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Effect of Capital Inflows and Fund Sizes on Private Equity Performance

School of Accounting and Finance
Master's thesis in Finance
Master's Degree Programme in Finance

Vaasa 2024

UNIVERSITY OF VAASA
School of Accounting and Finance
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Title of the Thesis: Effect of Capital Inflows and Fund Sizes on Private Equity Perfomance
Degree: Master's in Finance
Programme: Finance
Supervisor: Klaus Grobys
Year: 2024 **Pages:** 65

ABSTRACT:
Private equity markets have grown significantly in Europe in the last few decades and are an important part of European financial markets nowadays. Originally private equity investing emerged in the United States and is a relatively new asset class that has become more common in the last decades. Private equity funds help their portfolio companies to grow, and they influence the whole economy.

Private equity investing differs from stocks and mutual funds, for instance, PE funds are not traded publicly on the stock exchanges. Typically, only institutional investors can invest in private equity funds, because they require significant amounts of capital. Private equity investing is an illiquid asset class, where the investment horizon is long, often ten years. Private equity funds invest in non-listed stocks. There are different categories of funds. Venture capital funds invest in new start-up companies that have scalable business models. Whereas, leveraged buyouts acquire large companies using high leverage, maximizing returns with only a little own equity.

This thesis focuses on studying the connection between fund performance and capital inflows in European private equity funds between 2008 to 2022. Most of the previous studies have focused on the United States private equity markets, and they have found a negative connection between returns and capital inflows. Returns are measured as the internal rate of return with a sample of 284 funds and multiple on invested capital with a sample of 254 funds. OLS regression is used to examine the connection. This thesis finds that there is a negative connection between capital inflows and returns when using multiple on invested capital. The negative connection cannot be confirmed using the internal rate of return.

The second part of the study focuses on studying the effects of fund size on fund performance. Previous literature has no consensus about the connection between returns and fund size. Some studies conclude that larger funds have higher performance, whereas some studies indicate that there is no connection. Private equity fund sizes differ significantly, the smallest being hundreds of thousands of euros and the largest being billions of euros. OLS regression analysis is used to conduct the study. This thesis finds no connection between private equity fund size and returns in Europe.

KEYWORDS: Buyout, Venture Capital, Private equity, Capital inflow, Fund size

Vaasan yliopisto
School of Accounting and Finance
Tekijä: Jonne Seppälä
Työn nimi: Effect of Capital Inflows and Fund Sizes on Private Equity Perfomance
Tutkinto: Kauppatieteiden maisteri
Koulutusohjelma: Rahoitus
Työn Ohjaaja: Klaus Grobys
Valmistumisvuosi: 2024 **Sivumäärä:** 65

Tiivistelmä:
Pääomasijoitusmarkkinat ovat kasvaneet Euroopassa huomattavasti viimeisen kahdenkymmenen vuoden aikana ja ovat nykyään tärkeä osa Euroopan sijoitusmarkkinoita. Alun perin pääomasijoittaminen on lähtöisin Yhdysvalloista ja se on suhteellisen uusi omaisuusluokka, joka on yleistynyt vasta viimeisten vuosikymmenten aikana. Pääomasijoitusrahastot auttavat yrityksiään kehittymään ja kasvamaan, millä on vaikutusta koko talouteen.

Pääomasijoittaminen eroaa pörssinoteeratuista osakkeista ja rahastoista esimerkiksi siten, että pääomarahastot eivät ole julkisen kaupankäynnin kohteena. On tyypillistä, että vain institutionaaliset sijoittajat voivat sijoittaa pääomarahastoihin, koska niihin sijoittamiseen vaaditaan paljon pääomaa. Pääomasijoittaminen on epälikvidi omaisuusluokka, jossa sijoitusaika on pitkä, usein kymmenen vuotta. Pääomarahastojen sijoituskohteet ovat ei-listattuja yhtiöitä. Pääomasijoitusrahastoja on erilaisia. Riskipääomarahastot sijoittavat nuoriin kasvuhakuisiin yrityksiin, joiden liiketoimintamalli on skaalautuva. Kun taas osa pääomarahastoista keskittyy ostamaan suurempia yhtiöitä, hyödyntäen suurta velkavipua, maksimoiden tuotot käyttäen omaa pääomaa mahdollisimman vähän.

Tämä pro gradu tutkielma selvittää eurooppalaisten pääomarahastojen tuottojen ja sijoitetun rahavirtojen yhteyttä vuosien 2008 ja 2022 välisenä aikana. Aikaisemmat tutkimukset ovat enimmikseen keskittyneet Yhdysvaltojen pääomasijoitusmarkkinoille, löytäen negatiivisen yhteyden rahastojen tuottojen ja rahavirtojen välillä. Pääomasijoitusrahastojen tuottoa mitataan tässä tutkielmassa kahdella mittarilla, sisäisellä korkokannalla, jossa otos käsittää 284 rahastoa ja sijoitetun pääoman kertoimella, jossa otos on 254 rahastoa. Tutkimus toteutetaan OLS regressiolla. Kun tuottoja mitataan sijoitetun pääoman kertoimella tulokset ovat linjassa aikaisempien tutkimusten kanssa. Tuotot ovat negatiivisesti yhteydessä rahavirtoihin. Sisäisellä korkokannalla mitattaessa ei voida vahvistaa negatiivista yhteyttä.

Tutkimuksen toinen osa keskittyy tutkimaan pääomasijoitusrahastojen tuottojen ja rahaston koon yhteyttä. Kirjallisuudessa ei ole vallitsevaa konsensusta, onko tuotoilla ja rahaston koolla yhteyttä. Osa tutkimuksista on päätynyt siihen, että suuremmat rahastot tuottavat paremmin, kun taas osa tutkimuksista ei ole löytänyt yhteyttä niiden välillä. Pääomasijoitusrahastojen koko vaihtelee paljon, pienimpien ollessa satojatuhansia euroja ja suurimpien rahastojen ollessa miljardeja euroja. Tuottojen ja rahaston koon yhteyttä tutkitaan OLS regressioanalyysillä. Tämä tutkimus ei löydä yhteyttä pääomasijoitusrahastojen koon ja niiden tuottojen väliltä Euroopassa.

Avainsanat: Buyout, Venture Capital, Private equity, Capital inflow, Fund size

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1 Introduction

Private equity (PE) investing has emerged as an important asset class across the financial markets around the globe. It is a relatively new asset class, as the first venture capital (VC) firm was founded in the 1940s (Lerner, 1999), and buyout (BO) transactions became more popular in the 1970s (Kaserer & Stucke, 2013). Private equity investing originates from the United States, but steadily it has spread to the United Kingdom, rest of the Europe, and the world. Ever since it has become an important part of European financial markets. Private equity investments help the economy to grow, and venture capital funds constantly fund new start-up companies to develop innovative products and solutions, whereas buyout funds streamline existing companies and help them increase their market shares. The common feature of all private equity funds is that they aim to enhance their portfolio companies. Ever since buyout transactions boomed in the 1980s and venture capital investments became more popular in the 1990s, researchers have tried to find an answer to what drives the returns. Previous studies have examined factors affecting the deal level, fund level, as well as asset class, and macroeconomic level.

Private equity investments have risen substantially during the last 25 years in Europe. Private equity investments account for over 0,6% of the European GDP, being the highest in Luxembourg and France. The most important sectors are information and communication technologies and consumer goods and services coming in second. (Invest Europe, 2023a). The capital flows to European PE funds were roughly 20 billion euros in the year 1997 (European Central Bank, 2005), whereas the amount invested in the PE funds was over 170 billion euros in 2022 (Invest Europe, 2023a). Approximately 65% of the funds go to buyout funds and 14% to venture capital funds. This thesis examines the relationship between returns and capital inflows in the 2010s in Europe. Kaplan and Schoar (2005) are the first ones to introduce the connection. They provide evidence that fund performance and money flows to PE funds are negatively connected. After periods where capital inflows to private equity funds are high, fund performance weakens. Kaplan and Strömberg (2009) and Harris et al. (2014) study US private equity

markets in the 1980s, 1990s, and 2000s and have similar conclusions. The findings are robust. Moreover, Diller and Kaserer (2009) study the European PE market in the 1980s, 1990s, and the beginning of the 2000s, and find that there is a similar negative connection between returns and capital inflows.

Simultaneously, when capital inflows and the PE market have grown substantially, fund sizes have been growing too, hence this thesis studies the connection between returns and fund size as well. Interestingly, there is contradictory evidence on the impact of fund size on the returns. Kaplan and Schoar (2005) have evidence that PE funds benefit from increasing fund size until a certain point after the benefit disappears. Nikoskelainen & Wright (2007) conclude that larger buyouts perform better. Gianfrate and Loewenthal (2016) have similar conclusions. Harris et al. (2014) have opposite findings that there is no connection between returns and fund size.

Returns and risk are important parts of the discussion of private equity investing. Moreover, it has raised a question about whether PE funds outperform or underperform public equity. Quantifying returns differs from public equity in a couple of ways. First, listed stocks are traded daily but PE funds report returns of their investments quarterly. Moreover, returns are realized only after the PE fund exits its portfolio company, which often takes years. Hence, interim returns usually differ from final returns. This affects specifying the risk of the investments as well. Because there are no regular and concise time-series returns, risk cannot be measured in similar ways as in publicly listed companies. Private equity funds report the returns themselves. Returns can be measured in absolute and relative metrics. Absolute metrics include internal rate of return (IRR), multiple on invested capital (MOIC), distributed total value of paid-in capital (DPI), and cumulative total value of paid-in capital (TVPI) for instance The usual way to compare PE returns to stock market returns is to use the public market equivalent. PME calculation compares the cash flows of PE investment to investment in a public market index, typically the S&P 500 in the US and the MSCI Europe Index in Europe, over the

same period. If PME results over 1, PE investment outperforms the chosen stock index. (Kaserer & Stucke, 2013).

Buyout and venture capital funds improve their portfolio companies in several ways. When they invest in the target company they acquire board seats and veto rights. They can set performance-based compensation for the managers and they actively govern their investments. Especially, leveraged buyouts (LBO), improve the operating performance of the portfolio companies. Kaplan and Strömberg (2009) and Achleitner et al. (2010) find evidence that buyout-backed companies experience higher operating performance. Some studies suggest that focusing on growing revenue results in better returns. (Ayash et al., 2017). Leveraged buyouts use a substantial portion of the debt to finance the acquisitions, hence, it has been the object of several studies. Axelson et al. (2013) conclude that the capital structures of PE firms differ from listed stocks. Guo et al. (2011) have evidence that risks of buyout transactions have declined since the 1980s. Having higher leverage can lead to higher returns but operating improvements are still important and the importance is emphasized in the declining markets.

There is evidence that some GPs can outperform others continuously and the skill of the general partners (GP) and limited partners (LP) affect the returns. Kaplan and Schoar (2005) argue that skilled GPs do not increase their fund size. Metric and Yasoda (2011) argue that reputation has a crucial role in the VC markets. GPs have different investing and exit styles which affect performance (Ewens & Rhodes-Kropf, 2015). Giot and Swienbacher (2007) find that initial public offerings (IPO) are the preferred exit way. Other exit ways include trade sales, secondary sales, or liquidation. During crisis times in the market, PE funds survive relatively well. Gianfrate and Loewenthal (2016) find that PE funds exhibited betas under 1 during the 2007-2009 financial crisis, meaning less exposure to market returns. Moreover, GPs can adjust their investments and move investments away from sectors that are the most severely impacted (Stark and Lauterbach, 2021).

Private equity comprises several sub-categories. Those are buyouts, venture capital, mezzanine financing, and distressed investing. Buyouts are the largest category when measured in value, whereas venture capital is the largest measured in the number of deals. Moreover, buyouts have sub-categories, that are leveraged buyouts and management buyouts (MBO). In LBOs, PE firms acquire the target company using mostly debt to maximize returns. Cash flows and assets serve as collateral for the debt. In MBOs, the existing management team of the firm buys a controlling stake in the firm with the help of a PE firm. Typically, buyout funds concentrate on mature and large companies, whereas venture capital funds invest in early-stage firms that have scalable business models and aim to grow fast. (Metrick & Yasoda, 2011). The structure and the investing process of PE funds differ in multiple ways from public equity. PE firms invest in private firms with the exception of public-to-private transactions where a company is bought off from the stock exchange. Private equity is an illiquid asset class and there exist notable information asymmetries. (Metrick & Yasoda, 2011)

1.1 Purpose of the study

As private equity investing has grown as an asset class, the amount of research papers has grown as well. Private equity markets have existed longest in the US and therefore it is more studied than the European PE market. Although private equity is a popular subject in the field of financial studies there is only one study concerning returns and capital inflows in European private equity markets as far as the writer of this thesis is aware.

The purpose of this thesis is to analyze the European private equity market and find if capital inflows have a similar influence on returns as observed in the US private equity markets. The findings of Kaplan and Schoar (2005), Kaplan and Strömberg (2009), and Harris et al. (2014) provide evidence that increasing capital commitments to private equity funds influence negatively subsequent returns. There is evidence that a similar phenomenon exists in the European PE markets by Diller and Kaserer (2009) who study BO and VC funds. However, their data is from funds between 1980 to 2003, which is over

20 years old. As the PE market has evolved and especially as the amounts invested in the PE funds have grown notably it is important to study if it has an influence on the phenomenon. This research concentrates on buyouts and venture capital funds because they are the largest private equity subclasses (Metrick & Yasoda, 2011).

Furthermore, this thesis studies the connection between fund performance and fund size. It is ambiguous if fund size is connected to the fund performance. Harris et al. (2014) find no connection between returns and size whereas, Kaplan and Schoar (2005) and Gianfrate and Loewenthal (2016) find that larger funds perform better. The purpose of this paper is to clarify these contradicting findings and find if there is a connection between these variables in the European PE markets.

This paper adds to existing literature and research by studying European private equity markets with the latest data available. This thesis sheds light on the questions about capital inflows and fund sizes.

1.2 Hypotheses

The first hypothesis of the study concentrates on the effect of capital inflows on returns and it is constructed on the previous literature. Several studies (Diller & Kaserer, 2009; Harris et al., 2014; Kaplan & Schoar, 2005; Kaplan & Strömberg, 2009) have found a negative connection between capital inflows and fund performance. After periods when private equity funds have raised more capital, there follows a period of weaker returns. Hence, the first hypothesis of this thesis is the following.

H_1: There is a negative relationship between private equity fund performance and capital inflows.

The second hypothesis is related to the size of the fund and returns. Fund size is the amount of capital that an individual fund has raised during the fundraising period. Previous literature has found contradictory evidence that returns and fund size are

connected. Gianfrate and Loewenthal (2016), Kaplan and Schoar (2005), and Nikoskelainen and Wright (2007) have evidence that returns and size are positively connected. Harris et al. (2014) argue that they do not have a connection. Since the study will be conducted in the same way as in Harris et al. (2014) paper, the second hypothesis of the study is the following.

H_2: There is no relationship between returns and fund size.

1.3 Structure of the study

After the introduction part, the second chapter discusses the differences between private equity and public equity. The chapter highlights the structure of the PE funds and investing process. Moreover, development and present state are discussed as well. The third chapter presents the findings of factors that influence returns. The fourth chapter discusses the private equity returns. The fifth chapter presents the data and methodology of this thesis. The sixth chapter presents the findings of the study and discusses them. The last chapter concludes this thesis, discusses the results, and limitations, and suggests future research.

2 Private equity characteristics, structure, and developments

2.1 Private equity characteristics

Metrick and Yasoda (2011) list four key ways in which public equity and private equity differ. The first distinction is that a private equity fund is a financial intermediary that raises capital from investors and directly invests that capital in target firms, meaning that PE funds do not have significant amounts of their own capital. That distinguishes them from angel investors and private investment companies that invest their own capital.

The second distinction is the structure of PE firms. PE firms operate as limited partnerships, with the PE firm serving as the general partner (GP). Investors in private equity funds, referred to as limited partners (LP), often include institutional investors such as pension funds, banks, insurance companies, and endowments. Wealthy individuals can be LPs as well. Private equity firms are not required to disclose financial statements, whereas that is required from listed companies, mutual funds, and hedge funds highlighting the information asymmetry that exists among PE firms. (Metrick & Yasoda, 2011).

Thirdly, Private equity sets itself apart further by assuming an active role in the companies it invests in. Private equity funds generally secure board seats, use veto rights, and control rights, providing them with a means to influence the companies in which they invest. (Metrick & Yasoda, 2011).

The fourth difference to public equity is that private equity funds have a limited lifespan and therefore an important part of the process is the different exit strategies to realize returns. Exit strategies play an important role in PE funds because GPs need to return the capital to LPs. Exit strategies encompass options such as initial public offerings, divestment to another private equity fund, or acquisition by a larger corporation. (Metrick & Yasoda, 2011).

2.2 Structure of the private equity funds

The private equity funds are organized as limited partnerships, with GPs overseeing the fund's operations while LPs contribute capital. In this setup, investors commit specific amounts of capital to finance investments and cover management fees for the private equity firm. The private equity firm assumes the role of the fund's general partner and typically contributes approximately one percent of capital to the fund. (Metrick & Yasoda, 2011).

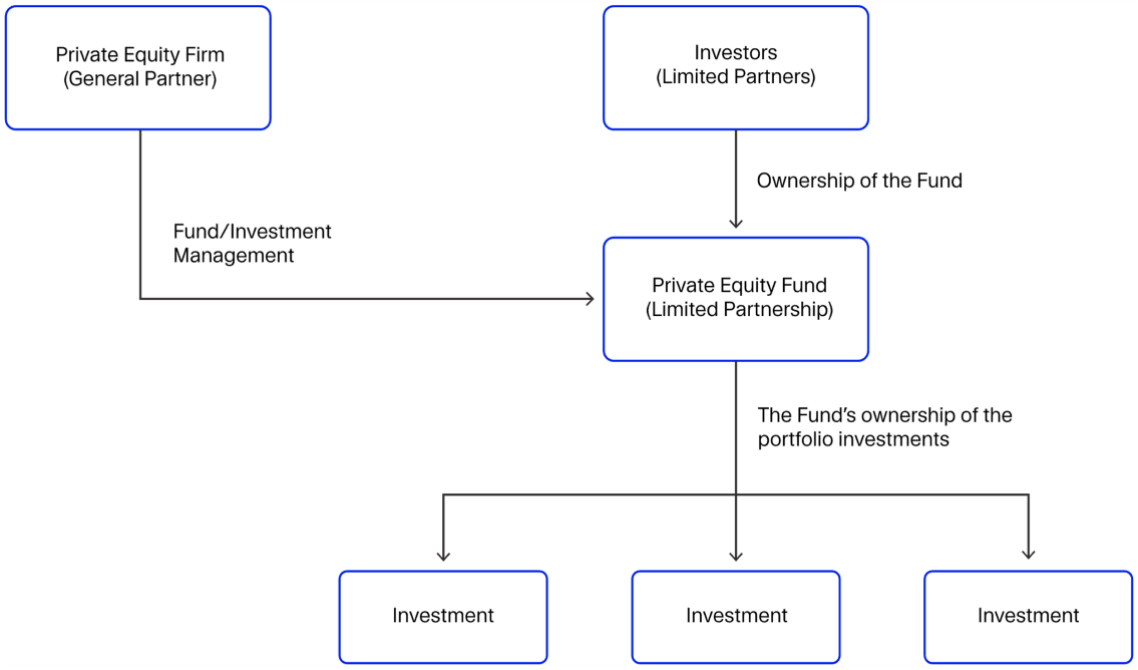

Figure 1. Private equity structure (Espinosa, 2023).

The lifetime of private equity funds is circa 10 years, with the option to extend for up to three years. Once the fund has secured investments, the general partners take charge of making investment decisions. Within a five-year timeframe, the GP invests the committed capital in various target firms, followed by an additional five to eight years to return the capital to investors. Limited partners who invest capital cannot influence the investment decisions. GPs receive compensation through an annual management fee, a percentage of realized investments known as carried interest, and typically set at 20%.

Furthermore, possible deal and monitoring fees may be charged to portfolio companies, in addition to the carried interest. (Kaplan & Strömberg, 2009).

At the fund level, BOs and VCs share similar structures. However, at the deal level, differences arise in the contracts between VCs and BOs. Typically, VC GPs acquire minority stakes and employ convertible securities, which can be syndicated and staged over multiple rounds. On the other hand, BO investments involve acquiring controlling stakes through a combination of equity and debt. Despite these variations, both VC and BO deal structures aim to manage portfolio companies. Furthermore, both VC and BO contracts at the deal level provide board seats to GPs to advise and monitor their investments. (Metrick & Yasoda, 2011).

Table 1. Main differences between BO and VC funds (Metrick & Yasoda, 2011).

	Buyout	Venture capital
Target company stage	Mature industries	Early stage companies
Acquired %	Controlling stake	Minority stake
Investment sum	Typically +100 million $	Typically 1-10 million $
Structure	Equity + debt	Equity
Company types	All industries	Focus on start-ups, growth companies

In a typical leveraged buyout a target company is purchased at a premium if the target company is publicly traded. The purchase is funded with debt, up to 90 percent resulting in a leveraged buyout. LBO transactions use both senior and junior debt. Senior debt is issued by banks and is secured, whereas junior debt is unsecured and subordinated to senior debt and financed by mezzanine debt or high-yield bonds. The remaining acquisition price is covered by the PE firm that invests its funds as equity, additionally, a new management team of the acquired company can invest a small proportion of equity. (Kaplan & Strömberg, 2009). Debt used in LBO transactions and the staged capital

commitment process in VC deals function likewise both aiming to control excess cash flows from portfolio companies. (Metrick & Yasoda, 2011).

The relationship between VCs and entrepreneurs follows the principal-agent models utilized in contract theory. Convertible securities, which combine equity and debt features, are a popular approach in VC investments. The use of convertible contracts in the venture industry allows VCs to convert their investments into equity or fixed debt at a future date, offering flexibility in addressing failure risk and valuation uncertainty (Gurudpesh, 2021). Convertible securities are particularly useful in mitigating conflicts that may arise from future sales to third parties, protecting against dilution and expropriation. They also serve as incentive properties, which are crucial to a startup's success when the investor's effort is essential. Convertible preferred stock addresses double moral hazard by allocating more cash flow rights to VCs in acquisitions than in IPOs. Staged financing shields VCs from inefficient project continuation. Fixed fund sizes and staged financing may enhance both VC bargaining power and entrepreneurial incentives. (Metrick & Yasoda, 2011).

Metrick and Yasoda (2011) argue that there is a distinct contrast in the compensation models utilized by BO and VC GPs. BO GPs usually charge transaction and monitoring fees to their portfolio companies up front, which are distinct from management fees paid by fund investors. These fees may be shared with investors or used to offset management fees. Nevertheless, when leverage is increased, transaction and monitoring fees can become a substantial part of expected carry. Consequently, higher leverage resulting in larger portfolio company fees may reduce the monitoring incentives of BO GPs to maximize firm value and earn carry. The credit market conditions have a significant impact on buyout prices, and high leverage adversely affects fund performance. When the junk bond market rises, both buyout investors and management teams tend to take more money upfront from transactions, leading to agency problems between BO fund managers and investors when cheap debt is available, allowing managers to pocket significant upfront fees. (Metrick & Yasoda, 2011).

VC funds concentrate on new and fast-growing companies. Often important criterion for VC funds is that the business model can be scalable. Buyout funds concentrate more on large and mature companies. (Metrick & Yasoda, 2011).

2.3 Private equity process

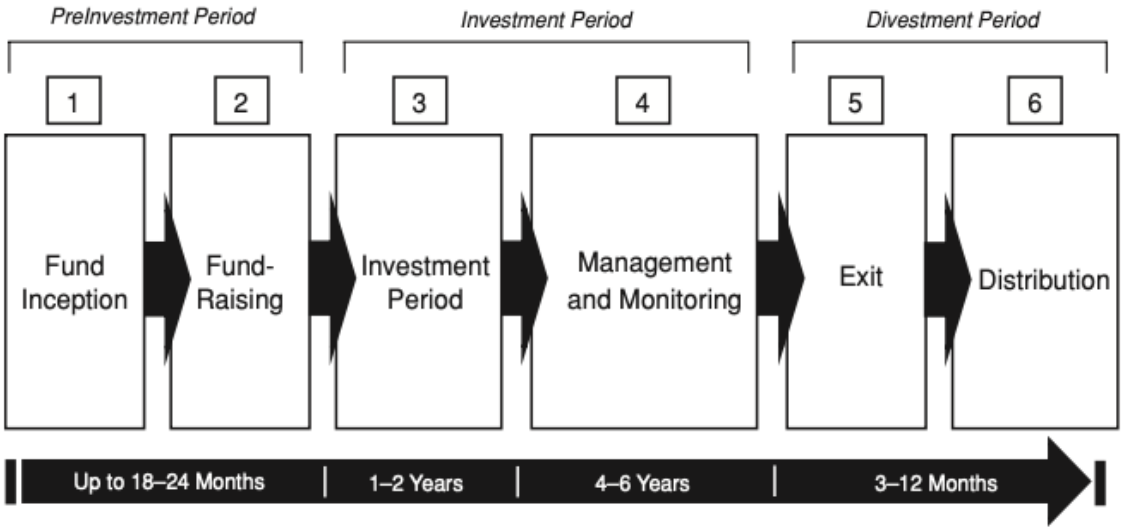

Figure 2. Private equity process (Kaserer & Stucke, 2013).

The private equity investment process starts with the pre-investment phase. It consists of the inception of the fund and raising capital. Important decisions are made in the beginning, for instance, the fund type and what is the fundraising target. Often funds can be sorted into two different categories, industry and macro funds. Industry funds focus on specific sectors and macro funds focus on specific geographic regions. (Kaserer & Stucke, 2013).

Capital is raised from pension funds, insurance companies, banks, corporations, family offices, and wealthy individuals, and often continues until the target amount of fundraising is achieved to ensure the desired funding structure. Achieving or failing to raise the target amount of capital can impact the fund's ability to generate returns.

(Kaserer & Stucke, 2013). Various factors influence fundraising at both industry and firm levels, such as macroeconomic conditions, regulatory changes, and changes in capital gains tax rates. Usually, PE firms raise capital for new funds in three to five years. (Kaserer & Stucke, 2013). After the pre-investment phase, PE funds screen and do due diligence on the potential investments and target firms. Syndicate partners and co-investors can help to get high-quality investment proposals, which are important, especially for the VC funds. Investment proposals go through in-depth due diligence. After the due diligence process, Funds value the companies they are investing in and determine the expected return.

The valuation process is complex due to high uncertainty and the option-like nature of many opportunities. PE investments are illiquid and risky and thus, funds require high returns. Expected returns vary between early-stage investments and later-stage investments. For the VC funds often only a few investments succeed and they compensate for all the failures. (Kaserer & Stucke, 2013). Funds acquire ownership of the target companies and start the process of developing and restructuring them. Buyout funds concentrate on two factors when investing in target companies. Since the majority of the investment is financed by debt, it is crucial that the target company can generate cash flow to pay the debt over time. In addition, the target company needs to achieve an exit value that meets the fund's target return. (Kaserer & Stucke, 2013).

In the monitoring phase, BO funds concentrate on financial engineering, operational engineering, and management and governance monitoring. These include streamlining operations and strategy, incentivizing management, and enhancing governance structures. (Kaserer & Stucke, 2013). VC funds monitor, assist, and certify their portfolio companies. Monitoring is done by having board seats and having veto rights. VCs can assist in adding experience and structures to management, and policies and provide networks. Having VC funding can act as a certification of quality to others. It can attract more talented employees and more financing. (Kaserer & Stucke, 2013).

The last phase of the process is to exit the portfolio company. Often exits can be IPOs where the company is taken to the stock exchange or trade sales where the company is sold to another investor. IPOs can be more profitable, compared to trade sales. However, IPOs are more complex and there are additional challenges. PE fund needs to sell the stocks relatively quickly and simultaneously avoid driving the stock price down. Capital is returned to LPs after deducting costs and carried interest. (Kaserer & Stucke, 2013). According to Invest Europe (2023b) PE divestments in 2022 in Europe were approximately 33 billion euros. Buyout funds divested most with 22 billion euros from 750 companies. Venture capital divestments were 2,7 billion euros from approximately 1 300 companies. Previous year's divestments were roughly 45 billion euros and the decrease is explained by the challenging financial situation in Europe. The challenging situation affected the number of IPOs in 2022 which was only 3% of all the divestments. The most popular divestment method was a sale to another PE fund and the second was a trade sale. Interestingly, average holding periods for BO investments were 5,8 years and for VC investments it was 6,0 years. Both numbers have remained approximately the same for the last five years. (Invest Europe, 2023b)

2.4 Developments of private equity

The history of venture capital started in 1946 when the first VC firm American Research and Development was founded to invest in technology-based manufacturing companies. It raised funds from endowments and wealthy individuals. Venture capital firms were primarily publicly funded Small Business Investment Companies (SBICs) until the 1980s. The firms that received government funding experienced significantly greater employment and sales growth. While there was no significant difference in the likelihood of receiving venture capital before the awards, awardees were more likely to receive such financing in subsequent years. (Lerner, 1999). SBICs were important to the VC industry's development but they had certain constraints. They lacked expertise and their capital structure was not very efficient. Moreover, bureaucracy limited their activity. Before the end of the 1980s, VCs were typically closed-end funds, which induced retail investors with short-term horizons that conflicted with venture capital's long-term

horizons. The fund structure of VCs started to shift to a limited partnership model at the end of the 1980s which meant notable development. Certain regulation changes were made which allowed pension funds to invest in VCs. These changes led to the growth of professionalization within the industry and significant growth of investment funds. US government funding affected as well VC development in the 1980s and 1990s. (Bottazzi & Da Rin, 2002). The venture capital market grew significantly during the 1990s in the US and capital raised to VC funds increased from 2 billion dollars in 1990 to 105 billion dollars in 2000 (Kaserer & Stucke, 2013). Although venture capital is closely related to startups in e-commerce and information technology it plays a role in more traditional industries too. Companies such as Apple, Microsoft, Amazon, and Intel but also Federal Express and Staples have received venture funding. Until the 1990s, venture capital was mostly a US phenomenon, since then VC investments have been growing significantly in Europe and Asia. (Bottazzi & Da Rin, 2002).

The buyout industry started to emerge in the 1960s due to the Introduction of junk bonds, booming capital markets, and inefficient corporations. (Kaserer & Stucke, 2013). The first LBO model was created in the 1960s when Jerome Kohlberg, Henry Kravis, and George Robertson were working at the Bearn Sterns and founded a specialized unit of leveraged buyouts of private family companies. Later, in 1976 they left Bears Sterns and founded KKR, which was the first private equity company. More private equity companies were founded after KKR successfully closed the buyout of Houdaille Industries (Seretakis, 2013). The buyout deals increased their popularity significantly during the 1980s. During the 1980s most of the buyouts occurred in the United States and few in the UK. Buyouts concentrated on large and well-established corporations. Moreover, a defining characteristic of the 1980s was the prevalence of public-to-private transactions but the popularity of those deals diminished at the beginning of the 1990s. After reaching its peak in 1988, public-to-private transactions decreased while smaller private leveraged buyout deals became more common. Buyout activities expanded into new industries, including information technology, media, and financial services. Throughout the 1990s and early 2000s, leveraged buyouts of private companies

continued. The beginning of the 2000s witnessed a resurgence in public-to-private transactions. Concurrently, secondary buyouts, where a PE firm divests its investment to another PE firm, gained popularity during this decade. In 2006 and 2007, private equity witnessed a surge in capital commitments. Nevertheless, in 2008, owing to turbulence in the debt markets and the financial crisis, private equity investments declined. (Kaplan & Strömberg, 2009). Following the financial crisis of 2007-2009, private equity investments experienced a gradual resurgence, with capital flows eventually returning to pre-crisis levels. Throughout the 2010s, this investment sector demonstrated steady growth, aside from a dip in 2020 due to the COVID-19 crisis. (Mckinsey, 2023).

2.5 Private equity in Europe

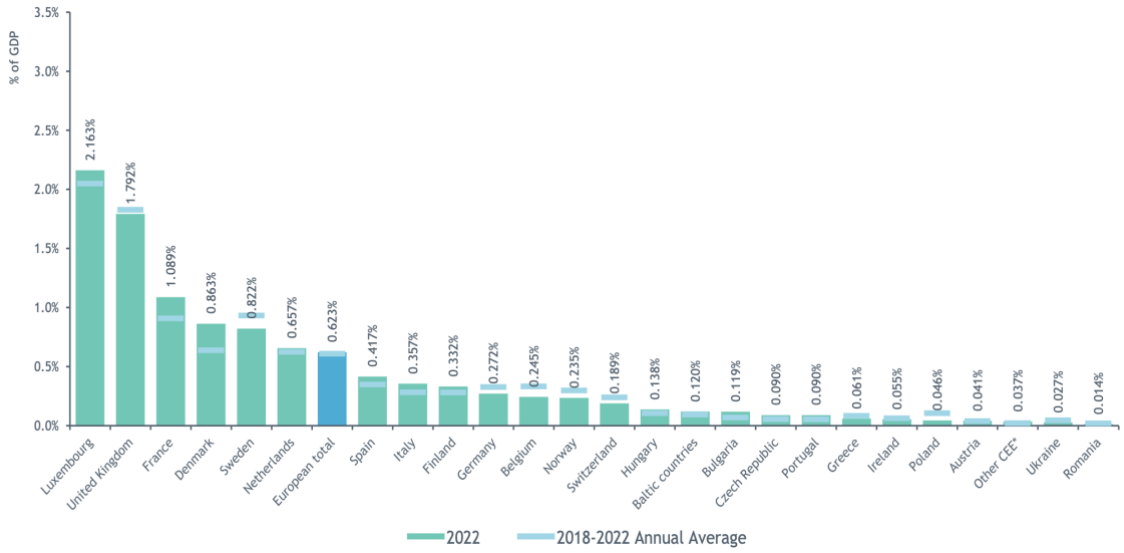

Figure 3. PE investments as % of GDP in Europe in 2022 (Invest Europe, 2023a).

Private equity activity spread to Europe initially to the UK from the US. Buyout transactions started to become general during the 1980s. The change of legislation in the UK at the beginning of the 1980s enabled buyout transactions because it was made possible for companies to use securities as a payment in the transactions (Seretakis, 2013). Both leveraged buyouts and management buyouts were significant in the UK in

the 1980s (Wright et al., 1994). The recession at the beginning of the 1990s slowed buyout deals. Despite the setback, private equity activity in the UK resumed in the latter part of the 1990s and deal activity was highest in 2000. Venture capital activity surged in the 1990s in Europe. Although, growth was substantially larger in the US where the amount of funds raised grew by a factor of 80 and only a factor of 12 in Europe. Most growth in Europe occurred after 1997. (Bottazzi & Da Rin, 2002). The dot-com bubble slowed PE activity and buyout and VC deals declined for a few years. The private equity market started to recover and grew until the 2007-2009 financial crisis. (Seretakis, 2013).

Private equity activity emerged in continental Europe later than in the UK. The progress followed the UK and the US PE markets. Buyouts surged at the end of the 1980s and declined coming in the 1990s. Deals resumed at the end of the 1990s and after the dotcom bubble, the deals were increasing even more. In continental Europe, private equity markets developed first in Germany and France. Contrary to the UK and the US, PE activity in Germany started in the 1990s. Family companies provided the capital in the first LBO deals and they played an important part in the development of buyout deals in Germany. The first deals concentrated on small and medium-sized companies that were family-owned. Private equity deals increased at the end of the 1990s when large companies started to divest underperforming businesses and executives became more open to the PE deals. Similar to other countries, the dotcom bubble decreased the amount of PE deals for a few years but then between 2004 and 2007, the number of buyouts in Germany surged. The financial crisis of 2007-2009 affected the German PE market and deal activity plummeted. (Seretakis, 2013).

A few pioneering buyout firms, such as LBO France, began to adopt the LBO model to acquire small family companies in the 1980s in France. Notable growth started at the end of the 1980s and the beginning of the 1990s. Several UK private equity firms established offices in France. However, it was not until the early 2000s that PE activity surged indeed. The main driver for this was increased bank lending, the emergence of the junk bond market, and an influx of institutional investor capital to PE funds. The

2007-2009 financial crisis affected the French PE market but it recovered relatively swiftly compared to other European countries. (Seretakis, 2013).

The first Nordic PE firms were established in the late 1980s. Some of the notable firms included Industri Kapital, Nordic Capital in Sweden, Capman in Finland, Nordic Private Equity Partner in Denmark, FSN Capital, and Herkules Capital in Norway. These firms focused mainly on carving out transactions, which involved acquiring non-synergistic firms from corporations. In the late 1990s, foreign PE firms started showing interest in the Nordic market. Gradually, Nordic PE firms expanded their investment reach across multiple Nordic countries. Despite the financial crisis in 2007-2009, Nordic PE firms rebounded in 2010, reaching higher investment levels compared to 2008, in contrast to the broader European trend, which saw reduced PE investment levels. (Spliid, 2013).

After the financial crisis of 2007-2009, European PE activity decreased substantially for years. In 2008 PE fundraising was approximately 83 billion euros, whereas in 2012 it was only roughly 29 billion euros. In 2016 private equity fundraising exceeded the amount raised in 2008, being 84 billion euros. In 2022 amount raised was over double compared to 2016 being over 170 billion euros. Venture capital funds raised 23 billion euros, whereas buyout funds raised 111 billion euros. In 2023 activity and funds raised decreased noticeably, being only 33 billion in the first half of 2023. Investments have been steadily growing all the 2010s. In 2020 when COVID-19 started, investments decreased but saw a surge in 2021. However year 2021 was the peak and since then, investments have been gradually decreasing (Invest Europe, 2023b). Follow-on funds raise capital significantly more than first-time funds, for instance, first-time BO funds raised only 7 billion euros compared to follow-on funds that raised 104 billion euros in 2022. Pension funds invest most in the PE funds, and fund of funds and asset managers provide the second most capital to the asset class. (Invest Europe, 2023a).

Approximately half of the raised capital is raised in the UK. Interestingly, the Nordic region and France and Benelux countries raised equal amounts of capital in 2022. Both

regions raised 35 billion euros. Germany, Austria, and Switzerland raised 11 billion, whereas, Southern Europe raised only 8 billion euros. In the UK private equity investments account for 1,8 percent of the GDP and in Luxembourg over 2 % in 2022. In France, PE activities account for 1,1 % of the GDP whereas in Germany it only accounts for 0,28 % of the GDP. (Invest Europe, 2023a).

There are differences between the acquisition of public companies in Europe and the United States. In Europe, structures vary in different countries since every country has different legislation. The scheme of arrangement is used in the United Kingdom. Target company issues new shares to the acquirer and cancels all the current shares. Target company's shareholders receive cash for their canceled shares. In Germany, the exchange of shares between the PE fund and the target firm in statutory mergers is possible, but uncommon. A profit or loss transfer agreement, where one company submits to the direction of another, with profits transferred but losses compensated is possible. In both cases, a minimum of 75% approval is required from the PE fund and the target company's shareholders. In France, the exchange of shares between the buyer and the target company is required in statutory mergers. Merger auditors are required to assure fair share value and exchange ratios. (Seretakis, 2013).

In the US there are two ways to execute public-to-private transactions. The first one is the one-step merger. It is a longer process, which requires shareholder and board votes. The other way to acquire a public company is a tender offer followed by a back-end merger. A tender offer is a faster way to acquire a company if the acquirer successfully acquires 90% of the shares in 20 days. If the acquirer does not get 90% of the shares in that time, a back-end merger is required. In conclusion, European regulation is more scattered and complicated than in the United States, which makes PE transactions more complex to execute. (Seretakis, 2013).

3 Value drivers of private equity

Several factors influence the performance of private equity funds. Different drivers can influence buyout funds and venture capital funds. Moreover, general partners' and limited partners' skills influence the returns. The assessment of PE returns may differ depending on the level of analysis, and various performance sources may have varying impacts at each level. These levels include the deal level, the fund level, and the asset class level.

3.1 Boom and bust cycles

Kaplan and Schoar (2005) provide evidence that capital raised during economic booms is less likely to secure subsequent investments. This suggests a cycle of boom and bust where initial positive returns attract investors, only to be followed by negative returns. Thus, the ability of GPs to raise funds is related to their past performance. Kaplan and Strömberg (2009) conduct a study that examines the relationship between PE fund capital commitments and returns, with a focus on the boom-and-bust cycle. Through the use of regressions, they investigate the connection between private equity fundraising and following fund returns. The results show a negative connection, indicating that increased fundraising leads to lower returns. Their study also considers how past performance influences capital commitments. Regression findings reveal a positive and significant relationship between returns and capital commitments, suggesting that LPs choose to invest in funds that are run by successful GPs.

Figure 4. EBITDA/EV minus High yield rates (Kaplan & Strömberg, 2009).

Kaplan and Strömberg (2009) examine the relationship between debt markets and PE activity. They argue that private equity investors can capitalize on discrepancies in debt and equity markets, and this strategy is only viable when market frictions exist. During times of favorable debt market conditions, private equity deals tend to increase. The study compares buyout characteristics over time, focusing on factors such as valuation multiples, capital structures, and debt levels. Interestingly, the research finds that prices paid for cash flow tend to be higher at the end of buyout waves. Kaplan and Strömberg (2009) introduce the concept of interest coverage ratios as a way to gauge the fragility of BO deals. They observe higher coverage ratios in the wave starting from the early 2000s, indicating less fragility compared to the wave of the 1980s, but the cyclical nature persists. In the 2000s debt is easier to get and covenants are looser for the LBO deals than in the 1980s and 1990s. Additionally, they study the cyclicality of private equity by comparing operating earnings yields to interest rates on high-yield bonds. High-yield rates need to be lower than earnings for a PE activity boom.

Ang et al. (2018) analyze the findings of Kaplan and Strömberg (2009). They concentrate on whether market sentiment plays a role in enabling GPs to create value. They investigate the relationship between the sentiment index, changes in the VIX, default spread, transaction volume, and expected risk premium and their impact on the PE cash flow index. The source of that value is the asset-debt yield spread and the results show

that the index is negatively related to changes in the VIX and positively related to transaction volume and the expected risk premium. These findings support the idea that PE performs well when the overall economy does well and debt covenants are better. Ang et al. (2018) develop a method to estimate private equity returns' time series using cash flow data and factor returns from public equity markets. This approach divides returns into component returns from factor exposure and a time-varying private equity premium that is not explained by factors. When applied to PE investments, the method produces a more volatile and less serially dependent return series than standard industry indices. Ang et al. (2018) suggest diversifying investments across sub-PE asset classes since different PE classes have uncorrelated cycles. They also find that relative yields on corporate assets compared to high-yield debt explain a portion of PE returns.

Harris et al. (2014) find evidence that supports boom and bust cycles. They conduct a study that analyzes the connection between performance and fundraising. The outcome of their research validates Kaplan and Strömberg's 2009 findings, confirming a negative connection between performance and capital inflows for both BO and VC funds. This negative correlation is observed in using both absolute and relative performance measures.

Moreover, boom and bust cycles are found in European PE markets as well. Diller and Kaserer (2009) study mature European private equity funds. The research findings reveal that a negative relationship exists between returns and the amount of money directed toward the PE industry during the investment period. This connection plays a role in explaining variations in private equity fund returns, particularly for venture funds, which are more susceptible to illiquidity and segmentation. Interestingly, this factor appears to be unrelated to stock market returns and negatively correlated with overall economic growth rates.

The notion that fundraising during boom times leads to poor post-performance results is challenged by Robinson and Sensoy (2016). While several studies indicate that funds

raised in boom markets underperform, Robinson and Sensoy (2016) argue that this underperformance can be mitigated by using relative performance measures, such as PME, rather than absolute measures such as IRR. By using relative performance measures, the negative effects of investment decisions made by GPs are reduced. High comovement between the stock market and the private equity market contributes to lower volatility in relative performance. According to their study, buyout funds and venture capital funds display varying levels of cyclicality. Cyclicality and liquidity premiums during declining markets are more robust with VC funds. Their research focuses especially on how capital calls impact the liquidity risk of investors. This approach differs from models that assume a fixed investment horizon and upfront commitment. Instead, it connects liquidity demands on investors with the returns generated by private equity investments, highlighting the impact of fund manager timing of capital calls and distributions. Robinson and Sensoy (2016) argue that fluctuation in cash flows is cross-sectional, thus, enabling diversification. It has consequences for returns and fundraising.

According to Metrick and Yasoda's research (2011), when there are limited attractive investment opportunities, the valuations of new investments and capital inflows have a positive relationship. However, venture capitalists with a strong reputation can mitigate the negative effects of capital inflows on performance by successfully negotiating advantageous investment terms in hot markets. Additionally, VCs with more industry experience tend to increase their investments when public equity market signals are favorable, and their investments are more responsive compared to firms with less experience. (Metrick & Yasoda, 2011).

3.2 Size and experience

Some studies indicate that the performance of private equity funds is positively correlated with their size. Typically, venture capital funds tend to be smaller than buyout funds. There are also opposite findings and the subject is not straightforward. Additionally, the experience of GPs has been found to significantly impact fund

performance. Overall, larger private equity funds are more likely to perform better than smaller ones, as suggested by Gianfrate and Loewenthal's (2016) research and it supports the findings of Kaplan and Schoar (2005). Nikoskelainen and Wright (2007) argue that due to better resilience against industry cycles and increased stability through multiple business lines, larger buyouts perform better. They argue that the equity stake of managers is positively related to returns, and the effect is more significant in larger buyouts. They argue that the governance mechanism does not affect returns significantly. According to research conducted by Kaplan and Schoar (2005), fund performance is positively correlated with fund size and the experience of the GPs. However, the relationship between these variables is concave, indicating diminishing returns to scale. Private equity differs from mutual funds in that sense. One explanation could be that GPs with good track records do not grow the size of their funds until they have achieved excess returns. Growing fund size could lead to hiring lower-quality partners and because of the diseconomies of scale performance might weaken. They note that GPs with better performance do not have higher fees. Marquez et al. (2015) argue that skilled GPs keep their funds small because it is easier to improve portfolio companies when the fund contains a smaller number of companies.

Harris et al. (2014) have the opposite findings of Gianfrate and Loewenthal (2016), Kaplan and Schoar (2005), and Nikoskelainen and Wright (2007). No significant correlation exists between the performance of buyout funds and their size. However, they observe that the smallest venture capital funds underperform.

Metrick and Yasoda end up with the same conclusions as Kaplan and Schoar (2005). The experience of the general partners is important and affects returns. A good reputation can be a useful asset, especially for VC general partners. Interesting start-ups can receive several deal offers from different VC funds and reputation can help to close the deal. Start-up companies are more likely to choose distinguished VC funds. Moreover, a good reputation can lead to a discounted equity rate. Successful deals help build a reputation. Moreover, networking is crucial in VC investing. GPs who collaborate on deals through

syndication have stronger networks, hence, they have better performance. (Metrick & Yasoda, 2011). Gredil (2022) argues that PE GPs have a better understanding of industry valuations compared to investors in public markets. The study argues that the source for this knowledge comes from the investment and divestment processes.

Diller and Kaserer (2009) and Ewens and Rhodes-Kropf (2015) have similar results that GP's skills have a notable influence on the returns. Ewens and Rhodes-Kropf (2015) analyze the movement of individual general partners between firms and find that the GP's performance is consistent over time. They argue that GPs have distinct investing styles, indicating that they possess unique investing skills. This emphasizes the importance of the allocation of performance between the firm and its partners. The results indicate that both partners and PE firms influence performance, but the human capital of the partner is more important. In addition to unique investing styles, GPs have specific exit styles and have consistent results for their deals. Partner fixed effects explain up to five times more variation in exit valuations than firm fixed effects. Highest-performing GPs have a significant impact on exit valuation and the difference to the weakest-performing GPs is around 80 million dollars. Hence, there is notable variation among general partners. These results demonstrate the effects of GP skills and performance persistence.

Partner effect being more influential than firm effect raises the question of optimal fund size. Venture capital firms typically remain relatively compact in terms of personnel. It can be the result of limited organizational capital, with individual partner effects primarily associated with brand, process, and deals. (Ewens & Rhodes-Kropf, 2015).

A study conducted by Giot and Swienbacher (2007) finds that VCs prefer different routes to exit their investments. These include IPOs, trade sales, or liquidation. The probability of IPO exit increases as time goes on, and it reaches a peak at some point, and after the probability declines. Similar patterns can be observed for trade sales. This indicates that GPs prefer IPO exit over trade sales. For portfolio companies, it is important to reach certain milestones, because it accelerates the exit process. Moreover, it highlights the

importance of making progress to assess product viability. The experience of the GP makes liquidation more probable, indicating that more experienced GPs have stricter investment criteria.

Yao and O'Neill (2022) study how VC GPs' exit pressure influences startup outcomes and exit decisions. Their research illustrates that exit pressure from VCs has a significant impact on the types of exits that startups pursue. However, it does not affect the likelihood of an IPO. The study shows that VC GPs' exit pressure remains an important factor in a startup's development and exit process, regardless of its performance in areas such as innovations, authority approvals, and growing sales. Cumming and Johan (2008) argue that when VCs address information disparities and agency costs, exit outcomes improve. They find that VC-backed IPOs are linked to high-tech firms and larger deal sizes. In corporate VCs, acquisitions are more prevalent. IPO exits outperform trade sales and secondary buyouts. (Nikoskelainen & Wright, 2007).

Achleitner et al. (2011) argue that more experienced GPs can use higher levels of debt for a transaction, thus they can pay higher prices for the target companies. Experienced GPs have better negotiation skills and with a given level of debt allows them to pay less for a target company. Revenue growth over the holding period is positively related to exit valuation. Achleitner et al. (2011) argue that GPs increase portfolio company sizes to have higher multiple classes. Timing plays a crucial role in exits since the public benchmark valuation is connected to higher exit values. When funds mature, EBITDA multiples decrease. This is the case, especially for first-time PE funds. Less experienced GPs have pressure to realize investment to successfully raise follow-on funds. New GPs need to invest in attractive target companies in the early stages of a fund life cycle in order to have sustainable performance. (Achleitner et al., 2011).

Not only does the skill of GP affect PE returns but also the skill of LPs is important since they choose in which PE funds they invest in. Lerner et al. (2007) argue that there are significant variations in returns among LP classes. They study institutional investors in

private equity funds, including endowments, banks, and public pension funds. The outperformance of endowments is over 20% higher than the average limited partner. The lowest performance is observed in funds that banks invest in. A possible explanation for the outperformance of endowments could be that they use the private information that they receive being LPs. Other LPs do not exploit private information as much as endowments, leading to poorer performance. Their study shows that older LPs achieve higher returns, suggesting that experience is important. Moreover, proof of skills of endowments is that those funds in which they invest again have higher returns. Cavagnaro et al. (2019) study how the skills of the LPs impact their PE investments. The study reveals that certain institutional investors consistently invest in the highest-performing PE funds. Those LPs do it systematically, which means that they have more skills than other LPs. A one-standard-deviation increase in LP skill results in a 1–2 percent increase in the annual IRR from private equity investments. This effect is even more significant for venture capital investments, where a one-standard-deviation increase in skill can result in up to a 5% increase in returns. However, as the sample period progresses, the impact of skill on returns decreases, which aligns with the maturation of the private equity industry. (Cavagnaro et al., 2019)

3.3 Leverage

Debt is a key element in LBO transactions and it plays an important role, therefore it is a subject in multiple studies. Leverage has been studied from several angles and whether the use of leverage has been varied over time.

Metrick and Yasoda (2011) provide evidence that for private equity firms that have better prestige, debt is easier to get. Relationships with banks are important for PE firms because, especially, BO firms who maintain close relations with banks, receive better pricing for their debt. Metrick and Yasoda (2011) argue that reputable PE firms are more adept at timing the debt markets, allowing them to secure more transactions when credit spreads are lower and debt is easier to come by, resulting in lower spreads and longer maturities. There is evidence that PE firms who receive cheaper debt, use higher

leverage, but the valuation of the deals is not higher, compared to deals that are made with lower leverage. Having better debt covenants allows performance persistence for certain PE firms. Moreover, a PE firm's reputation is positively connected to the strength of its relationship with banks. Often there is more than one potential buyer candidate for the target company, and the competition influences the the price of the target company. In large public-to-private deals, banks assist in tenders because there are multiple offers. In stapled finance, the seller of the company may organize pre-backed debt for the acquirer. There is evidence that deals with stapled finance are favorable for sellers because they grow the valuation of the company. Hence, for the acquirer, it predicts weaker performance. Consortiums represent contrary structures to stapled finance, where several PE firms acquire a target company together. Consortiums decrease the number of buyers and therefore it lowers the premiums paid for the target company. Short-term underperformance is observed for the target company returns, but in the long term, performance is enhanced. (Metrick & Yasoda, 2011).

Axelson et al. (2013) study the factors that influence the financial structure of buyouts, and how they compare to the debt structures of public companies. They find that there is no consistent relationship between the financial structure of buyout funds and public firms. This holds for various measures of leverage and control samples. The study uncovers that the capital structure decisions of public companies and private equity firms are driven by different factors. The leverage of LBOs is mostly affected by debt market conditions, whereas the leverage of public firms is related to firm-specific features. Traditional theories that explain the financial structures of public firms do not apply to BO funds. Axelson et al. (2013) find evidence that debt covenants influence BOs' capital structure, and the effect is stronger during the loose monetary policy when interest rates are lower. The results suggest that in LBO transactions, debt is used to the maximum extent. The debt market influences capital structures, deal valuation, and performance. Debt markets set limits on how high leverage can be used in a specific transaction. Moreover, it seems that there is a negative connection between performance and leverage, hence there is a conflict of interest between LPs and GPs who

maximize the leverage during bull markets. Franzoni et al. (2012) find that PE returns have an annual liquidity unconditional risk premium of 3% and they argue that it is due to sensitivity to the liquidity of the credit market.

The risk of LBO transactions has decreased slightly over time. Guo et al. (2011) study LBO transactions in the 1990s and 2000s and their findings show that although LBOs during this period are less risky than LBO deals in the 1980s, they still pose a risk of default. Leveraged buyout deals during the 1990s and 2000s involve several BO funds and modifying capital structure. Guo et al. (2011) find that higher leverage may contribute to returns but in exchange, it can make transactions riskier, especially during declining markets. The study finds that higher debt levels result in more cash flow gains, particularly when the GP changes the CEO shortly after the deal. Operating improvements, industry valuation multiples, and tax benefits from increases in debt contribute to the returns. However, without consistent operating improvements, returns are not sustainable in declining markets. (Guo et al., 2011).

3.4 Operating performance

It is argued often that improving portfolio companies' operating performance is one of the key reasons why BO deals create value. These arguments have existed since the 1980s, when Jensen (1989) concluded that improving operating performance is an important part of LBO deals.

According to Kaplan and Strömberg's research in 2009, firms acquired by BO funds have shown significant improvement in operating performance. These firms have experienced on average, a rise of 10 to 20 % in operating income to sales, a 40 % increase in cash flow to sales, and a decrease in capital expenditures to sales. This overall improvement has led to an increase in the firm's value. These findings have been observed in the United States and Europe during different time periods. LBO transactions may have changed in the 2000s. Some findings suggest that operating performance is increased slightly but simultaneously fund performance has remained high.

Evidence on performance improvements is contradictory. Cressy et al. (2007) examine the arguments of Jensen (1989), which suggests that buyouts outperform comparable firms because they improve the operating performance of the portfolio companies. They find that, on average, portfolio companies show a 4,5% higher operating profitability than comparable non-buyout companies in the first three years, which supports Jensen's (1989) arguments. However, Cressy et al. (2007) find the opposite evidence as well. The profitability of portfolio companies in the buyout year is connected to pre-buyout profitability, suggesting that investment selection skills and financial engineering strategies might be more important than managerial incentives in improving performance. This finding contradicts the emphasis on better governance structures in Jensen's hypothesis. Cressy et al. (2007) argue that specialization by industry or stage gives certain benefits for PE funds. Industry specialization increases profitability by approximately 9%, supporting the idea that specialization gives advantages. However, they find that the stage specialization has little consistent impact on profitability or growth. They also find evidence that PE funds that execute buyout transactions independently have more often significant growth in sales after the transaction, but it does not necessarily correspond to better profitability.

Ayash et al. (2017) study the idea that characteristics of BO transactions have evolved. In more recent LBOs, it is possible that increasing revenue is more important than enhancing the operating performance. They study LBO deals in the 1990s and 2000s and focus on two transaction strategies utilized by LBO sponsors to generate value and their impact on returns. The first strategy is the traditional LBO approach, where the PE fund aims to increase the operating profitability. In the second strategy, the aim is to boost the portfolio company’s revenues. The study highlights the use of timing tactics to improve returns. Ayash et al. (2017) examine individual transactions and the returns received by limited partners. The study finds that both strategies have the potential to generate positive sponsor equity returns. However, there is significant variation among LBOs. The first strategy that focuses on improving operating performance plays a smaller

role in explaining returns received by LPs. The second strategy that focuses on revenue growth and timing of exit explains returns better.

According to Guo et al. (2011), the performance improvements in operational terms in more recent LBOs are similar to or a bit better than those of the 1980s, depending on the performance metric and timeframe. While cash flow benefits are positive, they are not as substantial as those observed during LBOs in the 1980s. Achleitner et al. (2010) argue that while leverage plays a crucial role in enhancing returns for PE firms, operational improvements within PE-backed firms and changes in EBITDA multiples contribute even more significantly to value creation.

Achleitner et al (2011) study value creation in buyouts and find that expansion of EBITDA multiples is an important driver of returns. In addition, operational improvements and leverage have a significant effect on returns. Timing the valuation of the target company is important for the BO funds, at both entry and exit. There is a positive impact of industry-specific multiple levels in public markets and leverage on deal multiples.

3.5 Crises

During turbulent times in capital markets often all the asset classes experience a decrease in valuation, some larger decreases than others. Moreover, PE fund managers can make a difference in how they invest during crisis times. Gianfrate and Loewenthal's (2016) analysis reveals that during the financial crisis, PE funds outperform the public market. They find Private equity funds have betas lower than 1, indicating less susceptibility to market returns, which contributes to their positive performance. Moreover, the study highlights that the level of investments depends on the vintage year. They show that funds with vintage years 2002 and 2003 are almost entirely invested, the percentage of funds that are 90% invested decreases notably for funds from vintage years 2004 and onwards, reaching a low of 66% in 2007.

In a recent study, Stark and Lauterbach (2021) examine how PE fund managers responded to the 2000-2002 dotcom crisis and the financial crisis of 2007–2009. Their research aims to uncover the impact of these crises on the GPs' investment behavior. The study analyzes changes in investments across various industries before, during, and after the crises. They find that during the dotcom crisis, which significantly affected the technology and growth sectors, GPs adjusted their investment portfolio by withdrawing capital from those sectors. They redirected their investments towards sectors that demonstrated better performance during the crisis, such as energy and healthcare which experienced a significant increase in deal values during the period. Similarly, during the financial crisis, which had a severe impact on the financial sector, fund managers moved their investments away from financial industries and increased their investments in the energy sector. The energy sector was the only one that saw an increase in deal volume during the crisis, while the financial sector experienced a substantial decline (Stark & Lauterbach, 2021).

The study by Giot and Swienbacher (2007) reveals that stock market conditions impact exit dynamics. Investments initiated during favorable IPO conditions tend to exit faster, possibly because GPs seek new investment opportunities during these times. Bernstein et al. (2019) find evidence that PE-backed firms reduce their investments less than others during crisis times. They argue that this is possible because they can utilize the relationships and resources from the PE firms and thus, receive equity and debt funding during turbulent times and lower the cost of capital. They examine PE-backed companies during the 2007-2009 financial crises and study if the private equity transactions strengthen financial fragility. They conclude that PE transactions do not add fragility of financial systems during crises.

3.6 Cross-border deals

Buchner et al. (2018) evaluate the returns of cross-border venture capital deals in the United States, the United Kingdom, Continental Europe, and Asia from 1971 to 2008. The findings show that cross-border border VC deals typically underperform domestic deals

by 12% to around 30%, measured with IRR. Underperformance depends on the region. Cross-border deals underperform in terms of PME. These findings are observed during the whole sample period. Several factors contribute to underperformance. These include distance and cultural and institutional differences between the PE fund and portfolio companies. Despite the lower returns cross-border transactions can benefit PE firms by increasing portfolio diversification. Moreover, in saturated markets when there is a shortage of target companies, it can give more opportunities. (Buchner et al., 2018).

Chemmanur et al. (2021) study cross-border leveraged buyout deals to assess the impact of proximity to the United States on the success of private equity transactions. They find cross-border LBO investments with U.S. PE funds have a higher likelihood of successful exits. This could be attributed to the experience of U.S. PE investors in supporting portfolio companies, even when the geographical distance produces challenges in monitoring investments.

Jia and McCourt (2022) have opposite conclusions to Buchner et al. (2018). They find that both cross-border deals and domestic deals have similar performance. Cross-border deals are often larger-scale but they do not underperform, even though previous literature argues that they do because of overpayments and pressure. They find evidence that the success of cross-border deals is positively related to experience in LBO transactions, emphasizing the importance of expertise in navigating international transactions. Negative effects on cross-border LBO performance arise from communication costs, but this can be mitigated when the buyer establishes a local presence in the target firm's country. Better performance and transaction monitoring improve when the trust gap between the countries is smaller. If the legislation in the PE fund's country is protective of investors, it has positive spillover effects on the target country. (Jia & McCourt, 2022). Moreover, Lerner and Tåg (2013) argue that labor market regulation and financial market development affect private equity markets.

4 Private equity returns

This chapter discusses first how profitable the private equity asset class is and how it compares to publicly traded securities. The second section discusses different drivers of value and what might explain the returns.

Interpreting the returns on private equity can be a complex matter. Although some studies suggest that private equity funds outperform public markets (Gianfrate and Loewenthal, 2016; Harris et al., 2014), others indicate that their performance is inferior, particularly when considering associated fees (Kaplan & Schoar, 2005; Phalippou & Gottchalg, 2009). These conflicting findings may arise from factors such as divergent data sources, timeframes, and methodologies employed in calculating returns.

Assessing the returns of private equity funds can pose several challenges. Firstly, to realize the returns, the PE fund has to exit its investment, which can affect the outcome. Secondly, Returns can be measured in several ways, IRR being the most used. Others include MOIC, DPI, and TVPI, for instance. (Metrick & Yasoda, 2011). In addition, addressing risk can be complex. One approach to measuring both returns and risk is to utilize the public market equivalent (PME) method, which compares private equity investments with those made in a stock market index (Kaplan & Schoar, 2005). Korteweg and Nagel (2016) introduce the Generalized Public Market Equivalent (GPME) method, which incorporates a stochastic discount factor that reflects the true equity market conditions when evaluating the value of private equity deals.

A study conducted by Gianfrate and Loewenthal (2016) analyzes the performance of PE funds from 2002 to 2007. They find that buyout funds generate higher returns compared to both the S&P 500 and the S&P SmallCap 600 during that period. PE funds perform better than the stock market, with PME being 1,15 on the S&P 500 and 1,04 for the S&P 600 on an equal-weighted basis. PME on S&P 600 is lower because of the small size premium but because both PMEs are over 1, it shows that PE funds outperfom the public equity market during the financial crisis. Moreover, the size-weighted PME figures on the

S&P 500 and the S&P 600 average 1,52 and 1,38, respectively, suggest a positive relationship between performance and fund size. The study shows that buyout funds consistently outperform venture capital funds, with average PMEs of 1,88 and 1,38, except for the year 2007 when VC funds perform better than BO funds. The findings indicate that the PE asset class perform well during the financial crisis. (Gianfrate & Loewenthal, 2016).

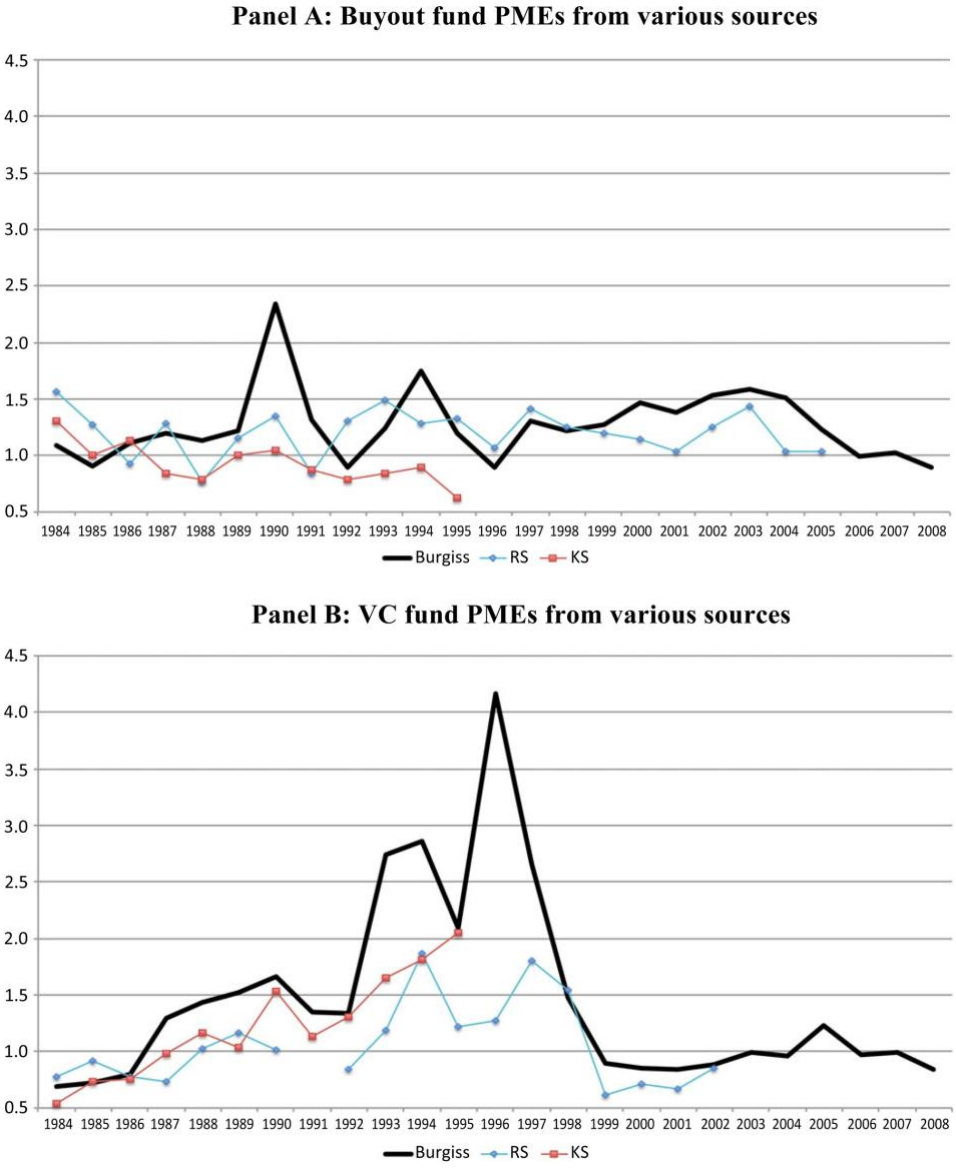

Figure 5. Private equity PME returns (Harris et al., 2014).

Harris et al. (2014) have similar findings that PE funds outperform public equity markets. They conduct a study on the performance of buyout funds and VC funds. They find that

buyout funds have outperformed public equity markets, net of fees, during the 1980s, 1990s, and 2000s, with an estimated outperformance of 3% annually. VC funds performed well in the 1980s and until the end of the 1990s but have since underperformed. The average VC fund has underperformed public markets by approximately 5% over its lifespan. However, underperformance is less dramatic when considering absolute return measures. Harris et al. (2014) argue that performance multiple exits within a specific vintage year are closely correlated with more widely available performance measures like IRRs and investment multiples. Benchmarking PE returns against public markets is common, but investing in a portfolio of PE funds across various vintage years introduces uncertainties and costs related to long-term capital commitment and fund liquidity. While PE outperformance is significant on average, their study does not consider required risk premiums.

The findings of Kaplan and Schoar (2005) differ from Harris et al. (2014) and Gianfrate and Loewenthal (2016). Venture capital and buyout funds outperform S&P 500 gross of fees. However, the results indicate that private equity funds, on average, perform similarly to the S&P 500 after accounting for fees. Moreover, closer examination reveals that when adjusted for committed capital, venture capital funds outperform the S&P 500 while buyout funds do not. They also discover strong performance persistence across private equity partnerships, with persistence observed in various measures and performance levels which is unlikely to be driven by risk or sample selection biases.

Phalippou and Gottchalg (2009) have similar findings as Kaplan and Schoar (2005). Private equity funds underperform the stock market index, the S&P 500, by 3% annually when considering fees. Gross of fees they measure 3% annual outperformance. Their study considers interestingly the risk aspect as well. They measure a risk-adjusted performance of 0,75 for BO funds and a risk-adjusted performance of 0,77 for VC funds. These findings result in negative alphas of approximately 6 % per year. Phalippou and Gottchalg (2009) emphasize that there is a wide variation in performance among private equity funds, making it challenging to make accurate predictions. These findings are

most applicable to mature funds but newly established funds exhibit similar performance to the sample funds at the same age. Fees can account for one-fourth of the invested value, constituting management fees and incentive fees. Different fee arrangements can significantly impact fund performance, with slight adjustments in management fees affecting alpha. There are also notable differences in performance across funds, with top-quartile funds outperforming the market index and displaying evidence of performance persistence. (Phalippou & Gottchalg, 2009). Furthermore, there is a significant difference between paper profits and actual profits for LPs. Liquidating security positions post-exit can significantly affect realized returns, leading LPs to seek ways to escalate cash payments, such as mid-stream dividends. (Ayash et al., 2017).

Gupta and Van Nieuwerburgh (2021) come to different conclusions. Based on their research, PE funds have experienced a significant decrease in expected returns since the 1980s, largely due to the declining risk premiums in public markets. Gupta and Van Nieuwerburgh (2021) develop a method for valuing private equity cash flows, which involves breaking them down into two parts. The first part is the systematic component, which reflects exposure to various sources of aggregate risk through a cross-section of stocks and bonds. The second part captures the return and risk for private equity investors. The systematic component involves a portfolio of listed security strips with different risk profiles, prices, and expected returns. This approach reveals inconsistencies in private equity fund risk exposures across different cross-sections, horizons, and time series. Gupta and Van Nieuwerburgh (2021) suggest that risk exposure is best modeled by incorporating bonds, the overall stock market, and sector-specific equity factors that are consistent with the nature of PE assets. They also note that private equity comes at a higher cost than public markets, despite offering access to unique risk exposures. However, PE funds underperform compared to their benchmark replicating portfolio, and this performance gap widens if fund managers fail to fully utilize committed capital or call it with a delay. This underperformance may indicate that investors are willing to pay a premium for the convenience of avoiding the

mark-to-market volatility of investments that share many risk characteristics with traditional stocks and bonds. They highlight that performance among private equity funds varies, with some funds outperforming and showing persistence in their performance. Rudin and Farley (2022) provide evidence that public equity and private equity returns are approximately the same after adjusting for excess volatility.

Jegadeesh et. al (2015) study funds of funds (FoF) and publicly listed PE funds that invest in PE transactions. Fund of the fund is a listed fund that invests in unlisted private equity funds. They find evidence that funds of funds have excess returns of 0,25 % to 2,0 % and listed PE funds have excess returns of minus 0,5 % to 0,25 %. Since these funds are listed, they are able to study asset pricing models that are normally used in listed stocks. They find that for these funds Fama-French factors and momentum are approximately 1. They argue that by using FOFs it is possible to predict consecutive net asset values of private equity funds that are not listed. Whereas NAVs reported by GPs do not reflect current valuation. Jegadeesh et. al (2015).

Harris et al (2023) study US PE fund persistence in the returns and how it has evolved over time. They find evidence that VC funds are particularly persistent, whereas BO funds have weakening persistence in returns. Buyout GPs may avoid raising capital during periods of poor performance since there is a low correlation between interim performance and final performance. Moreover, LPs do not benefit from knowing the BO fund's current performance, since it does not indicate performance persistence. In VC funds both interim and final performance data indicate persistence of returns. In buyout funds, new fund families have weaker returns, whereas in the VC industry, new fund families' returns align with the established ones. GP skills differ among funds and GPs concentrate on fundraising, thus they try to avoid negative impacts on returns. (Harris et al., 2023). Marquez et al. (2015) study performance persistence as well. PE firms try to invest in good companies but also companies try to find PE firms with skilled GPs, which partly explains the persistence.

5 Data & methodology

This section will cover the data and methodology utilized for the study. The first part will address the data, followed by a discussion of different variables and methods. In order to examine private equity funds returns in Europe, this paper will conduct a regression analysis of returns and capital inflow and size. Regression analysis is selected for this paper to test the connection between returns and capital inflows and returns and size because several previous studies have employed this method.

5.1 Data description

PE fund data for the regression analysis is obtained from Bloomberg. It contains useful data on the fund level and there are several variables available, including size, different return measurements as well as vintage years, for instance. However, Bloomberg does not contain all the PE funds, and some funds are missing data and cannot be used. Therefore, the data sample may contain biases and results can be distorted which is often the case in PE studies. Compared to public equity data which is widely available to everyone, private equity data is difficult to obtain. There are only a few databases that have complete data on most of the PE funds. Several recent studies use the Preqin database where there is a great deal of PE data available (Ang et al., 2018; Cavagnaro et al., 2019; Harris et al., 2014). Unfortunately, at the University of Vaasa, there is no access to the Preqin database and therefore Bloomberg is selected as a database for this thesis.

Data is obtained from 284 buyout funds and venture capital funds from the years 2008 to 2022 that contain IRR-measured returns and 254 funds that contain MOIC-measured returns. Thus, two portfolios are constructed. The dataset consists of European PE funds. Countries include Denmark, Finland, France, Germany, Iceland, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Spain, Sweden, Switzerland, and the United Kindom.

Table 2. Funds per country per portfolio.

Country	IRR Portfolio	MOIC portfolio
Denmark	3	1
Finland	2	2
France	19	16
Germany	11	11
Iceland	1	0
Italy	19	17
Latvia	2	2
Luxembourg	23	17
Netherlands	12	8
Norway	11	10
Poland	5	5
Spain	3	2
Sweden	19	20
Switzerland	15	14
UK	139	129
Total	284	254

Most of the funds that are included in the sample are located in the United Kingdom. In Europe, the most developed and active PE markets are in the UK and, thus it is logical that most of the funds are located there (Invest Europe, 2023a). The second most funds are located in France and Luxembourg. According to Invest Europe (2023a) that region has raised the second most funds in Europe and moreover, private equity activity to GDP is highest in Luxembourg and third highest in France, the UK being the second. The Nordic region contains several funds as well. According to Invest Europe (2023a), PE activity has been increasing during the 2010s in the Nordics, and it is most active in Sweden. In 2022, the Nordic region and France, and the Benelux region raised equal amounts of capital. The least number of funds are located in Latvia, Spain, and Poland. Private equity activity is smallest in Southern and Central Eastern Europe These regions

accounted for 6 % of all the capital raised in PE funds in Europe in 2022. (Invest Europe, 2023a).

5.2 Regression variables

The most common way to measure a fund's absolute return is to use an internal rate of return (IRR). IRR is the discount rate that makes the net present value of cash flows zero. (Kaserer & Stucke, 2013). There is data on 284 European funds from 2008 to 2022 that contain IRR variables in Bloomberg. The IRR is reported net of fees meaning that it is calculated after fees. Private equity fees can be relatively high and therefore IRR net of fees can provide more useful results. For liquidated funds, reported IRR is the final figure that the fund has achieved during its lifetime. For still-active funds, the IRR is the latest figure that the fund has reported, thus, it can change in the future. However, Kaplan and Strömberg (2009) conclude in their study that considering still active funds gives similar results when only considering liquidated funds, and therefore it does not affect notably the results. Including active funds makes the sample larger.

$$IRR = \frac{Cash\ flows}{(1+r)^i} - Initial\ investment, \quad (1)$$

Multiple on invested capital (MOIC) is a variable that tells how much the invested capital has multiplied. For instance, If MOIC is 2 it means that investors will receive twice their capital back. Realized value is the returns that the LP has received back from the fund and the unrealized value is the amount that they have still invested in the fund. Those figures are divided by the initial investment. Multiple on invested capital is available for 254 European PE funds between 2008 and 2022 in Bloomberg. IRR and MOIC are the independent variables in the first and second regression analyses.

$$MOIC = \frac{Realized\ value + Unrealized\ value}{Initial\ Investment}, \quad (2)$$

Capital inflow is the explanatory variable in the first regression analysis. Capital inflows to private equity funds are the amount of money that is invested in PE funds each vintage year. Capital inflows to European PE funds are obtained from Invest Europe. In addition to capital commitments to BO and VC funds, it includes growth, generalist, and mezzanine funds. Similar to Kaplan and Strömberg (2009) and Harris et al. (2014) papers private equity capital commitments are calculated for each vintage year summing current and previous vintage year capital commitments. For instance, capital commitments for the year 2022 are calculated by summing capital inflows from 2022 and 2021. Kaplan and Strömberg (2009) and Harris et al. (2014) explain that it gives an estimate of how much is capital available for PE transactions.

The second regression analysis of the study examines whether there is a relationship between returns and fund size. In Bloomberg, there is available data on the size of the PE funds. Size is the amount that the fund has raised capital. Fund sizes vary considerably between BO and VC funds, the smallest funds being only hundreds of thousands of dollars and the largest funds being several billion dollars, thus, logarithmic scale is being used in the regression models.

5.3 Methodology

The first part of the thesis examines whether there are relationship between returns and capital commitments. Similar equations are used in previous studies that analyze the connection between PE returns and capital commitments (Kaplan & Strömberg, 2009; Harris et al., 2014). Their models have returns as the dependent variable and only capital inflows as the explanatory variable. Having only one explanatory variable does not solve the whole picture but it is a way to study the connection between two variables, as Kaplan and Strömberg (2009) and Harris et al. (2014 do. IRR and MOIC are studied in separate regression models. The regression model used in this paper is OLS regression. In the first regression, the dependent variable is the weighted average vintage year IRR and the explanatory variable is the two years' capital commitments. In the second

regression model, the weighted-average vintage year MOIC is the dependent variable and two years' capital commitments are the explanatory variable.

$$Weighted\ avg.vintage\ year\ IRR = a + vintage\ year\ capital\ commitments, \quad (3)$$

$$Weighted\ avg.vintage\ year\ MOIC = a + vintage\ year\ capital\ commitments, \quad (4)$$

The second part of the study examines whether size affects the returns. Similar to the first part of the study, both return measurements weighted average IRR and MOIC are studied in separate OLS regressions. This paper conducts a similar study to Harris et al. (2014). They use PE returns as the dependent variable and only size quartiles as explanatory variables. First, funds are categorized in size quartiles, and then the connection between returns and size is studied by OLS regression. In both regression models, the size of the PE funds will be the explanatory variable. Sizes are in the logarithmic scale.

$$IRR = a + \log fund\ size\ quartile, \quad (5)$$

$$MOIC = a + \log fund\ size\ quartile, \quad (6)$$

6 Empirical results

This chapter analyzes the relationship between private equity returns, capital inflows, and fund size and presents the findings of the OLS regression analysis. The first section examines the relationship between PE returns and capital inflows. By employing regression analysis, this paper aims to uncover possible relationships between these variables in the European PE market. Descriptive statistics will provide a comprehensive overview of the data, offering insights into the distribution and variability of returns and capital inflows. Descriptive statistics include vintage year, number of funds, median, average returns, weighted-average returns, min and max of returns. The subsequent discussion will interpret the regression results.

In the second part of the chapter, this paper studies the relationship between returns and fund size. Through OLS regression analysis, the paper examines how fund size influences the returns. First, descriptive statistics are presented and they include fund quartiles and average returns for the quartiles. Results and discussion of the findings are presented after the descriptive statistics.

6.1 Returns and capital inflows

Table 3. Descriptive statistics of vintage IRR returns.

Vintage Year	Funds (N)	Median	Average	Weighted avg.	Min	Max
2008	29	8,20	2,94	0,73	-86,23	32,00
2009	12	12,04	10,00	7,63	-6,90	21,51
2010	13	7,22	6,99	3,17	-12,46	24,89
2011	24	11,35	17,92	13,64	-18,29	113,20
2012	20	15,25	16,07	13,83	-14,40	50,00
2013	20	10,44	10,81	14,06	-12,20	47,15
2014	14	11,82	12,65	15,00	3,37	23,70
2015	18	21,41	20,85	20,50	3,66	57,47
2016	28	14,45	21,08	17,56	-19,10	199,80
2017	13	18,20	21,94	21,61	-0,30	60,30
2018	18	17,55	15,39	17,63	1,90	28,30
2019	24	15,43	10,84	13,91	-100,00	63,93
2020	23	10,20	9,91	10,17	-17,00	84,63
2021	13	0,19	-13,30	-11,08	-91,30	54,04
2022	15	0	-6,34	-1,53	-40,90	36,00
Total	284		10,52	9,15	-100,00	199,80

Table 4. Descriptive statistics of vintage MOIC returns.

Vintage Year	Funds (N)	Median	Mean	Weighted avg.	Min	Max
2008	21	1,40	1,30	1,24	0,20	2,50
2009	8	1,53	1,44	1,56	0,29	2,67
2010	10	1,34	1,48	1,19	0,49	3,62
2011	23	1,52	1,58	1,62	0,25	3,30
2012	18	1,57	1,74	1,66	0,76	3,00
2013	18	1,55	3,85	2,02	0,01	4,28
2014	13	1,50	1,61	1,65	1,13	2,34
2015	19	1,92	2,07	2,07	1,09	5,49
2016	28	1,50	1,56	1,70	0,60	2,70
2017	14	1,70	1,75	1,83	1,00	2,50
2018	17	1,40	1,41	1,55	0,90	2,10
2019	21	1,27	1,28	1,25	0,00	1,90
2020	21	1,15	1,14	1,17	0,80	2,01
2021	13	1,10	0,91	0,91	0,01	1,58
2022	10	0,95	0,94	0,96	0,70	1,27
Total	254		1,60	1,49	0,01	5,49

Above are the descriptive statistics of IRR and MOIC measured returns for vintage years from 2008 to 2022. Sample starts in 2008 when the financial crisis of 2007-2009 is going on. In the sample vintage year 2008 has the most number of funds, approximately 30. The IRR returns are relatively low for that vintage year, the weighted average is only 0,70 %. From the sample can be observed the phenomenon that PE activity increased towards the financial crisis of 2007-2009 and then diminished (Invest Europe, 2023a; Seretakis, 2013). There are noticeably fewer funds in the vintage years 2009 and 2010 but the average returns for those are higher than in 2008. Minimum observed returns are also higher in 2009 and 2010 than in 2008 but the maximum observed return is

highest in 2008 between 2008 to 2010. Private equity activity starts gradually to strengthen in the 2010s and the number of funds start to increase in 2011. The most number of funds in the 2010s is in 2016 and there are reported 28 funds. Moreover, returns improve noticeably in the 2010s and reaches a peak in 2017, weighted average IRR being approximately 22 %. The number of funds is over 20 in 2019 and 2020 decreasing in 2021 and 2022. Average returns are decent in 2019 and 2020 but after that period, returns weaken significantly, being negative in 2021 and 2022. There are altogether reported 284 funds with IRR returns, the average IRR for the whole sample is 10,50%, the weighted average return for the whole period is 9,15, the minimum return is -100%, and the maximum return of approximately 200%.

Similar findings can be observed from the above table of descriptive statistics of MOIC. In 2008 the number of funds is 21 but in the next few years, number is lower. 2011 and onwards, both the number of funds and average returns increase. The highest number of funds is reported in 2016 and the highest average return is reported in 2015. In 2019 and 2020 number of funds is relatively high, being 21 in both years, and reported average returns are decent too. In 2021 and 2022 returns weaken and are below 1. The number of funds is lower as well. The whole sample covers 254 funds with MOIC returns, the average MOIC for the whole sample is 1,60, the weighted average MOIC return is 1,49 for the whole sample, the minimum is 0,01 and the maximum return is 5,49 %.

Table 5. Results of regression analysis on PE fund returns and capital inflows.

Panel A	Vintage year weighted-avg. IRR
Constant	110,10
	(116,18)
Capital inflow	-8,96
	(10,44)
R^2	0,05

Panel B	Vintage year weighted-avg. MOIC
Constant	9,05**
	(4,19)
Capital inflow	-0,68***
	(0,38)
R^2	0,20

In the above table are reported the OLS regression results of the private equity returns and capital inflows.*** and ** denote statistical significance at 1%, and 5% respectively. Standard errors are reported in brackets.

Panel A reports the regression analysis of IRR-measured returns and capital inflows. The dependent variable is the vintage year weighted average IRR. Vintage year refers to the year when the fund is established. The weighted average vintage year return denotes the average return that all the vintage years' funds have achieved and the returns are weighted by the fund size. Explanatory variables are capital inflows. Panel B reports the regression analysis of MOIC-measured returns and capital inflows. Previous studies and the hypothesis of this thesis state that there is a negative relationship between returns and capital commitments (Diller & Kaserer, 2009; Harris et al., 2014; Kaplan & Strömberg, 2009). From the results can be seen that the capital inflow variable is negative in both

regression models. However, results indicate that it is not statistically significant explaining the relationship with IRR returns. Capital inflow is statistically significant at a 1% level when explaining MOIC-measured returns. Moreover, it seems that capital inflows explain MOIC-measured returns better than IRR-measured returns. The R-squared is larger for MOIC regression than IRR, but still relatively low, being only 0,20. In conclusion, there is evidence that returns and capital inflows are negatively connected, but for the IRR returns, it needs further research to confirm that.

6.2 Returns and fund size

Table 6. Fund size quartiles.

1. quartile	Median	3. quartile
330 200 000	947 000 000	3 000 000 000

Fund size	IRR avg.	MOIC avg.
Small	13,10	2,17
2.	14,81	1,44
3.	8,25	1,48
Large	10,54	1,49

Above is a table of fund sizes and returns. Funds are classified into quartiles. The first quartile is 330 million dollars, whereas the median fund size is approximately 947 million dollars. The third quartile is 3 billion dollars. The smallest funds have an average IRR of 13,10 and MOIC of 2,17 which is the highest observed return. The second smallest funds have the highest average IRR, being 14,81, however, they have the lowest MOIC of 1,44. The second largest funds have the lowest average IRR returns. Their MOIC is 1,48. The largest funds have an average IRR of 10,54 and MOIC of 1,49.

Table 7. Results of OLS regression analysis between returns and fund size.

Panel A			IRR	
Constant	-32,68	-69,86	-146,15	103,42
	(84,69)	(148,97)	(199,89)	(74,23)
Smallest funds	5,59			
	(10,37)			
2. smallest funds		9,73		
		(17,01)		
2. largest funds			16,72	
			(21,63)	
Largest funds				-9,42
				(7,55)
R^2	0,00	0,00	0,00	0,02
Panel B			MOIC	
Constant	11,78	-1,81	-1,01	7,40
	(14,14)	(4,53)	(4,65)	(2,65)
Smallest funds	-1,19			
	(1,74)			
2. smallest funds		0,37		
		(0,52)		
2. largest funds			0,27	
			(0,50)	
Largest funds				-0,60
				(0,27)
R^2	0,00	0,00	0,00	0,07

In the above table are the results of the OLS regression analysis of returns and fund size quartiles. In table A are the results of IRR and size and in table B are the results of MOIC and size. Standard errors are reported in brackets.

These regression results indicate that there is no relation between returns and fund size. Fund size does not affect either return variable. Size variables are not statistically significant. Moreover, the R-squared is approximately zero, meaning that the model does not explain the returns. These results are similar to the findings of Harris et al. (2014).

7 Conclusions

The aim of this thesis is to conduct an analysis of European private equity funds, including both buyout and venture capital funds. Buyout and venture capital funds are chosen since they are the largest sub-category of private equity funds (Metrick & Yasoda, 2011). The private equity asset class has become an important part of financial markets in Europe, and the capital, investments, and deals have risen substantially during the last two decades (Invest Europe, 2023a). The primary focus of this thesis is to investigate the connection between the returns and capital inflows, as well as the impact of fund size on returns. OLS Regression model is implemented to analyze the relationship between returns and capital inflows, using IRR for 284 PE funds and MOIC for 254 PE funds from 2008 to 2022. The first regression employs capital inflows as the explanatory variable. In the second OLS regression, the study uses size quartiles as the explanatory variable to examine the relationship between returns and size. Compared to the US private equity market, the European PE market is later developed and therefore considerably smaller and less researched. This paper contributes to the existing literature by utilizing the latest available data to analyze the capital inflows and sizes of private equity funds.

The first literature part addresses characteristics that distinguish private equity funds from mutual funds and, discusses also the structure of the funds and how funds operate. The second chapter addresses the history and development of the private equity industry since it is a relatively new asset class compared to public equity and debt markets. Developments and the present state of the European private equity market are discussed as well.

The third chapter discusses different explanations that affect returns. These explanations include capital inflows, leverage, size, experience, operating performance, and crises. Based on the previous studies, one can conclude that multiple variables affect the returns at the deal level and fund level and both GPs and LPs contribute to the returns. The paper proceeds to discuss different findings of previous studies regarding the

returns and more importantly whether private equity as an asset class is more attractive in terms of returns compared to public equity.

7.1 Interpretation of results

The evidence from the previous literature that studies the United States private equity market indicates that there seems to be a connection between capital inflows and returns. Moreover, the relationship is negatively correlated, meaning that after periods where invested capital has risen, private equity funds' returns decrease. Kaplan and Schoar (2005) find evidence of a cycle of boom and bust where capital raised during economic growth times is less likely to receive follow-on investments. Kaplan and Strömberg (2009) confirm those findings and state that there is a negative relationship between private equity fundraising and subsequent returns, indicating that increased capital inflows lead to lower returns. They also observe that during favorable debt market conditions, private equity deals tend to increase. Harris et al. (2014) validate the negative connection between performance and capital inflows in the PE markets. Diller and Kaserer (2009) study European PE funds and find a similar negative correlation between returns and capital inflows that is observed in the US PE market. There is some opposite evidence as well. Robinson and Sensoy (2016) argue that when measuring returns with relative performance measures, such as PME, underperformance reduces during the growth periods.

Based on the previous studies, the first hypothesis of this thesis is that there is a negative connection between returns and capital inflows in European PE funds. Using both IRR and MOIC as dependent variables in separate OLS regressions and capital inflows as explanatory variables, capital inflow coefficients are negative. Thus, this paper confirms that there is indeed a relationship between returns and capital inflows. However, it is statistically significant only for the returns measured with MOIC. Moreover, capital inflows explain better MOIC returns than IRR returns. It is possible that the IRR results can occur due to data-based reasons, since Bloomberg does not contain all the PE funds, thus future research can validate this issue. The findings of MOIC-measured

performance are in line with the previous literature. Similar findings have been observed in the US private equity market as well as in the European PE market. Although previous studies use datasets that focus on the period before the 2007-2009 financial crises (Diller & Kaserer, 2009; Harris et al., 2014; Kaplan & Strömberg, 2009), a similar phenomenon is observed in this study in the 2010s. Moreover, these findings have been observed in the US and Europe, though the private equity markets are significantly larger and more developed in the US than in Europe. For example, in 2022 total fundraising of US PE funds was approximately 611 billion dollars (Falconer, 2024), whereas in Europe it was 170 billion.

The size of the funds has been many times the object of the studies that consider PE returns but the findings are contradictory. The size of the VC funds and BO differ notably, with VC funds being smaller compared to BO funds. Some studies suggest a positive relationship, especially for venture capital funds benefitting more from larger sizes. Larger funds generally perform better, supported by Gianfrate and Loewenthal (2016) and Kaplan and Schoar (2005). Kaplan and Schoar (2005) argue that the relationship is concave, denoting decreasing returns after some point. They conclude that one explanation for that could be that successful GPs may delay fund expansion to maintain returns if they do not find solid target companies. Harris et al. (2014) find opposite evidence in their study, noting no significant correlation between buyout fund performance and size, however, they find that small VC funds underperform compared to other PE funds.

The second hypothesis of this thesis is that size is not connected to PE fund returns. Using fund size quartiles to examine the effects on returns, this paper does not find evidence that there is a connection between size and returns which is in line with the second hypothesis. Size coefficients are not statistically significant. The R-squared is approximately zero for both IRR and MOIC-measured returns, meaning that the returns cannot be explained by this model.

7.2 Limitations of the study

Examining the private equity presents a few challenges. The limitation of this study is that the data is not comprehensive since Bloomberg does not contain data on all private equity funds between 2008 and 2022. That element does not necessarily negate the results of this thesis. They can be interpreted more in an indicative way. Since the fund data presents only a sample, there may occur some biases. Future research should consider a more comprehensive database, such as Preqin when continuing to study this subject.

7.3 Suggestions for future research

This thesis gives a path for future research to study this topic. Future studies could use PME in addition to IRR and MOIC as a return measurement and use a dataset that covers more European private equity funds. Moreover, it could focus on private equity activity in the 2010s and examine if the fund characteristics have changed after the 2007-2009 financial crises. The relationship between previous returns and capital commitments in Europe could be studied as well.

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