"The performance and characteristics of Private Equity"

Do private equity funds perform better than indices like

S&P500 and MSCI index?

Finance

Bachelor Thesis

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1. Introduction

The private equity industry has grown tremendously over the last decades. While investor committed less than $10 billion to private equity partnerships in 1991, they committed more than $230 billion in 2005. This asset class was believed to be an alternative investment for mainly institutional investors or wealthy families, but today more and more individual investors are attracted by private equity.

The first private equity funds have been established in the beginning of the 20th century. Pioneers like Industrial and Commercial Finance Corporation from the U.K. and American Research and Development Corporation made capital and management expertise available for small young start-up companies to develop themselves.

Private equity made its biggest growth in the 1980s. In this decade, the leveraged buy outs were characterized as hostile, which means that a takeover goes against the wishes of the target company's management and board of directors. An example of a hostile takeover in the 1980s is the takeover of RJR Nabisco by the private equity fund Kohlberg, Kravis & Robert. At the end of the 20th century the takeovers changed its character from hostile to friendly, which means that a takeover is supported by the management of the target company.

Today, private equity continues to play a role in the economy. Recently takeovers are the acquisition of Hospital Corporation of America by Kohlberg, Kravis & Robert, and the acquisition of Equity Office Properties Trust by Blackstone.

Despite the increased investments of this asset class and the potential importance of private equity investments for the economy as a whole, there is a limited understanding of what private equity is, and the performance of private equity. Therefore, the aim of this paper is to shed light on the meaning of private equity and its performance relative to indices like S&P500 and MSCI Index.

This paper is organised as follows. The first section will explain what private equity is. We will give several definitions of private equity that have been published in studies over the years. We will also describe the structure of private equity funds and its characteristics and why an investor should invest in private equity. In the next section, we will describe the differences and similarities between hedge funds and private equity funds. Then, in section four we will give a review of different studies that have been published through the years about the performances of private equity. The last section contains the conclusion of this paper.

Section 2. What is Private Equity?

This section will describe what private equity is. We will give an overview of the different definitions that are given to private equity, explain the different categories within private equity and describe the structure of private equity.

2.1 Private Equity

Mathonet, (2004) describe private equity as follows: "Private equity provides equity capital to enterprises not quoted on a stock market. It can be used to develop new products and technologies, to expand working capital, to make acquisitions, or strengthen a company's balance sheet. Private equity also can resolve ownership and management issues. A succession in family-owned companies, or the buyout and buy in of a business by experienced managers may be achieved using private equity funding."

Bauer et al (2001) define private equity as professionally managed investments in unregistered securities of mainly private companies i.e. the securities are not traded on a public exchange market. The investments are mostly in the form of equity, but also other structures combining debt and equity are possible. Most private equity managers acquire large ownership stakes and have an active role in monitoring and advising the companies in their portfolio. Thereby the investment horizon of the private equity managers is limited by an exit strategy with the aim of realizing a return on investment.

Smit (2002) gives a shorter definition of private equity and describes it as the long term commitment to companies, given the feature that the investment cannot be sold in the financial markets.

The broadest definition of private equity is given by Bance (2004). He describes private equity as investing in securities through a negotiated process.

In this paper we will discuss two types of private equity funds, namely venture capital and buyout funds. Other categories like angel investing[1] and mezzanine capital[2] will not be discussed in this paper.

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[1] The angel is a wealthy individual who invests in entrepreneurial firms. Angels perform many of the same functions as venture capitalists, but they invest their own capital rather than that of institutional and other individual investors.

[2] This is a fund investment strategy involving subordinated debt (the level of financing senior to equity and below senior debt).

2.1.1 Venture Capital

Gladstone (2002) defines venture capital in his book as money that is invested in new companies. In general, it means all forms of high-risk capital that finances a new business or buyout business, or an existing business experiencing strong growth. It is a source of private equity.

Huss (2005) describes that venture capital funds provide capital to firms that have difficulties attracting financing. Young firms that are plagued by high levels of uncertainty are helped by these venture capitalists. Venture capitalists provide an entrepreneur with management support. The most of these financed companies are young start-up companies, which have few tangible assets and are operating in a rapidly changing market. The financing of these companies happens by purchasing equity or equity linked securities, while the companies are still privately held.

Bance (2004) describes the different stages in which the venture capital funds finance companies. The first stage is called the seed stage. Here, the financing is provided to research, assess and develop an initial concept before a business has reached the start-up phase. The next stage is called the start-up stage. Venture capital funds finance for product development and initial marketing. In this stage the companies may be in the process of being set up or may have been in business for a short time, but have not sold their products commercially and will not yet be generating a profit. The third stage is called the expansion stage, in which the funds are financing for growth and expansion of a company which is breaking even or trading profitably. The capital that is provided may be used to finance increased production capacity, market or product development, or provide additional working capital. The final stage is called the replacement capital. Here, the venture capital funds purchase shares from another investor or reduce gearing via the refinancing of debt.

2.1.2 Leveraged buyout

Public-to-private or going private transactions are defined as the transaction when a listed company is acquired and subsequently delisted. When these transactions are financed by borrowing then they are called leveraged buyouts (Renneboog and Simon, 2005). A leveraged buyout is called a management buyout if the incumbent management team takes over the company. Outside management teams can also acquire a company and take it private. This is called a management buy in.

Cumming et al. (2007) have published a paper about the performances of these leveraged buy outs. They summarize the results of different studies that have been done through the years.

(Insert table 1)

In general, these studies show that buyouts generate significant financial returns. However, in this paper we will only concentrate on the performance of the transactions that are made by venture capital and buyout funds, e.g. the study by Kaplan and Schoar (2005).

A leveraged buyout or management buyout can be financed by a buyout funds (private equity funds). The buyout fund typically targets the acquisition of a significant portion or majority control of business. They invest in more mature companies with established business plans to finance expansions, consolidations, turnarounds and sales, or spinouts of divisions or subsidiaries. Huss (2005) states that the risk of financing such projects is moderate and so are the expected returns. To compensate the lower expected returns, most buyout funds operate with high leverage structures.

The financing of expansion through multiple acquisitions is often referred as a buy and build strategy. Smit (2002) explains this buy and build strategy in his paper. In a buy and build strategy, the private investor acts as an industry consolidator with the aim of transforming several smaller companies into an efficient large scale network. The initial platform acquisition generates the option for further acquisitions. Additional value is created through the consolidation of synergistic acquisitions as operations become integrated, cost efficiencies are realized, and market share increases. Financial buyers then have several exit strategies available, including a sale to a strategic buyer or a larger financial buyer, or an initial public offering.

Furthermore, Bance (2004) states that buyout funds may take either an active or passive management role.

2.2 Structure of Private Equity

Huss (2005) describes that investing in private equity can be done in two ways: a direct investment or an investment through a fund. A direct investor participates in privately placed offerings and is responsible for the investment process. Such an investment is not only very time consuming and costly, but it requires a certain know-how and experience in the private equity market.

When investing through a fund, one can be faced with problems due to asymmetric information between investors and entrepreneurs. These entrepreneurs have a better knowledge about the real conditions of the firm, the market and potential risk factors.

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Gottschalg and Phalippou (2007) describe the structure of private equity funds as follows. Investors in private equity funds are principally institutional investors such as pension funds. These investors, called Limited Partners (LPs), commit a certain amount of capital to private equity funds, which are run by the managers of the funds, General Partners (GPs). The GPs are specialized in either venture capital investments or buyout investments. When a GP sees an investment opportunity it calls (or draws down) the required investment amount from its LPs. Once a fund has reached its target size in terms of committed capital, it is closed for any further investments and thus, keeps a fixed pool of capital to make investments. When the investment is liquidated, the GP distributes the proceeds to its LPs. A fund typically has a life of ten years. This structure has proven to be most effective due to the professional experience of GPs, when having to deal with information asymmetries and other difficulties tied to this market.

2.2.1. Characteristics of Private Equity

The structure of private equity funds is a fixed limited partnership; therefore early withdrawals are not possible. Moreover, there is often a sales restriction that underlies private equity investments. Huss (2005) states that private equity investments generally are liquid, because when there is a possibility of a secondary sale of fund shares, investors can expect a substantial discount on the net asset value if selling in the secondary market.

When participating in a limited partnership, the investor needs a minimum amount of capital commitment. This minimum differs from fund to fund, but it is a small fraction of the wealth of an investor. So, the potential for diversification is highly restricted.

The private equity market is not transparent. One of the key characteristics in this market is that there is little publicly available information. The lacking of transparency is seen as a necessity for achieving the results, because substantial part of the returns, private equity experiences, is due to the ability to exploit inside information.

2.3 Why an investor is interested in Private Equity

Private Equity has a long and glorious history producing high returns over the last decades. It is believed that these results will continue in the years ahead. Oertmann and Zimmermann (1998) conclude that the rising correlations in traditional asset classes make investors seek for alternative investment possibilities. Private equity seems to be an alternative investment possibility as it offers the investors the opportunity to generate higher absolute returns whilst improving portfolio diversification. Other reasons why an investor should be interested in private equity are given by Bance (2004). He mentions that private equity have access to legitimate inside information. Private equity managers have a greater depth of information on proposed company investments. This helps the managers more accurately access the viability of a company's proposed business plan and to project the post investment strategy to be pursued and expected future performance. The greater level of disclosure helps significantly reduce risk in private equity investments. This information would be considered in the public market as "inside information". Investors in public markets will know less about the companies in which they invest. This is also a reason why private equity exists.

Smit (2002) gives two bottlenecks which are the source of the existence of private equity. The first bottleneck is the information problems in financial markets. One of the basic ideas of perfect financial markets is that each party involved has relevant information. However, in reality, this is not true. This is called information asymmetry. A market undervaluation due to information problems might be a reason taking a firm private, which could be carried out with the help of a private equity investor. The concentrated ownership of a private investor often goes hand in hand with a more direct and complete transfer of information.

The second bottleneck is that a public to private transaction facilitates discipline. A rationale for public to private transaction finds its origin in agency problems caused by separation of ownership and control. Jensen and Meckling (1976) define agency problems as follows: "a contract under which one or more persons (the principal(s)) engage another person (the agent) to perform some service on their behalf which involves delegating some decision making authority to the agent". This theory explains that shareholders are the 'principals' who hire managers, 'agents', to run the company of their behalf, thereby providing the agents with a certain degree of autonomy and decision power. If there is insufficient discipline a danger of moral hazard exists. Moral hazard means that the management abuses its position and decision power and tries to achieve its own objectives rather than the objective of shareholders. In a leveraged buyout, the private equity investor imposes a certain degree of discipline by financing the projects with debt, as this reduces the free cash flow and hence the

opportunities for waste and abuse of corporate resources. This free cash flow theory was introduced by Jensen (1986). He explains that free cash flow is the cash flow available after all tax payments and after all positive NPV projects are funded. The pay out of free cash flows can give a solution to the conflict between managers and shareholders. The manager has the freedom to invest or pay out these cash flows. Shareholders want the cash flow to be invested by the company in projects which yield a return that is higher than the return they receive after investing in the market on their own. When the company has positive free cash flows, it indicates that it has cash left after expenses.

Another reason that is given by Bance (2004) is that private equity funds have influence over management and flexibility of implementation. Private equity managers generally seek active participation in a company's strategic direction, from the development of a business plan to selection senior executives, introduction of potential clients, merger and acquisition strategy and identification of eventual acquires of the business. Furthermore, implementation of the desired strategy can normally be effected much more efficiently in the absence of public market regulation.

However, there are also reasons that investors might not find attractive to invest in private equity. Holding periods between investment and realization can be expected to average three or more years. Because the underlying portfolio assets are less liquid, the investor has very limited or no ability to withdraw its investments during fund's life. Private equity therefore should be viewed as a long term investment strategy. Another reason is that private equity demands increased resource requirement. As a result of the active investment style, the task of assessing the relative performances of different private equity funds is more complex than that of benchmarking quoted funds. This makes investment in private equity funds a more resource intensive activity than quoted market investments. Likewise, post investment monitoring of fund's performance are more resource intensive. The last reason that Bance (2004) gives is the feature "blind pool" investing. A commitment to a private equity funds is to provide cash to the fund on notice from the GP. Although launch documentation will outline the investment strategy and restrictions, investors give very wide degree of discretion to the manager to select the companies that the investors will have a share in. Usually there is no ability at the launch of a private equity fund to preview portfolio assets before committing, because they have not yet been identified.

Section 3. Private equity and hedge funds

This section will explain what hedge funds are. We will also explain the differences and similarities between private equity funds and hedge funds.

3.1 Hedge funds

According to Becket and Doherty-Minicozzi (2000) there is no standard definition of a hedge fund, however, the term is generally used to describe a wide range of investment vehicles with different strategies, structures and fee arrangements. Liang (1998) defines hedge funds as private investment partnerships in which the General Partner make a substantial personal investment. Hedge funds use various trading strategies and invest in multiple securities, including debt and equity securities, futures, options, and foreign currencies. Bevilacquat (2006) mentions different categories of hedge funds which use different strategies. "Event driven" funds focus on events such as mergers and acquisitions, tender offers and distress transactions; "market neutral" funds make long and short position investments to offset the systematic risk of the market; "sectoral" funds invest in companies in specific sectors of the economy; "relative value" funds, search for undervalued securities compared to their growth prospects; "global asset allocator" or "macro funds" use leverage to make global investments in companies, countries and currencies; and "funds of funds" are hedge funds that make investments in other hedge funds.

3.1.1. Characteristics of Hedge Funds

Hedge funds typically seek absolute returns (Rajwade, 2007). There is a lot of flexibility in the way that hedge fund advisers manage their funds. These advisers have the authority to take long as well as short positions in securities. In general, they enter in to and out of positions on a short term basis, using leverage as an additional tool to increase the returns. Hedge funds invest in liquid securities with readily attainable market values. The overall value of a fund can be determined on a regular basis. The fund assets are market-to-market and allow advisers to take both asset management fees as well as an additional incentive amount, which is based on the fund's performance, at certain intervals. Stulz (2007) describes in his paper that the fees are calculated based on the net asset value of the fund. Hedge funds generally receive a 1-2 percent management fee and a 20 percent performance based fee once the fund reaches a certain level of profitability. The asset management fee is paid quarterly, while incentive allocation is usually payable annually.

Since asset can be reduced to cash or invested quickly, funds usually permit investors to withdraw and subscribe at regular intervals.

3.2 Similarities

Bevilacquat (2006) mentions the similarities between hedge funds and private equity funds. Hedge funds and private equity funds are two categories in which various investors pool money to invest in certain securities. Like private equity funds, hedge funds are also managed by a team of skilled investment professionals that solicit investors directly rather than through general advertising, a registered broker, or a public offering. The structure of a hedge fund is the same as a private equity funds, as it is organised as limited partnerships (Lps) and where the management company, which acts as the adviser, holds the general partnership (Gps). Investors, like private equity funds, usually consist of individuals and families, pension funds and insurance companies.

3.3 Differences

Bevilacquat (2006) describes in his paper the differences between private equity funds and hedge funds.

A difference between a private equity fund and hedge fund is that private equity advisers concentrate fund assets in illiquid securities that do no actively trade in public markets. Many of these private equity advisers specialize in providing expansion capital for stable businesses, making leveraged buyouts, management buyouts, or turnarounds of under-performing companies. Private equity advisers try to create value by engaging in operational, managerial and strategic changes to portfolio companies.

While most hedge funds have indefinite lives, most private equity funds are established for a fixed term. This fixed term is usually a period of ten years and consists of an investment period and a holding period. During this investment period, which consists of the first three to five years of the fund, the adviser identifies portfolio companies and makes new investments. After the investment period comes the holding period, which lasts an additional five years to seven years, where little new investments is permitted and existing investments are managed and developed.

Hedge fends usually continue to admit new investors over the life of the fund. Private equity however, typically has a ramp-up period of about six months to a year, after which the fund is closed to new investors. Many private equity funds permit investor redemptions and

distributions of proceeds only upon realized events, when the fund's underlying assets are liquidated. Most private equity funds only make performance fee distributions to advisers after a portfolio company is sold.

Section 4. The performance of Private Equity

Over the past few years literature dealing with private equity has grown, but only a couple of them examine the performance of private equity. In this section we will give a review of the different studies that have investigated the relative performance with respect to public equity by indices like S&P500 or the MSCI index family.

4.1 Methodologies of measuring the performance of Private Equity

Measures to calculate the performance of private equity are mostly done using the Internal Rate of Return (IRR) of a fund (following a cash flow based approach). It can be defined as the discount rate, making the present value of the investment cash flows equal to zero (Ross et al, 2005). Another approach, that was introduced by Long and Nickles (1995), can be used to measure the performance of private equity funds is called the Public Market Equivalent (PME). Kaplan and Schoar (2005) define PME as the sum of all discounted cash outflows over the sum of the discounted inflows, where the total return to the index to which the investment is compared is used as the discount rate. If it is applied to the measurement of private equity and S&P500[3], the PME is calculated by investing or discounting all cash flows of the fund at the total return to the S&P500 and comparing the resulting value of the cash inflow to the fund invested using the total return to the S&P500. So the PME compares an investment in a private equity fund to an investment in the S&P500. A fund with a PME greater than 1 has outperformed the S&P500.

The Total Value over Paid-In-Capital (TVPI) is a performance measurement that is based on cash flows, but does not take into account the time value of money (Ljnungqvist and Richardson, 2003). This measure equals the cash distributions over invested capital minus one.

Cochrane (2004) and Bilo et al. (2004) have followed a different approach. They focuse on the individual portfolio company levels, rather than the funds as a whole. This will be discussed in the next section.

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[3] S&P500 index can be replaced by other indices like the MSCI Index or J.P. Morgan Government Bond Index.

4.2 Performance of Private Equity

A few studies show that private equity outperforms the S&P500. Kaplan and Schoar (2005) used a sample of 746 private equity funds (U.S.) with cash flow data over the time period 1980 to 1997, which were obtained from Venture Economics. They have measured the funds' performance in three ways: IRR obatained from the Venture Economics, IRR calculated by themselves using the funds' cash flows and the public market equivalent (PME). However, Kaplan and Schoar (2004) state there is an issue between the PME and systematic risk or beta. If private equity returns have a better greater (less) than 1, PME will overstate (understate) the true risk-adjusted return to private equity. In their research they do not attempt to make more complicated risk adjustments than benchmarking cash flows with the S&P500.

(Insert table 2)

This table shows that the median IRR (obtained from the VE) in the sample is 12 percent, the average IRR 17 percent equally weighted and 18 percent value weighted. Buyout funds have slightly higher returns than VC funds. The median and average PME are 0.74 and 0.96 which indicates that private equity has underperformed relatively to the S&P500 (using an equally weighted average). The value weighted calculations, that has an average return of 1.21, indicates that private equity out performance the public market. Kaplan and Schoar (2005) conclude that private equity generally performs better than the S&P500 since their sample is net of fees and fees are added back to the fund's return. A key result is the determination of substantial persistence in returns among the top performing funds. They also conclude that improving returns increases with the experience of the GPs.

An explanation for these results is the heterogeneity in the skill and quality of GPs which could lead to heterogeneity in performance and more persistence if new entrants cannot compete with established funds. There are several reasons why it is difficult to compete with established funds. First, unlike mutual funds and hedge funds, private equity investors have proprietary access to particular transactions, which means that GPs may be able to invest in better investments. Second, private equity investors typically provide management or advisory inputs along with capital. Third, Hsu (2004) states in his paper that some evidence show that VCs get better deal terms when negotiating with startups. A startup would be willing to accept these terms if some investors provide superior management, advisory or reputational inputs.

However, Kaplan and Schoar (2005) state that if indeed the persistence results are driven by heterogeneity in GP skill and limited scalability of human capital, it remains puzzling that these returns to superior skills are not appropriated by the scarce input in the form of higher fees. One could conjecture that better performing GPs have better governance structure or LPs who provide more value added.

Another study that comes from Ljungqvist and Richardson (2003) show that private equity investments not only outperform the S&P500 Index, but also the Nasdaq Composite Index. The sample comes from a large Limited Partner in the U.S. and consists of 73 private equity funds that were raised between 1981 and 1993. The funds in which this Limited Partner has invested form the basis of their analysis and are referred as "mature" funds since they have been around for ten or more years. Ljungqvist and Richardson (2003) have not revealed the identity of this partner as they agreed not to disclose certain characteristics of the funds raised after 1993, such as their number and size.

Their primary measure of a fund's return over its life is the internal rate of return (IRR) on invested capital, taking into account the exact time of profile of investments and distributions. IRRs are net of carried interest and management fees and represent actual returns to the Limited Partner. Capital gains are not reinvested in the fund, making their calculation straightforward. The IRR of Ljungqvist and Richardson (2003) differ from the IRR that were used by Kaplan and Schoar (2005), because they only count cash events (cash flows into and from portfolio companies annual management fees) and ignore unrealized capital gains (including stock distributions held in inventory) or capital losses. The IRRs that were reported by the Venture Economics represents a mixture of growth in net asset value for unrealized investments and cash IRRs for realized investments. Basically they have focused on the realized cash flows and left the net asset value aside.

Ljungqvist and Richardson (2003) found a mean IRR of 19.81 percent and a value weighted average of 18.13 percent.

(Insert table 3)

Further, they calculated the TVPI of the funds and also investigated the relative performance to a public market investment on the basis of excess IRR, which is the difference between a fund's IRR and the return on the public equity market. The purpose was to compare an investment of a total of one dollar in a private equity fund, spread out over the fund's life, to

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an investment of a total of one dollar in the market index, spread out in the same way and held until the end of the private equity's life. So they have compared returns over both roughly equivalent time period and with similar durations.

However, Ljungqvist and Richardson (2003) note that there are two potential problems with the excess IRR measure. First, many funds distribute capital prior to liquidation. The IRR calculations assume that these early distributions can be reinvested at the fund's IRR. The problem arises that it will weaken the differences (both negative and positive) in relative performance. Second, IRR calculations assume one discount rate for all cash flows. Some argue that outflows, like investments, should be discounted at a different and lower rate than inflows. If that is the case, IRRs will tend to overstate the performance of the fund relative to the true risk profile of the cash flows. A solution for these problems is to calculate the ex post net present value of investing in a fund, using realized cash flows discounted at the risk free rate for outflows and the cost of capital for inflows. In their paper they used the Treasury bond rate with corresponding maturity for the outflows, and the expected return on the aggregate market for the inflows. Next, the net present values are scaled by the present value of the investment, which is called the Profitability Index. This index can be thought of as the present valued return on invested capital, that is, the excess value created for each dollar. So, one dollar invested in private equity is worth one plus the Profitability Index in present value terms. The following table presents the distribution of the excess IRRs and the Profitability Indices, relative to various benchmarks, for the mature funds raised between 1981 and 1993.

(Insert table 4)

Ljungqvist and Richardson (2003) conclude that private equity investments outperform six to eight percent relative to the S&P500 and roughly three to six percent relative to the Nasdaq Composite Index. They suggest that the source of the outperformance may be related to the type of fund, such as buyout versus venture, and the timing of the fund.

Diller and Kaserer (2005) analyze the determinants of Europe private equity returns. The aim of their paper is to show that the 'money chasing deals' phenomenon explains a significant part of variation in private equity funds' return. This phenomenon states that there should be a negative correlation between a fund's performance and the amount of money directed to the private equity industry (Gompers and Lerner, 2000). They found this is especially true for venture funds, as they are more affected by illiquidity and segmentation than buy-out funds.

Diller and Kaserer (2005) also found that GPs' skills as well as the stand-alone investment risk of a fund have a significant impact on returns. Moreover, they seem to be unrelated to stock market returns and negatively correlated with the growth rates of the economy as a whole.

Diller and Kaserer (2005) used a data set that was provided by Thomson Venture Economics over the period 1980-2003 and contains 777 European Funds. Due to several limitations, their study is based on liquidated and mature funds only, which leads to a sample size ranging between 95 and 262 funds.

(Insert table 5)

To measure the performance they have used the PME, excess IRR and the undiscounted payback period, which can be defined as the number of months it takes before cumulated distributions equal cumulated take-downs.

(Insert table 6)

This table shows that they have found average median returns from 7.28 percent in the liquidated funds sample up to 9.56 percent in the sample that also contains mature funds, and average returns from 10 percent to 14 percent. The results are slightly lower than the results reported by Kaplan and Schoar (2005) for the U.S. market, as they reported an average IRR of 17 percent (equally weighted). The performance is measured relative to the MSCI Europe and the J.P. Morgan Government Bond Index.
The next table shows the excess IRRs to the MSCI Europe, which are 0.58 percent and 6.68 percent.

(Insert table 7)

On basis of PME calculation, Diller and Kaserer (2005) show underperformance of private equity investments with respect to the MSCI Index.

Gottschalg and Phalippou (2007) found an underperformance of three percent per year with respect to the S&P500 and a gross performance that is above that of the S&P500 by three

percent. They used a data of 1328 mature private equity funds obtained from Thomson Venture Economics. The sample contains the amount and date of all cash flows as well as the total quarterly book value of all unrealized investments (this is called residual values) for private equity funds from 1980 to 2003.

Unlike Kaplan and Schoar (2005) they did not find evidence of a concave relationship between performance and size nor between performance and fund sequence. They also did not find evidence of either money chasing deal effect, or of a performance difference between venture capital and buy out funds. In contrast, they find significant underperformance from EU focused funds. An explanation for the underperformance could be the objectives of the LPs, which is not only to maximize the return, but also to increase the purchases of services that the LP's corporate parent has to offer. These side benefits include consulting work and underwriting securities for debt or equity issues.

However, both studies, Kaplan and Schoar (2005) and Gottschalg and Phalippou (2005) find performance persistence.

Cochrane (2004) has followed a different approach, as he focuses on the individual portfolio company level, rather than on the funds as a whole. In his paper, he cites reasons why the risk and return of venture capital might differ from the risk and return of traded stocks. First, investors might require a higher average return to compensate for the illiquidity of private equity. Second, private equity is typically held in large pieces, so each investment might represent a sizeable fraction of the average investor's wealth. Third, VC funds often provide a mentoring or monitoring role to the firm. Compensations for these contributions could result in a higher measured return.

Cochrane (2004) obtained data from Venture One. He measures the performance of the financing rounds for 7765 companies. The main focus of his analysis lies in adjusting selection bias. He uses a maximum likelihood estimation that corrects the bias. Cochrane (2004) shows that the mean average returns decline from 698 percent to 59 percent when he controls for selection bias. Also he assumes that intermediate cash flows can be reinvested at a fund's IRR.

Bilo et al. (2004) concentrate on a data set of 229 listed private equity vehicles to examine the risk and return structure on this asset class. Listed private equity funds are instruments in which the underlying business is private equity investing, but the funds themselves are quoted on an exchange. Companies which only partly invest in private equity are excluded (e.g. investment banks, holding companies, venture capital pools) in their paper. These instruments fall into three categories. First they only used listed companies whose core business is private equity. The second category is the quoted investment funds, which invest a predetermined proportional equity share to specific private firms together with the company's funds. Third, they used specially structured investment vehicles which invest in private equity directly and indirectly through various private funds.

Bilo et al. (2004) document substantially larger Sharp ratio of 1,5 for listed private equity firms than for traditional asset classes. They also calculated a positive correlation between private equity and the MSCI World of 0.40 and the Global Bond Index of 0.02.

Huss (2005) describes in his paper the advantages of listed private equity. There are numerous advantages for an investor willing to engage in this type of private equity investment. One of the key advantages of listed private equity is the marketability and the availability of the market price. Private equity in the listed form is no longer illiquid. Investors are able to trade listed private equity as any other quoted asset.

Since a listed company has strict requirements concerning the publication of news and other information, listed private equity is far more transparent than its unlisted counterpart. Clearly, there is no minimum investment required, nor are there some other restrictions linked to listed private equity.

An academic advantage of listed private equity is that due to the availability of market prices, standard portfolio management tools can be applied to assess the risk and return characteristic of this asset class, at least if listed private equity really proves to bear the same characteristics as common private equity.

However, Huss (2005) states that the private character of private equity is reduced in some way.

Section 5. Conclusion

This paper has given a literature review of the performance of private equity and its characteristics.

First we have mentioned the definitions of private equity that are given by different studies over the years. We find that private equity can be divided into two main categories, venture capital and leveraged buyouts. Next, we described the structure of private equity and learn that investors, called limited partners, commit capital to private equity funds, which are run by the managers of the funds, called general partners. A feature of this structure is that it is a fixed limited partnership, which means that early withdrawals are not possible. A main characteristic of the private equity market is that it is not transparent. There is little publicly available information. However, the lacking of this transparency is seen as a necessity to achieve result, because part of the returns is due to the ability to exploit inside information. Smit (2002) explains that the need for inside information is the source of the existence of private equity due to information asymmetry and agency problems.

In the following section we described what hedge funds are, the differences and similarities between hedge funds and private equity funds. We found that the structure of hedge funds is the same as the structure of private equity funds. The most important difference that we have found between hedge funds and private equity funds is that hedge funds concentrate on short term investments and private equity funds concentrate on long term investments.

At last, we have summarized different studies that have measured the performance of private equity over the years. First, we have described the different methodologies that are used to measure the performance of private equity. Next, we have summarized the results that have been published by different studies through the years. We found that some studies show outperformance (Kaplan and Schoar (2005), Ljungqvist and Richardson (2005), Cochrane (2004) and Bilo et al. (2004)) and some show underperformance of private equity funds (Diller and Kaserer (2005) and Gottschalg and Phalippou (2007)).

Kaplan and Schoar (2005) explain that their results are due to the heterogeneity in the skill and quality of GPs. This could lead to heterogeneity and persistence in the performance. They also find improving returns when the experiences of GPs increase. Ljnugqvist and Richardson (2005) give suggestions that the source of the outperformance may be related to the type of fund and timing of the fund. Cochrane (2004) and Bilo et al. (2004) have used a different approach measuring the performance as they have focused on the individual portfolio company. However, these studies did not give an explanation for their results. Huss (2005) mentions the advantages of listed private equity in his paper. This could be an explanation for

the results of the work of Bilo et al. (2004). He mentions that one of the key advantages of listed private equity is the marketability and the availability of the market price.

Diller and Kaserer (2005) found that GP's skills as well as the stand-alone investment risk of a fund have significant impact on the returns of a private equity funds. In their study they show underperformance of private equity relative to the MSCI index. Gottschalg and Phalippou (2007) explain the underperformance of private equity funds are due to the objective of LP's, which is not only to maximize the returns, but also to purchase services that the LP's corporate parent has to offer.

More research has to be done to say if private equity funds perform better than indices like S&P500 or MSCI Index, as most studies give suggestions about why private equity under or out performs the indices. Further research can be done about the performance drivers of private equity funds, and more about the organizational structure of private equity funds i.e. corporate governance.

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Appendix

Table 1: Studies of Financial (Firm-Level) Returns to Private Equity and Leveraged and Management Buyouts and Private Equity: post-1995

This table contains the studies that have been published since 1995 and cover both the US and various European countries.

Authors	Country	Nature of Transactions	Findings
Wright, Wilson, Robbie (1996)	U.K.	Matched MBOs and non-MBOs	Profitability higher for MBOs than comparable non-MBOs for up to five years
Van de Gucht and Moore (1998)	U.S.	MBO,MBI,LBO	Share prices higher in aftermath of LBO
Andrade and Kaplan (1998)	U.S.	LBOs	Net effect of high leverage and distress creates value after adjusting for market returns
Halpern et al (1999)	U.S.	MBOs & non-MBOs	The poorer the prior performance of the LBO, the higher the share premium but moderated by size of managerial equity stake; low management stake cases more likely to exit
Cotter and Peck (2001)	U.S.	LBOs	Corporate governance mechanisms substitute for debt
Goh, Gombola, Liu and Chou (2002)	U.S.	MBO, MBI, LBO	Share prices higher in aftermath
Desbrieres and Schatt (2002)	France	MBOs, MBIs	Accounting performance changes depend on vendor source of deal
Citron, Wright, Rippington and Ball (2003)	U.K.	MBOs, MBIs	Secured creditors recover on average 62% of loans in failed buyouts
Cumming and Walz (2004)	U.S., U.K., Continental Europa (39 countries)	MBO/MBI/LBO, and VC	Private returns to investor in relation to law quality, fund characteristics and corporate governance mechanisms
Kaplan and Schoar (2005)	U.S.	VC and Buyout Funds	Persistence in returns among top performing funds
Renneboog, Simons and Wright (2006)	U.K.	MBO/MBI	Share prices higher in aftermath of LBOs associated with pre-buyout undervaluation of firm, incentive alignment, and interest tax shields
Groh and Gottschalg (2006)	U.S.	MBOs	Risk adjusted performance of U.S. buyouts significantly greater than s&p index
Nikoskelainen and Wirght (2006)	U.K.	MBOs	Private returns to investor enchanced by context-dependent corporate governance mechanisms

Table 2: Private Equity Returns: Cash Flow Based

This table shows the three different performance measures for all private equity funds, VC funds only, and LBO funds for the 746 funds with largely complete cash flow data. The first number in each cell is the median return; the next is the average return; followed by the standard deviation. The last row in each cell indicates the returns at the 25th and 75th percentile.

The first panel of the table reports equal-weighted performance measures while the second panel reports size-weighted performance measures (where size is the amount of committed capital that a fund has). The PME is calculated by discounting cash inflows and outflows with the returns in the public markets over the same time period. The benchmark that was used to discount funds are the returns on the S&P500 index. The variable IRR_{CF} is the IRR at the end of a fund's lifetime based on actual cash inflows and outflows. The variable IRR_{VE} contains the IRR that are reported to VE at the end of a fund's lifetime.

	Equally Weighted			Size Weighted		
Sample	All Funds	VC Funds	Buyout Funds	All Funds	VC Funds	Buyout Funds
IRR_{VE}	0.12	0.11	0.13	0.14	0.14	0.15
	0.17	0.17	0.19	0.18	0.18	0.19
	(0.32)	(0.34)	(0.27)	(0.19)	(0.19)	(0.19)
	0.04;0.20	0.03;0.19	0.06;0.24	0.08;0.22	0.05;0.22	0.09;0.23
IRR_{CF}	0.12	0.11	0.13	0.12	0.13	0.13
	0.17	0.17	0.18	0.18	0.17	0.18
	(0.31)	(0.30)	(0.22)	(0.26)	(0.31)	(0.26)
	0.03;0.22	0.03;0.22	0.05;0.22	0.04;0.23	0.03;0.23	0.06;0.20
PME	0.74	0.66	0.8	0.82	0.92	0.83
	0.96	0.96	0.97	1.05	1.21	0.93
	(0.81)	(0.69)	(0.52)	(0.70)	(0.74)	(0.65)
	0.45;1.14	0.43;1.13	0.62;1.12	0.67;1.11	0.55;1.40	0.72;1.03
No. Of Oberservations	746	577	169	746	577	169

Table 3: Fund Performance By Vintage Year

This table contains the internal rate of returns that are calculated by Ljungqvist and Richardson (2003). They are based on precisely dated cash flows. Unrealized capital gains or capital losses are ignored. IRRs are net of carried interest and management fees and represent actual returns to the Limited Partner. The mean IRR is simply weighted. The weighted average IRR is weighted by fund size. Mature funds have at least nine years of data post-first closing. These have either been liquidated or are likely to have earned most of their returns already.

Vintage Year	No. Of funds	No. Of funds with IRR data	Internal rate of return (in percent)					
			mean	weighted average	st. Dev.	first quartile	median	third quartile
Mature funds								
1981-1993	73	73	19.81	18.13	22.29	9.85	18.66	28.59

Table 4: The Relative Performance of Private Equity Funds

Panel A reports the excess IRRs between private and public equity investments for the 73 funds raised between 1981 and 1993. Excess IRRs are measured as the fund's IRR minus the return on a market index.

Panel B reports Profitability Index estimates for the 73 funds. The Profitability Index is a measure of the Limited Partner's return on invested capital, present-valued using various estimates of the cost of capital. It is computed as the ratio of the NPV of the fund's cash flows to the present value of the investment. All cash outflows are assumed riskfree and so discounted at the riskfree rate. Cash inflows are discounted at two different measures of the cost of capital: the annualized return on the S&P 500 or the Nasdaq Composite Index between the date the fund was raised and the date the fund matured.

Public equity returns	Relative to S&P500 (in%)					Relative to Nasdaq Composite (in%)				
	Mean	St.dev.	First Quartile	Median	Third Quartile	Mean	st.dev.	First Quartile	Median	Third Quartile
Panel A: Excess IRRs										
Excess IRRS=Fund Irr-Rm Where Rm is the IRR of ...										
… buy index at fund closing, sell at end of year 10	8.06	22.54	-2.34	6.04	15.01	6.28	23.01	-4.16	4.01	13.73
… invest $1 according to the average fund's draw down schedule, hold till end of year 10	7.17	22.93	-2.51	4.74	15.17	4.78	23.74	-6.34	2.85	11.59
… invest $1 according to the average fund's draw down schedule, sell at average index value in year 10	7.48	22.69	-2.23	5.63	16.03	5.39	23.11	-5.02	3.32	13.31
… invest $1 according to the fund's actual draw down schedule, hold till end of year 10	5.71	22.67	-4.21	4.06	13.82	2.63	23.34	-7.24	0.92	9.69
… invest $1 according to the fund's actual draw down schedule, sell at average index value in year 10	5.93	22.57	-4.49	3.94	14.23	2.62	23.16	-8.90	1.51	8.59
Panel B: Profitability Index	25.07	80.65	-23.65	12.18	48.03	9.96	79.39	-39.18	-9.93	38.37

Table 5: Characteristics of the three data subsamples

	Liquidated funds	Sample I	Sample II
Number of observations			
VC	47	99	131
BO	48	101	131
Total	95	200	262
Size in m€			
Average	52.14	78.05	121.24
Median	26.2	33.1	39.1
st.dev.	103.62	128.89	433.76

Table 6: Distribution of IRR (CF), IRR ($^1/_2$NAV) and Payback Period for Different Fund Types (in %)

IRR (CF) is the internal rate of return calculated on basis of its cash flows and the net asset value as a final cash flow. IRR ($^1/_2$NAV) is the internal rate of return assuming that only 50% of the net asset value can be realizes as a final cash flow.

IRR and Payback	IRR (CF)			IRR NAV=50%	Payback in Month		
	VC	BO	Total		VC	BO	Total
Liquidated Funds							
Average	7.32	12.64	10.01		108.53	83.63	94.62
Median	4.77	9.79	7.28		110.00	84.50	95.50
Sample I							
Average	12	13.39	12.69	12.41	102.79	78.38	90.35
Median	8.05	9.14	9.14	8.93	104.00	70.00	90.00
Sample II							
Average	12.5	15.63	14.07	13.47	99.58	81.48	90.09
Median	7.4	11.00	9.56	10.76	96.50	71.00	84.00

Table 7: Excess-IRR and PME of Private Equity Funds

The excess IRR is in this table defined as a fund's IRR minus the return on the MSCI Index Europe equity index that can be achieved by investing at fund closing and selling at the end of a fund's lifetime. The PME is the ratio of the present value of all cash distributions over the present value of all take downs.

	Excess IRR			PME		
	VC	BO	Total	VC	BO	Total
Liquidated Funds						
Average	-2.27	3.37	0.58	0.82	0.90	0.86
Median	-4.17	-0.77	-2.70	0.68	0.89	0.80
Sample I						
Average	3.62	5.29	4.45	0.98	0.94	0.96
Median	-1.37	1.57	0.61	0.75	0.86	0.82
Sample II						
Average	5.10	8.25	6.68	1.01	1.06	1.03
Median	0.64	3.53	1.71	0.76	0.92	0.85