MASTER THESIS
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# AGGREGATED OWNERSHIP

## THE EFFECT OF OWNERSHIP ON FIRST DAY POST-IPO PERFORMANCE

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# II. ABSTRACT

During an initial public offering – or IPO – a company presents shares to the public for the first time. For most companies, it one of the most important decisions made so far, and will bring many consequences. The ownership structure will change since the public can now become partially owner of the company. This research tries to find a new way to predict the performance on the first day of trading by using the pre-IPO owners.

Previous mainstream literature uses only the most important shareholders, most often the controlling shareholders, to predict this performance. A recent study used the term aggregated ownership to include all types and sizes of ownership. This study adopts this point of view by trying to predict the first day performance by using all the pre-IPO owners instead of the controlling owners. The Dutch equity market is used to test the aggregated ownership.

The sample consists of 67 cases of companies going IPO in the period between 1995 and 2015. In total 337 IPO cases were available but after filtering for IPOs which did not go live, were also listed elsewhere, have a re-admission, are investment or financial entities, are state owned or for the lack of information, a total of 67 cases remained available for this research.

The regression showed – in general – alignment with the hypotheses. The main issue is the lack of significance which make the results unusable for drawing actual, factual, conclusions. The various models found evidence for a higher first day return when founders are involved, but no ∪-shaped relation could be found. The involvement of non-founder EO and other insiders regarding first day return appeared to be mixed in line with literature. Despite this, results are opposite of the expected, showing a slight negative impact on the return. The same can be said for other outsiders, who show a negative impact on first day performance, as predicted. The VC ownership on the other hand does have a positive effect on the first day performance, in line with its hypothesis. Unfortunately, no interaction effect could be found and as such, no evidence could be found for aggregated ownership. The aggregated ownership has no significant effect on the first day performance in the Dutch equity market. Further research might focus on different countries or a more refined way of testing for the possible effects of aggregated ownership.

# TABLE OF CONTENTS

# 1. INTRODUCTION

Over 156 billion dollar was acquired via initial public offering in 2015. This is an incredible amount of money, despite the fact that it has declined with 35 percent relative to 2014.[1] A global average return of 33,2 percent reveals significant amounts of money can be earned, or lost. Because of this, much research has been done with regard to initial public offerings and how their potential value can be predicted or returns can be explained. In spite of a negative 2016 forecast in total investment of venture capital for startups, they spend over 128 billion dollar globally in 2015, a jump of 44 percent from 2014.[2] There are several ways for young companies to acquire capital and most of the time they are repaid in shares of the company, often accompanied by a voice in the everyday management and decision making. When a company is ready to go public, more than one type of shareholder can have a vote and thus different interests at that point can arise. This research will look at the impact of several 'owners' and their relation to initial public offering performance.

## 1.1 BACKGROUND

The image drawn will need some more clarification as to what exactly is that is going to be researched. Therefore, more information regarding the initial public offering will be given and it will be explained how ownership can influence this. Once this is clear the main research question will be derived from this, followed by the thesis outline.

### INITIAL PUBLIC OFFERING

[1] JD Supra: Review of the 2015 Global IPO Market

[2] Forbes: Everything You Need To Know About A Possible Slowdown In Venture Capital Investing

# Chapter 1: Introduction

Initial public offering, or IPO, is one of the first and probably the most important strategic action by a public firm (Sur & Martens, 2013; Zheng & Li, 2008). An IPO is "the first public equity issue that is made by a company" (Hillier, Ross, Westerfield, Jaffe & Jordan, 2013, p. 529). The IPO changes many characteristics of a firm, its ownership structure being one of the most important (Alavi, Pham, & Pham, 2008) as ownership is transferred via shares available to public. Alavi et al. (2008) state that an IPO results in an increased dispersion of shareholdings and ownership concentration will most likely decline for many years after. In essence, an IPO is a means to gain equity through making ownership publically available.

Having such a big impact on the company going IPO and the amount of money that can be gained or lost on the equity market, the IPO phenomenal is a broadly researched topic and researchers try to find new insights to better predict IPOs. The valuation of an IPO is probably one of the most researched topics of IPO. Many different factors together can explain a portion of the valuation. For example, the study of Engelen and Van Essen (2010) that looks at the cross-country differences and finds that "country-specific characteristics explain about 10% of the variation in the level of underpricing" (p. 1967). A study of Bertoni, Meoli, and Vismara (2014) finds a ∪-shaped relation of board independence with age as an effect on the firm value whereas younger firms have a higher value with high board independence. They also find a moderating effect for separation between ownership and control for mature companies. However, Alavi et al. (2008) state that until very recent, pre-IPO ownership has been ignored by literature.

## OWNERSHIP

Ownership has a bidirectional relationship with IPO. This implies that ownership influences the IPO but the IPO also influences the ownership. This is best elaborated with several examples. For example, research about managerial ownership and its post-IPO survivability (Yang & Sheu, 2006) shows a U-shaped relation between total insider managerial ownership and survivability. On the other hand, Mikkelson, Partch and Shah (1997) find no relation between change in ownership as a result of the IPO and the firms' operating performance. Despite these findings, ownership structure influences the IPO valuation process itself (Meoli, Paleari, & Vismara, 2009; Yeh, Shu, & Guo, 2008; as mentioned by Bertoni et al., 2014). In line with this point of view, Alavi et al. (2008) find evidence for the pre-IPO ownership structure influence

on different incentives by the different owners to retain ownership after the IPO. It is clear that ownership influences IPOs in various ways, and the other way around.

Ownership is also used in predicting the underpricing or overvaluation of IPO. Wang and Wan (2013) find support of the influence of different types – e.g. private, corporate, bank-affiliated and so on – of venture capitalists (VC) on the amount of underpricing. This suggests that stock market investor's view that different types of VC convey different information. Furthermore, the presence of a VC or a business angel influences short-term IPO performance favouring business angels over VC regarding the mitigating effect on underpricing according to Bruton, Chahine and Filatotchev (2009). Existing research often compares the influence of types of ownerships with another type or looks at the total impact of one type of ownership. For example, Wang and Wan (2013) try to explain the variance in underpricing by comparing various types of, and to what extend a company is owned by, VC's. They are able to explain a good proportion with a $R^2$ of 39,5%. An interesting finding is that private VC ownership increases IPO underpricing whereas corporate VC ownership decreases the amount of underpricing. However, Wang and Wang (2013) do not take into account other types of ownership. Besides including an "Other VC types" dummy, the presence of, for example, founder ownership plays no role in this research. In another way, Barry, Muscarella, Peavy, and Vetsypens' (1990) leading research regarding the role of VC in the creation of public companies first find that VC play an important role in underpricing but further conclude that the larger the proportion of VC is invested in the company, the more the underpricing is reduced. Again, as the title of the article suspects, no other types of ownership are included to try and find an aggregated effect in ownership. They also make no distinction in different types of VC like Wang and Wan (2013).

## AGGREGATED OWNERSHIP

Aforementioned studies indicate an effect between shareholders and underpricing. The lack of studies to look at the combined effect of various pre-IPO owners of the company is striking however. Alavi et al. (2008) show that key managerial decisions in the IPO process may very well be caused by various different incentives as a result of different pre-IPO ownership structures. Sur and Martens' (2013) findings conclude strong support for a direct effect of aggregated ownership on IPO performance. They argue that not only

controlling (or largest) holdings have influence but – instead – all pre-IPO shareholders have an impact. As a result, they introduce the term 'aggregated ownership'. Aggregate ownership is "the combined effect of all of the different ownership types within a firm, their respective shareholdings, as well as their interaction among them" (Sur & Martens, 2013, p. 265), implying that ownership is not homogeneous.

Current practice is to assume ownership has a homogeneous impact on IPO performance (Sur & Martens, 2013) and this new insight might result into different findings in future research. The method should be remodeled in such a way to include aggregated ownership, affecting outcomes. Aggregated ownership is a clear break from existing research and literature, containing a different point of view. This research embraces the aggregated ownerships' point of view and uses it to look at the first day performance of companies that went IPO, trying to find further evidence for aggregated ownership. The potential relation between different types of ownerships as well as their respective quotient and the performance will be assessed. Different ownership structures will be assessed and its relation to underpricing and overvaluation, or price premium, will be investigated.

## 1.2 MAIN RESEARCH QUESTION FORMULATION

Research has shown that IPO is in fact a well-covered topic in literature. A lot of different factors have been investigated resulting in interest conclusions. Recent research however has shed some new light upon the pre-IPO ownership. Where previously it was assumed that ownership is homogeneous, Sur and Martens (2013) have proven that, in fact, this is not the case. Furthermore, other research like Wang and Wan (2013), Barry et al. (1990), and Bruton et al. (2009) only try to explain one type of ownership or try to compare difference in impact of ownership types, instead of incorporating all owners of the company. Additionally, Alavi et al. (2008) has shown that pre-IPO ownerships structures, and the variation in it, influences management decisions in the IPO process. Therefore, this research will try to explain a portion of the first day IPO performance by adopting aggregated ownership and looking at all owners within a company and their influence regarding first day IPO performance.

This resulted in the following research question:

*"What is the effect of pre-IPO aggregated ownership on the companies' first-day IPO performance"*

## 1.3 RELEVANCE

As aforementioned, a lot of research has been done about the influence of ownership structure on IPO valuation and still new insights are gained on a regular bases. This research contributes to the literature in several ways. First, this study aims to use the most recent data available whereas many existing studies use data from the past millennia and the early years of the past decade (Sanders & Boivie, 2004; Hill, 2006; Yeh et al., 2008; Meoli et al., 2009; Elston & Yang 2010; Chen, Wang, Li, Sun & Tong, 2015). Second, many studies focus on the United States market or the Asian market and in particular the Chinese market, excluding companies from Europe. Here, we will use the Dutch market for data regarding IPO's. Finally, this study incorporates the tested assumption of Sur and Martens (2013) that ownership is not homogeneous, wherefore the term aggregated ownership is adopted, which, as mentioned before, shows a direct effect on IPO performance. To the knowledge of the writer, aggregated ownership has never been tested in relation to the short term, post-IPO, first day return performance of an IPO. In practice, companies and their employees are under constant pressure to perform. Explaining what effect pre-IPO ownership has on IPO performance, and in particular aggregated ownership, might give them an edge in predicting future IPO performances. Furthermore, many founders struggle in their search for optimal ownership structure versus getting sufficient capital to fund their company. This research might guide them in finding the equilibrium on road to their 'first' initial public offering and first day performance.

## 1.4 THESIS OUTLINE

The rest of this thesis will consist of several parts. First, a critical view on existing literature will be formed. Second, the method of executing this analysis will be determined. Based on theory and existing research the best method will be selected. The method include what data is going to be used, why and how it will be acquired. Third, the descriptive results and regression findings are going to be presented. This research will end by given the final conclusions and potential recommendations for further research.

# 2. LITERATURE REVIEW

This part will consist of a critical look at literature covering aspects of IPO and first day performance. First, the IPO process will be explained. Second, a closer look at the initial public offering and first day performance is required to get a better understanding of the main research question. Third, theories regarding the cause of underpricing are discussed. Fourth, there are a lot of types of owners. Based on literature the most important of them will be reviewed and, because there are several ways to categorize them, this critical look at literature will reveal what type of category is best to use for the purpose of this research. Finally, after discussing the types of owners, the hypotheses are formed.

## 2.1 INITIAL PUBLIC OFFERING PROCESS

The IPO process is more or less the same for every company. In the Dutch market, a prospectus is delivered to the AFM. The AFM approves prospectuses and guards the quality of these forms. But before a prospectus is delivered to the AFM, an underwriter is hired to value the company and the IPO. The prospectus is not required in the case of an IPO value of under €2.5 million according to the Dutch Law.[3] When it exceeds this value, the shares available for IPO need to be priced. According Roosenboom (2012) this process starts with setting a preliminary offer price. After the price is set, underwriters start investing the investor demand by doing an auction or a roadshow. Basically, there are three types of offerings used in the Dutch market. These are auction, bookbuilding and fixed-price. An auction lets interested investors bid on the shares, determining the final price based on demand. Bookbuilding measures demand from institutional investors by means of a pre-determined price range and a roadshow. A fixed-price is a price which is set by underwriters and investors can declare their interest in buying shares. The feedback gained from auction and bookbuilding are used to "adjust the preliminary offer price upward to arrive at the final offer price" (Roosenboom, p.1654, 2012). Meanwhile, the prospectus needs to be approved by the AFM, which can take up to 20 working days. Should is not be approved, a revised version can be submitted, taking up to 10 working days to be processed. When all has been successfully finalized, the

[3] Autoriteit Financiële Markten: https://www.afm.nl/nl-nl/professionals/doelgroepen/effectenuitgevende-ondernemingen/aanbieding-notering-effecten/prospectusplicht

shares have been allocated to the investor subscribers for the right price, the offering is submitted and listing in the stock exchange can be completed.

This process has a big impact on the potential underpricing. For example, Roosenboom (2012) states that "in order to induce investors to truthfully reveal their private demand schedules the underwriter only partially adjusts the offer price, thus underpricing the shares to reward investors for revealing favorable private information" (p.1654). Furthermore, underwriters have repeat business in the IPO market. As a result, they have to maintain relationships with investors which gives them extra incentive to reward them, but also that the offer price reflects past and future payoffs (Roosenboom, 2012).

## 2.2 INITIAL PUBLIC OFFERING PERFORMANCE

When the listing in the stock exchange is finalized, the shares become public for the first time. Generally, during the first day of trading, public interest is high for these new shares. Looking at the increase or decrease of share value as being IPO performance, IPO performance can be divided in long-term and short-term performance. Long-term performance is based on the firms' performance since its going public. Short-term performance on the other hand, is based on the expected performance. The share-price moves based on the popularity of the shares and the expected performance of the company. Hence, first-day return, or short-term performance, can be calculated after day one. This research will focus on the short-term performance. Literature focusses on the underpricing of IPOs but overvaluation can occur as well. A positive first-day return can therefore be seen as underpricing and a negative return would be the result of – albeit on purpose – overvaluation or overpricing. In the academic literature there is a general consensus on underpricing IPOs and how it should be calculated. Filatotchev and Bishop (2002) describe IPO underpricing as "the difference between a stock's offering price and the closing price on the first day the stock is offered for trading, is the norm and represents a direct transfer of wealth from the original owners to outside investors." This point of view is supported by Engelen and Van Essen (2010) who add that in some cases it is merely a premium paid to investors, protecting them from adverse outcomes. To further clarify performance it is stated that a higher return and therefore more underpricing is noted as a positive performance in this research. In spite of the general consensus, there are always other methods to determine performance (Purnanandam & Swaminathan, 2004 as cited in Snippert, 2015). For example, Chahine and Goergen (2011) state that IPO premium, or "the ratio of the difference between the offer price and the book value per share over

the offer price" (p. 414), is another measure of IPO performance. However, the main research question shows a clear connection with the publically accepted view. Now that we have defined underpricing as the difference between offering price and closing price at the end of day one, the first day IPO performance of our main research question is clarified.

## 2.3 UNDERPRICING

There are several theories – such as winner's curse, ex-ante uncertainty, agency cost, signaling theory, and underwriter reputation as a result from information asymmetries and adverse selection – leading in explaining underpricing. Though none of the theories can explain – or predict for that matter – underpricing fully, they can explain part of it. These theories will hereafter be explained.

### WINNER'S CURSE

The winner's curse is a model created by Rock (1986) which assumes that asymmetric information is the main cause of underpricing. Because some investors have more information regarding an IPO than others, they know which IPOs are worth subscribing and which to ignore. Assuming they interpret this information in a just way, they are better able to determine which are most profitable. Investors who do not possess the same information subscribe to both profitable and unprofitable offerings. The result is an oversubscription to the profitable offering and – assuming all things equal – leads to a balanced emission. On the other hand, unprofitable offerings are not oversubscribed and therefore more shares go to the uninformed investor. In the total portfolio an informed investor should have mostly profitable shares and the uninformed investor mostly the less profitable or overpriced shares. Research by Ritter and Welch (2002) confirms this as they come to a likewise conclusion. However, the uninformed investor will realize its mistake and will stop investing should this happen on a continuous base. This would result is less publically available equity and, unfortunately, the informed investors cannot meet all equity demands. To meet these demands, the issuer needs to attract uninformed investors according to Rock (1986). The only way to do so is to make shares attractive by underpricing, thus creating return for uninformed investors. Because of

unattractive IPOs, attractive – well performing – offerings need to create return via underpricing and are therefore literally leaving money in the basket. Hence the name winner's curse. This theory has been tested in empirical studies such as Koh and Walter (1989), Keloharju (1993), Michaely and Shaw (1994), Ljungqvist and Wilhelm (2003), and Su (2004). Without a doubt this model is a good explanation to underpricing. It is well backed by empirical studies and it seems like a natural phenomena and yet, some additions can be made, as the ex-ante uncertainty theory will explain.

## EX-ANTE UNCERTAINTY THEORY

Beatty and Ritter (1986, as cited by Khan, Anuar, Ramakrishnan, Malik, & Khan, 2016; Engelen & Van Essen, 2010) extend the winner's curse model. They show an increase of underpricing is the result of increased ex ante uncertainty. This theory has found widespread empirical support including different variables such as firm characteristics and prospectus information. For example, Engelen and Van Essen (2010) conclude that more or less 10% of the variation in the level of underpricing is explained by country-specific characteristics. In line with the ex-ante uncertainty theory by Beatty and Ritter (1986), Engelen and Van Essen find less underpricing in countries with strong legal protection as this provides more certainty for investors. This addition to the original model by Rock (1986) seem logical. Uncertainty, possibly or even likely due to information asymmetry, would definitely cause investors to be more restrained when they have doubt about the returns. In order to attract investors – in spite of this lack of information – would require some underpricing.

## AGENCY THEORY

In 1976, Jensen and Meckling have developed a model to agency cost. They have defined the agency costs as the sum of three types of costs. These are "(1) the monitoring expenditures by the principal, (2) the bonding expenditures by the agent, and (3) the residual loss" (Jensen and Meckling, 1976, p. 308). According to Ang, Cole and Lin (2000) the above mentioned costs arise because the firm owners' interests do not align with its managers. This misalignment can be caused by decisions made out of self-interest, on-the-job perks and shirking which eventually lead to reduced shareholder wealth (Ang et al., 2000). They

continue by stating that these costs can be reduced by monitoring at the hand of owners of third parties. Ang et al. (2000 find evidence for lowering agency costs through the monitoring of banks. Furthermore, Roosenboom and van der Goot (2005) state that before an IPO, managers are used to do thing their own way and they keep acting this way after an IPO. Because of this, an agency conflict can arise between managers and outside investors. According to Jensen and Meckling (1976), outside investors know that there might be misaligned interests and their include the cost of this in the price they are willing to pay for the given company. Monitoring is the best way to keep the cost of agency conflict in control (Jensen and Meckling, 1976; Ang et al., 2000; Roosenboom and van der Goot, 2005). Roosenboom and van der Goot find evidence for reduced agency cost as a result of "increased management ownership, independent supervisory directors, and monitoring by large nonmanagement shareholders" (p. 57). This in turn can increase the IPO value of a given firm. However, retaining a controlling position in the company by management compared to outsider shareholder increases the agency costs which negatively influences the IPO firm value (Roosenboom and van der Goot, 2005).

## SIGNALING THEORY

A different theory is the signaling model, which is not without its controversy. Here it is theorized that underpricing is a deliberate act of insiders such as owner-managers to signal the companies' true value to potential investors. One motivation according to the model is to "achieve better prices in subsequent seasoned equity offerings" (Allen & Faulhaber (1989), Grinblatt & Hwang (1989), and Welch (1989); as cited in Su, 2014, p. 2)

The signaling theory is not undisputed as US data only shows a weak link between this theory and quicker and or larger seasoned equity offerings according to Jegadeesh, Weinstein, and Welch (1993) as cited by Su (2014). Furthermore, Su finds a link in Chinese data that only supports larger seasoned equity offerings but not to offer them quicker. Contrarily, Jegadeesh et al. (1993) find empirical evidence to support the theory but even they report about a weak statistical relationship. It is clear that this theory is not without its controversy. Since empirical evidence is weak and only support larger seasoned equity offerings it would be hard to explain and prove this theory as the cause for possible underpricing.

Chapter 2: Literature Review

### UNDERWRITER REPUTATION

An important role is given to underwriters who prices the IPO, but also organizes and executes it. Since companies who are going IPO tend to have a short history and limited information is available, information asymmetry might arise. As mentioned in Khan et al. (2016), Booth and Smith (1986), Carter and Manaster (1990), Michaely and Shaw (1994) and Titman and Trueman (1986) demonstrate that one good way to deal with the information asymmetry is to hire an underwriter of good reputation. They should have good access to information and keep investors updated with valid information. Khan et al. (2016) finds mixed empirical results when looking at existing research. Some find a positive relation and some a negative relation between reputable underwriter and underpricing. Striking is the fact that older research finds a positive relation and more recent research found a negative relation. In spite of these mixed results, it is clear that the underwriter, along with its reputation, has an impact of the underpricing of IPOs.

## 2.4 OWNERSHIP STRUCTURE AND HYPOTHESES DEVELOPMENT

The ownership structure can be defined in many ways. Some adopt general terms like individuals, corporations and venture capitalists, or VC in short (Sur & Martens, 2013). However, alternative forms exist like family owned (Jain & Shao, 2015). Furthermore, each type of ownership can potentially be cut into subtypes such as founder and non-founder (Pollock, Fund, & Baker, 2009), and VC and Angel Investors (Chahine, Filatotchev, & Wright, (2007, both cited in Sur & Martens, 2013).

More general terms have been summarized by Hill (2006) using the following shareholder definitions:

- Block shareholder
- Insider shareholder
- Outsider shareholder
- New shareholder (post-IPO)
- Existing shareholder (post-IPO)
- Unidentified shareholders (post-IPO)

# Chapter 2: Literature Review

Sur and Martens (2013) is the first who writes about aggregated ownership. In their research they adopted three types of ownership. These types are individuals, corporations and VC. However, in their limitation they admit that these categories are not complete. As mentioned before, no distinction is made between VC and Angel investors or founders. Given the fact that this is already a limitation in their research, this research will adopt and extend ownership categories. First, in line with Alavi et al. (2008) we will only gather data from owners owning at least 5% of pre-IPO shares. Second, in main stream IPO research we find two types of categorization to be leading. The aforementioned summarization of Hill (2006), and managerial owners (Hills' Insider shareholders) including CEO, founder(s) and so on, and non-managerial owners (Hills' Outsider shareholders) like VC and Angel investors. Third, as we aim to find a relation for aggregated ownership we need to measure all types of ownership to get to 100 percent ownership, or at least as close as possible. In doing so, we will make no categorization with the exception of insiders and outsiders, but make a distinction between all – most common – types of owners. Additionally, Roosenboom and van der Goot (2005) have researched 154 Dutch firms in the period of 1984 until 2001. In table 2 they discuss the pre-IPO ownership structure and their average distribution along various types of owners. The research of Roosenboom and van der Goot (2005) with regard to the Dutch IPO market and research regarding the international IPO market combined lead to the following ownerships that will be discussed, in two main groups. First, for the insider shareholders we distinct the founder and non-founder CEO and other insiders such as executive directors and senior managers. These ownership-types are also represented in Roosenboom and van der Goot (2005). They also distinct family owned but this type of ownership is not sufficiently large enough represented in our sample to be included in the regression. The second group represents the outsider shareholders. Here venture capitalist is the most important shareholder for pre-IPO ownership. They are also well represented in both this sample as in the research by Roosenboom and van der Goot (2005). Furthermore, Corporation, banks and other outsiders are merged in the ownership type other outsiders. Banks are included based on the research of Roosenboom and van der Goot (2005) as they represent an average of 3.83 of the pre-IPO ownership distribution in their sample. Even though business Angels are an important outsider shareholder they are not included in the research of Roosenboom and van der Goot (2005) nor are they included in our sample. Next, the aforementioned ownership types are explained. Based on this information the hypotheses are formed.

# Chapter 2: Literature Review

## FOUNDER

The founder, or entrepreneur, is often heavily involved in its company. The IPO is a milestone of success to date and a means to more resources in pursuing even better goals in the future Bruton et al. (2009). Bruton et al. (2009) refers to the entrepreneurs as "paper millionaires" since the IPO is their first opportunity to cash from their firm. Because of this, their decision to sell or keep shares during the IPO matches the signaling theory. Leland and Pyle (1977) state that entrepreneurs can signal the high value of the venture by retained ownership. Not selling share, or at least only a small proportion, would communicate faith in a good and wealthy future and its founders expecting share value to rise as a consequence. However, Bruton et al. (2009) makes a very strong argument that in fact the opposite could happen. Initially, low underpricing as a result of retained ownership would make sense. Earlier research by Bruton (Bruton, Fried, & Hisrich, 2000) state there to be limits regarding the value of ownership by the founding entrepreneurs. He argues that retained ownership may lead to a conflict of interest with its external shareholders when personal gains are prevailing over the overall common interest, including the minority shareholders (Busenits, Fiet, & Moesel, 2005; Mello & Parsons, 1998; Sapienza, Manigart, & Vermeir, 1996; Schulze, Lubatkin, & Dino, 2003). This might be a results of the agency theory. Theory suggests that increased founder ownership may lead to moral hazard agency risk, though at first increased founder ownership can decrease agency risk. Bruton et al. (2009) find a "curvilinear (∪-shaped) relationship between founders' retained equity and underpricing" (p. 922). Their model has an adjusted $R^2$ of 21.8% when testing for a curvilinear relationship, an increase of 1.6% compared to the model in which the curvilinear relationship is not included. We expect this result to hold in our research despite the fact that we do not measure post IPO retained ownership. Therefore, hypothesis 1 is formulated accordingly.

**Hypothesis 1**: *There is a curvilinear relationship between the percentage of founders' ownership and the post-IPO first day performance; the performance first increases (more underpricing) and then decreases with the increase of the founder's share*

## NON-FOUNDER CEO AND OTHER INSIDERS

This type of ownership includes all types of owners except founder ownership and family ownership. This type of owner often bought itself into the company as an employee, received shares as compensation for a given position in the

company and received shares via an employee share plan. When mentioned in research they are a part of insider shareholder and results is very mixed. Sur and Martins (2013) describe that evidence has been found for positive and negative relations, and also a curvilinear relationship like founder ownership. For example, the research of Roosenboom and van der Goot (2005) has a significant impact of management ownership and management ownership squared in a model having an adjusted $R^2$ of 59.26%. In line with Sur and Martins, it appears as though a higher ownership percentage by this group is seen as a positive signal. Research by Roosenboom and van der Goot (2005) supports this point of view as they conclude that increased management ownership may "successfully reduce agency costs" (p.57). They state that outside investors will include agency cost into the price investors are willing to pay for the shares and as such, management has a personal incentive to do so. They conclude that this group seeks to ensure the long-term survival of the company. Hypothesis 2 is formulated accordingly.

**Hypothesis 2**: *"There is a positive relationship between the percentage of non-founder CEO and other insiders' ownership and the post-IPO first day performance"*

## VENTURE CAPITALIST

The presence of VC in a company is a heavily researched subject. According to Wang and Wan (2013) VCs have better and more detailed access to private information and are therefore in a unique position to evaluate the quality of the firm. This should have a positive impact on the earlier mentioned information asymmetry and ex ante uncertainty. According to Bruton et al. (2010) VCs have an incentive to exit an investment so that they can enter another. VCs are, in contrast to business angels, not in it for the long haul. Whilst the business angels' focus remains with the firm post-IPO, VCs will refocus on its own funds and what is in their best interest Bruton et al. (2010). Arthurs, Hoskisson, Busenitz, and Johnson (2008) have elaborated this. They state that one of the challenges of VCs is the need for quick return, mainly because of the temporality of their raised funds. Furthermore, VC need to keep in mind their long-term reputation so to acquire future funds (Bruton et al., 2010). Arthurs et al. (2008) conclude by making a statement about the relationships VCs maintain with underwriters. They suggest that because of prior collaboration underwriters are more inclined to enable more underpricing. Sur and Martens (2013) state that, although VCs are not in it for the long run and therefore do not maintain prolonged ownership, VCs retain their shares during the IPO until the lockup

period has passed. The research of Wang and Wan (2013) finds significant evidence that VC ownership increases IPO underpricing in their model, which has an adjusted $R^2$ of 39.5% in explaining the variance of VC backed IPO underpricing. It seems as though literature points towards more underpricing when VCs are present. Despite the fact that their main interest is quick return, they need to keep long-term factors in mind. Because of their expertise they assist the company to ensure its future and to increase the return after IPO. A hypothesis is formed on this belief.

**Hypothesis 3**: *"There is a positive relationship between the percentage of VCs ownership and the post-IPO first day performance"*

## OTHER OUTSIDERS

This group consists of a multitude of different types of owners. All types of outsider's owners that do not fit the venture capitalist profile. As described next, these various types of owners share the same sort of incentive and therefore one common hypothesis can be formed.

Corporations are represented world wide and it is argued they might have a different motivation to be partial ownership of companies. For example, Sur and Martens (2013) argue that corporates might be interested in important resources and technologies, using them to their own advantage. In some cases, they might even be using it to withhold them for their direct competitors. In other words, their might have an interest in a company not to for the return of equity, but to get insight or to prevent others from getting this insight or competitive advantage. Acquiring a controlling share is generally seen as an alternative to mergers and acquisitions (Palmer & Barber, 2001; Pfeffer, 1972; as cited in Sur and Marten, 2013). Since the interest of corporations might be different, its focus might not be on performance objectives (Sur and Marten, 2013). This would result in agency costs. As a result of their very specific form of interest, it is argued that they do not have the full interest of the firm at heart. Therefore, they would not maximize firm value – or, in the words of Sur and Martens (2013), "to negatively effect future financial return of the IPO firm and might be averse to paying a premium for such shares" (p. 267) – and this, in turn, would lead to less underpricing.

## Chapter 2: Literature Review

Banks play an interesting role in a Dutch IPO company. According to Roosenboom and van der Goot (2005), banks only have an average pre-IPO ownership of 3.83% in Dutch companies that went IPO in the period of 1984 and 2001. However, banks play an important role in a different way. A unique feature of Dutch companies is the two-tier board system. Just like in Germany there is a management board and an independent supervisory board. The management board is in charge of day-to-day operations and it is being monitored by the independent supervisory board (Roosenboom & van der Goot, 2005). Furthermore, the independent supervisory board has a legal obligation to watch over the company and not just to watch over the interests of the shareholder and or other stakeholders. Additionally, this board consists of at least three nonexecutive directors. Roosenboom and van der Goot (2005) point out one important difference in regard to the German supervisory board which is the fact that employees participate in this board, which is not the case in Dutch companies. They continue by stating that banks are given authority by their clients to participate in this board and through this board, banks can influence decisions. Furthermore, these banks often lend money to the company. As a result, Roosenboom and van der Goot (2005) state that "given the different payoff structures to debt and equity, lenders and shareholders may have conflicting interests" (p.48) which may result in an agency conflict. However, due to the neutral interest of the bank in the company and do not serve the interest of a particular stakeholder, they expect that banks are "successful in reducing the agency problem and increasing the price that investors are willing to pay for the firm's shares" (p. 48). Furthermore, Ang et al. (2000) state that banks require honesty in reporting, profitability of the company and "bank monitoring complements shareholder monitoring of managers, indirectly reducing ownership manager agency costs" (p. 88).

Both banks and corporate companies show a negative relation between percentage ownership and the first day performance. Agency costs and monitoring appears to be the underlying motive and cause. Therefore, the following hypothesis is formulated.

**Hypothesis 4:** "*There is a negative relationship between the percentage of other outsiders' ownership and the post-IPO first day performance*"

In table 1 an overview is given of the influence of the aforementioned types of owners within a company in relation to underpricing. Both the theory and the expected direction of influence on underpricing is given. Finally, also the

Chapter 2: Literature Review

Table 1
Overview ownership and their relation to underpricing and Hypotheses

| Type | Theory of underpricing / relation to underpricing | Expected influence on underpricing | Hypotheses |
|---|---|---|---|
| **Founder (Curvilinear)** | Signaling theory | + | +/- |
| | Agency theory | - | |
| **Non-Founder CEO and other Insiders** | Retaining control (agency theory) | + | + |
| | Ensure long-term survival | + | |
| **Venture Capitalist** | Ex-ante uncertainty | + | + |
| | Underwriters collaboration | + | |
| **Other Outsiders** | Agency costs | - | - |
| | Monitoring | - | |

hypotheses direction is given as to have one overview of ownership in relation with underpricing.

## INTERACTION

Different in this research compared to existing literature is the interaction effect. The definition of aggregated ownership as already given on page 5 is "the combined effect of all of the different ownership types within a firm, their respective shareholdings, as well as their interaction among them". A key part of this definition is the interaction. This interaction between ownership types is – in existing research - normally not taken into account (Sur & Martens, 2013). Because this research seeks to find evidence for the presence of significant relevant aggregated ownership in determining underpricing it adopts the given hypothesis to seek evidence in the Dutch market. Sur and Martens (2013) formulate the following interaction effect hypotheses.

**Hypothesis 5a:** "*Venture capital shares held at IPO will moderate the effect of founder shares at IPO on issue price premium such that higher venture capitalist shares held will have a greater positive effect on issue price premium than lower venture capitalist shares held*"

**Hypothesis 5b:** "*Founder shares held at IPO will moderate the effect of other outsiders on issue price premium such that higher founder shares held will have a greater positive effect on issue price premium than lower individual shares held*"

An important note is that hypothesis 5a and 5b have been slightly altered to fit this research. Individual shares are related to founder ownership and corporate ownership is merged with other outsiders. A significant interaction could prove the importance of taking aggregated ownership into account instead of the current standard in IPO research, the largest shareholder (Sur & Martens, 2013). Existing research finds a positive effect of VC ownership on first day performance according to Sur and Martens (2013). This is point of view is also stated by Bruton et al. (2010). Furthermore, Sur and Martens state that in family held firms VC presence also has a positive outcome for IPO performance. Backed by the agency theory, increased involvement of VC ownership should lead to more alignment by founder and VC since their share interest at that point. As mentioned before, VC companies have to not only take into account short term return, but also their long term reputation. VC's rely on large investment funds which are most often based on trust by wealthy people. As such, when their shares held are higher, they become more aligned with founders, increasing IPO performance.

Chapter 3: Methodology

# METHODOLOGY

In this section the methodology used in order to get the results is explained. First it is explained what exactly is required to be able to answer the main research question and its hypotheses. Then we are going to look at the possibility of control and the potential presence of moderating and or interaction. Third, a research method based on these requirements will be selected. And finally, it is explained how the data is to be acquired and what demands need to be met.

## 3.1 REGRESSION

The main aim is to find a possible relation between aggregated ownership and the first day post-IPO performance. In order to do so we will first describe the research method and the regression equation will be presented. Next, the dependent and independent variables and how they are to be used in a regression will be explained.

### ORDINARY LEAST SQUARES REGRESSION

In line with other research on IPO this research adopts the OLS regression in order to assess a potential relationship between aggregated ownership and underpricing. We will assess the hypotheses effects and controls influencing the underpricing. In Wang and Wan (2013) we can site that "OLS regression analysis is appropriate given the cross-sectional nature of the IPO data as well as the continuous dependent variable of the study (underpricing)" (p. 337). OLS is one most common methods used and is also present is most of the leading articles like Barry et al. (1990), Chahine et al. (2007), Ljungqvist and Wilhelm (2003), and Roosenboom and van der Goot (2005). For this reason, the OLS regression will be adopted.

Given the fact that ownership, an especially aggregated ownership, could be correlated, this will be assessed in order to prevent the potential influence it can have on results. "Multicollinearity refers to the correlation among three or more independent variables" as cited from Hair, Black, Babin, and Anderson (2014, p. 161). Should multicollinearity be present it can influence the predictive power. To test for multicollinearity the variance inflation factors can be used.

Chapter 3: Methodology

According to Hair et al. (2014) there is a common threshold value of VIF value 10. An important note is the smaller the sample size the lower the tolerance should be. The sample size of this research is adequate, however it would be preferable to have a bigger sample size. Therefore, it is required to be more careful for the VIF value threshold of 10, and instead be cautious. To do so, each regression model will be individually assessed regarding the risk of multicollinearity. Should the independent variables be above this threshold, the book of Hair et al. (2014) gives several methods that could be utilized. Furthermore, heteroscedasticity is another factor than can influence the results of an OLS regression. If heteroscedasticity, or unequal variances, are present it can have serious consequences. The significance of statistical tests is affected and care therefore be invalidated in some cases. This in turn would lead to the wrong interpretation of regression outcomes. A test for heteroscedasticity will be done in the descriptive statistics. Based on the aforementioned reasons we will now formulate the regression.

First day pre-IPO performance = Founder share + Founder share$^{Squared}$ + Non Founder CEO and Other Insider share + Venture Capitalist share + Other Outsiders share + Size of Company + Age + Industry + ε

or

$$\boldsymbol{FDR_t = \frac{(P_1 - P_0)}{P_0} = \alpha + \beta 1 Fo_{t-1} + \beta 2 Fo^2{}_{t-1} + \beta 3 CEO - OI_{t-1} + \beta 4 VC_{t-1} + \beta 5 OO_{t-1} + \beta 6 LNS_{t-1} + \beta 7 LNA_{t-1} + \beta 8 IND + \varepsilon}$$

where *t* is at IPO and *t-1* is pre-IPO.

## DEPENDENT VARIABLE

Finding the effect of aggregated ownership on first day post-IPO performance is the main objective. Therefore, the first day post-IPO performance is the dependent variable since we will try to use aggregated ownership to explain part of it. First day post-IPO performance has been described as 'the difference between a stock's offering price and the closing price on the first day the stock is offered for trading' earlier in this research. In line with prior studies (Arthurs et al., 2008; Daily, Certo, Dalton, & Roengpitya, 2003; Filatotchev & Bishop, 2002 as mentioned in Wang & Wan, 2013; Engelen & Van Essen, 2010) it is calculated by the closing price minus the offer price, and divided by the offer

price. In line with the explanation of performance, a positive difference means a positive performance which indicated that 'money is left on the table' and vice versa. Therefore, first day return –or FDR– equals the closing price of trading day one ($P_1$) minus the offering price ($P_0$), divided by the offering price.

## INDEPENDENT VARIABLES

There are 8 independent variables to be taken into account. These are categorized into insider- and outsider-shareholders and the control factors. Insider shareholders are founder and non-founder CEO and other insiders. Family shareholders are excluded because only 1 company in the sample has family based ownership. Outsider shareholders are venture capitalists and Other Outsiders. These other outsiders are corporations, banks and other outsiders. No Business Angels participate in the sample, in line with the sample of Roosenboom and van der Goot (2005). In both insider- and outsider-shareholder's others are included. Despite the fact that their impact is expected to be negligible they cannot be ignored as the is goal is to take all impact into account. The independent variables are calculated by their share as a percentage in the total ownership. The variable non-founder CEO and other insiders will be calculated by the amount of insider shares not accountable by founder. All shareholders in this group will be analyzed to make sure that there is not a fit with, for example, family via a different holding. The same procedure will be followed for the 'others' in the outsider-shareholders group.

A curvilinear relationship between founder and first-day performance is expected. Because this is a nonlinear instead of linear relation there are two founder variables in the regression formula. The founder variable is divided into the normal founder variable and the founder squared variable which are both included in the regression.

Chapter 3: Methodology

### CONTROL

As mentioned before, a lot of research has been done regarding the subjects of IPO and underpricing. Based on this prior research some controlling factors will be adopted. These firm characteristics have an effect on the amount of underpricing and therefore need to be controlled. Four main parts require control according to existing literature (Sur & Martens, 2013; Wang & Wan, 2013). These are year of IPO, size, firm age and sector. In order to control for year effects we include an IPO year dummy for each year of IPO data included. The second control factor is size. There are several ways to determine size. For example, the amount of employees at the time of IPO (Sur & Marten, 2013) or total assets (Wang & Wan, 2013) are two methods regularly used. In this instance the second method, a transformed logarithm of total assets will be adopted. Third, the firm age will be controlled for. According to Sur and Martens (2013) more matured firms have a higher chance of success during an IPO. Age will be measured as the difference between the year of IPO and the founding year. Finally, the industry will be controlled for to see if there is significant variance in between sectors, resulting in a more accurate explanation of underpricing.

## 3.2 SAMPLE DATA

The sample consists of Dutch companies going IPO in the period of 1995 until 2015. Using Thomson One and Thomson One Banker a list has been comprised of 337 IPO cases. However, after omitting cases that never went live, a total of 234 remained. Furthermore, based on prior IPO research, firms that are either (1) also listed elsewhere at IPO, or (2) have a re-admission are excluded. Additionally, (3) investment entities, and (4) Financial companies are also excluded as they have different characteristics than other IPO companies. These factors combined excluded 105 IPOs. Resulting in 129 IPO's. However, after hand checking every case a further 40 IPOs were omitted resulting in a total of 89 cases available for this research. These cases were omitted because no prospectus was available or there was a simultaneous listing elsewhere. Companies that had an IPO and have gone private, default, or delisted after, but as an immediate result of the IPO, are included provided that the information is complete. Finally, in line with Sur and Martens (2013), state ownership categorized companies will be excluded. Often, the transfer from state owned to public implies privatization. This is likely to be influenced by geo-political, societal, and national factors (Sur & Martens, 2013). Next, no information regarding pre-IPO ownership was available through Orbis, Thomson One,

# Chapter 3: Methodology

Thomson One Banker, SDC, or Zephyr and therefore all prospectuses were gathered by hand. A total of 89 prospectuses have been gathered through hand collection. After examining every prospectus, a further 22 company cases were deleted because they are not Dutch or there was not sufficient information available regarding ownership, or the IPO itself mainly due to the lack of share price information. The total sample therefore contains 67 IPOs, an overview of these companies can be found in Appendix I. Finally, IPO date and age were collected via the prospectuses, the industry and company size through the Thomson One (and in some cases Banker version) and prospectus, and the stock performance is collected through Thomson One Banker, the annual report, and through financial websites like Google-, and Yahoo-Finance.

# RESULTS

In this chapter the results of the OLS regression will be presented. In the first part the descriptive statistics will be presented alongside discussing factors that might influence the results, in the second part the influence of the independent variables is discussed. Third, the overall results will be discussed.

## 4.1 DESCRIPTIVE STATISTICS

The original sample contains 67 companies going IPO in the period 1995 until 2015. These 67 observations have the following statistics as can be seen in Table 2 – Descriptive statistics, panel A.

The First Day Return mean percentage value of 14.07% seems to be in line with other research however, there is some skewness to be detected. Age also has potential for skewness though its value of 2.52 is less extreme compared to first day return. Furthermore, the skewness value for size is high with a value of 5.92. However, in line with existing research a transformed logarithm of size is used in the regression, which has a skewness of 0.32. Based on the histogram and boxplot – which can be found in appendix II – made for both first day return and age there are some outliers detected. Based on these histogram and boxplot cases with an age higher than 80 and or have a higher first day return of 100% are omitted to counteract possible effects from outliers. This resulted in the deletion of 4 cases[4] and a new total number of observations of 63. The new descriptive statistics can be found in panel B.

Panel B shows clearly better values regarding the skewness of all values. After omitting some cases there are interesting changes in the values. For example, the first day return mean has changed from 14.07% to 5.81%. This is the result of deleting cases with a return of 275, 141, and 160 percent. Panel B also gives information regarding the ownership in companies. The average ownership of VC for example, is 42.29%. This is almost double the

[4] These cases are (1) VIA Network (first day return 275,41%), (2) Head (first day return 141,70%), (3) Chicago Bridge & Iron NV (Age 108), and (4) Tie Holding NV (first day return 160,00%)

# Chapter 4: Results

Table 2 – Descriptive Statistics

| | *Panel A - Including all samples* | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | Mean | Median | S.D. | Minimum | Maximum | Skewness |
| FirstDayReturn (%) | 67 | 14.07 | 1.75 | 43.12 | -18.75 | 275.41 | 4.47 |
| FounderOwnership (%) | 67 | 20.25 | 0 | 32.26 | 0 | 100.00 | 1.37 |
| Founder_Squared (%) | 67 | 14.35 | 0 | 28.05 | 0 | 100.00 | 2.14 |
| NonFounder CEO andOtherInsiders (%) | 67 | 17.56 | 5.47 | 26.44 | 0 | 100.00 | 1.97 |
| VCOwnership (%) | 67 | 41.20 | 35.00 | 38.48 | 0 | 100.00 | 0.18 |
| OtherOutsiders (%) | 67 | 20.62 | 0.29 | 34.50 | 0 | 100.00 | 1.71 |
| Age | 67 | 16.96 | 11.00 | 20.22 | 1 | 108 | 2.52 |
| ln(Age) | 67 | 2.32 | 2.39 | 1.04 | 0 | 4.68 | -0.09 |
| Size (tot. assets x€1000) | 67 | 1.767.295 | 102.946 | 7.832.832 | 901 | 54.118.000 | 5.92 |
| ln(Size) | 67 | 18.65 | 18.45 | 2.15 | 13.71 | 24.71 | 0.32 |
| | *Panel B - After correcting for outliers* | | | | | | |
| | N | Mean | Median | S.D. | Minimum | Maximum | Skewness |
| FirstDayReturn (%) | 63 | 5.81 | 1.68 | 14.09 | -18.75 | 51.50 | 1.61 |
| FounderOwnership (%) | 63 | 21.54 | 0 | 32.86 | 0 | 100.00 | 1.28 |
| Founder_Squared (%) | 63 | 15.27 | 0 | 28.70 | 0 | 100.00 | 2.04 |
| NonFounder CEO andOtherInsiders (%) | 63 | 15.59 | 4.50 | 23.45 | 0 | 100.00 | 2.16 |
| VCOwnership (%) | 63 | 42.29 | 46.23 | 38.41 | 0 | 100.00 | 0.13 |
| OtherOutsiders (%) | 63 | 20.29 | 0.29 | 33.86 | 0 | 100.00 | 1.75 |
| Age | 63 | 15.29 | 11.00 | 16.65 | 1 | 72 | 2.29 |
| ln(Age) | 63 | 2.27 | 2.40 | 0.99 | 0 | 4.28 | -0.23 |
| Size (tot. assets x€1000) | 63 | 1.864.800 | 98.100 | 8.072.000 | 901 | 54.118.000 | 5.73 |
| ln(Size) | 63 | 18.65 | 18.40 | 2.15 | 13.71 | 24.71 | 0.40 |

The FirstDayReturn variable is the percentage return of the issue price compared to the value at the end of trading day one. FounderOwnership is the portion of ownership owned by the founder. Founder_Squared is the squared value for founder ownership to test for a curvilinear relationship. NonFounder CEO and OtherInsiders include all types of owners from within the company. VCOwnership is the portion owned by the VC's. OtherOutsiders include all types of owners from outside the company. All values are pre-IPO measures. The Age is the year of IPO minus the founding age. The ln(size) is a transformed logarithm for the variable Age. Size is a companies' measure of total assets control for size. In line with existing research this variable is transformed to a logarithm, resulting in variable ln(Size).

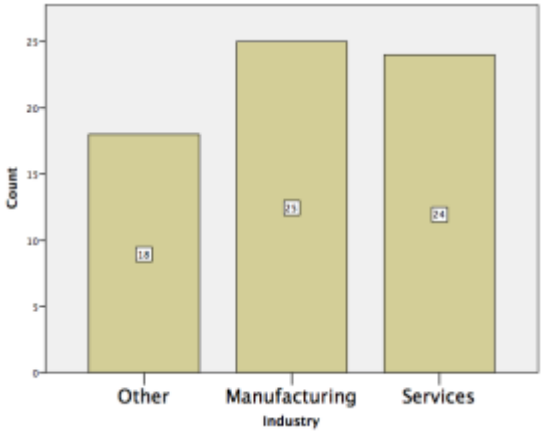
Chapter 4: Results

Table 2 – Descriptive Statistics

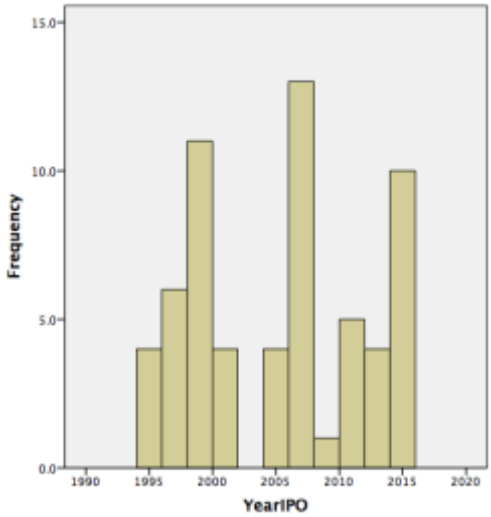
| | *Panel C – Sub-sample Hot-IPO market* | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | Mean | Median | S.D. | Minimum | Maximum | Skewness |
| FirstDayReturn (%) | 25 | 6.45 | 0.09 | 15.27 | -14.17 | 51.50 | 1.85 |
| FounderOwnership (%) | 25 | 16.10 | 0 | 26.32 | 0 | 93.00 | 1.61 |
| Founder_Squared (%) | 25 | 9.24 | 0 | 19.88 | 0 | 86.49 | 2.906 |
| NonFounder CEO andOtherInsiders (%) | 25 | 20.73 | 11.82 | 28.31 | 0 | 100.00 | 1.97 |
| VCOwnership (%) | 25 | 41.11 | 46.40 | 36.47 | 0 | 98.57 | 0.09 |
| OtherOutsiders (%) | 25 | 20.99 | 0.30 | 35.15 | 0 | 100.00 | 1.73 |
| Age | 25 | 10.60 | 9.00 | 9.80 | 1 | 51 | 3.05 |
| ln(Age) | 25 | 2.04 | 2.20 | 0.85 | 0 | 3.93 | -0.43 |
| Size (tot. assets x€1000) | 25 | 1.767.295 | 192.005 | 7.073.000 | 901 | 35.640.000 | 4.95 |
| ln(Size) | 25 | 18.55 | 19.07 | 2.45 | 13.71 | 24.30 | 0.03 |
| | *Panel D – Sub-sample Cold-IPO market* | | | | | | |
| | N | Mean | Median | S.D. | Minimum | Maximum | Skewness |
| FirstDayReturn (%) | 38 | 5.38 | 1.83 | 13.46 | -18.75 | 48.08 | 1.42 |
| FounderOwnership (%) | 38 | 25.12 | 0 | 36.43 | 0 | 100.00 | 1.08 |
| Founder_Squared (%) | 38 | 19.23 | 0 | 32.91 | 0 | 100.00 | 1.67 |
| NonFounder CEO andOtherInsiders (%) | 38 | 12.21 | 2.55 | 19.28 | 0 | 85.00 | 2.13 |
| VCOwnership (%) | 38 | 43.07 | 40.62 | 40.09 | 0 | 100.00 | 0.13 |
| OtherOutsiders (%) | 38 | 19.84 | 0.05 | 33.46 | 0 | 100.00 | 1.84 |
| Age | 38 | 18.37 | 14.00 | 19.44 | 1 | 72 | 1.85 |
| ln(Age) | 38 | 2.42 | 2.64 | 1.06 | 0 | 4.28 | -0.34 |
| Size (tot. assets x€1000) | 38 | 1.910.000 | 86.106 | 8.759.000 | 5.632 | 54.118.000 | 6.04 |
| ln(Size) | 38 | 18.72 | 18.27 | 1.96 | 15.54 | 24.71 | 0.94 |

Chapter 4: Results

value of founders (21.54%), non-founder CEO and other insiders (15.59%) and other outsiders (20.29%). The average age of the company is 15.29 years. When comparing this to, for example, the research of Roosenboom and van der Goot (2005), who also use the Dutch market sample in the period of 1984 and 2001, this is a very low value. Roosenboom and van der Goot have an average age of 26.78 years, which is almost twice the average age of this research. Furthermore, they find an average underpricing of 11.03%, which is slightly higher than the value of 5.81%. Another interesting difference in our sample is the pre-IPO ownership. In table 2 Roosenboom and van der Goot (2005) depict the average pre- and post-IPO ownership distribution (p. 50). The biggest difference is the management ownership of 42.53% compared to 15.59% in this sample. One reason might be that they do not make a distinction between founder and other management. The only distinction Roosenboom and van der Goot make is the Founding family instead of the founder itself. When this research would combine Founder and non-founder CEO and other insiders the values would be comparable. Furthermore, this research has found a high average VC presence with 42.29% compared to 14.52% used in the sample of Roosenboom and van der Goot.




*Graph 2*
*Overview of Industries*




*Graph 1*
*Histogram Year of IPO*

In graph 1 the distribution of the cases over the year of IPO is given. This graph shows three clear peaks, or hot seasons regarding the amount of IPOs. The first is during the tech bubble around the year 2000. After the tech bubble there was an economic crisis, explaining the drop in IPOs, up to a low point of 0 IPOs a year after going up again. It reached a biggest high just before the world credit crisis in the year 2008, again showing a steep drop in the amount of IPOs right after the crisis. After a couple of years with few IPOs it is now, again, on the rise with 10 IPOs in 2015. Furthermore, in graph 2 the spread for industry is given. Other industries consist of mining, construction,

Chapter 4: Results

Wholesale and Retail trade, and transportation and public utilities. The graph displays two main industries represented by 25 cases of manufacturing and 24 cases in the services area, and 18 cases of combined industries represented by other.

## MULTICOLLINEARITY AND HETEROSCEDASTICITY

An important factor to take into account is the multicollinearity. In the case of collinearity, or in case of multiple factors multicollinearity, it can cause decreasing ability to predict the first day return according to Hair et al. (2014). Therefore, it is very important that the issue of multicollinearity is addressed. According to Hair et al. (2014), one of the easiest ways to identify multicollinearity is by the use of a correlation matrix. In table 3 the Pearson correlation matrix is given.

According to table 3 there is some correlation. The correlation between founder and VC, and other outsider and VC is present. Therefore, when looking at the results, some caution has to be taken. These results are the first indication that there is some slight multicollinearity. Therefore, each separate regression model will be assessed for multicollinearity.

Table 3 – Pearson Correlation matrix

| | Founder Ownership | NF CEO and O-I | Other Outsiders | VC Ownership | Age | ln(Size) |
|---|---|---|---|---|---|---|
| Founder Ownership | 1 | | | | | |
| NF CEO and O-I | -.09 (.50) | 1 | | | | |
| Other Outsiders | -.28* (.02) | -.33** (.01) | 1 | | | |
| VC Ownership | -.55** (.00) | -.24 (.06) | -.44** (.00) | 1 | | |
| Age | -.15 (.24) | -.05 (70) | .02 (.87) | .16 (.22) | 1 | |
| ln(Size) | -.29* (.02) | -.06 (.62) | .30* (.02) | .01 (.92) | .13 (.33) | 1 |

First number is the Pearson correlation, between brackets is the significance.
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)
NF CEO and O-I equals Non-Founder CEO and Other Insiders
*For all values the number of observations is 63. For variable definitions see table 1*

Heteroscedasticity is another factor that needs to be assessed. There are several ways to check for the presence of heteroscedasticity. This research uses the Breusch-Pagan test, which uses the unstandardized residual value and the unstandardized predicted value. By saving the unstandardized residual value when running a regression including all variables a residuals squared value can be generated. These can then be inserted in the same regression but replacing the dependent variable. This in turn generates a null-hypothesis for homoscedasticity. If the model is significant then the alternative hypothesis of heteroscedasticity is accepted, if the model is insignificant then the alternative hypothesis we cannot accept the alternative hypothesis in favor of homoscedasticity. The Breusch-Pagan test shows there is no evidence for heteroscedasticity with an insignificance of F-test of .498, well above the required significance. This means that there is no heteroscedasticity and that the OLS results estimates are not influenced.

## 4.2 OLS REGRESSION

Here, the results regarding the OLS regression are displayed and discussed. In order to test all hypotheses a total of 6 models are run but each model is produced three times. To prevent the influence of multicollinearity, the first includes all ownership variables and the second and third each leave out one type of ownership. The type left out is based on the correlation as can be found in table 3. The first model only tests the influence of normal pre-IPO ownership on first day return. In the second model the founder squared model is added as to test a possible curvilinear impact of founder ownership on first day return. It is hypothesized that the underpricing first increases and then, as the amount of founder ownership percentage increases, decreases again. Part of the definition of aggregated ownership is the interaction of the total combined effect of all types of ownerships. To test this, interaction amongst various types of ownerships are tested in this model. In the third model the interaction effects are included but the squared founder ownership is left out again. In the fourth and fifth model a sub-sample analysis is produced to check for any changes in results when controlling for hot- and cold-IPO market circumstances. This is mainly due to the fact it is known that IPO of lesser quality wait for hot market conditions (Ritter & Welch, 2002). Finally, in the sixth model it is checked if the variance of ownership has any influence on potential underpricing. Furthermore, in line with existing research, age has been transformed through a logarithm. In table 4 the results are presented.

Chapter 4: Results

Table 4 – OLS Regression The effect of aggregated ownership on first day performance

| | | *Panel A – OLS regression including all samples* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Models | | (1)**** | (1a) | (1b) | (2)**** | (2a) | (2b) | (3)**** | (3a) | (3b) |
| *Ownership variables* | | | | | | | | | | |
| Founder Ownership (%) | H1 +/- | -1.741** | 0.052 | 0.036 | -2.072*** | -.066 | -0.087 | 1.824** | 0.056 | 0.040 |
| | | -(2.445) | (0.861) | (0.488) | -(2.685) | -(0.355) | -(0.424) | -(2.493) | (0.865) | (0.528) |
| Founder Squared (%) | H1 +/- | | | | 0.238 | 0.141 | 0.144 | | | |
| | | | | | (1.102) | (0.628) | (0.640) | | | |
| Non Founder CEO and | H2 + | -1.790** | -0.012 | -0.026 | 1.902*** | -0.001 | -0.016 | -1.887** | 0.016 | -0.029 |
| Other Insiders Ownership (%) | | -(2.527) | -(0.144) | -(0.306) | -(3.165) | -(0.008) | -(.0183) | -(2.583) | -(0.179) | -(0.326) |
| VC Ownership (%) | H3 + | -1.766** | 0.008 | | 1.894*** | 0.009 | | -1.859** | 0.007 | |
| | | -(2.507) | (0.126) | | -(4.551) | (0.148) | | -(2.560) | (0.016) | |
| Other Outsiders Ownership (%) | H4 - | -1.801** | | -0.020 | -1.934*** | | -0.022 | -1.892** | | -0.019 |
| | | -(2.526) | | -(0.324) | -(5.271) | | -(0.353) | -(2.578) | | -(0.306) |
| *Interaction variables* | | | | | | | | | | |
| Founder*VC | H5a | | | | | | | -0.280 | -0.106 | -0.100 |
| | | | | | | | | -(0.718) | -(0.263) | -(0.247) |
| Other Outsiders*Founder | H5b | | | | | | | 0.046 | -0.016 | -0.031 |
| | | | | | | | | (0.084) | -(0.029) | -(0.055) |
| *Control variables* | | | | | | | | | | |
| Log of total assets | | *-0.014* | *-0.010* | *-0.010* | *-0.017** | *-0.011* | -0.012 | *-0.016* | *0.011* | -0.011 |
| Log of Age | | *-0.021* | *-0.038*** | *-0.037** | *-0.021* | *-0.039*** | -0.038** | *-0.022* | *0.038** | -0.038* |
| Industry | | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* |
| R^2 (%) | | 24.4 | 15.5 | 15.6 | 26.1 | 16.1 | 16.3 | 25.2 | 15.6 | 15.8 |
| Adjusted $R$^2 (%) | | 13.2 | 4.8 | 4.9 | 13.6 | 3.7 | 3.9 | 10.8 | 1.3 | 1.5 |
| F value | | 2.183** | 1.442 | 1.457 | 2.083** | 1.297 | 1.313 | 1.751* | 1.091 | 1.102 |

First number is the beta value, between brackets is the t-score. For variable definitions see table 1.

* Correlation is significant at the 0.10 level (2-tailed)

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

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

**** Invalid model due to multicollinearity, when not mentioned VIF values not above 2.2

Table 4 – OLS Regression The effect of aggregated ownership on first day performance

Panel B – OLS including only hot-IPO cases (models 4, 4a, 4b) or cold-IPO cases (models 5, 5a, 5b) or variance of ownership (models 6, 6a, 6b)

Chapter 4: Results

| Models | | (4)**** | (4a) | (4b) | (5)**** | (5a) | (5b) | (6)**** | (6a) | (6b) |
|---|---|---|---|---|---|---|---|---|---|---|
| *Ownership variables* | | | | | | | | | | |
| Founder Ownership (%) | H1 +/- | -1.510 | 0.096 | 0.072 | 2.418* | 0.070 | 0.082 | -1.665** | 0.047 | 0.031 |
| | | -(1.609) | (0.905) | (0.504) | -(1.863) | (0.874) | (0.860) | -(2.312) | (0.783) | (0.417) |
| Founder Squared (%) | H1 +/- | | | | | | | | | |
| Non Founder CEO and | H2 + | -1.528 | 0.027 | 0.008 | -2.463* | 0.011 | 0.026 | -1.719** | -0.021 | -0.035 |
| Other Insiders Ownership (%) | | -(1.681) | (0.246) | (0.063) | -(1.902) | (0.083) | (0.204) | -(2.399) | -(0.246) | -(0.414) |
| VC Ownership (%) | H3 + | -1.501 | 0.007 | | -2.502* | -0.018 | | -1.687** | 0.009 | |
| | | -(1.704) | (0.065) | | -(1.931) | -(0.229) | | -(2.365) | (0.142) | |
| Other Outsiders Ownership (%) | H4 - | -1.610 | | -0.026 | -2.478* | | 0.010 | -1.722** | | -0.020 |
| | | -(1.722) | | -(0.244) | -(1.921) | | (0.120) | -(1.479) | | -(0.328) |
| Variance of Ownership | | | | | | | | 0.001 | 0.002 | (0.002 |
| | | | | | | | | (0.804) | (1.092) | (1.092) |
| IPO market condition | | Hot | Hot | Hot | Cold | Cold | Cold | | | |
| *Control variables* | | | | | | | | | | |
| Log of total assets | | *-0.016* | *-0.007* | -0.009 | *-0.017* | *-0.010* | -0.010 | *-0.014* | -0.010 | *-0.011* |
| Log of Age | | *-0.006* | *-0.041* | -0.038 | *-0.002* | *-0.017* | -0.017 | *-0.022* | -0.038** | *-0.037** |
| Industry | | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* | *Controlled* |
| R^2 (%) | | 60.7 | 53.4 | 53.6 | 20.6 | 10.5 | 10.4 | 25.3 | 17.3 | 17.5 |
| Adjusted $R$^2 (%) | | 41.1 | 34.4 | 34.5 | 0 | 0 | 0 | 12.7 | 5.1 | 5.2 |
| F value | | 3.091*** | 2.898*** | 2.804** | 0.939 | 0.501 | 0.495 | 2.000* | 1.415 | 1.429 |

First number is the beta value, between brackets is the t-score. For variable definitions see table 1.

* Correlation is significant at the 0.10 level (2-tailed)

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

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

**** Compromised model due to multicollinearity, when not mentioned VIF values not above 2.2

# Chapter 4: Results

As mentioned before it is important to check for possible multicollinearity in each model and as a result all models which include all ownership types cannot be used for interpretation. They all have severe multicollinearity, therefore they are all noted with four stars. Also, panel A is mainly used to test for the hypotheses and panel B offers a check for hot and cold market IPOs and also look for an alternative explanation for underpricing.

The first hypothesis expects that founders have a positive influence of first day performance, up to the point it reaches an agency risk which can explain a decrease in performance. This would result in a ∩-shaped relationship. Models 2a and 2b try to prove this point of view. However, these models show an opposite reaction, in line with the curvilinear – or ∪-shaped – conclusion as found by Bruton et al. (2009). The first and third model – both a and b – do not include the squared variable required to measure the curvilinear relationship. These models present a positive effect of founders on first day performance. Despite this matching the first part of hypothesis one, it fails to prove the entire hypothesis. Equally important is the fact that models 2a and 2b are not producing any significant evidence and therefore no real conclusions can be drawn based on the models. As a result, no evidence can be found in favor of the first hypothesis.

More non-founder CEO and other insiders percentage ownership should lead to a higher first day performance. This is the expectation as a result of the second hypothesis. Models 1,2, and 3 all suggest a very small but negative relation, which is opposite to the hypothesis. Even though it is expected that this group would try to ensure the long-term survival of the company, results of other research have shown the effect can be both negative and positive. Therefore, it might not be strange that the effect of non-founder CEO and other insiders on first day performance is only a quarter – and in some cases even smaller – compared to the impact by founders. A remarkable result is the influence of models 4 and 5. These models represent a sub-sample analysis in which only hot- or could-IPO market condition cases are included. Both in hot and in cold market conditions the results are in line the second hypothesis. As mentioned before the varied results match the existing literature where results are also mixed. In line with the first hypothesis the results of the models used to find an answer for the second hypothesis are not significant as are the beta's for the variables required to support of reject the hypothesis. Therefore, we can neither reject nor accept the second hypothesis.

The third hypothesis is related to VC ownership. The more VC's are involved as an owner pre-IPO, the higher the performance on the first day. VC's are – often

– not in it for the long haul, but they do need to keep in mind the impact of their actions on their long term reputation. Furthermore, they are experienced and have connections in the world of IPOs. The involvement of VC's is therefore associated with quality, and their experience helps monitoring management as VC's often try to install a manager or director within the company to align the interests of the VC with the company and vice versa. Due to the correlation between VC's and other outsiders they are each left out in turn, resulting in models a (VC) and b (no VC). All models seem to support the positive point of view with a small but positive effect on first day performance. This somehow what smaller effect can be justified as VC's are accounted for their results, often investing someone else's money. Therefore, they cannot afford to leave too much money on the table. Even though no models are significant to tell with certainty, this model seems to support the general consensus in literature with a positive VC effect on first day performance. The third hypothesis can therefore be accepted.

The fourth hypothesis is related to the other outsiders that can be partial ownership in a company pre-IPO. Most often these are Banks and or corporate owners. As they often have a different incentive we expect a negative impact on the first day performance. All models seem to support this with a reasonable negative impact on the performance. The beta value is higher than the VC and the adjusted $R^2$ all suggest that other outsiders have an bigger impact than VC. An interesting fact is that during hot-IPO market conditions the impact is negative, but with cold-IPO market conditions the impact is positive. This might be due to the mitigating effect of banks, whose only goal is to retrieve the money invested with a predetermined interest rate. This might cause an agency problem since young companies are often highly invested and – often – also in riskier projects with potentially higher returns. Banks do not profit from these results because they only receive their loaned sum increased with interest. Due to the Dutch two-tier board, banks have a big impact on the way the business is practiced from within, possibly explaining the high impact other outsiders have compared to VC's. Corporate owners often have different interests than a bank, but also different than the company going IPO. This might increase the agency costs and as a result the first day performance declines. All models seem to support the hypothesis which is accepted, taking into account that results are not significant and can therefore not be accepted with certainty.

Finally, the fifth hypothesis is related to the interaction between owners. It consist of a moderating effect by VC owners for the founder ownership (5a), such that a higher VC ownership leads to higher first day return than a lower VC ownership. When VC's become more involved, they also become more

aligned with the founders. Furthermore, hypothesis 5b suggest that founder ownership moderates the effect of other outsiders on first day performance. Model 3 is used to find support for these hypotheses. When the interaction variables are included in the regression, the explanatory power drops. Both the $R^2$ and the adjusted $R^2$ drop with the $R^2$ dropping just marginally but the adjusted $R^2$ loses almost halve its power, or in some cases even more. This would suggest that adding interaction between ownerships does not add any explaining power to the first day performance, and as a result do not influence first day performance. Furthermore, none of the variables have any significant power to enforce potential interaction. The fifth hypothesis, both 5a and 5b, can therefore not be explained by this model and are rejected as such.

An interesting finding in model 4 is that the significance of this model is very high, 1% (2-tailed). This model only includes IPOs in the hot-IPO market condition, in which there is general consensus that IPOs of lesser quality seize the opportunity of going IPO. Even though none of its predictors are significant, both models 4a and 4b explain over 30 percent of the first day return. No logical explanation can be given to explain why this is the case. Furthermore, in model 5, in cold-IPO market conditions no explanatory power is given to the same variables. Again, no logical reason exists why the model presents this data. The last model, model 6, seeks to find if the spread of ownership can predict the first day return, but no significant results can be presented, which leave out the probability that this spread has any explanatory power.

## 4.3 FINAL RESULTS

In table 4 results of the OLS been presented. These tables show the results of first day performance in the Dutch IPO market in the period of 1995 until 2015. The sample contains 63 IPOs after omitting cases that are not valid, such as financial companies or government owned, or are potential outliers.

The OLS regression does not show any prove of aggregated ownership. No models and variables combined are significant to enforce the hypothesis and as a consequence, prove aggregated ownership. A potential reason for this might the sample size. Due to the size of the Dutch equity market and lack of information available, only 63 cases are present in the OLS. Hypotheses 1,3, and 4 show an effect corresponding with the hypotheses, but none of them could significantly prove it. Hypothesis 2 showed some surprise by showing an effect in the

opposite direction. This effect was small, insignificant and in line with literature as there is no general consensus in what direction non-founder CEO and other insiders should influence first day performance. In general – though not significantly proven – this supports theory that all owners matter. Despite this first step towards aggregated ownership, the second part of the definition does not hold. Where aggregated ownership also implies that "the interaction of the total combined effect of all types of ownerships" is included, the OLS regression model finds no such evidence. In fact, all interaction variables are not even close to significant and their impact in negligible. A present and strongly significant interaction effect would imply serious impact on first day return, and give strength to the claim that aggregated ownership matters more than the largest shareholder when determining the amount of underpricing, or first day performance.

# CONCLUSION

This research has been set out to check a newly proven impact of aggregated ownership on underpricing. The Dutch IPO market in the period of 1995 until 2015 provides the setting to see if this finding holds. After controlling for certain factors such as outliers, government owned, excluding re-entries and so on, the sample comprises of 63 unique initial public offerings.

In the descriptive statistics some skewness was detected, which was the result of some outliers. After omitting these outliers no skewness was detected. Furthermore, after checking for multicollinearity seems to be some influence and therefore all models are individually check for multicollinearity. Also, heteroscedasticity can seriously impact the significance of models and variables, but none was detected. In total, six models of OLS regression have been run, in two stages to correct for multicollinearity.

First, the models seem to support the hypotheses regarding the ownership variables. Only the second hypotheses was not supported, but existing literature also has various conclusions. In the Dutch IPO market though, there appears to be no proof that founder ownership has a U-shaped impact on first day performance. Based on literature it was assumed that the amount of underpricing first increases as ownership percentage increases, but at a given point the underpricing decreases again as a result increased founder ownership. The OLS regression find no such evidence for the Dutch IPO market. Second, including interaction variables did not result in significant outcomes which should have been an important part of the aggregated ownership. Finally, the result of aggregated ownership does not hold for the Dutch IPO market, which is the main finding of this research.

This research does have some limitations. First, due to limited access of certain databases, a sample size of 63 is acceptable but not desirable. Full access to other databases would results in far larger sample size. A potential sample size of at least 129 cases could have been available for this research, resulting in better chance of detecting significant impact of variables. All information is gathered by hand via prospectuses and it is not to be excluded that mistakes are made, even though the author has been very careful and double checked all data. Furthermore, a list of Dutch companies going IPO has been retrieved from databases and some errors have been detected. For example, not all Dutch companies were actually Dutch, after hand selected several companies were omitted because of this. More or incomplete data of other companies as a result

of database data cannot be completely prevented. The author therefore advises readers to be extremely careful with databases, and to always check the data by hand.

This research has limited managerial implications. Both literature and empirical findings show that various types of owners do have an impact on first day performance, but aggregated ownership could not be proven. Therefore, existing literature can give the necessary guidance should specific information regarding certain types of owners be required.

## FUTURE RESERACH

Because one of the main challenges of this research is its limited sample size, further research could be done with the use of a bigger sample. Also, this research has been specifically for the Dutch market and literature has shown that countries differ on its impact on underpricing. As such, aggregated ownership should be actively researched in other countries due to its potential impact on existing literature. Also, no clear empirical definition of aggregated ownership exists. This research used standard OLS, including ownership and interaction. Other methods to measure the potential influence of aggregated ownership can potentially show different results as there has been no extensive history of research towards this topic.

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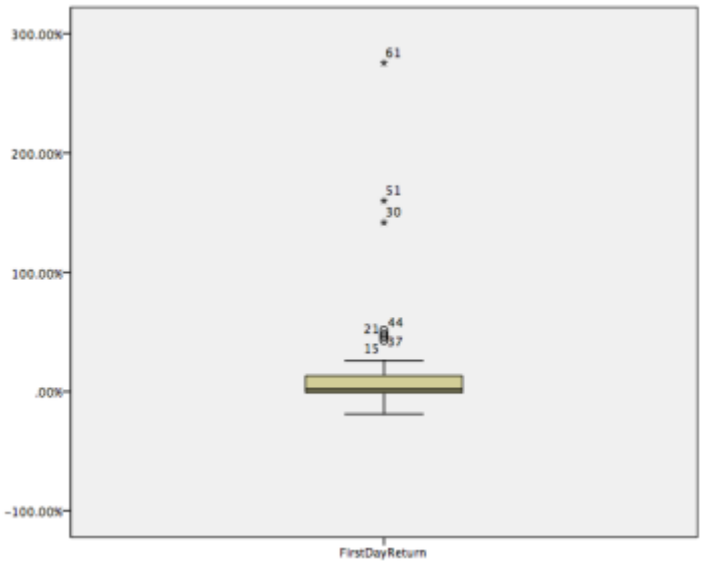
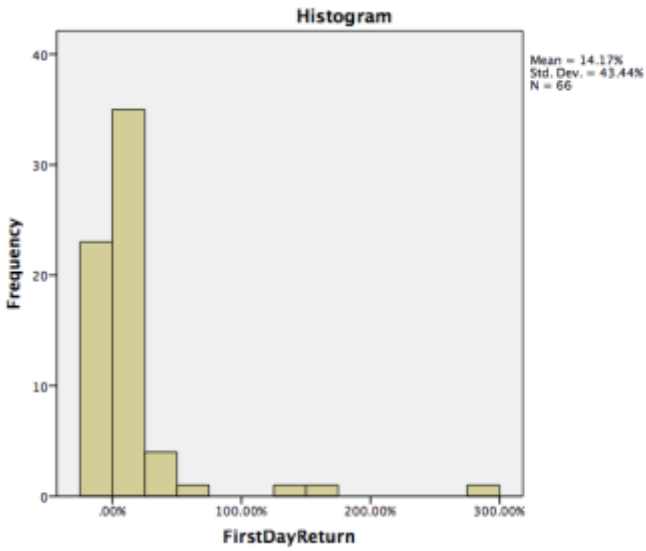
# APPENDIX I: AN OVERVIEW OF COMPANIES INCLUDED IN THE SAMPLE

| | | | |
|---|---|---|---|
| 2waytraffic | A&D Pharma | AerCap | AMG Advanced Metallurgical Group |
| AmRest | AMT | arGEN-X | AVG Tech. |
| BE Semiconductor Industries | Beter Bed | Blue Fox Enterprises | Brunel International |
| Chicago Bridge & Iron Co NV* | Cnova | Completel Europe NV | Constellium |
| Copaco NV | Core Laboratories | Crucell | Cryo-Save |
| Ctac | DOCdata NV | DPA Holding | EADS |
| Eurand | Exact Holding | Fortuna Entertainment Group N.V. | GrandVision |
| Gucci | Head* | ICT Automatisering NV | ICTS Holland Production BV |
| IMCD | Interxion | Jubilant Energy | Kiadis pharma |
| KPNQwest N.V. | Libertel | Lucas Bols | Mota Engil Africa |
| New World Resources | OctoPlus | ProQR Therapeutics | Prosensa |
| Refresco Gerber | Seagull | Sensata | Smartrac NV |
| Spyker Cars NV | TAS Groep NV | TIE Holding NV* | TMC NV The Member Company |
| TomTom | Toolex Alpha NV | Tornier NV | Trader Media East Limited |
| Triple P N.V. | uniQure | United Pan Europe Communications NV (UPC) | Versatel Telecom International NV |
| VIA NetWorks* | Vimetco | VistaPrint | Wavin |
| World Online International NV | Ziggo | Cinema City International | |
| * *Companies are excluded after checking for outliers* | | | |

# APPENDIX II: CHECKING FOR OUTLIERS

After the descriptives of table 1, panel A, it became apparent that it is necessary to check for outliers. Therefore, for both variables FirstDayReturn and Age a boxplot and histogram are produced. In the histogram it is clear that the FirstDayReturn in not normally distributed and the boxplot confirms some outliers. After omitting values 61, 51 and 30 a robustness check showed no need to exclude more variables, the skewness value was not impacted enough to justify excluding more cases.




Next, outliers were also detected for the variable Age. Only variable 13 was omitted because of this, for the same argument as mentioned before. After omitting this outlier, a logarithm of age is produced.