<td>Companies’ founding year</td>
<td>Allabolag</td>
</tr>
<tr>
<td>Industries</td>
<td>Avanza</td>
</tr>
<tr>
<td>Companies’ first day return (%)</td>
<td>Affärsvälden</td>
</tr>
</tbody>
</table>

*Table 1: Sources from which the data was obtained*

3.3 Population and sample

The sample in the study is consisting of all listed companies during the years 2017 to 2022 on Nasdaq Stockholm, First North and Spotlight. It was determined to investigate IPOs on more than one market to extend the sample and therefore to make the research more trustable. The choice of lists was based on the idea that the lists had noticeable different number of IPOs and different levels of underpricing which will contribute to varying data to do the analyze on. As the research includes IPOs on three different markets, the greater number of IPOs will make the study more statistically relevant. The number of IPOs included in the study is companies that have completed the listing and not those that have an ongoing or a cancelled listing. During the chosen period, 396 companies was listed on the selected markets. It appeared that this number included companies that have been listed on foreign markets. As this research examines underpricing on Swedish markets, it required to manually go through the data collection and verify which of those companies was listed on foreign markets and sort out those. After the
verification process, it resulted in a loss of 30 IPOs. The lapses left the research with 366 observable IPOs on the three markets during 2017 and 2022.

![Sample and lapses](image)

**Table 2: Bar chart showing the sample and the lapses in the data material.**

Further on, the research includes a survey of companies operating within 12 different industries, where the companies are categorized in the most established industries. The sample includes companies that have either been bankrupt or delisted since this research is based on the information before the companies first trading day and on information at the time of the listing which means these types of deviant events do not affect the reliability of the results and the conclusion. As mentioned in the opening chapter, the research is excluding companies that was secondary listed which was sorted out by sing the filter function at the IPO screener and this is because the purpose is to examine IPOs and not companies switching stock market. In summary, the criteria above have been chosen to obtain a representative result over the relevant period. The period 2017 to 2022 was chosen as it appeared to be huge differences in the number of IPOs and the level of underpricing within this period at the same time as the chosen industries are considered relevant to the study. At first, the industries were a bit scattered, so a manual process were gone through where the companies were deployed in the more general and established industries. The most notable difference in underpricing was between years 2018 and 2019 but the period was extended since the research aims to include major events to make it possible to investigate whether it has caused more factors affecting the independent variables’ degree of explanation of underpricing. The extension of period also made it possible for more industries to be involved, for example, the manufacturing industry.
3.4 Chosen industries

In the study, Avanza was used to provide the research with information about what industry each company operates in due to missing information from the main source IPO-Guiden. Avanza uses three different industry or sector description for each company. Due to the sample size the chose is based on the broader industry description to increase the sample size in each sector with a goal to get around 30 samples in each industry. However, some industries got a larger sample size, such as technology and healthcare. Therefore, the subindustry is used in these industries, medical equipment and service, biotech and pharmaceuticals are all subindustry of healthcare but are displayed as individual industries. Another similar example is technology and the subcategory software/tech. The advantage of this arrangement is that some major industries such as healthcare can differ a lot in company size and their financials, companies in the subindustry medical equipment & service might have a product that is already selling compared to companies in biotech & pharmaceuticals might only have a patent.

<table>
<thead>
<tr>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basic Materials</td>
</tr>
<tr>
<td>Biotech &amp; Pharmaceuticals</td>
</tr>
<tr>
<td>Consumer Goods and Services</td>
</tr>
<tr>
<td>Energy</td>
</tr>
<tr>
<td>Finance</td>
</tr>
<tr>
<td>Industrials</td>
</tr>
<tr>
<td>Medical Equipment &amp; Service</td>
</tr>
<tr>
<td>Real Estate</td>
</tr>
<tr>
<td>Software/tech</td>
</tr>
<tr>
<td>Technology</td>
</tr>
<tr>
<td>Telecom</td>
</tr>
<tr>
<td>Healthcare</td>
</tr>
</tbody>
</table>

Table 3: List of industries.

3.5 The variables and hypothesis for the study

3.5.1 Pricing level of IPOs

The dependent variable in the study is the pricing level of IPOs which hypothetically will be affected differently by the chosen independent variables. The dependent variable pricing level is categorized within three scenarios which is correct price level, underpricing and overpricing and this is determined by comparing the offering price to the closing price the first trading day of the company. The scenario where the share is either underpriced, overpriced or correctly priced is computed by taking the difference dividing by the offering price (Gao et al, 2020).
This means that when the ratio is greater than zero, the share had a greater closing price in comparison to the offering price and is therefore underpriced

<table>
<thead>
<tr>
<th>First day return (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td><strong>Standard Error</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
</tr>
<tr>
<td><strong>Mode</strong></td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
</tr>
<tr>
<td><strong>Sample Variance</strong></td>
</tr>
<tr>
<td><strong>Kurtosis</strong></td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
</tr>
<tr>
<td><strong>Range</strong></td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
</tr>
<tr>
<td><strong>Sum</strong></td>
</tr>
<tr>
<td><strong>Count</strong></td>
</tr>
</tbody>
</table>

Table 4: Descriptive statistics for the first trading day.

3.5.2 Global test for regression significance

This study is using global test which can be used to test if there is a significant relationship between the independent variables and the dependent variable as mentioned in the first chapter where the hypotheses are presented. To implement the global test, it is required to make a regression analysis with the following hypothesis:

H0: There is no significant relationship between neither of the independent variables and the level of underpricing.

H1: There is at least one independent variable that is different from zero and therefore is correlated with the level of underpricing.

3.5.3 Industry

Previous research regarding the underpricing and the differences in underpricing between the industries have had a major emphasis on the IT sector where the studies have shown contradictory results regarding the relationship between the level of underpricing and industry (Salerno et al, 2022). Another study explains that it seems that companies within the same industry tend to make an IPO at approximately the same time after it has been discovered that the competitors’ IPOs have resulted in great amount of capital (Ritter, 1984). This study may indicate that the level of underpricing has noticeable differences as a result of the companies that seem to act like a sort of industry cluster in the process of getting listed. The hypothesis is therefore:
H0: There is no significant relationship between the level of underpricing and a certain industry.

H1: There is a significant relationship between the level of underpricing and a certain industry.

3.5.4 List

As mentioned in the paragraph 5.3.5 it has been discovered that older companies tend to be more transparent with the company information which leads to less information asymmetry and therefore a decreased level of underpricing according to Zhou and Lao (2012). At the same time, it is common that small companies have higher probability of getting underpriced than bigger and more established companies and this is depending on two factors. Firstly, small companies are considered riskier in comparison to older companies which makes it more difficult to do the pricing correctly. Secondly, small companies are often the faster growing companies, and it is another factor that makes the company hard to price correctly ahead of an IPO since the financial situation could vary unpredictably comparing to bigger and older companies (Lowry et al, 2006). The hypothesis is:

H0: There is no significant relationship between the list and the level of underpricing.

H1: There is a significant relationship between industry and the level of underpricing.

3.5.5 The age of the company

Zhou and Lao (2012) insist on that the firm age at the time of IPO is affecting the level of underpricing where the correlation between these is negative. The relationship between firm age and the level of underpricing is because of the information asymmetry since it is ascertained that companies that are generally more known also are presenting firm-specific information in greater occurrence. This in turn results in investors getting more enlightened about the company’s business and their financial situation. In other words, an older company with less information asymmetry leads to a decreased level of underpricing. As this as a base to the relationship between firm age and underpricing the next coming hypothesis are:

H0: There is no significant relationship between the firm age and the level of underpricing of an IPO.

H1: There is a significant relationship between the firm age and the level of underpricing of an IPO.
Table 5: Descriptive statistics for company age.

<table>
<thead>
<tr>
<th>Founding year</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>2007.89344</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.80125867</td>
</tr>
<tr>
<td>Median</td>
<td>2012</td>
</tr>
<tr>
<td>Mode</td>
<td>2014</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>15.3289809</td>
</tr>
<tr>
<td>Sample Variance</td>
<td>234.977656</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>28.488472</td>
</tr>
<tr>
<td>Skewness</td>
<td>-4.5713251</td>
</tr>
<tr>
<td>Range</td>
<td>146</td>
</tr>
<tr>
<td>Minimum</td>
<td>1876</td>
</tr>
<tr>
<td>Maximum</td>
<td>2032</td>
</tr>
<tr>
<td>Sum</td>
<td>7348889</td>
</tr>
<tr>
<td>Count</td>
<td>366</td>
</tr>
</tbody>
</table>

### 3.5.6 Market value

Market value is defined as the total value of all outstanding shares available on the market and the market for this study is referring to the value that the companies had at the time of IPO (Cakici & Topyan, 2014). Companies with greater market value have better access to the phenomenon money left on the table. In other words, companies with a great market capitalization can afford and therefore have possibilities to underprice the shares before the IPO takes place and, in that way, take advantage of it as the price, with high probability, will rise at the first trading day. In consideration of the money left on the table phenomenon, the hypothesis to test this relationship is:

H0: There is no significant relationship between market value and the degree of underpricing.

H1: There is a significant relationship between market value and the degree of underpricing.

### 3.5.7 Pre-secured shares

The authors D’Agostino et al. (2007) are discussing the fact that it has become more common for issuers to use guarantee commitment or pre-secured shares as used in this thesis. The shares that are secured in advance shows the percentage of the offer that has been secured by institutional and private investors in advance. Some of these investors are so called cornerstone investors, for example funds, and they are sometimes offered to secure shares with a discount before the company will be listed and available for the public. This way of securing shares with a discount has gotten positive feedback but has also been criticized since the phenomenon has resulted in a worsen liquidity within the company after the IPO has taken place. The critics refers to investors having the shares “locked” at the same time as other, more general investors, do not have the same access to the shares where they do not have the possibility to either be the priority or to have the shares for a discount. On the other hand, the phenomena of funds securing
shares in this way has been acclaimed since the cornerstones have the conditions to have the benefit of securing beforehand and therefore getting a discount for it. At the same time this could result in a stable demand on the offer that takes place before the day that the company is planned to get listed. In turn, this will have a positive impact on the general investors since greater investors investing endorses the company (Chance, 2012). The hypothesis is:

H0: There is no significant relationship between the pre-secured shares and the level of underpricing.

H1: There is a significant relationship between the pre-secured shares and the level of underpricing.

<table>
<thead>
<tr>
<th>Secured beforehand (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td><strong>Standard Error</strong></td>
</tr>
<tr>
<td><strong>Median</strong></td>
</tr>
<tr>
<td><strong>Mode</strong></td>
</tr>
<tr>
<td><strong>Standard Deviation</strong></td>
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<tr>
<td><strong>Sample Variance</strong></td>
</tr>
<tr>
<td><strong>Kurtosis</strong></td>
</tr>
<tr>
<td><strong>Skewness</strong></td>
</tr>
<tr>
<td><strong>Range</strong></td>
</tr>
<tr>
<td><strong>Minimum</strong></td>
</tr>
<tr>
<td><strong>Maximum</strong></td>
</tr>
<tr>
<td><strong>Sum</strong></td>
</tr>
<tr>
<td><strong>Count</strong></td>
</tr>
</tbody>
</table>

Table 6: Descriptive statistics for secured beforehand

3.5.8  IPO year

Loughran and Ritter (2004) insists that the IPO has increased over time and that the change in the level of underpricing have three explanations. At first, the change depends on different risk composition which means that the change in underpricing is related to different risks among the companies going public. The risk change is measured in physical attributes as age or assets. Secondly, the change in level of underpricing has depended on realignment of incentives and it is argued that key person’s incentives to reduce underpricing has decreased which have resulted in a higher share of increasing underpricing at IPO. The last explanation to increasing underpricing over time is the changing issuer objective referring to companies choosing lead underwriter that had a reputation of leaving the money on the table, in other words, intentionally put a lower price in order to make profit out of the listing. As a result of this research, the year that the IPO was taken place should have an impact on the level of underpricing and the hypothesis is therefore:
H0: There is no significant relationship between the year of IPO and the level of underpricing.

H1: There is a significant relationship between the year of IPO and the level of underpricing.

3.6 Statistical method

The research question will be answered by running t-test and a regression model to test the hypothesis.

3.6.1 T-test

The purpose of using T-test for this research is to prove that it exists underpricing on the Swedish markets Nasdaq Stockholm, First North and Spotlight. The hypothesis that will be examined is by running a one sample t-test to investigate whether the mean is different from the hypothetical value and the hypothesis is formulated as follows:

H0: Underpricing is not existing on the Swedish stock exchange markets where X will be equal to or less than zero.

H1: IPO underpricing do exist on the Swedish stock exchange markets where X will be equal to or greater than zero.

3.6.2 Regression model

Further on, a multiple regression model is used in the study to do research on the independent variables and their relationship to the level of underpricing. A regression model is useful for a study with one dependent variable and several independent ones and the procedure to obtain the regression model is done via the program Stata 17. The study is built on the level of underpricing which is considered the dependent variable and six independent variables. The regression model can be illustrated as follows according to Silhavy, et al (2017).

\[ Y = \beta_0 + \beta_1X_1 + \ldots + \beta_6X_6 + \varepsilon \]

where Y is the dependent variable, beta is the regression coefficient, x is the independent variable, and the epsilon is the residual.

3.6.3 Hypothesis

<table>
<thead>
<tr>
<th>Variable/test</th>
<th>Hypothesis</th>
</tr>
</thead>
</table>

| **Global test**               | H0: There is no significant relationship between neither of the independent variables and the level of underpricing.  
|                              | H1: There is at least one independent variable that is different from zero and therefore is correlated with the level of underpricing. |
| **One sample T-test**        | H0: Underpricing is not existing on the Swedish stock exchange markets where X will be equal to or less than zero.  
|                              | H1: IPO underpricing do exist on the Swedish stock exchange markets where X will be equal to or greater than zero. |
| **Firm age**                 | H0: There is no significant relationship between the firm age and the level of underpricing of an IPO.  
|                              | H1: There is a significant relationship between the firm age and the level of underpricing of an IPO. |
| **Market value**             | H0: There is no significant relationship between market value and the degree of underpricing.  
<p>|                              | H1: There is a significant relationship between market value and the degree of underpricing. |
| <strong>Pre-secured shares</strong>       | H0: There is no significant relationship between pre-secured shares and the level of underpricing. |</p>
<table>
<thead>
<tr>
<th>Table 7: Summary of the hypotheses for the study</th>
</tr>
</thead>
</table>

### 3.7 The quality of the study

**3.7.1 Validity**

Patino & Ferreira (2018) defines validity as how well the study’s results are answering the research questions, in other words the relevance of the study which decides if the study really is measuring the desired measures of the research. At the same time validity is a concept that explains how well the study results can be generalized among the population and it is called external validity. As the study is investigating the factors affecting underpricing and differences in the degree of underpricing between the industries, the validity in this context refers to if the method is fulfilling the purpose of the research. The quality of the study is determined by
justification and argumentation for the theoretical framework, method and data. The study has been based on three different markets among different industries and through several years which covers over 300 IPOs and therefore should be justified as a generalization. In addition, the period covers a time of both stable financial situation as it covers the last three years that have been embossed by both a pandemic and a nearby military conflict. This means that the results will show differences in underpricing through two financially good years as well as how the underpricing has changed at the time of an abnormal event and the changes through the last three years where the general financial situation has not managed to recover.

3.7.2 Reliability

Reliability is describing how trustable the study is and is also showing how carefully the tests in the study can measure a value. As an example, a thermometer that is measuring the temperature and showing it with two decimals are a reliable measurement instrument while a thermometer that is broken and it is relatively hard to see the temperature is considered less reliable (Bryman & Bell, 2017). The data in this study has been collected from a publicly available source that has been considered the best platform for collecting stock exchange related information the last 26 years (Affärsvärlden, 2023). The data presented in this study is available for the public and in conjunction with the reliability of the source the study is reliable and convincing. In addition, the tests and regressions have been done in the program Stata 17 where the regressions have been done with robustness which means that it is a quality assurance method. This contributes to the reliability as well.

3.7.3 Method criticism

This study required a manual process of filtering out companies that appeared to be foreign that was showed in the data when obtaining it. Also, the data did not include secondary listings which was companies that had been listed before but has changed stock exchange market. As earlier mentioned, the reason is that the companies that have switched list did have a market value since earlier which was considered as a negative aspect in the research of IPOs’ underpricing, especially when investigating whether the independent variable market value had an impact on the dependent variable underpricing. These lapses have a meaning as a negative impact on the study’s reliability because it occurs a risk that the selected companies have deviant key figures and data compared to the sample mean that could have affected the result. If these companies would be included, it could make a noticeable change in the tests and results.
Another aspect in the method criticism is that the study has included companies that have been acquired shortly after their IPO has taken place. By making the company public, the company makes it easier to get in contact with a serious buyer which have tend to result in a higher degree of underpricing (Boulton et al, 2011). Another critic against the method is that companies that have been bankrupted have lower first day return in comparison to those businesses that are still operating which is affecting the results in the aspect that the mean of the first day return is lower, a so-called survivorship bias (Elton et al, 1996). Otherwise, the results of the first day return for all of the companies would be more extreme.

This research has also included those industries consisting of only a few companies, for example the energy sector. Taking this to account the research has some lack of validity since the concept is describing, among other things, how well the study results could be generalized among the population. The energy sector is consisting of four companies with some deviant values, especially regarding the first day returns, which may cause a deviant result where it is not reliable that the results can be applied into energy companies before the study period or in the future. Anyway, the energy sector was included as well as basic materials sector and the telecom sector since these sectors are considered established and also do have a relationship to the companies in the bigger sectors.

To conclude, this study has not completed any sort of trimming of the data which can be necessary in case of extreme values coming up and risking a distortion of the results. This decision was made because of two reasons. Firstly, a trimming of the data with extreme values regarding the returns seems to be relevant since they are contributing to the study that aims to investigate the degree of underpricing and the factors affecting it more or less. Secondly, an exclusion of companies with extreme values would lead to a too great number of lapses and therefore a too small sample which would to the study less validate and reliable.

4 Empirical results

4.1 Descriptive statistics

4.1.1 Pricing of IPO

The highest total number of underpricing is in healthcare industry with just over 80% of the IPOs being underpriced and the opposite industry is energy with only 33% of the IPOs being underpriced. In the industry with the greatest number of IPOs, industrials, the result is that 50% of the IPOs are underpriced. Biotech & pharmaceuticals have equal between level of
underpricing and overpriced by 23 to 23. The table below shows the total numbers of companies being underpriced, overpriced or priced such as the price after first trading day closes at the same price as offer price.

Table 8: Sum of pricing for IPOs during all years in different industries.

4.1.2 Number of IPOs between industries
Main focus in our analysis it to compare what factors due affect underpricing and how underpricing depends on industrial affiliation. The total number of IPOs during the chosen period is 366 listings and these are as mentioned divided into 12 different industries. The result in the table below shows that four industries got 20 or lower in sample size. The industry with lowest sample size is the Energy industry consisting of only six IPOs, followed by basic materials, telecom and healthcare. However, these are included anyway but with a bit less focus on these since the result might not be as accurate. The result shows that most of the companies with an IPO during our period are operation within Industrials with a total of 60 IPOs. Consumer goods and services are the second largest industry with 51 IPOs, closely followed by technology, biotech & pharmaceuticals and software/ttech where all have 45 or more samples.
Table 9: Bar chart showing the number of IPOs in each branch.

4.1.3 Average underpricing between industries

The above table “Pricing of IPO” provides information of the number of pricing distributions between the different industries. Another interesting factor is the average level of underpricing between industries, below this is provided in a table. Finance is the sector with the highest average level of underpricing with a result of 25.17%. Followed by basic materials with an average of 19.77% followed by healthcare with an average of 18.70%. Only 2 industries got a negative average of underpricing, in other words they were overpriced. The energy industry got the most negative result of –14.34% and telecom got a result of –6.86%.

Table 10: Table showing average percentage of underpricing in each sector.
4.1.4 Number of IPOs between lists

The distribution between the different stock exchange listings analyzed in the thesis shows that first north has been overrepresented during the years 2017-2022. The result is no amazement due to the excluding of secondary listings in our thesis. Assumption can be drawn that this is due to companies undergoing list changes and being moved to higher lists over time. As mentioned earlier both spotlight and first north aim for IPOs for smaller companies and companies do not need to undergo that large of a legal process when applying for an IPO on these lists. Total number of IPOs is 366.

Table 11: Pie chart shows the number of IPOs in each list.

4.1.5 Average underpricing between lists

As shown in table 11 most of the IPOs are listed at Spotlight 223 of 366 and the average first day return compared to subscription price is 8.46%. The results show that Nasdaq large cap have the highest rate of underpricing, but worth mentioning is that only 11 IPOs were made during the period. Same caution about the result applies to Nasdaq mid cap due to only 15 IPOs followed through.
Table 12: Table showing average percentage of underpricing between each list.

4.1.6 Market value

The variable market value determines the size of the company, and thus which of the different stock lists the company can get listed on. The table below shows that average market cap at IPO date is by far Nasdaq large cap. To be able go public on large cap, the company must not only, as already mentioned, undergo a legal inspection to see that all rules and regulations are being followed, but also have a certain market value. Due to these reasons only 11 of 366 samples did an IPO at large cap as shown in table 11. Spotlight, on the other hand, has the lowest average market cap with the reason that the list also has the softest rules and regulations.

Table 13: Pie chart shows average market cap for each list.
### 4.1.7 Pre-secured shares

The pre-secured shares before IPO thus gives the market a signal that issuer have investors who are willing to invest capital in the business because they are believing in the company's future, regardless of how other investors or the market acts. Guarantee commitments ensure the issuer that a part or the whole of the issue will be fully subscribed (D’Agostino et al. (2007). As shown in the table below, first north has the highest level of pre-secured shares and Nasdaq large cap the lowest. Market cap on companies differs a lot between the lists as shown in table 13 and this could be an explanation to why Nasdaq large cap has the lowest average of pre-secured shares.

![Pre-secured shares chart](chart.png)

**Table 14**: Table chart shows average level of pre-secured shares for each list in %.

### 4.1.8 Average underpricing between years.

The background to the choice of area to analyze is based on the record years of the number of IPOs and in our charts since there is an increase in the number of IPOs but also an increase in underpricing. In the table chart below the increase from 2018 to 2019 is nearly three times as high. During the record year in numbers of IPOs 2021 the average first day return was 12.18%, which is an extraordinary result compared to the mean of all 6 years analyzed which came out to be 9% shown in table 4. The mean is significantly higher than the median of the 366 IPOs and came out to be 2.84%. The result of a higher mean is since 2021 was a record year in numbers of IPOs as shown in earlier in table 2 and the second-best year of average underpricing, shown in the table below at 12.18%. Year 2020 was the best year with an average level of underpricing of 14,53%. The only year with a negative result was the last year, 2022 with a result of −0.70%. This do not come as a surprise due to the worse macroeconomic outlook.
4.2 Results

4.2.1 T-test

The table below is showing that the null hypothesis will be rejected because the t-value (4,939)>t one-tail (1,649) and it means that the null hypothesis will be rejected at 5% significance level. Rejecting the null hypothesis proves that the underpricing does exist on the Swedish markets and the 5% significance level means that there is a 5% risk that the null hypothesis is rejected wrongly (Frost, 2021).

<table>
<thead>
<tr>
<th>First day return (%)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0,090092077</td>
</tr>
<tr>
<td>Variance</td>
<td>0,121788816</td>
</tr>
<tr>
<td>Observations</td>
<td>366</td>
</tr>
<tr>
<td>Hypothesized Mean</td>
<td>0</td>
</tr>
<tr>
<td>df</td>
<td>365</td>
</tr>
<tr>
<td>t Stat</td>
<td>4,938826745</td>
</tr>
<tr>
<td>P(T&lt;=t) one-tail</td>
<td>5,99314E-07</td>
</tr>
<tr>
<td>t Critical one-tail</td>
<td>1,649039017</td>
</tr>
<tr>
<td>P(T&lt;=t) two-tail</td>
<td>1,19863E-06</td>
</tr>
<tr>
<td>t Critical two-tail</td>
<td>1,966484396</td>
</tr>
</tbody>
</table>

*Table 16: One-sample t-test for underpricing*
4.2.2 Multiple regression

4.2.2.1 Multiple correlation

The table below shows the correlation between the independent variables which is IPO year, secured beforehand, founding year of the company, market capitalization, list and industry. The highest correlation between the independent variables is between founding year and IPO year which is 0.1970. Since the value of the correlation between these variables falls below 0.7 there is no risk for multiple regression. If there was any risk for correlation between the independent variables it would have caused a reduced precision in the regression results, especially in the estimated coefficients. Multicollinearity, which refers to the correlation between two independent variables, would therefore cause a weakened statistical power where the p-values would not be trustable (Frost, 2023).

![Correlation Matrix Image]

**Table 17: Correlation matrix**

4.2.2.2 Regression analysis

Determination coefficient ($R^2$) is a measure of the explanation degree of the independent variables and the dependent variable. For this study the determination coefficient is 9.37%. According to Chicco, et al (2021) the R-squared in percentage is explaining the variance in the dependent variable that the independent variables explain. Zero percent represents a model that does not explain any of the variation in the dependent variable around its mean. Therefore, 9.37% means that it is the variation in percentage of the IPO first trading day return that is explained by the variation existing in the independent variables.
Further on, the p-value for the overall model test is 0.04% which is below the study’s 5% significance level and therefore the null hypothesis, saying that there is no significant relationship between neither of the independent variables and the level of underpricing, for the global test will be rejected.

<table>
<thead>
<tr>
<th>Linear regression</th>
<th>Number of obs = 366</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F(23, 342) = 2.41</td>
</tr>
<tr>
<td></td>
<td>Prob &gt; F = 0.0004</td>
</tr>
<tr>
<td></td>
<td>R-squared = 0.0937</td>
</tr>
<tr>
<td></td>
<td>Root MSE = 0.3432</td>
</tr>
</tbody>
</table>

| Firstdayreturn | Coefficient | Robust std. err. | t | P>|t| | [95% conf. interval] |
|----------------|-------------|------------------|---|-----|---------------------|
| logmarketcap   | 0.557444    | 0.0181651        | 3.07 | 0.002 | 0.0200151 | 0.0941738 |
| list_n Nasdaq Large | -1.142332 | 0.136974 | -1.05 | 0.293 | -0.4136523 | 0.1251858 |
| Nasdaq Md | 0.0098632 | 0.0586729 | 0.17 | 0.867 | -0.105542 | 0.1252684 |
| Nasdaq Small | -0.0599854 | 0.0523422 | -1.15 | 0.253 | -0.1629566 | 0.0429698 |
| Spotlight | 0.1299572 | 0.0608867 | 2.04 | 0.043 | 0.0041396 | 0.257208 |
| industry_n | | | | | |
| Biotech & Pharmaceuticals | -0.0873626 | 0.1642855 | -0.53 | 0.595 | -0.4104997 | 0.2357746 |
| Consumer Goods & Services | -0.1606835 | 0.1532666 | -1.05 | 0.295 | -0.461872 | 0.1405051 |
| Energy | -0.402753 | 0.1731839 | -2.33 | 0.021 | -0.7433928 | -0.0621132 |
| Finance | 0.0598167 | 0.18801 | 0.27 | 0.787 | -0.3188849 | 0.4206183 |
| Healthcare | -0.022334 | 0.188795 | -0.13 | 0.905 | -0.3355329 | 0.2988558 |
| Industrials | -0.1294363 | 0.158214 | -0.82 | 0.414 | -0.4407638 | 0.1818912 |
| Medical Equipment & Service | -0.063567 | 0.1604518 | -0.40 | 0.692 | -0.3799162 | 0.2513931 |
| Real Estate | -0.103942 | 0.1556305 | -0.69 | 0.492 | -0.4755927 | 0.2677193 |
| Software/tech | -0.118314 | 0.161822 | -0.73 | 0.465 | -0.4366956 | 0.1999777 |
| Technology | -0.0847186 | 0.16009 | -0.53 | 0.597 | -0.3996835 | 0.2301664 |
| Telecom | -0.2454559 | 0.1795854 | -1.37 | 0.173 | -0.5986868 | 0.107775 |
| Foundingyear | 0.0001206 | 0.002088 | 0.11 | 0.912 | -0.0020195 | 0.0022607 |
| Year | | | | | |
| 2018 | -0.0305413 | 0.0643905 | -0.47 | 0.636 | -0.1571925 | 0.0961099 |
| 2019 | 0.0306767 | 0.0618988 | 0.50 | 0.620 | -0.0910735 | 0.152427 |
| 2020 | 0.0240785 | 0.0471999 | 0.32 | 0.746 | -0.1218653 | 0.1700223 |
| 2021 | 0.0003781 | 0.0474577 | 0.02 | 0.844 | -0.0861447 | 0.1629008 |
| 2022 | -0.1470469 | 0.0569029 | -2.62 | 0.009 | -0.2573185 | -0.036754 |
| Secured beforehand | 0.1932114 | 0.0729749 | 2.65 | 0.008 | 0.0496753 | 0.3367475 |
| _cons | -0.820178 | 2.188446 | -0.22 | 0.822 | -4.796526 | 3.81249 |

Table 20: Multiple linear regression

The linear regression in the table above shows that all the p-values, except for the p-value for market capitalization, Spotlight, energy sector, IPO year 2022 and secured beforehand are greater than 5%. The variables with a p-value greater than 5% are not statistically significant and the null hypotheses for those cannot be rejected. It means that there is no evidence that these variables are not caused by coincidence.
On the other hand, the variables mentioned in the paragraph above are statistically significant and the null hypotheses for those variables can be rejected. It means that there is a significant relationship between those variables and the degree of underpricing.

### 4.2.3 Compilation of the study’s tests

<table>
<thead>
<tr>
<th>Variable/test</th>
<th>Hypotheses</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global test</strong></td>
<td>H0: There is no significant relationship between neither of the independent variables and the level of underpricing. H1: There is at least one independent variable that is different from zero and therefore is correlated with the level of underpricing.</td>
<td>Null hypothesis is rejected at 5% significance level.</td>
</tr>
<tr>
<td><strong>One sample T-test</strong></td>
<td>H0: Underpricing is not existing on the Swedish stock exchange markets where X will be equal to or less than zero. H1: IPO underpricing do exist on the Swedish stock exchange markets where X will be equal to or greater than zero.</td>
<td>Null hypothesis is rejected at 5% significance level.</td>
</tr>
<tr>
<td><strong>Firm age</strong></td>
<td>H0: There is no significant relationship between the firm age and the level of underpricing of an IPO. H1: There is a significant relationship between the firm</td>
<td>Null hypothesis cannot be rejected at 5% significance level.</td>
</tr>
</tbody>
</table>
age and the level of underpricing of an IPO.

**Market value**

<table>
<thead>
<tr>
<th>H0: There is no significant relationship between market value and the degree of underpricing.</th>
<th>Null hypothesis is rejected at 5% significance level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: There is a significant relationship between market value and the degree of underpricing.</td>
<td></td>
</tr>
</tbody>
</table>

**Pre-secured shares**

<table>
<thead>
<tr>
<th>H0: There is no significant relationship between pre-secured shares and the level of underpricing.</th>
<th>Null hypothesis is rejected at 5% significance level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: There is a significant relationship between pre-secured shares and the level of underpricing.</td>
<td></td>
</tr>
</tbody>
</table>

**Industry**

<table>
<thead>
<tr>
<th>H0: There is no significant relationship between the level of underpricing and a certain industry.</th>
<th>Null hypothesis cannot be rejected at 5% significance level.</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1: There is a significant relationship between the level of underpricing and a certain industry.</td>
<td></td>
</tr>
</tbody>
</table>
### Lists

| H0: There is no significant relationship between the list and the level of underpricing. |
| H1: There is a significant relationship between list and the level of underpricing. |
| Null hypothesis cannot be rejected at 5% significance level. |

| IPO year |
| H0: There is no significant relationship between the year of IPO and the level of underpricing. |
| H1: There is a significant relationship between the year of IPO and the level of underpricing. |
| Null hypothesis cannot be rejected at 5% significance level. |

*Table 21: Results of the Hypotheses in the study.*

## 5 Analysis

### 5.1 Variable analysis

As discussed in previous paragraphs, underpricing does appear on the Swedish markets. The analysis aims to examine firstly what factors affects underpricing on Swedish markets; Nasdaq, First north and Spotlight. Furthermore, to analyze if underpricing depends on industrial affiliation. Based on the statistical results, the analyzation of the regression is saying that the overall result based on the collected data is relatively weak. Starting from the determination coefficient, it was rather low because the percentage 9.37% is referring to only 9.37% percent of the variation in the independent variables explaining the variation in the degree of underpricing. On the other hand, it is quite usual for the determination coefficient to be low when studying either individuals or companies since there is a lot of individual variations that are not included by the variables in this study. At the same time a too large R squared is not good either because a large determination coefficient would say that the degree of underpricing is predictable (Ozili, 2022). A selection of the differences is presented under the section Empirical results, some which are statistically significant when running our different tests. In the following section the results will be discussed.

#### 5.1.1 Underpricing

Result from underpricing t-test, table 5, indicates that underpricing exists within the sample of 366 IPOs included in the thesis from the lists Nasdaq Stockholm, First north and Spotlight stock
market during the years 2017-2022. The average level of underpricing for the sample is 9.01%. Previous studies on underpricing receives similar results as our data. In an article from Ibbotson (1975), the author obtained the result that the average underpricing was 11.4% of IPOs. The study from Ibbotson was later supported by another study conducted by Ritter (1991). In the analyze Ritter receive the result that IPOs in average is underpriced by 16.4%. Interesting in relation to this result, the analyze by Ritter additionally gets the result that the more underpriced an IPOs is the worse performance in the long run.

In previous chapters First-tier and Second-tier markets are discussed. The result from the sample shows that for more regulated markets, Nasdaq Stockholm Stock Exchange, the entry barriers are higher, results in less IPOs directly to this market. Second-tier markets, also called MTF, which both First north and Spotlight is have lower regulations leading to easier for companies to get listed and increase the number of listings. (Vismara & Paleari, 2012) also explains this in their article and points out some key factors e.g., relaxed disclosure requirements, flexible listing rules and simplified trading mechanisms.

The hypothesis “H1: IPO underpricing do exist on the Swedish stock exchange markets where X will be equal to or greater than zero” cannot be rejected.

5.1.2 Industries
In an article written by Baig and Chen (2022), the authors are surprised about the fact that analysis of IPOs during the Covid-19 years still is a topic that’s largely unexplored. The authors are describing the era as “IPO frenzy” and in 2020 over 150 billion was raised by newly established firms although the pandemics negative effects on the economy. According to the article two industries were the ones that primarily drove the growth forward because of this “IPO frenzy” era 2020 was one of the best years to do an IPO since dot-com boom late 1990s. The authors get the result that underpricing for IPO increased as the pandemic increased also more volatility on average for stocks that got listed during the pandemic. Their first table shows that second half of 2020 had an extreme increase in healthcare IPOs and their sample consists of 421 IPOs from 2018-2020 listed on NYSE American, NYSE, and NASDAQ.

In the article from Baig and Chen (2022), the data from the US markets shown a clear majority that most IPOs belongs to the healthcare industry. However, the largest main industry in this thesis is technology, where the subindustry software/tech belongs with a total of 94 samples. Healthcare industry where the subindustries Biotech & Pharmaceuticals and Medical
Equipment & Service also are included, the numbers of IPOs in the sample size of this thesis is a total of 89 IPOs.

By analyzing the result from the regression model in the empirical paragraph is that only 1 of the 12 industries appears to be significant, which is the Energy industry who have the lowest P-value of 0.021. This result can be related to the fact that Energy is the industry with the least samples, only 6 and 4 of these were overpriced and 2 underpriced, see table 8. The second lowest P-value is Telecom (0.173), a sector like Energy has few samples, only 12. The industry with the highest P-value is Healthcare (0.895), the industry had the largest numbers of underpricing as seen in table 8, 13 samples were underpriced and three were overpriced. Finance is the industry with the second highest P-value of 0.787, however, in comparison with the result on table 8 the industry is the fourth highest. According to table 8 Biotech & Pharmaceuticals have equal 50%, of the total 46 IPOs in the industry, underpriced and overpriced. In the regression result the P-value is 0.595.

Clark (2002) finds support from previous study in the theory from Ritter (1991) about industry affiliation affects underpricing except for the technology industry. Regression results in our study contradicts with Clark (2002), technology industry is no exception in these results. By contrast the finance industry is the only variable with a positive coefficient value of 0.0508, but with a high P-value of 0.787 so the result has not statistically significant. Energy industry is the only statistically significant industry with a P-value at 0.021. The result is that only 1 of 12 industries is statistically significant and the hypothesis “H0: There is no significant relationship between the level of underpricing and a certain industry” cannot be rejected.

5.1.3 Lists

From the results, it was shown in the first regression model in table 8, that lists do not have a statistically significant relationship with the degree of underpricing since the null hypothesis for this variable was accepted. In table 9, on the other hand, the regression presented that not all the markets are insignificant. Spotlight exchange market were the one that had significantly greater underpricing than the reference list First North. Nasdaq Stockholm, large-, mid- and small cap did not seem to be significant at 5% level and are therefore not significantly different from First North.

In the theoretical framework it was ascertained that Spotlight market is an unregulated stock market having an ambition to help growth companies getting listed and to help them focus on their long-term goals. Also, from the spreadsheet that was collected from Affärsvärdens it was
easy to find out that the company with the largest market value listed on Spotlight did have a market value of 347 million Swedish crowns in comparison to the large cap companies having market values up to 11 billion crowns. One may conclude from this that the companies listed on Spotlight stock market are the smaller ones, in the growing phase. In addition, small companies are usually riskier than large firms as smaller firms tend to have lower liquidity at the same time as the leverage of the companies leads to greater volatility within the businesses’ earnings (Chincarini, 2020; Avanza, 2023).

Because of the risk characteristics of the small companies, it is considered to be more difficult to do a correct pricing of them compared to the pricing process of the larger companies. There is also a risk coming with underpricing on unregulated markets such as Spotlight because underpricing can lead to the companies not having enough of capital at the time of IPO. In table 4, it is illustrated that large cap on Nasdaq Stockholm is the market with highest underpricing, but since this list is only consisting of 11 companies in the sample for this study while Spotlight is consisting of 82 companies, the mean could have been manipulated by the number of companies on each market. Due to the regression, large cap might have less underpricing than First North but this statistic is not significant different from First North.

5.1.4 Age
Newly established companies tend to be obtained riskier and therefore require a higher rate of return (Ritter, 1991). Clark (2002) performed a study analyzing company age and returns for IPOs, the author got to the results that a positive correlation appeared. Older companies performed statistically significantly better than younger. The correlation appeared in all industries except for companies in technology industry. In the technology industry, the opposite was true, the younger companies performed better than the older ones. However, the difference was not statistically significant in the performance between younger and older companies.

In comparison to Ritter and Clark our results from the regression model shows that underpricing has not statistically significant. Therefore, hypothesis “H0: There is no significant relationship between the firm age and the level of underpricing” cannot be rejected.

5.1.5 Market value
The market value, named market cap in regression model, has a P-value is 0.02 and is statistically significant. One factor for this result can be explained by the phenomenon “money left on the table” discussed in an article by (Cakici & Topyan, 2014) where the authors explain this such as companies with a greater market value can take advantage by offering a lower price.
(Ritter 2022) also discuss the phenomenon and got the result that companies offered a higher amount of capital also experienced a higher level of underpricing.

The hypothesis “H1: There is a significant relationship between market value and the degree of underpricing” cannot be rejected.

### 5.1.6 Pre-secured shares

In connection with the increase in the number of IPOs during the years, the proportion of pre-secured shares has also increased. This have been of more and more relevance for the issuer and been a factor for a successful IPO. However, it is not only mentioned positively, due to the fact that these investors often have a lock-up period for their insured shares, the stock may suffer a period of low liquidity when it begins to trade publicly (Chance, 2012). Another concern if the level of pre-secured shares is high, an extreme increase in trading volume can take place after the lock-up period because the early investors now can trade the stock. Results from the regression model shows a p-value of 0.008, this shows a statistically significant for the variable pre-secured shares with a coefficient of 0.1932. Due to this result, the hypothesis “H1: There is a significant relationship between the share secured in advance and the level of underpricing.” cannot be rejected. Additionally, the regression results regarding this variable are implying the strong form of the Efficient Market Hypothesis based on the results in the regression saying the shares secured beforehand have a positive coefficient. This is because when it is a greater share of pre-secured shares, “usual” investors feel safer with investing in that share which results in the classical phenomenon on the first trading day; a lot of investors will trade shares from the same IPO and the first day return will increase instantly (Chance, 2012).

### 5.1.7 IPO year

The regression results in table 8 is showing that IPO year is not having a significant relationship to the degree of underpricing. At the same time, table 9 is saying that the IPO-year 2022 is statistically significant and therefore statistically different from year 2017 that is the reference year with a negative coefficient. This means that the IPO underpricing is significantly lower in year 2022 compared to the reference year 2017. As mentioned in the first chapter of this study, the chosen period is based on the major events that have occurred universally, primarily the Covid-19 pandemic starting in the end of 2019 as well as the Russian invasion of Ukraine in the early 2022. In the beginning of May year 2023 World Health Organization (2023) did the statement that the Covid-19 virus is no longer a global health emergency which means that at the time of the investigated period in the study, the Covid-19 pandemic still remained
(Gumbrecht et al, 2023). The same applies to the Russian invasion of Ukraine in the beginning of 2022 that still has not got an end. This study has therefore gotten the possibility to study both crisis- and non-crisis affected years.

The year 2022 in Sweden was mainly affected by the increasing inflation which resulted in the Central bank raising the interest rate and slow down the economy in. Raised interest rates have affected the Swedish society in many ways, but mainly it has been showed in the difficulties for people to deal with the private economies which also have affected the demand among the shares. A decrease of underpricing during year 2022 is firstly depending on the decrease of IPOs which is showed in table 4. The decrease in average underpricing in year 2022 was 12,88% in the study’s sample. Secondly, the demand was rather decreased during the first year of the Ukrainian war, 2022, since the war caused partly energy shorting and partly people were affected by the increasing household expenses. The consequence of raised interest rates is that people will choose to have their savings on usual bank accounts instead of having savings in securities which in turn will lead to falling prices on shares. The falling prices in for example shares will result in even less consumption for the people owning shares (Mosery, 2022).

6 Conclusion

The result of the study is showing that it does exist underpricing on the Swedish stock markets during the period 2017 to 2022. The sample was consisting of 366 companies which were categorized in both the three different lists and the 12 different industries. The average degree of underpricing is approximately 9% where year 2018 and 2022 was the years that were deviant comparing to the other years. The average undepricing for year 2018 was 4,01% and the average underpricing for year 2022 increased as much as to the negative value of –0,70 percent. The conclusion is that for the last year that was studied in this research, the underpricing in this sample went to overpricing. Although, the charts attached in this study, showing that the 6 years that have been studied have been embossed of underpricing, the regression could not show that there is a significant relationship between the IPO year and the degree of underpricing, expect from the year 2022. The economy year 2022 has been affected a lot by the Russian invasion of Ukraine which have been reflected in the demand from the population.

Further on, the regression results imply that there is a relationship between market capitalization and the degree of underpricing as well as there is a relationship between pre-securing of shares and underpricing. The fact that the regression showed a significant relationship between pre-secured shares and the degree of underpricing implies that the Swedish markets is partly acting
after the strong form in the Efficient Market Hypothesis. This is strongly related to the information asymmetry that has been considered as a considerable factor through the study. Risk and uncertainty are directly related to information asymmetry which is affecting the pricing level.

The study is taking into account the size of the companies where the IPOs have been categorized into large- mid- and small cap in the data collected which have contributed to a clearer view of which kind of companies that have the strongest association to underpricing. On the other hand, the study has only taken the first trading day into account in the study which has resulted in not reflecting over the happenings in the company after. It resulted in not removing the companies that were acquired shortly after the IPO took place and this kind of company tends to have a higher degree of underpricing.

In summary, a lot has happened during the years for the sample size who has affected the global economy, stock market and furthermore the IPO market. Due to this, the purpose with this thesis was to analyze what factors affect IPO underpricing during the year 2017-2022 between the three Swedish markets: Nasdaq, First North and Spotlight. In addition to this, the research aimed to analyze which differences in underpricing depend on industrial affiliation. In order to test this, we used eight hypotheses to get a result if a statistically significance could describe the fact that underpricing do appear on the Swedish stock market.

The findings suggest that IPO underpricing do appear on Swedish markets and of the study’s six variables examined to test the theory regarding IPO underpricing, two were found to be significant. In paragraph 4.2.3 the results from the hypothesis are shown. The regression results made it possible to reject the null hypothesis on the variables market value and pre-secured shares as well as the null hypotheses for the global test and one sample T-test. The variables we could not reject the null hypothesis for were firm age, industry, lists and IPO year. In conclusion this means that the factors affecting the IPOs in this study’s sample are market capitalization in the aspect that companies with a higher market value also tend to have a higher degree of underpricing, and the reasoning for pre-secured is the same since the two variables are related to each other. Companies with a greater share of pre-secured shares tend to have a higher degree of underpricing. The remaining variables could not be proved to have a significant relationship to the degree of underpricing and suggestions to improve the study in that aspect are found in the section below.
7 Future Research

This study is researching the degree of underpricing on three Swedish markets in a period of six years and with the support of regression testing the relationship between six independent variables and the dependent variable. In other words, this research was covering a bit more comparing to similar studies that have been done before this one. Despite this, there is some suggestions for future research that can improve the results that have been desired for this study.

Firstly, this study was delimited to only studying the first trading day return which was partly resulting in not removing certain companies and partly resulting in not following the development of the companies’ operation and performance afterwards. The advantage in extending the research to studying the rate changes during a longer period is that any of the variables might have appeared to have a greater degree of explanation which is interesting to take into consideration when studying the factors affecting underpricing.

Secondly, it would have been beneficial for the research to include greater period. It was discovered that studying six years was a bit challenging in the aspect of trying to obtain validate results. For example, the research was including some industries including a few companies including the energy sector and basic materials which is not optimal in the aspect of validation. By extending the period that will be researched, it will truly increase the companies in some of the industries, hopefully in those that have less. The tests and the result will thereafter be more validate and by a bigger number of observations, even the significance might be added or changed through the variables.

8 References


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Appendix 1
<table>
<thead>
<tr>
<th>Company</th>
<th>Date filed</th>
<th>Industry</th>
<th>List</th>
<th>Market Cap (in Mkr)</th>
<th>Premiaised (in Mkr)</th>
<th>Year</th>
<th>Fondering year</th>
<th>Company type</th>
<th>Understanded</th>
<th>Overpaid change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doro</td>
<td>2010-12-07</td>
<td>Tobacco</td>
<td>First North</td>
<td>126 (1,13%)</td>
<td>103.34</td>
<td>2017</td>
<td>2018</td>
<td>2013</td>
<td>1</td>
<td>-1.34%</td>
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<tr>
<td>Hållarna</td>
<td>2010-10-03</td>
<td>Healthcare</td>
<td>Nasdaq First</td>
<td>267 (15.7%)</td>
<td>221.77</td>
<td>2019</td>
<td>2018</td>
<td>2018</td>
<td>1</td>
<td>5.77%</td>
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<tr>
<td>Hammarby</td>
<td>2010-10-03</td>
<td>Consumer Goods and Services</td>
<td>First North</td>
<td>232 (0.9%)</td>
<td>201.03</td>
<td>2018</td>
<td>2018</td>
<td>2018</td>
<td>1</td>
<td>0.9%</td>
</tr>
<tr>
<td>Hennoskop</td>
<td>2010-01-21</td>
<td>Medical Equipment &amp; Services</td>
<td>First North</td>
<td>64 (8.1%)</td>
<td>54.19</td>
<td>2018</td>
<td>2018</td>
<td>2018</td>
<td>1</td>
<td>8.1%</td>
</tr>
<tr>
<td>Hovione</td>
<td>2010-07-30</td>
<td>Technology</td>
<td>First North</td>
<td>3,684 (38.4%)</td>
<td>3,298 (35.6%)</td>
<td>2017</td>
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<tr>
<td>Hovione</td>
<td>2010-07-30</td>
<td>Energy</td>
<td>First North</td>
<td>158 (4.3%)</td>
<td>131.23</td>
<td>2018</td>
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<td>First North</td>
<td>124 (8.8%)</td>
<td>124 (8.9%)</td>
<td>2017</td>
<td>2018</td>
<td>2017</td>
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<tr>
<td>IXL Group</td>
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<td>Construction Services</td>
<td>First North</td>
<td>87 (7.8%)</td>
<td>87 (7.8%)</td>
<td>2017</td>
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<td>2017</td>
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<td>Real Estate</td>
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<td>1407 (36.2%)</td>
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<td>2018</td>
<td>2017</td>
<td>1</td>
<td>36.2%</td>
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<tr>
<td>IXL Group</td>
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<td>First North</td>
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<td>873 (27.2%)</td>
<td>2017</td>
<td>2018</td>
<td>2017</td>
<td>1</td>
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<td>First North</td>
<td>293 (5.2%)</td>
<td>293 (5.2%)</td>
<td>2019</td>
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</tr>
<tr>
<td>IXL Group</td>
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<td>Medical Equipment &amp; Services</td>
<td>First North</td>
<td>67 (36.7%)</td>
<td>67 (36.7%)</td>
<td>2017</td>
<td>2018</td>
<td>2017</td>
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<td>Materials</td>
<td>Nasdaq First</td>
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<td>793 (6.07%)</td>
<td>2018</td>
<td>2018</td>
<td>2018</td>
<td>1</td>
<td>6.07%</td>
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2 (4)