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# **Private equity alpha and the capital market cycle**

Evidence on deal-level industry performance in Europe

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**ABSTRACT:**

Previous studies have demonstrated the outperformance of private equity funds compared to the public market benchmarks. Private equity has been found to generate positive alpha of even 12.6 % per annum, but discussion on the existence of outperformance continues as the measurement of non-liquid and liquid assets needs adjustments. Various methodologies have been introduced to calculate market-adjusted returns with similar implications, especially for recession periods. Still, European private equity performance behavior has been investigated very little in the past with industry specifications.

This thesis focuses on the private equity alpha on European leveraged-buyout transactions covering investments made between 2004 and 2012. Using a large deal-level dataset, the purpose of this study is to find evidence on private equity alpha in different stages of the economic cycle and to understand how different industries create market-adjusted returns relative to each other. Also, the findings of this paper are used to analyze if private equity sectors can perform over the private equity average. To calculate the performance, this paper uses two variables with different approaches from the previous literature: KS-PME and direct alpha. In addition, to be able to understand the basis of private equity performance, ratios and multiples for operational improvements are presented.

The results indicate that private equity outperforms stock market returns in every stage of the capital market cycle with KS-PME and direct alpha measures. Alpha seems to be highest before the recession and at the time of financial crisis with declining performance in next cycle phases, suggesting that private equity can create excessive returns on times of the biggest capital market uncertainty. When focusing on sectors classified by Global Industry Classification Standards, health care, consumer discretionary and industrials can also outperform the industry specified stock market indices persistently. The health care sector can generate excess returns over the private equity average. Consumer staple is the only sector in this dataset underperforming public market equivalent from the years 2007 to 2012.

Private equity firms can increase selling multiples during holding periods only in a smaller sample suggesting controversial results on this matter. This can be partly explained with high debt and leverage measures in the full sample. On contrary, absolute return metrics showed strong average returns on both samples supporting the performance results. To conclude, private equity performance seems to be dependent on the cash flows and the timing of those cash flows.

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**Keywords:** Private equity, leveraged buyouts, alpha, cyclicity, sector

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**Tiivistelmä:**

Aikaisemmat tutkimukset ovat osoittaneet yksityisten pääomarahastojen tuottavan paremmin julkisiin markkinoihin verrattuna. Vaikka pääomarahastojen kannattavuus voi tutkimuksien pohjalta ylittää jopa 12,6 % vuosittaisiin ylituottoihin vertailuindekseihin nähden, keskustelu näiden kahden omaisuuserän likviditeettieroista ja vaadittavista oikaisuksista on ajankohtainen. Monia laskentamenetelmiä on kehitetty mittaamaan markkinakorjattuja tuottoja hyödyntäen lähes vastaavia tekniikoita, ja varsinkin taantuma-ajat ovat olleet pääomarahastojen tuottotutkimusten keskiössä. Kuitenkin pääomarahastojen kannattavuutta ja käyttäytymistä sektoritasolla on tutkittu aikaisemmin hyvin vähän.

Tämä työ keskittyy eurooppalaisten pääomarahastojen tuottavuuteen julkisiin indekseihin verrattuna hyödyntäen transaktiotason sijoituksia aikaväliltä 2004–2012. Tämän tutkimuksen tarkoituksena on löytää todisteita pääomarahastojen ylituotoista eri julkisen talouden kiertokulun vaiheissa ja luoda ymmärrystä siihen, kuinka eri sektorit suoriutuvat toisiinsa nähden. Sektorikohtaisia tuloksia pyritään vertaamaan myös yksityisten pääomamarkkinoiden keskiarvoon löytääksemme kannattavimmat sektorit. Tehokkuuden mittaamiseen käytetään kahta laskentamenetelmää: KS-PME ja direct alpha, jotka tarjoavat erilaiset tuottavuusmittarit. Operatiivisen kannattavuuden tunnusluvut esitetään alkuun, jotta perusymmärrys pääomarahastojen toiminnasta tulee ilmi.

Tulokset osoittavat, että pääomarahastot pystyvät luomaan julkisia vertailuindeksejä korkeampia tuottoja jokaisessa talouden kiertokulun vaiheessa pohjautuen molempiin laskentamenetelmiin. Ylituotot vaikuttavat olevan korkeimmillaan juuri ennen taantumaa ja taantumana aikana laskien niitä seuraavissa ajanjaksoissa lähestyen lopulta kohti julkisten markkinoiden tuottoa. Pääomarahastot näyttävät tuottavan parhaiten silloin, kun julkisten markkinoiden epävarmuus on korkeimmillaan. Sektoreista terveydenhuolto, liikepalvelut ja teollisuus pystyvät myös suoriutumaan vertailuindeksejä paremmin. Ainoastaan terveydenhuoltosektori pystyi tuottamaan pääomarahastojen keskiarvoa parempia tuottoja. Edellisistä poikkeavasti päivittäistavarasektori alisuoriutui vertailuindeksiin nähden vuodesta 2007 vuoteen 2012.

Pääomayritykset näyttävät kykenevän parantamaan toimintojaan rahastossa oloaikana kasvat- taen kannattavuuslukuja pienemmässä otoksessa. Tämä selittyy osin korkeilla velka-asteilla suu- remmassa otoksessa vaikuttaen tuloksiin. Yritysten yksittäisiä tuottoja mittaavat tunnusluvut kui- tenkin osoittavat kummassakin otoksessa positiivisia tuloksia tukien päätutkimuksen johtopää- töksiä. Yksityisten pääomarahastojen tuottavuus vertailuindekseihin nähden vaikuttaisi riippu- van kassavirroista ja niiden ajoituksista.

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**AVAINSANAT:** Yksityinen pääoma, velalliset yritysostot, ylituotto, syklisyys, sektorit

## **Preface**

The research work presented in this thesis was carried out in the School of Accounting and Finance at the University of Vaasa from June 2020 to October 2020.

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## Abbreviations

ASMR	Adjusted stock market return
AUM	Assets under management
BO	Buyout
CBO	Corporate buyout
CF	Cash flow
DCF	Discounted cash flow
DVPI	Distributed value to paid-in
EBIT	Earnings before interest and taxes
EBITDA	Earnings before interest, taxes, depreciation, and amortization
EBO	Employee buyout
ECB	European Central Bank
ETF	Exchange traded fund
EV	Enterprise value
FBO	Family buyout
FOF	Fund of funds
GDP	Gross domestic product
GE	Growth equity
GICS	Global Industry Specification Standard
GP	General partner
IBO	Institutional buyout
IPO	Initial public offering
IRR	Internal rate of return
KS-PME	Kaplan and Schoar public market equivalent
LBO	Leveraged buyout
LP	Limited partner
MBI	Management buy-in
MBO	Management buyout
M-IRR	Modified internal rate of return

MSCI	Morgan Stanley Capital International
NAV	Net asset value
NPV	Net present value
PE	Private equity
PME	Public market equivalent
RVPI	Residual value to paid-in
S&P	Standard and Poor's
SDPR	Standard and Poor's Depository Receipt
SPY	SDPR S&P 500 ETF Trust
Std. Dev.	Standard deviation
TM	Times money
TVPI	Total value to paid-in
VC	Venture capital

## 1. Introduction

Private equity has been gaining interest in the last decades for its profitable exits and increased capital commitments by the investors. At the end of the previous cycle, private equity and leveraged buyouts, LBO's, had become a noticeable asset class providing noticeable profits for investors and general partners. The financial crisis of 2008-2009 made private equity firms to enhance efficiency, lower costs, and reconsider capital management. Afterward, the question about private equity's outperformance over the public markets rose to the center of the research.

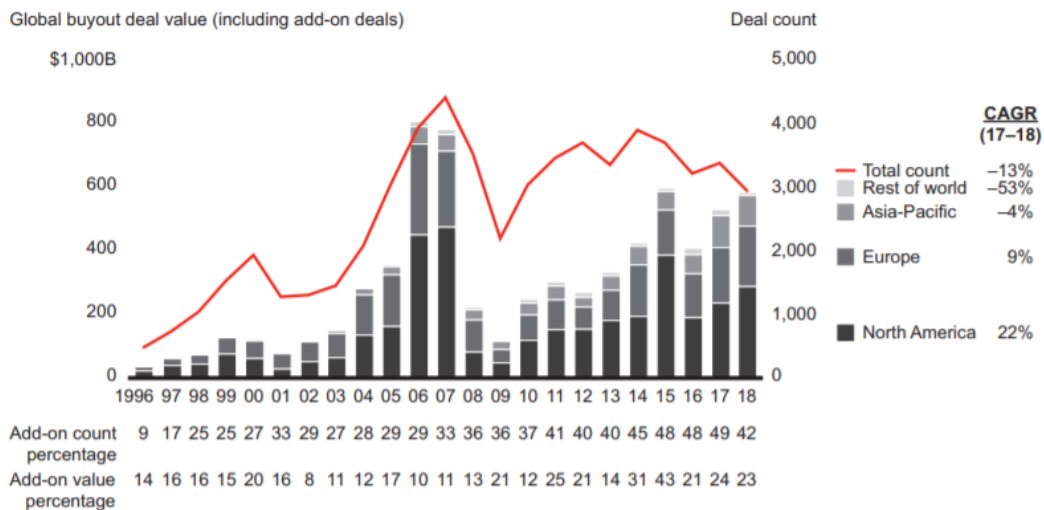
According to Stowell (2010, pp. 364), the public market in the U.S. lost 38.5 % more than private equity in 2008, when using the S&P 500 index as a public market measure. Golding Capital Partners & Gottschalg (2014) find that private equity outperforms public markets throughout the cycle. Private equity fund managers can generate 8.6 % alpha over stock market returns with transactions and show stable growth in crisis. Harris et. al (2014, pp. 1880) conclude that buyout funds outperformed public markets over 3 % per year in the 1980s, 1990s, and 2000s. Still, there is a lot to study when it comes to private equity sectors and cycle performance.

What can be found when comparing different private equity sectors and industries with different valuation factors? Does the private equity cycle affect the sector performance? Are there superior sectors or underachievers when studying private equity and public markets in Europe? Is private equity 'alpha' throughout the cycle when using different datasets?

GP's with strong results in public market equivalent (PME) and internal rate of return (IRR) is strongly correlated to future ability to raise funds and these measures are persistent with performance rather than risk factors. Evidence also shows that funds and partnerships created in boom times are less likely to succeed or raise follow-on funds. Kaplan & Schoar (2005, pp. 1821) suggest that boom funds perform seemingly worse. There are also noticeable differences in fund returns when comparing the best performing and

worst performing private equity funds, the gap exceeding 7 percentage points annually. Korteweg & Sortensen (2017, pp. 555) also point out that only 53-61 % of top quartile performing PE firms can continue to generate new top quartile performing funds in the future.

The financial crisis made private equity debt expensive, making funds access to leverage restricted. Buyout deals infused equity with more contribution and the fund size decreased readjusting firms focus on carveouts and sales of non-core assets in the international emerging markets. Eventually, fundraising came to a point in 2009, where new funds raised less than 40 % from the level year before. (Talmor et. al, 2011, pp. 7-8)



**Figure 1.** Buyout deal values and count (Bain & Company, 2019).

Figure 1 shows rising buyout deal value internationally after the financial crisis 2008-2009 capping the strongest five-year stretch in the private equity history. Still, the deal count shows the slowed progression around the world as a result of increased competition and more expensive asset prices. The current investment cycle has shown perseverance and strength and shown results for GP’s manner with unseen investor interest because of low interest rates, steady GDP growth, and weakened equity markets. (Bain & Company, 2019)

## 1.1 Objective and research questions

The main objective of this study is to compare private equity industries and sectors to each other in the leveraged buyout business before the financial crisis 2004-2006, in the crisis 2007-2009, and after the crisis 2010-2012. Industries selected in this study are from Global Industry Specification Standards (GICS): health care, consumer staples, industrials, and consumer discretionary. These industries present different economic cycles and GDP levels with varying performance behaviors and the available data offered the largest sample for the research. To understand the performance of private equity, we use public markets as a benchmark to see if outperformance exists in the public versus private markets in Europe.

In this study, we want to shed light on questions like how PE funds generate growth and profit? How different business models affect the performance if we use equity value, valuation multiples, revenues, margins, net debt, and enterprise value? Is private equity outperforming public equities in this dataset and is there a difference between the different stages of the cycle? And are different sectors/business models different vis-à-vis their outperformance in different stages of the cycle or is private equity 'alpha' consistent across the industries?

This study focuses on two main hypotheses, which are:

1. *Private equity outperforms public equities in this dataset and there is a positive correlation between different stages of the cycle.*
2. *Private equity is 'alpha' consistently across the GICS industries.*

We assume in the line with previous researches and especially paper done by Golding Capital Partners and Gottschalg (2014), that private equity is dominant in performance factors. Past and future performance is positively linked to each other over the different

cycles. Private equity will outperform public markets consistently across different industries and sectors.

## **1.2. Structure**

This thesis is divided into five chapters. First, the introduction to the paper and its main purpose will be demonstrated. Second, the theoretical section will follow explaining private equity with an operational approach first, focusing on private equity funds and private equity financing alongside the current situation in Europe. After that, the complex private equity capital structure will be explained thoroughly. One of the main hypotheses in this paper involves concepts like PE cycle and deal-level performance drivers which will end theoretical chapter to prepare the reader for the empirical part. This section will introduce the main performance drivers, which we will use later in this research.

Data and methodology will be explained in chapter three. First, the data description will be introduced before going into variables demonstrating the upcoming calculations. Assumptions are made regarding the variables when considering the possible outcome of this thesis. Lastly, methods of studying performance drivers between private and public markets and defining the 'alpha' will be introduced.

Chapter four will show the results of this study as chapter five focuses on conclusions and future implications/suggestions. The thesis will firstly explain the findings regarding deal-level performance between the private and public markets before revealing the outcome of the study considering alpha consistent. Sector-level results will also be demonstrated and concluded to understand the behavior of GP's in market uncertainties.

### **1.3. Scope**

This paper will focus on buyout investments and especially leveraged buyouts (LBO's) in European markets. The separation between buyout investments and venture capital investments will be done whenever possible, whether it's regarding theory or data selection. Data will be used in a way that defined PE sectors will be sorted out as efficient way as possible to be able to make conclusions of the behaviors. This paper will focus on small-and mid-cap buyout investments due to the used transaction data and market focus of the fund of funds offering the data.

## **2. Literature review**

### **2.1. Private equity financing**

Private equity investors are financial intermediaries that invest directly in target companies with the investors' capital. PE funds also invest only in private companies, which limits companies to go public immediately after capital investment and makes GP's actively monitor and help companies in its portfolio. Private equity's most important mission is to maximize financial returns by exiting investments through a sale or other kind of offering, such as IPO.

In the 1970s the earliest growth capital funds focused on early-and-mid stage companies. In the 1980s buyout and restructuring capital emerged often using high levels of leverage and debt. Corporate private equity such as mezzanine funds and sub-asset classes which have the debt and equity side gained traction in the 1990s with investments in real estate. Ownership and control of the fund management were the main focuses on private equity in contrast to public equity. (Jenkinson et. al, 2013, pp. 4-5)

Since 2000, global buyouts net asset values have grown 3.5 times faster than the public markets and the trend is continuing with around 50 % of Limited Partners being under allocated in 2020 to PE. Over 2 trillion dollars have been invested into buyout funds in the last decade and US buyouts alone have generated average net returns of 13.1 % compared to 8.1 % public market equivalent (PME). Still, after the sub-prime crisis from 2009 onwards, public markets have matched the private equity returns. (Bain & Company, 2019, pp. 82-85)

Private equity can be separated into three institutional investment sectors, which are venture capital (VC), growth equity (GE), and buyout (BO). This thesis will be focusing on buyout funds, where control of the underlying equity will be acquired from a mature investment targets as a focus to improve profitability through reorganizing. Growth equity funds invest in growing but also maturing businesses that may have troubled

financial situation or need for expansions or operation restructures without giving up control of the company. Venture capital funds focus on start-up companies and small-sized companies that are believed to have long term growth potential. Venture capital funds have also the biggest risk as the portfolio companies may only have an idea or business model, rather than a ready product or service. Buyout funds raised 72.5 % of all private equity in Europe 2019, according to Invest Europe (2020, pp. 12). Growth equity amounted 8.3 % and venture capital 13.8 % of the private equity leaving 5.5 % to pension funds. In total, fundraising in Europe reached 109 billion euros with final closings over 97 billion euros.

Van Swaay et. al (2015) divide private equity funds phases into seven stages which are: fundraising, fund launching, deal sourcing, deal financing, value creation, exiting, and fund liquidation. Each of these stages has its important role in the success of the fund and each of these stages must be focused on. After commitments are made and financing deals are done, value must be created. Key-value comes from expected earnings and cash flows mirrored by its risk profile in its simplest sense.

Returns must be realized in the exit phase where Pignataro (2013) suggests four business exit solutions. Strategic sale includes selling the business to a buyer that can find strategic benefits from owning the fund. The financial sponsor could be another private equity firm buying the business with a focus on different aspects and trust in taking the fund to another level. In an initial public offering (IPO) the company could be sold to the public markets. Lastly, a different kind of approach comes from a way to recapitalize dividends for a fund to get access on more liquidity from business investments. In this way the debt level of the business raises, and the cash raised from it will be distributed to owners of fund management.

### 2.1.1. Issues

The assets held by the private equity funds are hard to value because of no liquid markets and this appears to affect the fund evaluations and investor commitments. This can lead to conservative valuations of overperforming GP's and boosting overconfident valuations of underperforming GP's. After the investment period ends, GP's raise new funds to continue investing when the previous investments mature. This leads to prospective LP's having to rely on the recent performance reported by GP whose incentives are to maximize the fund value. (Brown et. al, 2019, pp. 269)

Partnership agreements between GP's and LP's in the main funds are well known but the nature of these arrangements stay still unknown. Contractual terms leave questions for future researches to open not just the observation of net cash flows of the LP's but also the net payments that have gone to the GP's. (Lerner et. al, 2018, pp. 33) Another problem is the private equity data available for the public, another way called information asymmetry. Unavailability makes it hard for especially non-professional investors to evaluate private equity funds and to study PE behaviors with the provided data in the markets. Financial statement regulations differ across the continents and the non-publicly listed companies' requirements differ from the public ones.

Gregory (2013) states that buyout funds should be monitored for macroeconomic reasons. Buyouts use high levels of leverage and LP's debt that generates a risk for the financial system to be unstable. Macroeconomic monitoring should be done to prevent the unpredicted crisis with their outcomes. The use of heavy amounts of leverage and investor debt by a focus on profit-making has been also seen affecting negatively to the overall performance of the private equity firms. This can lead to employment issues and low wages when seeking maximum returns (Appelbaum & Batt, 2014).

### **2.1.2. Opportunities**

As stated above in section 2.1.1., information asymmetry plays a big role in private equity financing. However, Intertrust (2018) finds that Big Data analytics and artificial intelligence can be used to reduce this asymmetry and provide even more accurate predictions of the probability of success. These technologies can also help democratize financial sectors and the expertise differences to create a level for all investors to operate, especially in the private equity and not just in the public markets.

Buyout funds outperformance over its PME's and success in the markets come from solo direct investments rather than co-investments. Private equity firms should exploit their information advantages and especially invest in local and in settings where information does not cause great problems. This on the other hand can generate growth in local economies. (Fang et. al, 2015, pp. 176-177)

Talmor et. al (2011) argue that emerging markets and developing countries provide opportunities in the field of infrastructure and growth. Private equity firms should indicate focus on earnings in the emerging markets which will outweigh the concerns arising from political and legal uncertainties. Also, for competitive reasons, PE firms should acknowledge the growing research interest in the field and focus on due diligence and understanding the competitive trends where the portfolio companies are operating. By putting effort into debt structure, quality of earnings, risk management, efficiency, and competitive intelligence firms can move from 'mainstream' to specialized funds.

## **2.2. Buyout funds**

A leveraged buyout is a financial technique where a company takes the acquisition of a company or companies using significant amounts of debt from the LP's to finance the acquisition cost. The target firms' shares, or assets will be owned majorly by the GP with a very minimal amount of equity. Leveraged buyout usually leaves the target firm with a

noticeably higher debt-to-equity ratio than it was before the acquisition. (Baldi, 2015, pp. 4) Axelson et. al (2009, pp. 1574) find that leveraged buyouts are structured to be highly efficient when requiring the fund to use only deal-by-deal debt financing. A high amount of external capital makes GP's liabilities limited and the financial risk of any deal low, which must be compensated with contractual features to distinguish agency problems with investors.

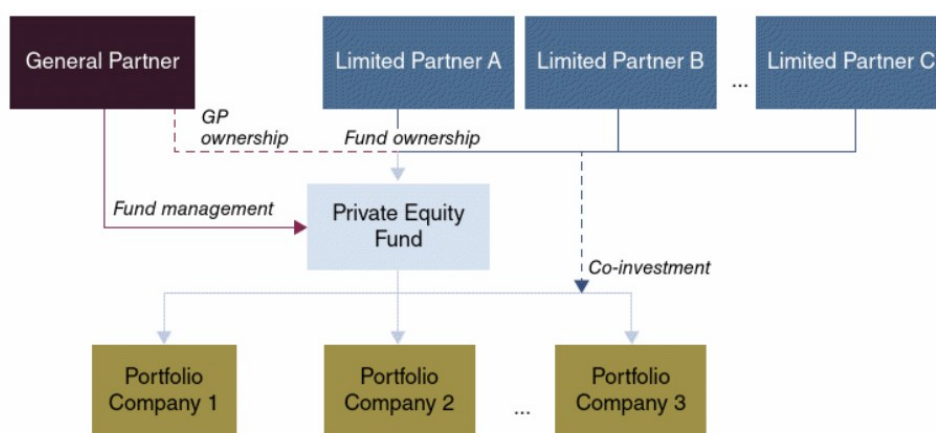
Talmor et. al (2011, pp. 275) recognizes three types of leveraged buyouts that can be subcategorized into management buyouts (MBO) where shareholders count amount the target company managers, management buy-ins (MBI) where external managers are counted into shareholders, and institutional buyouts (IBO) where the acquiring owner is institutional. When considering more hypotheses in the buyout field, Baldi (2015, pp. 5) mentions employee buyout (EBO) where firm employees are involved in the acquisition. EBO's can be found commonly in the U.S. as a transaction to promote activity with tax incentives to increase implementation. In the same sense can be named family buyout (FBO) and corporate buyout (CBO) that uses debt from these sources to finance operations. All these transactions can be used to structure a combination of elements forming a unique buyout strategy.

Consistent with free-cash-flow theory, buyout target firms have been found to have low Tobin's  $q$ , to be more diversified, and have high cash flows compared to the non-target companies. Expected costs of financial distress can determine if the firm is likely to do buyouts, with being less likely when the expected cost is high. (Opler & Titman, 1993, pp. 1985) Metrick and Yasuda (2011, pp. 636) state that leverage risk of buyout deals varies uniquely from a deal to deal and from fund to fund. Even when the average buyout beta is close to 1, it may not be steady cross-sectionally resulting from different levels of systematic risk.

### 2.2.1. Structure

Private equity firms manage different kinds of private equity funds and other alternative asset funds, where they receive cash from proceedings such as annual management fees of around 2 %, carried interests, and transaction fees (Stowell, 2010, pp. 287). Private equity structure commonly supports finite lifetime closed-end funds where the normal contractual lifetime can be from 6 to 10 years. The funds lifetime can be extended optionally with three years in maximum from the ending date. (Jenkinson et. al, 2013, pp. 5)

Private equity funds hold usually a legal structure where can be separated Limited Partners (LPs) managed by General Partner or Partners (GP) (see figure 2). Limited partnerships are reasonably called limited because of their restricted liability and passive role, whereas GP selects and manages the investments and the fund according to fund agreement. (van Swaay et al, 2015, pp. 58). European Union has its directive on alternative investment fund management, which PE fund managers must follow.



**Figure 2.** Private equity partnership structure (van Swaay et. al, 2015).

General Partner is usually the private equity firm, which manages and partly owns the underlying fund in the scenario. Corporations, institutional investors, private individuals, and, pension funds and fund of funds, which manages portfolios of various private equity

funds can be counted into the limited partnership category. General Partner can also found 'feeder' funds to support the 'master' fund to collect even more investments from limited partners that do not have access to large amounts of money. Private equity funds consist of portfolio companies decided by the GP and the managing private equity firm and they can choose to specialize in operational sectors or industries. (Demaria, 2013, pp. 73-86)

Fund investors, LP's, do not invest all the capital upfront to the raised fund, but actually make a commitment which the managing General Partner then calls when investments are needed, or fees are due. PE funds have an investment period and when it expires, no more capital can be called from the LP's, which leads to a period of investment realization that gives 'self-liquidating character' to private equity funds. (Jenkinson et. al, 2013, pp. 5)

### **2.3. Private equity cyclicality**

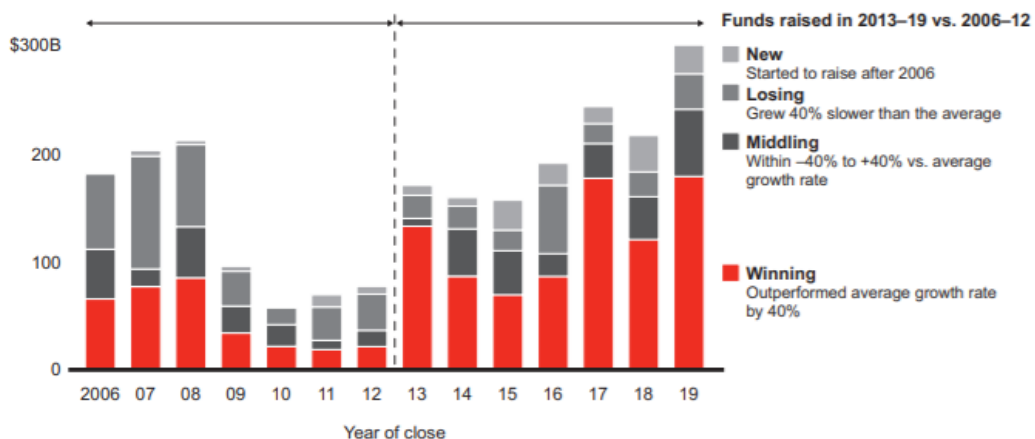
Private equity is cyclical between bubbles and crashes and it is affected by economic, financial, and industry-specific cycles. Consumer behavior, demand level projections, rates of technological innovation, and other parameters affect investments and performance of portfolio companies inside the economic cycle. The financial cycle can be explained with the amount or percentage of allocated capital into the asset class or with interest rates. Still, the most important term to describe private equity cycle is capital inflow. (Demaria, 2010, pp. 168-169)

With capital inflow, it is possible to measure the total amount of capital collected by segments, such as LBO's or VC, or even with sub-segments, such as healthcare or biotech, and where we are in the private equity cycle. Industries react in different ways to the market changes making some sub-segments more sensitive to cycles and performance variabilities than others. This should be considered when searching for investment opportunities along with investment period to find the right industries to outperform

public markets. Geographical allocations must be also considered as well as amounts of capital collected, invested, and divestment. (Demaria, 2010, pp. 168)

Changes in LP's allocation strategies and investment policies can create booms and busts on the PE market. Overall capital inflow depends on various investor related aspects including a liquid wealth of individuals, solvency and prudential ratios calculations, net results, and total assets under management (AUM). When LP's decide to change allocation strategy, it can release a large amount of investable capital in a short time period. When this occurs, Demaria (2010, pp. 169) state that the capital inflow levels can generate "sub-optimal allocations", as the PE market is hard to evaluate in size and in investment opportunities.

Long-period high equity returns and low interest rates increase private equity transactions creating a boom cycle where credit taking rises and debt covenants are cheaper. This is followed by a bust cycle when activity in the private equity market is low with tight credit and weak earnings resulting in defaults in debt and bankruptcies. (Stowell, 2012, pp. 414) The previous private equity cycle can be calculated from 2006 to 2012 and the now ongoing cycle from 2013 to 2019 and onwards being in matured late-stage period (see figure 3). 57 % of general partners worldwide believe that the PE markets have reached their cyclical peak at the end of 2019, which explains the overheated asset valuations on the market. (Bain & Company, 2020, pp. 20)



**Figure 3.** Private equity cycle performance (Bain & Company, 2020).

Robinson and Sensoy (2016, pp. 535-536) find also evidence on the procyclicality of capital calls and distributions. A Variation on cash flow activity is mostly cross-sectional and volatility in most part diversifiable. This implicates to the fund performance and connection between capital inflows and later performance. While the cyclicity of capital allocation is well known, institutional details of the sector allocations and LP's cash flow streams made by GP's choice and not on the underlying partnership assets remain unanswered questions that affect the cycle performance.

#### **2.4. Buyout performance and returns**

One of the most important issues when evaluating private equity investments is the difference between realized returns and unrealized returns. Appelbaum and Batt (2014, pp. 163) define realized returns as the cash paid to limited partners by funds already exited their investments and closed operations and unrealized returns as the overall value of the portfolio companies in the fund. LP's want to get active information on their returns in the fund so waiting for the realized returns for approximately 10 years is not fashionable. Because of this, studies on PE performance in the last decade have been calculated mostly with net asset values (NAV's), also known as net present value (NPV) or discounted cash flow value (DCF), that consider values of companies inside the portfolio estimated by the GP. Since new accounting standards issued in 2008, NAV's must be reported at fair value.

The most used performance measure of private equity funds is the internal rate of return (IRR), which is used to market funds to new LP's and inform other associations and firms. It is used by managers to know how to effectively allocate the funds into different financial assets. The internal rate of return can be used to evaluate the performance on fund-level focusing on a specific fund or relative performance of various funds. IRR can be also calculated as an asset class and compare private equity performance to public market

asset classes such as stock and bonds. Also, the NAV of unsold companies affects the determination of a fund's IRR. (Appelbaum & Batt, 2014, pp. 163-167)

For simplicity and easily comparable results, academic researcher's use public market equivalent (PME) to evaluate the differences in returns when comparing private equity relative to what limited partners could have generated with the same amount of capital over the same time period from a stock market index. (Appelbaum & Batt, 2014, pp. 163-167) In addition, Gomers et. al (2016) also raise the method of times money (TM) as one the most used evaluation techniques in private equity.

Investment performance and returns can be collected at the portfolio company level or the fund level. Net of fund fees and carry are the advantages of fund-level data, but it does not provide information about the timing of individual investments or exits. Deal-level data offers more bias selection control when observing outcomes of unsuccessful investments. (Metrick & Yasuda, 2011, pp. 632) Deal-level research still has its restrictions on limited data sources making it easily incomplete.

#### 2.4.1. Measurement

Probably the most used private equity performance method is to assess investments through return multiples. In simplicity, return multiples calculate the value of returns divided by the money invested into the PE fund. Paid-in capital can be named as the amount already drawn into the fund from the overall commitment. The total value to paid-in ratio (TVPI) is the sum of distributed value of paid-in ratio (DVPI) and residual value to paid-in ratio (RVPI) being the best performance measurement method at the end of the fund's life cycle. TVPI can be presented with the following formula (Talmor et. al, 2011, pp. 42):

$$(1) TVPI = \frac{\sum_{t=1}^{t < T} CF_t^{PAST, RECEIVED} + NAV_r}{\sum_{t=1}^{t < T} CF^{PAST, PAID IN}},$$

where  $CF^{PAST,RECEIVED}$  = net cash flows distributed by the fund,

$CF^{PAST,PAID IN}$  = cash flows transferred to the fund,

and  $NAV_r$  = net asset value.

Multiple measures are problematic in the sense that they do not take into account the time perspective of invested capital in the fund and the length of it. Also, return multiples are missing the necessary risk information and reinvestment reallocation information investors need. Multiples should be always reported with the duration of investment, the extent of leverage, and the amount of reinvested capital to accurately inform return performances. (Talmor et. al, 2011, pp. 42)

The internal rate of return (IRR) is calculated as the discount rate, which gives a net present value (NPV) of zero when applied to a series of cash outflows and inflows. The IRR has the time effect which is missing from the return multiples by reflecting the cash flows effect on certain times in the fund's portfolio. Private equity IRR differs from the time-weighted rate of return measure used in the public markets because the cash flow management has to be described when the control is on the GP's. The PE internal rate of return notices interim cash flows based on the amounts and timings and the time-weighted measure does not do that. (Talmor et. al, 2011, pp. 43)

In this study we demonstrate the interim IRR that equates the present value of all capital drawdowns besides with the present value of all cash distributions and the present value of the unrealized residual portfolio as follows (Talmor et. al, 2011, pp 43):

$$(2) \sum_{t=1}^{t < T} \frac{CF_i^{PAST,RECEIVED}}{(1 + IRR_{interim})^t} + \frac{NAV_r}{(1 + IRR_{interim})^T} = 0,$$

where  $CF^{PAST,RECEIVED}$  = net cash flow distributed by the fund,

$NAV$  = net asset value or value of the fund's holdings at the date T,

and  $IRR_{interim}$  = interim internal rate of return at the date T. The final IRR can be calculated with all capital drawdowns and all cash distributions during the life of the fund. After liquidation, the final IRR gives NAV value of zero.

Kaplan and Schoar (2005) introduce the public market equivalent (PME) to be used as a performance benchmark for private equity. The method also used later in this study can be formed as:

$$(3) \text{PME}_{it} = \alpha_t + \beta(\text{FundSize}_{it}) + \gamma(\text{Sequence}_{it}) + \gamma\text{VC} + \varepsilon_{it},$$

where  $\text{FundSize}_{it}$  = capital committed to the fund,

$\text{Sequence}_{it}$  = sequence number of the fund or later funds of the same partnership,

$\gamma\text{VC}$  = dummy equal to 1, if the partnership is VC firm and 0 otherwise,

and  $\varepsilon_{it}$  = standard error.

## 2.4.2. Results

### 2.4.2.1. Fund-level

The typical reporting timeline for private equity cash flows is every quarterly by netting opposite cash flows for the specific measurement period. Ewens et. al (2013) find in their study beta of 0.66 and alpha of 0.72 % at an annual level for buyout funds calculated by value differentiation estimated by general partners. They also found top-quartile PE funds outperforming bottom quartile by 4 % abnormal returns. Differently from the previous, Ljunqvist and Richardson (2003) use the realized returns to study average net-of-fee IRR between private and public equity samples. They find that their private equity sample generated 5.7 % higher IRR than the PME, S&P 500 index, in the same timeframe. Also, the results indicate the outperformance of buyout funds over venture capital funds in eight out of 11 sample years.

In contrast, research done by Kaplan and Schoar (2005) finds equal returns for private equity funds and S&P 500 using a large data set, where the PME has been converted from discounted present values of inflows and outflows. Net-of-fees returns in this data set do not mix results even if they divide buyout funds and VC into separate categories. Phalippou and Gottschalg (2009) adjust and expands the research made by Kaplan and Schoar (2005) with several fixes made into the public market equivalent measure resulting reduction of 0.13 of the PME compared to the not adjusted one.

Driessen et. al (2012) implement a fund-level cash flow data method because of the unavailability to access deal-level sources. A Resulting beta of 0.33 for buyout funds and a market beta of 3.21 gives slightly mixed performance results that do not clarify the academic research field with the conclusions. Braun et. al (2017) find evidence from performance persistence but not that strong effects as earlier studies. They conclude that out-performance is not valid anymore when studying private equity performance after the 2000s because of the matured markets and disappeared GP's performance persistence.

Results by Ang et. al (2018) indicate that private equity returns are just partly comprising of investable passive indices and leveraged business model fits private equity in small and mid-cap equities. Private equity is not highly correlated by sub-classes when evaluating cycles, suggesting diversified investment strategies. Private equity returns outperform public markets' corporate asset yields because of high-yield debt. Usage of the public market proxy index for private equity returns creates volatility estimates close to actual PE returns, suggesting these PME's to be used for accuracy in risk and return from illiquid private equity.

#### **2.4.2.2. Buyout: Deal-level**

Buyout transactions are found to create value despite leveraging heavily with later financial distress and generating high returns with succeeding operating performance, with tax privileges and experience with timing the market correctly. (Andrade & Kaplan, 2002;

Guo et. al, 2011) Lopez de Silanes (2010) find that approximately 10 % of deal-level buy-outs go bankrupt even while 25 % of those buyouts have an internal rate of return over 50 %. Buyouts have diseconomies of scale with a negative relationship between returns and the fund sizes investing.

Gottschalg et. al (2013) find positive abnormal performance of deals by controlling leverage and return specifics of private equity. Focusing on sales improvements and profit margins enable performance that stands out from the private equity GP's. Similar skills at the deal-partner level can be found from large PE transactions with outperforming characteristics to win significant mergers and acquisitions. Operational background in accordance with value creation strategies correlate positively with the outperformance in the market.

The performance of the leveraged buyouts around IPO has been studied with various implications. LBO's has been found to noticeably overperform industry peers in operating performance years before IPO's and even making a peak before the offering in some researches. Performance has been still noticed to decline after the IPO in the long run and the stock valuation is at the peer level suggested to result from market reaction to the effect. (Holthausen & Larcker, 1996; Degeorge & Zeckhauser, 1993; Muscarella & Vetsuypens, 1990)

Valkama et. al (2013) find the correlation between industry growth levels and GDP's effect on buyout returns and to the outperformance of the PME's with the possibility to achieve profitable exits. Allocation strategy provides top performing buyouts even when cost-cutting restructuring is out of the question. Private equity deals are found to be heterogeneity with buyouts outperforming buy-ins. Governance is not found to be key value creation factor but efficient use of leverage generates better returns that also explain the wide availability of financing to private equity deals. Acquisitions by portfolio company and the size of the portfolio company has an impact on the equity value and enterprise value (EV) returns.

### 2.4.3. Persistence and sources

Performance persistence can be measured with GP level and also at the LP level in private equity. Kaplan and Schoar (2005) find that GP's with top-performing funds perform well also later with other funds compared to the industry average. The persistence can be found even on three consecutive funds of the same GP. Marquez (2010) states that the positive value of alpha creates PE fund managers' incentive to allow over the top performance to get the best firms and other investees to invest in the fund. Surplus of alpha is focused on getting new investors involved leaving fund increasing activity and fee structure reforms in the background.

Buchner et. al (2016) find that buyout fund returns in line with VC are persistent, but the effect varies through geographical location, being stronger in US-funds and weaker in others. Still risk measured by the standard deviation of IRR is persistent in all funds which can be a result of PE funds investing simultaneously to deals with the same risk and return levels. They suggest that industry-crossing deals can weaken the persistence when trends move over time along with managerial changes. Bubble years can evolve performance and risk because of skewness in risk and return.

Demiroglu and James (2010) suggest that the pricing power of buyout firms is a possible source of performance persistence. BO's tend to time the credit markets efficiently by increasing deal activity on time of low spreads and relaxed lending standards gaining even cheap loan terms with long maturities and the big size of institutional loans. Buy-outs are highly levered, but the valuations paid are on the same level as others valuations making them outperforming the class of private equity.

Aigner et. al (2008) use the Markov transition matrices to evaluate the fund returns and performance of private equity funds. According to their findings, best performing private equity funds are found to persist remarkably high, averaging successful managers to be again top-quartile funds from 33.3 % to 41.7 %, depending on the measurement system used to calculate the performance. Regression analysis shows that experienced PE fund

managers tend to outperform and take more risk when the portfolio companies are not performing well. Also, public markets are connected to private equity in a way that GP's profit from public market growth, more in buyouts with higher returns than in venture funds.

Braun et. al (2017) find in their study the connection between performance persistence and competition. Performance is persistent in the data set during periods of low competition but indicates no evidence of persistence during high competition periods. Market conditions reflect on the possibility to repeat top-quartile performance with significant persistence during low competition periods but not in the state of high competition. Top quartile portfolios also generate better returns in low competition but returning to the mean comes at times of high competition.

Institutional investors are found to overperform other investors because of their skill to be able to find superior funds to invest. This results from the skills of specific fund managers and the idea of those managers performing better than other firms fund managers in the same category. This again creates more resource- and asset commitments flowing into these best-performing funds from LP's. Performance persistence is all about success following the earlier success and high-performing PE firms are found to be in partnerships with sophisticated investors, such as endowments and pension funds. (Lerner et. al, 2007; Metrick & Yasuda, 2011) Venture capital has been found to differ from this conclusion in private equity by trusting unsophisticated investors more (Phalippou, 2010).

## **2.5. Alpha**

Pushner and Viscio (2019) define alpha as "organic value creation on a company-specific outperformance basis relative to an appropriate industry benchmark." In other words, alpha can be defined as private equity outperformance after controlling leverage and public market returns. Investors measure alpha to recognize the managers or sectors outperforming their benchmark and can repeat and create consistency into the

performance in the future. Private equity alpha is a complicated method to use because of the measurement of benchmark portfolio companies' performance and isolation of organic growth.

The manager selection process includes return analysis, PME analysis, and conventional attribution analysis which tries to make public and private values more comparable. Comparing private equity returns gives a limited amount of information as well as public market equivalent because these do not pay attention to fund or portfolio company's performance on an industry or sector basis. The approach where calculations rely on changes in EBITDA, multiples and net debt does not take into account enterprise performance versus industry insight nor the difference between organic and purchased value creation. (Pushner & Viscio, 2019)

Alpha should be quantified as follows for robust attribution analysis (Pushner & Viscio, 2019):

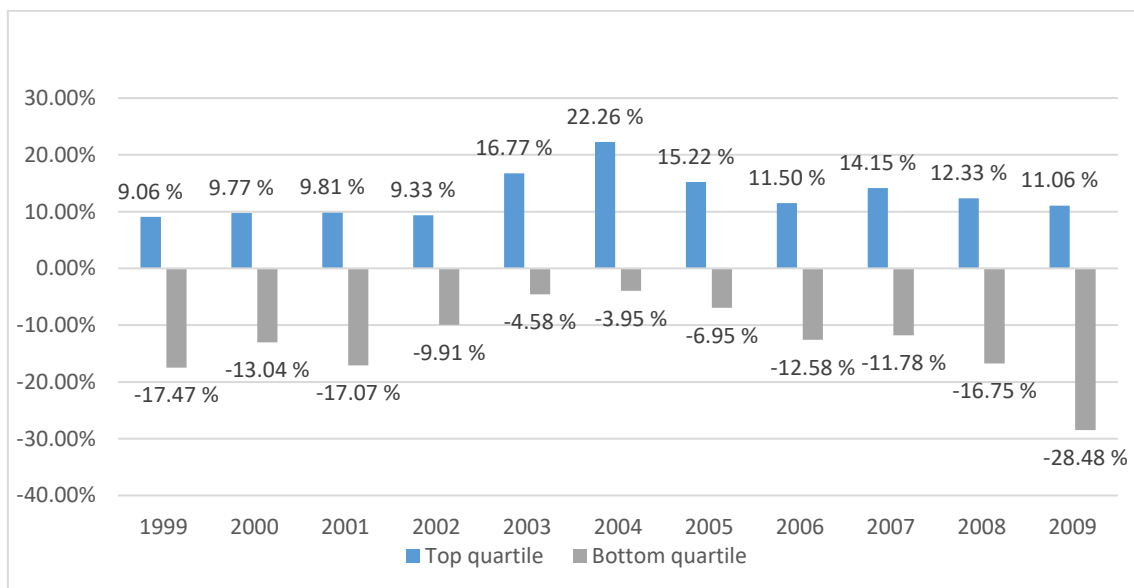
1. Portfolio company's performance measurements are done with benchmark values from industry equivalent.
2. Organic growth is separated from the growth generated from add-on acquisitions
3. The balance sheet will be reflected correctly to understand the impacts.

The relationship between EBITDA and alpha are weak in studies made by Duff and Phelps since 2012 as the correlation is very low between the value factors. Still, changes in EBITDA can not be explained yet precisely by the alpha because of the non-existing magnitude of those two. EBITDA and alpha are driven by other factors, providing results that consider EBITDA improvements not being the primary source of evaluation between fund managers. (Pushner & Viscio, 2019)

Golding Capital Partners and Gottschalg (2014) define alpha as the difference between the adjusted return of private equity transactions and the discount rate for reinvesting cash-flows (PME). Private equity transaction adjustment is made by using a modified IRR

function (M-IRR). The study shows alpha being anticyclical being high at the times of market uncertainty and declining market development. Supporting previous literature on performance persistence, alpha-level is also persistent creating future top results along with risk and holding period measures such as loss ratio, return dispersion, and duration.

Below in figure 4 is illustrated the alpha generated by the top and bottom quartile performing private equity funds from 1999-2009. Funds managed by top-performing fund managers are expected to have high adjusted returns compared to bottom performing low-quality managed funds and historically this matches the theory. Alpha has been calculated by taking the median of cumulative IRR and public market equivalent (S&P 500).



**Figure 4.** Alpha measures by the top and bottom quartile (Pantheon, 2013).

Researches studying alpha extensively show positive outperformance for private equity and especially for buyout funds over the public market equivalent. The results range from 5.6 % to 12.6 % when using different sets of data samples and time periods (Gredil et. al, 2014; Fan et. al, 2013). Even when controlling the risk variables alpha stays

relevantly higher to the benchmark topping it with over 3 % (Franzoni et. al, 2013). When separation of venture capital and buyout funds is possible in these studies, it shows the top-performing values for BO's. This can be explained with small growth-oriented companies being exposed more to the changes in the market and VC funds have been also found to be more oriented into cyclical behavior. (Fan et. al, 2013) Still, negative alpha measures were not found for private equity in this literature (see table 1).

**Table 1.** Studies on alpha and outperformance covering recent centuries.

Research	Period	Sample size	Alpha
Golding Capital Partners & HEC (2014)	1977-2014	5600	8.6 %
Buchner (2014)	1980-2009	4418	7.0 %
Franzoni, Nowak & Phalippou (2013)	1975-2006	4403	9.3 % (*3.1 %)
Gredil, Griffiths & Stucke (2014)	2001-2010	6184	12.6 %
Fan, Fleming, Warren (2013)	1983-2011	1600	5.6 %

\*Risk controlled

Buchner (2014) uses S&P 500 as a benchmark index to measure alpha for private equity. For buyouts, the study indicates an outperforming alpha of 7.0 % annually being statistically significant. Franzoni et. al (2012) use the four-factor model made by Pastor and Stambaugh (2003) to discover alpha of 9.3 % as the unexplained expected return by the CAPM model. After controlling the risk premium of the book-to-market factor and size factor the alpha drops to 3.1 % being still economically significant. When they also calculate the liquidity risk model, the alpha goes to nearly zero percent.

Gredil et. al (2014) derive the arithmetic alpha of a portfolio relative to the public market equivalent and calculate IRR of 17.5 % with corresponding alpha with a value of 12.6 %.

It is important to measure the private equity cash flows to the same time point as the public equity index. As a result, the present value calculations are added to the previous model counting the actual contributions of the PE portfolio, distributions, and NAV. With these implications, they find that the present values and future values remain unaffected differing only with one single factor keeping the alpha as the same.

Fan et. al (2013) find that BO funds create annually 5.6 % greater alpha which is around 1.4 % quarterly to benchmark funds and indices. Buyout funds can generate returns that outperform passive public market equivalents but the result on alpha varies whether using indices or index funds. This is because of the not exactly matching instrument details and other aspects such as transaction costs and trading restrictions. The rolling regression analysis shows 10-year estimates being around zero after 2005 suggesting that private equity returns are affected by investment volumes and cyclicity.

## 2.6. Value creation

When studying private equity from a theoretical perspective, we cannot exclude the value creation and the main parameters that drive the performance in more specific matters. In this study, we are going to present the private equity value creation process informatively as a suggestion for future studies. First, we must understand how to measure performance and evaluate the meaning of alpha before going further into the detailed factors generating value in various forms.

Value creation starts from understanding the drivers of a firm's value: earnings, cash flows, and risk. When the future expected earnings raise at the same time as risk regarding those future cash flows declines, the valuation of the company gets higher. Present valuation of private equity firm can be defined as (van Swaay et. al, 2015, pp. 78):

$$(4) V_0 = EBIT_0 \times Multiple_0,$$

where the  $Multiple_0$  = multiples applied by the market to PME companies or comparable private transactions. Multiple again has a role in expected growth and cost of capital resulting from the believed risk levels. Multiple is used to discount EBIT in growing perpetuity or as follows (van Swaay, 2015, pp. 79):

$$(5) Multiple_0 = \frac{1}{k-g},$$

where  $k$  = expected cost of capital,

and  $g$  = expected growth rate in perpetuity.

Berg and Gottschalg (2005) divide value creation into three different levers in buyouts with unique purposes in the specific value dimension. The dimensions are divided into phases of buyout value creation, causes of buyout value creation, and sources of buyout value creation. Dimension one includes acquisition phase where negotiation and due diligence process happens to get investors involved and business plan ready, holding period where the implementation of the business plan is realized through strategy and operational/organizational changes and lastly divestment phase where is decided the divestment mode and valuation to realize the investors return.

Dimension two, the causes of value creation is defined with equity value which is a sum of valuation multiple, revenue, margin, and net debt generating equity value equation below (Berg & Gottschalg, 2005, pp. 7):

$$(6) Equity Value = Valuation Multiple \times Revenues \times Margin - Net debt,$$

where  $Valuation Multiple$  = enterprise value/EBITDA,

$Revenues$  = generated income.

$Enterprise Value (EV)$  = equity + net Debt,

$Margin$  = EBITDA/sales,

and  $Net Debt$  = long and short term debt – cash and marketable securities.

In simplicity, value can be generated through firm valuation, financial performance including operating performance, reduced cost of capital, and resource reallocation in fixed or current assets. The third dimension collects the sources of value creation into intrinsic and extrinsic value creation which differ in the relationship with specific investor characteristics. Intrinsic value generation happens inside the boundaries of portfolio company independently on the context of equity investor characteristics, as in extrinsic value generates from the interaction between the portfolio company and the investor linked into specific characteristics.

van Swaay et. al (2015, pp. 79-86) divide value creation into three different channels which are operational improvements, multiple arbitrage, and leverage, or financial engineering. Operational improvements can be proposed as the enhancement of earnings and detailing every operation optimal with cost reductions, talent recruitment, and performance incentives. It also includes goals regarding market shares, EBITDA, returns on capital, and debt-pay-down schedules. Multiple arbitrage takes two forms of acquiring assets at the bottom of the cycle and selling them in the peak called as "multiple surfing " and arbitrage by doing the needed actions to explain and prove larger multiple to the market than it is, other ways called "multiple engineering ". Leverage or financial engineering can be seen as a value amplifier by using debt to amplify the return on equity, by tax deducting interests to shield the firm from costs, and by making managers focus on profit-making and meeting the deadlines.

Financial engineering is dependent on the debt to equity ratio and the realized equity return is equal to the return generated without the use of debt plus the return made from the leverage effect. By deleveraging the return and by clarifying the pieces of value creation it is possible to understand the value coming from earnings enhancement versus changes in the valuation multiples. Ignoring taxes, Kaserer (2011, pp. 13) presents a formula for leveraged equity return which can be formed as follows :

$$(7) R_e = R_u + \frac{V_d}{V_e} (R_u - R_d),$$

where  $R_e$  = leveraged equity return,

$R_u$  = Deleveraged asset return,

$V_d$  = market value of debt,

$V_e$  = market value of equity,

and  $R_d$  = difference between asset return and cost of debt.

### 3. Data and methodology

#### 3.1. Data description

The private equity data was collected from a fund of funds (FOF) investing in the funds of other PE firms. Also, data was collected from European PE managers representing other fund of funds to gather as much and as reliable information as possible to be able to make valid conclusions. This thesis focuses on small- and mid-cap companies transaction records in Europe as the focus of the fund of funds and PE managers is in these segments. The full dataset contained 2041 transactions made between 1989-2020.

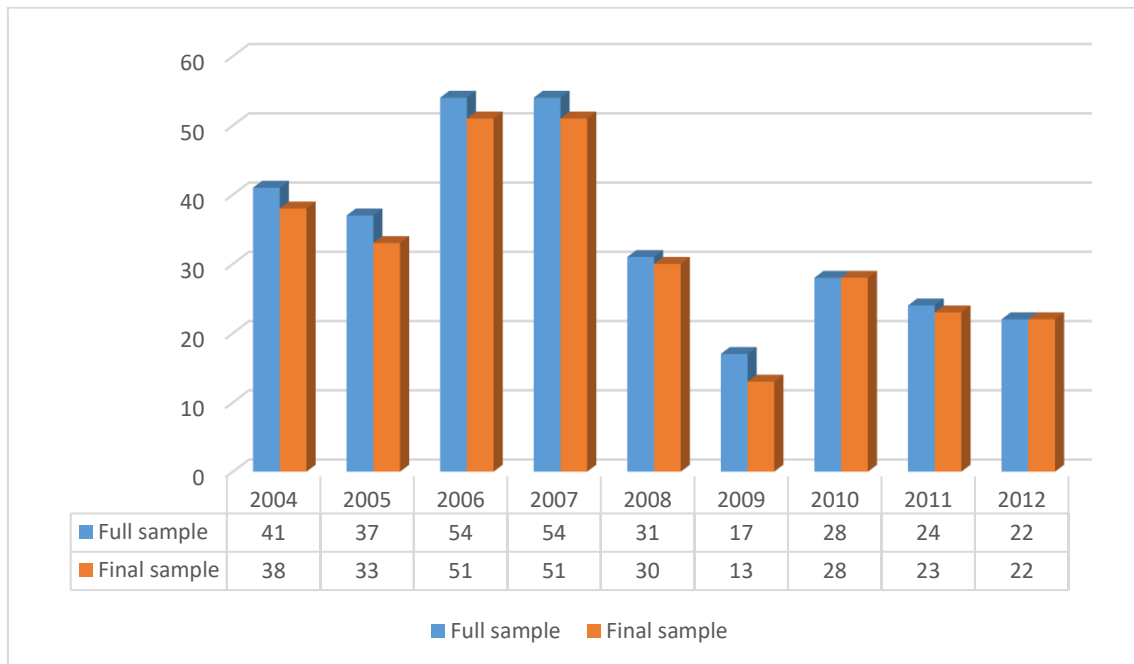
The dataset included information about the private equity firms, fund characteristics, fund cash flows at entry and exit, and possible acquired add-on financial transactions. Some of the transactions in the dataset were missing data points needed for the performance calculations and could not be used in the analysis. Industry/sector specifications were added to those companies that were missing details to be able to divide the data into different measurable groups.

**Table 2.** Illustration of sample selection.

Sample	Information	n	IRR	TM
Raw dataset		2041	-	-
	Investments in 2004-2012	1137	-	-
	Missing datapoints, VC / non-European transactions, realized values			
Full sample		308	24.30 %	2.45
	Industry / sector specification			
Final sample		289	25.30 %	2.48

First, transactions with an entry in between years 2004 and 2012 were separated from the full sample resulting in 1137 observations. After that, missing datapoints and

transactions leading to inadequate results were excluded from the entire dataset for the IRR, TM, and further alpha calculations. Also, transactions referring to venture capital or non-European firms were not used in the full and final samples as the focus of this thesis is on European buyouts. In addition, the realized values were noticed as over 2/3 of the full sample did not have any unrealized value in the firms. The full sample contained 308 transactions from eight different industries with an average internal rate of return of 24.3 % and an average TM of 2.45. From the full sample, four main industries were distinguished to create the final sample for the main part of the research. The final sample had an average internal rate of return of 25.3 % and TM of 2.48 in 289 transactions (see table 2).

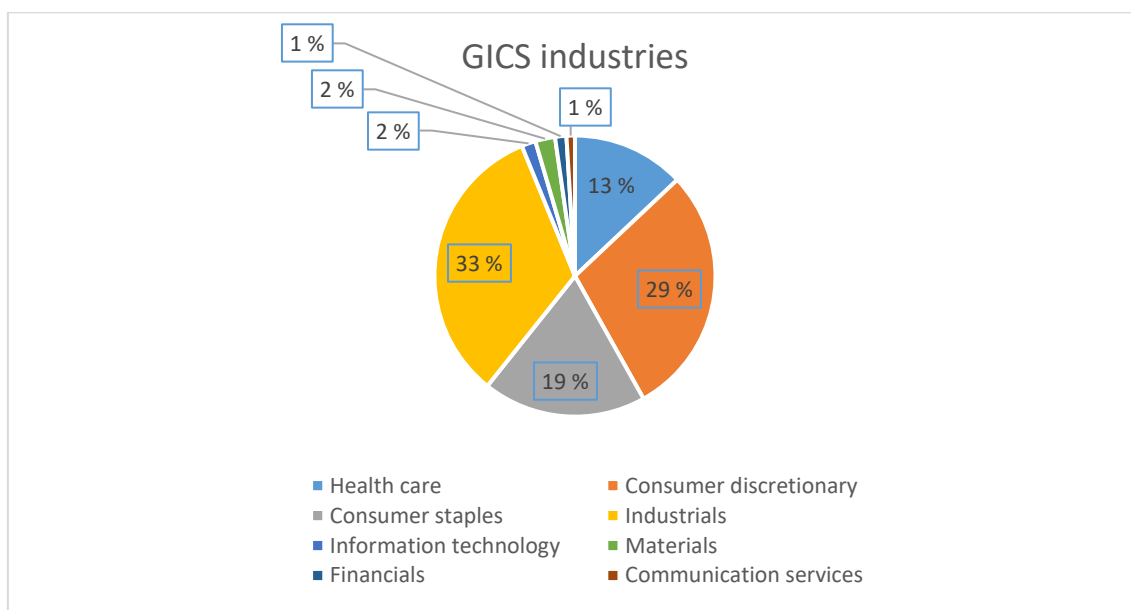


**Figure 5.** Transaction entry years.

Figure 5 presents the entry investment years for the full sample and the final sample. For both samples, the entry years varied from 2004 to 2012 and the highest amount of entries were in 2006 and 2007. The least amount of entry transactions was found in 2009. When taking the average of the entry years and months, both samples had an average

entry in December 2007. Detailed transaction amounts by years can be found in the descriptive statistic above.

In this study, industry specifications are taken from the Global Industry Specification Standard (GICS). Four industries used in this thesis are health care, consumer staples, industrials, and consumer discretionary. Chosen industries represent different economic- and investment cycles and various GDP levels to distinguish performance behavior and to recognize industrial differences. There is also a need to separate consumer staples and consumer discretionary from each other in the data, so the results are more focused on the real effects of these two industries. The dataset also included a lot of transactions from these industries making the widest final sample.



**Figure 6.** Industry specification in full sample.

In the full sample, industrials was the biggest sector where transactions were allocated with 102 firm values (33%). The second biggest industry sector was consumer discretionary with 89 transactions (29%). Third came consumer staples with 58 transactions (19%) and fourth, the last final sample sector, health care with 40 transactions (13%). Materials (7 transactions, 2%), information technology (5 transactions, 2%), financials

(4 transactions, 1 %), and communication services (3 transactions, 1 %) had the least transactions which resulted in those transactions only being evaluated in the full sample (see figure 6).

**Table 3.** Descriptive statistics of the samples.

	<u>Full sample</u>			<u>Final sample</u>		
	Mean	Median	Std. Dev.	Mean	Median	Std.Dev.
Holding period	4.76	5.76	0.85	4.58	5.61	0.83
Enterprise value (entry)*	778	663.9	2745	690.1	66.3	1636.7
Enterprise value (exit)*	1147.9	138.7	3553.5	1111.3	137	3616.3
Equity value (entry)*	366.6	34.3	1757.9	356.4	34.1	1805
Equity value (exit)*	879	93	3210.4	847.7	89.9	3276.3
Net debt (entry)*	411.5	25.6	1668.3	333.7	25.7	1490.2
Net debt (exit)*	268.9	20.0	1221.6	263.6	20.0	1250.8
Sales (entry)*	569.6	75.6	1670.7	521.5	74.2	1640.2
Sales (exit)*	738.4	122.8	2346.4	722.1	120.9	2395
<b>Profitability</b>						
EV/EBITDA (entry)	29.30	6.50	7.60	8.36	6.77	7.69
EV/EBITDA (exit)	12.25	13.64	9.90	9.89	9.57	9.95
<b>Leverage</b>						
Debt/EV (entry)	0.15	0.39	0.61	0.48	0.39	0.57
Debt/EV (exit)	0.23	0.14	0.34	0.24	0.15	0.35
Debt/Equity (entry)	1.12	0.75	0.95	0.94	0.75	0.83
Debt/Equity (exit)	0.31	0.22	0.38	0.31	0.22	0.38
<b>Absolute return</b>						
IRR	0.24	0.14	0.7	0.25	0.15	0.72
TM	2.45	1.81	2.55	2.48	1.81	2.61
TVPI	1.40	1.56	2.98	1.47	1.51	3.00

\*Values in 000'000

Table 3 presents the descriptive statistics divided into four sections: one section with values and three sections with ratios and multiples. Enterprise value, equity value, and sales all grew on average and on mean in both samples when moved from entry values to exit values. Private equity firms seem to have the ability to enhance sales and increase

the enterprise values of the target companies. Only net debt declined in both samples on average and on mean. This can be explained with the add-on data which did not affect the samples in a way that it would show in the statistics.

EV/EBITDA multiples show different results in the samples. In the full sample, target companies with industries not included in the final sample had lot more higher enterprise values than EBITDA. Still, this changed to the final sample with more steady profitability metrics indicating also higher selling values at the exit. This can be also seen in the debt/EV ratios. An increase in equity value showed positive results compared to the increase in debt in both samples. All absolute return metrics showed a great ability of GP's to be able to create strong returns. The results on standard deviations in the value metrics can be explained with the statistics measured in euros with no interpretation of more specific technical analyses or tests where the standard deviation is more useful.

Public benchmarks were considered to be chosen from the MSCI GICS exchange-traded funds in Europe. However, European MSCI ETF funds were decided not to use in this research as the aim of this thesis is to compare private equity performance in Europe relative to public markets, global indices such as S&P500, cover the benchmark better as a whole. Also, data available for European ETF's did not include enough benchmarks for industries starting from the year 2004 or earlier. All the benchmark indices used are Standard and Poor's Depositary Receipt (SPDR) indices including GICS specifications (excluding the full sample benchmark), which started the exchange in 2004 or before and are still active. These were considered the best available options for the sample performance calculations for their wide range geographically and the industry benchmarks being from the same provider making the results mutually supportive.

The private equity data contained transactions from various currencies. To make the transactions comparable, exchange rates were applied to other currencies than the euro. This was made by using historical exchange rates collected from the European Central Bank (ECB). Exchange rates were used for the exit and entry days of the dataset

transactions. All of the accepted currencies were from the European area and all other than that were excluded from the research.

### 3.2. Variables

As mentioned earlier in chapter 2.5., private equity performance can be measured with a time-adjusted internal rate of return and multiple of money, also called total value paid in, to show absolute returns of an investment. Still, these parameters will not show returns that could be reflected in the performance of liquid public equity markets where returns are calculated on a daily mark-to-market. To understand the performance relative to traditional asset classes, we need market-adjusted return calculations in the same matter that LP investment committees want realistic comparisons. In table 4 below is demonstrated commonly used methods for evaluating absolute returns and market-adjusted returns.

**Table 4.** Private equity performance methods (adapted from Insead, 2019).

	<i>Rate of return</i>	<i>Total return</i>
<i>Absolute return</i>	IRR, MIRR	TVPI, TM
<i>Market-adjusted return</i>	Long-Nickels PME (1996), PME+ (2003), Direct alpha (2009)	Kaplan-Schoar PME (2005)

To demonstrate the correlation of absolute returns between private and public equities, we use the correlation coefficient measure previously used by Kaserer and Diller (2004). The approach uses cash flows of the two asset classes to create continuously compounded returns for the private equity investments on an annual level. Also, the assumption of contributions reinvested into the public market benchmark will be applied to the

calculations. The methodology follows the Pearson product-moment correlation with further implication as follows:

$$(8) \text{corr} [x, y] = \frac{\sigma_y}{\sigma_x} + \frac{\text{Cov} \left[ y, \frac{1}{T} \ln PME \right]}{\sigma_x * \sigma_y} = \rho_{xy},$$

with  $\sigma_y$  = standard deviation of the public market index,

$\sigma_x$  = standard deviation of private equity,

$\text{Cov} \left[ y, \frac{1}{T} \ln PME \right]$  = covariance of public and private equity returns in time T,

$\rho_{xy}$  = Pearson product-moment correlation,

where *value of + 1 is a strong positive and – 1 a strong negative relationship.*

One of the most used PE performance methods has been presented by Kaplan and Schoar (2005). It measures the effect of investing in private equity versus public index by compounding each cash flow (calls and distributions) based on the public index performance. The public index performance is measured between the date of the cash flow and the valuation date. The formula used in this study is presented below as:

$$(9) \text{KS} - \text{PME} = \frac{\text{FV}(\text{Dist})}{\text{FV}(\text{Call})},$$

with  $\text{FV}(\text{Dist}) = \sum_t (\text{dist}(t) \times \frac{I_T}{I_t}),$

$\text{FV}(\text{Call}) = \sum_t (\text{call}(t) \times \frac{I_T}{I_t}),$

where  $\text{KS} - \text{PME} > 1$  is PE outperformance.

Mathematically, this can be also described as Kaserer and Diller (2004) has presented:

$$(10) \text{PME} = \frac{\sum_{t=1}^T \text{cf}_t \prod_{i=t+1}^T (1+R_{Ii})}{\prod_{i=1}^T (1+R_{Ii})},$$

where  $R_{Ii}$  = *public market benchmark return on time t,*

and  $\text{cf}_t$  = *distributions of the private equity fund on time t.*

Another more recent method to calculate private equity performance is direct alpha discovered by Griffiths (2009), which calculates the private equity fund out/underperformance with IRR calculations of the compounded cash flows plus the fund's NAV without the multiple. In a continuous-time log-return sense, the direct alpha method formalizes the calculation of exact alpha that a private equity portfolio would have made compared to the benchmark (Gredil et. al, 2014). By adding direct alpha to this study we can separate two different methods with very different benchmark insights to evaluate how important it is to include public index into the calculations and how much the alpha results differ in various circumstances. The change in IRR is used as an approximation of alpha and market-adjusted returns. Direct alpha can be formed as (Griffiths, 2009):

$$(11) \alpha = \frac{\ln(1 + a)}{\Delta},$$

where  $a = IRR(FV(C), FV(D), NAV_{PE})$ ,

$\Delta$  = time interval of the computed alpha in years,

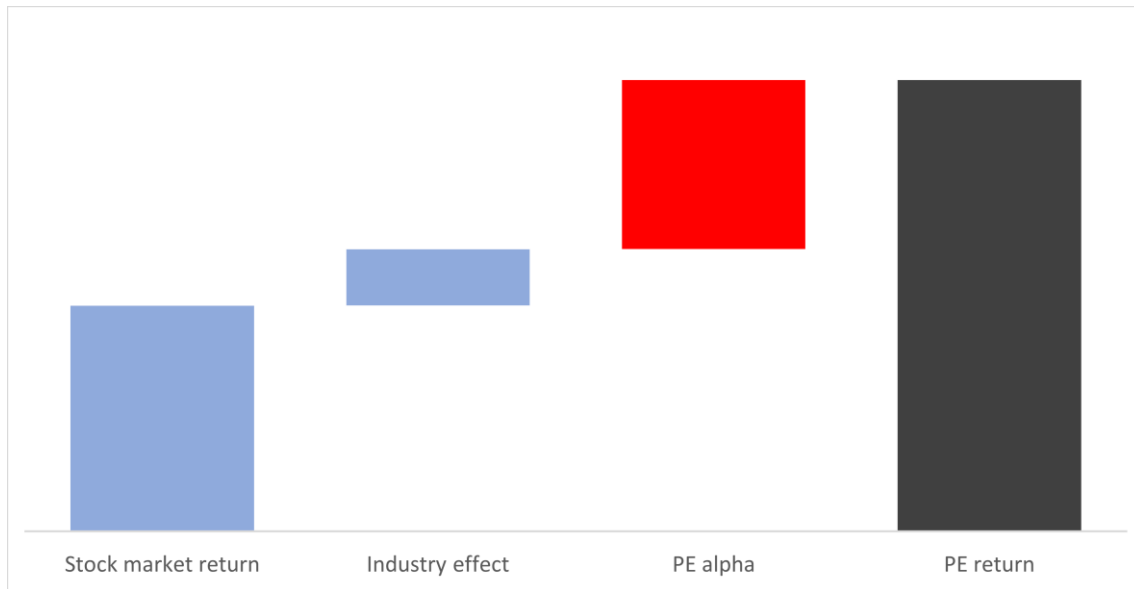
and  $\alpha > 0$  is PE outperformance.

Symbol  $a$  can be defined as the internal rate of return of the future values of the private equity portfolio's cash flows.

### 3.3. Methodology

This study uses univariate analysis to calculate and describe private equity and sector-adjusted alpha. Separation of public market equivalent, industry-specific public market equivalent and, private equity alpha will be described with a 3x4 performance matrix divided into time series from 2004 to 2012. Framework for private equity alpha adjustments has been inspired by a study made by Golding Capital Partners and Gottschalg (2014) which demonstrates the different effects generating excess returns over public

market returns and how to make private and public equity comparable. Below we will divide graphically the calculation parameters used in this study to gain a full understanding of the different returns (see figure 7).



**Figure 7.** Return adjustments of the study.

The stock market return is the earnings that could have been made in the stock market in the same period of time as the private equity investment. Industry effect will be calculated apart from the alpha calculations to adjust the results and find evidence on the industry behavior. Finally, the alpha will be the excess return of a private equity investment relative to a benchmark, and private equity return the sum of all these three components.

This study will demonstrate calculations and results for the full sample in data-available forms and for the final sample, which is the basis of this study. An example of the alpha methods will be calculated with fictional transactions so that the empirical data-based study can be informative and focused on the results, rather than introducing the framework. Private equity outperformance will be analyzed with two performance methods: KS-PME and direct alpha. Three-leveled question analysis will be formed to understand

alpha measures: 1. can private equity generate alpha compared to the public benchmark, 2. can industry/sector be a driver of alpha and does the market cycle have an effect on it, 3. are there any features of the alpha driver? (see table 5).

**Table 5.** Alpha analysis.

<b>Question</b>	
<b>1. Analysis level</b>	Can PE generate alpha versus public markets?
<b>2. Analysis level</b>	Can industry be a driver of alpha/does market cycle effect on it?
<b>3. Analysis level</b>	Are there any features of the alpha driver?

### 3.3.1. Example calculations

This chapter demonstrates example calculations for the two performance measures on alpha. As the data consists of entry values and exit values, we do not have access to annual cash flows. Therefore, we have to make some assumptions regarding data metrics and their use in this study. Below in table 6 is demonstrated the entry and exit values of a fictional portfolio company. Earnings before interest, taxes, depreciation, and amortization (EBITDA) of the company is assumed to be 7 million euros at entry and Enterprise value 56 million euros. From these two values, we get the EV/EBITDA factor of 8 ( $56/7$ ). By adding a net debt of 17 million euros to the calculations, the equity value becomes 39 million euros. With 70 million euros in sales, the entry EBITDA/Sales is 10 % ( $7/70$ ) and Debt/EV 0.30 ( $17/56$ ) (see table 6).

The holding period is assumed to be two years from the beginning of 2005 to the beginning of 2007. The realized value at that time period is 12 million euros, which means that the portfolio company has paid out to investors return equal to 12 million euros during the holding period. Unrealized value still kept in the company is assumed

to be 30 million euros and the investment cost to the company at the entry 16 million euros.

**Table 6.** Firm-level transaction values.

	<b>Entry</b>	<b>Exit</b>	<b>Change (delta)</b>
<b>EBITDA (000,000 €)</b>	7	8	1
<b>EV/EBITDA</b>	8x	9x	1x
<b>Enterprise value (000,000 €)</b>	56	72	16
<b>Net debt (000,000 €)</b>	17	14	-3
<b>Equity value (000,000 €)</b>	39	58	19
<b>Sales (000,000 €)</b>	70	88	18
<b>EBITDA/Sales</b>	10 %	9 %	-1 %
<b>Debt/EV</b>	0.30	0.19	-0.11
<b>Holding period</b>	1.1.2005	1.1.2007	2 years
<b>Realized value (000,000 €)</b>		12	
<b>Unrealized value (000,000 €)</b>		30	
<b>Cost (000,000 €)</b>	16		
<b>Capital injections (Add-on debt repays)</b>		5	
<b>Dividends</b>		3	
<b>Private equity ownership</b>	60 %		

At the exit, the EBITDA of the company increased to 8 million euros and Enterprise value to 72 million euros. The deltas for these are respectively 1 million euros and 16 million euros. The EV/EBITDA factor increased with one (9-8). Net debt at exit is 14 million euros making the change of entry and exit minus three million euros. Equity value increases at the exit to 58 million euros. With 88 million euros in sales, the entry EBITDA/Sales declines by 1 % to the exit and Debt/EV ratio by 0.11. Some of the transactions may include add-on data in which the acquired details are summed to the parent values.

Next, the return parameters for the PE portfolio firm will be presented (see table 7). The internal rate of return of the portfolio company can be calculated from the net present value formula. First, we need the equity which is 39 million euros. We can also define

the total equity at the exit, which is 58 million euros. By calculating the net present value to be equal to zero, the IRR takes a value of 21.95 %. The total value to paid-in is calculated to show the difference in results when calculating TM and TVPI. When using company transaction data, multiple of the invested capital can be formed also as Puche et. al (2015) to calculate absolute returns and contributions and distributions on a portfolio level. Unfortunately, the data does not include information about dividends so we have to exclude that from the real calculations.

**Table 7.** Firm-level absolute return parameters.

$NPV = -x_1 + \frac{x_2}{(1+r)^y} = 0$	$IRR = 21.95 \%$
$TVPI = \frac{\text{Realised value} + \text{Unrealised Value}}{\text{Invested amount}}$	$TVPI = 0.96$
$TM = \frac{\text{Change in Equity} + \text{Dividends} - \text{Capital Injections}}{\text{Entry Equity} + \text{Capital Injections}}$	$TM = 0.39$

As we have demonstrated the absolute returns metrics of the firm, the market-adjusted performance of the industry-specific portfolio can be calculated. The holding period is changed to three years to diversify the results gotten from absolute returns. At entry, EBITDA of the portfolio is 500 million euros with an enterprise value of 3500, resulting EV/EBITDA ratio of 7. Net debt is 1200 million euros and equity value 2300 million euros. Sales are 5000 million euros and EBITDA/sales is 10 %. Lastly at entry, the Debt/EV ratio was 0.34 (see table 8).

At the exit, EBITDA grew to 550 million euros resulting on a positive change of 50 million euros. EV/EBITDA ratio grew also 1.5 times making EV 1175 million euros. Net debt declined 200 million euros and equity value changed to 3675 million euros. Sales generated at exit is 5200 million euros and EBITDA/Sales grew only slightly with 0.6 %. Debt/EV ratio dropped to 10.6 % and the realized value is 450 million euros compared to the 1150 million euros still unrealized.

**Table 8.** Industry-level values.

	<b>Entry</b>	<b>Exit</b>	<b>Change (delta)</b>
<b>EBITDA (000,000 €)</b>	500	550	50
<b>EV/EBITDA</b>	7x	8.5x	1.5x
<b>Enterprise value (000,000 €)</b>	3500	4675	1175
<b>Net debt (000,000 €)</b>	1200	1000	-200
<b>Equity value (000,000 €)</b>	2300	3475	1175
<b>Sales (000,000 €)</b>	5000	5200	300
<b>EBITDA/Sales</b>	10 %	10.60 %	0.60 %
<b>Debt/EV</b>	0.34	0.21	-0.13
<b>Holding period</b>		3 years	
<b>Realized value (000,000 €)</b>		450	
<b>Unrealized value (000,000 €)</b>		1150	

When calculating the Kaplan and Schoar (2005) PME, we have to create cash flows for portfolio contributions and distributions (similarly to Gredil et. al, 2014 & Kaserer and Diller, 2004). Contributions and distributions of the portfolio must be benchmarked to public market performance daily by taking the net cash flows of the transactions from entry and exit dates. Contributions are considered as investments into the fund and distributions as net capital gains shared to 100% equity owners. We assume the public market index return to be as in below in the chart on cash flow dates which we then add to the calculations. As a result, the private equity portfolio has been outperformed its benchmark index during the holding period (see tables 9 and 10).

**Table 9.** KS-PME cash flow calculation approach.

Year	C	D	PME index
01.01.2005	100	0	100
01.01.2006	100	25	100
01.01.2007	50	150	117
01.01.2008	0	150	142

**Table 10.** Industry-level market-adjusted return parameters.

$KS - PME = 1.07$	>1, PE outperformance
$\alpha = 0.33$	>0, PE outperformance

Direct alpha (Griffiths, 2009) on the other hand can be calculated from the  $\Delta$ IRR of the portfolio taken from entry and exit data. Contributions and distributions are similarly benchmarked to the public equivalent and from the net cash flow of these benchmarked results are taken the IRR. Taking the natural logarithm of the internal rate of return and by dividing it with the preferred time interval of the return in years (in this case one year), we get the direct alpha of the fictional portfolio. Direct alpha over zero means that the private equity firm has outperformed its benchmark (see tables 9 and 10).

## 4. Empirical Results

Before presenting the results considering market-adjusted performance of private equity, it is important to demonstrate how the full sample and the final sample correlate with Standard and Poor's 500 index (SPY). For this, the internal rate of returns are created for public and private equities similar to Kaserer and Diller (2004) focusing on the private equity transactions made between 2004 and 2012. First, IRR measures are calculated separately with the preferred metrics including mean, median, and standard deviation. After this, the covariance of public market benchmark returns, and private equity returns are included with mean variables. Lastly, correlation coefficients of the samples are included to show the correlation of the asset classes.

The results indicate that public markets have generated higher absolute returns during the time period with both mean and median. The private equity IRR average was 24.33 % with a standard deviation of 70.27 % in the full sample. The final sample private equity average IRR resulted in 25.60 % with a standard deviation of 72.20 %. At the same time, public markets made an average IRR of 32.46 % with a standard deviation of 40.53 % and 31.59 % IRR with a standard deviation of 40.31 % respectively. The full sample covariance was -0.0418 and the final sample covariance -0.0412. The correlation coefficient has a value of 0.4299 in the full sample and 0.4158 in the final sample. This is explainable by the investment strategy defined in the methodology of the calculation by reinvesting the distributions into the public market index (see table 11).

Correlation coefficients of the samples and public market index can be seen as having a positive relationship. This means that public market benchmark returns correlate with private equity returns on an absolute level. However, the results indicate the correlation being less than +1 implying rather weak relationships that are not considered significant with the values around 0.42 (see table 11).

**Table 11.** Correlation coefficient.

<b>IRR</b>	<b>Full sample</b>	<b>Final sample</b>
<b>Private equity</b>		
Mean	0.2433	0.2560
Median	0.1397	0.1450
Std.Dev.	0.7027	0.7220
<b>Public markets</b>		
Mean	0.3246	0.3159
Median	0.2524	0.2461
Std. Dev.	0.4053	0.4041
Covariance	-0.0418	-0.0412
Correlation coefficient	0.4299	0.4158

#### 4.1. Full sample

Full sample performance results can be seen in table 12. Through the previous capital cycle, the public benchmark return was 25.84 % indicating quite low development. This is shown as a raw implementation of public markets to understand the basic development through the cycle. In reality, all the transactions are benchmarked from the entry date to the exit date, making the adjusted returns of the public market benchmark different from the reported ones. Due to the holding periods being on average higher than the 3-year ranges, the timeframes indicate the realization years of the private equity transactions. Private equity investments outperformed public markets with both measurement methods, KS-PME and direct alpha. KS-PME from investments made between years 2004-2012 got a value of 1.44 which indicates high outperformance over the public benchmark. Direct alpha was calculated as a per annum metric for the same investment period resulting in an average 4.14 % p.a. outperformance.

Dividing capital cycle performance into economic environments with returns realized and being active in the specific timeframes indicate also significant outperformance for

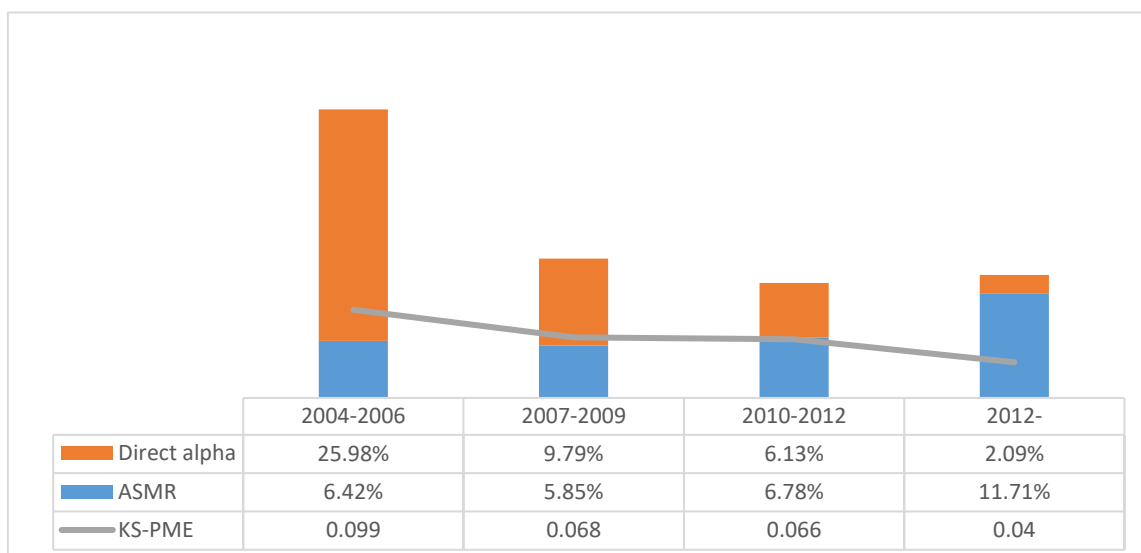
private equity. From 2004 to 2006, KS-PME and direct alpha are implicated with the highest outperformance relative to the benchmark with 1.99 and 25.98 % p.a. respectively. One explanation for the high-performance metrics in this timeframe can be the lowest sample size in realized returns and distributions being high overall. In the recession, outperformance of the private equity declined but showed still great values with 1.68 KS-PME and 9.79 % direct alpha on the transactions active during the crisis. In the moderate growth phase with transactions active in 2010-2012 and realized after 2012 alpha can be seen declining noticeably. KS-PME value drops from 1.66 to 1.40 while direct alpha drops a little over four percentage points per annum. Public benchmark return was not calculated for the transactions realized after 2012 due to not being able to measure it as a one return percentage.

**Table 12.** Full sample performance.

<u>Full sample</u>							
<i>2004-2012</i>							
Public benchmark return	25.84 %						
KS-PME	1.44						
Direct alpha	4.14 %						
<u>2004-2006</u>		<u>2007-2009</u>		<u>2010-2012</u>		<u>2012-</u>	
Public benchmark return	27.27 %	Public benchmark return	-21.31 %	Public benchmark return	27.79 %		
KS-PME	1.99	KS-PME	1.68	KS-PME	1.66	KS-PME	1.40
Direct alpha	25.98 %	Direct alpha	9.79 %	Direct alpha	6.13 %	Direct alpha	2.09 %

Adjusted stock market return (ASMR) has been calculated in figure 8 to show how private equity alpha develops through the capital cycle. KS-PME has been changed into a form that enables its development curve to be described next to percentage parameters by taking the one out of the result and dividing it by a hundred. The findings are in line with Golding Capital Partners and Gottschalg (2014) as it seems that private equity alpha is on average higher when transactions are executed in stable environment and in a recession that in boom and moderate growth times on both parameters. Private equity alpha can be considered correlating negatively with the capital market performance and

positively with different stages of the cycle confirming the hypothesis one to be valid (see figure 8).



**Figure 8.** Adjusted stock market return and alpha.

## 4.2. Final sample

Table 13 presents the final sample performance results divided into the four main GICS industries through the previous capital market cycle. Public market benchmark returns are presented to show the varying economic cycles and performance behaviors of the industries. The health care industry shows strong outperformance through the cycle with both measurements, KS-PME and direct alpha. Investments realized after 2012 had the greatest KS-PME value with 4.27 and investments realized between 2004-2006 the greatest direct alpha with 120.23 % p.a. However, there were less than five transactions on this section with very low standard deviation which can explain the result. We should also notice the performance parameters during the recession giving KS-PME value of 2.65 and direct alpha of 19.6 % p.a.

With consumer discretionary, we can also see private equity outperformance over the public benchmark, although the results show a difference in cycle performance. The results indicate that consumer discretionary performs best during the recession and after it with values of 2.33 and 2.58 when using KS-PME. On the other hand, direct alpha measure suggests the best outperformance on recession and before it with 21.18 % and 13.17 % per annum. To conclude, the consumer discretionary industry performs exceptionally well in private equity when the realization of transactions is during the years 2007 to 2009.

Consumer staples underperformed the public stock market industry index from 2007 to 2012 with KS-PME values over and under 0.70 and direct alpha of around -2 % per annum. Results from 2004 to 2006 before the recession indicated private equity outperformance but the sample contained again under 5 transactions with their respective cash flows. Returns realized after 2012 show however clear outperformance with KS-PME of 1.83 and slight outperformance with a direct alpha of 3.46 % p.a.

Industrials outperformed the public industry index in all four timeframes. Realized returns after 2012 show results that would not be considered outperformance after taking care of management fees and other costs LP's would have. KS-PME was highest after the recession with 2.88 and direct alpha before the recession with an annual return of 35.04 % making it the highest direct alpha metric in the final sample with the respective amount of cash flows.

**Table 13.** Final sample performance.

<u>Final sample</u>		<u>2004-2006</u>	<u>2007-2009</u>	<u>2010-2012</u>	<u>2012-</u>
<u>Health care (32.27 %)</u>					
	KS-PME	11.08 %	-7.23 %	28.36 %	
	Direct alpha	*2.35	2.65	2.54	4.27
	Public benchmark return	*120.23 %	19.76 %	11.85 %	12.61%
<u>Consumer discretionary (50.65 %)</u>					
	KS-PME	21.82 %	-22.39 %	59.35%	
	Direct alpha	1.45	2.33	2.58	1.82
	Public benchmark return	13.17 %	21.18%	5.74%	3.71%
<u>Consumer staples (60.24 %)</u>					
	KS-PME	19.93%	1.34%	31.85%	
	Direct alpha	*4.74	0.65	0.72	1.83
	Public benchmark return	*9.89 %	-2.24 %	-1.93 %	3.46%
<u>Industrials (24.87 %)</u>					
	KS-PME	18.97 %	-16.35 %	25.47 %	
	Direct alpha	2.26	2.80	2.88	1.15
	Public benchmark return	35.04 %	6.34%	6.69 %	0.77%

Table 14 presents the differences in industry outperformance relative to the full sample outperformance. To make these kind of calculations, we must notice the sample sizes being much smaller in the industry categories which can affect the delta values. The results indicate that the health care industry has generated better performance results in every cycle period compared to the full sample. Especially investments realized after 2012 have generated significant performance advantage for the health care industry. Consumer discretionary has made positive alpha with KS-PME in 2007 onwards with the highest value of delta 0.88 in 2010-2012. Direct alpha showed significant returns only on recession with delta 11.39 % while the full sample outperformed before and after the recession.

Full sample outperformed consumer staples industry in 2007-2012 and with direct alpha percentage point delta of 16.09. A period where consumer staples had a positive result compared to the full sample was investments realized after 2012 with delta KS-PME of 0.43 and slightly positive direct alpha delta of 1.37 percentage points. Industrials

generated positive returns with KS-PME from 2004-2012 and direct alpha from 2004-2006 and 2010-2012. Recession timeframe indicates positive returns for industrials with KS-PME but negative returns with direct alpha compared to the full sample. Overall results indicate that in this dataset only the health care industry can generate better returns in both performance metrics than the full sample.

**Table 14.** Industry performance relative to the full sample.

<u>Final sample</u>		<u>2004-2006</u>	<u>2007-2009</u>	<u>2010-2012</u>	<u>2012-</u>
KS-PME (PE)		1.99	1.68	1.66	1.40
Direct alpha (PE)		25.98 %	9.79 %	6.13%	2.09%
<u>Health care</u>					
	KS-PME (Ind.)	0.36	0.97	0.88	2.87
	Direct alpha (Ind.)	94.25 %	9.97 %	5.72 %	10.52 %
<u>Consumer discretionary</u>					
	KS-PME (Ind.)	-0.54	0.65	0.92	0.42
	Direct alpha (Ind.)	-12.81 %	11.39 %	-0.39 %	1.62 %
<u>Consumer staples</u>					
	KS-PME (Ind.)	2.75	-1.03	-0.94	0.43
	Direct alpha (Ind.)	-16.09 %	-12.03 %	-8.06 %	1.37 %
<u>Industrials</u>					
	KS-PME (Ind.)	0.27	1.12	1.22 %	-0.25
	Direct alpha (Ind.)	9.06 %	-3.45 %	0.56 %	-1.32 %

Regarding hypothesis two, this research can not denote that private equity is 'alpha' consistently across the industries. Health care, consumer discretionary, and industrials can generate outperformance over the PME while consumer staples underperform around two percentage points per annum during the recession and on moderate growth phases. This can be also explained with KS-PME values of 0.65 and 0.72.

## **5. Interpretation and conclusions**

The purpose of this study was to investigate small- and middle-cap private equity LBO investments outperformance over the public markets in Europe and to gain knowledge on how industry specifications can affect the returns throughout the previous capital cycle from 2004 to 2012. In addition, multiples and ratios for profitability, leverage, and absolute returns were calculated to demonstrate operational improvements in the portfolio companies as the basis for this research. A deal-level dataset of 2041 transactions with entries between 1989 and 2020 was used to examine private equity performance attributions with two different samples. The full sample (n=308) was used to examine if private equity can outperform the public market benchmark and if there is a correlation between different stages of the cycle. The final sample (n=209) calculations exploited the industry-specific results on alpha consistency across the industries. The performance was measured with two variables, KS-PME (Kaplan et. al, 2005) and direct alpha (Gredil et. al, 2014), with varying implications.

Due to the lack of previous researches studying private equity alpha in Europe, this thesis contributes new results into the private equity field with the large dataset. The inspiration for evaluating industry-level alpha came from research made by Golding Capital Partners and Gottschalg (2014) where returns from the US and European private equity investments were adjusted with several effects to make public and private assets comparable. The findings of this thesis support the outset of Golding Capital Partners and Gottschalg (2014) with positive alpha measures.

### **5.1. Interpretation of the results**

Private equity fund managers can create strong outperformance compared to the stock market return throughout the capital cycle with both market-adjusted performance metrics. Investments made between years 2004-2012 can generate KS-PME of 1.44 and an average direct alpha of 4.14 % annually. These findings are in line with previous studies

indicating alpha returns from 5.16 % to 12.6 % annually covering this research's timeframe almost by full (Fan et. al, 2013; Gredil et. al, 2014; Golding Capital Partners & Gottschalg, 2014). However, KS-PME as a methodology was not included in these researches.

The results indicate that the private equity alpha is highest with executed transactions before the financial crisis or recession period, and that outperformance keeps declining towards public market stock returns in the next cycle phases. Yet, private equity was able to show stable positive performance in recession with KS-PME of 1.68 and direct alpha of 9.79 % annually, supporting results by Golding Capital Partners and Gottschalg (2014). After the recession, the direct alpha metric declined significantly by 7.70 percentage points when comparing results of executed transactions after 2012 to the returns realized before 2010.

When comparing adjusted stock market returns with executed returns in private equity, it can be concluded that alpha seems to be highest at the time of biggest capital market uncertainty and lowest at the time of booms and moderate growth periods making private equity anticyclical. This can be supported with both, KS-PME and direct alpha measures. Hypothesis one can be accepted as the private equity alpha can be considered correlating negatively with capital market performance and positively with different stages of the economic environment/cycle.

Health care, consumer discretionary, and industrials sectors can create outperformance and positive alpha with KS-PME and direct alpha persistently through the capital cycle. However, the consumer staples industry seems to underperform the public stock market industry index between years 2007-2012 with around -2 % annual direct alpha and KS-PME ranging from 0.65 to 0.72. Still, we must point out that health care and consumer staples industry results from 2004-2006 contained just a few transactions that had an impact on the high-performance values gotten. Hypothesis two of this study stated that

private equity is 'alpha' consistently across the industries. After compiling the findings, we must reject hypothesis two not to be valid in this paper.

Health care is the only GICS industry in this dataset that can generate excessive returns with both alpha measures over the full sample private equity performance. Particularly, health care transactions realized after 2012 had a significant positive delta KS-PME of 2.87 and direct alpha of 10.52 percentage points per annum. By making these kinds of assumptions, we must notice that the results in private equity industry performance are not fully comparable to the full sample returns due to the much smaller sample sizes which affects the standard deviation of the industry sample variables. This naturally makes the full sample performance measures more stable.

Operational improvement metrics were calculated as a side note to see if target companies can create value during the holding period. Results indicate that private equity firms can increase enterprise value and sales during the holding period in both samples. Debt/EV ratio decreased and EV/EBITDA ratio increased only in the final sample indicating selling multiples to grow from the acquirement only in the smaller sample on average. Absolute return metrics IRR, TM and, TVPI showed strong average returns on both samples with gross values supporting the market adjusted performance results.

## **5.2. Limitations**

Limitations of this research focus on the unavailable information on dividends and the assumption of net debt equaling debt in the calculations. These adjustments affect the contributions calculated for portfolio transactions and further on to the results. Also, the calculations are gross-of-fees returns including expenses such as management fees so this study cannot make assumptions on the net-of-fees returns and their outperformance over the public markets. Furthermore, the data was collected from various fund managers presenting the transaction values with different practices. As a result, unifying assumptions were made to make the transactions comparable.

### **5.3. Suggestions for future research**

As the availability for private equity data especially on European transactions is difficult to get access to, demand for papers investigating private equity performance is high. Further researches should aim the focus on net-of-fees performance in Europe covering larger datasets on sectors focusing on technology, energy solutions, and financials. As the debate intensifies around private equity performance abilities in recent decades, researches focusing on the aftermath of the financial crisis would offer new insights on this question. Furthermore, with a different set of data and research questions, it would be interesting to see how committed capital affects the PE funds growth and profit.

## References

- Aigner, P., Albrecht, S., Beyschlag, G., Friederich, T., Kalepky, M., & Zagst, R. (2008). What Drives PE? Analyses of Success Factors for Private Equity Funds. *The Journal of Private Equity*, 11(4), pp. 63-85.
- Andrade, G., & Kaplan, S. (2002). How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. *The Journal of Finance*, 53(5), pp. 1443-1493.
- Ang, A., Chen, B., Goetzmann, W., & Phalippou, L. (2018). Estimating Private Equity Returns from Limited Partner Cash Flows. *The Journal of Finance*, 73(4), pp. 1751-1783.
- Appelbaum, E., & Batt, R. (2014). *Private Equity at Work: When Wall Street Manages Main Street*. New York, Russel Sage Foundation.
- Axelson, U., Strömberg, P., & Weisbac, M. (2009). Why Are Buyouts Levered? The Financial Structure of Private Equity Funds. *The Journal of Finance*, 4, pp. 1549-1582.
- Bain & Company. (2018). *Global Private Equity Report 2019*. Retrieved from: [https://www.bain.com/contentassets/875a49e26e9c4775942ec5b86084df0a/bain\\_report\\_private\\_equity\\_report\\_2019.pdf](https://www.bain.com/contentassets/875a49e26e9c4775942ec5b86084df0a/bain_report_private_equity_report_2019.pdf).
- Bain & Company. (2019). *Global Private Equity Report 2020*. Retrieved from: [https://www.bain.com/globalassets/noindex/2020/bain\\_report\\_private\\_equity\\_report\\_2020.pdf](https://www.bain.com/globalassets/noindex/2020/bain_report_private_equity_report_2020.pdf).
- Baldi, F. (2015). *The Economics of Leveraged Buyouts*. G. Giappichelli.

- Braun, R., Jenkinson, T., & Stoff, I. (2017). How persistent is private equity performance? Evidence from deal-level data. *Journal of Financial Economics*, 123, pp. 273-291.
- Brown, G., Gredil, O., & Kaplan, S. (2019). Do private equity funds manipulate reported returns? *Journal of Financial Economics*, 132, pp. 267-297.
- Buchner, A. (2014). The Alpha and Beta of Private Equity Investments. SSRN Electronic Journal.
- Buchner, A., Mohamed, A., & Schwienbacher, A. (2016). Does risk explain persistence in private equity performance? *Journal of Corporate Finance*, 39, pp. 18-35.
- DeGeorge, F., & Zeckhauser, R. (1993). The Reverse LBO Decision and Firm Performance: Theory and Evidence. *Journal of Finance*, 48(4), pp. 1323-1348.
- Demaria, C. (2010). Introduction to Private Equity. *Wiley*.
- Demaria, C. (2013). Introduction to Private Equity: Venture, Growth, LBO and Turn-Around Capital. *John Wiley & Sons, Incorporated*.
- Driessen, J., Phalippou, L., & Lin, T.-C. (2013). A new method to estimate risk and return of non-traded assets from cash flows: the case of private equity funds. *Journal of Financial and Quantitative Analysis*, 47(3), pp. 511-535.
- Ewens, M., Jones, C., & Rhodes-Kropf, M. (2013). The Price of Diversifiable Risk in Venture Capital and Private Equity. *The Review of Financial Studies*, 26(8), pp. 1854-1889.
- Fan, F., Fleming, G., Warren, G. (2013). The Alpha, Beta, and Consistency of Private Equity Reported Returns. *The Journal of Private Equity*, 16(4), pp. 21-31.

- Fang, L., Ivashina, V., & Lerner, J. (2015). The disintermediation of financial markets: Direct investing in private equity. *Journal of Financial Economics*, 116, pp. 160-178.
- Franzoni, F., Nowak, E., & Phalippou, L. (2012). Private Equity Performance and Liquidity Risk. *Journal of Finance*, 67(6), pp. 2341,2373.
- Golding Capital Partners & Gottshalg, O. (2014). Success in private equity is repeatable. Retrieved from: <https://www.goldingcapital.com/fileadmin/news/publications>.
- Gompers, P., Kaplan, S. N., & Mukharlyamov, V. (2016). What do private equity firms say they do? *Journal of Financial Economics*, 121(3), pp. 449-476.
- Gottschalg, O., Acharya, V., Hahn, M., & Kehoe, C. (2013). Corporate Governance and Value Creation: Evidence from Private Equity. *The Review of Financial Studies*, 26(2), pp. 368-402.
- Gredil, O., Griffiths, B., & Stucke, R. (2014). Benchmarking Private Equity: The Direct Alpha Method. SSRN Electronic Journal.
- Griffiths, B. (2009). Estimating Alpha in Private Equity, in Oliver Gottschalg (ed.). *Private Equity Mathematics*. PEI Media.
- Harris, R., Jenkinson T., & Kaplan, N. (2014). Private Equity Performance: What Do We Know? *Journal of Finance*, 69, pp. 1851-1882.
- Holthausen, R., & Larcker, D. (1996). The financial performance of reverse leveraged buy-outs. *Journal of Financial Economics*, 42(3), pp. 293–332.

- Intertrust. (2018). Disruptive technology in financial services: Are you focused on the future? Research Report. Retrieved from: <https://www.intertrust-group.com/~media/Files/I/Intertrust-Group/Research%20Materials/Disruptive%20Technology%20Report%20FINAL.pdf>.
- Insead. (2019). Measuring Private Equity Fund Performance: Background note. Retrieved from: [https://www.insead.edu/sites/default/files/assets/dept/centres/gpei/docs/Measuring\\_PE\\_Fund-Performance-2019.pdf](https://www.insead.edu/sites/default/files/assets/dept/centres/gpei/docs/Measuring_PE_Fund-Performance-2019.pdf)
- Invest Europe. (2020). Investing in Europe: Private Equity Activity 2019. Statistics on Fundraising, Investments and Divestments.
- Jenkinson, T., Sousa, M., & Stucke, R. (2013). How Fair are the Valuations of Private Equity Funds? *SSRN Electronical Journal*, pp. 1-28.
- Kaplan, S., & Schoar, A. (2005). Private Equity Performance: Returns, Persistence, and Capital Flows. *Journal of Finance*, 60, pp. 1791-1823.
- Kaserer, C. (2011). Return Attribution in Mid-Market Buy-Out Transactions – New Evidence from Europe. Research Report Series. Available at: SSRN 1946110. Retrieved from: [https://www.hvca.hu/wp-content/uploads/2012/01/Return.Atribution.PE\\_.kaserer.pdf](https://www.hvca.hu/wp-content/uploads/2012/01/Return.Atribution.PE_.kaserer.pdf).
- Kaserer, C., & Diller, C. (2004). European private equity funds – a cash flow based performance analysis. *CEFS Workin paper*, 1, 1-47.
- Korteweg, A., & Sorensen, M. (2017). Skill and luck in private equity performance. *Journal of Financial Economics*, 124, 535-562.
- Lerner, J., Schoar, A., & Wongsunwai, W. (2007). Smart institutions, foolish choices: the limited partner performance puzzle. *Journal of Finance*, 62(2), pp. 731–64.

- Lerner, J., Schoar, A., Mao, J., & Zhang, N. (2018). Investing outside the box: Evidence from alternative vehicles in private capital. *NBER Working Paper Series*, pp. 1-42.
- Ljungqvist, A., & Richardson, M. (2003). The cash flow, return and risk characteristics of private equity. *NBER Working Paper Series*, 9454, pp. 1-43.
- Long, A., & Nickels, C. (1996). A Private Investment Benchmark. The University of Texas System, AIMR Conference on Venture Capital Investing.
- Marquez, R., Nanda, V., & Yavuz, M. (2010). Private equity fund returns: do managers actually leave money on the table? Working Paper. Retrieved from: <http://ideas.repec.org/p/ecl/upafin/10-24.html>.
- Metrick, A., Yasuda, A. (2011). Venture Capital and Other Private Equity: a Survey. *European Financial Management*, 17(4), PP. 619-654.
- Muscarella, C., & Vetsuypens, M. (1990). Efficiency and organizational structure: a study of reverse LBOs. *Journal of Finance*, 45(5), pp. 1389–413.
- Opler, T., Titman, S. (1993). The determinants of leveraged buyout activity: free cash flow vs financial distress costs. *Journal of Finance*, 48(5), pp. 1985–99.
- Pantheon. (2015). It's the Alpha, Stupid! Value Creation and the Business Cycle. Report. Retrieved from: <http://www.pantheon.com/wpcontent/uploads/2015/10/InFocus-Value-Creation-and-theBusiness-Cycle.pdf>. Accessed 17 March 2016.
- Pastor, L., & Stambaugh, R. (2003). Liquidity risk and expected stock returns. *The Journal of Political Economy*, 111(3), pp. 642-685.

- Phalippou, L. (2010). Venture capital funds: flow-performance relationship and performance persistence. *Journal of Banking & Finance*, 34(3), pp. 568–77.
- Phalippou, L., & Gottschalg, O. (2009). The performance of private equity funds. *Review of Financial Studies*, 22(4), pp. 1747–76.
- Pignataro, P. (2013). *Leveraged Buyouts: A Practical Guide to Investment Banking and Private Equity*. John Wiley & Sons, Incorporated.
- Puche, B., Braun, R., & Achleitner, A. (2015). International evidence on value creation in private equity transactions. *Journal of Applied Corporate Finance*, 27(4), pp. 105–122.
- Pushner, G., & Viscio, P. (2019). Measuring Alpha for Private Equity: The Duff and Phelps Created Value Attribution Whitepaper Series. Working paper. Retrieved from: <https://www.duffandphelps.com/-/media/assets/pdfs/publications/valuation/measuring-alpha-for-private-equity.pdf>
- Robinson, D., & Sensoy, B. (2016). Cyclicalities, performance measurement, and cash flow liquidity in private equity. *Journal of Financial Economics*, 122, pp. 521–543.
- Rouvinez, C. (2003). Private equity benchmarking with PME+. *Private Equity International*, pp. 34–38.
- Stowell, D. (2010). *Investment Banks, Hedge Funds, and Private Equity*. Academic Press 2010.
- Talmor, El., Vasvari, F., & Talmor, Ez. (2011). *International Private Equity*. Wiley 2011.

Valkama, P., Maula, M., Nikoskelainen, E., & Wright, M. (2013). Drivers of holding period firm-level returns in private equity-backed buyouts. *Journal of Banking & Finance*, 37(7), pp. 2378-2391.

van Swaay, H., Megally, E., & Leleux, B. (2015). Private Equity 4.0: Reinventing Value Creation. *Wiley & Sons, Incorporated*.