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Evaluation of Influencing Factors of IPO Underpricing in Finnish Stock Market

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Initial public offerings (IPOs) have become more popular again in Finland after a very quiet period between 2002 and 2014. Listings have historically offered good short-term returns for investors, but in the long-term, IPO stocks have not performed as well as other listed companies.

The goal of this research is to examine the existence of IPO underpricing in Finland and the effect of selected factors on the level of underpricing. The factors chosen for this study are the size of the offering, IPO method, the chosen marketplace, and age and industry of the company. The data sample used in this research contains 50 companies that went public on First North Helsinki and the main list between 2012 and 2018.

At the beginning of the theory part, financial markets are introduced, and reasons to go public are examined. After this, the study deepens into describing the IPO process generally and then more specifically in Finland. Finally, the most important theories of IPO underpricing are introduced.

The effect of selected factors is examined by multiple regression analysis with six independent variables. A market-adjusted first-day return is used as a dependent variable. The results of the regression analysis are introduced, and the validity of the model is tested in the empirical part.

An average first-market day return of IPOs issued between 2012 and 2018 was 3.63%. According to the study, only the age of the firm can be used to explain the degree of underpricing. Other selected factors do not provide statistically significant results. The study indicates that IPO underpricing cannot be explained with individual theories or variables, but there are always multiple factors affecting the degree of underpricing.

Keywords
Initial public offering, IPO, Underpricing, Regression analysis

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1 Introduction

After the period of a very little number of initial public offerings (IPOs) in Finland between 2002 and 2014, the market has finally started to see more activity again. This trend is highly desirable because a healthy capital market is essential to Finland's economic well-being. The stock exchange does not only provide the additional way for firms to raise market-based capital, but it also maintains a financial ecosystem which consists listed companies, institutional investors, venture capitalists, investment funds, family enterprises, and private investors. The ecosystem offers listed companies the best possible environment for creating economic growth and support employment. Supporting the growth of small and medium-sized companies is crucial because companies with less than 50 employees generated as many as 73% of all new jobs in Finland during the period 2001-2012. In Sweden, where the listing activity is significantly higher than in Finland, the corresponding figure has been approximately 80% over the past ten years. (NASDAQ OMX 2014, 3-4.)

Increased activity in IPO markets has brought back the question; how can an investor benefit from initial public offerings? According to Keiding (2016), the listing price should reflect the real value of the business, but despite the market or IPO method, the systematic underpricing has been found. The phenomenon is called IPO underpricing. This research is implemented from the viewpoint of a private investor who wants to gain benefit from abnormal returns provided by the underpricing of IPOs. The study analyses various factors which are believed to affect the degree of underpricing and compares market adjusted first day returns to prior studies to determine if IPO underpricing has increased or decreased with additional listing activity. The analysis aims to help investors to understand how to choose the most profitable IPOs to invest in.

1.1 Background

Early evidence of IPO underpricing was initially found by Reilly and Hatfield (1969) when they researched 53 new equity offerings from 1963 to 1965. They compared the offer price and price on the first Friday to be able to find if there was short term underpricing in new issues. IPO stocks outperformed the market by 18.3% confirming the existence of underpricing. Reilly and Hatfield (1969) came up with several possible issue specific reasons for the outcome of the study. Underwriters tend to underprice the issue to ensure the success of the listing and to minimize their exposure with a quick sale. The successful issue is beneficial for all parties including the issuer, underwriter, and investors. Underwriters receive part of their commission as stocks or options to buy a large number of stocks at a price near issue price. This leads to a situation where it is more beneficial for the underwriter to set the issue price lower. Underwriters are also committed to stabilizing the issue

in case of higher volatility. To avoid stabilizing actions which tie resources and capital, underwriters tend to underprice issues to make them more attractive to the public. The issuer can benefit from lower price by leaving investors satisfied after successful issue so that they are more likely to buy stocks in future issues as well. (Supriya & Phani 2016, 35-36.)

More recently, Ritter (2019) has been collecting information of all companies that went public In the U.S. between 1980 and 2018. His data includes all IPOs with an offer price of at least $5.00, excluding American Depositary Receipts (ADRs), Real Estate Investment Trusts (REITs), closed-end funds, unit offers, natural resource limited partnerships, small best efforts offers, banks and savings & loans (S&Ls), and stocks that are not listed on NYSE or NASDAQ. Based on the data of Ritter in 80s there were 2048 listings with 7.2% mean first-day return. In 90s IPO market became a lot hotter and between 1990 and 1998 there were already 3613 listings with 14.8% first-day returns. Due to the dot-com bubble and extremely high number of listings at the end of the 90s and early 00s, Ritter had separated IPO listings of 1999 to 2000 into a separate line. During these two years in total of 856 companies listed in NYSE and NASDAQ and first-day returns of 64.6% were reported. From 2001 number of listings have stabilized and returns have decreased back to earlier rates. From 2001 to 2018 there were 1980 IPOs with 14.3% first-day returns. The average first-day return for his sample period was 17.9%.

IPO underpricing anomaly has been researched globally in various countries over time. Based on the research of Loughran, Ritter, and Rydqvist (1994) underpricing varies per country, and it is generally higher in Asian countries compared to European countries. Their research included data from 25 countries, and in all of them, companies going public were underpriced in the short run. The variation of the level of underpricing between different countries was explained by the amount of government interference, the time of setting a fixed offering price and the overall risk level of the firm. It was mentioned that when explicit auctions are used, very little underpricing exists. Ritter (2003) researched the differences between European and American IPO markets and published the table of average initial returns for 38 countries. The table has been updated since then, and there is currently data available for 54 countries. Figure 1. illustrates the underpricing between 24 different countries ranging from 6% in Austria to as high as 158% in China.

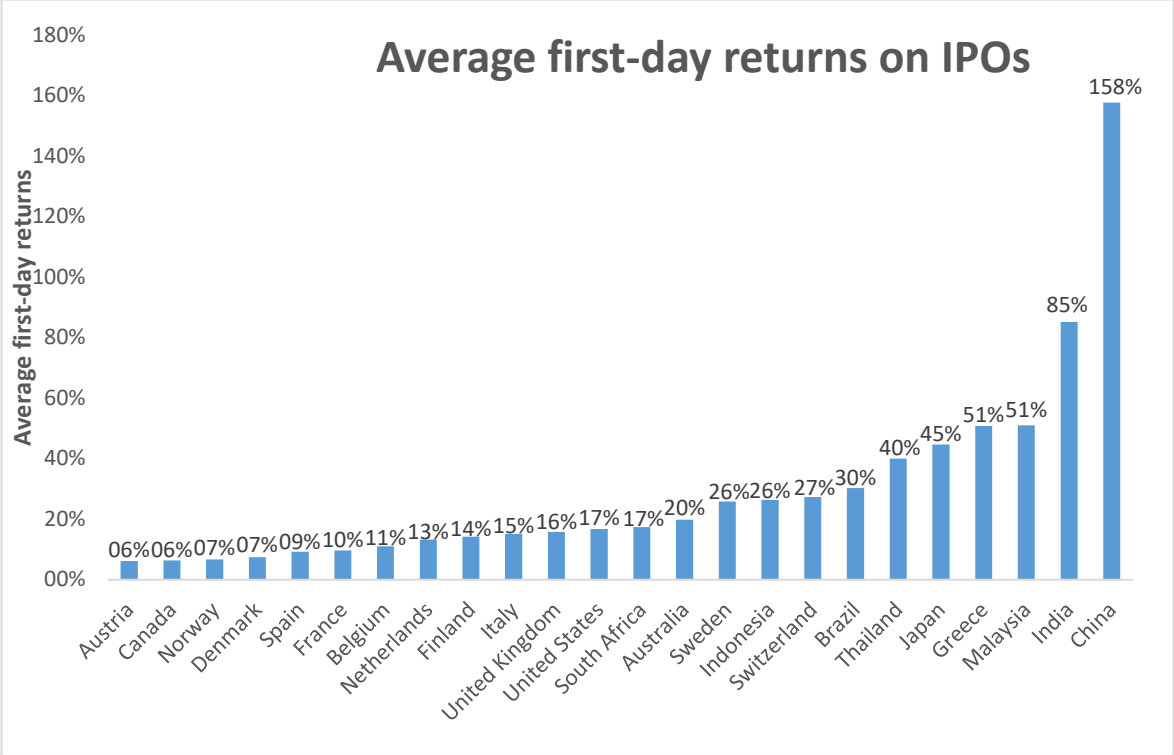

Figure 1. Average first-day returns on IPOs. (Compiled from the table of Ritter 2003, which is collected from studies of various researchers)

In Finnish stock markets, IPO underpricing was originally found by Keloharju (1993) whose research shows that there has been a short-term undervaluation of 8.7% in IPOs between 1984 and 1989. In his finding, the undervaluation is slightly lower than most studies have found on other markets. After the research of Keloharju (1993), Finnish IPOs have been examined by Westerholm (2006) and Hahl, Vähämaa & Äijö (2014). Westerholm (2006) reported an average underpricing of 21.9% between 1991 and 2002 while Hahl et al. (2014) found an underpricing of 15.6% between 1994 and 2006. Higher underpricing in the latter two studies can be explained with a different sample period. The study of Keloharju (1993) has been implemented before the dot-com bubble, the period when IPO underpricing was significantly higher than ever before or after it. There is a lack of recent researches of Finnish stock markets which examine the underpricing after the financial crisis.

Several studies including Keloharju (1993), Westerholm (2013) and Hahl et al. (2014) report that IPO stocks are not good long-run investments due to lower returns. Based on the research of Hahl et al. (2014) the average market-adjusted return for IPO stocks in Helsinki Stock Exchange is -30% in the next three years after the listing. Accordingly, this study focuses only on short term returns and more specifically only to first market day returns.

1.2 Thesis objective and demarcation

The goal of this research is to investigate the existence of IPO underpricing in Finland and the effect of selected factors on the level of underpricing. The factors chosen for this study are the size of the offering, IPO method, the chosen marketplace, age and industry of the company. The study examines and answers the following questions:

1. How do selected factors including the size of the offering, IPO method, the chosen marketplace, age and industry of the company affect the underpricing of initial public offerings?
2. What kind of returns can investors expect from investing in IPOs when looking at the first market day?
3. How high is the degree of underpricing compared to the time before the financial crisis?

Due to the scope of bachelor thesis, the research will be limited to publicly listed companies in Nasdaq OMX Helsinki and Nasdaq OMX First North Helsinki who have had an IPO between 2012 and 2018. Listings that did not include public offering are excluded in this study. Such exclusions include directed share issues, spin-offs, mergers, reverse mergers, parallel listings and companies that changed list. Prior researches suggest that an investor can expect a higher return in short-term, but worse in long-term, so this research will only cover returns of the first market day.

1.3 Key concepts

Initial public offering (IPO) is the process where a private company offers shares to the public for the first time to get listed in the stock exchange. Companies can either use IPOs as the way to raise capital for expenditures or to allow the owners to sell some or all of their ownership of the company. If the company decides to issue additional shares later after IPO, it is called a seasoned equity offering. (Brigham & Ehrhardt 2011, 30.)

Underpricing in IPOs is the listing of stocks below their fair value. Underpricing is typically used to make listings more attractive to investors. One of the reasons for underpricing is the possible risk of lower liquidity in IPO stock compared to already publicly traded stocks. There is also less historical data available, so IPO companies are less predictable. Underpricing increases the probability of oversubscription which reduces the risk of an underwriter. (Brigham & Ehrhardt 2011, 795.)

An underwriter is a party that evaluates and analyses the risks of another party. In IPOs Underwriter, which is typically an investment bank, acts as the middleman between investors and the company issuing shares. Depending on the agreement, the underwriter might be obligated to reduce the risk of the issuer by purchasing the entire offering and selling stocks to the public. (Brigham & Ehrhardt 2011, 14.) The underwriter also helps the company with practical preparements and decisions such as how much capital should be raised, what kind of securities to be issued and how to prepare for becoming public.

A market anomaly is also known as a market inefficiency. In financial markets, anomalies are empirical results that seem to be inconsistent with the efficient-market hypothesis. They indicate market inefficiency which can lead to profit opportunities. After being published anomalies tend to disappear, reverse or attenuate. (Schwert 2003, 940.)

Asymmetric information refers to situations, in which one party of the trade holds information while other party does not. A key assumption for economic theories is that the characteristics of all products traded should be equally observed by all parties. If this assumption fails to hold, information asymmetry is existing, prices are distorted and do not achieve optimality in the allocation of resources. (Quy-Toan 2003)

2 Influencing theories to IPO underpricing

In this chapter, the most important theories affecting the research are introduced. The theory of efficient markets is the cornerstone of capital markets, but IPO underpricing is an exception to efficiency which can be exploited by investors. This chapter also covers the reasons why firms go public and how the listing process goes. Prior studies related to underpricing reasons are introduced at the end of this part.

2.1 Financial markets

Some companies or individuals have profitable ideas, but no capital to implement the ideas. While others have more capital available than profitable ideas to implement. This creates the demand for financial markets that bring together organizations and individuals who need the money and who are ready to invest money (Brigham & Ehrhardt 2011, 27). The system creates economic efficiency by ensuring that the capital can move to the place where it is the most efficient. (Knüpfer & Puttonen 2016, 54.) Financial markets operate in many different ways, but all of them serve the same essential functions including price setting, asset valuation, arbitrage, raising capital, commercial transactions, investing and risk management (Levinson 2009, 2).

The financial market is divided into money market and capital market. Money markets are the markets for short-term securities with a running time of less than one year. Money market securities are typically more liquid and carry lower risk than capital market securities. Capital markets are for long-term investments such as stocks and debts maturing more than a year in the future (Brigham & Ehrhardt 2011, 27). Capital markets can be divided into the equity market and the debt market. Equity can be raised from stock markets while debt is raised from bond markets or directly from financial institutions. This research focuses on initial public offerings which are part of equity markets.

2.2 Efficient-market hypothesis

For this research, it is important to understand the efficient-market hypothesis (EMH) and how it affects financial markets. Efficient-markets were first introduced by Kendall (1953) who found that stock prices cannot be predicted by looking into historical data. Before that, there was a belief that future prices could be forecasted by looking at historical stock prices (Kendall 1953). Efficient-markets mean that returns of stocks follow random walk instead of relying on past price. By looking at yesterday's price, an investor cannot get any benefit. The price of the stock changes only when new information comes out and the price change should be almost immediate after news come out. New information must be unpredictable. Otherwise, it would not be new anymore. (Knüpfer & Puttonen 2016, 167.)

One of the most important theories on financial markets is the efficient-market hypothesis originally found by Fama (1970). The theory suggests that asset prices should fully reflect all publicly available information. For that reason, it should not be possible to beat the market and buy undervalued stocks by using the expertise of investor to pick the stocks which will perform better than the market. According to the research stocks always trade at their fair value and investors can only earn higher returns by buying riskier assets. (Fama 1970.)

Based on the efficient-market hypothesis, investors would not benefit from market timing or stock selection, but the best result would be achieved by investing in a passive portfolio with low costs such as ETF funds. In practice, there are limitations, because EMH expects that the market does not have any transaction fees, and all information is available to the public for free. Also, it is expected that investors are unanimous about how new information affects markets. (Fama 1970.)

2.2.1 A weak-form EMH

According to Fama (1970), efficient markets can be divided into three forms. A weak-form EMH suggests that share prices only reflect one information which is the historical share price. The theory argues that there are no patterns that exist, and the future price cannot be predicted from historical prices. Therefore, the investor would not benefit from technical analysis. Based on weak-form all new information must be unrelated to previous information or otherwise it would not be considered as new information. Due to that, every movement in the share price is the response to new information which was not available before. The movement cannot be predicted from historical movements or share prices. (Fama 1970.)

2.2.2 A semi-strong-form EMH

A semi-strong-form EMH suggests that the share prices reflect all publicly available information. Based on the theory market should quickly adapt to the new information and stocks should be traded to the new equilibrium price. Semi-strong-form suggests that using technical and fundamental analysis should not bring higher returns in the market, but the only way to produce returns above market averages would be utilizing the information that is not available to the public. (Fama 1970.)

2.2.3 A strong-form EMH

A strong-form EMH suggests that stock prices reflect all historical, public and private information. Therefore, there is no type of information which investors could use to gain an

advantage over the market. Based on the theory holders of private information would utilize it and buy underpriced stocks until the price would reach the fair value. (Fama 1970.) Despite the theory, securities market act restricts the trading of holders of inside information, so the idea of a strong-form EMH is more or less absurd. According to Fama (1970), it is possible that for instance only the weak-form and the semi-strong-form can be applied to the market, but the strong-form can not. Due to this, it is possible to deduce at which point the perfect reflection of information stops happening.

2.3 A market anomaly

Based on the efficient-market hypothesis market anomalies should not exist and there should not be underpricing in stocks. Nonetheless, researches have been able to find market anomalies which are also known as market inefficiencies. One of the first studies of market anomalies was done by Kelly (1930) when he revealed the existence of the Monday effect anomaly in the US stock markets. Based on his research returns were lower on Mondays.

In financial economics, the word “anomaly” refers to an irregularity from the common or natural order, or an exceptional condition (Frankfurter & McGoun 2001). According to their study anomalies can occur only once before vanishing or they can occur continuously. Investors can exploit market anomalies as part of their strategy to gain returns higher than the market return is. These returns are called abnormal returns.

2.4 Reasons to go public

The decision to go public is a massive step for the company. Being publicly listed company brings many advantages, but also some disadvantages. In most cases, the primary reason to go public is the desire to raise equity capital which could be used for example to capital expenditures or to rebalance accounts. Unlisted stocks are very illiquid, so it is difficult to convert some of the ownership of founders or other shareholders into cash without going public. Non-financial reasons, such as publicity reasons, also play a role for most companies.

Ritter and Welch (2002) suggest that firms go public if market conditions are favorable, but only if companies are beyond a certain stage in their life cycle. According to Loughran and Ritter (2004), the median age of firms going public in the USA has been very stable at seven years old since 1980. The only exception to this was the dot-com bubble when younger companies of the median age of five years were listed and the year 2001 right after the bubble when companies probably got more cautious, and the median age rose to 12 years. Pagano, Panetta & Zingales (1998) conducted empiric research of Italian IPOs

intending to determine the reasons why do companies go public. In their research, they mentioned that a typical Italian IPO is eight times as large and six times as old as the typical IPO in the USA. According to Rydqvist and Högholm (1995), the average age of firms going public in Continental Europe is 40 years old. The difference to the USA is significant, and it is notable that European companies are more likely to use the funds raised in IPOs to pay down debt instead of financing growth (Pagano et al., 1998.) That might explain the higher degree of underpricing in the USA compared to Europe.

2.4.1 Raising capital

Raising capital is probably the first reason to come up to mind when thinking why companies go public. Firms might face the problem that they want to grow, but they can no longer get more money from debt markets. Companies can either sell primary shares which are newly issued shares of common stock or secondary shares which are already existing shares. The main difference is that the sale of secondary shares do not increase the total number of shares outstanding or equity of the firm because these shares are sold by existing shareholders who get the proceeds of the sale.

Kim and Weisbach (2005) examined how companies use the money raised in IPOs by observing total assets, inventory, net property, plant & equipment (PPE), capital expenditures, research & development (R&D) costs, cash and debt reduction of new IPO companies. With each variable, the correlation on the relative proportion of primary shares was significantly positive, suggesting that issued primary shares are related to increases in above-mentioned accounting variables. By far the largest portion of the money raised in the IPO was used to increase capital expenditures and R&D. However, the study suggests that the capital raised in IPO is not used all at once, but in year one, firms hold as much as 68.8 percent in cash. Spending on inventory, net PPE, R&D, capital expenditures, and debt reduction all increase over time. A possible explanation for this could be the way how companies tend to spend cash acquired in the IPO over a several year time period (Kim & Weisbach 2005).

Pagano et al. (1998) suggest that probably the most cited benefit of going public is gaining access to other sources of finance than venture capitalists and banks. Being able to raise capital should be especially beneficial for companies with significant investments, high leverage, and a high growth rate. The opportunity is not only restricted to IPO, but firms that raise primary capital are more likely to raise subsequent capital in the years following the IPO (Kim & Weisbach 2005). Gaining access to the stock market does not only eliminate the issue of unilateral sources of funding but also increases the bargaining power with banks. When a private company seeks for debt capital, banks can benefit from their

privileged information about the creditworthiness of the company. Publicly listed companies are required to follow more strict reporting and accounting regulations than private companies. By disseminating information to the investors, a company increases competition to its lenders which decreases their cost of credit and could secure a more abundant supply of external capital. (Rajan 1992.) The bargaining power hypothesis was tested by Pagano et al. (1998) who assumed that firms with higher interest rates and fewer funding possibilities should be more likely to go public. They reported that their post-IPO data indeed indicated that the cost of credit decreased, and the concentration of credit reduced after the IPO. Nonetheless, they could find neither the higher interest rates nor the credit concentration to be the determining factor for the decision to get listed in a stock market.

2.4.2 Cash out

According to the study of Black and Gibson (1998), IPOs allow venture capitalists (VCs) to exit from their investment. Along with VCs also founders of the company and other shareholders get an opportunity to cash-out at least partially by selling secondary shares. The decision to go public does not only give an immediate opportunity for owners to cash-out, but it also increases the liquidity of a company's stock. Shares of publicly listed companies can be traded for significantly cheaper and with less effort than shares of private companies. As a result, the liquidity benefits provided by being publicly listed on an exchange increases the likelihood of initial owners to be able to sell shares to dispersed investors. This provides owners an opportunity for diversification, which can be achieved directly by selling stocks of the company and reinvesting in other assets, or indirectly, by having to raise fresh equity capital for the company after the IPO and to acquire stakes in other companies. (Pagano et al., 1998.)

Kim and Weisbach (2005) used a sample of 16,958 IPOs from 38 countries to be able to provide insight into how the motives for going public vary across types. They reported that in most countries firms issue a majority of primary shares, but the proportion varies considerably across countries. IPOs in European countries tend to have the lowest rate of primary shares sold while the highest rate is in Asian countries other than Japan. According to their sample of nearly 17,000 international IPOs, 79.4% of shares sold in IPOs were primary shares, and the remaining 20.6% were secondary shares. The sample suggests that in Finland it has been slightly more common to use IPOs as a cash-out method since 36.9% of shares sosd in Finnish IPOs were secondary shares. Kim and Weisbach (2005) also suggest that as the proportion of primary shares issued is significantly higher, most IPOs appear to aim to raise capital to support future growth. In countries where the proportion of secondary shares is more substantial, companies might have different motives to go public. Such motives could be for example the idea of eventually selling out the company, benefit from diversification or obtain liquidity.

2.4.3 Image

Going public does not only bring capital benefits but also increases the image and transparency of the firm due to the disclosure obligation. Going public brings media visibility to the company which can often be seen as a mark of quality in the eyes of investors, customers, and suppliers. The better image can also help the firm in the recruitment process to attract more skilled labor. (Pörssisäätiö 2014.)

IPO underpricing can be one way to increase interest in the firm. According to Demers and Lewellen (2003), both website traffic and media citations increase in a month of IPO and a month after it. They found that the degree of underpricing is significantly correlated with website traffic for a set of Internet IPOs. According to their data, one percent increase in underpricing generates on average 1,754 unique website visitors. The cost per unique visitor was then $450 of underpricing. They found that underpricing also correlates with media citations in the month of IPO for a sample of both non-internet and Internet IPOs.

2.4.4 Acquisitions

Firms might face the situation, that they want to acquire another company. The acquirer company can raise the capital in the IPO to be able to make cash acquisition, but the raised amount is not always enough. It is prevalent that at least part of the deal is done by exchanging stocks. To be able to use shares as a currency in the acquisition, the company might need to become public to avoid possible stock price misvaluation which can be caused by asymmetric information.

Brau and Fawcett (2006) researched how frequent post-IPO acquisitions are. Their sample consists of 336 completed surveys composed of 87 successful IPOs, 37 withdrawn IPOs, and 212 companies that were large enough, but never attempted to go public between 2000 and 2002. They found that IPO firms were acquirers 141 times and targets only 18 times suggesting that companies go public primary for using their shares to acquire other firms rather than positioning themselves to be acquired. They also compared the acquisition activity of IPO firms to a benchmark group of private firms. IPO firms were involved in 141 acquisitions while the benchmark group acquired only 96 times. Another way around there was not a significant difference. IPO firms were targets in 18 cases versus 17 cases in the benchmark group. Research of Brau and Fawcett (2016) suggests that IPOs increase the probability of both cash acquisitions and stock deals. According to their survey chief financial officers (CFOs) of their sample group valued the ability to create public shares for use in future acquisitions to be one of the most important reasons to conduct an IPO.

2.5 IPO process

Going public is a long process for the company, and it is recommended to start preparation already a couple of years before the actual listing. The process starts with planning. It is recommended to evaluate the strategic option and perform a health check to be sure that IPO is the right strategy for the company. Public companies are subject to increased transparency, compliance, filing requirements, scrutiny by investors and analysts, and overall accountability for delivering on promises. The firm needs to start to build capital market infrastructures to achieve IPO readiness and meet these requirements. (EY 2018.)

2.5.1 Pre-IPO transformation phase

After the decision to go public, it is the time to move to an actual preparation phase which typically starts by fine-tuning the business plan and IPO fact book. The business plan should provide a clear road map for the company and cover the period of two to three years before and after the IPO. IPO fact book is often a joint effort from management and advisors, and it consists a single collection of financial and non-financial data needed for important documents such as prospectuses, marketing materials and responses to information requests from lawyers, investment bankers and the auditors carrying out due diligence. (EY 2018.)

IPO preparation cannot be done alone. Listings typically involve an external team of bankers, lawyers, auditors, investor relations and other advisors. Auditors help the company to fulfill regulators' requirements for an independent audit of historical financial statements, provide all financial information in the prospectus required, and issue the required comfort letter. Banks advisors and issuers counsel help to prepare, file and complete listing application and prospectus. They also help to ensure that everything is checked and verified so that the company is not exposed to claims after the IPO. (EY 2018.)

One of the most critical decisions in the IPO preparation phase is to choose the underwriter which is usually an investment banker. If the issue is going to be large, it may be necessary to form an underwriter syndicate which is a temporary group of investment banks sharing the risk of IPO together. The syndicate is led by the lead underwriter. The role of an underwriter in IPOs is to help the company to prepare to listing, structure the offer by helping to determine the size and price of the issue, manage the IPO marketing campaign including the IPO roadshow, conduct IPO due diligence process, and help to ensure a stable and robust market for shares post-IPO. (EY 2018.)

The research of Brau and Fawcett (2006) suggests that the CFOs select lead underwriters based on overall reputation, quality of research department and industry expertise. They

compared their results to Krigman, Shaw, and Womack (2001) to find that CFOs' criteria have remained unchanged before and after the dot-com bubble. Carter and Manaster (1990) found that using well-reputed underwriters can reduce the risk of an issue and result in lower underpricing because investors are more confident investing in issue associated with the well-reputed underwriter. According to Dunbar (2000), the fair pricing of IPOs influences the market share of the underwriter. This increases the probability of well-reputed underwriters to price issues more accurately and decrease underpricing. Accordingly, there is a correlation between the underwriter's reputation and the degree of underpricing. The issuer does not only benefit from more accurate pricing when using well-reputed underwriter, but highly reputed underwriters also attract long term investors who help to decrease the volatility after trading starts (Carter & Dark 1993). In addition, institutional investors are more likely to participate in future IPOs, if they have built a relationship with a lead underwriter by past IPO participation (Binay, Gatchev & Pirinsky 2007).

2.5.2 IPO transaction phase

Typically, one to six months before the listing starts IPO transaction phase. The goal of this step is to maximize the confidence and credibility of investors to ensure that the issue will be successful. At this point at the latest, the company must shift from national accounting standard to IFRS and prepare consolidated financial statements for offering prospectus. In most of the countries, two or three years of annual financial statements are required. Marketing is a critical part of the IPO transaction phase to ensure a successful listing. One of the most important marketing activities is a roadshow. During IPO roadshow company's management and underwriter travel around the country to meet prospective investors, analysts and fund managers in order to get publicity and attract investments. Roadshow might be the only time a company's senior management communicates directly with potential investors. Institutional investors typically rely on the information presented at roadshow meetings instead of visiting the company. (EY 2018.)

One of the most important tasks of IPO transaction phase is setting the correct price for the stock. It can be very difficult, but crusial to make the IPO successful. There are various pricing methods such as fixed price or an auction, but the most common method is bookbuilding. The bookbuilding method is a systematic process by which an underwriter brings flexibility to the pricing by using investors to help to determine the valuation. Typically, the process starts with an appointment between the issuer and the lead underwriter who proposes the size of the issue and a price band for the shares to be sold. If the issuer agrees with the proposition, the prospectus will be prepared with the price range suggested by the underwriter. After publishing the prospectus, the underwriter can start to build an electronic book based on confidential bids by investors. Underwriter records the desired prices and quantities to the book. Based on the demand, underwriter and issuer

determine the final offer price which is also known as the cut off price. Shares are then allocated to the prospective investors based on the bids collected in an earlier stage.

In case of excess demand, underwriters can decide to whom to allocate shares. Benveniste and Wilhelm (1997) and Sherman and Titman (2002) suggest that underwriter discretion can be used to the benefit of issuing firms. Underwriters can allocate shares to those who are likely to be buy-and-hold investors so that the underwriter can minimize any costs associated with price support after the IPO. Because of that bookbuilding method has been criticized for inducing the allocation bias by the underwriter which can lead to an inefficient price discovery process. Underwriter discretion can eliminate the winner's curse if underwriters only allocate shares in hot issues to those investors who are willing to buy other listings as well. Based on the research of Ritter and Welch (2002), the problems caused by asymmetric information could be nearly eliminated, if underwriters used their discretion to bundle IPOs. However, the degree of information asymmetry cannot be utterly controllable trough issue mechanism, because the interaction of macroeconomic and firm-specific characteristics play a significant role in it (Supriya & Phani 2016). The resulting average level of underpricing should not be more than several percents if issuers desire to maximize their proceeds and underwriters act in the best interest of issuers. (Loughran & Ritter 2004.)

In the fixed price mechanism, the price and number of shares offered are fixed before the IPO is announced, and unlike in bookbuilding method, the information of investors is not used to determine the price. Generally, fixed price IPOs are considered riskier than bookbuilding IPOs, because the demand for the stock is not known in advance. (Geddes et al. 2003, 69.) The underpricing in fixed price IPOs are typically used to reduce the risk of under subscription. The method is suitable for relatively less developed markets where investors do not have the capability to evaluate the available information as well as investors in more efficient markets. However, the fixed price mechanism suffers from asymmetric information issue in the price discovery process. That is why bookbuilding method was built in the '90s. (Supriya & Phani 2016.)

The study by Krigman, Shaw, Wayne & Womack (1999) indicates that underwriters misprice IPOs intentionally because there is no direct penalty for doing it. Typically underwriting fees are linked to the successful listing. Therefore, underwriters tend to use underpricing to maximize the probability of a successful issue. The underwriter might also have a price stabilization agreement with the issuer which commits underwriter to buy stocks from the aftermarket in case the stock is traded below the IPO price. To avoid stabilization acts, underwriters may use a higher degree of underpricing in the pricing process.

Ljunqvist, Jenkinson and Wilhelm (2003) researched 2,051 public companies from 61 countries. According to their study, fixed price IPOs are two times cheaper to examine than bookbuilding IPOs, and bookbuilding method does not lead to lower underpricing on its own. However, they found that bookbuilding can reduce underpricing significantly when used in combination with U.S. banks and U.S. investors. They predicted that the smaller underpricing can be explained by the long bookbuilding experience of U.S. banks who might have access to key institutional investors, and may be in an excellent position to reward investors dynamically for their information revelation. They suggest that sectors with high degrees of information asymmetry, like biotech and information technology, are more likely to benefit from the information revelation often associated with bookbuilding. Underpricing occurs in both methods, but not for the same reasons. Benveniste and Spindt (1989) argue that underwriters tend to reward investors for revealing their information of issuer company by increasing the degree of underpricing and giving investors larger allocation of shares with high-demand. On the contrary, Rock (1986) suggest that in fixed price IPOs underpricing is used to compensate for the winner's curse.

The least common IPO method in most markets is an auction method. It is still occasionally used in some markets such as France, Belgium, Chile, Japan, and Portugal. In the auction mechanism, the issuer specifies a minimum price and allows investors to submit bids for the number of shares they are willing to claim at the minimum price or higher. Depending on the auction method, investors may be able to place only one bid at one price or place multiple bids at different prices. According to bids, the final offering price is determined, and all investors are charged the same price, even if they were willing to pay more. (Geddes et al. 2003, 66.)

The study of Jagannathan and Sherman (2006) suggests that the auction method is not very successful for pricing IPOs, because it results in higher volatility in aftermarket trading until the stock finds its fair value. This can attract short-term investors who want to benefit from underpricing and flip their stocks on the first day of trading. They also found that in the auction method there is high uncertainty for the issuer since it is difficult to estimate the number of participants and bids beforehand. The risk of under/oversubscription decreases the probability of successful listing. Auction method IPOs face greater volatility, a higher degree of underpricing and decreased the probability to attract long term investors. They have also faced a higher degree of winner's curse which led to the abandonment of the auction method by most markets. (Supriya & Phani 2016.)

The issuer can benefit from auction method by lower commissions and maximizing the number of shares sold. Although the auction method had not been prevalent in the USA, Google decided to go public with a Dutch auction method in 2004 raising astronomical

$1.9 billion. Google set the price range at $108-135 per share but ended up selling the stocks for only $85 per share. However, the stock traded slightly above $100 at the end of first market day accounting 18% abnormal return for the stock. In Google's case, the auction method failed to achieve its purpose of setting an IPO price as close as real market price as possible. (Ritter 2014.)

2.5.3 Post-IPO phase

Ringing the bell for the first trade is a big moment for any company. They still should not be blinded by the euphoria of this moment, because that is when the real work begins. Until the listing, the company has had the help of multiple advisors, but once they are public, things are getting more complicated. Newly listed companies face the high expectations of investors, and they must comply with new capital market regulations. If the company wants to have the journey to long-term success, it should have an aftermarket plan which includes proactive measures to establish share price stabilization and active trading support, to target an optimal investor mix and active trading support. (EY 2018.)

If the pricing of the IPO has been successful, the market should not price the stock below the issuing price. Lead underwriter and issuer might have agreed with the prize stabilizing commitment, which commits the underwriter to buy stocks from the aftermarket for a specific period in case the stock price is about to fall below the IPO price. Price stabilization is a form of market manipulation, but it is widely legal. Investors should be informed about prize stabilization agreement in the listing prospectus. (Hanley, Kumar & Seguin 1992.)

2.5.4 Going public in Finland

The process to go public is relatively similar regardless of country, but there are some country-specific differences. In Finland, companies can choose to get listed on First North list which is suitable for younger and smaller companies or to the main list. The main requirements of getting listed in Finland are discussed below, and differences between First North and main list are introduced.

The public marketplace does not only bring benefits to the company but also increase requirements. The actual process to get listed typically takes from six months to one year, but it is necessary that the company has started the preparation already before that. One of the biggest changes for many companies is the requirement to start to follow International Financial Reporting Standard (IFRS). The transition from Finnish Accounting Standards (FAS) to IFRS can be very time-consuming and expensive. In order to increase liquidity and ensure reliable price formation, the stock exchange requires the company to be a public corporation, and at least 25% of its shares must be out in public. If necessary,

the company can be required to have a market maker to ensure reliable price formation. (Pörssisäätiö 2016.)

As soon as the company leaves an application for listing, it must start to follow disclosure and insider obligations. Usually, this requires early preparation in management and reporting. Public companies must have resources to publish reliable, precise and timely information. Often hiring new employees is required to meet these requirements. Companies who wish to get public must also meet the requirement to have a market capitalization of at least one million euros. This requirement is understandable because the process to get listed is not cheap at all. In last years the costs of Finnish IPOs have varied from about one million euros to a few million. Most significant expense is typically the fee for underwriter which depends on the size and type of the IPO. Other significant expenses are a registration fee to the stock exchange and expenses on preparing the EU prospectus. (Pörssisäätiö 2016.)

NASDAQ OMX First North was introduced in 2005 in Denmark to facilitate access to the market for smaller Nordic companies who want benefits of being public, but do not have resources to go to the main list yet. In 2007 First North expanded to Helsinki, but only one company Eirikuva Digital Image listed on it. It took five years until the next company Siili Solutions got listed on First North. Since 2014, listing on First North has finally become very active, and in recent years there has been more listing activity compared to the main list. Currently, 29 companies are listed on First North Helsinki.

First North is an excellent first step for companies who wish to enter the main list, but are not ready to take that big step yet. First North companies are not required to elaborate EU prospectus, but less extensive company description is sufficient as long as the size of an offering is less than 5 million euros. Also, IFRS reporting is not required, but the company can continue using FAS reporting instead. However, it can be worth consideration to start to prepare to change to IFRS standard, if the ultimate goal is to get into the main list. All First North companies are required to have a nominated advisor whose role is to ensure that the company complies with the requirements and obligations of the First North Finland marketplace. There are no market capitalization requirements, and only 10% of shares need to be out in public before applying to the First North. (Pörssisäätiö 2014.)

2.6 Initial public offering underpricing

IPO underpricing is very widely studied subject since the 1960s and researchers offer numerous different explanations for abnormal returns connected to initial public offerings.

Theories can be divided into asymmetric information theories, institutional theories, ownership and control theories, and behavioristic theories. The most influential theories of each category are introduced below.

Many IPO underpricing explanations are based on asymmetric information theory. This theory suggests that information has not spread evenly to everyone and one party has superior information over other parties which is used to gain an advantage. Possible parties in the IPO process are investors, IPO issuer, lead underwriter, and possible other underwriters. (Copeland, Weston & Shastri 2005, 391-394.) All underpricing theories based on asymmetric information share the prediction that underpricing is correlated with the degree of asymmetric information. In these models underpricing disappears entirely when the asymmetric information uncertainty approaches zero. (Ritter & Welch 2002.)

Winner's curse is one of the most popular asymmetric information theories introduced by Rock (1986). It is assumed that there are two kinds of investors in the market, informed and uninformed. Informed investors have perfect knowledge of the value of the new issue, and they can use that information to subscribe only underpriced issues while uninformed investors invest in all issues. This leads to the situation that uninformed investors get all shares they subscribed only if the issue was not oversubscribed by the demand of informed investors. In the end, uninformed investors typically fully get unwanted issues with lower return, and only partly get issues with proper underpricing. Because of this, the average first-day return can be negative for uninformed investors, which results in their absence in new issues.

To attract also uninformed investors, the initial price has to be low enough. Otherwise only informed investors would bid for the new issue, and their demand would not be enough to cover the whole issue in most of the cases. Underwriters must adjust to this issue and set the price systematically lower to sell to risk-averse investors who want compensation for the risk in order to buy stocks with uncertainty. (Keiding 2016.)

Baron (1982) assumes that underwriters have superior information against the issuer about the market demand. It is also assumed that underwriters use this advantage by inducing the degree of underpricing to minimize their distribution efforts and to satisfy their customers who are then more likely to participate in future issues of an underwriter as well. The issuer is forced to accept the lower price, because of being in information disadvantage. (Supriya & Phani 2016.) Muscarella and Vetsuypens (1989) empirically tested the model of Baron (1982) by studying 38 IPOs by investment bankers who had acted as issuer and underwriter at the same time. Agency-related problems should be entirely elim-

inated in this kind of situations where information asymmetry between underwriter and issuer cannot exist. According to the study investment bankers had underpriced their own issue as much as other issues. It can be assumed that investment bankers would not underprice their own issues without a specific reason. Therefore, the study does not support the theory that underpricing is caused by asymmetric information between underwriter and issuer.

Other theory related to information asymmetry is a signalling theory. Signaling theory assumes that issuer would like to “leave good taste” in mouths of investors to increase the probability of having successful equity offerings in the future. Welch (1989) argues that high-quality firms use underpricing to signal their firm quality to investors. The degree of underpricing varies according to firm quality. In order to attract investors, low-quality firms must use higher underpricing to imitate high-quality firms. Therefore, according to signaling theory, the firm quality is correlated with the degree of underpricing.

According to theory the cost of underpricing will be redeemed in the future offerings. Due to increased regulation and disclosure obligations of public companies, all relevant information must be revealed to investors. This is an issue for low-quality firms, who might lose the advantage gained from imitating high-quality firms as soon as investors find out the real value of the firm and lose the interest in participating in future equity offerings. The risk of revealing the real quality to investors refrain low-quality firms to use signaling.

2.6.1 Institutional theories

Companies are operating under different laws and regulations which provides a framework for institutional theories. These theories are not universal, but they can exist in some specific markets. Lawsuit avoidance, for example, is expected to affect underpricing in the USA where firms face a higher risk of getting sued, while in Finland the risk is significantly lower and lawsuit avoidance is not believed to explain underpricing there. Price stabilizing is common method to support the IPO firm in the aftermarket. Although it can be considered as one form of price manipulation, it is still legal in most markets including the Finnish stock market.

In the USA public companies are exposed to very tough disclosure obligations which increases the legal risk if IPO prospectus is missing information that is relevant to investors. Tinic (1988) and Hughes and Thakor (1992) suggest that lawsuit avoidance is one of the most important reasons for IPO underpricing. As private companies are not obligated to exposure their information to the public, investors must rely on the information given by the issuer and the underwriter. Both the underwriter and the company are held liable for

this information as commanded by law. If the information is found to be misleading or untruthful, there is a risk of being sued by investors. According to lawsuit avoidance theory, IPOs are intentionally underpriced in order to decrease the risk of possible lawsuits, which could be very time-consuming, expensive and harmful for the image of the issuer and the underwriter. (Hughes & Thakor 1992.)

Nevertheless, Ritter (1998) suggest that the lawsuit avoidance hypothesis is not credible, because the degree of underpricing is similar in countries like Finland where such lawsuit actions are unknown. Drake and Vetsuypens (1993) studied 93 companies in the United States to find out that prosecuted companies are just as much underpriced as a comparable sample of companies that were not sued.

Price stabilizing is believed to affect the degree of underpricing. Ruud (1993) discuss that IPOs are not consciously underpriced, but they are priced according to expected market value. IPOs, where the price is likely to fall below the issuing price, are supported by stabilization acts which keep the price artificially at the level of issuing price. These stabilization acts eliminate the left side of normally distributed returns which highlights positive first day returns since negative returns barely exist. Due to this, first issues tend to seem to be systematically underpriced. Smith (1986) suggest that such a mechanism creates the bond between an issuer and investors because investors can expect that the issue is not appropriately overpriced if the issuer is committed to stabilizing the price in after-market. (Ruud 1993.)

2.6.2 Ownership and control

Booth and Chua (1996) researched the correlation between an after-market liquidity and the IPO underpricing. According to their theory, the broad ownership base already in the listing phase increases the liquidity of the stock in after-market which is typically wanted by investors. Issuers tend to increase the demand for listing by underpricing their issues to attract as many new investors as possible. (Booth & Chua 1996.) Based on the research of Brennan and Franks (1997) wide ownership base benefits mostly an issuer instead of investors. Companies are likely to allocate the shares in a way that not a single investor gets a significant part of the ownership of the company. If the ownership is spread out, the company maintains more power in its own hands. By underpricing, the issuer can increase the probability to get oversubscribed which creates the opportunity for the issuer to allocate the shares in a way that they wish. (Brennan & Franks 1997.)

Unlike Brennan and Franks (1997), Stoughton and Zecner (1998) argue that it is beneficial for the issuer to allocate a large number of shares to one single investor who has the ability to monitor the acts of the management of issuing company. Monitoring is not only

beneficial for the issuer, but also minority owners. Firm management is expected to increase the shareholder value when there is someone with significant ownership monitoring the acts of management. According to the theory of Stoughton and Zecner (1998) companies tend to underprice IPOs in order to attract a single significant investor who has the power to monitor the issuer. Ownership dispersion theories seem to be contradictory. Thus it is difficult to argue that IPO underpricing could be explained by ownership dispersion.

2.6.3 Behavioristic theories

Under behavioristic theories, the cascade effect and hot issue market phenomenon is introduced. Cascade effect assumes that investors tend to follow the decisions of each other, so it is crucial to attract investors with high reputation early on to ensure successful listing. Hot issue market phenomenon suggests that IPOs are cyclical and during hot issue period more firms go public, and firms need to use higher underpricing to attract investors.

Cascade effect mainly applies to institutional investors who have significant investment capital. Welch (1992) argues that investors make their investment decisions based on the decisions of other investors. In the IPO process, this means that the underwriter offers the issue to investors one by one, and investors get the information of decisions of other investors. This can lead to the situation that investors who were originally going to participate might hesitate if the issue has not attracted enough interest among others. In the situations described above, investors do not give enough room to their own views, but they act according to the decisions of other investors. (Welch 1992.)

The cascade effect gives the power to early investors to request higher underpricing so that they would participate in the IPO and attract other investors to join as well. Participation of well-known investors can start a snowball effect and listing can get oversubscribed even if it is not significantly underpriced. On the other hand, even high-quality listings with substantial underpricing can disappoint, if they do not manage to attract important early investors, and other investors keep their rejection as a sign of a low-quality issue. The cascade effect does not have an influence in the bookbuilding process, because underwriter can refrain from publishing the demand of the issue.

According to the hot issue market phenomenon, the returns of the following month of IPO are higher during the hot market period while during the cold market it is the opposite. The definition of a hot issue market considers the period when the number of new issues is higher than usual, and the degree of an average underpricing is higher. The study of Ibbotson and Jaffe (1975) suggests that the series of first month’s residuals do not follow a

random walk and investors could exploit this information to participate in IPOs during hot markets when new issue returns are expected to be higher. Since the hot issue phenomenon is cyclical and predictable, the issuer could obtain a higher offering price by issuing during the cold issue markets. (Ibbotson & Jaffe 1975.) Ritter (1984) found that hot issue markets feature larger proportions of smaller IPOs which are concentrated in specific sectors. In a more recent study, Ritter (1991) suggests that hot issue markets are characterized by overoptimistic investors, which attracts riskier firms to take advantage of the opportunity.

3 Research methods

This chapter starts by introducing how the research is designed and what kind of data is collected. Multiple regression analysis is introduced in the data analysis part, and selected independent variables and research hypotheses are introduced and discussed at the end of the chapter.

3.1 Research design

Quantitative method is the most suitable method for the project which includes a large amount of numerical data that can be transformed into statistics. Choosing the quantitative research method was obvious to be able to answer the research question of this thesis. Research is designed to test hypotheses formed based on the earlier theories and ultimately support or reject them.

IPO underpricing is typically considered to be the abnormal return of a security. In this study, the degree of underpricing is calculated as the percentage change between the IPO offering price and the first market day closing price. Abnormal initial return is defined as the difference between the first market day return and the return on the market index, which in this case is OMX Helsinki Cap index. Stock market development affects the desire of firms going public, so typically we see more IPOs when the market is growing. In order to eliminate the positive effect of market growth in first day returns, initial returns must be adjusted, so that only company-specific factors affect the level of underpricing.

Using the stock index to adjust initial returns might not give fully reliable results, because the daily variance of individual companies can distort the returns. To minimize the risk, Cap index, where the maximum weight of an individual firm is limited to 10%, is chosen. Nevertheless, usage of the CAP index does not entirely eliminate the issue but reduces it so that the research results can be kept reliable. The market-adjusted method is the most common method used in various researches including Ritter (1991), Keloharju (1993), Alvarez and Gonzales (2005) and Hahl et al. (2014).
Market-adjusted first-day return can be calculated with the following formula:

$$RM_{i1} = (P_{i1} - P_{i0}) - (I_1 - I_0)$$

Where: RM_{i1} = The return of the stock adjusted by market return
P_{i0} = IPO price of stock i
P_{i1} = First market day closing price of stock i
I_0 = Market index score, moment 0
I_1 = Market index score, moment 1

3.2 Data collection

The data of this research consist of 50 IPOs issued in the Finnish stock market between 2012 and 2018. Listings that did not include public offering are excluded in this study. Such exclusions include directed share issues, spin-offs, mergers, reverse mergers, parallel listings and companies that changed list. All 50 IPOs issued during the sample period are included in this research since the market adjusted first day returns of all firms are normally distributed.

The data are collected from a variety of sources. The list of IPO companies, the issue dates, offering prices and sizes are received from Nasdaq Helsinki, and missing data is filled from the press releases of the firms and web page of Kauppalehti which is also used to collect industries and ages of IPO firms. IPO methods are collected from listing prospectuses. Historical stock prices for IPO firms and the Finnish OMXHCAP index returns are collected from NASDAQ OMX.

One of the goals of this research is to find the possible difference between the underpricing of the main list and First North companies. Thus, the sample period is limited to 2012 when Siili Solutions was the first company to go public on First North Helsinki by issuing a "real" IPO. Eirikuva went public on First North already in 2007, but they used a directed share issue method which is excluded from this research. During the sample period 18 companies listed on the main list and 32 listed on First North. Mirroring to history, the current period of high listing activity could be considered as hot issue market in Finland.

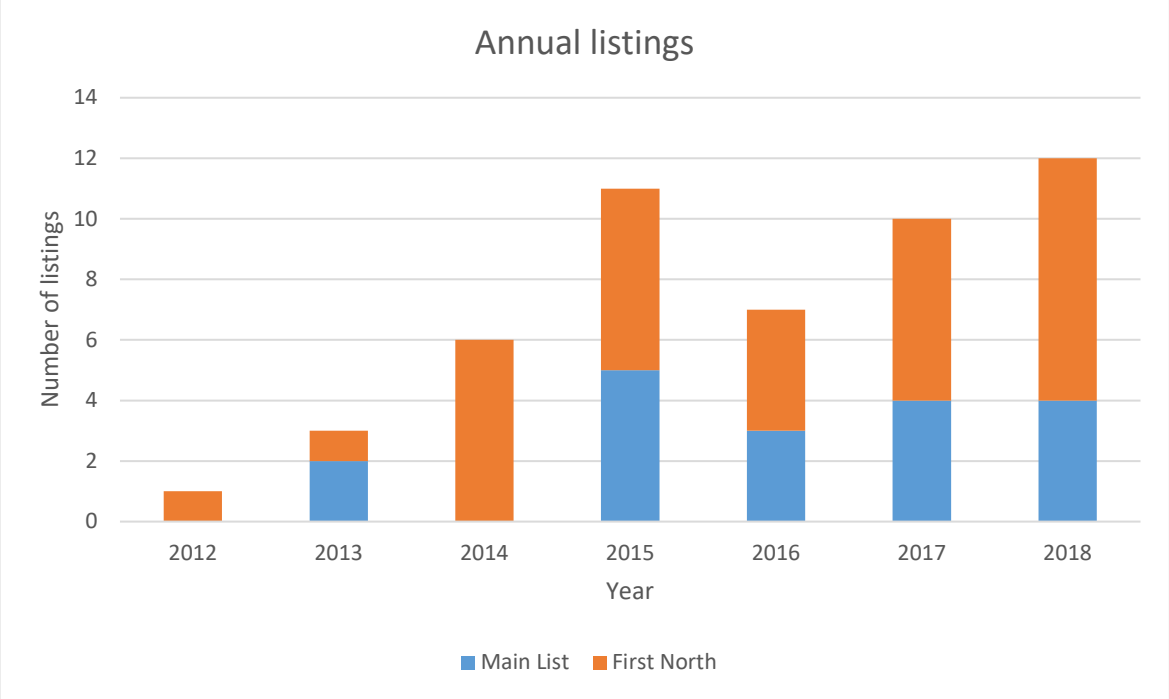

Figure 2. Number of annual listings

Variation of the sizes of IPOs was significant, and proceeds of IPOs varied from 1.5 million euros listing of Siili Solutions to 762 million euros listing of Terveystalo. In average the size of First North listing was 14 million euros while it was 172 million euros on the main list. Altogether 50 companies raised 3.5 billion euros. Table 1. indicates the number of IPOs and raised capitals in euros.

Table 1. IPO sizes and the number of IPOs

IPO size	Number of IPOs
Under 10 million €	15
10 - 25 million €	13
25 - 100 million €	14
Over 100 million €	8

3.3 Data analysis

Regression analysis is used to analyze the sample of this research. Regression analysis is a statistical tool which is used to predict the value of a given outcome variable from another one. The outcome variable can be called a dependent variable while the predictor variable is an independent variable. The basic idea of regression analysis is that a straight line can summarise the association between dependent and independent variables. To define the line, regression uses a mathematical method called the least squares method. Basically, it means that there will be less or more values which either lie above or below the line. The vertical measurement from each point to the line indicates how well the line fits. The distances from each point are called residuals, and the criteria used to determine the best line is minimizing the total size of the squared residuals. (Lee & Lings 2008.)

A regression line can be summarized by the following equation:

$$Y_i = (b_0 + b_1 X_i + e_i)$$

Where: Y_i = The predicted value of the dependent variable for subject *i*

b_0 =The intercept of the line

b_1 = The gradient of the line

X_i = The value of in the dependent variable for subject *i*

e_i = The difference between the predicted value of *Y* for subject *i* and the actual value of *Y* that subject *i* scored

The goal of this study is to understand how different factors affect IPO underpricing. Using simple regression would be problematic because it would not take into account each independent variable at the same time, which would lead to very misleading results. Because of this, an extension of simple linear regression is used. Multiple regression analysis allows using multiple independent variables at the same time. Independent variables should be carefully chosen to avoid overfitting and multicollinearity. Overfitting is caused by adding too many independent variables which account for more variance but add nothing to the model. Multicollinearity is caused by independent variables which are correlated with each other. High multicollinearity makes it hard to separate the influence of each individual variable on the outcome variable. Any variables should not have a higher correlation than 0.8. (Lee & Lings 2008.)

Multiple regression can be summarized by the following equation:

$$Y_i = (b_0 + b_1 X_i + b_2 X_2 + \cdots b_n X_n) + e_i$$

Where: Y_i = The predicted value of the dependent variable for subject *i*

b_0 = The intercept of the line

$b_1 =$ The coefficient of the first independent variable X_1

$b_2 =$ The coefficient of the second independent variable X_2

$b_n =$ The coefficient of the *n*th independent variable X_n

X_i = The value of inthe dependent variable for subject *i*

e_i = The difference between the predicted value of *Y* for subject *i* and the actual value of *Y* that subject *i* scored

Regression analysis follows certain assumptions. The expected value of the errors is zero. If this assumption is violated, the model does not include a necessary systematic component, which has an effect on the error terms and makes it more difficult to estimate the intercept. Errors must be normally distributed. Otherwise, hypothesis test and confidence and prediction intervals can be misleading. The variance of the errors must be constant. This assumption of constant variance is called homoscedasticity. Nonconstant variance is known as heteroscedasticity which means that the least squares estimates are not as efficient as they could be in estimating the correct parameters. Heteroscedasticity of regression model results in poorly calibrated confidence and prediction intervals. (Chatterjee & Simonoff 2013, 8-9.)

3.1 Independent variables of regression analysis

In the regression model of this research both, categorical and quantitative variables are used. Quantitative variables represent a measurable quantity while categorical variables are based on qualitative data. Since categorical variables are used as independent variables, they need to be coded as dichotomous dummy-variables (Taanila, 2010). Initially, IPO underwriters were designed to be used as dummy variables, but the variety of different underwriters was too wide to be able to use any of them in the regression model. The market capitalization of the firm was dropped off as well because it had a too high a correlation with the IPO size. All independent variables used in this study are introduced below.

Firm age

Firm age as a factor influencing the degree of IPO underpricing has been studied by various researchers. According to Ritter (1984) and (1991) the age of the firm and IPO underpricing have a negative correlation. Older companies have more financial information publicly available, which can be used to determine the real value of the firm. This decreases information asymmetry which is believed to be one of the reasons for IPO underpricing. Younger companies carry higher uncertainty of their future perspectives which reflects higher underpricing.

The age of the firm is calculated by subtracting the establishment year from the offering year. The average age of sample firms is 21.0 years, and the median age is 16.0 years. As expected, firms going public on First North were younger with 19.2 years average against 24.2 years on the main list. Youngest companies to go public were only 3-years-old at the time of IPO while the oldest one, Piippo was 73-years-old. In this study, firms are divided into two categories according to their age. Group of young companies consists 0 to 15-years-old firms before listing. Remaining companies are considered as old companies.

According to earlier studies, the following hypothesis is proposed:
H1: The firm age has a negative influence on the degree of underpricing of IPOs in Helsinki stock exchange. The hypothesis is tested with the dummy variable.

Chosen IPO marketplace

There are no prior studies on how the choice of IPO marketplace affects the degree of underpricing in Finland, but typically larger companies tend to go directly to the main list, and smaller ones begin from the First North and possibly move to the main list later. During the sample period, an average market capitalization of the First North company straight after the IPO has been approximately 48 million euros while the main list companies have

been nearly ten times bigger with a market capitalization of 445 million euros.

Larger companies tend to have more information publicly available for investors who should be able to have a better understanding of the real value of issuing company. Smaller risks associate with larger firms because they are well monitored, have better access to investment capital, have more diversified product lines and have better access to resources crucial for firm profitability and survival (Finkle, 1998). Several studies including Ibbotson, Sindelar & Ritter (1994) and Carter, Dark & Singh (1998) suggest that there is a negative correlation between firm size and short-run underpricing.

On the other hand, First North companies are less-known, and they can suffer from cascade effect if they do not succeed in attracting enough early investors. Other investors can keep the rejection of early investors as a sign of a low-quality issue, which can lead to under subscription. Under subscribed issues can be seen as they are overpriced in the eyes of investors which affects the first market day price. Therefore, it is difficult to form any hypothesis for this variable. Dummy-variable is used to test if the main list issue affects the degree of underpricing.

Size of the offering

The size of the IPO is measured by the total gross proceeds raised from the investors. Larger IPOs are typically offered by larger and more well-known firms which are associated with lower risks. Thus, the required level of underpricing is not as high as it is for smaller listings. Multiple studies including Clarkson and Merkley (1994) reported a negative correlation between the size of the offering and underpricing.

Prior studies suggest the following hypothesis:
H2: The size of the offering has a negative influence on the degree of underpricing of IPOs in Helsinki stock exchange. The hypothesis is tested with the quantitative variable.

IPO method

In Finnish IPOs, only the bookbuilding method and fixed price method were used during a study period. According to asymmetric information theories underpricing is correlated with the degree of asymmetric information and it disappears entirely when the asymmetric information uncertainty approaches zero. With the bookbuilding method, asymmetric information can be reduced, which should be seen as smaller underpricing. It is argued if the bookbuilding method can actually reduce the level of underpricing. The study of Ljungqvist et al. (2003) suggests that the bookbuilding method alone does not reduce underpricing, but when combined with U.S. banks and U.S. investors, the reduction is significant.

The following hypothesis is formed based on earlier studies:
H3: Using a bookbuilding method has a negative influence on the degree of underpricing of IPOs in Helsinki stock exchange. The hypothesis is tested with the dummy variable.

Industry

The industry can affect the degree of underpricing. Various studies have reported abnormal returns for tech and internet-related companies. Loughran and Ritter (2004) examined over 6,000 companies and found that the underpricing on tech companies was extremely high during The dot-com bubble. While non-technology companies were reported to have an average underpricing of 23.1%, tech companies had as high as 80.6% underpricing. The difference has been significant before and after the bubble as well. The effect can be explained with the information asymmetry. Certain industries are likely to have a higher degree of information asymmetry. This leads to higher underpricing.

Due to the low number of technology IPOs in Helsinki stock exchange during the sample period, it is not possible to test if tech companies have higher underpricing. However, the sample includes enough IPOs by financials and industrials firms to test if these industries affect the degree of underpricing. Both industries are added to the model as dummy-variables.

Based on earlier studies, the following hypothesis is proposed:
H4: The industry of the company has an influence on the degree of underpricing of IPOs in Helsinki stock exchange.

4 Empiric results

In this chapter, empiric results are introduced. The study aims to determine how selected factors affect the degree of underpricing of IPOs by using the multiple regression model where the dependent variable is market-adjusted first-day return. Graphs and Plots used in this chapter are generated by statistical software SPSS.

4.1.1 Normality test

Regression analysis assumes that errors are normally distributed. If the errors distribution significantly differs from normal, confidence intervals may be too wide or too narrow (Nau, 2018). Normality test is required in order to make sure that the dependent variable values follow a normal distribution. Violations of normality are typically caused either because the linearity assumption of the regression model is violated, or the distributions of the variables are themselves significantly non-normal (Nau 2018).

In this study, Shapiro-Wilk (S-W) test is used to determine the normal distribution. Kolmogorov-Smirnov test is one of the most popular normality tests, but it is recommended to be used if the sample size is larger than 50, while S-W is suitable for 50 and less. Since the sample of this study is exactly 50, S-W test was chosen. The null hypothesis of S-W test is that the samples are normally distributed. If the p-value is less than the chosen significance level, then the null hypothesis is rejected which indicates that the samples tested are not normally distributed. In this study, the chosen significance level is commonly used 0.05, so the p-value (Sig.) of 0.117 seen in table 2. indicates that the data is normally distributed, and no entries need to be removed.

Table 2. Test of normality of the dependent variable; market-adjusted first-day return

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
MktAdjReturn	.112	50	.158	.963	50	.117

a. Lilliefors Significance Correction

Normal distribution assumption can also be checked with graphical tools such as a quantile-quantile plot (Q-Q plot) of the residuals or histogram. These tools only provide visual assessment, so the results are somewhat subjective. Since the points on the Q-Q plot (Figure 3.) fall close to the diagonal reference line, the distribution is normal. Small devia-

tions in the Q-Q plot do not seriously compromise the reliability of the study. Also, a histogram (Figure 4.) suggests that the errors are normally distributed so an actual regression model can be formed next.

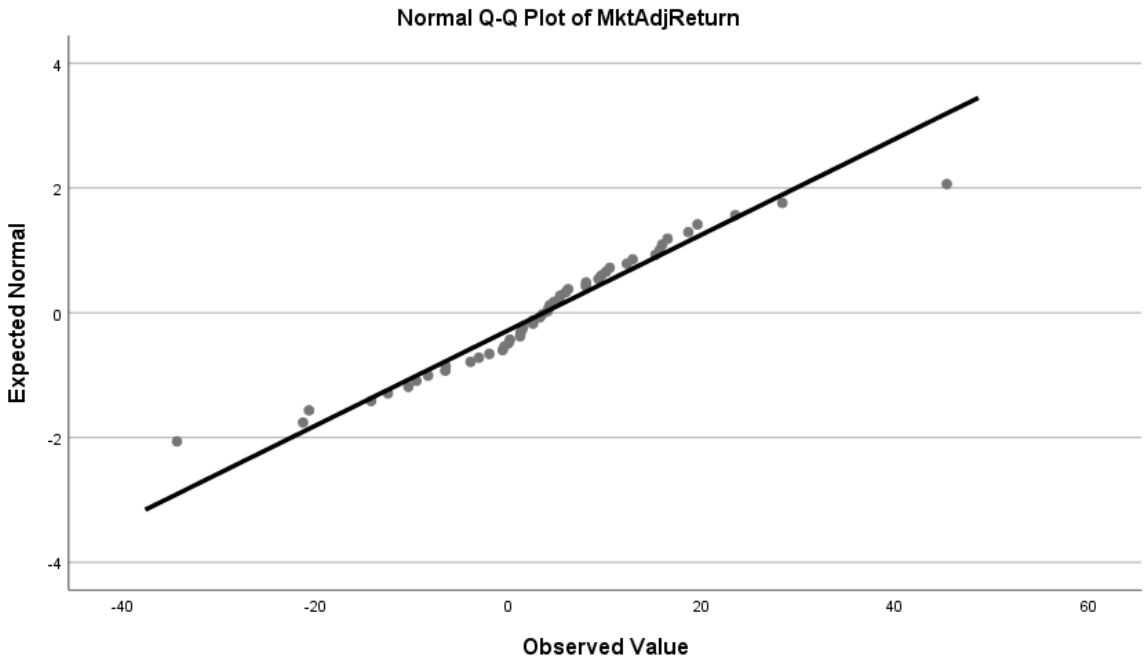

Figure 3. Quantile-quantile plot of the distribution of market-adjusted first-day returns

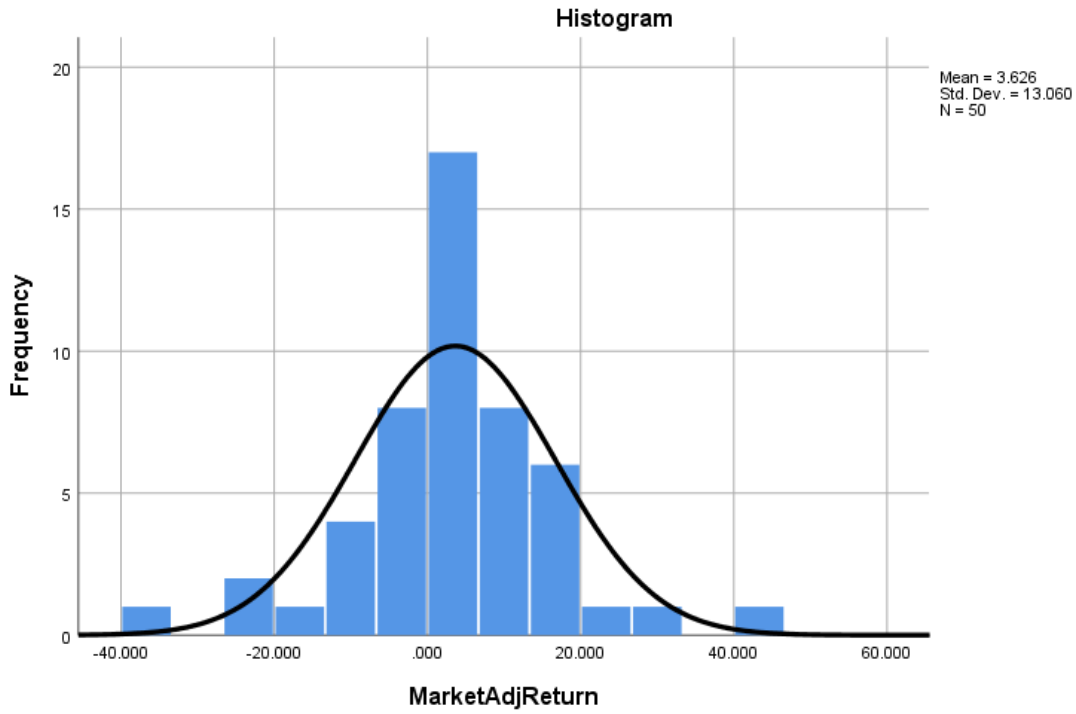

Figure 4. Histogram of the distribution of market-adjusted first-day returns

4.1.2 Regression model

In order to be able to the research question and research hypotheses introduced in chapter 3.1, multiple regression analysis was formed. To goal is to find how the selected factor affect the market-adjusted first-day return with the following regression equation:

$$\text{MktAdjReturn} = b_0 + b_1 Age + b_2 Marketplace + b_3 Size + b_4 Method + b_5 Financials + b_6 Industrials + e_i$$

Table 3. represents the results of the regression model. The first number to be considered is the coefficient of determination (R square) which is relatively low in this model. The value 0.105 indicates that the chosen variables of the model could explain 10.5% of first market day returns. Generally, in multi regression model, it is better to look at adjusted R-square because it is unbiased estimator that corrects for the sample size and numbers of coefficients estimated (Nau 2018). The reasonably big difference between R-square and adjusted R-square indicates that the model is too complex for the chosen sample size and/or the independent variables do not have a high predictive value (Nau 2018).

Table 3. Summary of the regression model

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.325[a]	.105	-.019	13.187082

a. Predictors: (Constant), Industrials, Method, Age, Size, Financials, Marketplace

b. Dependent Variable: MktAdjReturn

The statistical significance is measured by the f-value (F) and p-value (Sig.) in the analysis of variance ANOVA which is presented in table 4. In this model, the f-value is 0.844 and p-value 0.543 which indicate that the model is not statistically significant. An absolute value of F-value should be more than 2, and p-value less than 0.05 to make the model significant (Nau 2018).

Table 4. Summary of the ANOVA test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	880.470	6	146.745	.844	.543[b]
	Residual	7477.663	43	173.899		

	Total	8358.133	49			

a. Dependent Variable: MktAdjReturn

b. Predictors: (Constant), Industrials, Method, Age, Size, Financials, Marketplace

Inspection of coefficients in table 5 reveals that with the chosen sample, most of the variables used in the model do not explain the IPO underpricing. P-values (Sig.) of independent variables indicate that only the age is near 0.05 so it could be considered to be kept significant. The age of the firm correlates negatively with the first market day returns, so it indicates that the older companies have a lower degree of underpricing in their IPOs. Some other variables such as size and marketplace seem to have a substantial effect on the degree of underpricing, but they lack with the significance so that they cannot be used to explain the abnormal first market day returns. Using larger sample size could increase the significance of these variables.

Table 5. Regression model coefficients and p-values

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	5.571	3.854		1.446	.156
	Age	-6.913	3.845	-.265	-1.798	.079
	Marketplace	3.828	5.559	.142	.689	.495
	Size	-8.850	.000	-.099	-.577	.567
	Method	1.347	4.867	.051	.277	.783
	Financials	2.682	4.769	.089	.562	.577
	Industrials	-.023	4.800	-.001	-.005	.996

a. Dependent Variable: MktAdjReturn

4.1.3 Homoscedasticity of the regression model

Regression model assumes that the variance of the errors is constant across all values of the independent variables. This assumption of constant variance is called homoscedasticity. When the size of error terms differs across values of independent variables, the violation of homoscedasticity appears. It is called the heteroscedasticity. Heteroscedasticity may have the effect of giving too much weight to a small subset of the data when estimating coefficients (Nau 2018). Violation of homoscedasticity might not have an effect to the p-values of the regression model, but it affects the statistical significance of the model (Laininen 2000, 124).

Assumption of homoscedasticity can be tested with a scatter plot. Figure 5. indicates that the values of the independent variables of this study violate homoscedasticity. The most likely reason is the usage of many categorical variables instead of quantitative variables. However, this does not compromise the reliability of the study but only indicates that the regression model used in this study is not statistically significant. Regardless of heteroscedasticity, the p-values of the model are still usable.

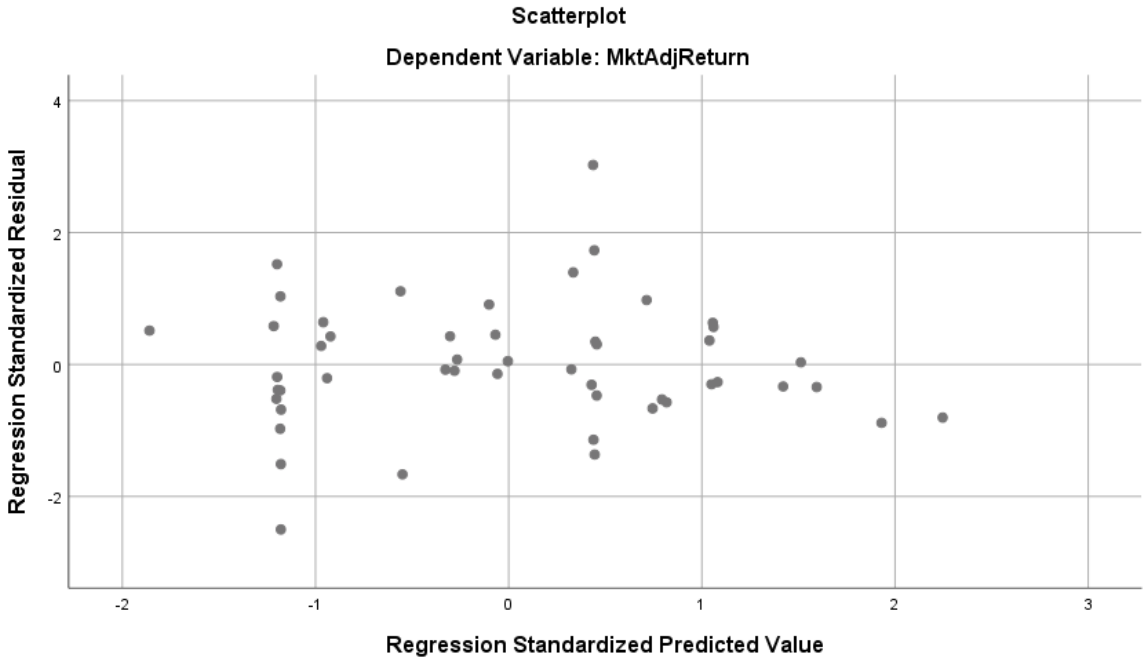

Figure 5. Scatterplot of the errors of the regression model

4.1.4 Multicollinearity of the regression model

Multicollinearity can be evaluated by using the correlation matrix. It is normal that independent variables correlate with each other as long as the correlation is not too high. Otherwise, the situation is called multicollinearity. Table 6. represents the correlations of variables used in the regression model of this study. The highest correlation is 0.578 between IPO method and the IPO marketplace. The correlation is significant, but not too high to cause multicollinearity. Initially, the model included the market capitalization of the firm as an independent variable, but the correlation between it and IPO size was over 0.9 which would have caused multicollinearity, so the market cap was removed from the model.

Table 6. Correlation matrix of variables.

Correlations

		MktAdjReturn	Age	Marketplace	Size	Method	Financials	Industrials
MktAdjReturn	Pearson Correlation	1	-.272	.105	-.027	.070	.133	-.073
	Sig. (2-tailed)		.056	.467	.853	.627	.356	.613
	N	50	50	50	50	50	50	50
Age	Pearson Correlation	-.272	1	.077	.068	.066	-.162	.121
	Sig. (2-tailed)	.056		.594	.638	.650	.260	.404
	N	50	50	50	50	50	50	50
Marketplace	Pearson Correlation	.105	.077	1	.527**	.578**	.066	-.226
	Sig. (2-tailed)	.467	.594		.000	.000	.647	.114
	N	50	50	50	50	50	50	50
Size	Pearson Correlation	-.027	.068	.527**	1	.304*	-.008	-.190
	Sig. (2-tailed)	.853	.638	.000		.032	.956	.186
	N	50	50	50	50	50	50	50
Method	Pearson Correlation	.070	.066	.578**	.304*	1	-.172	.019
	Sig. (2-tailed)	.627	.650	.000	.032		.232	.895
	N	50	50	50	50	50	50	50
Financials	Pearson Correlation	.133	-.162	.066	-.008	-.172	1	-.316*
	Sig. (2-tailed)	.356	.260	.647	.956	.232		.025
	N	50	50	50	50	50	50	50
Industrials	Pearson Correlation	-.073	.121	-.226	-.190	.019	-.316*	1
	Sig. (2-tailed)	.613	.404	.114	.186	.895	.025	
	N	50	50	50	50	50	50	50

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

4.2 Summary of the results

The study reveals that the average market-adjusted first-day return in Helsinki stock exchange has been 3.63% which is a lot lower than it has historically been. Investors could have achieved better returns if they managed to sell their stock immediately for the opening price of the first market may instead of waiting until the end of the day. In this case, the return would have been 7.74%. Healthcare stocks seemed to be the most overpriced with an average 4.86% negative returns while technology firms had the biggest underpricing of 6.82%. However, these results cannot be kept reliable, because of very low sample sizes and also other factors affecting the degree of underpricing at the same time. Table 7. summarizes the degree of average market-adjusted first-day returns year by year. Also, the average degree of underpricing is compared between the main list and First North companies.

Table 7. Average market-adjusted first-day returns year by year

Year	Main List	First North	Total
2018	2,18%	-3,77%	-2,59%
2017	4,26%	13,16%	9,60%
2016	5,30%	7,68%	6,66%
2015	9,62%	0,15%	2,48%
2014		-0,09%	-0,09%
2013	4,06%	15,64%	7,92%
2012		9,60%	9,60%

When it comes to the regression model itself, the chosen variables of the model could not explain the first market day returns very well, so all hypotheses excluding the one must be rejected. Only the hypothesis of the negative influence of the age of the firm to IPO under-pricing could be considered to be significant with a little reservation.

5 Discussion

Initial public offering underpricing has been stimulating discussions for decades, and the reasons behind the phenomenon have attracted interest among many researchers. Early evidence of IPO underpricing was initially found by Reilly and Hatfield (1969), and since then it has been researched by various researchers using the data from numerous different markets including Finnish stock markets. In Finland IPO underpricing has been examined by Keloharju (1993), Westerholm (2006) and Hahl, Vähämaa & Äijö (2014), but all of them were using the data sample before the financial crisis. The capital markets have changed their shape after the crisis, so it opened the window for this research to examine the current post-crisis situation of IPO underpricing phenomenon.

5.1 Key results

The IPO underpricing was particularly high during the dot-com bubble, and Hahl, Vähämaa & Äijö (2014) and Westerholm (2006) covered this period in both of the studies. Partially due to the effect of the dot-com bubble, the reported average abnormal returns on the first market day were very high. In this study, 50 IPOs issued in the Finnish stock market between 2012 and 2018 were examined. The selected sample period covers the time after the financial crisis. This study confirms that IPOs are still underpriced, but the degree of underpricing has reduced significantly. Compared to the average underpricing of 21.9% between 1991 and 2002 and 15.6% between 1994 and 2006 the underpricing of 3.63% found in this study is remarkably low (Westerholm 2006; Hahl et al. 2014). The specific reason for such low underpricing in recent years is still unknown.

The goal of this study was not only to find if IPOs are still underpriced in Finland but also to find what explains the underpricing in the Finnish stock market. Based on a literature review, four hypotheses were formed and tested in multiple regression analysis. Only one hypothesis could be accepted with a little reservation. Other hypotheses lacked with the significance level.

H1: The firm age has a negative influence on the degree of underpricing of IPOs in Helsinki stock exchange was the only hypothesis which was not rejected. With the p-value slightly higher than 0.05 it could be considered to be statistically significant with a little reservation. If the hypothesis were accepted, it would indicate that the IPOs of older companies have smaller degree of underpricing. This would support earlier studies such as Ritter (1984) and (1991) which claim that older companies have more financial information publicly available, which can be used to determine the real value of the firm.

H2: The size of the offering has a negative influence on the degree of underpricing of IPOs in Helsinki stock exchange was supported by coefficients but had to be rejected due to the low significance level. The hypothesis is widely supported in earlier studies, but the effect of the IPO size has either decreased recently or alternatively the sample size used in this study was not sufficient to support this hypothesis.

H3: Using a bookbuilding method has a negative influence on the degree of the underpricing of IPOs in Helsinki stock exchange was rejected. The chosen IPO method seemed to have a very marginal effect on IPO underpricing, and the significance level of this variable was very low. It seems that in Finland firms cannot gain any advantage by using the bookbuilding method when it comes to an attempt to lower the degree of underpricing.

H4: The industry of the company has an influence on the degree of underpricing of IPOs in Helsinki stock exchange was not supported by two dummy variables used in the model. Financial and industrial companies did not have a significantly different degree of underpricing compared to other firms. Healthcare companies were systematically more overpriced than companies of other industries, but healthcare firms could not be used as an independent variable in the regression model due to too low sample size.

The effect of chosen IPO marketplace was also tested. Coefficients indicate that the degree of underpricing has been higher for main list issues compared to the First North listings, but the significance level is too low to accept the result. It seems that the result does not have conformity with the theories that larger and older firms tend to have a lower degree of underpricing. One of the possible explanations for this could be the effect of the hot issue market when there are more low-quality firms seeking funding from overoptimistic investors. These companies are more likely to choose First North marketplace instead of the main list.

In overall, it can be said that the IPO underpricing in Finnish stock market has been lower than it has been internationally, and selected factors cannot explain the degree of underpricing, but there are always multiple factors affecting it. One of the possible explanations for the lower degree of underpricing could be the lack of information asymmetry in Finland. Business is well regulated in Finland, and essential information is easily available for investors. It might also be possible that the long-lasting economic growth and low-interest rates have increased the interest in initial public offerings which have historically offered notable returns with moderately low risk. Investors might have gotten overly optimistic which could be exploited by the firms by decreasing the IPO underpricing. Neither is it impossible that investors have become more aware of abnormal returns of IPOs which have caused the IPO market to become more efficient.

According to Ritter (2019), the degree of underpricing for the similar sample period was 16.7% in the USA which indicates that the reason for a low degree of underpricing in Finland is more likely structural than driven by the economy or investor behavior. When comparing the degree of underpricing in the USA and Finland, we also have to remember that the lawsuit avoidance is believed to be one of the most significant factors influencing the IPO underpricing in the USA In Finland lawsuit avoidance is nearly absent, due to different law system. Also, American IPO firms are significantly younger than firms becoming public in Finland. Younger firms tend to have less information available for the public, and they are seen riskier. Thus, the higher degree of underpricing is required from the investors.

Gaining benefit from the IPO underpricing in the current market situation is difficult in Finland because investors also need to consider the fees charged by the stock broker and capital taxes paid from the returns. Winner's curse cannot be forgotten either. If an investor blindly participates all listings, there is a significant risk that he only partially gets requested shares from the best IPOs which are typically oversubscribed and fully gets the worst ones. This can lead to negative returns. Thus, investors should always analyze IPO firms carefully before making the decision to invest.

5.2 Recommendations

One of the most interesting aspects for further research would be to study the reasons for such a big difference between the degree of underpricing in Finland and the USA. Historically the difference has not been as big as it seems to be after the financial crisis. It would also be interesting to make a comparison of underpricing in other Nordic countries. During the same sample, there have been over seven times more IPOs in Stockholm. It would be interesting to test the regression model of this research with the data sample of Stockholm IPOs to see if chosen factors could explain the underpricing of Swedish IPOs. Also, the sample of Swedish IPOs would be sufficient to include the underwriter's reputation as one of the independent variables.

5.3 Reliability and validity

The sample size for this study is moderately small which created problems for statistical significance. Some findings could not be kept reliable due to too small sample size. Initial public offerings have not been particularly common in Finland which creates challenges for such studies. The sample of 50 is still large enough to be able to make conclusions based on the research.

The data was collected from a variety of sources. The data received directly from Nasdaq Helsinki, and historical stock prices and index returns collected from NASDAQ OMX could

be considered reliable. The data collected from listing prospectuses and press releases of IPO firms could be considered reliable as well, because of high regulation on disclosure obligation in Finland. Remaining data was collected from Kauppalehti and verified from other sources in order to make sure that the data is reliable. The biggest risk for the reliability of the study is personal mistakes in transferring information from the sources to the Excel and SPSS.

5.4 Reflection on learning

The thesis process has been very interesting, but also challenging mainly because I did not have any prior experience of doing research nor any academic background. I was not familiar with any research methods nor regression analysis. I have nearly ten years of experience from stock markets, so I was familiar with the subject and prior theories on IPO underpricing which facilitated the planning and the process itself. Since the beginning, I had the clear vision of the required steps, but the biggest challenge occurred with the data collection which I had underestimated in the planning phase. Prior studies have mainly gathered the data from private databases of universities or paid databases such as Bloomberg Terminal or Reuter Datastream which are not available for Haaga-Helia students. I thought that Pörssisäätiö or Nasdaq Helsinki would have the required data available, but unfortunately, Nasdaq Helsinki had only collected some of the data of most recent years, and older data was not available at all. Hereby, most of the data had to be hand picked from other sources. In overall, thesis process taught me research skills and deepened my understanding of the listing process of firms.

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Attachments

Attachment 1. The list of initial public offerings used in the study and market-adjusted first-day returns

Company	Date	Underpricing
Altia	23/03/2018	3,49%
Harvia	22/03/2018	1,50%
Rovio	29/09/2017	0,00%
Kamux	12/05/2017	5,26%
Tokmanni Group	29/04/2016	1,18%
Kotipizza Group	03/07/2015	4,27%
Restamax	28/11/2013	7,98%
Oma Säästöpankki	30/11/2018	2,54%
Kojamo	15/06/2018	1,21%
Evli Pankki	02/12/2015	23,45%
Asiakastieto	27/03/2015	4,03%
Asuntorahasto Orava	14/10/2013	0,14%
Terveystalo	11/10/2017	2,52%
Silmäasema	09/06/2017	9,28%
Pihlajalinna	04/06/2015	10,46%
Lehto Group	28/04/2016	15,19%
Consti Yhtiöt	11/12/2015	5,87%
DNA	30/11/2016	-0,46%
Remedy Entertainment	29/05/2017	18,60%
Next Games	23/03/2017	19,54%
Rush Factory	16/11/2018	-0,64%
Verkkokauppa.com	24/04/2014	3,22%
Fellow Finance	10/10/2018	4,13%
Titanium	09/10/2017	12,83%
Privanet	15/06/2016	-20,67%
Suomen Hoivatilat	31/03/2016	16,45%
Elite Varainhoito	30/11/2015	4,69%
United Bankers	24/11/2014	15,90%
Taaleritehdas	24/04/2013	15,64%
BBS-Bioactive Bone Substitutes	28/02/2018	-21,29%
Fit Biotech	01/07/2015	-34,35%
Nexstim	14/11/2014	-2,00%
Herantis Pharma	11/06/2014	1,39%
Nordic ID	30/11/2018	-14,24%
Viafin Service	20/11/2018	-3,95%
VMP	19/06/2018	5,33%
Enersense International	24/04/2018	-9,56%
Fondia	04/04/2017	28,33%
Talenom	11/06/2015	-8,35%
Robit	21/05/2015	8,01%
Detection Technology	16/03/2015	-3,08%
Piippo	10/03/2015	12,24%
Cleantech Invest	12/06/2014	-12,49%
Admicom	09/02/2018	10,09%
Efecte	08/12/2017	-6,52%
Gofore	16/11/2017	6,15%
Heeros	10/11/2016	-10,39%
Vincit	17/10/2016	45,36%
Nixu	05/12/2014	-6,57%
Siili Solutions	15/10/2012	9,60%