The Optimal Performing Exit Strategy: IPO or Trade Sale?

- A Revised Exit Valuation Analysis -

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Abstract

The aim of this research is to provide a comprehensive analysis of the performance of exit strategies, with a focus on IPOs and trade sales. Before performing the performance-analysis, this paper executes a logistic regression to illustrate which factors play an important role in the exit decision. The performance-analysis includes an Accounting Analysis, Premium Analysis, Exit Valuation Analysis and Revised Exit Valuation Analysis. The Revised Exit Valuation Analysis comprises a revised interpretation of the conventional analysis on exit valuations. Prior literature computes exit values at the time of the exit event. However, the majority of IPO exit events are subject to lock-up provisions, which bars insiders from selling their stake until the expiration of the lock-up. The existing literature does not consider lockups when computing exit values. In order to provide an adequate performance analysis of exits, this paper does take the lock-up provision into account by revising the exit values.

Keywords IPO • Trade Sale • Exit • Venture Capital • Lock-up • Multiples

"Affairs are easier of entrance than of exit; and it is but common prudence to see our way out before we venture in".

[Aesop | Ancient Greek writer]

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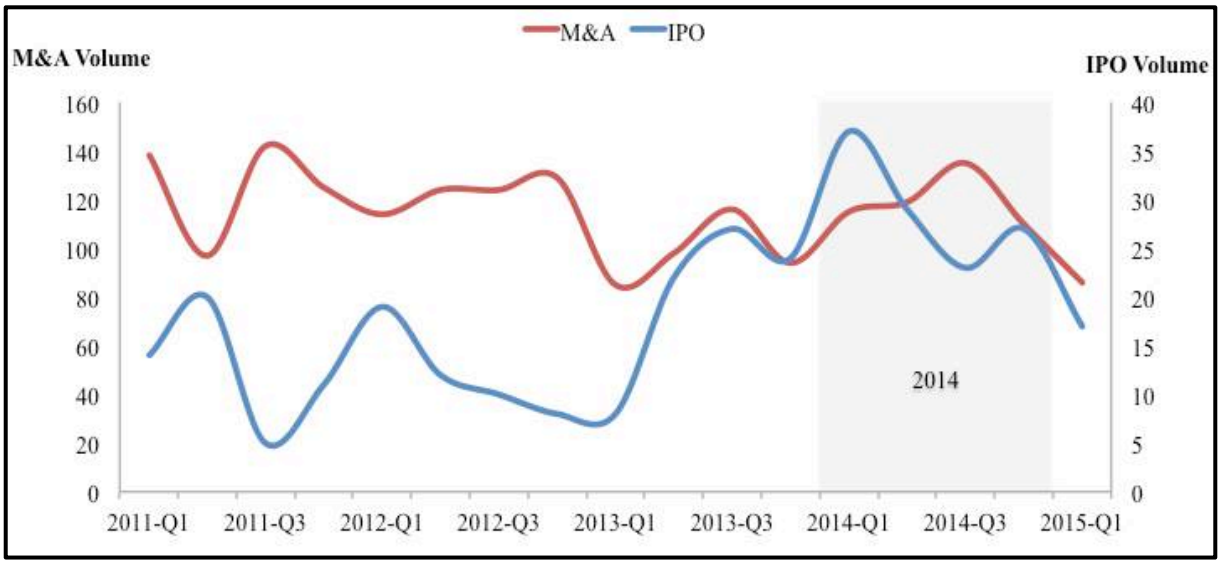
INTRODUCTION

The business climate is changing. It is the age of Silicon Valley, FinTech and "unicorns". Unicorns – the fast growing Tech start-ups with an enterprise value of over $1 billion – were once a myth that is becoming reality. In the early days these types of businesses were a dream too good to be true for investors. Nowadays it's just part of the economy, as companies such as Facebook and Uber are dominating the market and disrupting the entire industry. This evolving trend creates questions for private investors and arbitrageurs. Should they enter these companies by means of investments to take a piece of the action? A question even more important, as these mega start-ups continue growing, is *when and how to exit* as an investor? The timing of the entry as well as the exit is crucial in order to obtain an optimal return on investment. Many start-ups are financially sponsored by private investors, such as venture capitalists, business angles, and institutional investors. Raising private equity comes however with a price. An investment would not be an investment if the investor would not receive the opportunity to exit and "cash out" its stake in the company. A company exit creates a *'liquidity event'* – providing management with the opportunity to go public and raise capital, whilst providing investors with the possibility to capitalize their return. The two most common and leading exit strategies are Initial Public Offerings (IPO) and trade sales (TS).

Figure 1 illustrates the quarterly deal volume of IPOs and trade sales (M&A) between 2011 and 2015. The chart clearly indicates *2014 as a record-year of IPOs* in terms of deal activity. Many high-valued companies such as Alibaba, Lending Club, GoPro, and Virgin America exited through an IPO. Alibaba was the year's biggest IPO, setting a record of $22 billion of capital raised (Inc. Magazine, 2014). The year 2014 was especially strong for the TMT (Technology, Media and Telecommunications), Financial Services and Healthcare sector in the European private equity market. Global Tech exit activity grew with 58% on a year-to-year basis. This trend was primarily triggered by a growing global venture capital market, reaching record-levels in funding since the dot.com crisis in 2001. Venture capitalists financed $47.3 billion across 3.617 deals, with the second and fourth quarter reaching $13 billion in funding (CB Insights, 2014). Overall, the IPO exit market performed very well.

Figure 1: Quarterly U.S. Exits



**Source: Thomson Reuters, National Venture Capital Association (2015)*

However, this tremendous growth slowed down from 2015 on. IPO exit activity reached its weakest level in the first quarter of 2016, as global IPO volume declined by 38% compared to 2015. This was primarily the consequence of a highly volatile equity market due to political and economical uncertainty (PwC, 2016; Ernst & Young, 2016). Monetary policy changes, U.S. presidential elections, the EU referendum and the 'Brexit' contributed to a volatile market and risk aversion. Yet, despite these concerns overall private equity exit activity remained strong. This was particularly the result of the rise in exits through trade sales and secondary buyouts. Strategic acquisitions accounted for a total of 72% of exit activity in 2015 (Ernst & Young, 2015). Hence, investors seem to have a strong appetite for trade sales, which is also supported by the greater frequency of exits relatively to IPOs in figure 1.

Nevertheless, an IPO is often perceived as the optimal exit route due to its prominent valuations. There exists a common notion that IPOs are more profitable, leading to higher internal rates of returns and exit values (Bienz, 2004; Wall & Smith, 1998). This is visible in practice, as the largest private equity exit deals appear to be driven by IPOs. As Sachin Date (EY's Private Equity Leader for EMEIA) once proclaimed:

"Of the top 10 PE exits by value – five were IPOs, four were trade sales and only one was a secondary buyout."

Hence, IPOs appear to be leading the exit market in terms of value. Nevertheless, there exist an empirical dispute if this "outperformance" of IPOs is truly due to the exit event itself. Maybe IPO candidates are just more profitable companies (Bienz, 2004), and are these higher valuations a consequence of a sample selection bias. Or maybe IPO candidates know how to better time the exit based on market conditions compared to trade sales. This is supported by research of Bayar and Chemmanur (2010), indicating that entrepreneurs will be more likely to exit by means of an IPO at times when IPO valuations are higher.

Needless to say, an IPO is certainly *not always* the optimal way to exit the venture. One of the largest IPOs of 2014, King Digital Entertainment, ended up in a financial disaster. The company experienced a difficult time in convincing public investors, and became one of the worst performing IPOs with a loss of 16% relatively to its offering price (MarketWatch, 2014). This example is just one of the many that illustrates that an IPO is not suitable for every "upcoming youngster". The gains of an IPO can be enormous, but the process can be subject to multiple downfalls. Going public is an expensive and time-consuming process. Not only the expenses of underwriters can be extensive, but also meeting the Sarbanes-Oxley requirements and other criteria of the SEC can be gruelling. Not to forget that listed companies are subject to public scrutiny, revolving in a continuous pressure to increase earnings and "pleasure shareholders".

This explains why a trade sale may be a good alternative. Not only do trade sales occur frequently, but are also ranked as the preferred route of divestments by venture capitalists according to a survey of Murray (1994). Furthermore, trade sales do have advantages over IPOs as they are more time-efficient, and a direct way to capitalize a return on investment.

Despite this, the IPO hype keeps "on-going" and is popularized by the financial press. Global IPO activity is already picking up since the decline in 2015 (Ernst & Young, 2016), and one may wonder what to expect in the next years. Uber, Airbnb, Dropbox, Pinterest, Snapchat and several other emerging start-ups are driving investors interest and are banging at the doors of Wall Street. Are these the prime candidates for an IPO in 2016? Or should these

entrepreneurs pursue other lucrative exit strategies, such as a trade sale?

In order to answer questions such as these, investors should review their possible exit strategies. And that's exactly the purpose of this research. There are multiple means to exit, such as an IPO, trade sale, secondary sale, buyback, write-off and reverse merger (Cumming & MacIntosh, 2003). For the sake of simplicity and comparability, this paper primarily focuses on **exits through IPOs and trade sales.** The purpose of this research is to provide a comprehensive analysis on the comparison between IPOs and trade sales, *with a focus on performance*. This research will give an indication of the best performing exit strategy, and is divided into a qualitative and quantitative analysis. Firstly, this paper captures the qualitative aspects of the decision on which exit strategy to pursue. An academic literature review is provided, including a general overview of the exit market. Amongst other things, the different exit strategies including their respective strengths and weaknesses are discussed.

The quantitative analysis of this paper mainly consists of a comparison in performance between IPOs and trade sales. Exit values and multiples play an important role in analysing performance and in determining if an investment has been profitable. This thesis applies a similar exit value computation as implemented in prior literature. However, this specific part of the performance-analysis requires extra attention. IPOs are restricted to lock-up provisions. These are clauses of underwriters, restricting insiders to sell a part of their shares at the time of an IPO. A part of the shares are literally "locked up" until the provision expires. Surprisingly, prior literature does not take these lock-up provisions into account when computing exit values at liquidity events. In order to obtain an accurate representation of reality, this research does take these provisions into account when calculating exit values. Therefore, the traditional exit valuation analysis has been revised in this thesis.

The findings of this research will provide an extensive overview of the relative performance of IPOs versus trade sales, and based on this study the research-question should be answered:

Research Question: Is an IPO or trade sale a more optimal performing exit strategy from the perspective of the private investor?

This research-question is approached from the perspective of the private investor. The company's management or investors will look at completely different facets when deciding on which exit strategy to pursue. That's why it is important to make a distinction between these perspectives at forehand. To derive a well-constructed answer to this main-question, six sub-questions have been formulated:

(A.) What are the advantages and disadvantages of an IPO versus a trade sale?

(B.) What factors influence the exit decision between an IPO and trade sale?

(C.) Do IPO or trade sale candidates achieve greater operating performance before the exit event?

(D.) Do investors achieve greater exit premiums when pursuing an IPO or trade sale?

(E.) Do investors achieve greater exit valuations when pursuing an IPO or a trade sale at the time of the exit event?

(F.) Do investors achieve greater exit valuations when pursuing an IPO or a trade sale, considering IPOs comprise lock-up provisions?

Contributions

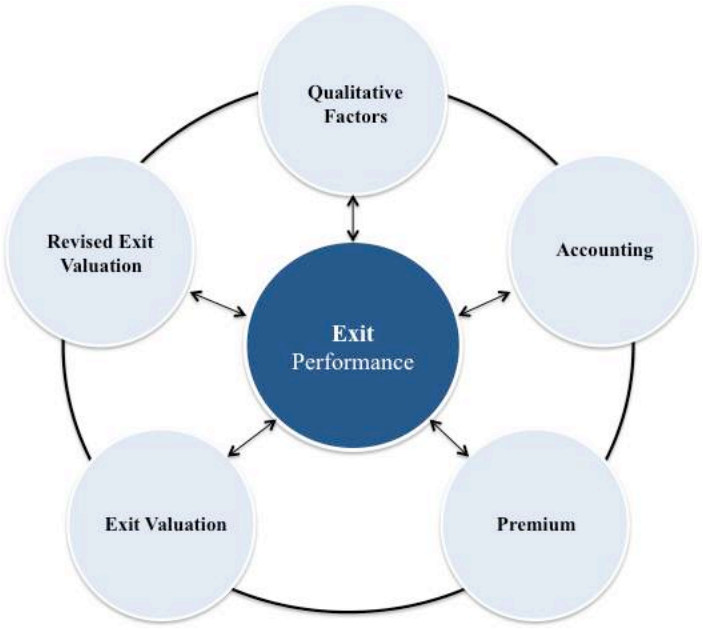
The main contribution of this report is to provide external investors with a realistic and accurate framework of differences in performance between IPOs and trade sales. There exists a great extent of literature on the qualitative factors that affect the exit decision between an IPO or trade sale. These empirical studies research the significance of macro and micro factors that are relevant in the process of selecting an exit strategy. This is however not the objective of this research! This paper mainly analyses the differences in performance and returns between exit routes. There does exist some prior research on private equity returns. The majority of this research however only captures overall fund performance, without making a true distinctive comparison between IPOs and trade sales.

Furthermore, this research attempts to shed light on the importance of lock-up agreements in order to revise and calculate realistic exit values at liquidity events. This revised performance-analysis is new in the field of private equity, and will provide an alternative method for private investors to review their exit strategies.

Outline

This paper is structured as follows. **Section 1** provides a literature review on exit strategies. This section emphasizes the different exit strategies, their respective advantages and disadvantages, the venture capital industry, and exit performance. The first sub-question (A) is answered in this section. **Section 2** clarifies the methodology and data of this research. The methodology of the different performance analyses is discussed, including the revision of the traditional exit valuation of IPOs. Also the databases are discussed, including the descriptive statistics. **Section 3** provides the results of the performance-analysis of IPOs and trade sales. The performance-analysis consists of an Accounting Analysis, Premium Analysis, Exit Valuation Analysis, and a Revised Exit Valuation Analysis. Furthermore, a logistic regression of firm-characteristics is executed in order to understand which factors may influence the decision to exit. Sub-questions (B), (C), (D), (E), and (F) are answered in this section. An overview of this performance analysis is portrayed in figure 2. **Section 4** summarizes by means of a conclusion and by addressing implications. Also limitations are identified, followed by recommendations for further research.

Figure 2: Overview Performance Analysis



**Source: B.M.M. van Hövell (2016)*

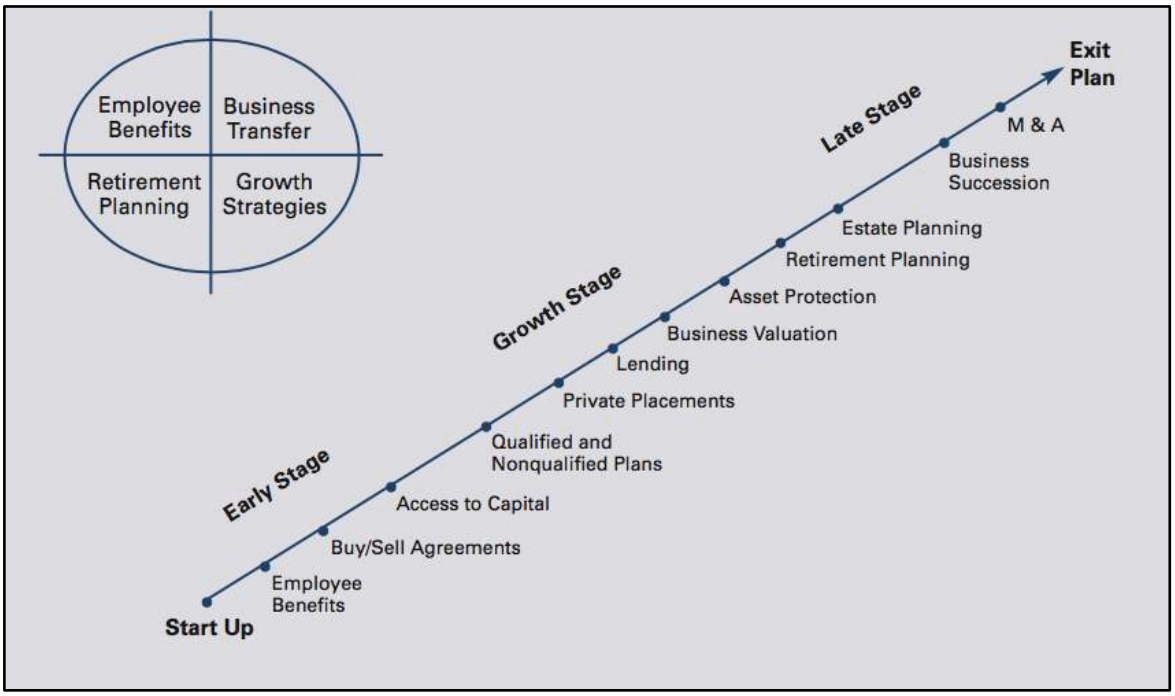
CHAPTER 1: Literature Review

"Most entrepreneurs over time should start to think about a future exit strategy because preparing for an exit takes some time, … Most of those options take some forethought and preparation. Management should be thinking about what their end goal is and the best way to get there for the company, its shareholders, and its employees."

[C.J. Fitzgerald | Managing Director Summit Partners]

This statement illustrates the importance of a well-thought exit strategy of a company. When building a new company, an entrepreneur should already think in the long term regarding the exit. It's not only the point of entry, but also the point of exit that's crucial in the development of a financial healthy business. Assumptions about the exit price are known to be the most important factor in the valuation process of target companies (Barber & Goold, 2007). Therefore, management should always take the exit plan at forehand into account when considering starting a business. This relation between entry and exit is described in figure 3, also known as the *Value Path of Businesses* (Prisciotta & Weber, 2005).

Figure 3: The Value Path



**Source: Prisciotta & Weber (2005)*

The Value Path illustrates the business cycle with its different stages, including the corresponding corporate needs. Every start-up consists of an *early stage*, *growth stage* and *late stage* in corporate development. All business stages require an amount of capital in order to "feed the needs" of the corresponding stage. Without the proper funding, growth cannot be financed nor sufficient working capital for business operations can be delivered. The stage that requires capital funding the most is the early stage. Without the required funding a start-up will never transfer to the growth or later stage. One of the biggest challenges however is attracting capital at the beginning of a start-up. Loans from banks are difficult to obtain

because of credit scorings, loan policies, loan committees and the criteria of underlying collateral. The majority of these start-ups do not meet these specified requirements. Thus, the next best thing is to reach out to investors to obtain private equity. Sources of equity are angle investors, venture capital funds, private equity groups, friends, family and founders. Typically the largest cash investors are the venture capital (VC) funds. Most VC investments fall between the range of $1 to $20 million (Prisciotta & Weber, 2005). However, investing in fragile start-ups is accompanied with tremendous risk. To compensate for this risk, venture capitalists anticipate annual targets returns of between 30% and 40% (Prisciotta & Weber, 2005). However initially, start-ups do not generate returns this big. Starting companies are accompanied with great liabilities and constrained cash flows. The exit route functions therefore as the primary way for VC firms to generate positive returns on investments. This exit plan is often executed at the later stage of the business. Since investors do not make money at the start of their investment, they have a clear wish to exit after 4 to 7 years (Schwienbacher, 2008). An exit strategy creates a liquidity event, which provides the investor with the opportunity to "cash-out" its investment. It's the corporate route to realise returns. The problem with an investment in a private company is that the firm is trading at illiquid stock. However when an exit event occurs, such as with an IPO, investors are able to trade freely on the public market. The exit event transferred illiquid stock into liquid stock, providing the investor with the possibility to exit the venture if desired. There are multiple routes to derive an exit, which are explained in the next paragraph.

§1.1. Exit Strategies

There exist various routes to exit a venture as an investor. There exist traditional and unconventional exit routes. This paragraph will firstly touch upon the traditional exit routes, followed by an explanation of the unconventional exit strategies (reverse mergers).

(A.) Initial Public Offering
An IPO, also known as a "floating", gives the issuing company the opportunity to sell its shares on the primary market, often accompanied with a listing on a stock exchange. This exit strategy does however never lead to a direct exit. Almost every IPO features a lock-up agreement. This is an agreement with the underwriter (i.e. investment bank) underlying the issue. The agreement ensures that a part of the outstanding shares are "locked-up" and essentially prohibits the insiders of the issuing company to directly sell their entire stake. The result is that the large investors are not able to directly sell their entire stake and exit directly. A lock-up agreement comprises an average time period of 180 days, but could even last longer (Field & Hanka, 2001). Lock-up agreements and their impact on exit valuations will be discussed in Chapter 8 (Revised Exit Valuation Analysis).

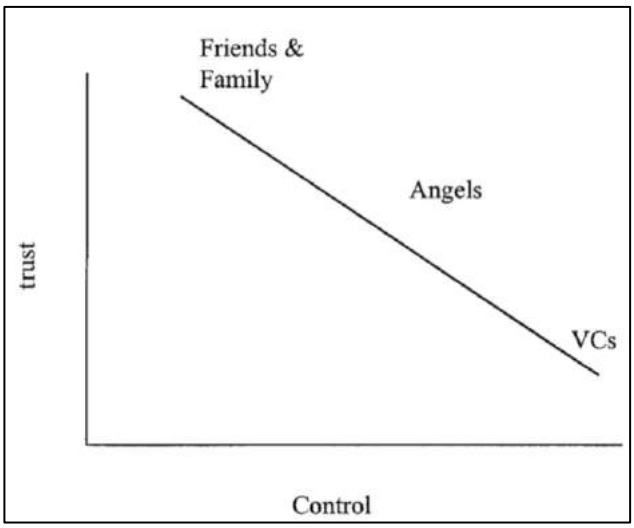
(B.) Acquisition Exit i.e. Trade Sale
An acquisition exits involves the sale of a company to a third party. A ***trade sale***, also known as a ***'sellout'*** (Poulsen & Stegemoller, 2006), is a special type of an acquisition exit. A trade sale comprises an exit event, in which a public company buys all the outstanding shares of a privately-owned company. Because the private company is fully acquired, it consolidates with the public entity. Therefore this exit strategy is known to be an alternative for going public and obtaining public status. There are different ways to execute an acquisition exit, including the sale of all shares, a merger, or the sale of the firm's assets. The buyer, or acquirer, in an acquisition exit can also vary. It can be either a financial acquirer or a strategic acquirer. In the case of a financial acquisition, the VC owner will sell the entire company to another VC firm. An underlying motivation of such a financial acquisition could be the input of the new VC owners in terms of skills and human capital (Cumming & MacIntosh,

2002). If the financial acquirer is confident about its relative skill-set compared to the prior VC owner, or if the acquirer is more familiar with the product, service, technology or industry of the firm, the new owner will probably add value to the company – making the acquisition a lucrative investment. Nevertheless, an acquisition exit most frequently involves a strategic acquirer (Cumming & MacIntosh, 2002). In a strategic acquisition both parties – the acquirer and target – often operate in the same business or industry. Such a transaction often leads to synergies, such as economies of scale or economies of scope, by integrating operations or business-lines of the target and the acquirer. These synergetic gains could also form a rationale for performing an acquisition exit, as it creates upside potential for management and investors.

(C.) Secondary Sale

In a secondary sale only the venture capital insiders sell their shares to a third party – which could again be another venture capital firm or a strategic acquirer. With this type of exit all other insiders (i.e. business angles, PE parties) and the management retain their stake in the company. A secondary sale only concerns the exit of the VC, making this exit route not very attractive for other insiders. This also leads to a disruption of the relationship between the VC and entrepreneur, accompanied with a lack of clear direction and purpose (Cumming & MacIntosh, 2003). An article of Shepherd and Zacharakis (2001) acknowledges the importance of a healthy and well-structured relationship between the VC and entrepreneur. They emphasize the relevance of achieving confidence in partner co-operation within the relationship between the VC and entrepreneur. In order to achieve this optimal level of confidence, both parties need to balance the level of "control and trust building mechanisms". The interplay between these mechanisms of control and trust, dependent on the type of investor, is illustrated in figure 4. The figure indicates low levels of trust between the VC and entrepreneur relatively to other investors, such as 'Family & Friends' and 'Angles'. Taking these findings into account, one would suggest that the breakdown of the relationship between the VCs and entrepreneurs in a secondary sale is associated with negative effects. It comes therefore as no surprise that a study of Cumming and MacIntosh (2002) claims the secondary sale to be inferior compared to the acquisition exit.

Figure 4: VC - Entrepreneur Relationship



**Source: Shepherd & Zacharakis (2001)*

Another difference between a secondary and acquisition sale is the amount of shares sold. With an acquisition exit the entire firm is taken over, whereas with a secondary sale the target is not fully acquired. The buyer will acquire less than 100% of the company, usually seeking a "window" on the firm's technology or a certain part of the operations.

(D.) Buyback

A buyback implies the transaction in which the entrepreneur or management repurchases the shares of the VC, or other private equity owners. A buyback is often the consequence of the execution of contractual rights taken by the venture capitalists. These contractual provisions are agreed at the time of the initial investment of the VC. These types of clauses require the firm to buy back the shares of the VC, if certain thresholds are not being met. For example, this could relate to the elapse of a stated period of time, failure to meet specified performance targets, or failure to go public (Cumming & MacIntosh, 2002). Like a secondary sale, existent literature also states the inferior quality of buybacks as an exit route compared to other channels. This exit route is used in situations where the investment of venture capitalists could be seen as a "living dead" (Cumming & MacIntosh, 2003).

(E.) Write-off

A write-off occurs when the business is collapsing by corporate incapability or market turmoil, and the investor had no other option to withdraw from the investment and "walk away". This will happen only if the forecasts anticipate that the initial investment of the private equity firm will not be recovered or restored (Cumming & MacIntosh, 2003).

Besides the traditional exit routes such as the IPO, trade sale, secondary sale, buyout and write-off, there exists also unconventional exit routes that investors could consider. An example of such an exit is *the reverse merger*, which is explained in the paragraph below.

(F.) Unconventional Exit: Reverse Merger

Managers, who want a simpler and cheaper alternative than the traditional route of an IPO to go public, could consider a *reverse merger*. However, reverse mergers most frequently trade on small exchanges or Over-The-Counter (OTC), which leads to limited data availability. That's also why this exit route is not examined in the empirical research of this study. Nevertheless, reverse mergers are known as the substitute of IPOs, and it's thus highly relevant for investors to consider when planning an exit.

A reverse merger is a merger or takeover of a public company by a private company in order to go public, and bypass the time-consuming and expensive process of an IPO. It's a fast-track option to obtain public status through the exchange of the private company's shares for the public company's shares. The private company engages in a stock swap in order to obtain control of the public listed company. After completion of the reverse transaction, the management of the private company frequently replaces the management board of the public company, resulting in a new public entity (Gleason, Jain, & Rosenthal, 2006).

The public company involved in this transaction functions, and is therefore often referred to as a "shell" company. The typical shell company is a "hollow corporate entity", that went through bankruptcy, and has thus *nominal* assets and day-to-day business operations (Feldman D. , 2012). Because the shell company has no business operations, this vehicle functions as an optimal platform for the private company to transfer into a public entity. The complete process of the reverse transaction is illustrated in figure 25 of the Appendix.

A reverse merger has relative advantages over an IPO, and may function as an appropriate alternative. One advantage is the time-efficiency. When performing an IPO, a firm has to meet several requirements of the SEC. The requirements for reverse mergers are, in contrast, less demanding. In addition, firms that engage in a reverse merger do not have to apply to disclosure requirements. Unlike an IPO, very little financial information of the private firm has to be disclosed before the transaction (Gleason, Jain, & Rosenthal, 2006). Thus, reverse mergers involve less scrutiny of the SEC, which results in a faster completion of the

transaction, typically taking between one to six months (Atkins, 2011). The process of an IPO however can be extensive and could take longer than one year. Thus, the relative short completion period of reverse mergers can be seen as an advantage and a motivation to engage in such a transaction (Gleason, Jain, & Rosenthal, 2006).

Reverse mergers are also known to be less costly relatively to IPOs (Lee, Li, & Zhang, 2013; Gleason, Jain, & Rosenthal, 2006). The latter requires investment banks to underwrite the transaction, resulting in underwriting fees. This is not the case for reverse mergers, which will save costs for the private entity. Not every company features the ability and capabilities to execute an IPO due to financial constraints. A reverse merger is faster and cheaper, which can be favourable for small and mid-capitalized firms. That is also the reason why this transaction is often referred to as *"The Poor Man's IPO"* (Forbes, 2011).

Yet, reverse mergers also posses disadvantages compared to IPOs. One disadvantage is the risk of the incorporation of "shady" shells in the reverse transaction, which may have questionable business activities or disorganised financial records. The existing law governing reverse mergers is relatively mild compared to IPOs. Amongst other things, this consequently resulted into accounting scandals and fraud (Lee, Li, & Zhang, 2013). This uncertainty of a legitimate and applicable shell may form a burden of the reverse merger.

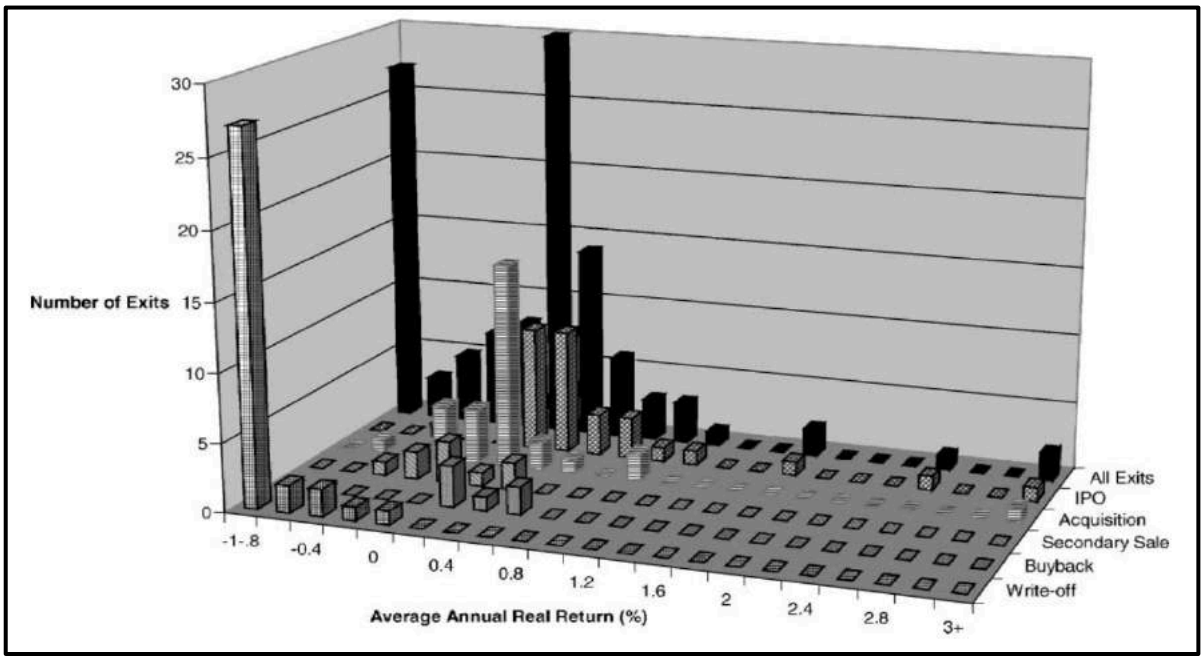
Prior literature presents another disadvantage of the reverse merger. The majority of research consistently presents that firms engaging in reverse mergers are riskier and more speculative (Feldman, 2009; Sjostrom, 2008). A study of Adjei et al. (2008) shows that reverse merged companies are usually smaller, younger, riskier and achieve relatively worse ex ante performance. In addition, their study finds that 42% of the reverse merged firms are delisted within three years, compared to an amount of 27% of matched IPOs. These figures support the alarming risk profile of a reverse merger.

Based on these disadvantages and advantages of reverse mergers and IPOs, managers and insiders should carefully decide on which exit route to pursue – *traditional versus unconventional*. However, one final critical note on the comparability of these two exit strategies. Many business journals portray reverse mergers as the perfect substitute of an IPO. Yet, the majority of reverse merger candidates are in fact not completely comparable to matched IPO candidates and are also not IPO-eligible (Lee, Li, & Zhang, 2013). Many companies issuing an IPO land on large national public exchanges, whereas the majority of reverse merger candidates trade on informal exchanges such as the OTC or "Pink Sheets".

Scope of Research

The scope of this study only considers IPOs and trade sales as exit routes. The rationale for only focusing on IPOs and trade sales is that these are the most fundamental exit routes of successful entrepreneurial companies backed by venture capital (Sahlman, 1990; Gompers & Lerner, 1999; Cumming & Johan, 2008). All alternative exit channels, such as secondary sales or buyouts, generate lower profits consequent to the exit (Cumming, Fleming, & Schienbacher, Legality and venture capital exits, 2006; Hedge, Palomino, & Swienbacher; Cumming & MacIntosh, 2003). IPOs and trade sales are also the leading exit routes in terms of volume and deal activity. This is supported by a study of Cumming and MacIntosh (2003), illustrated in figure 5. As shown in the chart, the number of exits is highest for IPOs and acquisitions (trade sales).

Figure 5: Deal volume and Return of Exits



**Source: Cumming & MacIntosh (2003)*

Furthermore, the chart supports the fact that IPOs and trade sales generate the highest returns amongst all other exit strategies. Therefore, one could suggest that these two exit channels are the most noteworthy and appealing to investors. This explains the rationale of this thesis to study primarily the performance of these two transactions.

An additional reason for the focus on IPOs and trade sales is because of the comparability between the two. It's difficult to compare exit strategies, which are totally different in its nature, such as comparing reverse mergers with a secondary buyout. However, IPOs and trade sales are comparable exit strategies as they have similar functions and purposes. One example of a similar purpose is that both exit routes ensure that the privately-owned company becomes a public entity by getting listed. In the case of an IPO the company goes public, and with a trade sale the private company gets integrated into the public company.

Besides public status, a study of Francis et al. (2009) addresses other purposes that are similar between IPOs and trade sales, which are outlined below:
(1.) Both exit routes are used to raise capital funds,
(2.) Both exit routes are used to create liquidity for owners, and
(3.) Both exit routes are used as a way to shift ownership and control

Hence, IPOs and trade sales are comparable exit strategies in many ways, and this explains the motivation for the scope of this thesis.

§1.2. Advantages & Disadvantages of Exit Routes

Despite similarities, IPOs also differ from trade sales in several ways. These differences create comparative advantages or disadvantages, which are outlined in this paragraph. The differences – underlying respective "pros and cons" for the investor – can be summarized by the following categories: (A.) ownership, (B.) regulation and costs, (C.) valuations, (D.) information asymmetry, (E.) synergy, (F.) lock-up provisions, (G.) dual-track exit, (H.) innovation, (I.) public scrutiny, and (J.) market and company. These are discussed below.

(A.) Ownership

A trade sale functions as a direct exit. The entire company is fully acquired by the public entity. This means that all insiders, including the management and founders, have not only lost ownership – but also control over their company. All private insiders have lost the ability to influence firm policy due to total dilution of ownership (Poulsen & Stegemoller, 2006).

This matter on losing control could trigger internal conflicts between the entrepreneur and private investors. Private investors are eager to capitalize their investment by means of a trade sale at a certain point in time. The entrepreneur however, could have the incentive to avoid a trade sale, and the preference to retain control over the company. A trade sale will have the consequence that the "entrepreneurial team" (i.e. founders and executives) will lose control over the firm and even may lose their jobs. This explains why some entrepreneurs would prefer to stay independent, or to exit by means of an IPO rather than a trade sale. It also illustrates the divergence in interests between insiders that engage in a trade sale (Broughman & Fried, 2013).

In the case of an IPO, management stays in charge and retains control on firm policy. Nevertheless, the level of ownership does also change as a consequence of the public offering. Becoming a listed company typically leads to a separation of managerial control and stock ownership. This could have negative effects on managerial incentives (Mikkelson, Partch, & Shah, 1997), leading to agency problems. The median ownership stake of insiders significantly declines from the year before the exit event to ten years after the event. In other words: an IPO also results in dilution of ownership, consequently leading to weaker levels of control. Nevertheless, a trade sale generally leads to a relatively greater dilution of ownership.

That's why insiders, who aspire great levels of control over their company, would probably prefer an IPO to a trade sale (Brau, Francis, & Kohers, 2003).

(B.) Regulation and Costs

The costs of an IPO are greater compared to a trade sale, which can be seen as a relative disadvantage. These costs comprise costs associated with the initial registration at the SEC, the requirement of continuous public disclosure, underwriter fees, and the effects of 'underpricing' at the time of the IPO (Poulsen & Stegemoller, 2006). All these types of costs don't incur in the course of a trade sale, which makes this strategy a cheaper method of exit.

A frequently occurring feature of an IPO is underpricing. An IPO is considered underpriced when the offer price of an IPO falls below its market value. This implies that the stock is trading below its intrinsic value, and is therefore undervalued. Underpricing occurs when there is uncertainty related to the level of liquidity in the market, or uncertainty related to the level at which the stock will trade. There exist information asymmetry between the issuing company and potential new public shareholders. Firms know exactly the true value of the company at the time of the public offer. In contrast, the potential public buyers don't. This leads to uncertainty in the market. Companies don't want to send a signal that their stock is overvalued. In order to send a strong positive signal, issuing firms will underprice their stock at the time of the public offer. A study of Ritter (1984) presents evidence supporting the underpricing effect. This paper reports first day returns of 18.8% for IPOs from 1960 to 1982. In addition, a recent study of Ritter and Welch (2002) illustrate an immense high underpricing effect on returns of 65% for IPOs during the Internet Bubble.

The reason for mentioning underpricing, is that this process represents a significant cost of an IPO. Underpricing can be seen as a cost, as the issuing firm literally wastes money. Issuing firms "leave money on the table". The costs associated with underpricing of an IPO are estimated to be 11% for IPOs from 1990 to 1994 (Lee, Lochhead, Ritter & Zhao, 1996; Poulsen & Stegemoller, 2006). As this underpricing effect of IPOs is of significant size, investors should take it seriously when reviewing exit routes based on their costs.

In addition, trade sales are faster and simpler methods to exit a venture (Wall & Smith, 1998). This is primarily due to the fact that trade sales are subject to a lesser extent of regulation criteria or legislation. Firms performing IPOs, on the other hand, have to apply to many binding requirements of the SEC, resulting in a time taking and costly process. Not to forget the demanding set of rules of the Sarbanes-Oxley Act, putting extensive financial reporting requirements on an issuing company. This stringent set of regulations leads to a lengthy process of an IPO, that may take months or even years, whereas a trade sale could be completed in just a couple of weeks.

Hence, trade sales provide advantages in that they are faster and cheaper channels to exit a venture. Companies who are financially constraint or budget-minded should therefore consider a trade sale instead of an IPO.

(C.) Valuations

An advantage of IPOs is that they often receive greater valuations, and thus a higher price at the time of the exit. This is supported by a study of Lerner (1994), providing evidence of significantly greater return to investments of IPOs relatively to trade sales. The IPO return appears to be *more than four times larger* than that of a trade sale backed by venture capital, justifying higher levels of valuations of IPOs. The price an IPO receives depends however strictly on market conditions. This is summed by a quote of a major European venture capital fund (anonym) from a survey by John Wall and Julian Smith (1998):

"You get the best price if the market is strong –

it also flushes out the trade buyers."

This market timing strategy is also verified by another study of Lerner (1994), examining IPOs of the biotech industry between 1978 and 1992. This paper analyses the differences between IPOs and private financings, and finds that venture capitalists successfully time an IPO by taking companies public when valuations are highest at short-term peak levels. This research explains why IPOs receive high valuations, based on a market-timing strategy.

(D.) Information Asymmetry

Different exit routes obtain different degrees of information asymmetry between insiders and outsiders. IPOs are associated with the greatest degree of information asymmetry compared to other forms of exit, such as trade sales, secondary offerings, buyouts and write-offs (Cumming & MacIntosh, 2003). This is partly due to the knowledge and skill deficit of the "unsophisticated" public buyers. These buyers are typically institutional investors. In the case of a trade sale however, the buyers are often strategic acquirers. The level of experience and skills of the institutional investor is dramatically below that of the strategic acquirer. This

experience deficit will raise the level of information asymmetry in the case of a firm that is performing an IPO.

This high level of information asymmetry creates a disadvantage, as it could lead to negative signalling. When a company engages in an IPO, there exist information asymmetry between the public market and insiders of the issuing company. The new potential shareholders do not have detailed information on the true fundamental value of the company. However, management is aware of the exact value of the firm at the time of the exit. This creates uncertainty in the public market. Insiders who sell a large portion of their stake of the issuing firm will send a negative signal that the IPO is overvalued (Leland & Pyle, 1977). This negative signal could lead to a drop in the price and value of the company.

In contrast, a company engaging in a trade sale will be less subject to the negative signalling effect. This is because the acquirer in a takeover will face fewer information asymmetries regarding the fundamental value of the target (Leland & Pyle, 1977). Therefore, in the case of a trade sale the insiders could divest the entire company by selling it to the acquirer, who may not interpret this divestment and exit by insiders as a negative signal. That's also why information asymmetry creates a disadvantage for IPOs relatively to trade sales.

(E.) Synergy

An advantage of a trade sale is the possibility of synergies between an acquirer and target in the takeover. The success rate of a company to establish itself in the product market and to compete with its industry competitors increases significantly through the considerable support and synergies provided by the acquirer (Bayar & Chemmanur, 2006). A firm issuing an IPO, on the other hand, gains no synergies with another party and has to fight the battle on his own in the competitive market. An example illustrating the positive impact of synergies was the merger between the online brokerage firm CyBerCorp, and Schwab. This transaction gave the merged entity access to a $6.6 million retail brokerage account, access to the institutional market, and access to international connections – all defined as synergies. Synergies are more than just cost-efficiencies or revenue boosting processes, and could add value by different means. This explains why many acquirers are willing to pay a *premium* on top of the stand-alone firm value in a trade sale. This premium captures the synergy gains, market share or new market entry gains (Wall & Smith, 1998). This premium ends in the hands of investors and other insiders, making a trade sale with synergies an attractive option for an exit.

However, not all trade sales consist of synergies. These "perks" are highly dependent on the type of transaction, the target and acquirer, and the industry and market. In addition, prior literature has shown that synergies are often overstated and over-emphasized, leading to valuation errors or disappointments after the transaction (Koller, Goedhart, & Wessels, 2015). This could result in post-merger integration problems. Hence, management of the target or acquiring firm should be careful when analysing the "synergy potential" of a trade sale.

Yet, the ability to gain synergies functions as a main driver to conduct a trade sale. This is empirically supported by a study of Poulsen and Stegemoller (2006), examining the *motivations* behind a trade sale and IPO. Table 19 in the Appendix illustrates an overview of these underlying motivations. The authors found that **80.9%** of the trade sale' firms have claimed 'synergies' to be the reason to conduct the exit. This illustrates that trade sales are motivated based on strategic considerations, and that synergies play a prominent role.

(F.) Lock-up Provisions

One could argue if an IPO is really a true exit… IPOs are subject to lock-up agreements, preventing an initial 100% exit. A lock-up is an official agreement between the underwriter and management of the issuing firm. This provision "locks" a certain amount of outstanding shares at the time of the initial public offering, in order to create confidence among institutional investors and to send a positive signal to the market. Such a lock-up provision typically takes a period of around 180 days (Field & Hanka, 2001). This may be truly frustrating for investors as they are being prohibited to exit at the time of the liquidity event. One could therefore argue that an IPO is more like a "gradual exit" instead of a direct exit.

This "continued shareholding" is also accompanied with risk (Wall & Smith, 1998). Venture capitalists are "strapped" to their holdings, and have no other option than to wait. Waiting and sitting on your investments creates risk. Returns cannot be realized in this way, and investors face the risk of a volatile stock price. If the stock price falls below the offer price of the IPO, an investor relatively makes a loss. Thus, the retention of ownership may be a costly practice for the private investor (Lin & Smith, 1998). That's why venture capitalists prefer to sell as much as possible at the time of the initial offering (Lin & Smith, 1998). Yet, the investor has no other option to hold on to the stock until the lock-up period expires.

In contrast, trade sales are almost never subject to lock-up agreements. An acquisition can be completed in the form of a cash- or stock-deal. When an acquisition is paid in cash, investors face a direct exit as the entire company is taken over. As there are no shares involved in the payment structure, a lock-up agreement is dispensable. But even when an acquisition is paid in the acquirer's stock, lock-up provisions do not frequently occur. A lock-up provision is implemented to stabilize the financial market by preventing insiders from selling their entire stake. However the acquirer is often an established listed company, implying that the sale of a block of shares is unlikely to destabilise the share price. A lock-up agreement will thus be redundant. If shareholders are affiliated with the target or acquirer, mergers and acquisitions (as with IPOs) may be constraint to resale restrictions of stock to avoid insider trading (Borgogni & Moloney, 2003). However these regulations are not similar to the contractual agreements as with lock-up provisions, and are therefore ignored in this research.

Overall, IPOs are subject to lock-up agreements whereas this is almost never the case for trade sales. An IPO is therefore not a direct exit and more complicated – which may be a motivation to pursue a trade sale instead of an IPO.

(G.) Dual-track Exit

According to a survey of John Wall and Julian Smith (1998) on exit events, pursuing an IPO can be advantageous, as the process until an initial offering may trigger pre-emptive bids of trade buyers. This means that the preparation process of an IPO could end in a dual-track exit. A dual-track exit is an approach of a selling company, in which the firm leaves both exit options (IPO and trade sale) open. The firm prepares for an IPO – while welcoming bids of strategic or financial buyers. The preparation process of an IPO is lengthy, and creates media attention. This public event may attract buyers who are interested in an acquisition, leading to a dual-tack exit. In the end the target selects the most optimal option.

Such a dual-track exit process could be advantageous for investors, as it creates flexibility to select the most optimal exit route in terms of returns and non-monetary benefits.

(H.) Innovation

Innovation is another factor that is worthwhile taking into account. Innovation often leads to growth, and may be necessary for a company to compete in a fierce market or to sustain financially strong. As innovation contributes to growth and development of a company, it surely also adds value for investors. Both exit events, IPOs and trade sales, have a significant impact on the innovative character of a company. This is confirmed by a study of Aggarwal and Hsu (2012), who examined the effects of an exit event on the level of innovation. They analysed the post-innovative outcomes of an IPO versus a trade sale. They measure 'innovation' by patent and product data in their study. Innovation reaches peak levels the years following an IPO, because of an increase in forward patent citations and in product portfolio outcomes. This astonishing increase is however only a *short-term effect*, as the effects fade over time. An acquisition has different effects on innovation outcomes. Firms following a trade sale experience a *lasting and stable* increase in innovation. Yet, the average patent originality and generality are neither less strongly affected by the exit event.

Hence, the exit route selection has a significant impact on innovation of a firm. This may play a role when deciding on which exit route to pursue. A firm, eager to sustain durable innovation in the long-term, may prefer a trade sale to an IPO in order to achieve this.

One critical note however. Innovation is important to a firm as it's used as a tool to survive in a changing competitive market. Hence, highly relevant for the management and survival of the company – however less relevant for investors and their optimal route to exit! An investor, eager to exit the venture and to generate maximum return, is less involved and concerned about the long-term survival of the company following the exit. Therefore one could argue if innovation is important for the exit decision when looking from an investor perspective. If investors pursue a direct exit, they probably feel less concerned. But if an investor has to wait until the lock-up agreement expires after 180 days, innovation may become relevant as it has an impact on firm performance and the stock price development.

(I.) Public Scrutiny

"Professionals are terrible at forecasting bear markets. The media's worse."

[Kenneth Fisher | CEO Fisher Investments]

This quote underlines the harmful impact media and social platforms can have on forecasting and on financial markets in general. Media drives and "feeds" speculation on stocks and other financial assets. These effects of speculation could support, but also harm a business at the same time. A company involved in an IPO creates much more public acknowledgement and media attention compared to a trade sale. And could therefore initiate stock speculation.

In addition to speculation, media attention also creates a continuous pressure for the issuing company to outperform market expectations, and to sustain stable earnings for its shareholders. It also creates a tension to pleasure the other stakeholders. These forms of public scrutiny are less apparent for trade sales, which could be seen as a relative advantage.

(J.) Market & Company

The number of potential buyers differs completely between the two exit strategies. IPOs are focussed on the entire public market – creating possibilities for many investors to buy stock.

The amount of potential buyers is enormous, and therefore many investors need to be convinced about the value of the company. This could lead to additional costs, respectively resulting in a share price drop of an IPO (Chemmanur, He, & Nandy, 2005).

Trade sales only consist of a few potential acquirers, which could be a relative advantage to an IPO. The private target has only to convince the acquirer of its intrinsic value, leaving less room for speculation.

However, having a relatively small amount of potential buyers has also downsides. In some countries there are only a handful of appropriate trade buyers (Wall & Smith, 1998), decreasing the number of options and bargaining power in such deals. Raising capital may also be negatively affected by the small supply of buyers. Not only is it more difficult to raise sufficient capital at the moment of transaction, but a trade sale could also trigger problems on raising capital along the way. The financing of the private firm's projects would be competing with the financing of other projects of the acquiring firm in a trade sale transaction. Most of the time, there is not sufficient capital to finance all projects and there has to be made a decision on how to allocate these resources. Thus it could be more difficult to raise capital for the firm's projects (Poulsen & Stegemoller, 2005; Stein, 1997).

It's not only the market conditions, but also the company's characteristics that play a role in the exit event. It's common notion that IPOs are impossible for small companies, leaving these firms only with a trade sale to exit the venture (Wall & Smith, 1998). This was also reported by the Wall Street Journal in 2012, stating that most small ventures prefer taking loans or using credit cards in order to raise capital rather than issuing an IPO (Chron Magazine, 2015). The reason for this is that most small businesses cannot afford the costs associated with an IPO. These costs typically fall in the range between $250.000 to $1 million (Chron Magazine, 2015), which could be a real burden for a growing start-up!

The SEC made an attempt to change this, by introducing the committee's new 'regulation A+' in June 2015 (Suhay, 2015). This new regulation represents a change to the former used 'regulation A', which allowed small companies to raise capital but contained difficult registration rules. The SEC has introduced this new regulation to make raising capital easier and less costly for small enterprises. These companies, planning to pursue a so-called "mini-IPO", are now subject to less scrutiny and more stimulated to complete the transaction.

This new rule may change the game. Maybe small ventures will now more frequently conduct an IPO – prior to be seen as difficult. Yet, there are many critics questioning if this new rule will lead to its intended effects (NASAA, 2013). Even so, one thing is sure, this regulation change will reduce the differences between large and small firms in terms of which exit route to pursue. This will enhance the flexibility of the small entrepreneur and company size will play a less relevant role.

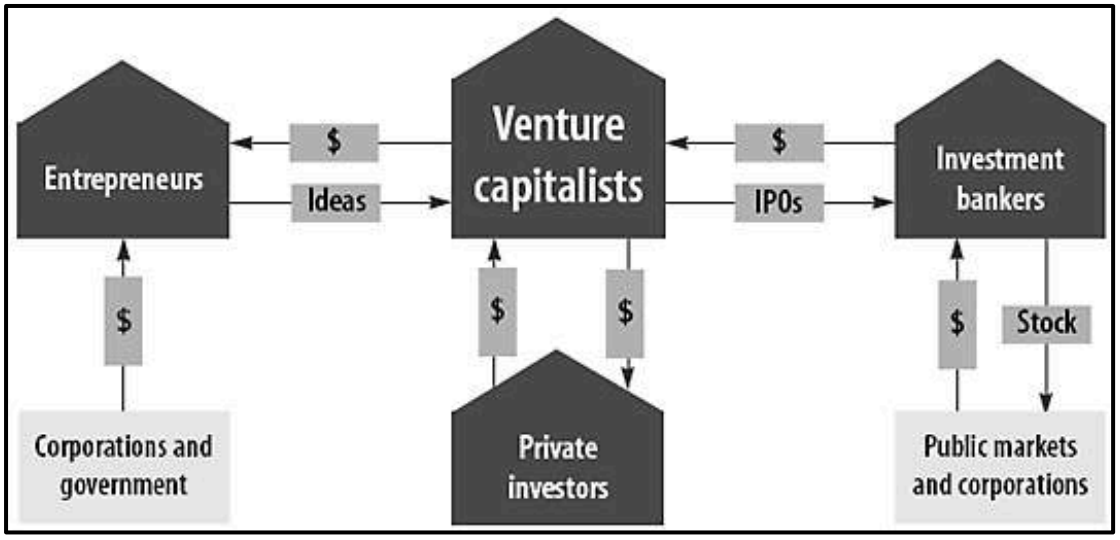
§1.3. Venture Capital

The venture capital industry has supported many start-ups to develop into successful corporations, such as Apple Computer, Intel, and Microsoft. However everything comes with a price, as venture capitalists leave their mark on the invested company. According to a study of Bayar and Chemmanur (2006), venture capitalists affect the exit decision, thereby influencing the decision between *an IPO versus a trade sale*. This could be a problem, as venture capitalists and entrepreneurs may have conflicting interests. Entrepreneurs are not only focussed on realizing returns, but also acknowledge the benefits of control. Whereas

venture capitalists make the exit decision solely based on financial incentives (Bayar & Chemmanur, 2006). This illustrates a potential gab between the entrepreneur and VC. Because of the significant influence of the VC on the exit event, this paragraph will emphasize this type of investor.

VC firms are professionally managed funds of private capital with the main objective to invest in new private (tech) ventures. Simply said, these funds raise money of institutions and wealthy individuals in order to invest and become one of the early-stage investors of start-ups. In former times, banks traditionally provided financing in order to support a company. However due to the strict regulation and credit criteria, it has frequently become impossible for start-ups to acquire sufficient capital from commercial banks. This created a gap, which led to the rise of VC. The VC firms became the prevalent intermediary in financing, acting as the "market maker". Figure 6 illustrates these mechanics of the VC industry.

Figure 6: The Venture Capital Industry



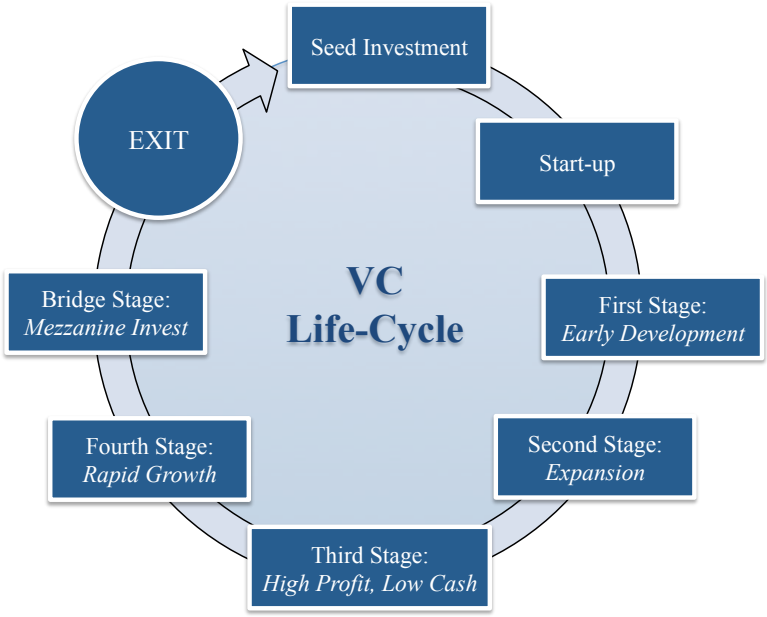
**Source: Zider (1998)*

As the figure shows, the industry has four primary players: the entrepreneurs, venture capitalists, private investors and investment banks. It all starts with the need for capital of entrepreneurial firms. Venture capital firms satisfy this need by gathering a pool of money from investors. When the investment matures, investment bankers are eager to "jump in" and to facilitate the exit through an IPO or acquisition. All these steps in the entire process are coordinated by the venture capitalist – "*making the market" for all players in the industry*.

In return for all these services, VCs receive tremendous returns, often around ten times the return of capital (Zider, 1998). The typical portfolio has an average annual compensation between $0.2 and $5.4 million, depending on the annual internal rate of return (IRR) of the fund (figure 26, Appendix). However, high returns are usually accompanied with high risk following traditional economic theory. And that's certainly the case with VC investments. The probability on company success in the VC industry is less than 20%, indicating the enormous risk venture capitalists face when making an investment (Zider, 1998). Company success depends on various critical components, making it therefore a risky business (these components are illustrated in figure 27 of the Appendix). If only one of these components deteriorates, the chance on success decreases immediately.

Nevertheless, is risk of failure the only reason why VCs claim tremendously high returns? Prior literature recognizes the active involvement as another reason. *"VC investors are active, value-added investors"*, according to a paper of Cumming and MacIntosh (2003). They are a source of knowledge, skill and network. The main contributions of VC's recognised by the existing literature can be categorised into **(1.) monitoring** and **(2.) certification**. Monitoring implies the active role of the VC, and their influence on company' decisions. They take place on the board of directors, provide advice and consultation, and control the recruitment process. The most essential mechanism for controlling the firm is by staging the commitment of capital (Sahlman, 1990). Venture capitalists invest their funds not all at once – but instead invest at specific stages in the development of the venture. At every stage the VC can make a decision to invest, consequently leading to a financing round. Every stage could thus trigger an entry, but also an exit at the same time. These stages of VC investing are shown in figure 7. The cycle of a firm can be divided into various stages, from the seed phase till the exit.

Figure 7: VC Investing Stages



**Source: Sahlman (1990) – modified by B.M.M. van Hövell*

By investing capital not at once, but only at certain stages, VCs preserve the right to abandon the company at these stages. It also provides incentives to management to make good use of the available funding. This explains how VCs gain control of the firm (Sahlman, 1990).

Figure 7 also displays the formation of the exit event. VCs step into a business in order to finance development and growth, with the intention to exit at its optimal level. *"Venture money is no long-term money"*, according to Harvard Business Review (1998). VCs invest in a company's operations to develop it to an optimal size with credibility, so that it can be sold through a trade sale or IPO. This point of exit often starts after 'the bridge stage' (see chart), and takes around 4 to 7 years (Schwienbacher A. , 2008).

One may wonder what incentivizes a VC to exit. A study of Cumming and MacIntosh (2003) finds that a venture capitalist will have the incentive to exit if the projected marginal added value, as a result of the VC's commitment, falls below the projected costs of the VC. This happens when the VC's skill-set has been exhausted, the maintenance costs have sharply increased or, when the marginal added value has unexpectedly declined. Another reason for

an exit may be the overvaluation of a venture – giving the VC the opportunity to exit at an abnormal price.

VCs also contribute to firms by means of *certification*. Companies, who are sponsored by VC, will send a signal of higher quality – consequently attracting better underwriters and analyst coverage (Dai, 2007). VC's have the reputation that they invest in growing companies and that they add value along the way. In other words, a firm that is VC-backed sends the signal that it is undervalued, which is lucrative for potential buyers. Hence, VCs engage in positive signalling and "certify" the start-up in a fruitful way.

The existing literature finds empirical evidence that VCs add value by improving company performance through active involvement, monitoring, and certification. Monitoring contributes to better stock and operating performance of VC-backed firms following an IPO. The same holds for certification, leading to better stock performance in the short and long run (Dai, 2007). This positive valuation effect of VC-support indicates that *investor identity matters!* VCs not only affect the exit decision, but also contribute to company' performance. This obviously affects the exit valuation of IPOs and trade sales and will cause differences in performance between exit events *sponsored by VCs,* and exit events that are *not sponsored by VCs*. For this reason, this paper makes a distinction between VC and non-VC backed firms, when analysing the performance of IPOs and trade sales. By means of this separation I can examine if performance differs and if my results are in line with prior literature, stating that investor identity matters. This will be further explained in Chapter 2 (Methodology).

§1.4. Exit Performance

There exist an extensive level of academic literature that approaches venture capital and exit routes *from a qualitative perspective*. Prior literature explains the structure of VC funds, with all its financing rounds and development stages. The different exit routes, and all the micro and macro factors influencing the exit decision, are also evaluated by many academics (Brau, Francis, & Kohers, 2003; Poulsen & Stegemoller, 2006). However there are *few* academic papers analysing the returns and performance of private equity funds. There is even less academic research on the performance of the different exit routes of these private equity investors. This is illustrated by a quotation of a paper of Das, Jagannathan and Sarin (2002):

"Little is known about the risk and return characteristics of private equity investments."

The reason for this shortfall in academic literature is the limited availability of data (Ljungqvist & Richardson, 2003). Examining private equity investments and exits may lead to data problems because of the dependency on information of private firms. Nonetheless, based on supporting evidence of Poulsen and Stegemoller (2006), I believe there is sufficient financial information in order to construct a valid and genuine sample of exit announcements in this research. In order to create such a liable data sample, this paper sets specific criteria when extracting data from the financial databases, which is explained in Chapter 3 (Data).

The academic literature on private equity and exit returns can be divided into two main streams: (1.) private equity performance at the fund level, and (2.) exit returns of particular exit strategies. These two categories, with corresponding literature, are discussed on the next page.

(1.) Private equity performance at the fund level

There exists literature on aggregate private equity performance, and on performance at individual fund level. A work of Bygrave and Timmons (1992) examined the performance of venture capital funds between 1974 and 1989. They reported an average internal rate of return of 13.5% for this time period. Another study of Chen, Baierl and Kaplan (2002) presented similar results. They focussed also on venture capital fund performance, and examined a sample of 148 VC funds. They found an annual compound average return of 13.4%, and an annual arithmetic average return of 45%. A third study, Ljungqvist and Richardson (2003), also focussed on VC fund-level performance by analysing the cash flow, return and risk characteristics of private equity. They reviewed all VC investments of one large institutional investor, and found an internal rate of return of 19.81%. In addition, they suggested that private equity returns outperform the aggregate public market with 5% to 8% per annum.

Hence, the majority of academic literature on private equity performance presents highly positive returns, and an outperformance relative to the equity market. In contrast, a research of Kaplan and Schoar (2005) illustrates opposing results (table 20, Appendix), by presenting a zero outperformance of VC investments on performance and capital inflows of private equity partnerships. Their findings suggest that the average fund returns (net of fees) are an approximate *equivalent* of the returns of the S&P 500. Gross of fees, the private equity returns slightly outperform the S&P 500. However, the authors acknowledge potential sample selection biases in their research, but do not correct for these.

A more recent study of Cochrane (2005) does take the selection bias into account by making the proper corrections. The selection bias identified by Cochrane (2005) is a result of the process that returns are only observed in the case of a new financing or acquisition (Cochrane, 2005). A VC project has a higher probability of getting a new financing, or going public, when their value has risen. It is for example common notion, that a company will initiate an IPO when valuations are high. Mean returns will be thus inflated, and not a true representation of reality if only observed at these moments of new financing.
Cochrane (2005) accounts for this selection bias, thereby affecting the private equity returns. The “inflated” returns dramatically decrease because of this sample correction. Initially they find a mean (log) return of 108% and a log market model intercept of 92%, which decreases to 15% and -7% respectively. They also find a mean arithmetic return of 698% and arithmetic alpha of 462%, which consequently decreases to 59% and 32% respectively. Cochrane (2005) illustrates the “skewed” impact of the selection bias on returns. Yet, the returns are still highly positive after correcting for the selection bias, indicating the marginal benefit of VC.

A limitation of all these researches is that they represent private equity returns from a general perspective, without making a distinction between the various private equity vehicles and exit routes. In order to evaluate the performance difference between IPOs and trade sales, this paper will only focus on the return differences between these exits routes. There is almost no prior literature making a comprehensive distinction between the two exits and their returns. The existent academic journals are discussed below.

(2.) Exit returns of particular exit strategies

The common notion exists that IPOs are more profitable and prestigious exit routes relatively to trade sales for venture capitalists (Rossetto, 2008; Dai, 2005; Black & Gilson, 1998; Sahlman, 1990). This is explained by the larger exit values and exit multiples of IPOs. Poulsen and Stegemoller (2005) make a comparison between the exit multiples, based on a comprehensive literature review, and find higher market-to-book multiples for IPOs

compared to trade sales (3.5 versus 2.4), and higher price-to-sales multiples for IPOs compared to trade sales (2.7 versus 1.4). In addition, a study of Lerner (1994) presents return to investment multiples of VC-backed IPOs that are *4 times larger* than the respective multiples of trade sales.

These significant differences in exit values do not only hold at individual company level, but also on an aggregate domestic level. A study of Hellmann, Egan and Brander (2005) analyses the exit values of IPOs and trade sales at a national and regional level, and makes a comparison between the US and Canadian provinces. This report also supports the common notion of profitable IPOs, by presenting higher mean and median exit values of IPOs relative to trade sales in both the United States as well as in Canada. Their findings regarding these exit values are presented in table 21 of the Appendix.

Nevertheless, high exit values don't say everything. When reviewing the potential of a VC investment, a private investor should always take the financing (i.e. "entry value") and the investment duration into account. Based on these values the annual compounded rate of return can be computed, also known as the internal rate of return (IRR). This return rate is typically used in private equity as a performance proxy, and captures the entire time horizon of an investment.

Table 1 below indicates the internal rate of return for a sample of IPOs and trade sales from 1971 to 2003 (Bienz, 2004). The table illustrates a larger median and mean IRR, as well as a lower standard deviation for IPOs compared to trade sales. The median IRR of IPOs and trade sales is around 58% versus 18%. Another paper (Gompers, 1995) focussing on the IRR of IPOs and trade sales, supports this finding by indicating an annual rate of return of 60% for IPOs, whilst presenting an annual rate of return of 15% for trade sales. Hence, both papers present approximately equivalent values of the IRR. These studies illustrate the distinctive outperformance of IPOs relative to trade sales. Not only are IPOs more profitable in terms of exit values, but also in terms of internal rates of returns.

Table 1: IRR of IPO v.s. trade sale

Exit Choice	No. of Obs.	Median IRR	Mean IRR	Standard Deviation
IPO	108	58,39	123,42	207,97
TS	423	18,32	75,32	408,27

**Source: Bienz (2004)*

There is consensus in academic literature in explaining the higher profitability of IPOs relative to trade sales. The literature explains this phenomenon by means of three theories: *the selection bias, the market-timing strategy,* and *the liquidity premium*. These explanations are elaborated below.

(A.) Selection bias

Based on the finding that IPOs obtain greater exit values and returns, one may suggest a *pecking order* of venture capital exit routes: IPOs placed first, and trade sales placed second. Table 1 empirically supports this pecking order theory. Bienz (2004) analyses this pecking order theory and presents an explanation – *the selection bias*. This bias implies that highly profitable and growing firms will go public, whereas less profitable or growing firms will engage in a trade sale. Hence, IPO candidates differ greatly from trade sale candidates. This creates a measurement error in the sample, as observed returns may suffer from a sample selection bias. Therefore Bienz (2004) suggests that observed returns may be misleading, and the IPO exit does not have to be per se more profitable in comparison to a trade sale exit.

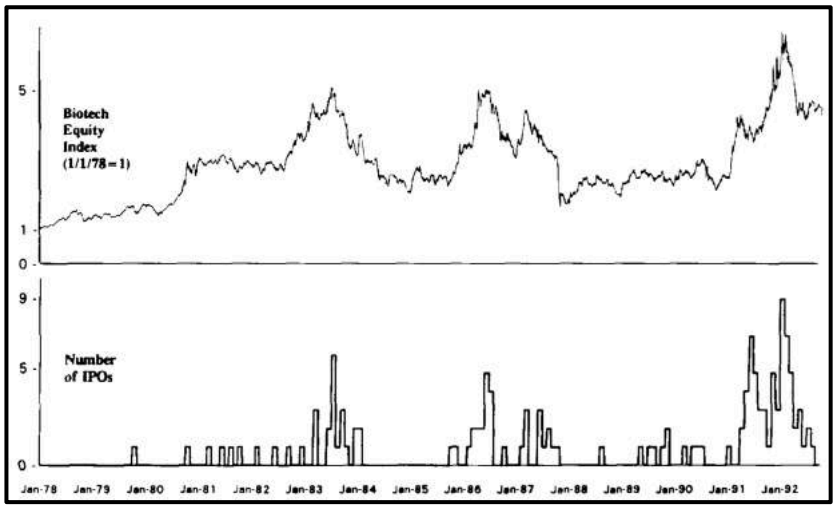
A paper of Schwienbacher (2002), studying VC exits in Europe and the United States, also finds empirical evidence supporting the selection bias. This paper suggests that only highly profitable companies consider going public – leading to high IPO exit valuations. Trade sales, on the other hand, are more universal exit routes. Highly profitable firms may consider trade sales to create synergies, whilst failing businesses (i.e. the "living deads") could also consider a trade sale as the deal value may exceed its liquidation value. Thus a trade sale is a universal exit strategy, employable by every market participant, whilst the IPO market only focuses on the upper-segment.

My research corrects for this selection bias, by controlling for profitability, size, and growth variables when performing regression-analyses. This will give an indication if the results and conclusions will change due to firm characteristics of IPO and trade sale candidates.

(B.) Market-timing

There is a high extent of academic literature investigating the "role of market-timing" and its play in exit decisions (Ritter J. , 1984; DeLong, Shleifer, Summers, & Waldmann, 1990; Golbe & White, 1993; Rajan & Servaes, 1997). Market timing is very important for exits, as especially exit values of IPOs are highly dependent on the conditions of the capital market. A research of Lerner (1994) examines the timing of IPOs, using a sample of 350 biotechnology companies between 1978 and 1992. The results of this research are presented in figure 8.

Figure 8: Market timing of IPOs



**Source: Lerner (1994)*

This graph supports the market timing explanation. Lerner finds that venture capitalists are inclined to take a company public when valuations reach maximum short-term peaks on the equity market. This appears to be primarily the case for IPOs.

This may be an explanation why IPOs achieve greater valuations compared to trade sales. This thesis examines the validity of the market-timing strategy as an explanation for the outperformance of IPOs compared to trade sales. The market-timing strategy will be examined by controlling for market variables in the regression analysis.

(C.) Liquidity discount

Insiders involved in an IPO will achieve a significantly greater premium of 22% on their offer compared to target insiders involved in a trade sale (Brau, Francis, & Kohers, 2003). In retrospect, this means that target insiders of a trade sale obtain a deal return of 78% of an IPO return. The cause of this premium difference is the state of liquidity. Research finds trade sales to experience a higher level of liquidity compared to IPOs. This higher level of liquidity

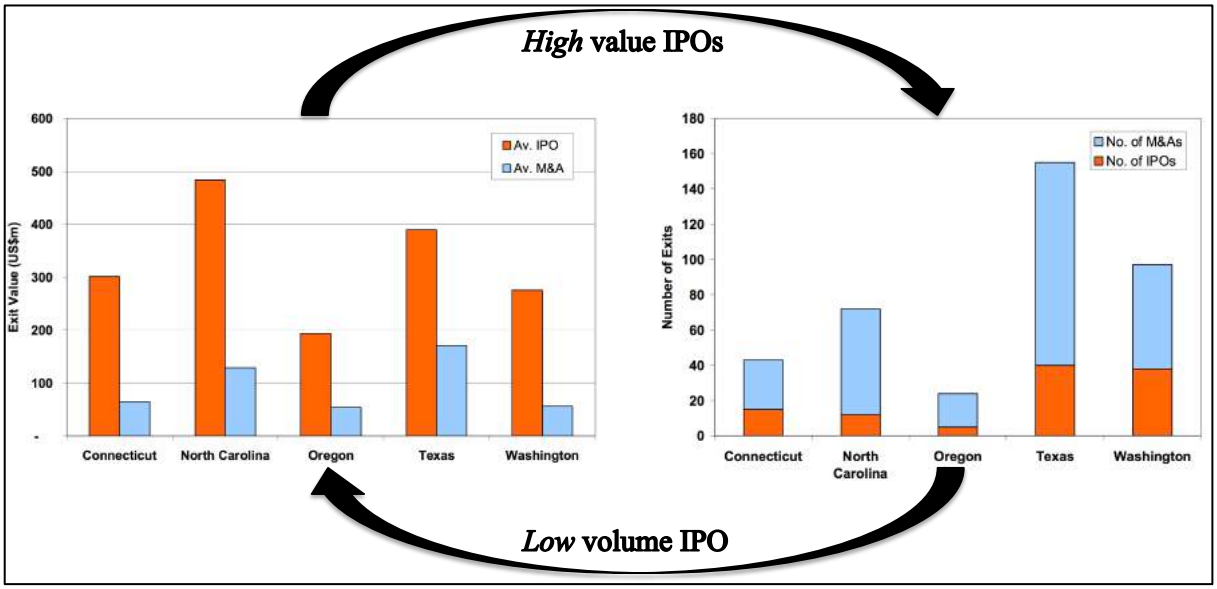
may result in a liquidity discount in the case of a trade sale, as insiders of IPOs may face liquidity risk. The greater premiums received by IPOs may also contribute to their greater exit values. This explains why this thesis examines the potential presence of a liquidity premium by comparing the premiums received by insiders of IPOs and trade sales in Chapter 6.

All in all, existent literature finds IPOs to acquire greater exit values relatively to trade sales, which may be explained by a selection bias, and market-timing strategy. Also the premiums significantly differ between IPOs and trade sales, caused by a liquidity premium. The selection bias, market-timing strategy, and premiums are examined in this thesis.

§1.5. Final Remarks

The previous paragraph on exit performance illustrates a great extent of empirical evidence indicating superior performance of IPOs relatively to trade sales. Yet, real-life data shows an increasing trend in trade sale activity. The number of takeovers highly exceeds the number of IPOs. This is illustrated in the figure below. The left chart indicates the average values of IPOs versus M&A's, and the right chart deal-volumes of IPOs versus M&A's.

Figure 9: IPO Valuation Puzzle



**Source: Hellmann, Egan & Brander (2005) – Modified by B.M.M. van Hövell*

These charts indicate a greater deal-volume of M&A in all states of the United States, despite the fact that IPOs obtain greater exit values. From a rational perspective this trend doesn't make any sense. Why would a private investor exit a venture by means of a trade sale, if an IPO generates greater returns? This anomaly is the so-called 'IPO valuation puzzle'. A study of Bayar and Chemmanur (2006) examines this valuation puzzle and finds an explanation. The authors suggest that entrepreneurs expect the long-term exit value of IPOs to be lower compared to the acquisition value of a trade sale. IPOs are constraint by lock-up agreements, forcing shareholders to hold to their stake in the long run. According to Bayar and Chemmanur, entrepreneurs have the expectation that the IPO-issuing firm will have difficulties to succeed and survive in the long-term in a competitive market. This fierce competition may negatively affect the long-term exit valuation of IPOs, with the result that entrepreneurs will exit through a trade sale with a lower short-term exit value.

I test the validity of the explanation of the IPO valuation puzzle in my research, through the

computation of exit values of IPOs and trade sales from a long-term perspective by taking the lock-up agreements into account. If this explanation holds, the long-term exit values of IPOs should fall below the exit values of trade sales. Nevertheless, this thesis holds a different prediction regarding the revised exit valuation. Due to the positive effects of underpricing on stock performance, this research expects the exit value to rise over the lock-up period after the initial public offering, which is in contrast with the explanation of the 'IPO valuation puzzle'. This is further explained in Chapter 8 (Revised Exit Valuation Analysis).

§1.6. Conclusion

This first chapter analysed the different exit routes, with a focus on IPOs and trade sales, and provided a theoretical framework based on a comprehensive literature review. The process of the exit event is explained, the venture capital industry is addressed, and IPOs and trade sales are analysed based on their relative strengths and weaknesses and their performance.

Based on the findings of this first chapter, sub-question (A) can be addressed:

Sub-Question (A): What are the advantages and disadvantages of an IPO versus a trade sale?

IPOs and trade sales obtain their own strengths and weaknesses, based on the characteristics of the exit transaction. These respective advantages and disadvantages are summarized in table 2 (next page). A takeover creates a direct exit through the shift of ownership and control, whereas with an IPO entrepreneurs can retain control on firm policy. This provides management with long-term stability to remain a foothold in the business. Yet, IPOs face stringent regulatory standards leading to a time-consuming and costly process. Not to forget the impact of information asymmetry, underpricing, and public scrutiny which may "make or break" the success of an IPO.

The greater costs associated with an IPO may however be compensated by greater exit values and returns. From a performance-perspective, IPOs seem to outperform trade sales. However, will this outperformance hold in the long run when accounting for lock-up agreements? And what about synergies? Synergies are only utilized in the case of a trade sale and could play a significant role in acquiring a key position in a competitive market and realizing returns.

Summarized, table 2 clearly implies trade sales to be a direct exit, comprising a time- and cost-efficient process, where synergies may be realized. IPOs in contrast, involve a time-consuming and costly process – yet this is compensated by greater returns. The exit decision thus appears to relate to the company's resources and size, as small companies may not have the financial strength or management' experience to pursue an IPO.

One thing is clear, there exists no "one fits all answer" to this question merely based on their respective strengths and weaknesses. In the end it depends on the context of which the firm is operating in. A financially constrained firm with nominal assets may prefer a trade sale to minimize costs and fast-track the process. A large-capitalized company led by an experienced management board may prefer an IPO to retain control and exploit media attention. It's all dependent on firm characteristics, market conditions, and the appetite of private investors.

Nevertheless, the theoretical framework provided in this chapter makes a clear distinction in qualitative factors between IPOs and trade sales, which should be taken into consideration when investors decide on which exit route to pursue.

Table 2: Advantages and Disadvantages

Advantages / Disadvantages	Description	IPO	Trade Sale
Ownership & Control	Insiders remain the ability to influence firm' policies in the case of an IPO	✓	✗
Regulation & Costs	Greater costs and regulatory constraints in the case of an IPO	✗	✓
Valuations	Greater (exit) valuations in the case of an IPO	✓	✗
Information Asymmetry	IPO's have greater information asymmetry due to unsophisticated buyers	✗	✓
Synergy	Trade sales have the possibilities on synergies between acquirer & target	✗	✓
Lock-up Provisions	IPOs are subject to lock-up agreements, preventing a direct exit	✗	✓
Dual-track Exit	The process of an IPO may trigger pre-emtive trade bids of trade buyers	✓	✗
Innovation	Both exist enhance innovation, IPO short-term, and trade sale long-term	✓	✓
Public Scrutiny	IPOs may be harmed by speculation, and by (media) pressure to perform	✗	✓
Public (Media) Attention	IPOs may benefit media attention and greater analyst coverage	✓	✗
Buyers	The wide range of buyers in IPOs need to be convinced about the value	✗	✓
Size	IPOs can only be executed by big firms, whereas trade sales are universal	✗	✓

**Source: B.M.M. van Hövell (2016)*

CHAPTER 2: Methodology

This chapter starts with the methodology of the logistic regression, which is used to identify factors that play a role in the decision between an IPO and trade sale. The second section provides the performance-analysis, and is divided into the following components: Accounting Analysis, Premium Analysis, Exit Valuation Analysis and Revised Exit Valuation Analysis. The methodology of these performance-based analyses is explained below.

§2.1. Logistic Regression

A logistic regression is executed in order to identify significant factors that play a role in the exit decision. To distinguish between the exit strategies a dummy variable is created. This variable takes the value of '1' for companies announcing an IPO, and the value of '0' for companies announcing a trade sale. This is illustrated below:

Table 3: Dependent Variable

Dependent Variable	Dummy Value	Description
EXIT	= 1	IPO Event
EXIT	= 0	Trade sale Event

This dummy variable functions as the dependent variable of the logistic regression. The dependent variable is a binomial choice variable of either an IPO or trade sale.

According to a study of Poulsen and Stegemoller (2006), the explanatory variables of the exit decision should comprise factors representing *the growth*, *capital structure, asymmetric information*, *and venture capital*. These are the essential factors that have an impact on the exit decision. My research extended these factors with *profitability and size factors*. Research suggests IPO candidates to be larger and more profitable compared to trade sale candidates (Bienz, 2004), thereby creating a selection bias. Thus, it's essential to analyse the comparative differences between these factors. Company profitability and size are measured by the return on assets, sales, and assets respectively. Both sales as well as assets have been stabilised by using log transformations, which is in line with the literature (Gleason, Jain, & Rosenthal, 2006). Log transformations are known to enhance the fit of the regression model and to transform skewed distributions into more normalised distributions (Lane, 2016).

All firm-characteristics that are included in the logistic regression are measured by sub-factors (proxies). These proxies are illustrated in table 4 below. All explanatory variables are measured in the year before the transaction (year '-1' if the exit event is equal to '0'), in order to separate the effects of the exit event from the company financials.

Table 4: Independent Variables

Factor	Proxy	Description
Growth	CAPEX Ratio	= CAPEX / Total Assets
Capital Structure	Leverage	= Debt / Total Assets
Information Asymmetry	Intangibles Ratio	= Intangibles / Total Assets
Profitability	ROA Sales	= EBITDA / Total Assets = Log (Sales)
Size	Assets	= Log (Total Assets)
Venture Capital	VC-Backed	✓ = 1 ✗ = 0

A logistic regression is performed based on these dependent and independent variables. The following regression model is estimated in this research:

$$\text{EXIT}\,[1\ if\ IPO, 0\ if\ trade\ sale] \quad (1)$$

$$= a_i + \sum_{i=1} \beta i\ \text{Growth Factor} + \sum_{i=2} \beta i\ \text{Capital Structure Factor} + \sum_{i=3} \beta i\ \text{Information Asymmetry Factor} + \sum_{i=4,5} \beta i\ \text{Profitability Factors} + \sum_{i=6} \beta i\ \text{Size Factor} + \sum_{i=7} \beta i\ \text{Venture Capital factor} + \varepsilon$$

Where,

i	the i-th observation
i = 1	growth factor (CAPEX ratio)
i = 2	capital structure factor (Leverage)
i = 3	information asymmetry factor (Intangibles ratio)
i = 4, 5	profitability factors (ROA, Sales)
i = 6	size factor (Assets)
i = 7	venture capital factor (VC-backed)

Lastly, all independent variables are winsorized at the 2.5% and 97.5% percentiles, to limit possible negative effects of spurious outliers in the sample. This is in line with prior literature on logistic regressions of exit events (Poulsen & Stegemoller, 2005).

Overall, based on the results of this logistic factor regression, sub-question (B) can be answered:

Sub-question (B): What factors influence the exit decision between an IPO and trade sale?

§2.2. Accounting Analysis

The Accounting Analysis provides information on the operating performance of IPOs versus trade sales. Different accounting factors can be used to measure the operating performance. Yet, *profitability*, *solvency*, and *liquidity* performance indicators are prevailed to be most significant in financial analysis of a company (Altman, 1968). This explains why this thesis will focus on these performance measures. Profitability is measured by the log values of sales and EBITDA. Earnings Before Interest Taxes Depreciation and Appreciation (EBITDA) is one of the important factors, as it functions as a proxy of free cash flow – a key element in the valuation process. Profitability is also measured by the Return on Equity (ROE), and the return on Capital Employed (ROCE). These return ratios have been selected, as they directly

relate to the private investor, i.e. the shareholder. This is not the case for the ROA, as it represents the return for both the equity- and debtholders.

The accounting analysis is further extended by not only focussing on profitability indicators, but also by analysing the solvency and liquidity of the IPO and trade sale candidates. Solvency presents a company's ability to meet long-term commitments, and is often reflected by the gearing ratio – a multiple of debt over total assets (Bryan, Wheatley, & Tiras, 2002). Liquidity, in contrast, presents the company's ability to meet short-term obligations, and is reflected by the current ratio. All accounting variables are measured from one year (year -1) prior the exit event, as going back further in time will limit data availability and the robustness of the sample. Table 5 summarises the accounting indicators used in this research.

Table 5: Accounting Performance Variables

Accounting Performance	Proxy	Formula
Profitability	Sales	= Log (Sales)
	EBITDA	= Log (EBITDA)
	ROE	= EBIT / Common Equity
	ROCE	= EBIT / Capital Employed
Solvency	Gearing	= Debt / Total Assets
Liquidity	Current Ratio	= Current Assets / Current Liabilities

Finally, the t-test is executed to test for differences in means between the operating performance of IPOs and trade sales. The following hypothesis will be tested for every accounting performance indicator, as described in table 5:

H0: $\mu 1\ (IPO) = \mu 2\ (Trade\ Sale)$
H1: $\mu 1\ (IPO) \neq \mu 2\ (Trade\ Sale)$

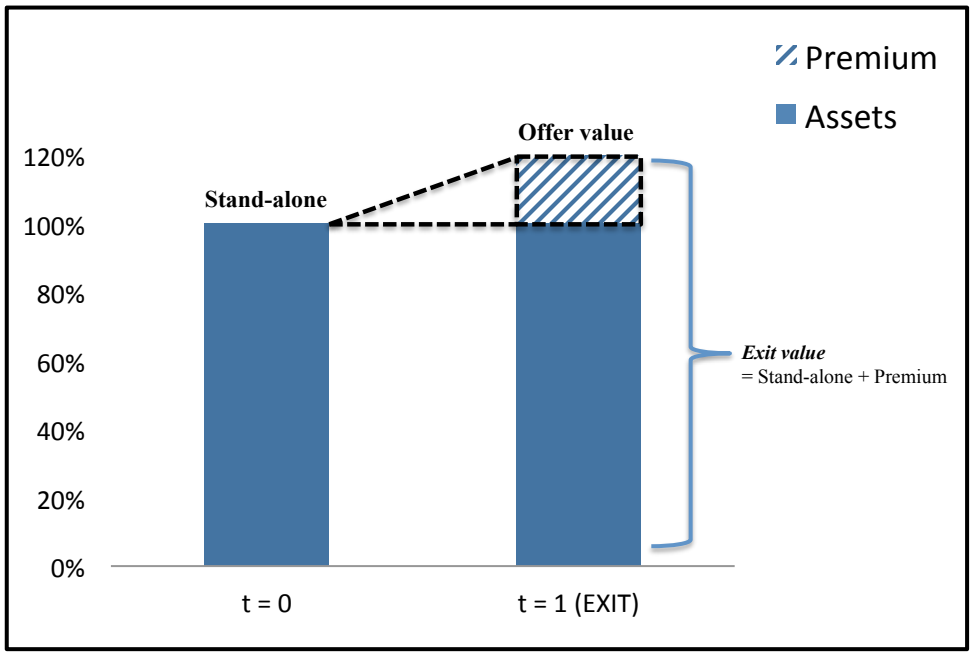
Based on the results of these hypothesis tests, sub-question (C) can be answered:

Sub-question (C): Do IPO or trade sale candidates achieve greater operating performance before the exit event?

§2.3. Premium Analysis

This analysis examines the seller premiums to insiders in IPOs and trade sales. Hence, this section explores the pay-offs that selling insiders receive at the time of an IPO and trade sale. Premiums are measured as the ratio of the offer price per share to the book value of equity per share, which is in line with research of Brau et al. (2003). Both median as well as mean premiums are measured. If the offer price exceeds the book value (per share) of the exiting company, this will translate into a positive premium. If the offer price falls below the book value this results in a negative premium (discount). I constructed a theoretical framework (figure 10), illustrating the connection between the standalone value, premium and exit value.

Figure 10: Premium Framework



Source: B.M.M. van Hövell (2016)

As the figure indicates, premiums have a huge impact on the exit value and should therefore play a highly important role in performance evaluation of IPOs versus trade sales.

Finally, this section will end with a t-test and Wilcoxon rank-sum test in order to test for differences in means and medians of deal premiums between IPOs and trade sales. It's expected that the deal premiums of IPOs to be larger than trade sales due to an illiquidity premium (Brau, Francis, & Kohers, 2003). Thus, the following hypothesis can be derived:

H0: $\mu 1\ (IPO) = \mu 2\ (Trade\ Sale)$
H1: $\mu 1\ (IPO) \neq \mu 2\ (Trade\ Sale)$

Overall, based on the results of the premium analysis, sub-question (D) can be answered:

Sub-question (D): Do investors achieve greater exit premiums when pursuing an IPO or trade sale?

§2.4. Exit Valuation Analysis

This analysis presents both the median as well as mean exit value multiples of IPOs and trade sales. The exit values are calculated at the time of the IPO or trade sale, which is common practice in private equity analysis. This is therefore more or less a traditional exit valuation analysis, that doesn't account for lock-up provisions. The exit value of a trade sale is defined as the deal (transaction) value at the event. The exit value of an IPO is defined as the product of the offer price on the opening day multiplied by the number of outstanding shares. This is in line with prior research of Poulsen and Stegemoller (2006).

This research focuses on exit values, without considering entry values. Reasoning for this is that exit values are the key to evaluate the performance of venture capital markets (Hellmann, Egan, & Brander, 2005). Besides, there are many drawbacks to performance-analyses including entry values or internal rates of returns. Entry values (i.e. VC investments) are often obtained from self-reported data sources. This creates a reporting bias, which could result into

an unreliable data sample (Hellmann, Egan, & Brander, 2005). Drawbacks such as these explain why this thesis solely focuses on exit values in order to review the performance of exit strategies.

This study measures different types of exit multiples. Exit value multiples are computed by scaling exit values to (1.) the book value of total assets, (2.) sales, (3.) EBITDA, (4.) EBIT, and (5.) the NASDAQ Index. The rationale for selecting these exit benchmarks is that some of these are used in prior research. For example, Poulsen and Stegemoller (2005) report exit values as a multiple of total assets and sales. They however do not report multiples of EBITDA or EBIT. My research does account for these performance measures, as EBITDA and EBIT typically function as the proxy of free cash flow, which is a highly important performance metric of a business. The advantages of using EBITDA and EBIT is that they are before-tax earnings measures, and therefore independent of the capital structure of the acquired firms (Koeplin, Sarin, & Shapiro, 2000).

The last exit multiple is calculated by scaling the exit value to the overall stock performance, the NASDAQ. The data sample of this research covers a period (1990 – 2014) consisting of both bear and bull markets. These economic cycles definitely affected the financial markets, stock performance, investor returns and hence, the exit values of IPOs or trade sales. An exit multiple based on the NASDAQ index is included in this analysis in order to control for these "busts and booms". This is in line with a study of Hellmann, Egan and Brander (2005).

After calculating the exit value multiples, this section will perform both a t-test as well as a Wilcoxon rank-sum test to test for differences in the mean and median exit value multiples between IPOs and trade sales. It is expected that the exit value and multiples of IPOs to be larger than trade sales due to the selection bias (Bienz, 2004) and market-timing strategy (Lerner, 1994). Therefore the following hypothesis can be derived:

H0: $\mu 1\ (IPO) = \mu 2\ (Trade\ Sale)$
H1: $\mu 1\ (IPO) \neq \mu 2\ (Trade\ Sale)$

In addition, this section performs a regression analysis. The literature review explained the possible presence of a selection bias in an exit performance analysis. Prior literature finds IPO candidates to be larger, more profitable, and growing companies (Bienz, 2004). This could explain why exit values of IPOs are greater than exit values of trade sales. In order to test the validity of this selection bias, a regression analysis is conducted in order to control for profitability and size factors. Moreover, a study of Lerner (1994) suggests that IPOs time the moment of going public. Companies appear to exit through an IPO when short-term market valuations are high. This market-timing strategy may therefore also explain why IPOs reflect greater exit values. To correct for both the selection bias as well as the market-timing strategy, the following regression is executed:

$$\text{Exit Value} = a_i + \beta 1\ \text{DUMMY (IPO or TS)} + \beta 2\ \text{SIZE} + \beta 3\ \text{SALES} + \beta 4\ \text{GROWTH} + \beta 5\ \text{MARKET} + \varepsilon \quad (2)$$

Where,

DUMMY	IPO (= 1) or trade sale (= 0)
SIZE	Log (Assets)
SALES	Log (Sales)
GROWTH	Market-to-Book (M/B)
MARKET	Price-Earnings (P/E) Ratio

The regression controls for size, sales, and growth variables in order to mitigate the selection bias. Both size and sales variables have been transformed into log values to enhance the distribution of this sample. In addition, the regression accounts for the market valuation cycle by including the Price-Earnings ratio[1] (PE) of the S&P 500 as a market valuation measure. This monthly PE ratio has been matched with IPO and trade sale exits based on the month of the exit announcement. The main emphasis of the regression is however the dummy variable. A significant positive $\beta 1$ coefficient implies a significantly greater exit value of IPOs compared to trade sales, regardless of the profitability, size or growth potential of the company, and regardless of the market valuations at the time of the exit event. If that's the case, the selection bias and market-timing strategy can be rejected in this research.

Overall, based on the results of the exit valuation analysis, sub-question (E) can be answered:

Sub-question (E): Do investors achieve greater exit valuations when pursuing an IPO or a trade sale at the time of the exit event?

§2.5. Revised Exit Valuation Analysis

This paragraph explains *the revision* of the traditional exit valuation analysis. This section requires extra attention, as an entire *new theoretical framework* and exit valuation analysis are constructed. Normally, the exit values of IPOs and trade sales are calculated by assuming investors liquidate their entire stake at the time of the initial offering or completion of the deal. This is however in practice almost never the case for IPOs, as they are constrained by lock-up agreements with underwriters. These lock-up provisions, usually lasting for a period of 180 days, bar insiders from selling a part of their stock following an IPO. Thus, investors are only able to sell a minor part of their stake at the exit event. At the time of the lock-up expiration investors may sell the remaining of their outstanding shares, giving them the opportunity to exit the venture completely. This is explained in figure 11 below – *the conceptual framework of the lock-up provision*. This figure illustrates the impact of lock-up provisions on the amount of outstanding shares and the exit values of IPOs. A lock-up provision creates three separate events: (1.) the exit event, (2.) the lock-up period, and (3.) the lock-up expiration. All time phases are explained below:

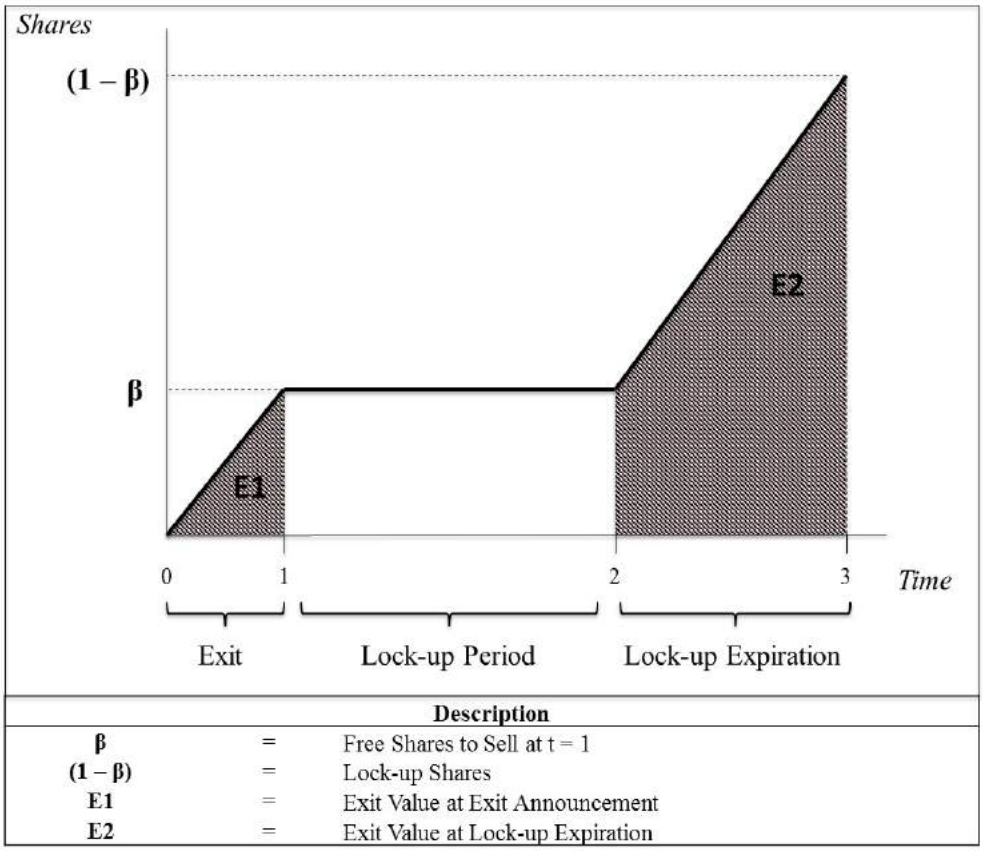
1. **The exit event:** The exit event takes place at the announcement of the IPO. It's the first moment where insiders are able to liquidate a part of their investment. It's often the first day of the initial offer, where investors may sell a part of their stake. These shares sold, which are freely to trade and don't apply to the lock-up provision, are defined as '$\boldsymbol{\beta}$' in the conceptual framework in figure 11. '**E1**' illustrates the exit value of the amount of shares sold in this period. This period falls between t = 0 and t = 1.
2. **The Lock-up period:** This is the period where insiders are not allowed to sell their stock to the public. A part of their stake is "locked" until the lock-up period expires. This period falls between t = 1 and t = 2.
3. **The Lock-up expiration:** This is the period where the lock-up provision expires, providing insiders with the opportunity to sell the remaining part of their stake and to liquidate their entire investment. All outstanding shares may be sold, which are

[1] Schiller PE Ratio of the S&P 500 by month – obtained from the database *Quandl*

[3] This framework assumes a hypothetical situation where stock prices increase over time following IPOs.

defined as '$(\mathbf{1-\beta})$' in the conceptual framework. '**E2**' in figure 11 illustrates the exit value of the amount of "lock-up shares" sold at the lock-up expiration date. This period falls between t = 2 and t = 3.

Figure 11: Conceptual Framework of Lockup Provision



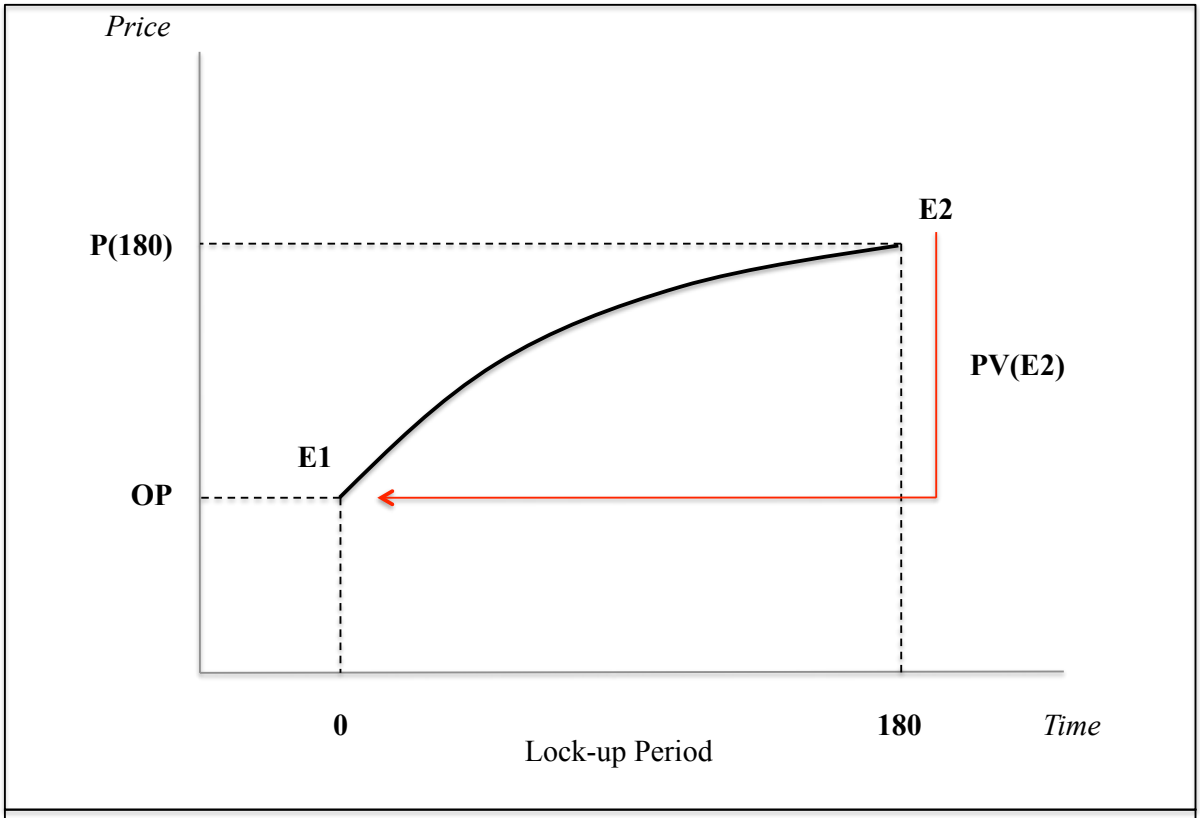
Description		
β	=	Free Shares to Sell at t = 1
(1 – β)	=	Lock-up Shares
E1	=	Exit Value at Exit Announcement
E2	=	Exit Value at Lock-up Expiration

**Source: B.M.M. van Hövell (2016)*

The conceptual lock-up framework describes the allocation of shares sold over time. The figure however only comprises IPOs. Trade sales are not relevant here, as acquisitions typically don't obtain lock-up provisions. Reason for this, is that lock-up periods are required to stabilise the share price after an exit event occurs. An immediate sale of a block of shares could fiercely harm the market value of a company. This is crucial in the case of a new fragile market such as with an IPO. However, trade sales often involve established public acquirers, and the impact of a potential sale of shares will therefore be negligible. This explains why lock-up agreements normally don't occur in the case of an acquisition. Moreover, lock-up provisions for acquisitions are also irrelevant from an economic perspective. According to the Efficient Market Hypothesis (EMH), prices capture all information and reflect the true fundamental value (Fama, 1970). Prices paid in an acquisition normally reflect the fair value of the company, as targets receive what the company is worth. This is however different with IPOs. IPO candidates are underpriced at the time of the offering to avoid negative signalling effects due to information asymmetry. The price of an IPO is thus initially undervalued and doesn't reflect its intrinsic value. This mispricing will be automatically corrected for as time evolves. Hence, this explains why it's essential to account for lock-up periods when calculating exit values of IPOs, whereas it's irrelevant when analysing trade sales as they already trade at fair value. The revised exit valuation analysis is therefore *solely* used to compute revised exit values of IPOs. Trade sales are analysed by using similar exit values as in the traditional exit valuation analysis, by calculating exit values at the time of the exit.

Figure 12 illustrates *the conceptual framework of the revised exit valuation analysis*. This framework presents the relation between the exit process, the lock-up period and stock market performance. The chart represents a hypothetical process[2] of an IPO, including a lock-up period of 180 days. The IPO starts on the exit event date (t = 0) at the offering price ('OP'), followed by a lock-up period of 180 days, ending on the lock-up expiration date (t = 180 days) at the 180-day post-IPO share price ('P(180)').

Figure 12: Conceptual Framework of Revised Exit Analysis



Formula's Description			
E1	*Exit Value at Exit Announcement*	=	**β x Offer Price**
E2	*Exit Value at Lock-up Expiration*	=	**(1 – β) x P(180)**
PV(E2)	*Present Value of E2*	=	**E2 / (1+R) ^ t**
E(NEW)	*Revised Exit Value*	=	**E1 + PV(E2)**

**Source: B.M.M. van Hövell (2016)*

The lock-up period creates a shift in time and *"breaks"* the total exit value of the IPO into two components: '**E1**' and '**E2**'. 'E1' is the exit value of an IPO at t = 0, and 'E2' is the exit value of an IPO at t = 180 days (6 months). Both 'E1' and 'E2' are part of the total exit value of the IPO. 'E1' is the exit value based on the number of shares sold at the time of the exit transaction, and 'E2' is the exit value based on the "lock-up shares" sold at the time of the lock-up expiration. Both exit values are dependent on different levels of stock prices. The exit values are calculated by using formulas (3) and (4), illustrated on the next page:

[2] This framework assumes a hypothetical situation where stock prices increase over time following IPOs. IPOs are frequently subject to underpricing, resulting in tremendous price increases in the short run

- $Exit\ Value\ 1\ ('E1') = (Outstanding\ Shares - Lockup\ Shares) \times Offering\ Price$
  $\boldsymbol{= E1 = \beta \times OP}$ (3)
- $Exit\ Value\ 2\ ('E2') = \#\ Lockup\ Shares \times 180\ Day\ Stock\ Price$
  $\boldsymbol{= E2 = (1 - \beta) \times P(180)}$ (4)

Where,

E1	Exit value 1
E2	Exit value 2
P(180)	Post-EXIT share price at t = 180 (in days)
OP	Offering Price
β	Freely tradable shares
(1 – β)	Lock-up shares

However, there is a distinct difference between 'E1' and 'E2' in terms of timing. 'E2' is generated in the future, whereas 'E1' is generated at present. The value of 'E2' should therefore account for *time value of money*. The opportunity costs should be considered. This is realized by the calculation of the present value of 'E2', based on the cost of capital. Finally, the total exit value of the IPO can be calculated. This is the sum of the exit value at the announcement of the exit, and the present value of the exit value at the time of the lock-up expiration. The formula (5) is shown below.

$$Revised\ Exit\ Value = E1 + PV(E2) \quad (5)$$

$$With, PV(E2) = \frac{E2}{(1 + r)^{0.5}}$$

Where,

E1	Exit value 1
E2	Exit value 2
PV(E2)	Present value of E2
r	Cost of capital

The fractional power of 0.5 in the formula stands for the time period (number of years). The entire time horizon exists of 180 days, i.e. six months. When calculating present values, it's common practice to discount values in terms of years. As the time horizon only consist of half a year, 'E2' should be discounted to the cost of capital with a fractional power of 0.5.
After calculating the revised exit values, these will be compared with both the exit values of trade sales, as well as the traditional exit values of IPOs as calculated in the previous paragraph. However, this time no exit multiples are calculated and compared due to its irrelevance. These multiples have already been calculated for IPOs and trade sales in the 'Exit Valuation Analysis". The revised exit values of IPOs are the only parameter that has changed in comparison to the traditional exit valuation of IPOs and trade sales. Hence, the level of assets, sales, EBITDA, EBIT, and the NASDAQ (denominators of the exit multiples) are similar for both the revised as well as traditional exit valuation analysis. This means that the exit multiples would only change through changes in the revised exit value. It's therefore only relevant to compute the new revised exit values, and to compare those with trade sales and the traditional exit value of IPOs. The t-test and Wilcoxon rank-sum test are performed in order to test for significant differences in the mean and median of these exit values. Hence, the following statistical tests are performed:

A. T-test and Wilcoxon rank-sum test for differences in mean and median between the exit values of IPOs and trade sales.
B. T-test and Wilcoxon rank-sum test for differences in mean and median between the revised and traditional exit values of IPOs.

The exit values of IPOs are expected to be larger than trade sales due to the selection bias and market-timing strategy. And the revised exit value of IPOs is expected to be larger than the traditional exit value of IPOs due to the positive affects of underpricing on short-term stock performance during the lock-up period. Thus, the following hypotheses are derived:

H0: $\mu 1(IPO) = \mu 2(Trade\ Sale)$ **H0:** $\mu 1(Revised\ IPO) = \mu 2(Traditional\ IPO)$
H1: $\mu 1\ (IPO) \neq \mu 2\ (Trade\ Sale)$ **H1:** $\mu 1(Revised\ IPO) \neq \mu 2(Traditional\ IPO)$

The second hypothesis is an additional statistical test, that will indicate if the revised exit values significantly differ from the traditional exit values, as employed by the majority of academic literature. The revised exit values provide a better reflection of the true exit value. Therefore, it's my belief that this analysis will give an indication if the traditional exit values of the academic literature are underestimated, overestimated, or fairly valued by comparing the revised with the traditional exit values.

Finally, the revised exit values are adjusted for the selection bias and market-timing strategy, by executing a similar regression analysis as performed in the traditional exit valuation analysis. This regression analysis (6) is modelled as follows:

$$\text{Revised Exit Value} = a_i + \beta 1\ \text{DUMMY (IPO or TS)} + \beta 2\ \text{SIZE} + \beta 3\ \text{SALES} + \beta 4\ \text{GROWTH} + \beta 5\ \text{MARKET} + \varepsilon \quad (6)$$

Where,

DUMMY	IPO (= 1) or trade sale (= 0)
SIZE	Log (Assets)
SALES	Log (Sales)
GROWTH	Market-to-Book (M/B)
MARKET	Price-Earnings (P/E) Ratio

The results of this regression analysis, and in particular the p-value of the coefficient of the dummy variable, will indicate if the revised exit values are subject to a sample selection bias or market-timing strategy. Therefore, it will clarify if the level of exit value is determined by profitability characteristics of the exiting company, or if it's influenced by inflated valuation cycles of the equity market. Overall, based on the results of the revised exit valuation analysis, sub-question (F) can be answered:

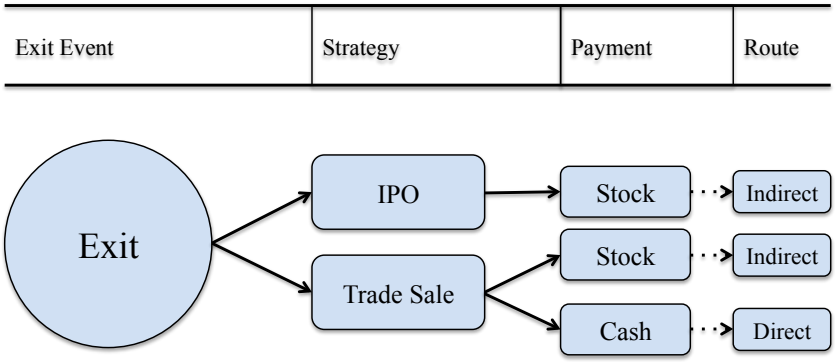
Sub-question (F): Do investors achieve greater exit valuations when pursuing an IPO or a trade sale, considering IPOs comprise lock-up provisions?

CHAPTER 3: Data and Sample

§3.1. Conceptual Framework

This paper only considers IPOs and trade sales as exit events. Other exit routes, such as buybacks, are excluded from this research. Solely takeover deals led by a public acquirer are considered in the case of a trade sale. Private acquirers most frequently finance the takeover in illiquid stock, making the event not a direct exit and difficult to measure. That's why these types of takeovers are excluded from this empirical research. The conceptual framework of the data is represented below.

Figure 13: Conceptual Framework of Data



**Source: B.M.M. van Hövell (2016)*

As the figure illustrates, trade sales can be completed in the form of a cash or stock deal. Cash deals will lead to a direct exit, whereas stock deals to an indirect exit. IPOs, in contrast, will always result into an indirect exit, where investors are constrained by lock-up agreements.

§3.2. Data

This research acquires all its data from two large financial databases, *Securities Data Company (SDC)* and *Compustat*. The full sample, including both IPO and trade sale transactions from 1990 to 2014, is extracted from SDC. The trade sale sample is acquired from SDC U.S. Mergers & Acquisitions and constructed based on the takeover announcement date. The total sample comprises 18,988 trade sales. A trade sale is a special kind of acquisition, in which all private shares are acquired by a public entity. Therefore, this sample only covers fully completed takeovers (100% acquisition), involving a private target and public acquirer. The public acquirer should be listed on the NYSE, NASDAQ or AMEX. Limited partnerships and leveraged buyouts are excluded from the sample. I also limit the trade sale sample to acquisitions with a deal value of $5 million or greater. The rationale for this, is that the SEC requires target firms to disclose company financials when a certain "threshold of materiality" is met. This threshold of materiality is met when the acquisition equals 10% of the acquirer's total asset value. The trade sale sample of this thesis has average total assets of 85 million[3], implying a threshold of $8.5 million. For ease of measurement, I apply a threshold of a minimum deal value of $5 million. This is in line with prior research on

[3] Average Total Assets (trade sale sample of 1990 – 2014): $85.04 million. Hence, 10% × $85.04 ≈ **$8.504**

trade sales and IPOs (Poulsen & Stegemoller, 2006). Because of these filters and criteria, the sample declined in number of observations from 18.988 to 12.347.

The IPO sample is extracted from SDC U.S. Global New Issues. These IPOs are extracted based on their issue date. The total sample size comprises 13.356 IPOs. Solely initial offers that become subsequently listed on the NYSE, NASDAQ or AMEX are considered in this sample. Unit issues, closed-end funds, limited partnerships, spinoffs, previous leveraged buyouts and foreign issuers are excluded because of their irrelevance. Also solely the outstanding shares of the main tranche (when a company discloses shares on multiple listings) have been considered. For the sake of comparability with the IPO sample, I also restrict the IPO sample to an offer value of $5 million or greater. These data filters reduced the number of observations of the sample to 3.381 IPOs.

The full sample, consisting of the IPO and trade sale sample, is further constrained and reduced in sample size by requiring the availability of company financials[4]. This is where the second database, *Compustat*, comes into play. This thesis requires many financials of IPO and trade sale candidates from their balance sheets of *one year prior the exit event*. This is necessary to disentangle the effects of the exit event from operating performance. SDC doesn't provide financials of IPOs of the fiscal year prior the exit event, but does provide these financials for trade sales. Therefore, Compustat has been used to bridge this gap, and to extract the financials of IPOs of the fiscal year before the exit. The CUSIP9 codes[5] have been used in order to match the financials of Compustat with the exit samples of SDC. Lastly, the online database *Quandl* has also been used in order to retrieve the monthly Price-Earnings ratio of the S&P500 index, which has been used in the regression analyses.

Besides all these financials, information on lock-up provisions is also required in order to calculate the revised exit values. The amount of shares locked-up is provided by SDC, creating another filter and consequently reducing the full sample. This paper focuses on IPO and trade sale exits within the period 1990 to 2014. SDC started with acquiring lock-up provision data from 1988 and on. This explains why this paper employs the year 1990 as the starting point of this empirical research. The ending point of the timeframe, 2014, is selected in order to capture the impact of the financial Credit Crunch, which started in 2008.

§3.3. Samples

The full (aggregate) sample, consisting of the IPO and trade sale exits, is extracted from SDC as described previously. From this sample, five different sub-samples for the empirical research have been applied. The empirical research comprises five small performance analyses: **(1.)** logistic regression, **(2.)** accounting performance analysis, **(3.)** premium analysis, **(4.)** exit valuation analysis, and **(5.)** revised exit valuation analysis. These performance analyses use different financials and variables in the corresponding empirical tests. It's therefore better to create five sub-samples of the aggregate sample, as the number of observations would decline tremendously when only using one universal sample for all empirical tests. Some samples, such as the sample of the exit valuation analysis and the revised exit valuation analysis, are exactly the same as this is required to make accurate

[4] Company financials include key factors originated from financial statements, such as EBITDA, sales and the Market-to-Book ratio.

[5] Unique company identifier

comparisons. The number of observations used in each sub-sample is indicated in the results of the statistical analysis of this research.

§3.4. Descriptive Statistics

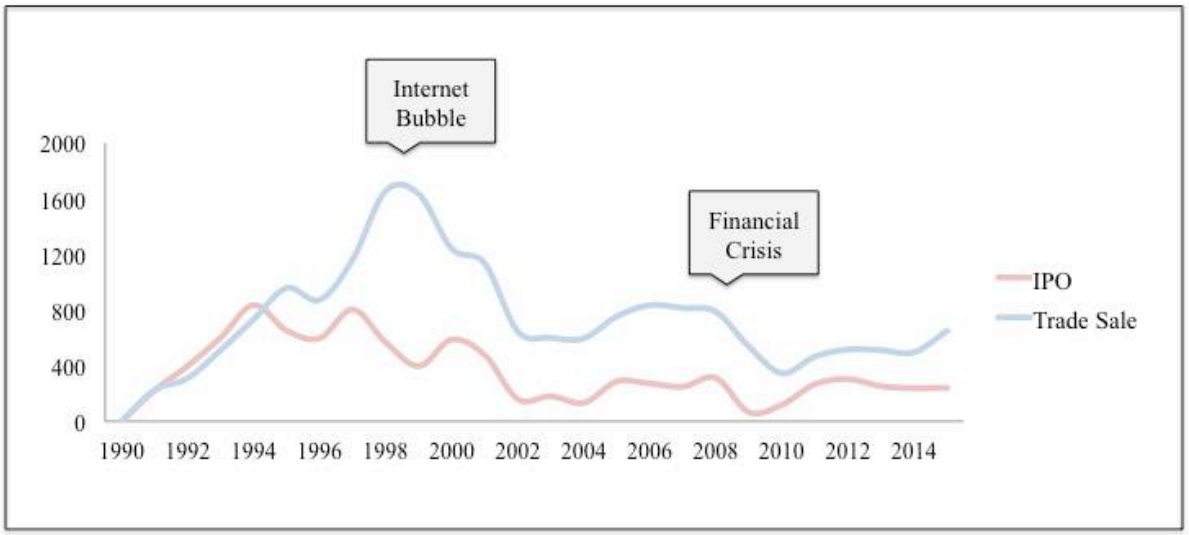
The deal volume of IPOs and trade sales of the aggregate sample is illustrated in table 6. The total number of IPO and trade sale exits are 9.208 and 18.988, respectively. Generally, there have been more trade sales than IPOs. On an average basis, IPOs formed ***32%*** of total deal volume, implying trade sales contributed significantly more to the exit industry in terms of volume. This is not surprising, as literature found trade sales to occur more frequently than IPOs over time, despite that IPOs are found to generate greater exit valuations. This is also known as the *'IPO valuation puzzle'* (Bayar & Chemmanur, 2006).

Table 6: Descriptive Statistics (Aggregate Sample)

Year	Total Volume	Deal Volume		IPOs % of Total Volume
		IPO	Trade Sale	
1990	446	222	224	50%
1991	707	398	309	56%
1992	1,113	602	511	54%
1993	1,568	835	733	53%
1994	1,610	652	958	40%
1995	1,470	597	873	41%
1996	1,967	803	1,164	41%
1997	2,223	567	1,656	26%
1998	2,031	397	1,634	20%
1999	1,828	587	1,241	32%
2000	1,610	476	1,134	30%
2001	805	159	646	20%
2002	780	180	600	23%
2003	730	133	597	18%
2004	1,040	286	754	28%
2005	1,105	271	834	25%
2006	1,063	249	814	23%
2007	1,097	311	786	28%
2008	601	65	536	11%
2009	465	119	346	26%
2010	731	266	465	36%
2011	819	303	516	37%
2012	763	252	511	33%
2013	734	238	496	32%
2014	890	240	650	27%
Total:	**28,196**	**9,208**	**18,988**	
Average (p.a.):	**1,128**	**368**	**760**	**32%**

The table also illustrates the volatility in deal volume over time. This is further illustrated by figure 14 on the next page. There were many IPOs during 1993 to 2000, with particular peaks in 1993 (835 IPOs), 1996 (803 IPOs), and in 1999 (587 IPOs). This was mainly driven because of the Internet bubble. Yet, around 2000 – 2001 this bubble bursted, consequently leading to a tremendous drop in IPOs. A similar pattern is observable at the start of the financial crisis in 2008, which resulted in a drop of IPOs from 311 to 65. Trade sales also seemed to be affected by these economic cycles. However, the deal volume of trade sales has been more resilient and stable over time. This seems reasonable, as the literature review of this thesis found trade sales to be more universal exit strategies in comparison to IPOs. IPOs are highly dependent on market valuations, whereas this is not always the case for trade sales.

Figure 14: Deal Volume Patterns



§3.5. Robust Statistics

As explained in the methodology, the empirical research comprises several statistical regressions. Linear regressions underlie *assumptions* that need to be satisfied in order to generate valid and efficient statistical results. Satisfying these assumptions enhances the robustness of the outcomes. These assumptions include the normality of the distribution, homoscedastic errors, and the absence of serial correlation and perfect multicollinearity (Nau, 2016). Also outliers should be considered, as they will have a tremendous impact on the sample. All these considerations are further explained:

(A.) Normality

Theoretically, the errors of linear regressions are required to follow a normal distribution. A sign of non-normality is a skewed distribution. Although non-normal distributions may distort relationships, it is found by academics not to form a huge treat as it doesn't contribute to inefficient or biased regressions models (Statistics Solutions, 2013). In addition, the normality assumption seems only to be an issue when having a small sample size. With a sufficient size, the distribution of the error term will approach normality due to the Central Limit Theorem (Li, Wong, Lamoureux, & Wong, 2012).

Despite its insignificance, it's still good to identify normality, and to make proper corrections to enhance the robustness of the results. One way to identify normality is by means of a distribution histogram or a normal Q-Q plot (Tabachnick & Fidell, 1989). Another way is by means of statistical tests for normality, such as the Jarque-Bera test (Nau, 2016).

When non-normality is identified, corrections can be made. Firstly, ***non-linear transformation*** of variables by transforming values into log values, can improve normality (Osborne & Waters, 2002). Secondly, robust regression methods may be a good alternative. These types of regressions are not dependent on model assumptions, such as with the Ordinary Least Squares (OLS), and are thus used by academics when distributions of residuals are non-normal (Susanti, Pratiwi, Sulistijowati, & Liana, 2013). The most commonly used robust regression is the ***MM-estimator*** (Stuart, 2011).

This thesis will make use of log-transformation of variables, and the MM-estimator in addition to the standard OLS, if non-normality is identified.

(B.) Homoscedasticity

A second assumption of linear regressions relates to homoscedasticity of the errors, implying a constant variance between the errors across a range of values of the independent variable. Heteroscedasticity may cause incorrect standard deviations of the error, thereby leading to a distortion of the statistical output (Osborne & Waters, 2002). It's thus crucial to identify heteroscedasticity and to correct for if needed. Heteroscedasticity can be identified by using the ***Breusch-Pagan-Godfrey test*** (1979), or the ***White test*** (1980). Both heteroscedasticity identification tests will be applied in the empirical research of this thesis.

If heteroscedasticity is identified, particular corrections should be undertaken. The ***Huber-White test*** can be applied in order to create robust standard errors that control for heteroscedasticity. These robust standard errors relax the assumption of identically distributed errors and homoscedasticity. This correction doesn't change the coefficients of the regression, but will generate more accurate p-values (Berry & Feldman, 1985). The Huber-White test will also be applied in the empirical research of this thesis, if heteroscedasticity is observed.

(C.) Serial Correlation

Another assumption of linear regressions is the absence of serial correlation (i.e. autocorrelation). Autocorrelation occurs in the case of statistical dependence between the residuals of the regression model, and when there exists a trend or correlation between those residuals over time. Serial correlation will not negatively affect the consistency of the OLS estimators, yet it may create an inefficient regression model (Harvey, 1990). All in all, it may distort the accuracy of the p-value in statistical hypothesis tests. This explains why it's essential to investigate if a regression analysis is prone to autocorrelation before interpreting the results. Serial correlation can be identified with the support of ***correlograms*** (Q-statistics), a statistical tool that displays the (partial) autocorrelations of the residuals. Another formal statistical test to identify autocorrelation is through the ***Breusch-Godfrey Lagrange Multiplier test*** (Asteriou & Hall, The Breusch-Godfrey LM test for serial correlation, 2011). Both statistical tools will be applied to test for serial correlation in the empirical research of this thesis.

(D.) Multicollinearity

The Classical Linear Regression Model (CLRM) also assumes the absence of perfect multicollinearity. Multicollinearity occurs when independent variables strongly correlate, thereby making it difficult to disentangle the effects of individual estimators on the dependent variable. Although imperfect multicollinearity does not harm the efficiency of the estimators (they remain 'BLUE'), it may create problems by affecting the variances and standard errors of the OLS (Asteriou & Hall, 2015). Multicollinearity can be identified by means of the Variance Inflation Factor (VIF), which is a widely accepted measure. This measure provides VIF statistics, and when these exceed the value of 10 (rule of thumb), strong multicollinearity is detected (Jiménez, 2013). The VIF measure is applied in the empirical analysis of this thesis to identify multicollinearity.

(E.) Outliers

Lastly, outliers play a significant role as they can harm the "fit" of the regression model with regards to the data observations (Northwestern University, 1997). In particular, linear regressions are known to be highly sensitive to outliers and deviations from the normal distribution, and outliers could potentially lead to incorrect models (Zygmont & Smith,

2014). The robust regression methods can be used as an alternative in the presence of outliers. This makes robust regressions a powerful statistical tool, as they can be used in the case of non-normality, or when facing tremendous outliers. The robust regressions generate a robust fit with the data by assigning different weights to different data points, thereby giving outliers a smaller level of influence on the regression results (Stuart, 2011). This makes robust regressions relatively insensitive to outliers compared to the standard OLS. This thesis will apply the ***MM-estimator*** as a robust regression method if outliers are detected.

Another way to deal with outliers is by ***winsorizing*** the data. Winsorization is the transformation of data by limiting extreme values by restricting data to a certain percentile. This process will mitigate spurious outliers (Tukey, 1962). This thesis applies a 2.5% and 97.5% winsorization, implying the lower values will be limited to a 2.5% percentile, and the upper values will be limited to a 97.5% percentile.

All in all, the empirical research of this thesis will perform *three different regressions* to enhance the robustness of the results. The standard OLS is performed, with correction for heteroscedasticity if required. A robust regression method (MM-estimator) is performed to correct for non-normality and other violations of standard assumptions. And a regression based on winsorized values is executed, to mitigate the effects of spurious outliers. The results of these three regressions are compared, and similar results will support the validity and robustness of the statistical outcomes.

CHAPTER 4: Logistic Regression of Exit Decision

§4.1. Introduction

There exist three comprehensive papers focussing on the essential factors that affect the "attractiveness" of an IPO versus a trade sale. These papers make an attempt to figure out which factors could play a relevant role in the process of deciding between the exit options. They perform diverse statistical regressions to test the relationship between the factors and exit choice. One of these three empirical papers (Francis, Hasan, & Siregarc, 2009) focuses solely on the banking industry, and is thus not discussed in this chapter.

Brau, Francis and Kohers (2003) were the first to write on this topic. They primarily focussed on industry and macroeconomic determinants of the decision between IPOs and trade sales. These industry and macroeconomic determinants included industry-related factors (e.g. the level of concentration in an industry), market-timing factors (e.g. investor sentiment), deal-specific factors (e.g. firm size) and funding demand factors (e.g. returns SMB and HML portfolio's). The authors illustrate that firms are more likely to exit through an IPO in industries that are highly-concentrated, where the overall ratio of IPOs to mergers is high, and when 3 month T-bill rates are relatively high. Deal-specific factors also play an important role, as firms with a lower leveraged position are more likely to go public through an IPO than through a trade sale.

Hence, macroeconomic and industry-specific factors partly solve the puzzle, but face the problem that they are solely focussed on aggregate market and industry facets. What about the firm-specific factors that may play a role in the decision on how to exit? These firm-specific factors have been analysed in a study of Poulsen and Stegemoller (2005), focussing on company growth, capital structure and information asymmetry. They measured the influence of firm characteristics on the exit route.

Their findings suggest that all firm-specific factors are key. They measure growth in different ways, and find that faster growing companies will be more likely to exit through an IPO. The capital structure, or need for capital, seems also relevant as IPO candidates obtain a lower leveraged position in comparison to trade sales. In addition, information asymmetry is also an important determinant. Firms engaging in IPOs have fewer intangible assets, are less likely to be positioned in the development stage, and are more likely to be financially backed by VC's. Finally, their analysis shows that IPO candidates are larger in terms of size.

Hence, firm-specific factors contribute significantly to the exit decision between IPOs and trade sales. Therefore, this research also accounts for these firm-specific factors in the logistic regression model. The firm-specific factors as described by the study of Poulsen and Stegemoller (2005), are extended with profitability, size, and venture-capital factors as explained in the methodology. My research does not take the macroeconomic and industry factors of Brau, Francis and Kohers (2003) into consideration, as this is not in line with the objectives of this research.

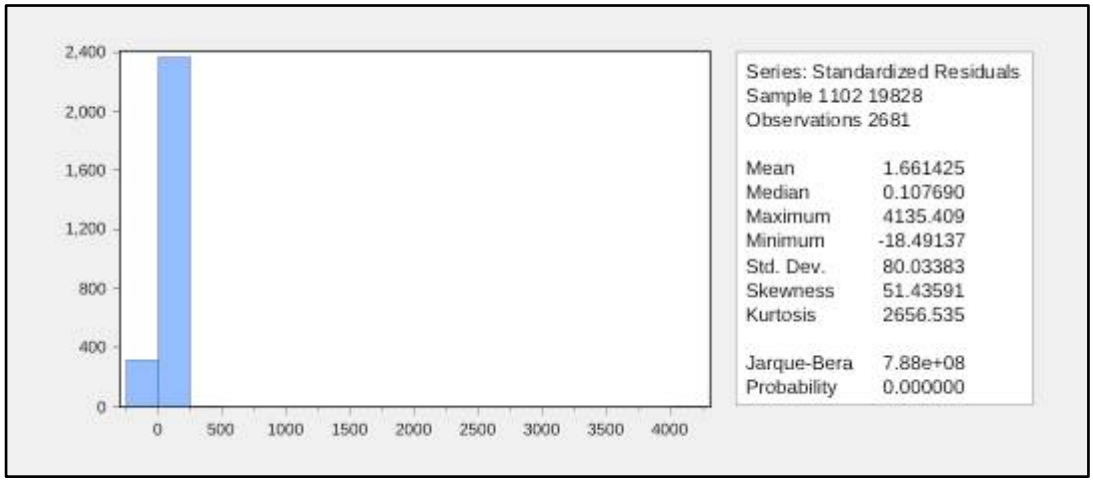
§4.2. Analysis & Results

The empirical analysis of this chapter discusses firstly the robustness of the sample, by looking at the robustness criteria (normality, heteroscedasticity, serial correlation, multicollinearity, outliers) as described in Chapter 3 (Data). Heteroscedasticity is not discussed, as logistic regressions don't require homoscedastic error variance. Also normality is not required, yet normal distributed residuals may lead to more accurate results (Statistics Solutions, 2016). Heteroscedasticity is thus not analysed, but normality, serial correlation, and outliers are. Afterwards, the statistical output of the logistic regression is interpreted.

Robustness

Figure 15 illustrates the distribution of the logistic regression. The histogram clearly indicates a skewed distribution. This is further supported by the Jarque-Bera statistic, and corresponding p-value of zero. This implies that the null hypothesis of a normal distribution can be rejected. As a result of this non-normality, this research uses a log transformation of values in order to approximate normality.

Figure 15: Normality Logistic Regression



The logistic regression consists of no serial correlation, supported by the correlogram in table 22 in the Appendix. However, the sample does comprise outliers. Not all variables of the logistic regression are affected by outliers. Figure 28 in the Appendix evidently shows that the variables 'Capex/Assets', 'Debt/Assets', and 'ROA' obtain outliers that deviate from the general data pattern. It is because of these outliers, that these variables have been winsorized on a 2.5% and 97.5% percentile. Overall, the logistic regression has been performed in two alternative ways by using the standard logistic regression, and a logistic regression based on winsorized variables to mitigate the effects of outliers.

Output

Table 7 presents the results of the standard logistic regression. All variables are found to be significant. The dependent variable is a dummy variable takes a value of '1' in the case of an IPO, and a '0' in the case of a trade sale. The Capex ratio is significantly positive, implying IPO candidates are more growing companies by spending more on Capex as compared to trade sale candidates. The gearing (Debt/Assets) is significantly negative, implying trade sale candidates are more leveraged, which could form a signal of financial risk. The intangibles ratio is an indicator of information asymmetry. This ratio is greater for IPOs, and thus IPO companies appear to be more prone to information asymmetry. This is in line with academic literature (Cumming & MacIntosh, 2003), finding that IPO companies obtain a great extent of

information asymmetry due to the unsophisticated nature of the public buyers, thereby creating significant "knowledge gaps" between insiders and outsiders. The profitability ratios (ROA, Sales) provide contrasting results, as the ROA seems to be significantly greater for trade sales, whereas sales seem to be significantly greater for IPOs. This matter will be further analysed in the accounting performance analysis in the next chapter. Furthermore, the assets are significantly positive and thus IPOs seem to be larger than trade sales. And finally, IPOs are significantly more frequently backed by venture capitalists relatively to trade sales.

Table 7: Standard Logistic Regression

Dependent Variable: EXIT Method: Binary Logitic Regression				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
Capex / Assets	3.86	0.89	4.35	0.0000
Debt / Assets	-2.35	0.19	-12.37	0.0000
Intangibles / Assets	2.00	0.70	2.87	0.0041
ROA	-0.69	0.14	-4.94	0.0000
Log (Sales)	0.53	0.15	3.45	0.0006
Log (Assets)	1.08	0.15	7.30	0.0000
VC-Backed	2.73	0.30	9.24	0.0000
C	-0.13	0.21	-0.63	0.5301
McFadden R-squared	0.42		**Total obs**	2681

*Red number: Significance on 95% confidence interval

The results of the standard logistic regression are also supported and verified by the alternative regression that controls for transformed winsorized variables. This is presented in table 8. The r-squared increased from 42% to 48%, thereby indicating a better fit with the model. All variables are significant, and the coefficients have a similar impact as in the standard regression.

Table 8: Winsorized Logistic Regression

Dependent Variable: EXIT Method: Winsorized Logitic Regression				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
Capex / Assets (Winsorized)	6.91	1.49	4.64	0.0000
Debt / Assets (Winsorized)	-3.41	0.26	-13.04	0.0000
Intangibles / Assets	3.20	0.80	4.02	0.0001
ROA (Winsorized)	-0.85	0.29	-2.89	0.0038
Log (Sales)	0.96	0.20	4.90	0.0000
Log (Assets)	0.91	0.18	4.97	0.0000
VC-Backed	3.03	0.35	8.59	0.0000
C	-0.48	0.28	-1.74	0.0826
McFadden R-squared	0.48		**Total obs**	1917

*Red number: Significance on 95% confidence interval

§4.3. Conclusion

Based on the empirical analysis sub-question (B) can be answered:

(B.) What factors influence the exit decision between an IPO and trade sale?

All analysed factors (growth, capital structure, information asymmetry, profitability, size, venture capital) have a significant influence on the exit decision between IPOs and trade sales. The logistic regression finds IPO candidates to be larger and more growing companies compared to trade sale candidates. This may indicate a potential selection bias, as documented by the existent literature (Bienz, 2004). Furthermore, IPOs obtain greater levels of information asymmetry, and are more frequently backed by venture capital. Capital structure also plays a significant role, as trade sale candidates seem to be more highly leveraged. The impact of profit is yet ambiguous.

The results of this regression are in line with a similar research of Poulsen and Stegemoller (2005), with exception of the intangible ratio. This ratio is found to be lower for IPOs in their study. This thesis implies the contrary, but this finding seems reasonable due to the unsophisticated nature of public buyers in the case of an IPO.

CHAPTER 5: Accounting Analysis

§5.1. Introduction

The existing literature suggests that both IPOs as well as trade sales are profitable prior to the exit event. There is empirical evidence stating that IPO candidates outperform their industry counterparts, whereas firms involved in takeovers outperform similar public firms (Poulsen & Stegemoller, 2005). Hence, both IPOs and trade sales seem to be lucrative businesses for investors before they exit the venture. The question is however which exit route is more lucrative in terms of operating performance. The accounting analysis will make an attempt to answer this question by comparing operating performance measures prior to the exit transaction. A company with a better operating performance prior to the exit, will probably also achieve a greater exit valuation. This explains why historical operating performance is key when evaluating the different exit strategies.

Poulsen and Stegemoller (2005) find trade sales to be more profitable than IPOs in terms of operating performance. The authors measure the pre-transaction operating performance by analysing the return on assets (ROA) and return on sales (ROS). They however do not take the solvency or liquidity position of the firm into account. These factors should be considered, as they form an essential part of the short and long term profitability and "financial health" of a company. Neither does the study of Poulsen and Stegemoller (2005) look at other profitability measures, such as the ROE and ROCE. This thesis will thus focus on the profitability, solvency, and liquidity by comparing the sales, EBITDA, ROE, ROCE, gearing ratio, and current ratio (see methodology). All these operating performance factors are analysed and the results are discussed below.

§5.2. Analysis & Results

This empirical analysis of this chapter performs difference tests between the means of the accounting indicators of IPOs and trade sales. The means and medians of the various accounting measures are illustrated in table 9. These descriptive statistics clearly show that trade sales outperform IPOs in terms of the (mean and median of) ROE and ROCE, whereas they underperform in terms of sales and EBITDA. On the contrary, IPOs have a lower solvency, but a greater liquidity position.

Table 9: Descriptive Statistics Accounting Analysis

	ROE		ROCE		Sales		EBITDA		Solvency		Liquidity	
	IPO	TS	IPO	TS	IPO	TS	IPO	TS	IPO	TS	IPO	TS
Mean	**0.29**	**0.35**	**0.40**	**0.55**	**1.51**	**1.16**	**0.93**	**0.39**	**0.23**	**0.93**	**2.52**	**2.24**
Median	**0.26**	**0.27**	**0.06**	**0.19**	**1.55**	**1.16**	**0.90**	**0.38**	**0.07**	**0.77**	**1.60**	**1.28**
Maximum	9.72	9.72	495.21	211.81	5.02	3.74	4.23	2.97	12.10	9.54	50.76	50.28
Minimum	-9.49	-9.86	-72.23	-63.78	-2.70	-2.52	-3.00	-3.00	0.00	0.00	0.00	0.00
Std. Dev.	1.42	1.51	14.48	7.57	0.85	0.77	0.75	0.77	0.51	1.00	3.38	3.98
Observations	2504	1922	2515	1730	2360	3395	1509	1387	2517	2346	2179	2113

**Source: Eviews (2016)*

A t-test has been performed to test for significant differences in means between IPOs and trade sales. The statistical results are presented in table 10. Both the sales as well as EBITDA are significantly greater for IPOs compared to trade sales. However, the ROE and ROCE are lower for IPOs. This difference in ROE and ROCE is however *insignificant!* The difference in profitability is thus not entirely clear. Nevertheless, one could argue that IPOs are more profitable in absolute terms, whereas the difference in relative performance (returns scaled on equity and capital employed) is not significantly different with trade sales. These results are thus not completely in line with prior literature, as Poulsen and Stegemoller (2005) found trade sale candidates to *significantly* outperform IPO candidates on a relative basis (by measuring return on assets, and return on sales).

IPO' companies also have a significantly lower (**-0.70%**) solvency position, and are thus leveraged to a lesser extent. This may imply that trade sales obtain greater financial risk due to tremendous levels of debt. This may also form a potential explanation for why these trade sale' target companies are taken over due to the presence of financial distress. Lastly, IPOs have a significantly greater current ratio (**0.29**) than trade sales, thereby indicating a greater level of liquidity and stronger ability to meet short-term financial obligations.

Table 10: Accounting Analysis Hypothesis Test

Accounting Indicators			Total	IPO	Trade Sale	t Test Difference	t Test p-value
Profit	Log (Sales)	(Value)	2.6741	1.51	1.16	0.36	0.0000
		(Obs.)	5,755	2,360	3,395		
	Log (EBITDA)	(Value)	1.3258	0.93	0.39	0.54	0.0000
		(Obs.)	2,896	1,509	1,387		
	ROE	(Value)	0.6423	0.29	0.35	-0.06	0.1756
		(Obs.)	4,426	2,504	1,922		
	ROCE	(Value)	0.9439	0.40	0.55	-0.15	0.6969
		(Obs.)	4,245	2,515	1,730		
Solvency	Gearing	(Value)	1.1611	0.23	0.93	-0.70	0.000
		(Obs.)	4,863	2,517	2,346		
Liquidity	Current Ratio	(Value)	4.7567	2.52	2.24	0.29	0.0113
		(Obs.)	4,292	2,179	2,113		

*Red number: Significane on 95% confidence interval

§5.3. Conclusion

Based on the empirical analysis sub-question (C) can be answered:

(C) Do IPO or trade sale candidates achieve greater operating performance before the exit event?

Overall, IPOs outperform trade sale candidates by having greater absolute profitability measures and liquidity ratios, whereas lower gearing ratios that reduce financial risk. The difference in the relative profitability (ROE and ROCE) is not straightforward, as trade sales seem to obtain greater ratios that are insignificant. The greater absolute profitability measures of IPOs may indicate a potential selection bias, which will be tested in the exit valuation analysis.

CHAPTER 6: Premium Analysis

§6.1. Introduction

To my knowledge there is only one academic article examining the premium differences between IPOs and trade sales (Brau, Francis, & Kohers, 2003). This article suggests that premiums are significantly greater for IPOs than for trade sales in the period from 1984 to 1998. They find a mean premium of 13.3 versus 10.9 for IPOs and trade sales respectively. Their empirical research indicates that selling insiders of an IPO will gain a premium that's 22%[6] larger than the premium gained with a trade sale. Brau et al. (2003) argue that this premium difference is due to the liquidity discount, and IPOs are "compensated" by having a stronger liquidity risk relatively to trade sales.

§6.2. Analysis & Results

The empirical analysis of this chapter performs a difference test in means and medians between the premiums of IPOs and trade sales. The t-test is applied to test for differences in the mean, whereas the Wilcoxon test is used for the median difference test. The premium multiples (the offer price divided by the book value of equity) is restricted to a maximum multiple of 100, as a greater multiple wouldn't seem reasonable. Figure 29 in the Appendix illustrates that this restriction has mitigated the impact of outliers. Still, the mainstream of data falls between a multiple of 0 to 20. Nevertheless there do exist many observations between 20 and 100, so these data points cannot be interpreted as an outlier and should be taken into account. The outcome of the t-test and Wilcoxon test are presented in table 11.

Table 11: Premium Analysis Hypothesis Test

Premium (Offer Value / Book Value)	Total	IPO	Trade Sale	t-Test & Wilxocon Test Difference	p-value
Mean	21.79	12.23	9.56	2.66	0.0000
Median	10.37	6.18	4.19	1.99	0.0000
Observations	3,815	2,161	1,654		

*Red Number: Significance on 95% Confidence Level

The outcomes clearly illustrate the outperformance of IPOs. IPOs obtain both a significant greater mean premium (12.23 versus 9.56) as well as a significant greater median premium (6.18 versus 4.19) relatively to trade sales. The mean premium of IPOs is 28%[7] larger, whereas the median premium of IPOs is 47%[8] larger. These results are in line with the existent literature on exit premiums. Brau, Francis & Kohers (2003) also found IPOs to obtain greater premium, with a difference of 22% compared to trade sales. The findings of this research, implying a 28% mean difference, are thus even stronger than expected.

[6] (13.3 - 10.9) / 10.9 = 22%

[7] (12.23 – 9.56) / 12.23 = 28%

[8] (6.18 – 4.19) / 4.19 = 47%

§6.3. Conclusion

Based on the empirical analysis, sub-question (D) can be answered:

(D) Do investors achieve greater exit premiums when pursuing an IPO or trade sale?

The target insiders of IPOs acquire greater premiums compared to trade sale insiders. This creates a comparative advantage and forms a rationale for companies to engage in IPOs. This premium difference may be explained by the liquidity premium as proposed by the academic literature (Brau, Francis, & Kohers, 2003). IPOs are less liquid compared to trade sales. Trade sales are often completed by cash deals, thereby leading to a direct exit. IPOs, in contrast, are dependable on the equity market, which may lead to illiquidity issues. This translates into an illiquidity discount (or liquidity premium) for IPOs.

The greater premiums of IPOs may also be an indication of greater exit values for IPOs. The extent to which this is true, is examined in the next chapter.

CHAPTER 7: Exit Valuation Analysis

§7.1. Introduction

The only two academic papers making a true distinctive comparison between the exit values or multiples of IPOs versus trade sales are Poulsen and Stegemoller (2006), and Hellmann et al. (2005). Poulsen and Stegemoller compare the two exit routes based on diverse factors, and find significantly greater valuation multiples for IPOs compared to trade sales from 1995 to 2004. They report a median exit value to total assets of 5.8 for IPOs versus 3.9 for trade sales and a median exit value to sales of 5.9 for IPOs versus 3.5 for trade sales. They suggest that IPO candidates are fast growing companies, resulting in larger valuations.

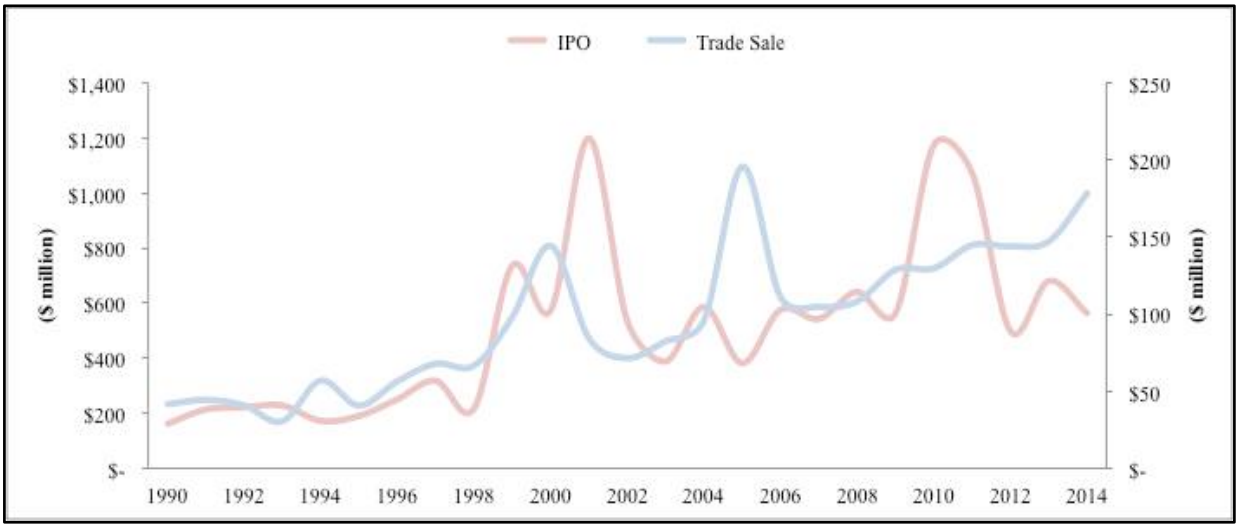
The study of Hellmann et al. also reports exit values of IPOs and trade sales. However they create an international analysis on the value of exit routes, by comparing the performance of IPOs and trade sales between the USA and Canada. Their main findings illustrate the outperformance of the USA to Canada in terms of exit routes, and the outperformance of IPOs to trade sales in both countries. They report a domestic average exit value of $333.2 million for IPOs versus $113.5 million for trade sales in the United States.

Hence, the majority of the existent empirical literature acknowledges the outperformance of IPOs over trade sales in terms of exit values. Two important explanations of this outperformance are the selection bias and the market-timing strategy. This section will provide empirical results on the exit value differences between IPOs and trade sales. The validity of the selection bias and marketing-timing explanation are also tested.

§7.2. Analysis & Results

The introduction illustrates the common notion in academics that IPOs appear to obtain greater exit values. This is also supported by figure 16 - presenting the raw data on exit values of the sample of this thesis. The left axis illustrates the values of IPOs, and the right axis the values of trade sales. There have been several billion dollar valued IPOs, whereas trade sale valuations remained in millions, illustrating a clear difference in exit values. During the Internet bubble, IPO exit values rose to a maximum average exit value of $1.2 billion in 2001. This was followed by a burst, which is supported by a fierce drop in IPO's exit values.

Figure 16: Annual Average Exit Values



**Source: SDC Database, 1990 – 2016*

Hence, the difference in exit valuations between IPOs and trade sales is evident. Nevertheless, a formal statistical analysis is required in order to make valid statements. Firstly, this chapter performs hypotheses tests by analysing the difference in means and medians between the exit values and multiples of IPOs and trade sales. This is followed by a regression analysis to control for profitability, size, and market variables that may explain the difference in exit values. Before performing these regressions, robustness tests are required by analysing the normality, heteroscedasticity, serial correlation, multicollinearity, and outliers of the sample.

Hypothesis Tests

Table 12 presents the results of the hypothesis tests, using a t-test and Wilcoxon test for differences in means and medians. Not only the exit values, but also five exit multiples (scaled to assets, sales, EBITDA, EBIT, NASDAQ) are compared. IPOs obtain exit values that *significantly outperform* trade sales by $373 million for the mean and by $146 million for the median. Hence, IPOs generate greater investor returns from an absolute perspective.

Table 12: Exit Valuation Hypothesis Test

Exit Multiple		Mean		t-Test		Median		Wilxocon Test	
		IPO	Trade Sale	Difference	p-value	IPO	Trade Sale	Difference	p-value
Exit Value	(Value)	470	97	373	0.0000	174	28	146	0.0000
	(Obs.)	3,381	12,347			3,381	12,347		
Exit / Assets	(Value)	100	24	76	0.2904	5.26	2.27	2.99	0.0001
	(Obs.)	2,094	2,109			2,094	2,109		
Exit / Sales	(Value)	169	104	65	0.3403	5.38	1.70	3.68	0.0000
	(Obs.)	1,948	2,962			1,948	2,962		
Exit / EBITDA	(Value)	55	10	45	0.3600	7.22	7.89	-0.68	0.0548
	(Obs.)	1,984	1,689			1,984	1,689		
Exit / EBIT	(Value)	68	48	20	0.8795	7.27	8.84	-1.57	0.0001
	(Obs.)	2,047	1,915			2,047	1,915		
Exit / NASDAQ	(Value)	0.29	0.05	0.24	0.0000	0.11	0.02	0.10	0.0000
	(Obs.)	3,371	12,346			3,371	12,346		

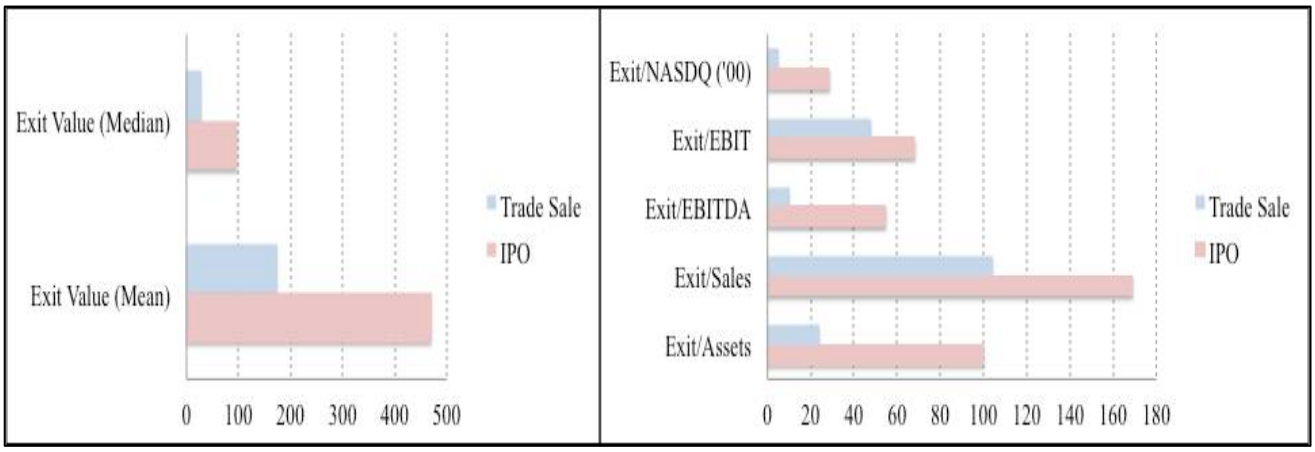
*Red Number: Significance on 95% Confidence Level

The results of the exit multiples are less clear-cut. All mean exit multiples are *larger* for IPOs than for trade sales, in particular the Exit/Assets multiple (difference of $76 million). However, only the Exit/NASDAQ multiple is significant among the mean multiples! This implies that IPOs acquire greater exit values, even when controlling for the cycles of the equity markets (bear and bull markets).

The majority of the median exit multiples are however significantly different. The Exit/Assets, Exit/Sales, and Exit/NASDAQ are significantly larger for IPOs. Yet, the median of the Exit/EBIT is significantly lower for IPOs. However, one could question the validity of this result, as the t-test clearly shows the mean of the Exit/EBIT multiple to be greater for IPOs with $20 million. Overall, one could argue that IPOs outperform trade sales on an absolute level by obtaining greater exit values. Generally speaking, IPOs also outperform trade sales on a relative level, yet not all mean multiples are significantly greater, and there exists some inconsistency with regards to the median exit multiples. The exit values and mean exit multiples are summarised in figure 17 (next page)[9].

[9] The numbers of the figures are in $ million

Figure 17: Exit Multiples

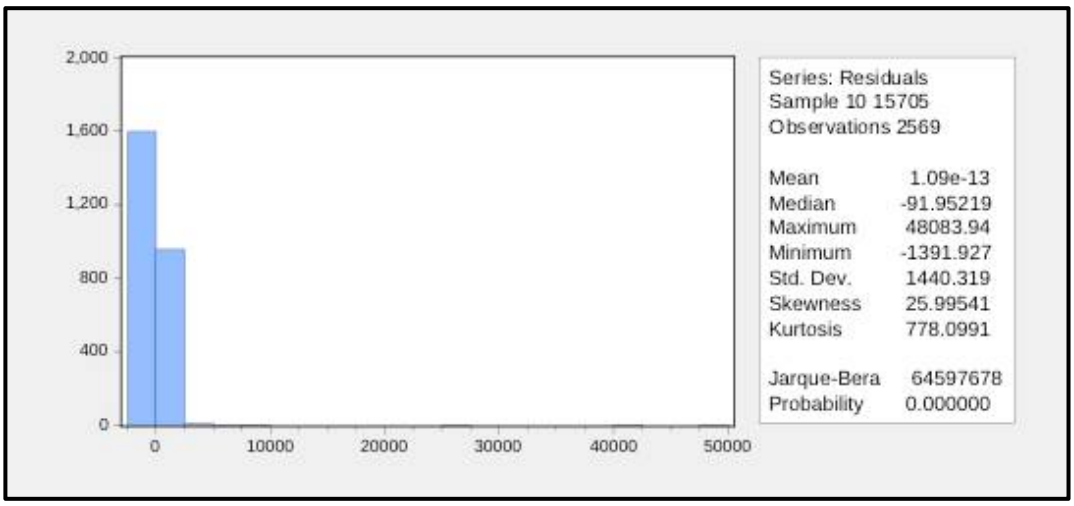


**Source: SDC, Compustat (1990 – 2014)*

Robustness

Before interpreting the outcomes of the regression results, the robustness should be verified. The residuals of the regression follow a non-normal distribution, indicated by the skewed histogram (figure 18). The Jarque-Bera statistic reaches zero, implying the null hypothesis of normality can be rejected. In order to mitigate potential disadvantageous effects of non-normality, the variables (sales, assets) have been transformed into log values to approximate normality. Also, a robust regression method (MM-estimator) is applied to enhance the robustness of the statistical results.

Figure 18: Normality Exit Regression



**Source: Eviews, 2016*

The data is not subject to serial correlation, supported by the correlogram in the Appendix (table 23). Also, the Breusch-Godfrey Lagrange Multiplier (LM) test has been used to identify autocorrelation. This test, indicated in table 24 of the Appendix, supports the absence of serial correlation. Furthermore, there exists no strong form of multicollinearity, which is confirmed by the Variance Inflator Factor analysis in table 32 (Appendix). The standard errors are however biased because of heteroscredasticity. Heteroscedasticity is identified by the Breusch-Pagan-Godfrey test (table 25, Appendix) and the White heteroscedasticity test (table 26, Appendix), presenting low p-values and thereby rejecting the null hypothesis of homoscedasticity.

Thus, proper corrections should me undertaken. The Huber-White correction will be applied to the regression to create robust standard errors by controlling for heteroscedasticity. This consequently leads to more efficient and accurate statistical results.

Lastly, outliers should be detected in order to make proper corrections. Figure 30 in the Appendix illustrates the leverage plots of the regressors of the statistical analysis of this chapter. Clearly, there exist several outliers that may deteriorate the robustness of the results. As a result, this chapter runs the robust regression method (MM-estimator), and runs a regression based on winsorized variables (on a 2.5% and 97.5% percentile) to avoid unfavourable effects of outliers.

Output

The results of the standard Least Squares regression, which corrects for heteroscedasticity, are presented in table 13. The dummy variable takes the value of '1' for IPOs, and '0' for trade sales (see methodology for the regression formula). The results have two implications. Firstly, all variables (dummy, size, sales, market) have a favourable significant effect on the exit value, except the growth factor. Not only has the growth variable a very low coefficient (near zero), it's also insignificant. This implies that growth plays a minor role in the level of exit returns. The second implication relates to the dummy variable. The coefficient is positive significant, implying the difference in exit values between IPOs and trade sales ***remains significant***, even after controlling for profitability, size, and market variables. This means that the difference in exit values cannot be explained by the selection bias, or the market-timing strategy. However, the p-value of the dummy coefficient has increased from zero[10] to 0.0041, indicating that some of the difference in exit values may partially be explained by the control variables. Hence, profitability, size, and market do play a prominent role, and have a minor effect on the difference in exit values, but the difference remains highly significant.

Table 13: OLS Regression Exit Value

Dependent Variable: EXIT VALUE Method: Least Squares White heteroskedasticity-consistent standard errors & covariance				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Dummy	140.95	49.10	2.87	0.0041
Log (Size)	335.53	71.26	4.71	0.0000
Log (Sales)	174.01	57.17	3.04	0.0024
Growth	0.00	0.00	0.74	0.4564
Market	14.62	5.70	2.57	0.0104
C	-943.07	280.76	-3.36	0.0008
R-squared	0.064	Observations: 2569		

*Red Number: Significance on 95% Confidence Level

These results are also verified by the winsorized Least Squares regression, and by the robust regression method (MM-estimator). The findings of the winsorized and robust regression are presented in table 14 (next page). Both the winsorized as well as the robust regression verify

[10] Regression analysis without control factors (Exit value = α + βDummy) finds a zero p-value for the dummy

the statistical findings of the standard OLS. The r-squared increases from 6.4% to 30.5% in the case of the winsorized regression, indicating a better fit. The dummy coefficient remains significant for both regressions after controlling for the selection bias and market variable.

Table 14: Winsorized & Robust Regression

Dependent Variable: EXIT VALUE **Method: Winsorized Least Squares** White heteroskedasticity-consistent standard errors & covariance				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Dummy	91.62	5.70	16.07	0.0000
Size (Winsorized)	72.09	5.46	13.21	0.0000
Sales (Winsorized)	35.09	6.30	5.57	0.0000
Growth (Winsorized)	0.49	0.12	4.12	0.0000
Market (Winsorized)	5.18	0.43	12.01	0.0000
C	-217.34	14.95	-14.54	0.0000
R-squared	0.305	Observations: 2117		

*Red Number: Significance on 95% Confidence Level

Dependent Variable: EXIT VALUE **Method: Robust Least Squares**				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
Dummy	59.28	2.29	25.88	0.0000
Log (Size)	21.85	2.00	10.93	0.0000
Log (Sales)	12.48	2.03	6.15	0.0000
Growth	0.00	0.00	5.75	0.0000
Market	1.79	0.14	12.38	0.0000
C	-49.73	4.94	-10.06	0.0000
R-squared	0.139	Observations: 2569		

*Red Number: Significance on 95% Confidence Level

Also, the dummy coefficient remains strong. In the robust regression, the dummy coefficient equals 59.28. This means IPO's exit values remain significantly greater than trade sales with almost $60 million, even after accounting for the profitability, size and market features.

§7.3. Conclusion

Based on the empirical analysis of this chapter, sub-question (E) can be answered:

(E) Do investors achieve greater exit valuations when pursuing an IPO or a trade sale at the time of the exit event?

Investors will acquire significantly greater exit values when pursuing an IPO. On a relative basis, by analysing the exit multiples, the answer to this question is less clear. The mean (and particular median) exit multiples of IPOs do outperform trade sales. However, some of these are insignificantly different.

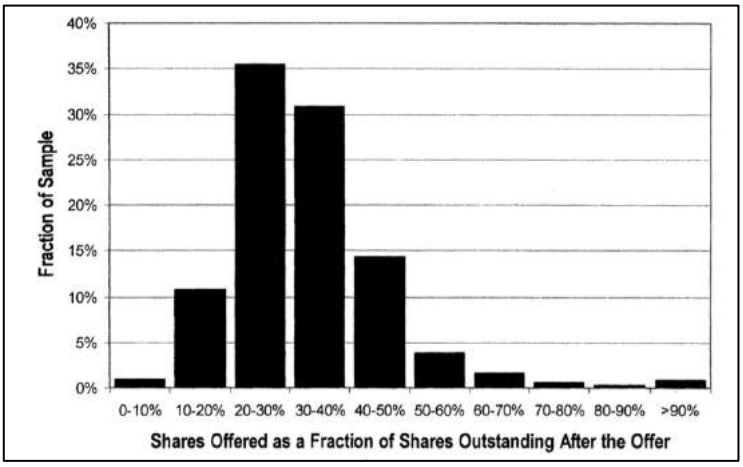
The significant difference in exit values between IPOs and trade sales cannot fully be explained by the selection bias and market-timing strategy. The difference remains strongly significant after controlling for size, sales, and the market. However, both the coefficient as well as the p-value of the dummy variable change when controlling for these factors, which may indicate a minor explanatory effect of these controlling variables on the exit value divergence. Nevertheless, these findings suggest the IPO route to be optimal, as the greater returns are not fully explained by firm- or market-characteristics. Thus, it is the exit route itself that is optimal, and not the companies involved in the sample.

CHAPTER 8: Revised Exit Valuation Analysis

§8.1. Introduction

Lock-up agreements are very common, and almost every IPO features one. This is supported by figure 19, originated from a paper of Field and Hanka (2001), examining a sample of IPOs with lock-up provisions. This chart illustrates the shares offered as a fraction of shares outstanding *after* the offer. The majority of IPOs in the sample offers a fraction between 20% and 50% of the outstanding shares after the initial offering. This implies that a huge amount of outstanding shares is not directly sold at the time of the IPO, and thus "locked" until the lock-up period expires.

Figure 19: Shared Offered at Public Offering



**Source: Field & Hanka (2001)*

Hence, the chart illustrates the common nature of lock-up provisions in the event of an exit. Yet, the current academic literature on private equity returns has *not* taken these provisions into account when calculating exit values. This thesis is therefore *the first one* accounting for lock-up agreements in a performance analysis.

A lock-up provision is a contractual agreement between the insiders and the underwriter issuing the IPO. Prior empirical research indicates that a provision typically covers an average period of 180 days (6 months). Between 80% and 90% of the IPO lock-up provisions cover a period that's exactly equal to 180 days (Bradley, Jordan, Roten, & Yi, 2001). The lock-up agreement prohibits insiders from selling their entire stake during this period, in order to increase the likelihood of success and to maintain the marketability of the IPO. These types of provisions are not forced by law, but based on a mutual agreement between the issuing firm and underwriter. Therefore, selling "lock-up shares" before the lock-up expiration may be possible when given approval by the underwriter. Practice however shows that this almost never happens. In addition to the lock-up features, firms undergoing an IPO face the legislation of Rule 144[11] and Rule 701. These rules of the U.S. Securities and Exchange Commission (SEC) set regulations around the resale of shares following an IPO. Insiders of an IPO candidate are, for example, restricted to a specific holding period and a trading volume limit of their shares. These rules create additional restrictions on insider trading, and

[11] More information on Rule 144 can be found at http://www.sec.gov/investor/pubs/rule144.htm

function as an additional explanation why the majority of shares are not liquidated at the time of the initial offering.

Academic literature finds several purposes of lock-up agreements, explaining why IPOs feature these provisions. The lock-up agreements reinsure a (1.) credible signal of quality and align interests, (2.) constrain the supply of shares, and (3.) create wealth effects for insiders. All three explanations are clarified below.

(1.) Credible signal of quality and aligning interests

There exist information asymmetry regarding the quality of the issuing firm and information asymmetry regarding the actions of managers in the aftermarket of the IPO. Many academics hypothesize that lock-up agreements provide a credible signal of the quality of the issuing firm (Brav & Gompers, 2003; Field & Hanka, 2001; Courteau, 1995; Leland & Pyle, 1977). Public investors are not aware of the quality of the issuing firm. They cannot make a true distinction between low-quality and high-quality firms. The insiders of the issuing firm are however aware of the fundamental value of the firm. Thus, there is a level of information asymmetry between the insiders and outsiders of the company. This may cause problems, as outsiders may be less willing to pay a high price for the shares of a firm with a concealed quality level. In order to alleviate issues such as these, insiders can provide a signal of high quality by retaining a part of their stake at the initial offering.

Information asymmetry could also lead to moral hazard. Insiders may not always act in the best interest of shareholders because of conflicting interests. This could cause moral hazard problems in the aftermarket of the exit event (Brav & Gompers, 2003). Outsiders may be less willing to accept an offer price if high levels of moral hazard come into place or if they feel disadvantaged by the actions of the management. A lock-up agreement may align these conflicting interests and mitigate the moral hazard problems. Insiders who retain a part of their stake following the IPO maintain “skin in the game”. Again, this could send the right signal, reducing agency-problems, and leading to greater levels of acceptance of the IPO.

The problems described illustrate the impact of information asymmetry, often accompanied with moral hazard. Information asymmetry affects the decision to what extent insiders retain or liquidate their stake following the exit event. This thesis takes these academic insights into account when analysing the performance of exit routes, by including lock-up agreements. This can be best illustrated by figure 20, portraying *the timeframe of the revised exit valuation analysis*. This timeframe represents the entire set-up of the revised exit valuation analysis in this research. The investment of a private investor in a venture can be seen as an investment cycle, consisting of an (A.) entry stage, (B.) exit stage, and (C.) unlock stage:

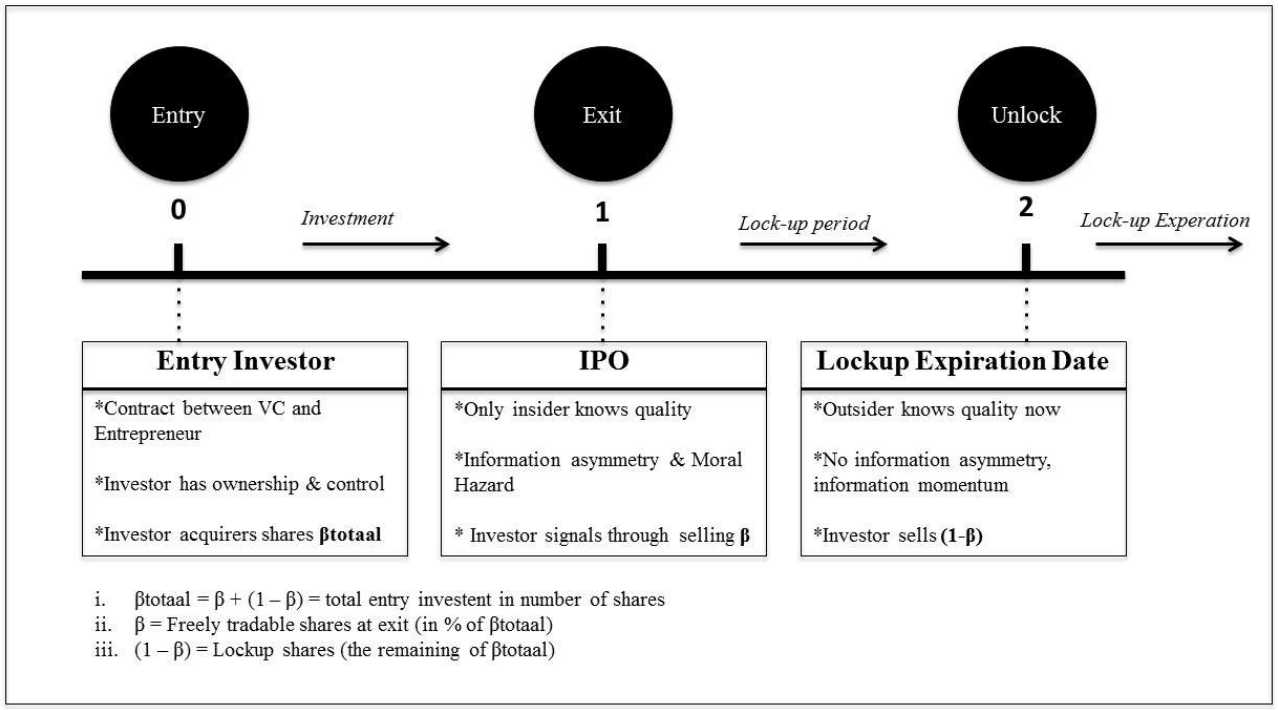
(A.) **Entry stage:** In this stage, the entrepreneur and the private investor (i.e. VC) decide to cooperate and sign a contract. The investor makes an entry investment and takes ownership in the venture by acquiring an amount of shares of the company. This amount is the total amount of shares, consisting of both freely tradable shares as well as lock-up shares. Conceptually, this is formulated as: $\beta totaal = \beta + (1 - \beta)$.

(B.) **Exit stage:** This stage creates an indirect exit event in the course of an IPO. I assume levels of information asymmetry between the insiders and outsiders in this stage. This implies that insiders are aware of the quality of the issuing firm, whereas outsiders are not. This information asymmetry could lead to moral hazard. In order to alleviate these problems, insiders are subject to lock-up agreements. Investors are

only able to partially exit by selling the freely tradable shares (β).

(C.) **Unlock stage:** This is the lock-up expiration date, typically after 180 days post-IPO. There is no or nominal information asymmetry between the agents, as information momentum has reached. Outsiders are aware of the quality and intrinsic price of the shares offered. Investors are able to fully exit by selling the lock-up shares ($1 - \beta$).

Figure 20: Conceptual Timeframe



**Source: B.M.M. van Hövell (2016)*

The reason for showing figure 20, is not only to present the timeframe of the revised exit valuation analysis of this research. The conceptual timeframe also explains the first purpose of lock-up agreements: *sending a credible signal and aligning interests between agents*. This is clearly illustrated by the interplay between information asymmetry, moral hazard, and the signalling of quality by partially selling the stake instead of a complete liquidation.

(2.) Supply of shares

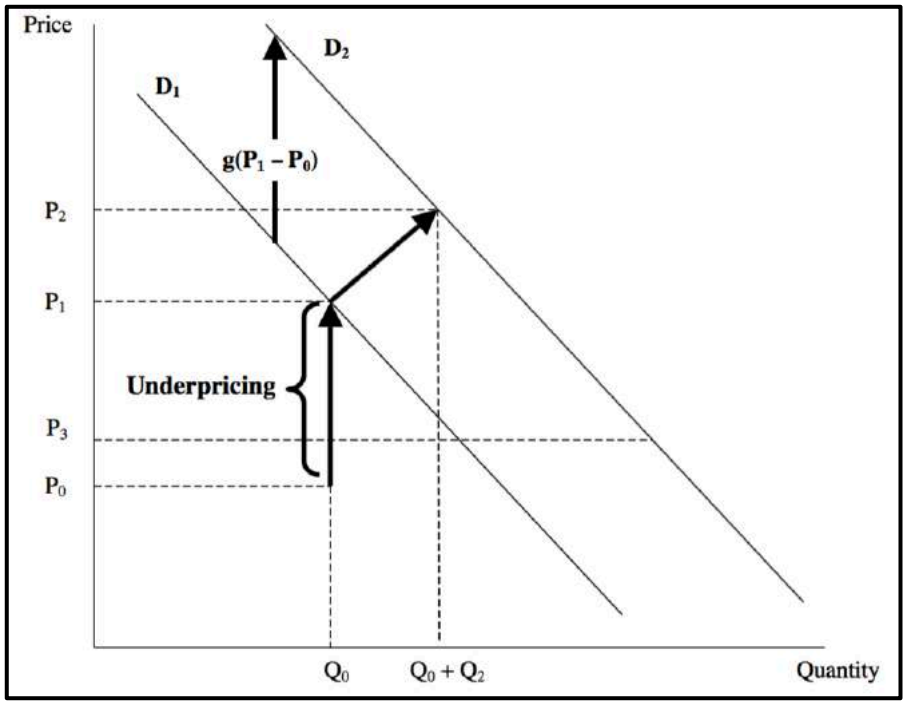
A second purpose of lock-up agreements centres the supply side of shares. The lock-up provision limits the supply of tradable shares following an IPO. This limitation may support the stability of the issue price in the post-transaction period (Bradley, Jordan, Roten, & Yi, 2001). If the supply-side gets the "free hand", and is not constrained by limits, an impulsive increase of supply could have disastrous consequences for the stock price. Assuming downward-sloping demand curves for stock, a significant increase in the supply could lead to an abnormal price decline. Lock-up agreements can prevent situations such as these.

(3.) Wealth effects for insiders

A third purpose of lock-up agreements is provided by Aggarwal et al. (2002). They suggest that insiders utilise the process of underpricing and lock-up agreements to strategically time the lock-up expiration selling of "lock-up shares" in order to maximise returns and personal wealth. The underpricing of an IPO often leads to an instant increase in the offer price on the opening day of the offering. This process creates information momentum, as the "hot price-

increasing IPO" receives more attention from the media and public market. The issuing company will receive a greater extent of coverage of analysts, who write stock recommendations. This attention will put the stock into the spotlight, resulting in a greater demand of potential investors. Figure 21 explains this.

Figure 21: Impact Lockup and Underpricing on Demand



**Source: Aggarwal et al. (2002)*

The greater demand of investors leads to a shift in the downward-sloping demand curves. This is shown in the figure, illustrating the effects of underpricing on the demand curve. The issuing firm offers a price of 'P0'. This price is underpriced, and at the opening day this offer price increases to 'P1'. The public attention, as explained above, leads to a shift in the demand curve (the curve 'D1' shifts to 'D2'). This shift of the demand occurs during the lock-up period. At the time of the lock-up expiration, insiders are now able to sell their lock-up shares for an increased price of 'P2'. Hence, insiders strategically exploited the impact of underpricing and the lock-up period in order to generate greater returns at the liquidation event. Following these findings of the authors, this may form an explanation of why insiders have an incentive to engage in lock-up agreements with underwriters.

Based on this last purpose of lock-up agreements, I expect the revised exit values to be ***greater*** than the exit values calculated in the (traditional) way as described by the existent literature. The last purpose suggests that investors follow a strategy, based on underpricing and lock-up provisions, to exploit greater personal wealth. This implies that exit values at the time of the lock-up expiration have to be larger than exit values at the time of the initial offering. Considering this, one could suggest that the exit value is larger when accounting for lock-up periods, as investors know how to gain additional returns during this lock-up period. Therefore, I expect the traditionally calculated exit values to be underestimated compared to the revised exit values. The validity of this expectation is tested in the next paragraph, illustrating the results of the empirical research.

§8.2. Analysis & Results

The revised exit values are calculated by the following formula (see methodology):

$$Revised\ Exit\ Value = E1 + PV(E2) \tag{7}$$

$$With, PV(E2) = \frac{\mathrm{E2}}{(1\ +\ \mathrm{r})^{0.5}}$$

The main distinction between the traditional and revised exit values of IPOs is thus created by the difference between the offer price and the stock price when the lockup period expires. The lockup period determines this disparity in stock price, and this period may differ between IPOs. However, the existent literature finds the 180-day period to be predominant. This is also supported by the sample of this thesis. The median lockup days are exactly 180 days, whereas the mean lockup days are 238 days. Yet, the 180-day period forms **72%**[12] of the entire sample. This implies that most IPOs are subject to the 180-day lockup period, and this explains why this thesis will apply this period for the calculation of the revised exit values.

The 180-day post-IPO stock price is found to be larger relatively to the offer price of the IPO sample. The average offer price is $15.77, whereas the average 180-day post-IPO price is $13.01. This implies an average increase in the IPO stock price of **21%** over the lockup period, which seems reasonable due to the effects of underpricing. One should however also consider the time value of money, thereby the cost of capital. The cost of capital is computed by using the CAPM model (Sharpe, 1964). This thesis applies a market premium of 6%, and a risk-free rate of 2.27%. The risk-free rate reflects the U.S. long-term Treasury bond rate, and the market premium reflects the implied equity premium, which is determined based on the (historical and expected) growth rates of the S&P500 (Damodaran, 2016). The beta of the CAPM is calculated by using industry-specific betas, specified by a database of the NYU Stern professor Damodaran. These industry-specific betas have been matched with the industry of every IPO exit of the sample, based on the SIC codes. Table 27 in the Appendix illustrates these betas. By using the inputs of the CAPM, the cost of equity can be calculated, as illustrated in formula (8):

$$Cost\ of\ Equity = \alpha + \beta\ (Market\ Premium)$$

Which is equal to,

$$\boldsymbol{Cost\ of\ Equity = 2.27\% + \beta industry \times 6\%} \tag{8}$$

This cost of equity is used to compute the present values of the exit value at the time of the lockup expirations (which is 'PV(E2)'). The exit values are discounted to the power of 0.5, as a standardised lockup period of 180 days (6 months) is applied for the sake of simplicity.

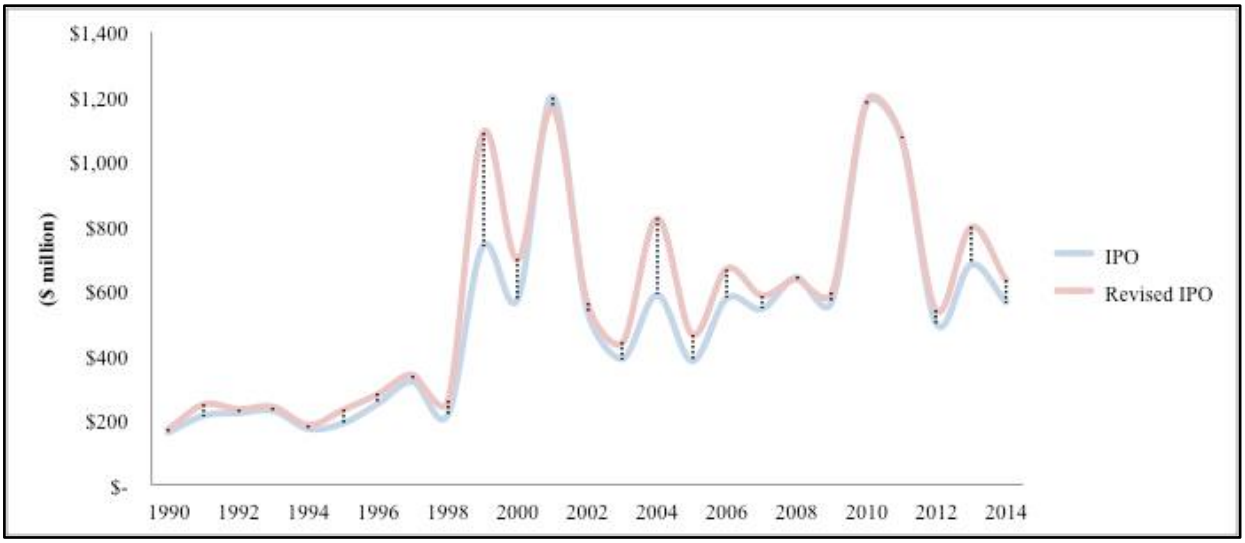
The outcome of these calculations are graphically illustrates in figure 22 (next page). This chart portrays both the traditional as well as the revised exit values for IPO exit events of the sample[13]. The chart clearly illustrates the outperformance of the revised exit values relatively to the traditional exit values of IPOs. This is also in line with the fact that the average 180-day post-IPO price increased by 21% over the lockup period. It seems, as investors are able to generate additional exit returns through the effects of lockup provisions. The extent to which this pattern is significant is examined by means of statistical analysis. Firstly, hypotheses tests

[12] (3386 lockup '180-day' provisions / 4735 total lockup provisions) * 100 = 72%

[13] Facebook IPO is excluded due to its obscene exit value, which would deteriorate the general pattern

are performed to examine differences in means and medians, followed by a robustness check and regression analysis to control for the selection bias and market-timing strategy.

Figure 22: Annual Revised and Traditional Exit Values



**Source: SDC Database, 1990 – 2016*

Hypothesis Tests

This section performs a t-test and Wilcoxon test for differences in mean and median exit values between IPOs and trade sales. The following two types of hypothesis are executed:

(A.) T-test and Wilcoxon rank-sum test for differences in mean and median between the exit values of IPOs and trade sales.
(B.) T-test and Wilcoxon rank-sum test for differences in mean and median between the revised and traditional exit values of IPOs.

The output of hypothesis (A.) is presented in table 15. The results indicate that IPOs outperform trade sales for both the mean as well as the median exit value. The mean exit value is $443 million greater for IPOs, which creates a tremendous advantage for private investors that participated in funding rounds of IPO candidates.

Table 15: Hypothesis Test - IPO vs Trade Sale

Exit Multiple		Mean		t Test		Median		Wilxocon Test	
		Revised IPO	Trade Sale	Difference	p-value	Revised IPO	Trade Sale	Difference	p-value
Revised Exit Value	(Value)	540	97	443	0.0000	179	28	151	0.0000
	(Obs.)	3,381	12,347			3,381	12,347		

*Red Number: Significance on 95% Confidence Level

Table 16 presents the statistical results of hypothesis (B). The p-value (0.2355) indicates an insignificant difference between the revised and traditional mean exit values.

Table 16: Hypothesis Test - Revised vs Traditional IPO

Exit Multiple		Mean		t Test		Median		Wilxocon Test	
		Revised IPO	Traditional IPO	Difference	p-value	Revised IPO	Traditional IPO	Difference	p-value
Revised Exit Value	(Value)	540	470	70	0.2355	179	174	5	0.0323
	(Obs.)	3,381	3,381			3,381	3,381		
Revised Exit Value (Winsorized)	(Value)	335	286	48	0.0000	179	174	5	0.0215
	(Obs.)	3,211	3,211			3,211	3,211		

*Red Number: Significance on 95% Confidence Level

However, the median difference is significant on a 95% confidence interval! The mean is known to be highly sensitive to outliers, whereas the median is often more resilient. This makes the mean more efficient in the case of normal distributions, but the median more efficient in the case of skewed (long-tail) distributions (Venables & Ripley, 2002). The robustness tests of the regression analysis in the next section will indicate non-normality of the distribution, and the existence of outliers. For this sample, the median may thus be more efficient and reliable measure than the mean, and I thus expect a significant difference between the revised and traditional exit values. This is further supported by the second row of table 16, illustrating the results of the t-test and Wilcoxon test of the winsorized exit values. The exit values do obtain extreme values, which may function as potential outliers. The winsorized hypothesis controls for this, and finds a significant difference in both the mean and median exit values. Overall, the revised exit values seem to significantly outperform the traditional exit values. This is summarized in figure 23.

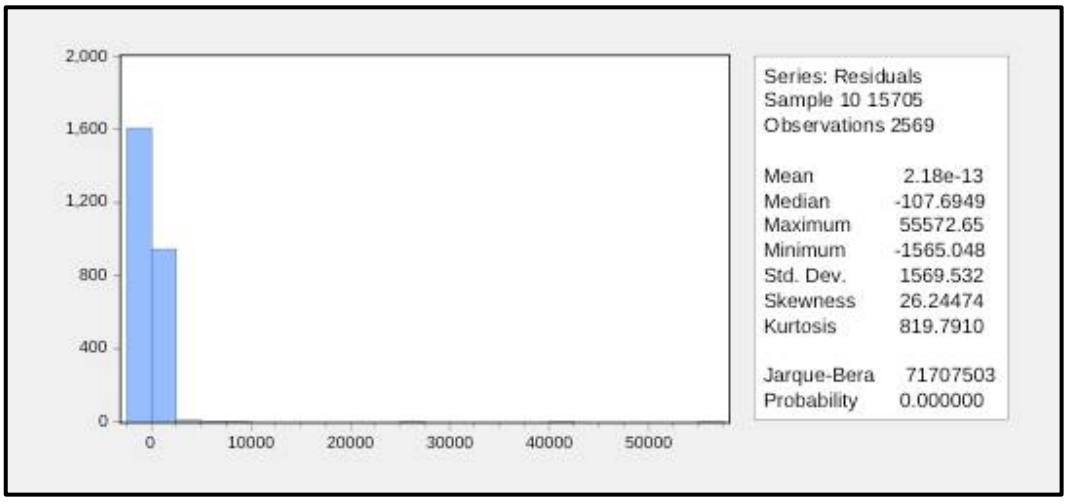
Figure 23: Revised Exit Value Analysis ($ million)

Source: SDC & Compustat database (1990 – 2014)

Robustness

Before running the regression analysis, the robustness of the results should be examined and corrections should be made if needed. The normality, serial correlation, multicollinearity, heteroscedasticity, and outliers are analysed. Figure 24 presents the distribution of the residuals of the regression, clearly indicating a non-normal distribution. This is further supported by the zero Jarque-Bera p-value. Thus, this thesis applies a log-transformation of variables, and a robust regression method (MM-estimator) in order to relax this normality assumption of the regression analysis.

Figure 24: Normality Revised Exit Regression



Source: Eviews, 2016

Moreover, there exists no significant serial correlation, indicated by the correlogram (table 28, Appendix), and the Breusch-Godfrey Lagrange Multiplier test (table 29, Appendix). The absence of multicollinearity is also supported by the Variance Inflator Factor (VIF) analysis in table 33 of the Appendix. However there does exists heteroscedasticity, thereby negatively impacting the standard errors of the regression. Heteroscedasticity is identified by the Breusch-Pagan-Godfrey test (table 30, Appendix), and the White heteroscedasticity test (table 31, Appendix). The p-value in both tests is zero, suggesting the null hypothesis of homoscedasticity should be rejected. Heteroscedasticity shoud be corrected for by means of the Huber-White test, which consequently leads to more robust standard errors. This correction is applied in the regression analysis.

Lastly, outliers have been identified in the leverage plots of the regressors (figure 31, Appendix). In order to avoid unfavourable effects of spurious outliers, two additional regressions have been performed, including the robust regression (MM-estimator) and a regression based on winsorized variables. These additional regression analyses will enhance the robustness and validity of the statistical results.

Output

The output of the standard Least Squares regression, that corrects for heteroscedasticity, is presented in table 17. The regression controls for sales, size, and market factors in order to test for the selection bias and market-timing strategy. The dummy variable takes a value '1' in the case of an IPO, and a value of '0' in the case of a trade sale (see methodology for regression formula). The results are highly similar to the findings of the traditional exit valuation analysis. All controlling factors, except growth, have a positive significant impact on the exit value. The dummy coefficient remains significant, suggesting the exit value difference is not fully explained by the selection bias or market-timing strategy. Yet, as explained in the traditional exit valuation analysis, the p-value does increase from zero[14] to 0.0001, thereby indicating a minor explanatory value of the control variables.

Table 17: OLS Regression Revised Exit Value

Dependent Variable: REVISED EXIT **Method: Least Squares** White heteroskedasticity-consistent standard errors & covariance				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Dummy	199.05	52.20	3.81	0.0001
Log (Size)	363.01	78.02	4.65	0.0000
Log (Sales)	168.12	60.92	2.76	0.0058
Growth	0.00	0.00	0.72	0.4723
Market	19.17	6.59	2.91	0.0037
C	-1094.87	318.46	-3.44	0.0006
R-squared	0.064	Observations: 2569		

*Red Number: Significance on 95% Confidence Level

The statistical results are in line with the winsorized and robust regression, illustrated in table 18 (next page), thereby verifying the robustness of the results. The r-squared increases from 6.4% to 27.5% in the winsorized regression, which reflects a better fit. The dummy coefficient remains significant, and even the growth factor has now a positive significant

[14] Regression analysis without control factors (Exit value = $\alpha + \beta$Dummy) finds a zero p-value for the dummy

effect on the exit value. In the robust regression, the dummy coefficient is still 59.01, implying a revised exit value of IPOs that significantly outperforms trade sales with $59 million. Hence, the IPO appears also to be more optimal in the revised exit valuation by generating greater exit returns than trade sales.

Table 18: Winsorized & Robust Regression

Dependent Variable: REVISED EXIT **Method: Winsorized Least Squares** White heteroskedasticity-consistent standard errors & covariance				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
Dummy	109.64	6.75	16.25	0.0000
Size (Winsorized)	74.86	6.58	11.38	0.0000
Sales (Winsorized)	37.40	7.50	4.99	0.0000
Growth (Winsorized)	0.60	0.13	4.66	0.0000
Market (Winsorized)	4.93	0.50	9.95	0.0000
C	-216.89	16.75	-12.95	0.0000
R-squared	0.275	Observations: 2106		

*Red Number: Significance on 95% Confidence Level

Dependent Variable: REVISED EXIT **Method: Robust Least Squares**				
Variable	**Coefficient**	**Std. Error**	**z-Statistic**	**Prob.**
Dummy	59.01	2.30	25.68	0.0000
Log (Size)	21.50	2.01	10.72	0.0000
Log (Sales)	15.61	2.04	7.66	0.0000
Growth	0.001	0.00	5.63	0.0000
Market	1.38	0.14	9.55	0.0000
C	-41.71	4.96	-8.41	0.0000
R-squared	0.126	Observations: 2569		

*Red Number: Significance on 95% Confidence Level

§8.3. Conclusion

Based on the empirical analysis, sub-question (F) can be answered:

(F) Do investors achieve greater exit valuations when pursuing an IPO or a trade sale, considering IPOs comprise lock-up provisions?

The revised exit valuation analysis has three main conclusions. Firstly, also the revised exit values of IPOs significantly outperform the exit values of trade sales. IPOs are thus, from an absolute perspective, optimal. Secondly, this divergence in exit values cannot be explained by the selection bias or market-timing strategy. There is some indication that these variables may play a role, yet the difference in exit values remains strongly significant. And thirdly, the (winsorized) mean and median revised exit values are significantly greater than the traditional exit values of IPOs. The literature review indicated that insiders of IPOs strategically utilise lockup periods to extract personal gains, which may form a purpose to engage in lockup agreements (Aggarwal, Krigman, & Womack, 2002). The findings of this empirical analysis support this explanation, as investors are able to acquire greater exit values when liquidating at the lockup expiration date.

Overall, these findings suggest a potential *misconception* in the existent academic literature. Academics have only applied the traditionally calculated exit valuations to examine exit strategies. Yet, these exit valuations are thus actually *underestimated* by the exclusion of lockup provisions. The revised exit valuation is a true representation of real-life, and may thus form a better benchmark for making comparisons in exit strategies.

CONCLUSION & DISCUSSION

"Decide on three things at the start: the rules of the game, the stakes, and the quitting time."

[Anonym | old Chinese proverb]

A company's exit strategy is crucial, as it influences a broad range of facets that will affect private investors. It's therefore the responsibility of the company to select the most optimal exit route. This research attempted to find the optimal exit strategy by analysing the differences between IPOs and trade sales. Qualitative and quantitative analyses have been performed. The qualitative component emphasized the comparative advantages and disadvantages of both exit routes, and the firm-characteristics that influence the exit decision. The quantitative component analysed the differences in performance, by examining the operating performance, premiums on the offer, and exit valuations. Moreover, this thesis contributed to the existent literature by revising the exit valuations through the inclusion of lockup provisions. The revised exit valuation is a more accurate representation of exit events, and private investors should take these into consideration when deciding on an exit strategy. All in all, this research attempted to answer the following research-question:

Is an IPO or trade sale a more optimal performing exit strategy from the perspective of the private investor?

The literature review reveals IPOs and trade sales to have their own strengths and weaknesses. IPOs are time-consuming and costly, and are often restricted by lockup provisions. Trade sales, in contrast, are relatively fast and cheap. In addition, they are subject to a smaller set of regulations, and the parties involved are often able to gain synergies. However, IPO candidates are compensated by greater exit valuations, and insiders will have the possibility to retain control over the company.

The logistic regression found also other qualitative aspects that play a role in the exit decision. So are firms that decide for an IPO growing and significantly larger, and often financed by venture capitalists. In contrast, trade sale candidates are smaller in size and sales, but obtain lower levels of information asymmetry.

From a quantitative perspective, IPOs seem to outperform trade sales. The accounting performance analysis indicates IPOs to obtain significantly greater absolute profitability measures (i.e. sales and EBITDA) and liquidity ratios. Furthermore, IPO candidates have lower leverage positions, thus reflecting a better risk profile. The premium analysis also indicates that IPOs are able to receive premiums that exceed trade sales by 28%! This greater premium is also reflected by the greater exit values of IPOs. IPOs receive exit values that are $373 million larger than the exit values of trade sales. IPOs also outperform trade sales on a relative basis to some extent. Certain exit multiples of IPOs significantly exceed the multiples of trade sales. Yet, this holds in particular for the median values, but these values can be considered relevant due to the skewed distribution of the sample.

The difference in exit values between IPOs and trade sales cannot be explained by the selection bias or market-timing strategy. IPOs acquire significantly greater exit values, even after controlling for size, sales, or market measures. Hence, the IPO is optimal as an exit

route, and not because of the firm-characteristics of the companies involved in this sample.

The revised exit values also exceed the exit values of trade sales. Moreover, these values outperform the exit values that are calculated in the traditional way (by excluding the lockup period). The traditional exit values are thus *underestimated*, and private investors could make significantly greater exit returns by delaying their liquidation until the lockup period expires.

Overall, the IPO appears to be the optimal exit strategy. Not only will IPO candidates perform better prior the exit, but also investors will receive greater exit values and premiums. The lockup period was initially perceived as a disadvantage of the IPO, as this restricted investors from liquidation and a direct exit. But based on this analysis, it can be concluded that it is this very lockup provision that creates additional wealth for investors. Therefore, lockup provisions form an additional motive for investors to select an IPO over a trade sale.

Yet, one should never lose perspective. In the end the exit decision is also a matter that relates to the entry investment. If an investor has to finance a larger entry investment for an IPO than for a trade sale, conclusions may change. One should thus always take the entry investment into consideration. Also the company's resources may change the exit decision. A company with nominal resources will be unable to engage in lengthy and costly IPO. Trade sales may than be preferable, despite the lower exit returns. Overall, investors and management should decide for an IPO when allowed by resources, and when in line with the entry investment.

Limitations & Recommendations

There exist several limitations with regards to the revised exit valuation analysis. This research applied a standardised lockup period of 180-days, as this has been observed as the most frequently used lockup period by IPOs. A total of 72% of lockup provisions consisted of 180-days. Nevertheless, this implies that 28% of all exit events have used different lockup periods. This creates a measurement bias, and future research should extend the revised exit valuation by matching every individual exit event to the corresponding lockup period. Also, the post-IPO stock price should than be adjusted. This research applied a 180-day post-IPO price to compute exit values at the lockup expiration date. Future research should improve this research by applying different post-IPO stock prices based on the corresponding lockup period. Nevertheless, despite its limitations, this research created awareness by pioneering a complete new approach for calculating realistic exit values in the field of private equity.

Future research should also further analyse the explanations of the significant differences in exit values between IPOs and trade sales. The selection bias and market-timing strategy have not been found to play a significant role. This has been examined by controlling for the assets, sales, and price-earnings ratio. Nevertheless, larger successful companies often pursue IPOs, whereas trade sales are a more universal exit route. Thus, there may exist another selection bias, in the form of a different company' success factor, that has not been tested yet in this thesis. There are many alternative variables that represent the size and profitability of a company, or the market in general. Hence, future research should involve various additional variables that may explain the differences in exit valuations. One potential suggestion could be the Economic Value Added (EVA), which is known to be one of the indicators of successful companies (Johnson & Soenen, 2003). Controlling for alternative success factors may change the conclusions regarding the selection bias.

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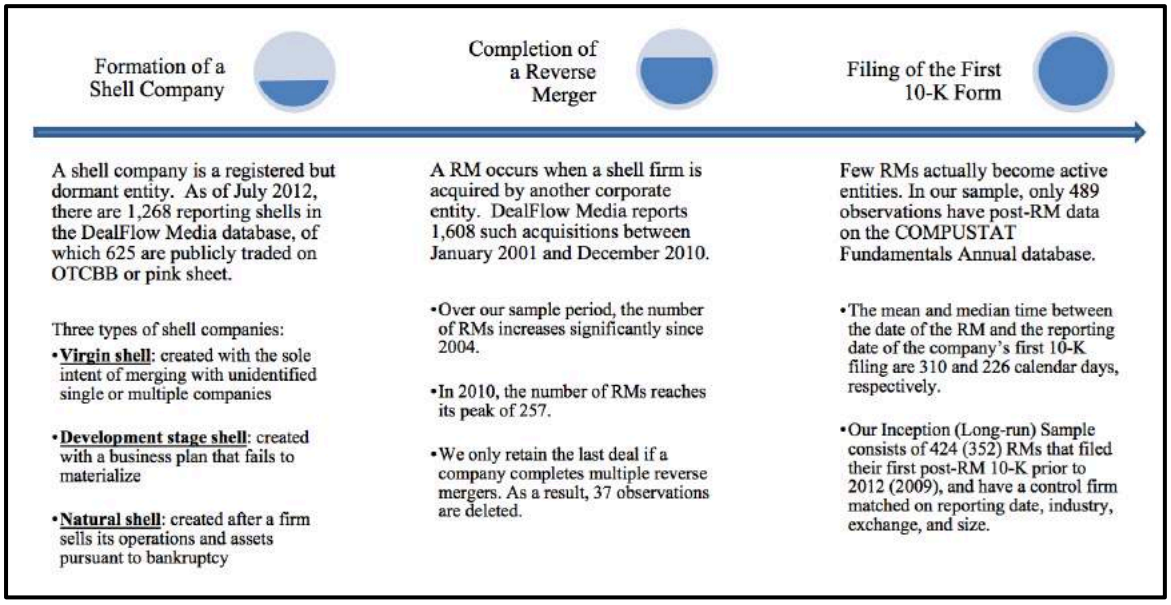
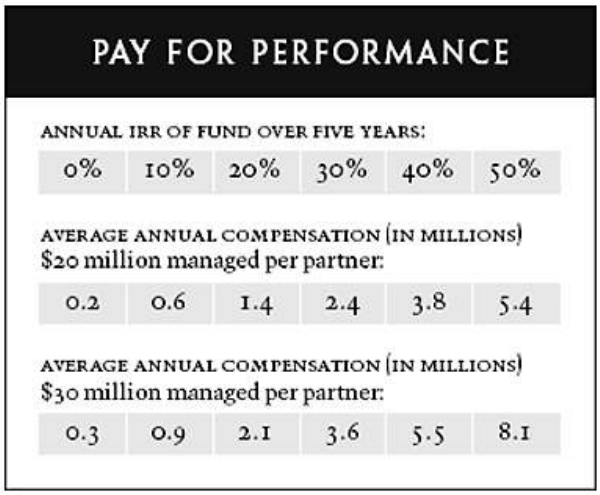
APPENDIX

Figure 25: Reverse Merger Transaction Structure



**Source: Lee, Li, & Zhang (2013)*

Figure 26: Pay For Performance VC Funds



**Source: Zider (1998)*

Figure 27: Probability On Company Succes

**Source: Zider (1998)*

Table 19: Underlying Motivations for IPO and Trade Sale

	Sellouts (N=115)		IPOs (N=856)	
	#	%	#	%
Access to Capital and Growth				
Acquisitions	7	6.1%	314	36.7%
Capital Expenditures (access to capital)	46	40.0%	296	34.6%
General Corporate Purposes	3	2.6%	642	75.0%
Growth	60	52.2%	73	8.5%
R&D	24	20.9%	198	23.1%
Working Capital	-	-	561	65.5%
Debt				
Debt Reduction	-	-	432	50.5%
Payouts				
Favorable Tax Consequences	42	36.5%	-	-
Liquidity / Fair Price / Stock of public firm	108	93.9%	6	0.7%
Pay a Distribution	7	6.1%	55	6.4%
Redeem Preferred Stock	-	-	67	7.8%
Pay a Termination Fee	-	-	5	0.6%
Repurchase Common Stock	-	-	12	1.4%
Marketing and Personnel				
Issues Related to Personnel	31	27.0%	18	2.1%
Marketing Activities	29	25.2%	125	14.6%
Other				
Create Value	16	13.9%	-	-
Efficiencies / Scale / Synergies	93	80.9%	-	-
Industry Conditions / Competition	27	23.5%	-	-
Risk Reduction	38	33.0%	-	-
Timing	9	7.8%	-	-
Fund Operating Losses	-	-	12	1.4%
Litigation Expenses	-	-	2	0.2%
Reorganization & Alliances	-	-	9	1.1%

**Source: Poulsen & Stegemoller (2005)*

Table 20: VC returns

	Equal Weighted			Size Weighted		
Sample	All Funds	VC Funds	Buyout Funds	All Funds	VC Funds	Buyout Funds
IRR_{VE}	0.12	0.11	0.13	0.14	0.14	0.15
	0.17	0.17	0.19	0.18	0.18	0.19
	(0.32)	(0.34)	(0.27)	(0.19)	(0.19)	(0.19)
	[0.04;0.20]	[0.03;0.19]	[0.06;0.24]	[0.08;0.22]	[0.05;0.22]	[0.09;0.23]
IRR_{CF}	0.12	0.11	0.13	0.12	0.13	0.13
	0.17	0.17	0.18	0.18	0.17	0.18
	(0.31)	(0.30)	(0.22)	(0.26)	(0.31)	(0.26)
	[0.03;0.22]	[0.03;0.22]	[0.05;0.22]	[0.04;0.23]	[0.03;0.23]	[0.06;0.20]
PME	0.74	0.66	0.80	0.82	0.92	0.83
	0.96	0.96	0.97	1.05	1.21	0.93
	(0.81)	(0.69)	(0.52)	(0.70)	(0.74)	(0.65)
	[0.45;1.14]	[0.43;1.13]	[0.62;1.12]	[0.67;1.11]	[0.55;1.40]	[0.72;1.03]
No. of Observations	746	577	169	746	577	169

**Source: Kaplan & Schoar (2005)*

Table 21: Comparing Exit Values: Canada versus US

Table 1: Comparing Exit Values: Canada versus US

	Canada	USA	Canada / US
All Exits			
Total Value of Exits (US$b)	29.7	381.4	8%
Number of Exits	509	3,047	17%
Average Value of Exits (US$m)	58.9	191.6	31%
Median Value of Exits (US$m)	20.5	92.4	22%
Average Time Founding to Exit (Months)	76	85	90%
Median Time Founding to Exit (Months)	50	61	82%
IPO			
Total Value of Exits (US$b)	15.2	35.9	6%
Number of Exits	139	746	19%
Average Value of Exits (US$m)	111.9	333.2	34%
Median Value of Exits (US$m)	49.9	224.9	22%
Average Time Founding to Exit (Months)	80	85	93%
Median Time Founding to Exit (Months)	67	62	107%
M&A			
Total Value of Exits (US$b)	14.51	145.45	10%
Number of Exits	370	2301	16%
Average Value of Exits (US$m)	39.3	113.5	35%
Median Value of Exits (US$m)	15.2	46.7	32%
Average Time Founding to Exit (Months)	74	85	87%
Median Time Founding to Exit (Months)	48	61	79%
Benchmarks			
Total Value per $1000 GDP	4.99	4.83	103%
Total Value per $1000 GERD	333.04	186.4	179%
Total Value per $1000 BERD	579.89	257.53	225%
Total Value per $1 VC Invested (5 yr avg.)	2.07	1.8	115%
Total Value (NASDAQ Normalized)	15.1	193.3	8%
Total Value (Domestic Index Normalized)	20.0	193.3	10%
Sector Breakdown			
EST / Total Value of Exits	15%	2%	N/A
ICT / Total Value of Exits	50%	74%	N/A
Life Sciences / Total Value of Exits	8%	13%	N/A
Other / Total Value of Exits	27%	11%	N/A

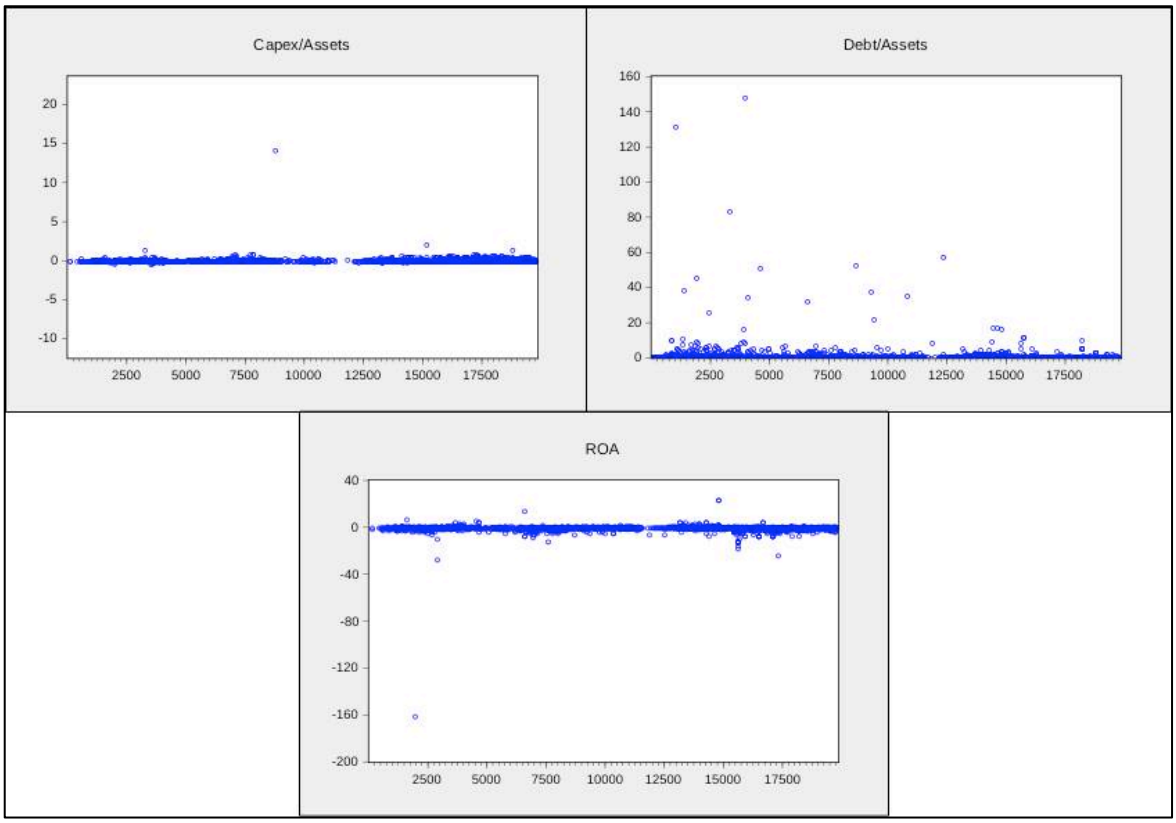
**Source: Hellmann, Egan, & Brander (2005)*

Table 22: Correlogram Logistic Regression

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	-0.000	-0.000	0.0002	0.989
		2	-0.001	-0.001	0.0010	0.999
		3	0.000	0.000	0.0011	1.000
		4	-0.000	-0.000	0.0017	1.000
		5	0.000	0.000	0.0017	1.000
		6	-0.001	-0.001	0.0027	1.000
		7	-0.001	-0.001	0.0034	1.000
		8	-0.000	-0.000	0.0035	1.000
		9	-0.000	-0.000	0.0036	1.000
		10	-0.000	-0.000	0.0038	1.000
		11	-0.000	-0.000	0.0039	1.000
		12	-0.000	-0.000	0.0040	1.000
		13	0.000	0.000	0.0041	1.000
		14	-0.000	-0.000	0.0043	1.000
		15	-0.000	-0.000	0.0044	1.000
		16	0.000	0.000	0.0044	1.000
		17	-0.000	-0.000	0.0046	1.000
		18	0.000	0.000	0.0047	1.000
		19	-0.000	-0.000	0.0048	1.000
		20	-0.001	-0.001	0.0057	1.000
		21	-0.000	-0.000	0.0058	1.000
		22	-0.000	-0.000	0.0059	1.000
		23	-0.001	-0.001	0.0068	1.000
		24	0.000	0.000	0.0068	1.000
		25	-0.001	-0.001	0.0075	1.000
		26	-0.000	-0.000	0.0077	1.000
		27	-0.000	-0.000	0.0078	1.000
		28	0.000	0.000	0.0078	1.000
		29	-0.000	-0.000	0.0079	1.000
		30	-0.000	-0.000	0.0081	1.000
		31	-0.000	-0.000	0.0082	1.000
		32	-0.000	-0.000	0.0084	1.000
		33	-0.000	-0.000	0.0084	1.000
		34	-0.000	-0.000	0.0085	1.000
		35	-0.000	-0.000	0.0092	1.000
		36	-0.000	-0.000	0.0093	1.000

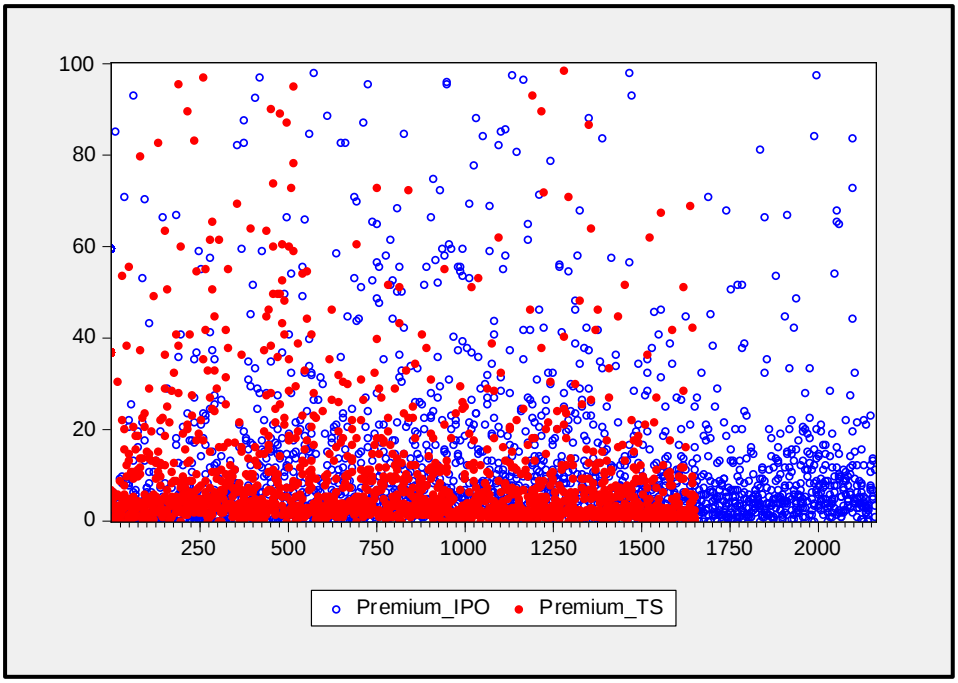
**Source: Eviews (2016)*

Figure 28: Outliers Logistic Regression



**Source: Eviews (2016)*

Figure 29: Data Plot Premiums



**Source: Eviews (2016)*

Table 23: Correlogram (Exit Value Analysis)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.002	-0.002	0.0148	0.903
		2	0.000	0.000	0.0148	0.993
		3	-0.000	-0.000	0.0154	0.999
		4	0.003	0.003	0.0389	1.000
		5	-0.002	-0.002	0.0510	1.000
		6	0.002	0.002	0.0642	1.000
		7	0.007	0.007	0.1787	1.000
		8	0.013	0.013	0.6099	1.000
		9	0.001	0.002	0.6156	1.000
		10	-0.009	-0.009	0.8146	1.000
		11	0.004	0.004	0.8523	1.000
		12	0.001	0.001	0.8544	1.000
		13	0.002	0.002	0.8637	1.000
		14	0.002	0.002	0.8782	1.000
		15	-0.004	-0.005	0.9255	1.000
		16	0.002	0.002	0.9371	1.000
		17	0.001	0.001	0.9377	1.000
		18	0.015	0.015	1.4942	1.000
		19	-0.003	-0.003	1.5244	1.000
		20	-0.001	-0.002	1.5298	1.000
		21	0.003	0.003	1.5498	1.000
		22	0.003	0.003	1.5716	1.000
		23	-0.003	-0.003	1.5993	1.000
		24	-0.010	-0.010	1.8344	1.000
		25	0.002	0.002	1.8462	1.000
		26	0.007	0.007	1.9920	1.000
		27	0.006	0.006	2.0826	1.000
		28	0.003	0.003	2.1034	1.000
		29	-0.002	-0.002	2.1137	1.000
		30	0.000	0.000	2.1141	1.000
		31	0.002	0.002	2.1237	1.000
		32	-0.004	-0.004	2.1690	1.000
		33	0.002	0.002	2.1837	1.000
		34	-0.004	-0.004	2.2192	1.000
		35	0.001	0.001	2.2221	1.000
		36	-0.001	-0.001	2.2266	1.000

**Source: Eviews (2016)*

Table 24: Breusch-Godfrey LM Test (Exit Value Analysis)

Breusch-Godfrey Serial Correlation LM Test				
F-statistic	0.003916	Prob. F(6,2557)		1
Obs*R-squared	0.023603	Prob. Chi-Square(6)		1
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DUMMY	1.95	57.70	0.03	0.97
LOG_SIZE_	-0.56	50.23	-0.01	0.99
LOG_SALES_	2.01	51.17	0.04	0.97
GROWTH	0.00	0.00	0.01	0.99
MARKET	0.02	3.63	0.00	1.00
C	-2.34	124.38	-0.02	0.99
RESID(-1)	-0.01	0.03	-0.18	0.86
RESID(-2)	0.00	0.03	0.00	1.00
RESID(-3)	-0.01	0.10	-0.12	0.91
RESID(-4)	0.01	0.03	0.22	0.82
RESID(-5)	0.00	0.03	-0.16	0.87
RESID(-6)	0.06	0.10	0.59	0.55
R-squared	0.00	Mean dependent var		0.00
Adjusted R-squared	0.00	S.D. dependent var		1440.32

**Source: Eviews (2016)*

Table 25: Breusch-Pagan-Godfrey Test (Exit Value Analysis)

Heteroskedasticity Test: Breusch-Pagan-Godfrey				
F-statistic	6.06	Prob. F(5,2563)		0
Obs*R-squared	30.01	Prob. Chi-Square(5)		0
Scaled explained SS	11604.10	Prob. Chi-Square(5)		0
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
C	-18070814	4946812	-3.653022	0.00
DUMMY	1724769	2292589	0.752324	0.45
LOG_SIZE_	4910418	2000435	2.454676	0.01
LOG_SALES_	3736766	2032432	1.838569	0.07
GROWTH	5.40	150.8038	0.035799	0.97
MARKET	263336.10	144365.2	1.824097	0.07
R-squared	0.01	Mean dependent var		2073712
Adjusted R-squared	0.01	S.D. dependent var		57819091
S.E. of regression	57536485	Akaike info criterion		38.58
Sum squared resid	8480000000000000000	Schwarz criterion		38.59
Log likelihood	-49544.96	Hannan-Quinn criter.		38.58
F-statistic	6.06	Durbin-Watson stat		2.16
Prob(F-statistic)	0.00			

**Source: Eviews (2016)*

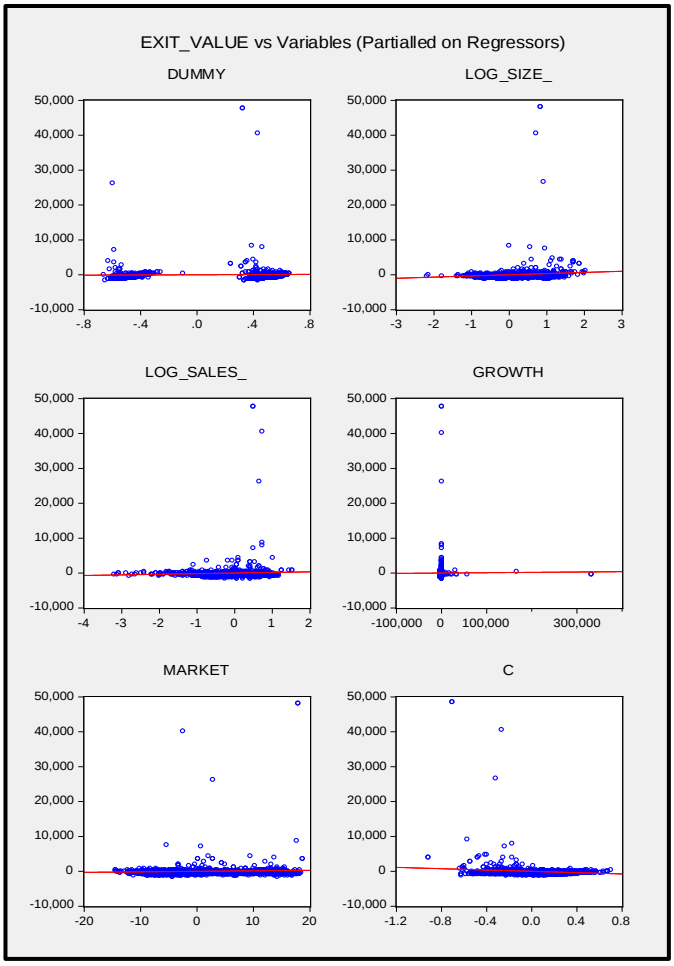
Table 26: White Test (Exit Value Analysis)

Heteroskedasticity Test: White			
F-statistic	5.765382	Prob. F(19,2549)	0
Obs*R-squared	105.8528	Prob. Chi-Square(19)	0
Scaled explained SS	40937.15	Prob. Chi-Square(19)	0

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	79075204.00	21419602.00	3.69	0.00
DUMMY^2	-15296155.00	10180384.00	-1.50	0.13
DUMMY*LOG_SIZE_	1875635.00	4367553.00	0.43	0.67
DUMMY*LOG_SALES_	3244024.00	4211512.00	0.77	0.44
DUMMY*GROWTH	3060.94	8392.21	0.36	0.72
DUMMY*MARKET	332391.50	291316.10	1.14	0.25
LOG_SIZE_^2	-327702.80	2925128.00	-0.11	0.91
LOG_SIZE_*LOG_SALES_	10883987.00	4816579.00	2.26	0.02
LOG_SIZE_*GROWTH	801.23	1914.00	0.42	0.68
LOG_SIZE_*MARKET	550484.90	251375.00	2.19	0.03
LOG_SIZE_	-26028874.00	8618720.00	-3.02	0.00
LOG_SALES_^2	-297634.10	2255794.00	-0.13	0.90
LOG_SALES_*GROWTH	70.72	985.49	0.07	0.94
LOG_SALES_*MARKET	363220.90	247191.80	1.47	0.14
LOG_SALES_	-23728239.00	8774855.00	-2.70	0.01
GROWTH^2	0.00	0.00	-0.58	0.56
GROWTH*MARKET	78.73	113.32	0.69	0.49
GROWTH	-3208.85	3095.74	-1.04	0.30
MARKET^2	40734.63	21876.75	1.86	0.06
MARKET	-3636323.00	1373359.00	-2.65	0.01
R-squared	0.041204	Mean dependent var		2073712
Adjusted R-squared	0.034057	S.D. dependent var		57819091

Source: Eviews (2016)

Figure 30: Leverage Plots (1)



Source: Eviews (2016)

Table 27: Industry Beta

SIC Code	Industry	Beta	D/(D+E)	D/E	Unlevered Beta	Cost of Debt	Cost of Capital
1	Agricultural - Crops	0.61	17.88%	21.78%	0.54	8.23%	9.99%
2	Agricultural Production	0.60	29.44%	41.72%	0.48	8.20%	9.68%
8	Forestry	0.63	47.65%	91.02%	0.41	8.27%	9.43%
10	Fishing, Hunting and Trappin	0.80	17.01%	20.49%	0.71	8.60%	10.93%
12	Coal Mining	0.93	39.59%	65.53%	0.67	8.87%	10.84%
13	Oil and Gas Extraction	0.66	24.70%	32.81%	0.55	8.31%	10.04%
14	Mining of Non-metals	0.54	17.23%	20.81%	0.48	8.08%	9.63%
15	Building Contractors	1.14	34.77%	53.29%	0.86	9.28%	11.89%
16	Heavy Construction	0.74	20.38%	25.60%	0.64	8.48%	10.54%
17	Construction- Special Trade	0.38	19.70%	24.53%	0.33	7.75%	8.80%
20	Food and Kindred Products	0.82	24.51%	32.46%	0.69	8.64%	10.82%
21	Tobacco Products	1.27	31.16%	45.27%	1	9.54%	12.61%
22	Textile Mill Products	0.64	39.83%	66.19%	0.46	8.28%	9.62%
23	Apparel & Other Finished Products	0.83	19.44%	24.14%	0.73	8.66%	11.00%
24	Lumber & Wood Products	1.07	23.35%	30.46%	0.91	9.14%	12.02%
25	Furniture & Fixtures	0.93	23.75%	31.15%	0.78	8.85%	11.32%
26	Paper & Allied Products	0.88	31.95%	46.96%	0.68	8.75%	10.83%
27	Printing & Publishing	0.92	19.80%	24.68%	0.8	8.84%	11.42%
28	Chemicals & Allied Products	1.28	11.01%	12.38%	1.19	9.56%	13.55%
29	Petroleum Refining	0.62	33.95%	51.39%	0.47	8.24%	9.66%
30	Rubber & Plastic Products	0.92	25.33%	33.93%	0.76	8.83%	11.22%
31	Leather & Leather Products	0.97	17.13%	20.67%	0.86	8.94%	11.75%
32	Stone, Clay, Glass & Concrete	0.67	30.44%	43.76%	0.53	8.34%	9.97%
33	Primary Metal Industries	0.96	34.91%	53.64%	0.73	8.92%	11.10%
34	Fabricated Metal Products	0.76	24.13%	31.81%	0.64	8.52%	10.54%
35	Industrial & Commercial Machinery	1.06	16.54%	19.82%	0.95	9.12%	12.22%
36	Electronic and Electrical Equipment	1.18	12.25%	13.96%	1.09	9.36%	12.99%
37	Transportation Equipment	0.90	31.42%	45.81%	0.71	8.80%	10.96%
38	Measuring, Analyzing & Controlling Instruments	1.13	10.25%	11.42%	1.06	9.26%	12.80%
39	Miscellaneous Manufacturing	0.95	18.62%	22.88%	0.84	8.90%	11.61%
40	Railroad Transportation	1.10	37.77%	60.70%	0.81	9.20%	11.60%
41	Suburban Transit and Highway Transportation	1.30	26.49%	36.04%	1.07	9.60%	12.94%
42	Motor Freigth Transportation	0.72	39.21%	64.50%	0.52	8.44%	9.97%
44	Water Transportation	1.07	41.35%	70.49%	0.75	9.14%	11.35%
45	Air Transportation	1.44	37.31%	59.51%	1.06	9.87%	13.02%
46	Pipelines	0.37	41.41%	70.67%	0.26	7.73%	8.49%
47	Transportation Services	0.85	21.23%	26.96%	0.73	8.70%	11.04%
48	Communications	1.13	25.60%	34.40%	0.94	9.26%	12.21%
49	Electric, Gas & Sanitary Services	0.52	44.87%	81.38%	0.35	8.03%	9.03%
50	Wholesale trade - Durable goods	1.01	22.16%	28.46%	0.87	9.03%	11.79%
51	Wholesale trade-Nondurable goods	0.98	26.43%	35.93%	0.81	8.97%	11.50%
52	Building materials, hardware & Garden Dealers	0.85	38.42%	62.39%	0.62	8.71%	10.55%
53	General Merchandise	0.95	37.40%	59.74%	0.7	8.89%	10.96%
54	Food Stores	0.68	30.12%	43.09%	0.54	8.35%	10.01%
55	Auto Dealers & Gas Service Stations	1.01	23.86%	31.33%	0.85	9.02%	11.70%
56	Apparel & Accessory Stores	1.11	22.22%	28.57%	0.95	9.22%	12.25%
57	Home Furniture, Furnishings & Equip Stores	1.06	33.65%	50.73%	0.81	9.12%	11.59%
58	Eating & Drinking Establishments	1.06	21.96%	28.14%	0.91	9.13%	12.03%
59	Miscellaneous Retail	0.99	17.50%	21.22%	0.88	8.99%	11.86%
60	Depository Institutions	1.20	40.00%	66.67%	0.86	9.40%	11.92%
61	Non-depository Institutions	1.15	25.00%	33.33%	0.96	9.30%	12.32%
62	Security & Commodity Brokers, Dealers ..	1.37	19.15%	23.69%	1.2	9.73%	13.60%
63	Insurance Carriers	0.78	23.69%	31.04%	0.66	8.56%	10.64%
64	Insurance Agents, Brokers & Services	0.50	10.83%	12.15%	0.47	8.00%	9.56%
65	Real Estate	0.50	21.34%	27.12%	0.43	8.00%	9.38%
67	Holding & Other Investment Services	1.03	15.99%	19.03%	0.93	9.06%	12.09%
70	Hotels, Rooming Houses & Lodging Places	1.22	39.64%	65.68%	0.87	9.44%	12.01%
72	Personal Services	1.08	17.44%	21.12%	0.96	9.16%	12.28%
73	Business Schools	1.36	9.03%	9.92%	1.28	9.72%	14.04%
75	Auto Repair, Services & parking	0.92	38.93%	63.75%	0.67	8.84%	10.81%
76	Miscellaneous Repair Services	1.30	45.48%	83.43%	0.87	9.60%	12.08%
78	Motion Pictures	0.94	27.63%	38.17%	0.76	8.87%	11.25%
79	Amusement & Recreation Services	1.13	29.23%	41.30%	0.91	9.27%	12.07%
80	Health Services	1.29	19.85%	24.76%	1.13	9.59%	13.22%
82	Educational Services	0.67	10.53%	11.77%	0.62	8.33%	10.42%
83	Social Services	1.30	17.49%	21.19%	1.15	9.60%	13.35%
87	Engineering, Accounting, Research Services	1.28	14.55%	17.03%	1.16	9.56%	13.39%
89	Services not listed elsewhere	0.45	34.19%	51.96%	0.34	7.90%	8.94%

**Source: Damodaran (2016)*

Table 28: Correlogram (Revised Exit Analysis)

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
		1	-0.001	-0.001	0.0018	0.966
		2	0.003	0.003	0.0278	0.986
		3	-0.001	-0.001	0.0320	0.998
		4	0.008	0.008	0.2017	0.995
		5	0.015	0.015	0.7954	0.977
		6	0.003	0.003	0.8194	0.992
		7	0.007	0.007	0.9368	0.996
		8	0.017	0.017	1.7121	0.989
		9	0.002	0.002	1.7221	0.995
		10	-0.010	-0.011	2.0040	0.996
		11	0.008	0.007	2.1551	0.998
		12	0.002	0.002	2.1699	0.999
		13	0.009	0.008	2.3643	0.999
		14	0.004	0.004	2.4058	1.000
		15	-0.004	-0.004	2.4527	1.000
		16	0.002	0.002	2.4636	1.000
		17	-0.001	-0.001	2.4680	1.000
		18	0.032	0.032	5.0717	0.999
		19	-0.001	-0.001	5.0745	0.999
		20	0.002	0.002	5.0852	1.000
		21	0.004	0.004	5.1186	1.000
		22	0.000	-0.000	5.1191	1.000
		23	-0.001	-0.001	5.1201	1.000
		24	-0.012	-0.012	5.5058	1.000
		25	0.003	0.002	5.5256	1.000
		26	0.013	0.012	5.9700	1.000
		27	0.006	0.006	6.0573	1.000
		28	0.002	0.003	6.0719	1.000
		29	0.007	0.007	6.1929	1.000
		30	0.000	0.000	6.1932	1.000
		31	0.003	0.002	6.2155	1.000
		32	-0.001	-0.001	6.2190	1.000
		33	0.003	0.002	6.2365	1.000
		34	-0.004	-0.005	6.2775	1.000
		35	0.002	0.002	6.2846	1.000
		36	-0.002	-0.003	6.2989	1.000

**Source: Eviews (2016)*

Table 29: Breusch-Godfrey LM Test (Revised Exit Analysis)

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.003588	Prob. F(1,2562)	0.9522
Obs*R-squared	0.003598	Prob. Chi-Square(1)	0.9522

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
DUMMY	-0.03	62.61	0.00	1.00
LOG_SIZE_	-0.03	54.64	0.00	1.00
LOG_SALES_	0.09	55.53	0.00	1.00
GROWTH	0.00	0.00	0.00	1.00
MARKET	0.01	3.95	0.00	1.00
C	-0.33	135.22	0.00	1.00
RESID(-1)	0.00	0.03	-0.06	0.95

R-squared	0.000001	Mean dependent var	2.18E-13
Adjusted R-squared	-0.002341	S.D. dependent var	1569.532
S.E. of regression	1571.368	Akaike info criterion	17.56
Sum squared resid	6.33E+09	Schwarz criterion	17.57595
Log likelihood	-22548.82	Hannan-Quinn criter.	17.56578
F-statistic	0.000598	Durbin-Watson stat	1.931065
Prob(F-statistic)	1		

**Eviews (2016)*

Table 30: Breusch-Pagan-Godfrey Test (Revised Exit Analysis)

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	5.709919	Prob. F(5,2563)	0
Obs*R-squared	28.30118	Prob. Chi-Square(5)	0
Scaled explained SS	11532.32	Prob. Chi-Square(5)	0

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22546705.00	6031734.00	-3.74	0.00
DUMMY	2257444.00	2795394.00	0.81	0.42
LOG_SIZE_	5828121.00	2439165.00	2.39	0.02
LOG_SALES_	4176104.00	2478179.00	1.69	0.09
GROWTH	5.22	183.88	0.03	0.98
MARKET	361950.00	176027.00	2.06	0.04

R-squared	0.011016	Mean dependent var	2462472
Adjusted R-squared	0.009087	S.D. dependent var	70476184
S.E. of regression	70155242	Akaike info criterion	38.97265
Sum squared resid	1.26E+19	Schwarz criterion	38.98632
Log likelihood	-50054.37	Hannan-Quinn criter.	38.97761
F-statistic	5.709919	Durbin-Watson stat	2.592587
Prob(F-statistic)	0.00003		

**Source: Eviews (2016)*

Table 31: White Test (Revised Exit Analysis)

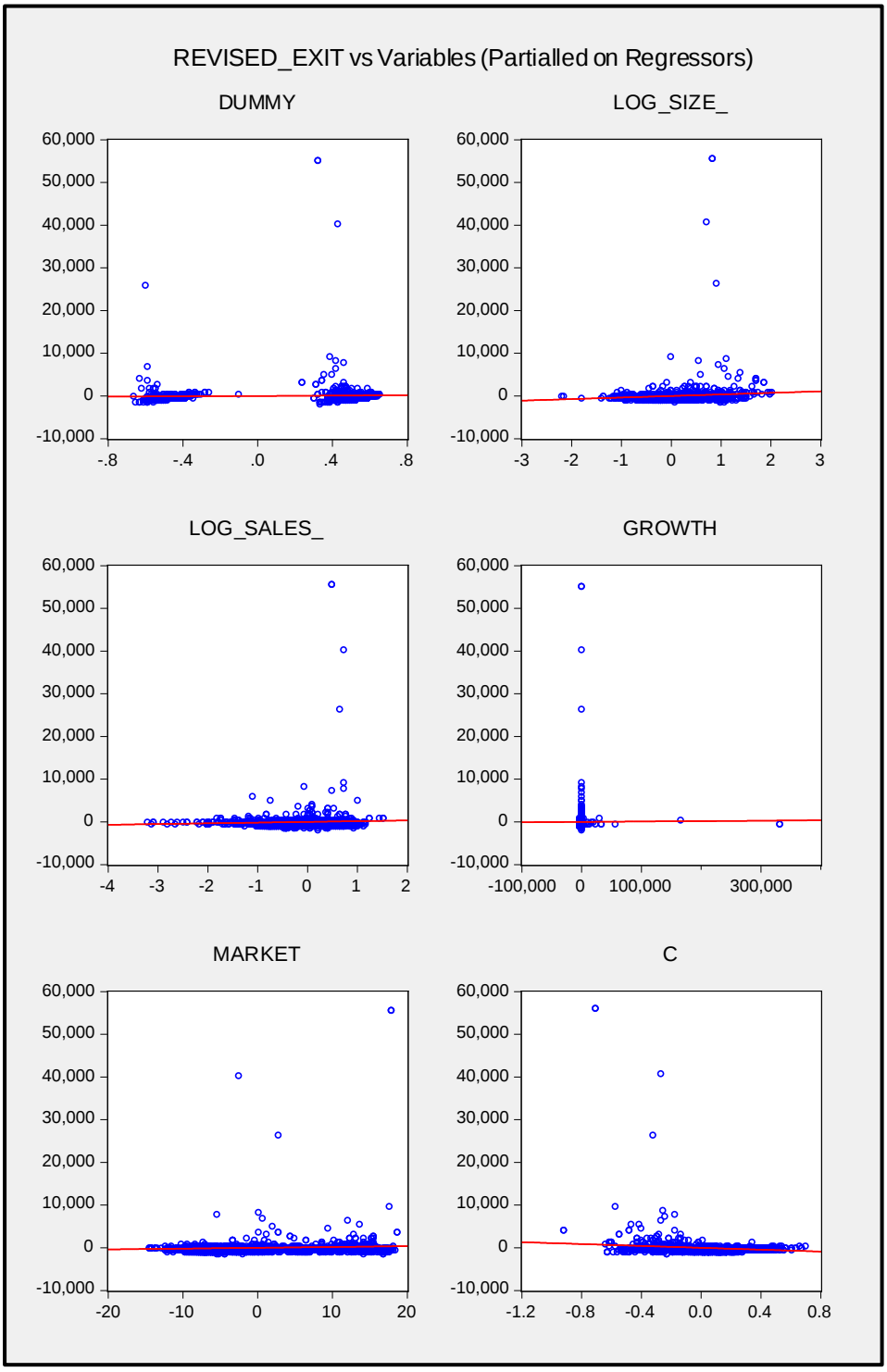
Heteroskedasticity Test: White			
F-statistic	5.668973	Prob. F(19,2549)	0
Obs*R-squared	104.1545	Prob. Chi-Square(19)	0
Scaled explained SS	42441.42	Prob. Chi-Square(19)	0

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.07E+08	26117535	4.080484	0
DUMMY^2	-21222888	12413234	-1.709699	0.0874
DUMMY*LOG_SIZE_	3043313	5325482	0.571462	0.5677
DUMMY*LOG_SALES_	3862354	5135217	0.752131	0.452
DUMMY*GROWTH	3505.84	10232.86	0.342606	0.7319
DUMMY*MARKET	473730.1	355210	1.333662	0.1824
LOG_SIZE_^2	-272414.1	3566692	-0.076377	0.9391
LOG_SIZE_*LOG_SALES_	12254679	5872993	2.086616	0.037
LOG_SIZE_*GROWTH	931.7274	2333.798	0.399232	0.6898
LOG_SIZE_*MARKET	766759.7	306508.7	2.501591	0.0124
LOG_SIZE_	-33661830	10509052	-3.203127	0.0014
LOG_SALES_^2	-414694	2750554	-0.150767	0.8802
LOG_SALES_*GROWTH	97.09058	1201.635	0.080799	0.9356
LOG_SALES_*MARKET	501596	301408	1.664176	0.0962
LOG_SALES_	-29331964	10699432	-2.741451	0.0062
GROWTH^2	-0.002242	0.003892	-0.576127	0.5646
GROWTH*MARKET	96.23075	138.177	0.696431	0.4862
GROWTH	-3851.218	3774.72	-1.020266	0.3077
MARKET^2	56120.37	26674.95	2.10386	0.0355
MARKET	-5019283	1674576	-2.997346	0.0027

R-squared	0.040543	Mean dependent var	2462472
Adjusted R-squared	0.033391	S.D. dependent var	70476184

**Source: Eviews (2016)*

Figure 31: Leverage Plots (2)



Source: Eviews (2016)

Table 32: VIF Analysis Exit Valuation

Variance Inflator Factor Analysis Included observations: 2569		
Variable	**Variance**	**VIF**
Dummy	2410.557	1.363764
Log (Size)	5078.499	4.274846
Log (Sales)	3268.592	3.595264
Growth	1.73E-06	1.011758
Market	32.47556	1.831979

**Source: Eviews (2016)*

Table 33: VIF Analysis Revised Exit Valuation

Variance Inflator Factor Analysis Included observations: 2569		
Variable	**Variance**	**VIF**
Dummy	2725.141	1.435165
Log (Sales)	3711.167	2.863556
Log (Size)	6086.962	3.707202
Growth	1.61E-06	1.012755
Market	43.41787	2.049882

**Source: Eviews (2016)*