Private Equity in the U.S.

“Is U.S. small – and mid cap private equity investment performance influenced by the business cycle?”

MSc. Management Thesis Open Universiteit
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Abstract

This paper investigates the nature of private equity fund performance, and empirically looks for evidence for effects of business cycle on this measure. The data on the U.S. private equity market is examined to arrive at a comprehensive answer to a question of importance to investors with a long-term horizon and a tolerance for illiquidity: does investing in private equity save investors the struggle of going through years of low performance when the business cycle is not in their favor?

This thesis finds no evidence of direct influence of GDP growth on private equity fund performance. The paper does however find leads for the influence of both interest rates and fund size on abnormal returns. This in turn implies very interesting grounds for further research into the field of private equity investment and business cycles.
Chapter 1: Introduction, relevance & outline

1.1 Introduction

In the past fifteen years since the turning of the century, the world has seen various shocks on financial markets. These shocks have been characterized by varying magnitude and origin. In fifteen years, the world has seen stock markets worldwide lose up to 70% of their value in downward cycles. In the early 2000s, the so called “internet bubble” burst, causing great suffering on financial markets and individual wealth worldwide. The great financial crisis following the bankruptcy of Lehman Brothers has been the most recent worldwide shock, and presumably the one of severest gravity in recent financial history. Parallels have been drawn between the aftermath of this meltdown and the great depression of the 1930s, which has seen a worldwide loss of income, jobs and overall perspective for a generation. Since 2008, the world has been trying to cope with the widespread consequences of the meltdown caused by the bursting housing bubble in the U.S. and the economic depression that followed. Governments and central banks worldwide have been stretched to their limits when trying to save their public banks and after that revitalizing their economy. Trillions of dollars have been added to the balance sheets of the respective central banks of the U.S., Japan, the Eurozone, the United Kingdom and China, in order to stimulate growth when the economy was ailing at levels the world had not seen for over a century.

The events mentioned above all have one trait in common: the fact that however harsh the consequences of the real economy may be, there is always a significant stock market bust that precedes these events. However, returns on stock markets are not the only indicator of economic performance and, more importantly, investment performance. There are several asset classes that show completely different fluctuations in performance over time, compared to publicly owned stocks as traded on the markets. Be it sovereign bonds, corporate credits, CDS, MBS or any other type of “paper asset”, they will all have to bear the same exposure to financial markets or economic (in)stability.

An investor, be it an institutional one or an individual investing to enhance his retirement, will always aim for the highest return achievable within his or her personal risk parameters. The ideal investment for any investor will therefore lead to an unlimited percentage of capital gain, combined with no risk. In reality, this is obviously a utopia. However, compared to the so-called paper assets, there is an asset class that has always been known informally for its ability to perform well, no matter which way the stock markets were moving at that time. The question remains if this has just been stock market gossip, or if it is based on
genuine real life examples. This asset class of interest presented is private equity, in any shape or form in which it may appear.

In investment literature and in general investment practice, private equity is said to be the one asset class that should perform well throughout all stages of the traditional business cycle. In other words: if you are an institutional investor or an individual, private equity should suit your needs given any economic circumstance. For example, Lerner et al. (2004) state that the investors of the Yale endowment fund, one of the largest investors in private equity funds worldwide, believes that these funds can “generate incremental returns independent of how the broader markets perform”. Besides the fact that this is a rather blunt statement to make, an investment without cyclical risk that performs well may trigger suspicion among any investor. Regardless of any experience in the investment industry any person may have, this hypothesis will sound intuitively incorrect.

Therefore, it will not come as a surprise that there is no empirical evidence to be found to support this statement. The subject central in this thesis will therefore be the performance of private equity funds throughout business cycles. Will the popular hypothesis which implies that private equity performance is immune to external economic pressures hold, or will the contrary be proven? To arrive at an extensive reasoning and answer to this question, that is understandable to readers of differing experience in investment, a conclusive path needs to be set out.

The aim of this thesis is to firstly gain a thorough insight into the private equity practice and take the reader on a path towards understanding the industry. This will include providing an overview of the pros and cons of investing in private equity, but will also aim to provide an objective critique of the prejudice the industry has been coping with over time. This prejudice is particularly relevant in the Netherlands nowadays, because of government efforts to eliminate the so-called “excess” from the private equity practice.

Apparently, private equity attracts certain types of investors that exhibit so-called “leech behavior”, by overly leveraging their investments in portfolio companies to achieve an astronomically high return on investment and leaving the companies as empty shells afterwards (FD,2015). Labor Party member of parliament Nijboer has made it his personal crusade to eliminate this greed from private equity.

This public opinion is by no means unique to the Netherlands or the European way of looking at investment. In the U.S., the nation of birth of the private equity industry, the same holds. In the U.S., 3.300 firms are active in the private equity industry. The Dutch private equity industry is limited to a few hundred participants, and is active in a relatively small market of portfolio companies. It is because of the scale
advantages and vintage the U.S. private equity market provides, that the scope of this thesis will concentrate on this market. Furthermore, Kaplan et al. (2003) and Hege et al. (2003) documented that certain European private equity funds have led to poor performance partly caused by the fact that the private equity industry outside the U.S. is younger and thus at a lower point in the learning curve.

In the light of the relevance to the public, this thesis will also aim to construct an objective image of the industry, and will leave the reader to form whatever opinion on private equity suits him or her, based on the data supplied. Eventually, the purpose of this thesis will be twofold: to obtain an objective view on private equity performance throughout business cycles, and to assess whether the popular view on “greedy” private equity investors is indeed correct.

To arrive at a satisfactory result of pursuing the two objectives of this thesis, this introduction will firstly introduce the research question central to this thesis. Secondly, a brief history of the industry as well as basic private equity knowledge will be provided to lay solid theoretical groundwork for the remaining parts of this research paper.

1.2 Research Question

The subject central in this thesis is the private equity industry in the United States. This section of the global private equity industry has been chosen because of the data available and the maturity of this market.

The central purpose of this research will be to shed light on the widespread hypothesis that private equity is an asset class that will always yield satisfactory returns, be it in flourishing or ailing economic climates. In this manner, the relevance of private equity as an asset class in the current volatile state of the markets worldwide can be assessed. Furthermore, as a second objective in this thesis, the private equity industry will be placed in the light of recent popular attention. This will partly include introducing the reader to common private equity practices and partly making a connection with recent opinions and news.

The problem stated in this introduction will form the basis for the central research question. The assessment of the performance rigidity of private equity funds during any stage in the business cycle will be led by the following research question:

“Is U.S. small – and mid-cap private equity investment performance influenced by the business cycle?”
The research question stated above will serve as the common thread throughout this thesis. All analyses conducted will be done to arrive at a satisfactory answer to this question. Empirical research will serve to arrive at this purpose.

The empirical research in this paper will consist of two components. At first, the question arises whether capital inflows in private equity in the U.S. are more significant during economic downturns when confidence in the economy is at below-average levels. The hypothesis that private equity is an asset class that features performance characteristics neutral to business cycle influences, would suggest that capital inflows into private equity funds should rise when business is slowing, and investors are seeking steady performance.

Obviously, resulting from the hypothesis mentioned above, the question rises whether private equity performance is constant throughout business cycles. In case academic analysis provides evidence for increased inflows into private equity funds in times of market turmoil, this does not necessarily mean that performance of these funds will be better than the stock market. Later on in this chapter, insights into the private equity practices will be provided to obtain a better understanding of the external forces of influences on fund performance.

To apply as much structure as possible when answering the main research question throughout this thesis, sub-questions and hypotheses need to be put in place. Considering the two-fold nature of this question, the following research questions can be stated:

RQ 1: Which parameters are crucial when measuring private equity performance?
RQ 2: Which external factors influence private equity performance?
RQ 3: Which factors are used to determine the position in the business cycle?

The literature study included in this research under chapter 2 will seek preliminary answers to these questions. Based on the literature applied in this chapter, hypotheses will be formed to subsequently take into the data analysis part of this research. The literature study in this thesis will also serve to provide in-depth definitions of key subjects introduced in this chapter.
1.3. Relevance

1.3.1. Academic Relevance
First, the current state of research of the two different components of this thesis will be assessed by examining the papers most relevant to the subjects. Second, the gap in existing research will be indicated upon which this thesis aims to make an extension.

1.3.1.1. Private Equity Research
Academic focus on private equity as an industry is not characterized by extensive research dating back decennia. Part of the problem is the fact that obtaining a satisfactory set of data from individual funds is difficult. Exemplary of this phenomenon is earlier research by Prowse (1998), which seeks to prove that private equity data is not as readily available as stock market data is. Nevertheless, in occasions when academics managed to obtain significant amounts of data from private equity funds, research has turned out to be very interesting and has contributed vastly to research in the financial field.

In this thesis, the focus lies on private equity fund performance and capital inflows into these funds, to indicate behavior of these factors during business cycles. Former research into private equity fund performance is not limited to capital inflows or net performance. Specific research into fund performance through business cycles is available, albeit not to the extent desired in this thesis. For instance, Palipou & Zollo (2005) show that returns of private equity funds in Europe are indeed related to consumer confidence and stock market returns, hence by the position in the business cycle in which a country, or in this case a monetary union, is located. This research is most in line with the purpose of this thesis, and will be central to the extension made to current academic research.

The relevant extension to available private equity which will be made in this thesis will be to move the scope of the concept introduced by Palipou & Zollo (2005) to the U.S., and introduce further measures of performance to the concept.

1.3.1.2. Business Cycle Research
In the past, research into business cycles has focused on the economic data able of optimal indication of the position in the business cycle. The scope of the research indicative of the aim of this thesis is centered around the behavioral aspects of the business cycle. This includes, for instance, the consumer and investment sentiment indicator, which are proven to be positively correlated (Lemmon & Portniaguina 2006). The extension to be made to any literature into the field of business cycles is obvious. In itself a very popular academic field, business cycle research aims to explain the effects of the cycle of economic growth on any aspect of economic or financial life. The extension to be made thus is the focus private equity, and to
indicate the effect business cycle movements have on its performance. This is done through ample empirical research. The methods applied for this research will be introduced in detail in a later chapter.

1.3.1.3. Extension to research
The combination of the disciplines of private equity and business cycles contributes to academic literature already available concerning the individual components. The different components are of behavioral nature, and of course of quantitative nature when focusing on private equity historical data.

For instance, Lemmon & Portniaguina (2006) have shown that stock returns for stocks with limited institutional ownership can be forecast by analyzing Consumer Sentiment Index measures. Furthermore, Fisher & Statman (2003) have provided evidence that consumer confidence rises with high stock returns. Moreover, they show that investor sentiment rises significantly when consumer confidence in the economy is soaring. These two exponents of academic literature into consumer confidence are merely an excerpt of the extensive research in this field.

1.3.2. Societal relevance
First, private equity has grown as an important catalyst of economic activity in Western societies, with capital committed rising from $5 billion in 1980 to $2.6 trillion worldwide in 2015 (Bundonis & Magnusen, 2015). Second, it has been widely argued that the people managing the funds have made a significant impact on the performance of the companies they finance (Lerner 1995, Hellmann 1998). This research shows that, when compared to companies that abstained from the influence of private equity, private equity owned businesses show superior earnings growth. Lerner (1995) further substantiates this fact by finding the origin of these growth differences. Amongst others, Lerner shows that the presence of private equity officers on the board of the company is a driver for growth. The contribution the private equity practice makes to society in terms of employment, economic growth and increase of wealth obviously follows.

Added to this, private equity is a particularly hot topic in the Netherlands, as one member of parliament has made it his personal crusade over the past few years to regulate the industry more strictly. Mister Nijboer aims to ban excessive profits from private equity practices and, more importantly, to protect Dutch companies from taking up too much debt in so-called leveraged buy-outs. In the past, several Dutch companies financed by private equity funds have turned out to be too weak to withstand the burden of debt that came with a leveraged buy-out (Kuppenberg, 2015)

In contrast to the companies mentioned here, there is a vast amount of companies that have provably benefited from private equity ownership as a catalyst of their performance. The Dutch economy has for
instance benefited from the rise and growth of companies such as Bol.com whose presence has created jobs and purpose for many people. In 2014, 350.000 (10% of total employment) worked for one of the 1.450 companies that have a private equity shareholder. The combined revenues of these companies amount to €85 billion (NVP 2015)

On the other hand, it is the opinion of the researcher that private equity firms stand to blame for individual company bankruptcies far too often. In December 2015, the bankruptcy of Dutch department store Vroom & Dreesman was one of the latest examples of private equity being blamed for mismanagement of a company, that has been losing money since the late 80s. Thousands of people lost their jobs and Sun Capital, an American buy-out firm (Kuppenberg, 2015) was the one to blame according to public opinion. In fact, V&D was a warehouse that had been coping with declining revenues since the mid-90’s and it had been a decade since they had seen profits.

However, there is substantial proof that private equity is indeed of interest to the public. For instance, Harold Bierman Jr. describes the virtues of private equity to the management of the target companies and to the public. He names several factors on which a company and its employees can benefit from private equity partnership, such as the alignment of management and ownership, earnings growth, job creation, etcetera (Bierman, 2003).

1.3.3. Practical relevance
In current times, the worldwide economy has been ailing, as have been stock markets, bond markets and the general sentiment of investors. Combined with rising volatility in these markets and declining interest rates, this makes the case for any asset class that can withstand these forces. In case the hypothesis stated in this introduction proves to be correct, this will make the case for the addition of a private equity part to any portfolio. The practical relevance to investors is therefore of obvious importance. Any investor seeks to maximize his or her return while simultaneously minimizing the risk of losing part of his or her wealth. Whenever an asset class offers the opportunity to take risk and earn a decent return, while withstanding the volatility of common financial markets, this is of interest to investors who can cope with the lack of liquidity that private equity implies.
1.4 Thesis Outline

The research in this thesis will be conducted by following a strict outline, of which this introduction chapter was the first stage.

Following this introduction, literature research will go into depth regarding every single aspect of the subject posed in the problem statement, and will touch upon private equity basics, business cycle basics and academic research and will further introduce the link between the two.

In the following chapter the methodology of the empirical research will be introduced. Furthermore, data collection and analysis practices will be introduced, conducted and evaluated. Results of this quantitative research will be presented eventually.

In the last chapter findings and conclusions will be presented. The thesis will be concluded by a thorough discussion of the results and the implications it may have to either the relevance of the subject, the public opinion or future research.
Chapter 2 Theoretical Framework

2.1. Introduction

In this chapter, a thorough literature review will be provided to construct a theoretical framework. This literature study is essential to be able to conduct a thorough quantitative research in the following chapters. The main research question to be answered over the course of this research is

“Is U.S. small – and mid-cap private equity investment performance influenced by the business cycle?”

To apply structure to this theoretical framework, the two main subjects of this thesis will be outlined. Firstly, private equity will be thoroughly introduced down to the basic level, while touching upon performance metrics, effects on businesses and ending with an overview of literature provided.

Secondly, the simple definition of the business cycle will be basically explained. Furthermore, a literature review considering elements of the business cycle and measurements of business cycle characteristics will be provided.

Concluding this theoretical framework, the position in the academic spectrum will be indicated by means of a graphical presentation that summarizes the theoretical work in this field.

2.2. Private Equity

The business of private equity has been around for quite some time, and has been growing in assets under management ever since. However, although the industry has gained significant influence on businesses across the world, the phenomenon is not very well known amongst the public. The level of discretion that comes along with private equity practices is partly to blame for this. It has also been operating under the radar of the public because an investment in a private equity fund is not often readily available to retail investors. The largest private equity investors are mostly pension funds, public endowments or (ultra) high net worth individuals.

2.2.1. What is Private Equity?

Because of the obscure nature of most private equity investments, the way it works is not common knowledge. To be exact, the term private equity refers to the common stock of a corporation where that common stock is held by a relatively few investors and is not traded on any of the conventional stock markets. Often, a minority stake in the company is also held by senior management (Bierman 2011).
In practice, the term “private equity” is used in several different ways. There are private equity funds that invest directly into publicly owned corporations and venture capital, which is also a form of private equity, but tends to invest in earlier stages of the corporate life cycle.

In general, private equity funds broadly function in the same way as open ended mutual funds, in terms of the manner of financing. The general partner of the private equity firm collects capital from investors in his fund, the so-called “limited partners”. He or she will then apply this capital to obtain an interest in a company, be it publicly owned or private, to gain control of this company. Obviously, publicly owned companies preferably are taken private at the moment of investment, and the general partner will in any case strive to obtain most the controlling rights in the target company.

When the target company is acquired, the general partner will aim to add as much value as possible within the time he has to complete the cycle.

An investment in a private equity fund usually is illiquid over the course of the cycle, which usually will take up to 10 years. Possible liquidity from sales of interests or dividends from owned companies will be distributed to the partners over the course of the cycle. For professionals with experience in investing through multiple asset classes, private equity investments are best characterized by the key words illiquidity, stickiness and segmentations.

When spoken of private equity in terms of returns compared to returns that can be achieve on the normal stock market, the illiquidity of the asset class intuitively needs to find its compensation. Despite the fact that expectation of a significant illiquidity premium, academics do not necessarily find evidence of such an outperformance of the stock market. In fact, Gottschalg, Phalippou, and Zollo (2003) find that private equity funds underperformed the stock market by 20% over the 15 year course of their dataset, whereas A. Ljungqvist and M. Richardson (2003) find that private equity funds outperformed the stock market by 5-8% per year on average. To summarize; nothing is 100% certain when it comes to academic research into private equity, which makes this asset class nonetheless fascinating to examine.

2.2.2. Why do companies go private: the edge of private equity over publicly traded equity
As one may understand, there are several costs and benefits involved with a choice of either one of the two options. For instance, when a company makes the decision of going from private to public, for this specific company the benefits of liquidity will outweigh the loss of control Barath & Dittmar 2010). However, for several companies, it may be the other way around. This is when the opportunity arises to reverse the
decision of going public and become a private company once again. There are several market- or macro-
economic factors that will contribute to the reversal of the decision to go public. This paragraph of the
theoretical framework on which this thesis is built, will identify such factors and serve to deepen your understanding of the market.

A side note can be made to the above; not every private equity-owned company necessarily has to be a former publicly listed company. Numerous examples exist of private companies being owned by private equity investors without ever having gone public before.

External factors influencing the decision
Empirical evidence is available when it comes to the “private equity decision”. It is a matter of marginal costs and marginal benefits when it comes to this decision. When the level of costs of being a public company exceed the level of benefits, the moment to go from public to private has come. However, which external factors can be identified that can push this decision beyond the tipping point? There are waves of going-private transactions identifiable that suggest that exogenous factors may influence the number of firms going private. By this, we can conclude that these factors directly influence the decision made. As a matter of fact, empirical research has shown that individual company characteristics do not change that much that it would influence the probability of going private. It may therefore be a conclusion to think that external factors tend to push companies in doubt over the threshold (Bharath and Dittmar (2010)). The following exogenous factors play a role in this phenomenon.

Movement of the Broader Market
Bharath and Dittmar (2010) found that fluctuations in IPO markets and the general financial markets influence the decision to go private significantly. For instance, in times when market sentiment is high, companies tend to withhold from the decision to go private. Furthermore, they have found that in times when the IPO market is hot, the same negative relation holds. This suggests that the costs and benefits of being a public company tend to fluctuate over time, thereby influencing the decision. This is a crucial finding that will also turn out to be very useful over the course of this research. Research by Bharath and Dittmar (2010) hereby suggest a whim of a relationship between investor sentiment and the business cycle, with the decision to become a private equity-owned company. Further along in this research, the question remains to be answered whether strong- or weak markets will eventually influence the performance of private equity.
Interest rates and debt supply

During times of easing monetary policy, in which interest rates are at a low level, literature finds evidence that supply of debt in the shape of bank loans will be significantly higher than in the opposite situation. The years following the financial crisis of 2008 show that low interest rates could also be uncoupled from high credit availability, but bears no academic consensus. It is at these times that both (Bharath & Dittmar, 2010) and Hege, Palomino, and Schwienbacher (2003) find that there is a significant connection between the amount of available debt and the number of transactions that involves companies returning to privately owned structures. In the light of these findings, it is also noteworthy to state that Gompers and Lerner (2000) found that capital inflows into private equity funds, driven by the availability of debt, have a significant effect on valuations of investments, the so-called “money chasing deals effect”. Furthermore, they find that this in turn influences the performance of these private equity funds. Given the data, it is a stretched assumption to believe that the availability of debt negatively influences private equity fund performance by driving up valuations of acquired projects. However, it is a step towards the hypothesis that private equity fund performance is indeed related to market circumstances, be it monetary factors or the broader market sentiment. Obviously, every step taken towards the achievement of a solid conclusion of this research is very welcome.

The academic literature mentioned in this chapter has indicated which theory lies at the foundation of the privatization decision. The following will focus on the virtues that this decision will eventually yield, when private equity firms get involved in the business processes of the target companies. When the decision has been made to take a company private, the former public company will stand to benefit from several virtues of private equity. Bierman (2011) points out these benefits extensively.

Simplicity
Now the decision to become private has been made, there are no public equity investors left to control the processes in the business. Ownership will be much more concentrated, which makes it a lot easier to manage the business. The number of stakeholders has been radically decreased. Added to this, this significantly decreases the number of entities to which financial reporting is owed. This simplifies the responsibilities of management, and significantly reduces costs (Bierman 2011).

Management and ownership
Due to the rigidity of the private equity structure obtained after the company has gone from public to private, or after the company has been taken over by a private equity firm, things have gotten simpler for every party involved. The interests of the “agents” involved are now more aligned than in the hundreds of papers that
have extensively researched agency theory in publicly traded companies (Jensen 1986). In privately owned companies, be it with or without involvement of private equity firms, ownership and management have the same interests.

Capital Structure
Public companies have both management and owners with different interests. Part of the misalignment of these interests is the fact that owners and management are rewarded in different ways (Bierman 2011). When a company is private, the management has an incentive to turn debt into equity in order to gain control and (more importantly) add value to their investment. Debt becomes a more important factor for management when a company is privately owned. This could lead to perverse incentives on the side of the general partners in a private equity firm, as Thomsen (2009) points out. However, an in-depth analysis of the ethical complexities of private equity practice falls beyond the scope of this thesis.

2.2.3. Performance measurement
Research into private equity performance is not as extensive as, for instance, generally accepted economic phenomena like agency theory or arbitrage opportunities. This is partly since the performance measurement of private equity funds is a difficult task to conduct. In general, private equity firms tend to provide their investors with one number in the form of Internal Rate of Return (IRR) of the consolidated underlying investments. Obviously, this is not in every case a sufficient measure of the activities of a firm, and is sensitive to manipulation from the side of the fund. Gottschalg et al. (2003) make three remarks concerning the problematic nature of this performance measure. First, IRR “implicitly assumes that capital distribution occurring before liquidation can be reinvested at the fund’s IRR”. This is problematic because of the fact that when a fund raises capital, investment is seldom immediate.

Second, the profile of investments in the industry is of such nature that general partners can be stimulated to manipulate IRR by strategically reporting residual value and by timing cash flows accordingly. Lastly, inflows and outflows are treated as two flows with the same risk, which is an assumption that will not hold in any case.

Obviously, IRR has its shortcomings in terms of accuracy. However, this measurement is most common in the private equity industry and will therefore serve as the leading performance indicator in this research as well.
2.2.4. Factors that Influence Private Equity Performance

Internal Rate of Return will be the leading performance indicator throughout the analysis central in this research. Opposite to the fact that certain parts of research into private equity have not been sufficiently deepened, there is ample research on external factors influencing private equity performance. Several factors that are also of influence on the decision whether to take a public company private may also serve as factors that influence the residual performance of the private equity owned business. Diller and Kaserer (2009) have found that several factors drive private equity fund performance, apart from the ones mentioned before. These include both external and internal factors.

Earlier, we mentioned fund inflows and the availability of debt on the market as factors influencing private equity valuations (and thus fund performance). Now, there are several other factors also of significant influence on private equity performance. In frictionless and perfectly efficient capital markets, returns on investment in private equity fund would only be determined by systematic risk. Due to the characteristics of the asset class, f.e. illiquidity, stickiness of fund flows, the restricted number of target companies and the segmentation from other classes, the market may however be far away from being perfect and frictionless. Fund inflows, the level of skill of general partners and risk all have their contribution to the fund’s performance, be it negative or positive. If the theories proposed by Gompers and Lerner, Inderst and Müller (2004) are right, we should find a relationship between fund inflows and fund performance.

However, there is a third element to be taken into account, which is stressed by A. Ljungqvist and M. Richardson (2003). This factor is the competitive environment faced by the management team of the private equity fund. Simply put, this means that general partners are put under pressure to find the best deals possible in the industry on which their focus lies. If this power is combined with the phenomenon of “money chasing deals”, the result is obvious. The time that is needed to return a given multiple of committed capital becomes longer the higher the inflow of money into private equity funds is, and hence the performance measure IRR is significantly lower (A. Ljungqvist & M. Richardson, 2003). Stated differently, this phenomenon could also be described as “the more money that is pouring into the industry in a given vintage year, the lower is the return of funds closed in that particular vintage year”.

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General Partner skill

Obvious from the above stated factors, is the phenomenon that “money chasing deals” is closely related to the characteristics of the average private equity fund. The most important factors here are the illiquidity, stickiness and the segmentation of private equity markets. According to Diller and Kaserer (2009) this partly implies that the skill set of a general partner (GP) in a private equity firm should have a more significant impact on fund performance than would be the case for funds investing in public market equities. This is mainly since much of the available information on public equity markets is incorporated in the asset prices. In such an environment, undertaking any action into information gathering activities would not increase fund performance dramatically, as Ljungqvist & Richardson (2003) have found evidence for. Moreover, there is no empirical evidence that fund returns may be driven by fund managers’ skills. As amongst others Fisher & Statman (2003), Baker & Wurgler (2007) and Hege et al. (2003) have found, there is also no evidence that mutual fund performance is in any way driven by fund inflows or other factors influenced by investor sentiment, as we have seen is the case for private equity funds.

Given the characteristics of the industry, information is much less readily available in private equity than on the public equity markets. It therefore requires an impressive network, great screening abilities and overall skill by GP’s to maximize results by finding the best deals out there. Hege et al. (2003) show that, when comparing the mature private equity market in the U.S. to the somewhat less developed European industry, the outperformance of U.S. funds is at least partly due to superior screening skills of American GP’s. This consequently suggests that the best deals should always be concentrated in the funds that inhibit the most skilled GP’s. In fact, Kaplan and Schoar (2005), Gottschalg et al. (2003) and A. Ljungqvist and M. P. Richardson (2003) find proof for the so-called “persistence phenomenon”, which implies that there is a significant correlation between performances of funds run by the same management team. We therefore see GP skill as an important factor in determining the performance of private equity funds.

2.2.5. The Economic Benefit of Private Equity

As stated before in the introduction, this thesis also aims to shed light on the question whether private equity is a benefit to the broad society. We have seen that traditional media tend to overemphasize on the negative impact of private equity, especially on those cases of leveraged buy outs that come with a significant loss of employment. Although it may seem from media coverage that this is all that private equity can do to the companies it invests in. In fact, it is without question that private equity investments yield a gross job creation when U.S. buyouts are assessed over a timespan ranging from 1980 to 2005 (Davis et al. 2014). It is the initial job loss that occurs in many cases of leveraged buy outs that spurs negativity.
There are numerous publications written by organizations specialized in the promotion of private equity, but they cannot be indicated as representative for the real effect of private equity funds on the economy. We will therefore only take proven academic evidence into account in this thesis.

Obviously, there is no uniform effect of private equity on the performance of target companies or on the local or regional economies that said companies are a part of. We will therefore break down these effects into three different categories, being the net effect on the number of jobs, the effect on regional or local economies and the effect on the distribution of value. Shleifer & Summers (1988) provide a report of three case studies in which the varying effects of buyouts by private equity funds are shown. In all three cases the effect on the private benefits of the company shareholders is equal, however in all three cases the effects on the other two variables are vastly different. The social consequences are of a very different magnitude.

In the worst-case scenario of the hostile takeover of USZ by Carl Icahn, headquarters are immediately closed after take over, thousands of senior staff are laid off and factories that dominated local economies are shut down. As a consequence, numerous stores, restaurants and banks in the areas go bankrupt (Shleifer & Summers 1988).

The image that is created by cases like the worst-case scenario mentioned in the last case is the one that lasts in the mind of the public, and it is because of this that private equity funds are viewed as greedy and bad for the health of the general economy. However, as we have seen from the other cases and numerous situations in the past, it does not necessarily have to be that way. There are numerous

This thesis tests the assumption that private equity funds perform steadily during times of economic downturn. If this assumption holds in the empirical research in this thesis, we may find that jobs are preserved in private equity-owned companies when other businesses are obliged to lay off workers. As such, the broad economy will benefit from these practices, the social consequence may not be as negative as perceived, and the negative image may be laid to rest, supported of course by more research into this field.
2.3. Business Cycles

Academic evidence provided by Diller and Kaserer (2009) handily provides this research with an indication of the single most important relation; the question whether market sentiment has any impact on private equity fund returns.


The business cycle is an economic phenomenon that was first introduced in the early years of the 19th century (Golinelli & Parigi 2004). During that time, economic cycles were mostly viewed as the result of wars and geopolitical instability, more than as a function of several economic factors such as production, consumption and industrial activity. Nowadays, every scholar has some idea of what economic cycles are. It can just be as simple as “fluctuations in economic growth over time, which explains the very general idea behind it. Over the years, several economists have contributed meaningful research to this phenomenon, of which John Maynard Keynes obviously is the most significant one. In 1946, the now standard definition of the business cycle was constructed by Burns and Mitchell (1946). Their interpretation of countless research that led to this definition is as follows:

“Business cycles are a type of fluctuation found in the aggregate economic activity of nations that organize their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; in duration, business cycles vary from more than one year to ten or twelve years; they are not divisible into shorter cycles of similar characteristics with amplitudes approximating their own”.

The definition of what a business cycle is, is quite clear to any scholar that understands the definition mentioned above. It is however more difficult to see the factors influencing the business cycle. It is at this point where academic literature goes beyond the scope of this research. The aim of this research is to identify the results of the business cycle on a certain asset class, not to indulge in a vast review of macroeconomic literature, or more specific of Keynesian economics. It is not the task of the researcher to see how to smoothen out the cyclical movements, by monetary or fiscal policy, just to assess the effects.
2.3.2. Business Cycles and Sentiment

Earlier in this research, several academics suggested that there is a relation between the business cycle and sentiment, be it consumer sentiment or investor sentiment. Sentiment in itself is the general perception of investors toward the price development of financial assets (Baker and Wurgler (2007). Obviously, sentiment is positive when investors expect prices to grow and vice versa. The difficulty about this subject lies in the fact that the evidence for this relation is ambiguous and that some researchers may suggest that sentiment is in fact one of the drivers of business cycles, opposite to the other way around as one may assume intuitively. There is less evidence however of economic cycles being influenced by consumer and investor sentiment than the evidence that proves that these phenomena work as accelerators, as Golinelli and Parigi (2004) show.

2.3.3. Relevance of Business Cycles in Private Equity

The importance of business cycles when private equity is concerned is obvious. Simply the fact that private equity funds consist of companies implies that business cycles are always of influence on the funds. Extensive research exists into the workings of business cycles and the nature of the phenomenon, as private equity literature is also available, be it in a smaller volume. The connection between business cycles and private equity has been made in academic literature already mentioned in this theoretical framework. For instance, Gompers and Lerner (2000) and Golinelli and Parigi (2004) show that economic activity, and with this the business cycle, has influence on company performance. This confirms the aforementioned hypothesis.

2.4. Placement in Literature

An overview of the academic readings that have comprised the foundation of this thesis has been given in the previous chapter. This chapter suits to indicate where this research aims to make an addition to existing literature.

The theoretical foundation can be divided into three different subsections. The first two sections, private equity and business cycles, are essential by forming the base of literature that introduces the subject. The third section focuses on the practical relevance of this research by supplying relevant literature in the field of statistical analysis of research results. This theoretical base will be introduced later and put to work in the
chapters that will concern the actual data crunching around this subject. For a thorough understanding of
the place in the literature this research aims for, the following image is suitable.

![Image of Venn diagram with overlapping circles labeled Private Equity Theory, Business Cycle Research, and Investment Theory.]

**Extension to Literature**

More striking perhaps than all the factors mentioned above, is the discovery that Kaplan and Schoar (2005) made when comparing private equity returns to the returns on the stock market. They found that funds raised in certain years, so called “vintage years”, with above average stock market returns have lower returns and vice versa. Considering that stock returns tend to correlate with economic growth, this suggests that market sentiment might have an impact on fund returns. Given the fact that we have also noted that the position in the economic cycle is of influence on investor sentiment, these findings provide this research with an ideal entry point into the academic literature on this subject, and makes it obvious that the topic is of sincere academic relevance. Obviously, data analysis will ultimately have to show that the whim of connection between the two subjects is indeed concrete, but there is ample reason to pursue this phenomenon. The extension that will be made to the available research on these subjects is whether we can provide evidence for the connection between the business cycle and private equity fund performance and whether there is a causal relationship between the two, or just a statistical correlation.
Chapter 3: Data and Methodology

Within this chapter the research method that is used in this paper will be described. Firstly, the methodology used in this analysis will be thoroughly discussed. Secondly, the dataset used will be introduced. Visual representation will be used to familiarize the reader with the data in the dataset, and to make the connection between literature and data more easily understandable.

3.1 Methodology

3.1.1. Research Purpose

The research question central in this thesis is as follows:

“Is U.S. small- and mid-cap private equity investment performance influenced by the business cycle?”

A translation of the research question to a hypothesis needs to be provided to have a strict directive for the empirical part of this thesis. An important thing to keep in mind is that an investor in private equity invests for a significant time span (10 years) and will want to be compensated for the fact that he or she will not be able to use the invested sum for that time. An illiquidity premium, as proven by f.i. Cochrane (2005) and Ljunqvist (2003), is what the investor will be looking for.

Literature has suggested that several variables are of influence on the performance of private equity funds. Several papers have earlier studied private equity returns. Kaplan and Schoar (2005) examine returns using cash flow data, while Phalippou and Gottschalg (2009) use the same data. Cash flow data provided by funds are often used in the analysis of private equity returns. Jegadeesh et al (2009) choose a more market driven approach, as is also the “weapon of choice” in this thesis. In the research design chapter, the Public Market Equivalent, as used by Jegadeesh et al (2009) and introduced earlier bij Long and Nickels (1996) will be introduced.

Thus far we have indicated internal and external powers such as fund size, fund management skill and interest rates. This research will aim to provide predictive value for future investments in private equity when compared to investing in regular liquid assets. The hypothesis to be tested, as it follows naturally from past research presented in this thesis, is that private equity investment is advisable for severable different reasons, but investing through business cycles without losing significant exposure is not one of those reasons. In other words: the research question can be answered negatively. As mentioned earlier in this thesis, the base hypothesis is that Private equity is expected to be the haven during business cycle downturns that it is thought to be. The foundation of this expectation lies in earlier empirical research. For
instance, Robinson and Sensoy (2011a) and Harris et al. (2012) show that private equity fund returns exceed those of public markets for most of the vintage years since 1984. However, Jegadeesh et. Al (2010) show that private equity funds have market betas close to one. They also show that private equity fund results are negatively related to the credit spread and positively related to GDP growth. Evidence is more present however when it comes to private equity funds outperforming the S&P 500, as for instance Ljungqvist & Richardson (2003), Cochrane (2005) and Peng (2001) show. Empirical research conducted in this chapter will show if the data at hand in this thesis will show significant support for any one of these statements.

3.1.2. Research Design

To be able to assess private equity fund performance compared to the S&P 500, a measure of public market performance needs to be found to consistently conduct the analysis. Per Long and Nickels (1996), a benchmark for private investment performance needs to be “unambiguous, investable, measurable, appropriate and reflective of current investment opinions”. To do this, a Public Market Equivalent (PME) needs to be used as a benchmark for private equity fund performance.

In this thesis, we will use the Long-Nickels PME (Long and Nickels 1996), as it provides for a perfect apples-to-apples comparison when compared to the fund Net IRRs available in our dataset (Harris et al. 2012), and is available for every vintage year included in this research. Long and Nickels (1996) translate S&P 500 performance data to time-weighted dollar-weighted data, similar to private equity fund IRR. When using PME benchmarks, a private equity fund is compared to a hypothetical alternative investment, the PME vehicle. The idea is to take cash flows of a private equity fund, redirect them to the PME vehicle, and obtain the vehicle’s NAV for use in an IRR calculation. In essence, the LN PME calculates the IRR of an equal investment in a public market, in this case the S&P 500 index, as opposed to an investment in private equity. The Long-Nickels PME is calculated as follows from equation (1):

\[
NAVPME = \sum_{S}^{T} C_S \times \frac{I_t}{I_S}
\]

(1)

Where:
$Cs$ is the cashflow from the investment at date $s$, positive for a contribution, negative for a distribution.

$I_s$ is the value of the index at date $s$. Then PME follows from equation (2).

$$PME = IRR(Cs, NAV_{pme})$$

(2)

A list of PME numbers will be provided in the appendix to this thesis.

Several lifespans of private equity funds are assessed in this research. As mentioned, private equity funds have a regular life of 10 years. When vintage years from 1990 to 2000 are included, this automatically implies 10 different life spans, ranging from 1991-2001 to 2000-2010. During these lifespans, GDP data will expectedly show fluctuations ranging from GDP decline (for instance in 2000-2001) to GDP growth. Essential in this model will thus be to assess the out- or underperformance by private equity funds over the public market, in relation to the fluctuations of GDP in said periods.

Moreover, since we have identified evidence for several factors of influence on the performance of the funds in our sample, the model to be tested would not be complete without controlling for variables that have been indicated in the literature. In this model, chosen control variables are FED policy rates and private equity fund value as identified by Diller & Kaserer (2009) and Gompers & Lerner (2000).

The statistical model aims to assess whether private equity fund performance compared to PME in the U.S. can be predicted by U.S. GDP growth rates. To prevent the predictive power of the model to be clouded by omitted variables, and by assuming that we thoroughly understand the powers of influence on the dependent variable through literature, we need to add control variables.
By running a regression for the dependent variable excess returns of Private Equity funds over S&P 500 equivalent returns (PME) that is a product of the equation in (3).

\[ \text{ER} = \text{FundIRR} - \text{PME} \]  \hspace{1cm} (3)

on GDP Growth rates while controlling for FED policy rates and fund value (size), a concise conclusion can be reached.

The corresponding regression model will look like it is shown in equation (4).

\[ \text{ER} = b_0 + bGDP + bFED + bFundvalue \]  \hspace{1cm} (4)

With

\[ \text{ER} = \text{Private equity excess returns} \]

\[ \text{GDP} = \text{U.S. GDP growth rate} \]

\[ \text{FED} = \text{FED policy 10-year interest rates} \]

\[ \text{Fundvalue} = \text{underlying value of the private equity funds} \]

For reasons of providing a complete analysis of the statistical issue at hand, a regression without control variables will also be provided. This approach is expected to yield an extra insight into the factors that ultimately influence the performance of the funds observed in this research.

Furthermore, we will examine systematic risk in the private equity fund returns by applying CAPM and the three-factor model from Fama and French (1993).

The Capital Asset Pricing Model (Mullins, 1982) is a model that strives to determine the expected return of a certain security. The CAPM model is well known and will be used in this thesis to estimate the expected return for the portfolio of private equity funds that is underlying to this research piece.
Let $\alpha$ be the abnormal return that the markets expect our private equity funds to earn. The expected return of the underlying dataset is determined by the cost of capital according to the CAPM plus the expected abnormal return. The CAPM model is summarized in equation (5).

\[
Et[Ru - Rf] = \alpha + \beta_u(Et[Rm] - Rf)
\]  

(5)

Where $\beta_u$ is the underlying fund beta, $Et[Rm]$ is the expected return on the market, and $Rf$ is the risk-free rate. According to this model, investors are merely compensated for the systematic risk.

For the underlying fund beta, we follow Jegadeesh et al (2009) who have determined that the beta for private equity funds equals 1 when compared to the S&P 500, as is relevant in this thesis.

Since our sample consists of only American private equity funds, the S&P 500 index will be used as the market factor in this model, 10-year U.S. treasury yields will be used as the risk-free rate. To test the CAPM in this thesis, we must assume hypotheses concerning private equity alpha as flow from the academic literature in the theoretic framework. We can state that the hypotheses should be as follows:

\[
H_0: \alpha = 0
\]

\[
H_1: \alpha \neq 0
\]

After testing we find that we can find no statistically significant evidence for CAPM to hold for the underlying portfolio of private equity funds in our dataset, and therefore can reject the null-hypothesis. Obviously, this should not come as a surprise to the reader of this thesis, as we have stated repeatedly that private equity only works without f.i. complete transparency of information or broad diversification that should eliminate systematic risk. We can therefore conclude that private equity risk cannot be grasped by CAPM.

For the sake of providing a most complete estimation of expected returns, we will also include the Fama and French three-factor model. As prove n earlier in academic research, CAPM is not completely able to explain the cross-section of expected return because it implies that betas remain constant over time. As one may intuitively assume, and Jagganath and Wang (1996) have shown empirically, the risk of a firm will vary over time. Especially in the case of private equity firms this assumption holds (Jegadeesh 2009).

It was to be expected that further research would prove that betas would not be static and that more factors would be involved in evaluation risk at the security level. To further strengthen the measure of systematic risk in this thesis, we will utilize the Fama and French three-factor model to include size in the equation.
Fama and French (1993) describe their three-factor model as follows from equation (6).

\[ r = R_f + \beta_3(K_m - R_f) + b_s \times SMB + b_v \times HML + \alpha \]  

With:

- \( R_f \) = the risk-free rate
- \( K_m \) = the return of the market portfolio
- \( SMB \) = Small market capitalization Minus Big
- \( HML \) = High (book to market ratio) Minus Low

Factor returns for small and large business portfolios from Kenneth French’s website will be used. Concluding the data analysis part of this thesis, macro-economic factors GDP growth and 10-year treasury yields will be used to assess the impact of these factors on the performance on private equity.

To test whether CAPM holds when adding the size factor for our portfolio of private equity funds we conduct the same alpha analysis as we have done in the CAPM model. After testing in the Fama and French model we find that alpha is not zero for the underlying private equity portfolio even when adding the SMB and HML size factors to the CAPM model. Estimation results for the Fama and French three-factor model are included in this thesis in the appendix under

Results of the general linear model in this analysis will be provided under the results paragraph of this chapter.

3.2. Data

Given the fact that the research question is twofold, the data originates from multiple sources. To obtain significant amounts of data, the chosen period of examination is 1990-2010. This particular period implies significant differences relative to the types of data. Private equity fund returns are examined with fund vintage years ranging from 1990 to 2000, since private equity funds have a usual life span of 10 years. Obviously, non-liquidated (still active) funds, or funds that were not fully funded to start with are excluded from the sample. This is done to prevent results to be clouded by incomplete data or extreme outliers in
terms of life span. An unwanted effect of leaving these observations out of the data is that the results will be biased toward successfully funded an exited fund, expectedly leading to a less than perfect predicting power for the empirical research (Gottschalg et al. 2003). As mentioned earlier, the data that will be examined will be focused on the American private equity market. This implies that private equity fund returns will be compared to stock returns on the American stock market. As the benchmark for stock returns, the S&P 500 index is chosen. To arrive at the most consistent result, the data for this index is on a total return basis (including dividends). The data for the total return of the S&P 500 was extracted from the database provide by Kenneth R. French. Also, factor data for use in the models provided to examine systematic risk was derived from Kenneth R. French’s database.

The position in the business cycle will be examined by means of GDP growth rates and credit spread data. Business cycle related data are derived from the FactSet economic databases. This data includes GDP growth data in the United States over the time span.

Data on private equity funds was obtained from the Preqin private equity intelligence database. Albeit that business cycles data is rather straightforward and does not need additional explanation, the same does not hold for private equity data. The characteristics of private equity investments demand a different approach. Given the fact that the theoretical framework indicates that the optimal performance measure for private equity funds is the Internal Rate of Return (IRR), data should be compiled accordingly. Since IRR is calculated by taking investment exits into account, the funds in the database should be entirely liquidated. This leaves 770 observations of completely liquidated private equity fund performance in the aforementioned time frame. An extra benefit of this approach is the fact that accounting valuation of ongoing investments is not a disturbing factor in the database.
3.2.1. Visual Representation of the Data

In this thesis, the choice has been made to identify the different variables in the dataset by making graphical representations of the values of the variables over time. In the light of the theoretic framework on which this thesis is built, one will see that pieces of the scientific evidence are also noticeable in the data. Obviously, basic descriptive statistics are an evenly important part of getting to know the data, and are also provided.

In this thesis, several publications have been named that provide evidence of factors influencing the performance of private equity funds. Evidence was presented that declining FED policy rates have a positive effect on fund value, and fund value correlates negatively with private equity fund performance, because of the so called “money chasing deals” phenomenon (Gompers & Lerner 2000). In the light of, amongst others, the presentation of these findings, it is advisable to look at the data used in this thesis in a graphical manner. The reader is encouraged to look at the different pillars as an interconnected scheme. It is beyond the scope of this thesis to attempt to arrive at the conclusions drawn in literature of the theoretical framework, but it is important to keep in mind that the variables presented in this dataset are without exception related to the performance of private equity funds. When closely looking at the charts one can tell in which direction the data is pointing, and as such where the findings are supposedly going to lie.

Chart 1 visualizes the fluctuation over time of U.S. GDP growth rates on an annual basis. As mentioned, in this thesis the position in the business cycle will be represented by these growth rates. Easily identifiable in this chart are the burst of the dotcom bubble and the financial crisis in 2009, which account for the greatest economic turmoil in the period under review.
Chart 2 visualizes the 10-year FED policy rate. As we have seen in presented literature, the decline of this rate has a significant positive correlation with mean fund values, thus sparking the “money chasing deals” phenomenon that has proven to be present in the earlier years of private equity in the U.S. (Gompers & Lerner 2000).
Chart 3 visualizes the number of private equity funds starting in a given vintage year. Literature has found evidence for a negative correlation between policy rates and mean fund values, but also states that when costs of financing new funds are lower, the incentive to start a new fund is obviously higher.

Chart 4, in combination with chart 2 visualizes the fact that mean fund value growth sparked by declining policy rates is, at least visually, real in this dataset.
Chart 5 visualizes Private Equity fund IRR of the funds in the dataset. It also presents a simple visual presentation of the fluctuation over time of the dependent variable in this thesis.
3.3. Descriptive statistics

The visual representation of the data as shown above provide the reader with an idea of what to look for in the results, and to better grasp the practical relevance of the data in the dataset subject to this research. To further complete the insight into the nature of the data, descriptive statistics will hereby be provided. One will observe that the dataset at hand is quite extensive. Furthermore, note that the data in this dataset also inevitably shows the mature nature of the private equity market in the U.S., when the frequency distribution is examined. A skewedness to the years in the late 90s is also observable.

*Table 1: Frequency distribution of observations per Vintage Year*

<table>
<thead>
<tr>
<th>Vintage Year</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>41</td>
<td>5,3</td>
<td>5,3</td>
<td>5,3</td>
</tr>
<tr>
<td>1991</td>
<td>21</td>
<td>2,7</td>
<td>2,7</td>
<td>8,1</td>
</tr>
<tr>
<td>1992</td>
<td>46</td>
<td>6,0</td>
<td>6,0</td>
<td>14,0</td>
</tr>
<tr>
<td>1993</td>
<td>57</td>
<td>7,4</td>
<td>7,4</td>
<td>21,4</td>
</tr>
<tr>
<td>1994</td>
<td>68</td>
<td>8,8</td>
<td>8,8</td>
<td>30,3</td>
</tr>
<tr>
<td>1995</td>
<td>81</td>
<td>10,5</td>
<td>10,5</td>
<td>40,8</td>
</tr>
<tr>
<td>1996</td>
<td>89</td>
<td>11,6</td>
<td>11,6</td>
<td>52,3</td>
</tr>
<tr>
<td>1997</td>
<td>95</td>
<td>12,3</td>
<td>12,3</td>
<td>64,7</td>
</tr>
<tr>
<td>1998</td>
<td>113</td>
<td>14,7</td>
<td>14,7</td>
<td>79,4</td>
</tr>
<tr>
<td>1999</td>
<td>82</td>
<td>10,6</td>
<td>10,6</td>
<td>90,0</td>
</tr>
<tr>
<td>2000</td>
<td>77</td>
<td>10,0</td>
<td>10,0</td>
<td>100,0</td>
</tr>
<tr>
<td>Total</td>
<td>770</td>
<td>100,0</td>
<td>100,0</td>
<td></td>
</tr>
</tbody>
</table>
Table 2: Descriptive Statistics for dependent and independent variables

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Fund IRR</td>
<td>770</td>
<td>-96,0</td>
<td>123,0</td>
<td>17,39</td>
<td>23,04</td>
</tr>
<tr>
<td>Fund Value</td>
<td>770</td>
<td>1,0</td>
<td>982,0</td>
<td>194,35</td>
<td>202,82</td>
</tr>
<tr>
<td>S&amp;P500 Total Annual</td>
<td>770</td>
<td>-7,44</td>
<td>34,40</td>
<td>17,41</td>
<td>14,15</td>
</tr>
<tr>
<td>Return</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>USA Annual GDP Growth</td>
<td>770</td>
<td>-0,07</td>
<td>4,69</td>
<td>3,71</td>
<td>1,008</td>
</tr>
<tr>
<td>10-year Treasury</td>
<td>770</td>
<td>4,72</td>
<td>8,21</td>
<td>6,33</td>
<td>0,99</td>
</tr>
<tr>
<td>Abnormal Returns</td>
<td>770</td>
<td>-93,65</td>
<td>116,61</td>
<td>11,55</td>
<td>22,26</td>
</tr>
<tr>
<td>Valid N</td>
<td>770</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.5. Results

In this paragraph the empirical research is continued by means of presenting results for the general regression model. In the earlier chapters of this empirical section we have identified that CAPM and the Fama & French 3-factor model have shown to have no predictive power over the returns of the underlying private equity portfolio in our dataset. As mentioned in the methodology section of this thesis, regression results will be provided both including and excluding control variables, to provide the reader with the most complete image of the problem. Returning throughout this thesis have been the control variables that eventually are to be found in the regression model. Both fund value and FED policy 10-year rates have found their way into academic literature surrounding this subject. Jegadeesh et al. (2009) and Gompers and Lerner (2000) have proven statistically significant explanatory power of the two control variables over private equity returns. It therefore follows logically from this literature and many other related pieces of research that these two control variables should be part of the equation. The model central in this data analysis is, as it originates naturally from both the academic literature presented in this thesis and the research design in this chapter as follows under equation (7).

\[ ER = b0 + bGDP + bFED + bFundvalue \] (7)

With

\[ ER = \text{Private equity excess returns} \]
\[ GDP = \text{U.S. GDP growth rate} \]
\[ FED = \text{FED policy 10-year interest rates} \]
\[ Fundvalue = \text{underlying value of the private equity funds} \]

And

\[ ER = FundIRR - PME \] (8)

In the practical execution of the empirical research, hierarchical multiple regression was used to assess the ability of the GDP growth rates in the model to predict excess returns of private equity funds, while controlling for policy rate levels and fund size. Fund size and policy rate variables were entered in step 1, explaining only 1.4% of the variance in Abnormal Returns. After entry of GDP growth rates, only 1% of the variance in Abnormal Returns of private equity funds was explained by the model. The two control
measures accounted for most the predictive value of the variance in Abnormal Returns. In the final model, none of the two control variables fund size and interest rates have proven to be statistically significant.

Table 1 shows the results of the model as mentioned under methodology and above. The model has proven to have weak explanatory power as is to be seen in the R Squared levels, while not showing significant results for every variable.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Change Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: 10-year treasury rates &amp; Fund Size</td>
<td>.118(^a)</td>
<td>0.014</td>
<td>0.011</td>
<td>0.014</td>
</tr>
<tr>
<td>2: GDP Growth, Fund Size and 10-year treasury rates</td>
<td>.119(^b)</td>
<td>0.014</td>
<td>0.010</td>
<td>0.000</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Fund Value, 10 Year Treasury Rates
b. Predictors: (Constant), Fund Value, 10 yr. Treasury, USA Annual GDP Growth
c. Dependent Variable: Excess Returns

Furthermore, table 2 shows B estimates for the model at hand. There are several conclusions to be drawn from this table. It shows that several assumptions made beforehand will not hold, and some will. We can see in the matrix that the assumption holds that treasury rates have a positive effect on private equity excess returns, which in fact is right when placed in the light of the “Money Chasing deals” phenomenon as introduced by Gompers & Lerner (2000), be it the inverse of this effect.

We can also see that the relationship between private equity excess returns and GDP growth is in fact negative, although not statistically significant. This can be a justified result when keeping in mind that GDP growth has a positive correlation with 10-year interest rates, as can be seen in the correlation matrix of the variables in this model, which is presented in the appendix under (1). Interest rates in turn have a negative correlation with fund size, spurring the already infamous “Money chasing deals” phenomenon mentioned before.
Table 2: Coefficients

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t-statistics</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>2 (Constant)</td>
<td>10.108</td>
<td>12.020</td>
<td>.841</td>
<td>.401</td>
</tr>
<tr>
<td>10 year treasury rates</td>
<td>.871</td>
<td>1.262</td>
<td>.039</td>
<td>.690</td>
</tr>
<tr>
<td>USA GDP Growth</td>
<td>-.558</td>
<td>1.247</td>
<td>-.025</td>
<td>-.448</td>
</tr>
<tr>
<td>Fund Size</td>
<td>-.010</td>
<td>.004</td>
<td>-.094</td>
<td>-2.581</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Excess Returns

Although these tables only include abstract data, the underlying meaning of the numbers at hand is of great importance. The interrelatedness between the variables GDP growth, 10-year treasury rates and fund size is the crux of this thesis. It is the fact that these variables are correlated that spurs the intuition that private equity performance cannot be the safe haven it is expected to be.

However, as the groundwork for this analysis was laid out in the theoretical framework and in the empirical theory presented in the chapter, one could expect results to go either way. There is almost as much empirical evidence for private equity being the safe haven that this thesis expects it to be, as there is for the opposite to be true. We have identified several empirical publications in the research design chapter that state that private equity actually has a market beta of close to 1 (Jegadeesh et al. 2009), hereby immediately eliminating the initial expectation, supported by the interrelatedness of the variables mentioned before. However, results of the model in this thesis were yet to be presented and as such a preliminary conclusion was not drawn. We can however arrive at a conclusion derived from the data presented in this chapter, although weak.

As we see in the regression results above, and as was to be expected in the results we have shown for the CAPM and Fama French 3-factor model, we find no statistically significant explanatory power for excess returns in the variables presented in this model.

The result of this thesis therefore implies that the research question at hand cannot be positively answered. That said, the empirical research has shown that the model presented in this paper has low (1.4%) predictive power over the excess returns of private equity funds in the U.S.. When drawing conclusions from this model we should therefore keep in mind that correlations among presented variables are present but
weak and still leave a big chunk of the variance in private equity fund performance unexplained. Given the fact that significantly explanatory models have yet to be introduced, this leaves challenging opportunities for future research.
Chapter 4: Conclusion

4.1 Main Findings

In this paragraph, answers to the main question at hand will be provided. The main research question sounds as follows:

“Is U.S. small – and mid cap private equity investment performance influenced by the business cycle?”

While laying out the theoretical framework in this study, several nuances have been made to this research question. This particularly implies that the answer to the research question must be viewed from the perspective of an investor in both private equity and liquid paper assets such as stocks. In accordance with the evidence provided in the theoretical framework this research finds no evidence of business cycles to be of significant contrary influence to private equity performance when measured by GDP growth rate data. No significant relation is traceable between Private Equity fund returns and the business cycle, meaning as much as the absence of predictive power of the business cycle. For portfolio management in the investment industry to work, investors need evidence of clear and significant links between asset classes in different business cycle times. The empirical research in this paper has not succeeded in providing such a concrete result that satisfies this need.

Traces, however, are found regarding the influence of FED policy rates on private equity fund size. Lowering interest rates has a correlation with private equity fund size although very limited, thus implying rising valuations for acquired holding companies. This evidence provides ground, although not too firmly, for the assumption of the earlier identified phenomenon “money chasing deals”, as identified by Gompers & Lerner (2000) and Diller & Kaserer (2009).

Subject to limitations implied in the research design and the available data, the conclusion can therefore be made that an investor with a desire for steady performance through the business cycle and desire to abstain from market influences on performance, will not find satisfaction in the U.S. private equity market. The underlying portfolio of private equity funds in the dataset central to this thesis, does not possess the characteristics of a portfolio immune to market movements or the business cycle. The conclusion to be drawn should be: there is no statistically significant evidence for private equity fund performance being immune to macroeconomic cycles. Interrelatedness of GDP growth and interest rates prevents this for the larger part.
4.2 Discussion

Although the research in this paper produces results that seem intuitively correct, when the direction of findings is concerned, findings will not be generally applicable. When placed in the light of the earlier academic work presented, it is by all means far-fetched to assume the findings hold for different geographic areas. GDP growth has proven not to be a significant predictor for private equity fund performance, but has its influence on performance by all means. Intuitively, through basic understanding of economic principles, one can feel that declining GDP growth will lead to declining policy rates, which will lead to increasing fund size and by that in some cases to the “money chasing deals” phenomenon. As has been stated time after time by well-known scholars such as f.i. Fama and Gibbons (1982) and Merton (1974), securities are priced in accordance with the current policy rates. Moreover, amongst others Barro (1991) states that when savings are not as rewarding when policy rates are low, consumers and investors tend to move into more risky assets such as stock and bonds, and ultimately private equity. That does not mean however that we can predict the outcome of the effect on each individual private equity fund, but it goes without saying that there is a degree of logic in the economic principles stated above.

It is a too far-fetched statement to make that the performance of private equity and the statistical model that is provided in this thesis prove a solid link between GDP growth rates, policy interest rates and private equity fund performance. This paper does, however, provide a good starting point for future research, as it builds on formerly effective empirical models, and touches upon an interesting divide in academic literature: whether private equity can be market-immune or not. The next section will show that there are ample directions to choose for future research when considering the thought process at the basis of this paper.

4.3 Limitations & Future Research

With every academic research comes the inevitable observation that there is a lot of room left for further exploration. This is obviously not a bad thing, as findings in every research can point in a new direction that may be of interest to academics. This is not different in this thesis.

This research piece has provided insight into the private equity industry in the U.S., has explored factors of influence on the performance of private equity funds, but most importantly sheds light on the question whether an investment in private equity ultimately makes sense. Statistical correlations, although weak, were found for several statements made in literature, but limitations were also encountered.
Among these limitations are amongst others the nature of the dataset used and the geographical limit that was set while collecting the data. Obviously, the concentration on U.S. private equity forbids us to assume that the findings are also applicable to markets such as the European private equity market. However, a logical choice for reasons of maturity, the choice does imply limitations. The collected data also implies a significant limitation because of its characteristics. The fact that in this thesis the data available was not detailed up to the level of holding companies implies limitations concerning real time valuations over time. Of course it is worth considering whether this kind of data is available in the first place. Private equity funds tend to report performance every quarter, half year or annually, and real time valuation is often highly sensitive and confidential information.

Although limitations can be identified in the data, interesting topics for further research are always identifiable. Future research opportunities can be divided according to the three pillars of this research.

In the field of business cycle research, this academic piece gives way to further research into the effects on GDP growth on several financial assets. This is obviously an aspect of academic finance that has been well researched. However, it is the opinion of the writer that further research needs to be conducted to arrive at a consistent answer to the question of how to invest properly through business cycle stages. In the light of the findings in this thesis the conclusion can be drawn that no such financial asset is available as of yet, and further academic research is the sole solution for this issue.

Regarding private equity, the potential research directions are very promising, as data is not always readily available. Private equity as an investment class has not been around for nearly as long as the regular paper asset classes, so there is plenty of exploration left to do. Making an ending extension to the findings and literature in this thesis, it would be advisable to dig deeper into abnormal returns related to valuations of portfolio companies. Not only this thesis has run into limitations when it comes to the available data at a deeper level. This data will be able to contribute strongly to any future research, which could turn out to be especially useful in times when policy rates are at unprecedented levels and the financial world finds itself in unknown territory.

As a whole the conclusion can be drawn that there is ample room for research still to be conducted in the fields upon which this thesis touches. The main recommendation to be given here is to dig deeper into the data, especially when it comes to evaluating relations between private equity returns and general investment theory.
In the introduction chapter of this thesis, the statement was made that the aim of this thesis is twofold. Within this paper lies not only the ambition to arrive at a concise empirical analysis of private equity performance. A second goal is to take the reader on a trip through private equity theory and practice, and less thoroughly touch upon the other pillars in this thesis, in order to show that there is more to private equity than just the greed that makes headline news. Therefore, I expect that the insights gained in this thesis will help to reshape the image of the industry, and just view private equity as just one asset class like any other.

4.4. Implications for the Image of Private Equity

As we have stated repeatedly in this thesis, this research also aimed to shed more light on the benefits and social consequences of private equity. The empirical research in this thesis is designed to test the private equity performance during times of economic downturn and to assess whether private equity performance holds up in times when the broader market is ailing. As we have seen in the rest of the concluding remarks in this chapter, the evidence provided by this research is not decisive as to whether this hypothesis holds up. Furthermore, the dataset used in this thesis lacks the job production and productivity data to be able to derive a conclusive answer. We can therefore state that the results presented in this thesis are not sufficient to contribute to a general rejection of the image of private equity as a job destroyer. Future research may be able to provide a statistically robust foundation to this rejection when data for job production, productivity and social consequences is included. As such, earlier research by Davis et al. (2014) provides a great insight into the effects of leveraged buyouts on society. In the future, research can build on this to either confirm the negative image or reject it. Concluding this thesis we can however say that private equity fund performance seems to hold up when the broader market is going down, indicating but not proving that jobs are preserved. As mentioned, there is however still ample room for further research.
References


*MSc. Thesis: Private Equity in the U.S.*


Appendix: Descriptive statistics attachments

(1) Correlation matrix

As an extra feature to show the relations between the different variables, hereby the correlation matrix for the variables at hand is attached. Although abundant for regular analysis, an extra insight into the nature of the problem.

<table>
<thead>
<tr>
<th></th>
<th>Net IRR</th>
<th>Fund Value</th>
<th>USA GDP growth (annual %)</th>
<th>10 yr Treasury</th>
<th>S&amp;P 500 Total return</th>
<th>Abnormal Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net IRR</td>
<td>Pearson Correlation</td>
<td>1</td>
<td>-.129**</td>
<td>-.155</td>
<td>.225**</td>
<td>-.051</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.450</td>
<td>.000</td>
<td>.154</td>
<td>.000</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>770</td>
<td>770</td>
<td>26</td>
<td>770</td>
<td>770</td>
</tr>
<tr>
<td>Fund Value</td>
<td>Pearson Correlation</td>
<td>-.129**</td>
<td>1</td>
<td>.215</td>
<td>-.156**</td>
<td>.069</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.291</td>
<td>.000</td>
<td>.055</td>
<td>.004</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>770</td>
<td>770</td>
<td>26</td>
<td>770</td>
<td>770</td>
</tr>
<tr>
<td>USA GDP growth (annual %)</td>
<td>Pearson Correlation</td>
<td>-.155</td>
<td>.215</td>
<td>1</td>
<td>-.410*</td>
<td>-.155</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.450</td>
<td>.291</td>
<td>.000</td>
<td>.038</td>
<td>.450</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>10 yr Treasury (Rf)</td>
<td>Pearson Correlation</td>
<td>.225**</td>
<td>-.156**</td>
<td>.b</td>
<td>1</td>
<td>-.035</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.000</td>
<td>.000</td>
<td>.331</td>
<td>.042</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>770</td>
<td>770</td>
<td>26</td>
<td>770</td>
<td>770</td>
</tr>
<tr>
<td>S&amp;P Total return</td>
<td>Pearson Correlation</td>
<td>-.051</td>
<td>.069</td>
<td>-.410*</td>
<td>-.035</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.154</td>
<td>.055</td>
<td>.038</td>
<td>.331</td>
<td>.006</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>770</td>
<td>770</td>
<td>26</td>
<td>770</td>
<td>770</td>
</tr>
<tr>
<td>Abnormal Returns</td>
<td>Pearson Correlation</td>
<td>.973**</td>
<td>-.103**</td>
<td>-.155</td>
<td>.073*</td>
<td>-.099**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td></td>
<td>.000</td>
<td>.004</td>
<td>.450</td>
<td>.042</td>
<td>.006</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>770</td>
<td>770</td>
<td>26</td>
<td>770</td>
<td>770</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
b. Cannot be computed because at least one of the variables is constant.
(2) Normality Tests

Attached here are the normality tests for the dependent variable abnormal returns. Essential for the statistical significance of the research model, but abundant for a concise answer to the empirical research questions.

![Histogram of Abnormal Returns](image)

- Mean = 11.55
- Std. Dev. = 22.258
- N = 770
(3) Cumulative abnormal returns per fund life span

<table>
<thead>
<tr>
<th>Fund Lifespan</th>
<th>CAAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990-2000</td>
<td>7,207</td>
</tr>
<tr>
<td>1991-2001</td>
<td>12,802</td>
</tr>
<tr>
<td>1992-2002</td>
<td>14,442</td>
</tr>
<tr>
<td>1993-2003</td>
<td>22,942</td>
</tr>
<tr>
<td>1994-2004</td>
<td>14,726</td>
</tr>
<tr>
<td>1995-2005</td>
<td>11,897</td>
</tr>
<tr>
<td>1996-2006</td>
<td>9,890</td>
</tr>
<tr>
<td>1997-2007</td>
<td>12,960</td>
</tr>
<tr>
<td>1998-2008</td>
<td>3,408</td>
</tr>
<tr>
<td>1999-2009</td>
<td>8,071</td>
</tr>
<tr>
<td>2000-2010</td>
<td>16,024</td>
</tr>
</tbody>
</table>

(4) Long-Nickels PME per vintage year

<table>
<thead>
<tr>
<th>Vintage Year</th>
<th>Long-Nickels PME</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>15,41</td>
</tr>
<tr>
<td>1991</td>
<td>15,16</td>
</tr>
<tr>
<td>1992</td>
<td>10,61</td>
</tr>
<tr>
<td>1993</td>
<td>7,49</td>
</tr>
<tr>
<td>1994</td>
<td>9,12</td>
</tr>
<tr>
<td>1995</td>
<td>9,77</td>
</tr>
<tr>
<td>1996</td>
<td>7,6</td>
</tr>
<tr>
<td>1997</td>
<td>6,39</td>
</tr>
<tr>
<td>1998</td>
<td>3,65</td>
</tr>
<tr>
<td>1999</td>
<td>-3,6</td>
</tr>
<tr>
<td>2000</td>
<td>-2,35</td>
</tr>
</tbody>
</table>

(5) The Performance of Private equity in the CAPM model

(6) The Performance of Private Equity in the Fama and French three-factor model